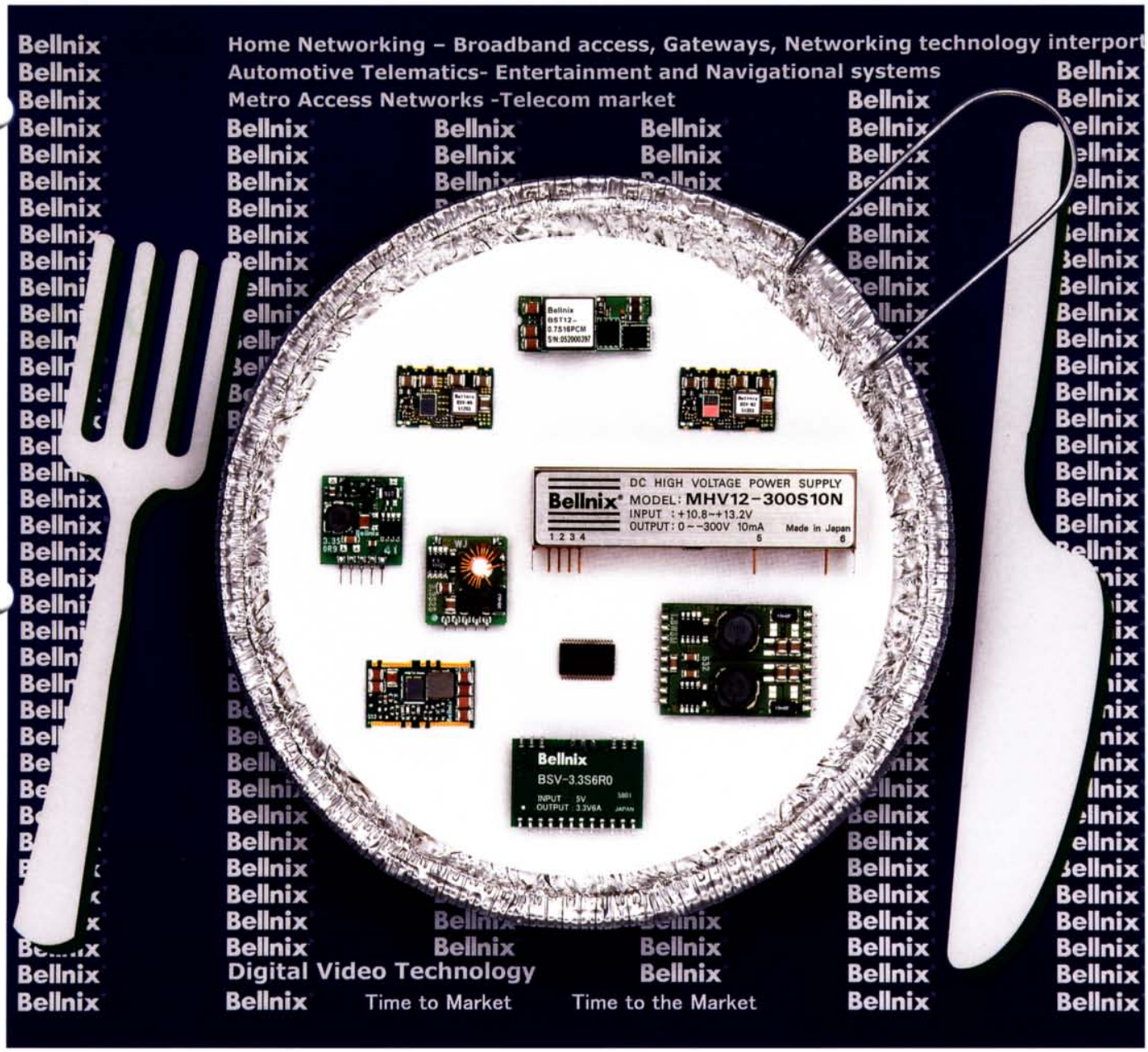
MCM-IC for DC-DC Converters
POL DC-DC Converters
Isolated-Type DC-DC Converters
High Voltage DC-DC Converters
Ultra Low Noise AC-DC Switching Power Supplies

Bellnix PRODUCTS SELECTION GUIDE 2006-2007: DC-DC Converters AC-DC Switching Power Supplies High Voltage Power Supplies



Bellnix BDD2005.10B(EV) PRODUCTS CATALOGUE GUIDE

Bellnix is proposing their original technology to the world.

Bellnix®

Safety Standards

Be sure to go through the data sheets before using these products.
When using these products, pay attention to the notes written below and design. If you make a mistake in use, smoke or fire may occur.
And when the individual notes are overlapping, the individual notes will take priority.

Notes !

"Safekeeping"

- Keep these products within the standard of the specification or the data sheet.
- Do not keep these products within where corrosive gas occurs or within where there is much dust.
- Do not keep in strong electric field or the magnetic field. It will cause trouble.
- For safekeeping with dampproof package article, follow the notice of the specification and so on.

"Using environment and conditions"

- This digest catalogue is an outline of the products. Be sure to read the data sheets before using these products.
- For the use environmental condition, use within the standard of the specification or the data sheet.
- Avoid using at over load, because it may cause smoke and damage.
- For products that do not have built-in input protection element, for protection against smoke and damage when using, connect a protection fuse outside the input pin. In the individual pages, besides the products which have the description of "input protection element" do not have the input protection element built-in.
- For the products in metallic cases, pay attention to the isolation of the bottom and surrounding components, along with the pattern.
- Do not use in place with strong electric field, magnetic field and where corridible gas may be generated.
- When there is possibility that serge voltage will be impressed, implement a serge voltage prevention countermeasure.
- For products which are not in cases, be careful not to touch because there is a high-pressure part inside. There also is a possibility to get an electric shock.
- For products which have ventilating holes or which are not in cases, be careful that no foreign obstacles get in. It may cause damage, fire and electric shock.
- For the products in cases, do not remove or take apart the cases.
- Do not remodel or process. We can not take responsibility for those remodeled or processed products.
- Do not resolve or remodel the inside. It may cause electric shock.
- This product is not designed to sustain radiation. Therefore, do not use for atomic control system and medical equipment etc.
- Be sure to be safety designing not to cause damages of accidents resulting in injury or death, and fire accidents etc.
- The measurement circuit in the specification or data sheet is the standard for these products connection. Damage may occur, so please inquire when using in exception.
- Request for repair to our sales shops you purchased the product. Repairing by customer itself will be extremely dangerous, so, make sure not to do it at all.
- It is prohibited to use these products in case that the damage of the product may affect directly to the life and the property.
- The soldering may degrade, so be careful when safekeeping in a place with high-temperature, humidity and rapid temperature change for more than one year.
- If it drops, the pins may be bent or the components may be damaged, so be sure not to give strong impact by dropping etc.
- The intention of these products are to be used for general electronic devices (communication equipment, business equipment, measuring equipment and home electric appliances). Therefore, do not use for medical equipment, atomic equipment, and trains, malfunction and damage of which may cause influence directly to human life and property.
- Always keep the standards (input voltage, operating temperature and so on), without fail.
  Also, always verify the product before using, and confirm each polarity (input and output) that there is no miss wiring before energizing.
  <<Wrong way of using will cause smoke fire.>>
- When there is a problem, an excessive voltage may occur to the output and cause voltage decrease. Built-in a protection circuit (over-voltage protection, over-current protection etc.) assuming to have problems of malfunction and damage of the equipments.
- When there is a possibility that opposite voltage may be impressed, confirm the data sheet before using.
- As for the step down DC-DC converters, due to the damage mode, sometimes the input voltage appears as it is. There is a mode that even if you stop the operation, the input voltage appears as it is to the output and may cause smoke and fire. To prevent these, be sure to add an over-voltage protection circuit. <<When overvoltage occurs, the remote ON/OFF pin of these ICs do not function (BIC)>>.
- These products include high voltage power supplies, so do not remove or take apart the cover because there is a possibility of getting shocked. (BYH, MHV, SHV, PHV)
- Do not touch the high voltage output pins. It is extremely dangerous. If you touch it, you may get electric shock. (BYH, MHV, SHV, PHV)

- The contents specified herein are accurate and reliable, however we shall not take any responsibilities for any damages and loss or infringement of patent and any other rights, as a result of using these materials.
- Bellnix reserves the right to make changes to the product(s) or information contained herein for product improvements without notice.
- We have made efforts to improve quality and reliability, however examine a safety design that is redundant, fire spread preventing and malfunction preventing for necessity, which will prevent accidents resulting in injury or death, fire accidents and social damages etc. as a result whenever necessary.
- This material does not guarantee the execution of patent or other rights of third party or approve the right of execution thereof.
- Reprinting and copying these materials are not allowed partially or totally without our prior written approval.
- Please contact for any questions about the use of these products.
- Products will be changed over to RoHS compliant products serially, once they become out of stock.

Warranty Information

The products specified in this catalogue shall be under warranty for 1 year. If detects should occur during the warranty period due to the design or workmanship attributable to Bellnix, we will repair or replace it free of charges.
However, if any inside remodeling has been done by customer, shall be out of warranty.
Also, our guarantee shall be for the damage and loss for our own product and not for the defects which may cause due to the loads. In case you request for a warranty exceeding said replacement warranty when defect occurs, prior consultation will be made by and between the parties hereto regarding the scope of warranty therefor, and present a quotation to conclude an individual contract.
Also, the products specified in this catalogue, shall not be used for the case directly affecting to life and property caused due to the defect of these products.
Please contact for any questions.

Export regulations for strategy goods

- BIC series is classified into integrated circuits, in the export regulations 1-7 section of the attached table, and the ordiance of the Ministry of Economy, Trade and Industry clause 6. (This regulation is restricted only when exported from Japan.)

Notes for "Tentative specification products".

This digest catalogue introduces new products that are still under development. This is to listen to our customers request, so manufacturing its product by us shall not be guaranteed accordingly it is.

Under Evaluation Tentative

Be sure to contact our sales group before using a product with "Tentative" mark on.
These tentative specification products are also subject to change without prior notice.

- **Most abundant varieties in the industry**
- **Various technologies**
- **High Isolation technology**
- **Low voltage operation technology**
- **High density**
- **High voltage technology unique in wide world**
- **Lightweight technology**
- **Ultra small size**
- **Ultra low noise technology**
- **Ultra high efficiency technology**
- **Ultra low profile technology**
- **High-speed response technology**

- The originality of technology achieved MTBF 1,000,000hrs- Reliability has been proved

In 1986, BELLNIX was the first to develop a 24pin DIP-IC size DC-DC converter, BY series and began to sale in Japan. The royer circuit, world standard circuit, was the mainstream of the industrial's DC-DC converter at that time. However, it was a low reliability product since the circuit method had many problems and lots of defects occurred. BELLNIX has developed its original TCT circuit method which have solved these problems fundamentally, and commercialized it as BY series. This BY series is an innovative product practically adopted not only the circuit method but also technology innovation such as metallic-shield case, no electrolytic capacitor, no tantalum capacitor, development of SMT micro transformer, original low noise technology, full surface mount structure and so on, which has took leading in the world. As for the B series of BELLNIX, these latest technology, long life and high performance have been highly evaluated and the sale accomplishment have reached to more than 1,000,000 in grand totals. Furthurmore, in these 19 years defected products were negligible small, which has much contributed to the electronic equipment world by maintaining amazing reliability and long life.

- Unique and various product group with most variaties in the industry which have clarified the usage and purpose

BELLNIX is a leading power supply manufacturer in this industry which has accumulated broad technology, such as high frequency switching regulators, high-voltage power supplies and digital control power supplies etc., in addition to the DC-DC converter. Bellnix's DC-DC converters have made the best of these power supply technologies, rich experience and achievements, not only for manufacturing DC-DC converters but also for clarifying the usage and working on developing new products on the basis of usage-environment and manufacturing design most suitable for the loads.

- Bellnix's original technology

* TCT circuit method (patented)	A large reduction of switching loss and long life technology which realizes the smooth without depending on the capacitor
* I type resonant circuit method	A partial resonant circuit which realizes high efficiency with the cockcroft boosting voltage circuit
* Ultra high efficiency synchronous rectification technology	A technology which applies the POWER MOS FET as the rectification element and makes the conversion efficiency of the converter 95% or above
* Ultra high isolated technology	It achieves the I/O isolation of DC6000V and AC4000V which are required in the EN standard, with an ultra small size
* Ultra low noise technology	Commercialized with 1mVpp-3mVpp by the ultra low noise technology which can be used in a high accuracy analog circuit
* Noise filter technology	Not only the normal mode but considered the common noise, radiation noise and common impedance
* High voltage circuit and mounting technology	With the latest SMT technology, the 100V-2000V output DC-DC converter has been miniaturized to 1/8
* High voltage components for producing device technology	As a pioneer, the new material technology which actualized commercialization of high voltage output DC-DC converter by SMT
* Wide input range circuit technology	The gate drive technology that can corrrespond to high efficiency with the 4:1 input voltage range unique control system
* Technology for high and low temperature	The application technology has made the -40°C to +85°C operation possible by using the know-how of the MIL standard power supply
* The latest surface mounting technology	Surface mount technology has made the best of our 13years achievement and it secures reliability and furthermore corresponds to ultra high density mounting

- Bellnix's products usage examples - rich experience and achievements

* Telecommunication equipment	Mobile communication, mobile satellite communication, POS, industrial navigator, LAN, CP network and the electronic switching machine
* Radio equipment	Disaster prevention radio system, ship wireless, police wireless, defense equipment, telemeter system and river information equipment
* Medical equipment	Ultrasonic diagnostic equipment, cardiograph, radiation equipment, CT scanner and other medical equipments
* Electronic tube equipment	CRT, hi-vision camera, X ray pipe, progress wave pipe, photomultiplier tube and television projector
* Tram & vehicle electronic device	Train wireless and ATS
* Ship equipment	Ship wireless, sonar, shoal of fish finder and ship radar
* Electric power equipment	Thermal power generation, hydroelectric power generation, gas power generation, nuclear power generation and substation equipment
* Board use	VME boat, isolated A/D converter, isolated D/A converter, CPU board, LAN board and the I/O board
* Physics research	For elementary particle detection, high-voltage distributor, NIM power supply, BIN power supply and neutron detection equipment
* Aircraft equipment	Inboard video system, cockpit CRT monitor, inboard announcement system and Doppler power supply
* Aerospace industry	Exploration satellite, space shuttle built-in equipment and observation radiation equipment
* Computer	I/O equipment, LAN, various automatic control, laser printer and computer
* Optical electronic equipment	Optical communication and avalanche photodiode bias
* Defense equipment	Infrared rays camera, radar, noctovision camera and missile installed equipment
* Semiconductor manufacturing equipment	Ion driving, electron gun, ion pump and the various vacuum equipment
* Precision tools	Electron microscope, magnescale, electro discharge machine, mass analysis equipment and the non-destruction inspection equipment
* Control system	FA control, crane control, system control and robot

Bellnix Step-Up DC-DC Converter

Model	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BUP	3	3.3 (3.3-5.0 Adjustable)	0-0.9	1.3-(4.2)	-20 to +70	Non-Isolated	86	14

BUP

Bellnix MCM-IC for High Efficiency Synchronous Rectification Step-Down DC-DC Converter

Model	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Operating Temp. °C	Package	Efficiency %	Page
BIC1421	15	3.3/5	0-3	8-40	-30 to +85	SSOP32	89	15
BIC1422	15	2.5-12	0-3	8-40	-30 to +85	SSOP32	89	15
BIC1222	15	2.5-12	0-5	8-20	-30 to +85	SSOP32	88	15
BIC221C	15	0.8-12	0-3	4.5-20	-30 to +85	SSOP32	87	15

BIC1421

Bellnix 8pin, 14pin IC size Small Size, Non-Isolated Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Output Current (mA)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
EB	0.3	-5, +12, -12, +15, -15	0-20/50	4.5-5.5	100	0 to +70	Non-Isolated	75	16
EC	0.6	-5, +12, -12, +15, -15, -24	0-25/100	4.5-5.5	300	0 to +70	Non-Isolated	75	16

8pinDIP-IC 16pinDIP-IC

Bellnix Ultra High Efficiency, Non-Isolated Type POL Single Output DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BSA	5	3.3 (3.0-5.0 Adjustable)	0-1.2	9-36	60	-20 to +70	Non-Isolated	82	17
		12 (9.0-12.0 Adjustable)	0-0.55	18-36	100			88	
BSA	15	1.8 (1.0-3.3 Adjustable)	0-6	3-5.5	30	-20 to +70	Non-Isolated	86	18
		3.3 (3.0-5.0 Adjustable)	0-2.2	9-36	50			82	
		12 (9.0-12.0 Adjustable)	0-1	18-36	100			91	
BSI24-mini	6	3.3/5	0-1.2	8-36	40	-10 to +70	Non-Isolated	87	19
BSI-mini	10	3.3 (1.8-3.3 Adjustable)	0-2	4.75-13.6	30	-10 to +70	Non-Isolated	92	20
		5.0 (3.0-5.0 Adjustable)	0-2	6-16.5	30			93	
BSI	10	2.5 (1.5-2.5 Adjustable)	0-4	2.5-5.25	40	-10 to +70	Non-Isolated	90	21
	10	3.3 (1.8-3.3 Adjustable)	0-3	4.75-13.6	50	-10 to +70	Non-Isolated	91	
	15	5.0 (3.0-5.0 Adjustable)	0-3	6.0-16.5	50	-10 to +70	Non-Isolated	95	

Series	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BSI24	15	3.3/5.0 (1.2-5.1 Adjustable)	0-3	8.0-27.0	40	-10 to +70	Non-Isolated	90	22
BSI-P	20	3.3 (1.8-3.3 Adjustable)	0-6	4.75-7.5	50	-10 to +70	Non-Isolated	88	23
		5.0 (3.0-5.0 Adjustable)	0-4	6.0-16.5				92	
BSI-POWER	40	3.3 (1.0-3.3 Adjustable)	0-12	4.5-13.6	40	-10 to +70	Non-Isolated	93	24
		5.0 (5.0-6.0 Adjustable)	0-8	8.0-13.6	60			95	
BSV-Light	13	1.8 (1.0-3.3 Adjustable)	0-5	3.0-5.5	30	-40 to +85	Non-Isolated	85	26
BSV	20	3.3 (0.8-3.6 Adjustable)	0-6	3.0-5.5	40	-40 to +85	Non-Isolated	93	25
BSV-m3,6,8	9.9-26.4	3.3 (1.0-3.3 Adjustable)	0-3	3.0-5.5	30	-40 to +85	Non-Isolated	96	27
			0-6		50			94	
			0-8		50			96	
BSV-H	39.6	3.3 (0.8-3.3 Adjustable)	0-12	3.0-5.5	30	-40 to +85	Non-Isolated	93	28
BPM	8-40	8.0-15 Adjustable	0-3	20-36	50	-40 to +85	Non-Isolated	93.5	29
		0.8-3.3 Adjustable	0-10	3-5.5	50	-40 to +85		94	
		0.8-5.0 Adjustable	0-8	8-14	40	-40 to +85		93	
		1.2-2.5 Adjustable	0-3	8-36	30	-40 to +85		84	
		3.3-6.5 Adjustable	0-3	11-36	50	-40 to +85		90	
BST	30	0.75 (0.75-3.3 Adjustable)	0-6	2.8-5.5	40	-40 to +85	Non-Isolated	94	30
		0.75 (0.75-5.0 Adjustable)		10-14	30			91.5	
	50	0.75 (0.75-3.3 Adjustable)	0-10	2.8-5.5	25	-40 to +85	Non-Isolated	96	30
		0.75 (0.75-5.0 Adjustable)		10-14	30			94.5	
	80	0.75 (0.75-3.3 Adjustable)	0-16	2.8-5.5	25	-40 to +85	Non-Isolated	95	30
		0.75 (0.75-5.0 Adjustable)		10-14	30			93.5	

Bellnix Ultra High Efficiency, Non-Isolated Type POL Dual Output DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BSD	30	1ch:+1.8 , 2ch:+1.8 (1.0-5.0 Adjustable)	0-3 / 0-3	4.75-13.6	30	-40 to +70	Non-Isolated	87	31

Bellnix Ultra High Efficiency, Non-Isolated Type POL Single Output DC-DC Converter

BSA 5W

BSA 15W

BSI24-mini

BSI-mini 10W

BSI 10-20W

BSI-POWER

BSV-Light

BSV 20W

BSV-m3

BSV-H

BPM

Bellnix Ultra High Efficiency, Non-Isolated Type POL Dual Output DC-DC Converter

BSD

Bellnix Large Capacity, Isolated Type DC-DC Bus Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BE	240	8	48	TBD	TBD	DC2250	TBD	32
		9.6		150	-40 to +85		96.5	
		12		100	-40 to +85		96.3	
BQ	300	10.8	36-60	120	-40 to +85	DC2250	95.5	32
		12	42-53	120	-40 to +85		96	
		12		150				

BE 58.4 × 22.8 × 11.3mm

BQ 57.9 × 36.8 × 12.7mm

Bellnix Ultra Low Noise, Long Life, High Reliability, Isolated Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BY-L	1.5	5, 9, 12, 15, ±5, ±12, ±15	4.75-6	8	-25 to +71	DC500	60	33
BX-L	2	±12, ±15	4.75-6	8	-25 to +71	DC500	60	35
BZ	3.6	5, 9, 12, 15, ±12, ±15	4.75-6	12	-20 to +70	DC500	60	36
BR	4.5	5, 12, 15	4.75-6	25	-20 to +70	DC500	60	37
BR-LB	5	±12, ±15	4.75-6	3	-20 to +70	DC500	64	38

BY-L 20.42 × 32.6 × 11.2mm

BX-L 20 × 49 × 9.8mm

BZ 42 × 49×9.8mm

BR-S 51.3 × 51.3 × 9.8mm

BR-LB 51.3 × 51.3 × 9.8mm

Bellnix Ultra High Isolated, Small Size, Low Combination, Isolated Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BY-C	1.5	5, 9, 12, 15, ±12, ±15	4.75-6	100	-20 to +70	DC500	60	34
BY-H	1.5	5, 12, 15, ±12, ±15	4.75-6	100	-20 to +71	AC1500	60	34
BJ-H	2	±12, ±15	4.75-6	50	-10 to +60	AC4000	55	35

BY-H 20.42 × 32.6 × 11.2mm

BJ-H 30 × 60 × 18mm

BY-C 20.42 × 32.6 × 11.2mm

Bellnix Corresponds to SMD, Wide Input Voltage Range, High Efficiency, Isolated Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BSM	3	3.3, 5, 12, 15, (24), (30), ±12, ±15	4.5-9	45	-40 to +85	DC750	79	39
			9-18			DC750	80	
			18-36			DC750	81	
			36-72			DC1500	81	

Note: (24) and (30) are available by connecting pins.

BSM 22.35 × 33.02 × 8.5mm

Bellnix The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

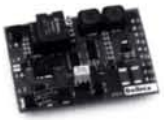
Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BTA	1.5	3.3, 5, 12, 15, (24), (30), ±12, ±15 Note: (24) and (30) are available by connecting pins.	4.5-9	30	-40 to +85	AC500	79	40
			9-18				80	
			18-36				80	
			36-76				80	
BTB	3	3.3, 5, 12, 15, (24), (30), ±12, ±15 Note: (24) and (30) are available by connecting pins.	4.5-9	30	-40 to +85	AC500	81	41
			9-18				82	
			18-36				81	
			36-76				81	
BTC	6	3.3, 5, 12, 15, (24), (30), ±12, ±15 Note: (24) and (30) are available by connecting pins.	4.5-9	30	-40 to +85	AC500	83	42
			9-18				85	
			18-36				87	
			36-76				87	
BTD	10	3.3, 5, 12, 15, (24), (30), ±12, ±15 Note: (24) and (30) are available by connecting pins.	4.5-9	30	-40 to +85	AC500	84	43
			9-18				88	
			18-36				87	
			36-76				88	
BTE	15	3.3, 5	18-36	40	-40 to +85	AC500	89	44
BTF	25	3.3, 5	18-36	40	-40 to +85	AC500	90	45

BTA BTB BTC BTD BTE BTF

Bellnix Low Noise, High Efficiency, Isolated-Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Output Current (A)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BFP	60	5.0	0-12	18-35	100	-25 to +70	AC500	88	46
		12	0-5					87	
		15	0-4						
		24	0-2.5		200				
	120	3.3	0-20	18-35	100	-25 to +70	AC500	86	46
		5.0	0-24					87	

BFP60W

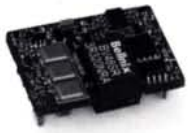


BFP120W

Bellnix 1/16 Brick, Ultra Small Size, Isolated-Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BV48SR	30	1.2	36-75	50	TBD	DC2250	85	47
	37.5	1.5					87	
	45	1.8					88	
	50	2.5					89	
	66	3.3					90.5	
	65	5					91	
	66	12						
	66	15						

BV48SR



Bellnix 1/8 Brick, Ultra Small Size, Isolated-Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BE48SR BE24SR	30	1.2	36-75	40	-40 to +85	DC2250	88	48
	37.5	1.5					89.5	
	45	1.8				DC1500	90.5	
	50	2.5		50			89	
	66	3.3		60		DC2250	90.5	
	60	5					91.5	
	60	12		80		DC1500	92	
	60	15		70			91.5	
	84	12		60		DC2250	93	

BE48SR

Bellnix 1/4 Brick, Ultra Small Size, Isolated-Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Efficiency %	Page
BQ48SX	175	5	36-75	35	-40 to +85	DC2500	91	49
	82.5	3.3		20			90.5	

BQ48SX

Bellnix High Voltage (100V-2000V), World's Minimum Size, Non-Isolated Type DC-DC Converter

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Page
BYH	0.2	100, 200	4.75-5.25	10	-10 to +60	DC250	50
			11-16	10		DC250	
MHV	3	180, 300, 350	10.8-13.2	30	-10 to +60	Non-Isolated	50
MHV	2-3	500	10.8-13.2	40	-10 to +60	Non-Isolated	51
		1000, 1500, 2000	10.8-16.5	50		Non-Isolated	
SHV	2-3	500	10.8-13.2	40	-10 to +60	Non-Isolated	52
		1000, 1500, 2000	10.8-16.5	50		Non-Isolated	
PHV 3.5W	3.5	350	10.8-16.5	100	-10 to +50	Non-Isolated	53
PHV 5W	5	500, 1000, 2000	10.8-16.5	160	-10 to +50	Non-Isolated	53

BYH
20.42×32.6×10.3mm

MHV 180 - 350V
12×80×19.75mm

MHV 500-2000V 12×110×19.75mm
SHV 500-2000V 21×131×14mm including the chassis

PHV 350V 40×60×15mm
PHV500-2000V 40×60×20mm

Bellnix Ultra Low Noise (10mVpp), High Isolation (AC4000V) AC-DC Switching Power Supply

Series	POWER (Watt)	Output Voltage (Vdc)	Input Voltage (Vdc)	Ripple/ Noise (mVpp)	Operating Temp. °C	I/O Isolation (V)	Page
BLN	15	5, 15, ±15	85-264	10	-10 to +60	AC4000	54-56
	30	5, 12, 15, ±15	85-264				
	60	5, 12, 15	85-132 / 170-264				

BLN 15W
34×140×92mm

BLN 30W
34×166×92mm

BLN 60W
38×200×92mm

APPLICATION

Medical equipment
- *For ultrasonic diagnostic equipment*
- *Medical equipment for CT scanner*
- *Medical equipment for laser surgical unit*
- *Electrocardiograph*
- *Bone Densitometry System*
- *Various portable medical equipments*
- *Endoscope equipment*

Radiocommunication and Information Instruments
- *Electronic switching*
- *Disaster prevention radio system*
- *Radiocommunication device*
- *For information processing/terminal equipment*
- *Telephone exchange machine*
- *Optical communication equipment*
- *Telemeter system*
- *System equipment*
- *Disaster prevention wireless device*
- *POS(sales information management)*
- *Mobile telecommunications products*
- *Telecommunications Base Terminal System*
- *Movement/satellite communication apparatus system*

Ship equipment
- *Ship communication device*
- *Ship facsimile*
- *Fish finder*

Semiconductor manufacturing equipment
- *Ion driving device*
- *Electron gun*

Computer
- *Laser printer*
- *I/O system*
- *A/D and D/A conversion insulation board*
- *Process computer*
- *Image information equipment*

Control equipment and FA system
- *For transportation device*
- *Program controller*
- *FA control system*
- *LED display equipment*
- *Robot control*

Defense electron equipment
- *High voltage power supply for control radar*
- *Power supply for radar*

Electronic equipment equipped with vehicle
- *Train wireless*
- *Train ATS(Auto Train System) backup*
- *Business navigation*
- *Traffic signal controller*

Electric power and power generation device
- *Nuclear power generation control*
- *Atomic power watch management system*
- *Protective relaying machine for electric power*
- *Thermal power generation control system*
- *Hydro-power control system*
- *For emergency battery management system*

Physics,radiation equipment and quantum mechanics
- *For neutron detection*
- *Elementary particle detection*
- *Alpha,beta and gamma ray measurement*
- *VIN/NIM Power Supply*
- *Elementary particle detection system*
- *Various medical equipments*

Optical electronic equipment and X rays
- *Electron microscope*
- *Photomultiplier tube drive*
- *Optical communication APD bias*
- *Infrared rays camera*

Analysis equipment and X rays
- *For nondestructive inspection*
- *For mass analysis device*
- *For various analysis devices*

Airlines and space electronic equipment
- *ATC radar system*
- *Explorer machine for rocket*
- *High voltage power supply for base station radar*
- *Doppler equipped with aircraft*
- *Equipped with space shuttle*
- *Video equipped with aircraft*
- *Aircraft in-flight broadcasting sound system*
- *Earth resourcing satellite*

Measurement equipment
- *Magnetic measurement machine*
- *Analog measurement machine*
- *Digital measurement machine*

Boost from Low Input Voltage to 3.3-5.0V!

3Watt BUP Series

NEW Bellnix RoHS Compliance

Ultra Small Size Step-Up DC-DC Converters / BUP 3Watt Series

Minimum Size, Step-Up DC-DC Converter

Input: 1.3V-4.2V Output: 3.3V (3.3V-5.0V)

Voltage can be optionally set with external resistors. (Ex.: 3.3V, 4.0V, 5.0V)

- Efficiency 86% (at 0.7A load)
- Efficiency 90% (at 0.5A load)
- Latest Technology, Synchronous Rectification Circuit
- Non-Isolated Type Converter
- Wide Input Voltage Range
- Remote ON/OFF Control
- Adjustable Output Voltage
- High Reliability, High Performance
- Operating Temp. Range -20°C to +70°C (Temp. derating required)
- RoHS Compliance

Models BUP Series	Input V Vdc	Output V Vdc	Output I A	Output ADJ Vdc	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BUP-3.3S0R9 **BUP-3.3S0R9D**	1.3-(4.2)	3.3	0-0.9	3.3-5.0	10	82 (86)

Note 1: Regarding this converter, for normal operation the output voltage needs to be higher than that of the input voltage.
Input voltage range at 3.3V output ------ 1.3V-2.8V
Input voltage range at 5.0V output ------ 1.3V-4.2V

Note 2: Ripple noise, efficiency value is when input voltage is at 2.5V.

Note 3: Efficiency ( ) value is at 0.7A load.

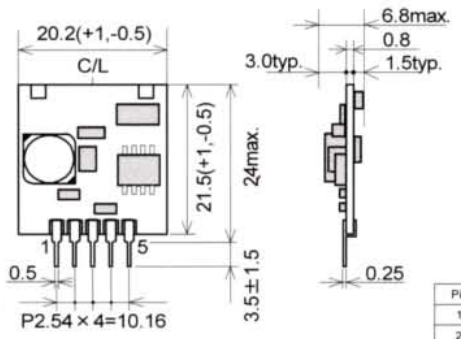
Note 4: Ripple noise is measured at 20MHz bandwidth.

Note 5: Depending on the ambient air temp. conditions, air flow is required.

Note 6: For this product, there is a limit of max. output current depending on the input voltage. Refer to the data sheet.

<Outline>

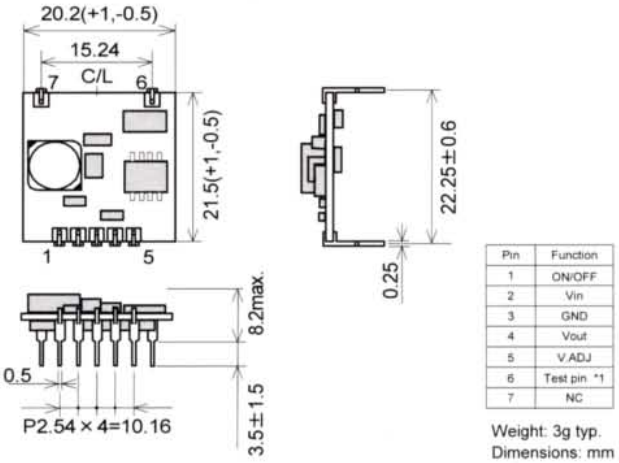
BUP-3.3S0R9 (SIP type)



Pin	Function
1	ON/OFF
2	Vin
3	GND
4	Vout
5	V.ADJ

Weight: 3g typ.
Dimensions: mm

BUP-3.3S0R9D (DIP type)

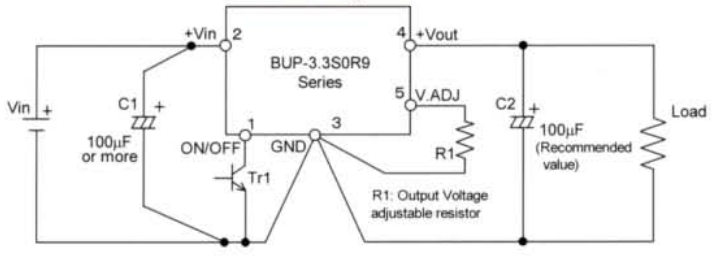


Pin	Function
1	ON/OFF
2	Vin
3	GND
4	Vout
5	V.ADJ
6	Test pin *1
7	NC

Weight: 3g typ.
Dimensions: mm

*1 This pin is for our testing.
Do not connect to anywhere.

<Standard Connection Circuit Diagram>



Tr1
OFF ⟶ Output ON
ON ⟶ Output OFF
ON: Between 1pin and 3pin (-0.3 to +0.4V)

- When in not using the ON/OFF control, keep the ON/OFF pin open.
- When in not adjusting the output, keep the V.ADJ pin open.
- Low impedance product is used for the input capacitor (C1), and closen it to the pin (2pin, 3pin).
- Be sure to put an input and output capacitor. Output capacitor: ESR≧25m ohm.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Easy to design and high efficiency!

6-20Watt BIC Series

RoHS Compliance

DC-DC Buck Converter IC / BIC 6-20Watt Series

High Efficiency, Synchronous Rectification Method Step-Down DC-DC Converter MCM-IC

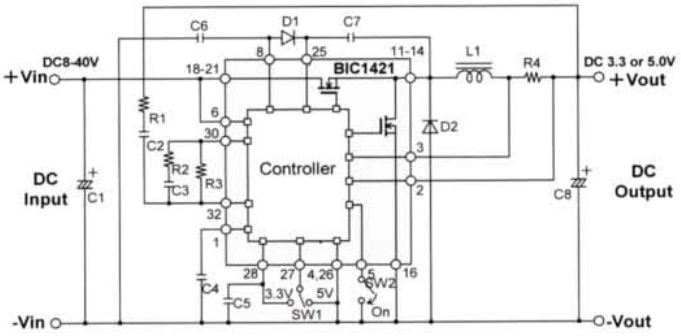
Input: 8V-40V **Output: 3.3V, 5V, 2.5V-12V**
Input: 8V-20V **Output: 2.5V-12V**
Input: 4.5V-20V **Output: 0.8V-12V**

- High Efficiency (Latest Synchronous Rectification Circuit)
- 32pin SMD-IC
- Output Current: 0-3A, 0-5A
- SMD Package
- Corresponds to IEEE-1394
- Remote ON/OFF Control
- Built-in Over-Current Protection Circuit
- Long-Life, High Reliability
- Easy for anyone to design
- Operating Temp. Range -30°C to +85°C
- RoHS Compliance

Models BIC Series	Input V Vdc	Output V Vdc	Output I A	Operating Temp. °C	Package SMD type	Efficiency %(typ.)
BIC1421	8-40	3.3/5	0-3	-30 to 85 *1	SSOP32	89
BIC1422 *2	8-40	2.5-12	0-3	-30 to 85 *1	SSOP32	89
BIC1222 *2	8-20	2.5-12	0-5	-30 to 85 *1	SSOP32	88
BIC221C *2	4.5-20	0.8-12	0-3	-30 to 85	SSOP32	87

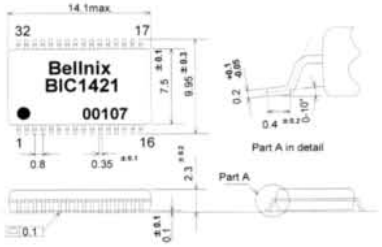
*1: Ta=-30°C to -10°C, Input voltage 8.5V or above. Ta=-10°C to 85°C, Input voltage 8.0V or above.
*2: There are requirements of input/ output voltage difference.

Enable to design a high efficiency DC-DC converter.
Ex.: BIC1421Application circuit example.



SSOP32 Package

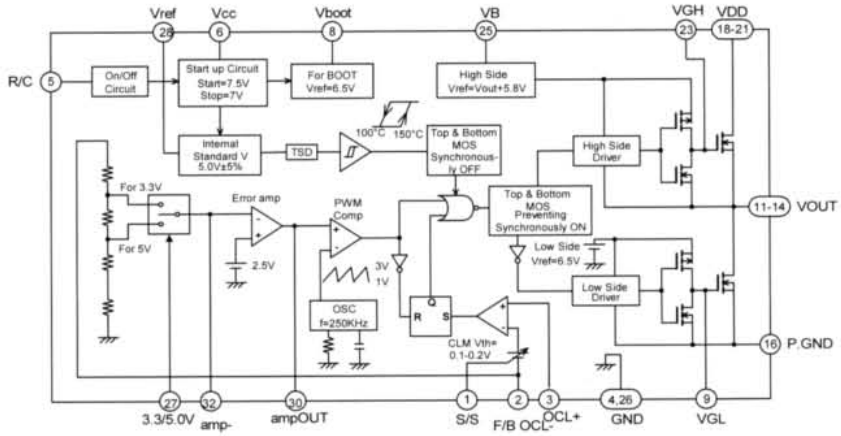
- For sale in tape & reel.



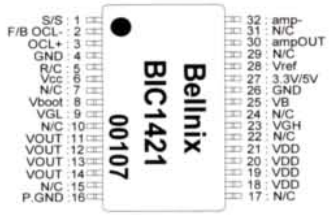
<Usage>

- Information devices
- Digital home electric appliances
- Portable terminal unit
- Telecommunication devices
- Consumer products
- OA equipments
- Picture processing
- Various power supplies

Ex.: BIC1421 Internal Circuit Diagram (Each model has a different circuit.)



Ex.: BIC1421 Pin Function



Easy to design, high efficiency and low cost!

It is easy to make a high efficiency step-down DC-DC converter with small quantity of external components. Please refer to the application notes for each model and specific designing examples and circuit designing procedures necessary for designing are available. Especially for this MCM-IC, high-side and low-side FET driving circuit for synchronous rectification is built-in, to achieve high efficiency improvement. This has made the complicated components selecting and circuit designing easy.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

0.3 Watt EB Series

RoHS Compliance

8pin DIP-IC Type Single Output DC-DC Converters/ EB Series

8pin DIP-IC Size, Non-Isolated Type DC-DC Converter

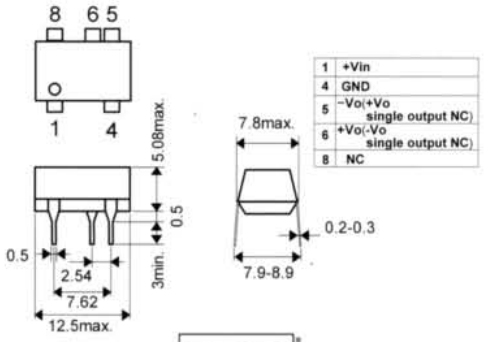
Input: +5V Output: -5V, +12V, -12V, +15V, -15V

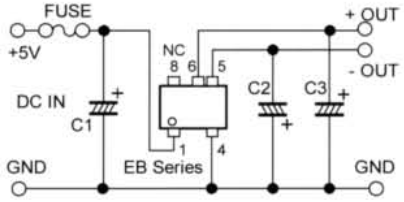
- High Efficiency Step Up
- 8pin DIP-ICSize Ultra Small Size
- Analog, Digital Optimum
- Corresponds to automatic insertion machine
- MTBF 1,000,000Hrs
- Polarity Conversion + → -
- Non-Isolated Type Converter
- Polarized by PN Connection
- Long Life, High Reliability
- Operating Temp. Range 0°C to 70°C
- RoHS Compliance

Models EB Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg %(max.)	Load Reg %(max.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
EBN-0550	4.5-5.5	- 5	0-50	2	2	100	65
EBP-1225		+12	0-25				75
EBN-1225		-12		3			65
EBP-1520		+15	0-20	2			75
EBN-1520		-15		3			65

Note 1: Ripple noise is the value measured with an additional capacitor.
Note 2: Load regulation is when load changes from 10% to 100%, at rating input.
Note 3: For short-circuit protection add a fuse to the input.
Note 4: External capacitors are required.

- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.





The output will be either + or −.

Additional capacitor
- C1=220μF
- C2 or C3 5V=15μF
  12V=3.3μF
  15V=2.2μF

0.6 Watt EC Series

RoHS Compliance

14pin DIP-IC Type Single Output DC-DC Converters/ EC Series

14pin DIP-IC Size, Non-Isolated Type DC-DC Converter

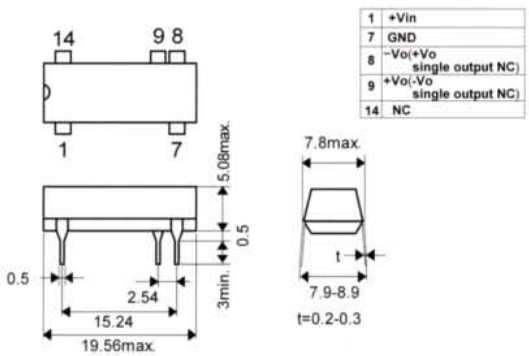
Input: +5V Output: -5V, +12V, -12V, +15V, -15V, -24V

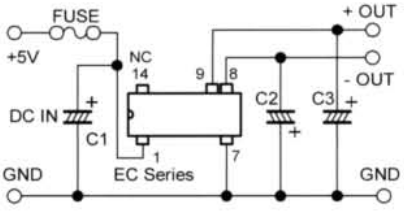
- High Efficiency Step Up
- 14pin DIP-ICSize Ultra Small Size
- Analog, Digital Optimum
- Corresponds to automatic insertion machine
- MTBF 1,000,000Hrs
- Polarity Conversion + → -
- Non-Isolated Type Converter
- Polarized by PN Connection
- Operating Temp. Range 0°C to 70°C
- Long Life, High Reliability
- RoHS Compliance

Models EC Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg %(max.)	Load Reg %(max.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
ECN-0510	4.5-5.5	- 5	0-100	2	2	300	65
ECP-1250		+12	0-50				75
ECN-1250		-12	0-50	3			65
ECP-1540		+15	0-40	2			75
ECN-1540		-15	0-40	3			65
ECN-2425		-24	0-25	2		500	70

Note 1: Ripple noise is the value measured with an additional capacitor.
Note 2: Load regulation is when load changes from 10% to 100%, at rating input.
Note 3: For short-circuit protection add a fuse to the input.
Note 4: External capacitors are required.

- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.





The output will be either + or −.

Additional capacitor
- C1=470μF
- C2 or C3 5V=220μF 15V=10μF
  12V=10μF 24V=10μF

Achieved high efficiency at a low price !

5 Watt BSA Series

RoHS Compliance

High Efficiency POL DC-DC Converters/ BSA 5Watt Series

High Efficiency, Small Size, Low Price Step-Down DC-DC Converter

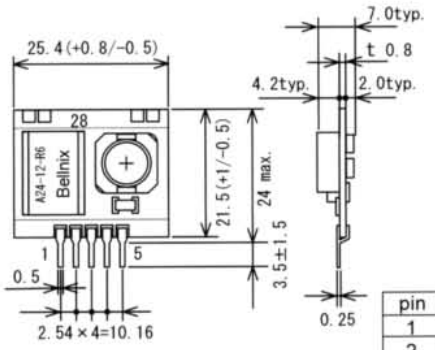
Input: 12V, 15V, 24V **Output: 3.3V (3V-5V)**
Input: 24V **Output: 12V (9V-12V)**

- High Efficiency (82%-89%)
- Ultra Small Size
- Adopted Original MCM
- MTBF 1,000,000Hrs
- Low Price
- Simple Structure
- Built-in Over-Current Protection
- Easy Using SIP, DIP Type
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Heat Sink Not Required
- Long Life, High Reliability
- Operating Temp. Range
  -20°C to +70°C
  (Temp. derating required)
- RoHS Compliance

Models BSA Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSA24-3.3S1R2	24 (9-36)	3.3 (3-5)	0-1.2	1.5	1	60	82
BSA24-3.3S1R2-D							
BSA24-12S0R6	24 (18-36)	12 (9-12)	0-0.55	1.5	1	100	88
BSA24-12S0R6-D							

Note 1: Suffix "D" will be added to the model name for DIP type.
Note 2: External capacitors are required.
Note 3: The output voltage inside the ( ) indicates the adjustable range.

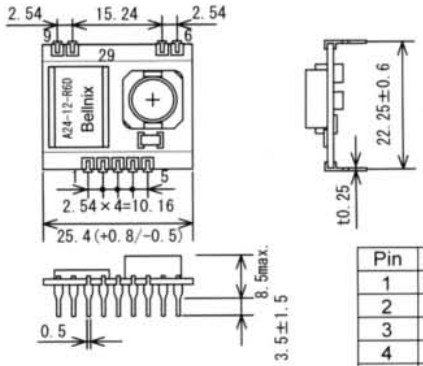
<Outline> (SIP type)
BSA24-3.3S1R2
BSA24-12S0R6



pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	V.adj

Weight: 4g typ. Dimensions: mm

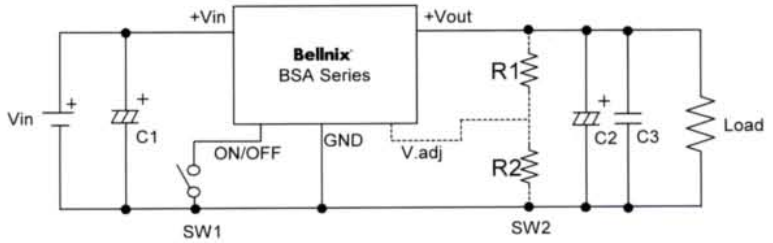
(DIP type)
BSA24-3.3S1R2-D
BSA24-12S0R6-D



Pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	V.adj
6-9	NC

Weight: 4g typ. Dimensions: mm

Use BSA 5W and BSA 15W according to the point of using 3 terminal regulators !



- SW1: When short, it is as written below.
  BSA03 type = Output OFF
  BSA24 type = Output ON
- V.adj: When open, it is the rating output voltage.
- R1, R2: When adjusting the output voltage, connect R1 or R2 to V.adj. Please refer to the data sheet.
- External capacitors are required. Refer to the data sheet.

- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

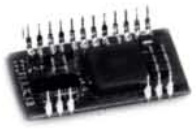
Achieved high efficiency at a low price !

15 Watt BSA Series

NEW Bellnix

RoHS Compliance

High Efficiency POL DC-DC Converters/ BSA 15Watt Series



BSA03

BSA24

High Efficiency, Low Price Step-Down DC-DC Converter

Input: 3.3V, 5V Output: 1.8V (1.0V-3.3V)
Input: 12V, 15V, 24V Output: 3.3V (3V-5V)
Input: 24V Output: 12V (9V-12V)

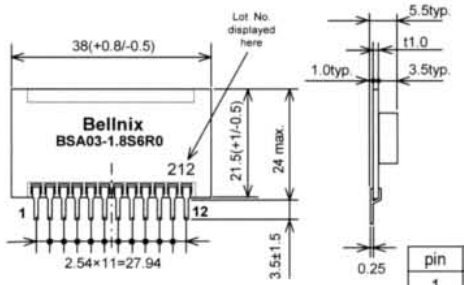
- High Efficiency (82%-91%)
- Ultra Small Size
- Adopted Original MCM
- MTBF 1,000,000Hrs
- Low Price
- Simple Structure
- Built-in Over-Heat Protection
- Built-in Over-Current Protection
- Easy Using SIP, DIP Type
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Heat Sink Not Required
- Long Life, High Reliability
- Operating Temp. Range
  (Temp. derating required)
  BSA24 series: -20°C to +70°C
  BSA03 series: -30°C to +85°C
  (-30°C to -20°C :
  Startup guarantee)
- RoHS Compliance

Models BSA Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSA03-1.8S6R0	3.3	1.8	0-6	1	1	30	86
BSA03-1.8S6R0-D	(3-5.5)	(1-3.3)					
BSA24-3.3S2R2	24	3.3	0-1.8	1.5	1	50	82
BSA24-3.3S2R2-D	(9-36)	(3-5)	(0-2.2)				
BSA24-12S1R0	24	12	0-0.75	1.5	1	100	91
BSA24-12S1R0-D	(18-36)	(9-12)	(0-1)				

Note 1: Suffix "D" will be added to the model name for DIP type.
Note 2: External capacitors are required.
Note 3: The output voltage inside the ( ) indicates the variable range.
Note 4: The output current inside the ( ) indicates the value with air flow.
Note 5: BSA03 have requirements of input/ output voltage difference. Depending on conditions, air flow is required.

- Note!
  This catalogue is an outline of the products.
  When designing, be sure to refer to the
  data sheets.

<Outline> (BSA03 SIP type)

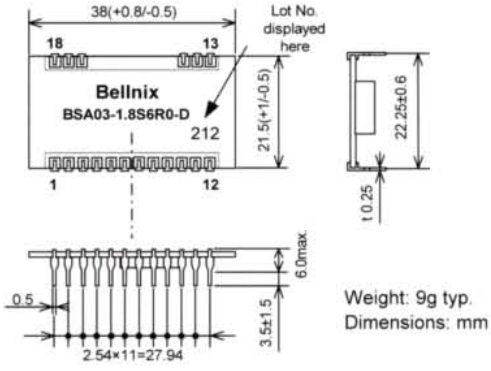


pin	Function
1	ON/OFF
2-4	+Vin
5-8	GND
9-11	+Vout
12	V.adj
13-18	NC

*13-18pin: For DIP type.

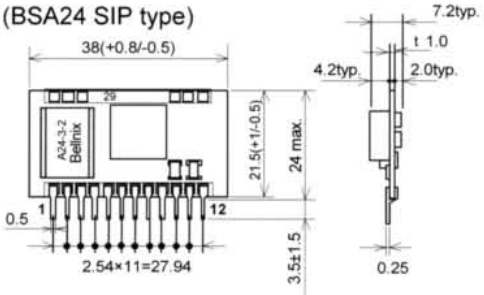
Weight: 9g typ.
Dimensions: mm

(BSA03 DIP type)



Weight: 9g typ.
Dimensions: mm

(BSA24 SIP type)

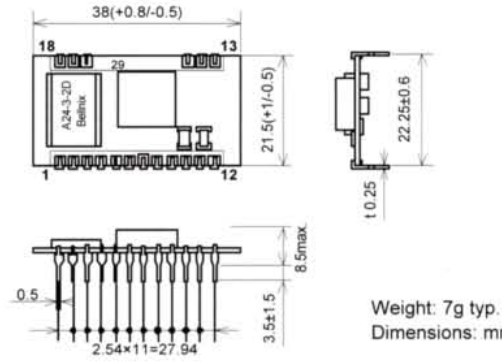


pin	Function
1	ON/OFF
2-4	+Vin
5-8	GND
9-11	+Vout
12	V.adj
13-18	NC

*13-18pin: For DIP type.

Weight: 7g typ.
Dimensions: mm

(BSA24 The DIP type)



Weight: 7g typ.
Dimensions: mm

Succeeded in low price!

6 Watt BSI24-mini Series

RoHS Compliance

High Efficiency POL DC-DC Converters BSI24-mini +8V to +36V Input Series

High Efficiency (87%), TO-3PL Size Step-Down DC-DC Converter

Input: 8V-36V Output: 3.3V or 5V

- High Efficiency 87%
- Latest Technology, Synchronous Rectification Circuit
- TO-3PL Wide Package
- Output Voltage Select 3.3V/5V
- Heat Sink Not Required
- Input Voltage Range 8V-36V
- Simple Structure and High Reliability
- MTBF 1,000,000Hrs
- Low Profile, Ultra Small Type
- Remote ON/ OFF Control
- Built-in Over-Current Protection
- Non-Isolated Type
- Switchable Output Voltage
- High Reliability, High Performance
- New Development MCM Power-IC

- Operating Temp. Range -10°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

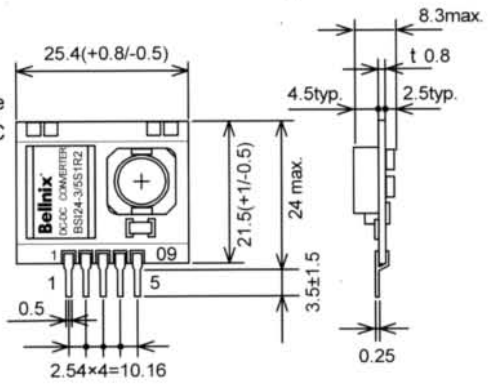
Models BSI24-mini Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI24-3/5S1R2	8-36	3.3/5	0-1.2	2.0/ 2.5	0.4	40	83/ 87
BSI24-3/5S1R2F							

Note 1: Suffix "F" will be added to the model name for DIP type.

Note 2: External capacitors are required.

<Outline>

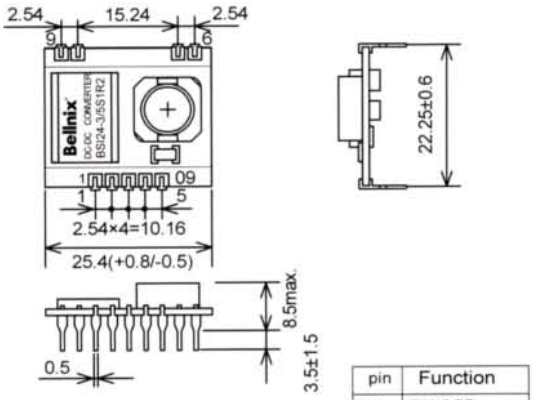
BSI24-3/5S1R2 SIP type



pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	+Vout .Select

Weight: 4g typ.
Dimensions: mm
External: non-coated.

BSI24-3/5S1R2F DIP type



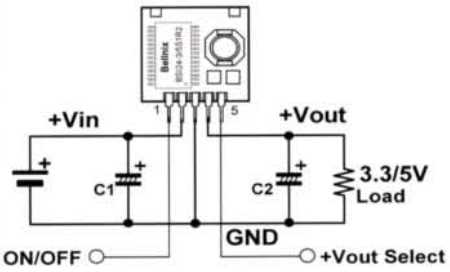
pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	+Vout .Select
6-9	NC

Weight: 4.2g typ.
Dimensions: mm
External: non-coated.

- Note!

This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Easy Usage



- Output Voltage Select
5pin Open: Output=3.3V
5pin-3pin Short: Output=5.0V

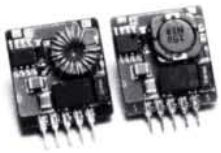
- ON/OFF Control
1pin-3pin Short: Output=ON
1pin-3pin Open: Output=OFF

- Recommended Capacitors
C1=120μF, 50WV ZL Series (Rubycon)
C2=220μF, 10WV SH type OS-CON (Sanyo)
When the wiring to the load is long, the noise lowers further by adding a 2.2μF-4.7μF to the load pin.

World's Standard TO-3PL 10W

10 Watt BSI-mini Series

RoHS Compliance



Ultra High Efficiency POL DC-DC Converters/ BSI-mini 10Watt Series

Ultra High Efficiency (93%), TO-3PL type Step-Down DC-DC Converter

Input: 5V, 12V **Output: 3.3V (1.8V-3.3V)**
Input: 6V, 12V, 15V **Output: 5V (3V-5V)**

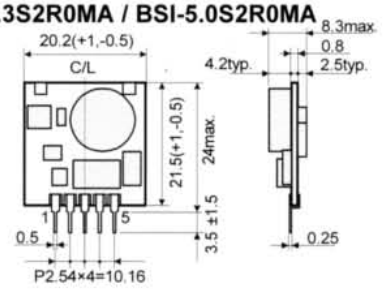
- High Efficiency 92%-93%
- Latest Technology, Synchronous Rectification Circuit
- TO-3PL Package
- Heat Sink Not Required
- New Development Synchronous Rectification Control IC
- Built-in Solid Aluminum Electrolytic Capacitor
- Low Standby Current 100μA
- MTBF 1,000,000Hrs
- Built-in Input/ Output Capacitor
- Low Profile, Ultra Small Type
- Remote ON/OFF Control
- Wide Input Voltage Range
- Built-in Over-Current Protection
- Non-Isolated Type
- Adjustable Output Voltage
- High Reliability, High Performance
- Operating Temp. Range -10°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

Models BSI-mini Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI-3.3S2R0MA	4.75-13.6	3.3 (1.8-3.3)	0-2	0.7	2.0	30	92
BSI-3.3S2R0FMA							
BSI-3.3S2R0SMA							
BSI-5.0S2R0MA	6.0-16.5	5.0 (3.0-5.0)	0-2	0.2	0.4	30	93
BSI-5.0S2R0FMA							
BSI-5.0S2R0SMA							

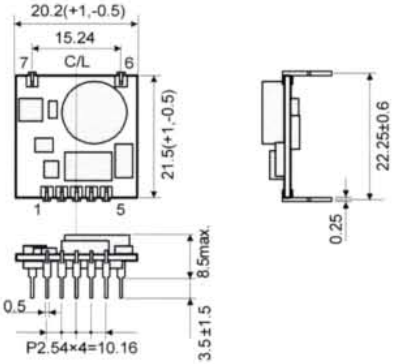
Note 1: There is a min. purchasing requirement for SM (Surface Mount) type, so please contact our sales dept.
Note 2: The output voltage inside the ( ) indicates the adjustable range.
Note 3: Suffix "A" stands for verision.

<Outline>

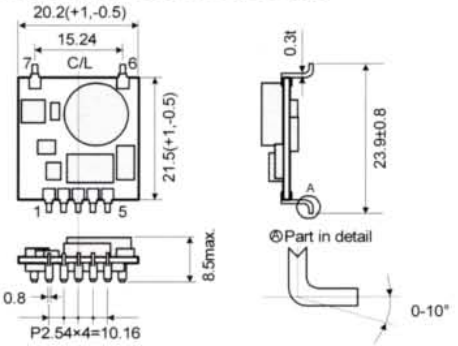
BSI-3.3S2R0MA / BSI-5.0S2R0MA



BSI-3.3S2R0FMA / BSI-5.0S2R0FMA



BSI-3.3S2R0SMA / BSI-5.0S2R0SMA

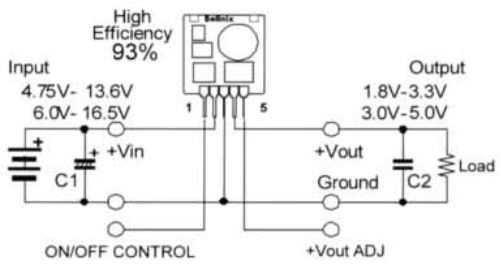


Dimensions: mm

pin	Function
1	ON/OFF CONT
2	+Vin
3	GND
4	+Vout
5	+Vout.ADJ
6	NC
7	NC

- Note!
This catalogue is an outline of the products.
When designing, be sure to refer to the data sheets.

Easy Usage



- Output Voltage Setting
When 5pin is open, set the Output to 3.3V or 5V

- How to adjust the Output Voltage
Put an adjustable resistor (fixed resistor) between 5pin and 4pin, and set to 1.8V-3.3V or 3V-5V.

- ON/OFF Control: Output ON
When 1pin is open, 3.3V or 5V will be output.

- Additional Capacitor
C1=100μF or more
C2= Output Capacitor is built-in. But, when adjusting the output, add a 100-220μF capacitor to the output.

- External Coating
SIP, DIP type has resinous coating. Surface mount type small power inductor series are non-coated.
Since SMD (SM) type is mounter adsorbing, it is non-coated.

10-15 Watt BSI Series

RoHS Compliance

Ultra High Efficiency POL DC-DC Converters/ BSI 10-15Watt Series

Ultra High Efficiency (90-95%), Minimum Size Step-Down DC-DC Converter

Input: 2.5V, 3.3V, 5V
Input: 5V, 12V
Input: 6V, 12V, 15V

Output: 2.5V (1.5V-2.5V)
Output: 3.3V (1.8V-3.3V)
Output: 5.0V (3.0V-5.0V)

Non-Isolated Type DC-DC

- Input Voltage Range 2.5V-16.5V
- Output Voltage Range 1.5V-5V
- Latest Technology,Synchronous Rectification Circuit
- Efficiency 90%-95%
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Heat Sink Not Required
- Minimum Size
- Remote ON/OFF Control
- Low Standby Current 100μA (3A output type product)
- MTBF 1,000,000Hrs
- Operating Temp. Range -10°C to +70°C

(Temp. derating required from 50°C)

- High Reliability, High Performance
- RoHS Compliance

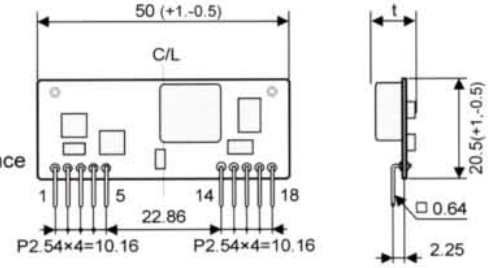
- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Models BSI-Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI-2.5S4R0A / **BSI-2.5S4R0FA**	2.5-5.25	2.5 (1.5-2.5)	0-4	0.2	0.2	40	90
BSI-3.3S3R0A / **BSI-3.3S3R0FA**	4.75-13.6	3.3 (1.8-3.3)	0-3	0.5	1.5	50	91
BSI-5.0S3R0A / **BSI-5.0S3R0FA**	6.0-16.5	5.0 (3.0-5.0)		0.2	0.2		95

Note 1: The output voltage inside the ( ) indicates the adjustable range.
Note 2: External capacitors are required.
Note 3: Suffix "A" stands for verision.

<Outline> (SIP type)

BSI-2.5S4R0A (t=9.8typ.)
BSI-3.3S3R0A (t=9.8typ.)
BSI-5.0S3R0A (t=8.8typ.)



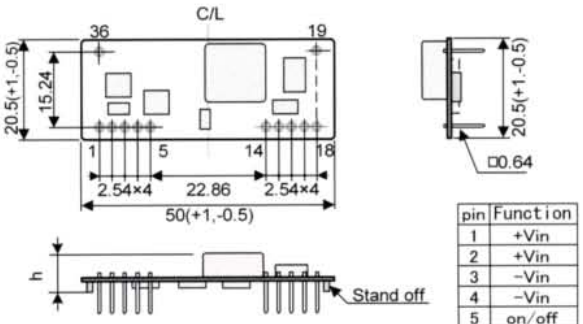
pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout

Weight: 10g typ.
Dimensions: mm

- External resinous coating
- Tolerances unless otherwise specified: ±0.5

(DIP type)

BSI-2.5S4R0FA (h=11.3max.)
BSI-3.3S3R0FA (h=10.3typ.)
BSI-5.0S3R0FA (h=9.3typ.)

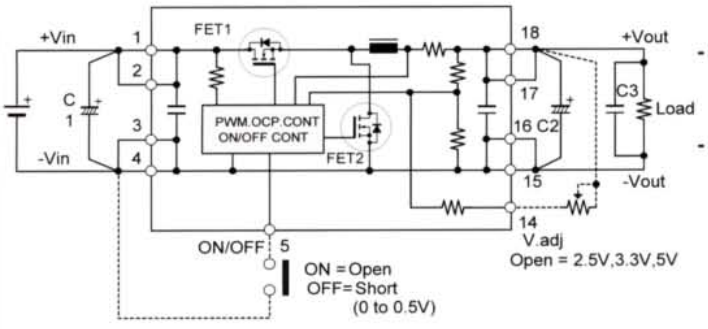


pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout
19	NC
36	NC

Weight: 10g typ.
Dimensions: mm

- External resinous coating
- Tolerances unless otherwise specified: ±0.5

<Standard Connection Circuit Diagram>



- **External Capacitors** (SH, FA type OS-CON Recommended)
  3.3V, 5V Output Product
  C1=100μF20WV×2pcs or more
  C2=220μF10WV×1pce or more
  2.5V Output Product
  C1=220μF10WV×2pcs or more
  C2=330μF6.3WV×2pcs or more
- **ON/OFF Control**
  ON/OFF control is controlled by opening and shortening between 5pin(ON/OFF) and 3, 4pin (-Vin) pin.
- **Adjustable Output Voltage**
  The output voltage is adjustable by connecting a resistor between 14pin (V.ADJ) and 17, 18pin (+Vout).
  When 14pin is open, the following rating voltage is output.
  BSI-2.5S = +2.5V±5%
  BSI-3.3S = +3.3V±5%
  BSI-5.0S = +5.0V±5%
- 0.6V or more Input/ Output voltage difference is required for output current 4A type.

15 Watt BSI-24 Series

RoHS Compliance

Ultra High Efficiency POL DC-DC Converters/ BSI 24V Input Voltage 15Watt Series

Ultra High Efficiency (87%, 91%), Minimum Size Step-Down DC-DC Converter

Input: 8V, 12V, 15V, 24V Output: 3.3V (1.2V-5.1V)

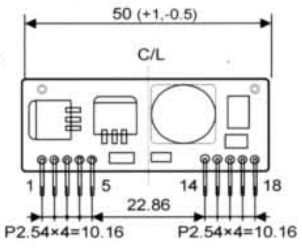
- Efficiency 87%-91%
- Input Voltage Range 8V-27V
- Output Voltage Range1.2V-5.1V
- Latest Technology,Synchronous Rectification Circuit
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Heat Sink Not required, 15W
- Minimum Size
- Remote ON/OFF Control
- MTBF 1,000,000Hrs
- High Reliability, High Performance
- Operating Temp. Range -10°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

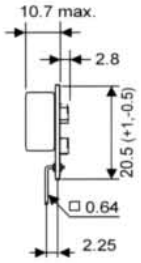
Models BSI Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI24-3.3/5S3R0	8-27	3.3 (1.2-5.1)	0-3	0.3	3	40 (50)	87 (91)
BSI24-3.3/5S3R0F							

Note 1: The output voltage inside the ( ) indicates the adjustable range.
Note 2: Ripple noise ( ) value, efficiency ( ) value is at input voltage 5V.
Note 3: External capacitors are required.

<Outline>

(SIP Type)
BSI24-3.3/5S3R0

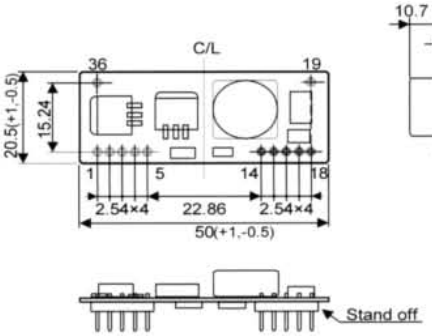




pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout

Weight: 10g typ.
Dimensions: mm

(DIP Type)
BSI24-3.3/5S3R0F

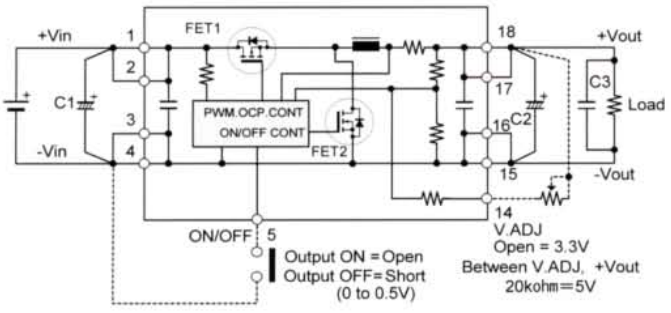


pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout
19	NC
36	NC

Weight: 11g typ.
Dimensions: mm

- Note!
This catalogue is an outline of the products.
When designing, be sure to refer to the data sheets.

<Standard Connection Circuit Diagram>



- External Capacitors

Use two of C1=330μF or more, impedance 81m ohm (20°C/ 100kHz) or below.
Recommend: Electrolytic Capacitor
C2=150μF (ESR=28m ohm or below) ×2 or more
Recommend: OS-CON
To set the output voltage 3.1V or below, use three OS-CON (different from the one written above).

- ON/OFF Control

ON/OFF control is controlled by opening and shortening between 5pin(ON/OFF) and 3, 4pin (-Vin).
Be sure to always keep the slew rate of 5pin at turn-on and turn-off transient 0.03V/ μs or more, when the voltage is near 1V.

- Adjustable Output Voltage

The output voltage is adjustable by connecting a resistor between 14pin (V.ADJ) and 17, 18pin (+Vout).
When 14pin is open, the following rating voltage is output.
Output = +3.3V±5%

20Watt BSI-P Series

RoHS Compliance

Ultra High Efficiency POL DC-DC Converters/BSI 20Watt Series

Ultra High Efficiency (88%-92%), Minimum Size Step-Down DC-DC Converter

Input: 5V, 6V
Input: 6V, 12V, 15V

Output: 3.3V (1.8V-3.3V)
Output: 5.0V (3.0V-5.0V)

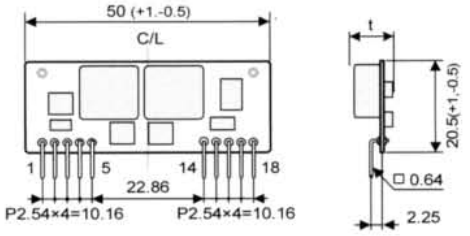
- Efficiency 88%-92%
- Latest Technology, Synchronous Rectification Circuit
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Built-in Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Heat Sink Not Required
- Minimum Size
- Remote ON/OFF Control
- Low Standby Current 100μA
- MTBF 1,000,000Hrs
- High Reliability, High Performance
- Operating Temp. Range -10°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

Models BSI-P Series	Input V Vdc	Output V Vdc	Output I A	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI-3.3S6R0PA **BSI-3.3S6R0FPA**	4.75-7.5	3.3 (1.8-3.3)	0-6	0.5	1.5	50	88
BSI-5.0S4R0PA **BSI-5.0S4R0FPA**	6-16.5	5.0 (3.0-5.0)	0-4	0.3	0.2	50	92

Note 1: When operating at output current 3A-6A, air flow (1m/sec) is required.
Note 2: The output voltage inside the ( ) indicates the adjustable range.
Note 3: External capacitors are required.
Note 4: Suffix "A" stands for verision.

<Outline>

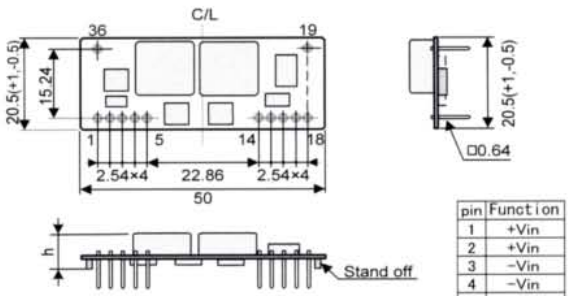
BSI-3.3S6R0PA (t=9.8typ.)
BSI-5.0S4R0PA (t=9.8typ.)



pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout

Dimensions: mm Weight: 12g typ.
Load current: 3A or more
Air flow (1m/sec) required.

BSI-3.3S6R0FPA (h=10.3typ.)
BSI-5.0S4R0FPA (h=10.3typ.)

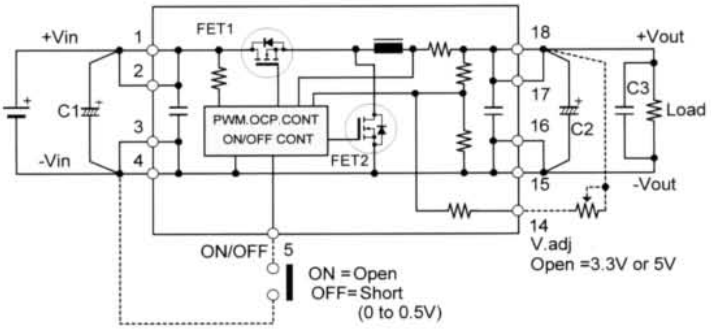


pin	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	on/off
14	V.ADJ
15	-Vout
16	-Vout
17	+Vout
18	+Vout
19	NC
36	NC

Dimensions: mm Weight: 12g typ.
Load current: 3A or more
Air flow (1m/sec) required.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

<Standard Connection Circuit Diagram>



- External Capacitors

C1=100μF20WV× 2 pcs or more (Recommended OS-CON SH, FA type)
C2=220μF10WV× 2 pcs or more (Recommended OS-CON SH, FA type)

- ON/OFF Control

ON/OFF control is controlled by opening and shortening between 5pin(ON/OFF) and 3, 4pin (-Vin).

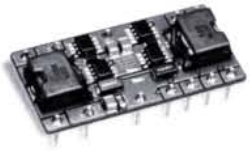
- Adjustable Output Voltage

The output voltage is adjustable by connecting a resistor between 14pin (V.ADJ) and 17, 18pin (+Vout).
When 14pin is open, the following rating voltage is output.
BSI-3.3S = +3.3V±5%
BSI-5.0S = +5.0V±5%

Minimum Size with Large Capacity of 40W !

40 Watt BSI-POWER Series

RoHS Compliance



Ultra High Efficiency POL DC-DC Converters/BSI 40Watt Series

Ultra High Efficiency (95%), Minimum Size Step-Down DC-DC Converter

Input: 5V, 12V
Input: 12V

Output: 3.3V (1.0V-3.3V)
Output: 5.0V (5.0V-6.0V)

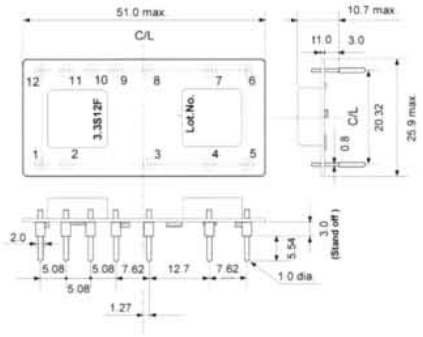
- Efficiency 93%-95%
- Input Voltage Range 4.5V-13.6V
- Output Voltage Range 1.0V-3.3V
  5V-6V
- Latest Technology, Synchronous Rectification Circuit
- Heat Sink Not Required
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Built-in Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Minimum Size
- Remote ON/OFF Control
- MTBF 900,000Hrs
- High Reliability, High Performance
- 40W+40W=80W
  Parallel Operation Possible
  (Application note available)
- Operating Temp. Range
  -10°C to +70°C
  (Temp. derating required)
- RoHS Compliance

Models BSI Series	Input V Vdc	Output V Vdc	Output I A	Line Reg mV(typ.)	Load Reg mV(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BSI-3.3S12R0F	4.5-13.6	3.3 (1.0-3.3)	0-12	10	8	40	93
BSI-5.0S8R0F	8-13.6	5.0 (5.0-6.0)	0-8			60	95

Note 1: The output voltage inside the ( ) indicates the adjustable range.
Note 2: External capacitors are required.
Note 3: Depending on conditions, air flow is required.

<Outline>

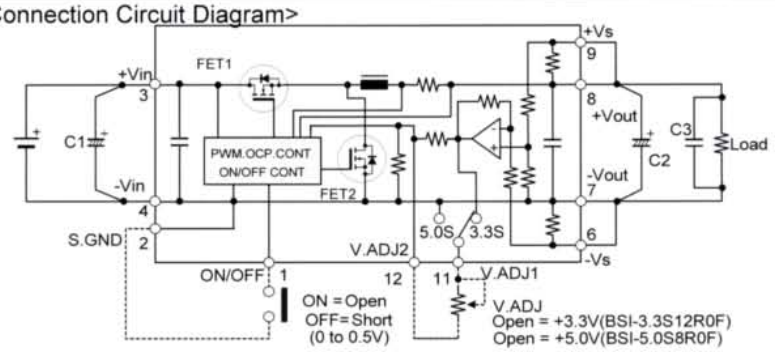
BSI-3.3S12R0F/ BSI-5.0S8R0F



pin	Function
1	ON/OFF
2	S.GND
3	+Vin
4	-Vin
5	NC
6	-Vs
7	-Vout
8	+Vout
9	+Vs
10	NC
11	V.ADJ 1
12	V.ADJ 2

Dimensions: mm Weight: 13g typ.
Tolerances unless otherwise specified: ±0.5
External is non-coated

<Standard Connection Circuit Diagram>



- External Capacitor

C1: 68μF(ESR=34m ohm or less)×2pcs or more *2 (Recommended: OS-CON)
*2 BSI-5.0S8R0F: 1pce or more
C2(Vout=3.3V): 220μF(ESR=28m ohm or less)×2pcs or more (Recommended: OS-CON)
C2(Vout=5.0V): 150μF(ESR=30m ohm or less) ×1pce or more (Recommended: OS-CON)
C2(Vout<1.7V): 330μF(ESR=25m ohm or less)×3pcs or more (Recommended: OS-CON)

- ON/OFF Control

ON/OFF control is controlled by opening and shortening between 1pin (ON/OFF) and 2pin (S.GND).
Output ON = Open (Max. 6V occurs at 1pin.)
Output OFF = Short (0-0.5V 500μA max.)

- Adjustable Output Voltage

The output voltage is adjustable by connecting a resistor between 11pin (V.ADJ1) and 12pin (V.ADJ2).
When between 11 and 12pin is open, the following rating voltage is output.
BSI-3.3S12R0F = 3.3V±4% BSI-5.0S8R0F = 5.0V±4%

- Remote Sensing

9pin (+Vs), 6pin (-Vs) are remote sensing pins. Be sure to wire without making loops.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Able to drive New CPU with High-Speed Load Response!

20Watt BSV Series

RoHS Compliance

Ultra High Efficiency POL DC-DC Converters/ BSV 20Watt Series

Ultra High Efficiency (93%), High-Speed Response Step-Down DC-DC Converter

Input: 3V-5.5V Output: 3.3V (0.8V-3.6V)

Voltage can be optionally set with external resistors. (Ex.: 0.8V, 1V, 1.2V, 1.3V, 1.5V, 1.8V, 2V, 2.5V, 3.3V, 3.6V)

Non-Isolated Type DC-DC

- Latest Power-IC Adopted
- Latest Technology, Synchronous Rectification Circuit
- High-Speed Response T=160ns
- Efficiency 93%
- External Capacitors Not Required
- Heat Sink Not Required
- Built-in Short Circuit, Over-Current Protection
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Minimum Size
- Operating Temp. Range -40°C to +85°C (Temp. derating required)
- Remote ON/OFF Control
- MTBF 1,000,000Hrs
- High Reliability, High Performance
- RoHS Compliance

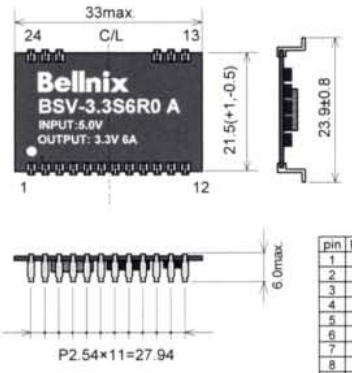
Models BSV Series	Input V Vdc	Output V Vdc	Output V Vdc	Output I A	Load Reg mV(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)	Package
BSV-3.3S6R0SA	3.0-5.5	3.3	0.8-3.6	0 - 6	50	40	93	SMD
BSV-3.3S6R0DA								DIP
BSV-3.3S6R0A								SIP

Note 1: When adjusting the output voltage, the input and output voltage difference needs to be 0.5V or more.
Vin(V)-Vout(V)≧0.5V

Note 2: Possible to optionally set the voltage by the internal resistor. Orders acceptable from 2k/lot.

<Outline>

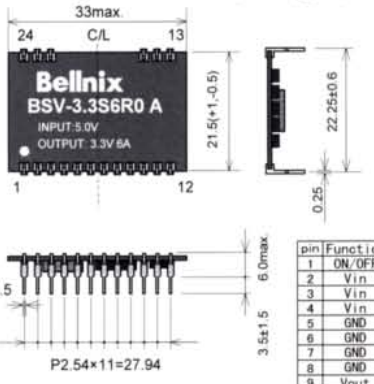
BSV-3.3S6R0SA (SMD type)



pin	Function
1	ON/OFF
2	Vin
3	Vin
4	Vin
5	GND
6	GND
7	GND
8	GND
9	Vout
10	Vout
11	Vout
12	Vadj
13	NC
14	+S
15	-S
22	NC
23	P-Good
24	NC

Weight: 4g typ.
Dimensions: mm

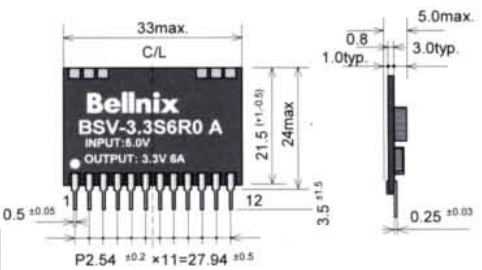
BSV-3.3S6R0DA (DIP type)



pin	Function
1	ON/OFF
2	Vin
3	Vin
4	Vin
5	GND
6	GND
7	GND
8	GND
9	Vout
10	Vout
11	Vout
12	Vadj
13	NC
14	+S
15	-S
22	NC
23	P-Good
24	NC

Weight: 4g typ.
Dimensions: mm

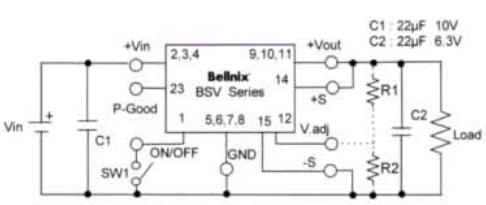
BSV-3.3S6R0A (SIP type)



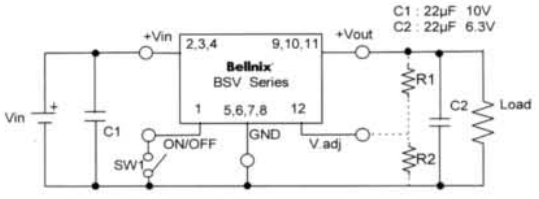
pin	Function
1	ON/OFF
2	Vin
3	Vin
4	Vin
5	GND
6	GND
7	GND
8	GND
9	Vout
10	Vout
11	Vout
12	Vadj

Weight: 4g typ.
Dimensions: mm

<Standard Connection Circuit Diagram> (SMD, DIP type)



(SIP type)



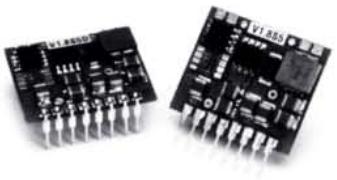
- SW1: When short, output will go OFF. - Vadj: When open, it will be rating output voltage.
- R1, R2: When adjusting output voltage, connect R1 or R2 to V.adj.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Low price product of BSV series appears !

13Watt BSV-Light Series

RoHS Compliance



High Efficiency POL DC-DC Converters/ BSV-Light 13Watt Series

Low Price, High Efficiency Step-Down DC-DC Converter

Input: 3.0V-5.5V Output: 1.8V (1.0V-3.3V)

Voltage can be optionally set with external resistors. (Ex.: 1V, 1.2V, 1.3V, 1.5V, 1.8V, 2V, 2.5V, 3.3V)

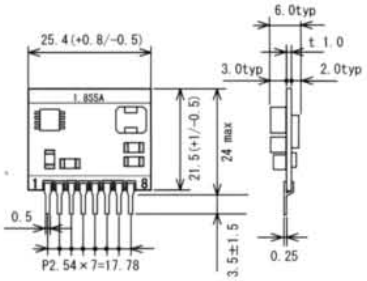
- Latest Technology, Synchronous Rectification Circuit
- Simple structure and Large capacity
- Ultra Small Size, Lightweight
- Less External Capacitors
- Heat Sink Not Required
- Built-in Short Circuit, Over-Current Protection
- Adjustable Output Voltage
- Non-Isolated Type Converter
- Minimum Size
- Remote ON/OFF Control
- MTBF1,000,000Hrs
- High Reliability, High Performance
- Operating Temp. Range -40°C to +85°C (Temp. derating required)
- RoHS Compliance

Models BSV-LA Series	Input V Vdc	Output V Vdc	Output I A	Load Reg mV(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)	Package
BSV-1.8S5R0LA	3.0-5.5	1.8 (1.0-3.3)	0-5	30	30	85%(3A) 82%(5A)	SIP
BSV-1.8S5R0DLA							DIP
BSV-1.8S5R0SLA							SMD

Note 1: The output voltage inside the ( ) indicates the adjustable range.
Note 2: There are requirements of input/ output voltage difference.
Note 3: There are input/ output derating requirements when adjusting output etc.
Note 4: External capacitors are required.
Note 5: At startup, there is load current limit.
Note 5: Depending on conditions, air flow is required.

<Outline>

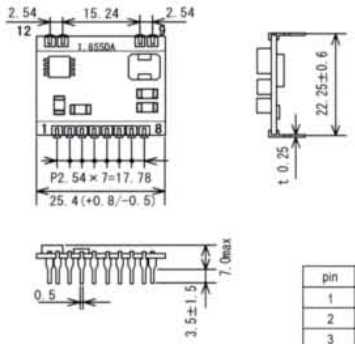
BSV-1.8S5R0LA (SIP type)



pin	Function
1	ON/OFF
2	Vin
3	Vin
4	GND
5	GND
6	Vout
7	Vout
8	V.adj

Weight: 4.5g typ.
Dimensions: mm

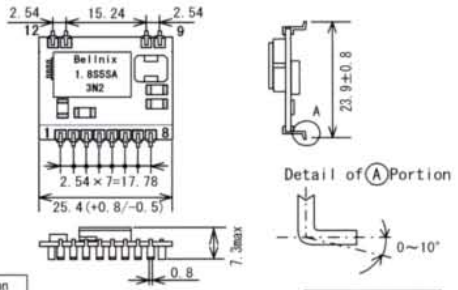
BSV-1.8S5R0DLA (DIP type)



pin	Function
1	ON/OFF
2	Vin
3	Vin
4	GND
5	GND
6	Vout
7	Vout
8	V.adj
9-12	NC

Weight: 4.5g typ.
Dimensions: mm

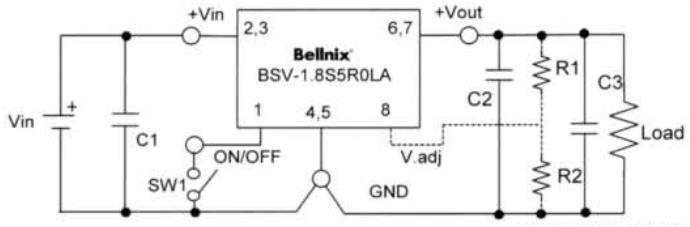
BSV-1.8S5R0SLA (SMD type)



pin	Function
1	ON/OFF
2	+Vin
3	+Vin
4	GND
5	GND
6	+Vout
7	+Vout
8	V.adj
9-12	NC

Weight: 5g typ.
Dimensions: mm

<Standard Connection Circuit Diagram> SIP Type

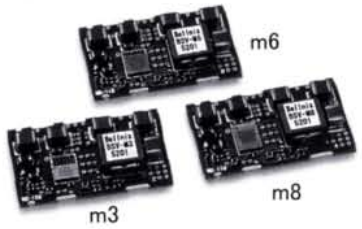


C1=0.47-10μF10V (Multilayer Ceramic)
C2=22-47μF6.3V (Multilayer Ceramic)
C3=0.47-10μF6.3V (Multilayer Ceramic)

- SW1: When short, output will go OFF.
- Vadj: When open, it will be rating output voltage.
- R1, R2: When adjusting output voltage, connect R1 or R2 to V.adj. Refer to data sheet.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Non-Isolated Type DC-DC



SMD Correspondence. Able to drive the Latest LSI with High-Speed Load Response!

BSV-m Series (m3, m6, m8)

NEW Bellnix RoHS Compliance

High-Speed Response POL DC-DC Converters/BSV-m Series

High-Speed Response, POL Converter

Input: 3.0V-5.5V Output: 3.3V (1.0V-3.3V)

Voltage can be optionally set with external resistors. (Ex.: 1V, 1.2V, 1.3V, 1.5V, 1.8V, 2V, 2.5V)

- Ultra Small Size 15×24mm
- Low Profile 4mm
- High-Speed Response
- Ultra High Efficiency
- Built-in Over-Current Protection
- External Capacitors Not Required
- Heat Sink Not Required
- Non-Isolated Type
- Built-in Low Input Voltage Protection
- Remote ON/ OFF Control
- Adjustable Output Voltage
- Surface Mount Package (SMD)
- Simple Structure and High Heat Radiation
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance

Models BSV-m Series	Input V Vdc	Output V Vdc	Output I A	Output ADJ Vdc	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BSV-3.3S3R0M	3.0-5.5	3.3	0-3	1.0-3.3	30	96
BSV-3.3S6R0M			0-6		50	94
BSV-3.3S8R0M			0-8		50	96

Note 1: When adjusting the output voltage, the input and output voltage difference needs to be 0.5V or more.
Vin(V)-Vo(V)≧0.5V

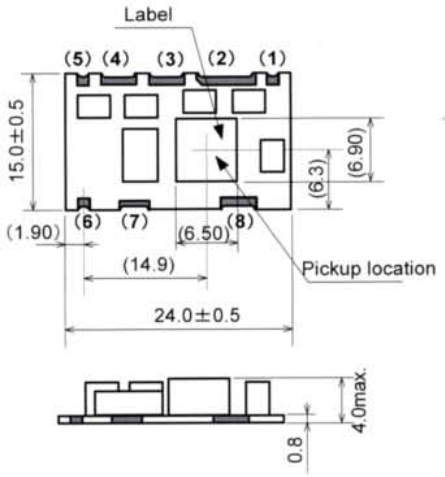
Note 2: Ripple noise, efficiency value is at Vin=5V, Vo=3.3V and Io=max.

Note 3: Ripple noise is measured at 20MHz bandwidth.

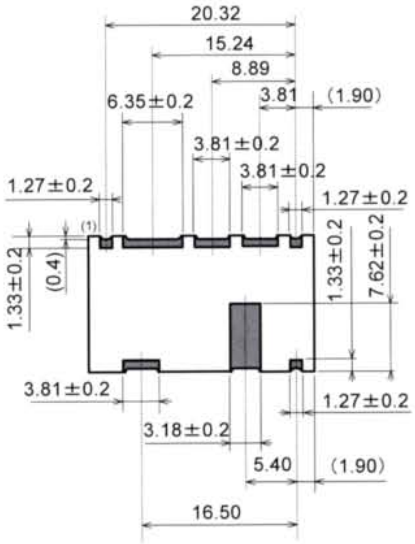
Note 4: Depending on the ambient air temp. conditions, air flow is required.

<Outline>

Top View



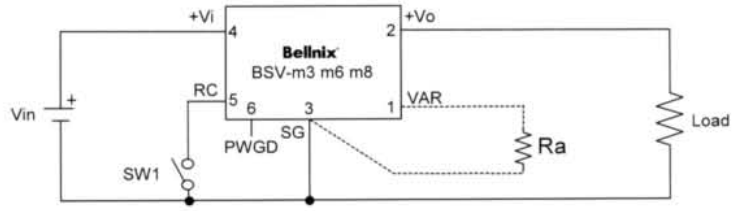
Bottom View



Pin	Function
1	VAR
2	+Vo
3	SG
4	+Vi
5	RC
6	PWGD
7	HS
8	NC

Dimensions: mm
Weight: 2.7g typ.
Tolerances: ±0.5

<Standard Connection Circuit Diagram>



- SW1: Output goes OFF when in short.
- VAR: Rating output voltage when in open.
- Ra: When adjusting the output voltage, connect Ra between VAR pin and SG pin.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Ultra Small Size. Able to drive the Latest Digital LSI with High-Speed Load Response!

BSV-H Series

NEW Bellnix RoHS Compliance

High-Speed Response POL DC-DC Converter/BSV-H Series

High-Speed Response, POL Converter

Input: 3.0V-5.5V Output: 3.3V (0.8V-3.3V)

Voltage can be optionally set with external resistors. (Ex.: 0.8V, 1V, 1.2V, 1.5V, 1.8V, 2V, 2.5V, 3.3V)

- Ultra Small Size 16.5×27mm
- Low Profile 4.2mm
- High-Speed Response
- Ultra High Efficiency
- Built-in Over-Current Protection
- External Capacitors Not Required
- Heat Sink Not Required
- Non-Isolated Type
- Built-in Low Input Voltage Protection
- Remote ON/OFF Control
- Adjustable Output Voltage
- Surface Mount Package (SMD)
- Operating Temp. Range -40°C to +85°C (Temp. derating required)
- RoHS Compliance

Models BSV-H Series	Input V Vdc	Output V Vdc	Output I A	Output ADJ Vdc	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BSV-3.3S12R0H	3.0-5.5	3.3	0-12	0.8-3.3	30	93

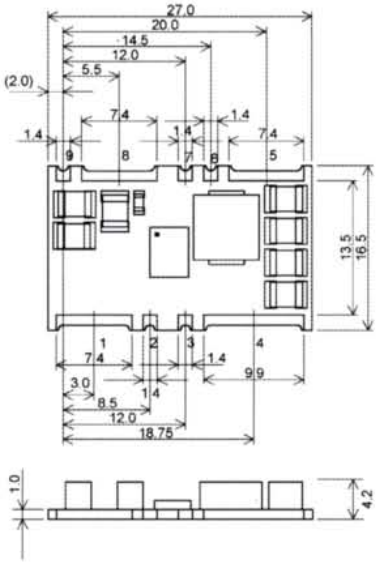
Note 1: The input and output voltage difference needs to be 0.5V or more. Vin(V)-Vo(V)≧0.5V

Note 2: Ripple noise, efficiency value is when input voltage is at 5V.

Note 3: Ripple noise is measured at 20MHz bandwidth.

Note 4: Depending on the ambient air temp. conditions, air flow is required.

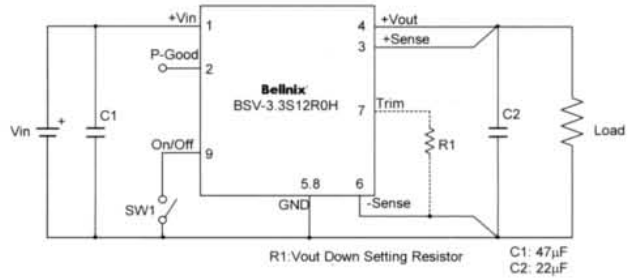
<Outline>



Pin	Function
1	+Vin
2	P-Good
3	+Sense
4	+Vout
5	GND
6	-Sense
7	Trim
8	GND
9	On/Off

Weight: 3.1g typ.
Dimensions: mm
Tolerances: ±0.5

<Standard Connection Circuit Diagram>



- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

- SW1: Output goes OFF when in short.
- Trim: Rating output voltage when in open.
- R1: When adjusting the output voltage, connect R1 between Trim pin and -Sense pin.

8-40 Watt BPM Series

Under Evaluation Tentative

RoHS Compliance

SIP or SMD Package Single Output DC-DC Converters/BPM Series

5pin SIP-IC Size (7pin SMD-IC Size), Non-Isolated Type DC-DC Converter

Input: 3.0V-5.5V
Input: 8.0V-14V
Input: 11.0V-36V
Input: 20V-36V

Output: 0.8V-3.3V
Output: 0.8V-5.0V
Output: 1.2V-2.5V
Output: 3.3V-6.5V
Output: 8.0V-15V

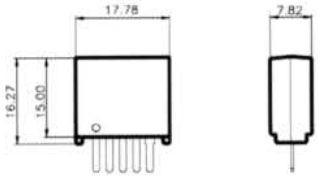
- 5pin SIP-IC Size, Ultra Small Size (7pin SMD-IC Size)
- Non-Isolated Type
- High Efficiency
- Remote ON/ OFF Control
- Wide Input Voltage Range
- Built-in Over-Current Protection
- Adjustable Output Voltage
- RoHS compliance

Models BPM series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Efficiency % (typ.)	Frequency kHz
BPM04S0A0R10 A	3.0-5.5	0.8-3.3	10	0.1	0.3	94	300
BPM12S0A0R08 A	8.0-14	0.8-5.0	8			93	500
BPM24S0A0R03 A	8.0-36	1.2-2.5	3	0.3	0.3	84	150
BPM24S0B0R03 A	11.0-36	3.3-6.5				90	300
BPM24S0C0R03 A	20-36	8.0-15.0				93.5	300

Note 1: The listed models are SIP types. For SMD types, the models changes "R" to "S".

Note 2: For step-down type non-isolated converters, there need to be difference between the input and output. Refer to data sheets, for more details.

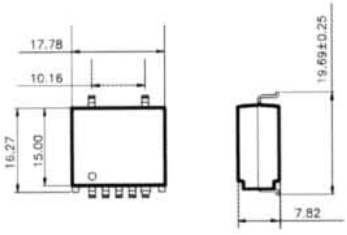
<Outline> (SIP type)



Dimensions: mm
Tolerances: ±0.10

pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	Trim

<Outline> (SMD type)

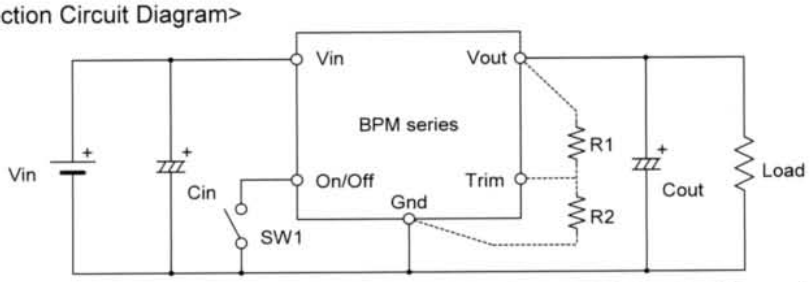


Dimensions: mm
Tolerances: ±0.10

pin	Function
1	ON/OFF
2	+Vin
3	GND
4	+Vout
5	Trim
6	NC
7	NC

- Note!
This catalogue is an outline of the products.
When designing, be sure to refer to the data sheets.

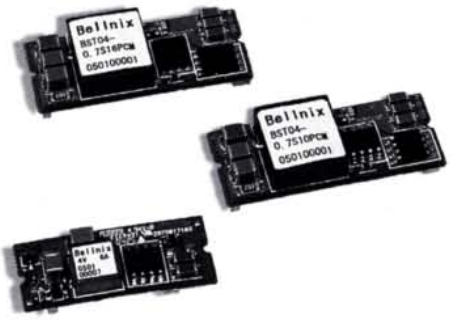
<Standard Connection Circuit Diagram>



Cin: BPM04=2×22μF Ceramic capacitor // 2×100μF Tantalum capacitor
BPM12=2×22μF Ceramic capacitor // 2×47μF Tantalum capacitor
BPM24=3.3μF Ceramic capacitor // 2×100μF Tantalum capacitor

Cout: BPM04, 12=1μF Ceramic capacitor // 10μF Tantalum capacitor
BPM24(A, B)=1μF Ceramic capacitor // 220μF POSCAP
BPM24(C)=1μF Ceramic capacitor // 2×100μF OS-CON

- SW1: Output goes OFF when in short.
- Trim: Rating output voltage when in open.
- R1, R2: When adjusting the output voltage, connect R1 or R2 to trim pin. Please refer to data sheets.



World Standard Size!

BST Series

NEW Bellnix

RoHS Compliance

Low Price POL DC-DC Converters/ BST Series

Low Price, Tracking Function, POL Converter

Input: 2.8-5.5V Output: 0.75V[0.75-3.3V]
Input: 10-14V Output: 0.75V[0.75-5.0V]

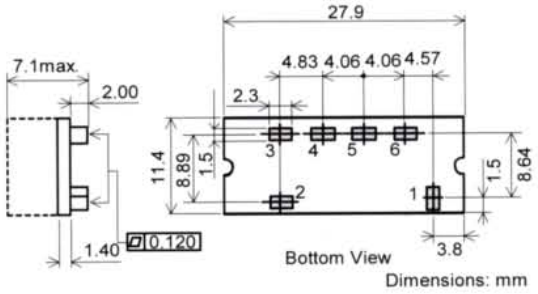
Voltage can be optionally set with external resistors. (Ex.: 1V, 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V)

- Tracking Function
  Sequencial Operation
  Simultaneous Tracking Operation
  Ratio-Metric Tracking Operation
- Remote ON/ OFF Control
- Industry's Standard Package
- Surface Mount Package (SMD)
- Ultra High Efficiency
- Adjustable Output Voltage
- Built-in Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance

Models BST Series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BST04-0.7S06PCM	2.8-5.5	0.75-3.3	6	0.3	0.4	40	94
BST12-0.7S06PCM	10-14	0.75-5.0		0.2		30	91.5
BST04-0.7S10PCM	2.8-5.5	0.75-3.3	10	0.3	0.4	25	96
BST12-0.7S10PCM	10-14	0.75-5.0				30	94.5
BST04-0.7S16PCM	2.8-5.5	0.75-3.3	16	0.3	0.4	25	95
BST12-0.7S16PCM	10-14	0.75-5.0				30	93.5

Note 1: Rating output voltage is Vo=0.75V.
Note 2: When adjusting the Vout, the input and output voltage difference needs to be 0.5V or more.
Vin(V)-Vo(V)≧0.5V
Note 3: Ripple noise is measured at 20MHz bandwidth.
Note 4: Efficiency value is when BST04 series is at: Vin=5V,Vo=3.3V and BST12 series is at: Vin=12V,Vo=5V respectively.
Note 5: Depending on the ambient air temp. conditions, air flow is required.

<Outline> (6A series)



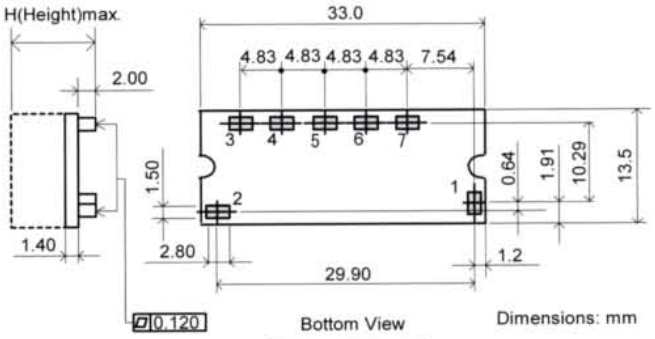
Dimensions: mm

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Pin	Function
1	On/Off
2	Vin
3	Seq
4	Gnd
5	Trim
6	Vout

Pin no. is not shown in the converter.

<Outline> (10/16A series)



Dimensions: mm

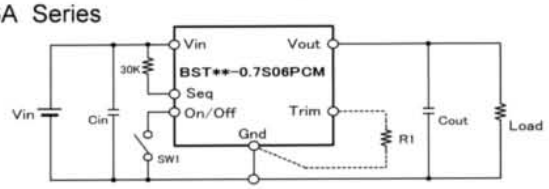
Model	H(Height)
BST04	8.3
BST12	9.7

Pin	Function
1	On/Off
2	Vin
3	Seq
4	Gnd
5	Vout
6	Trim
7	Sense

Pin no. is not shown in the converter.

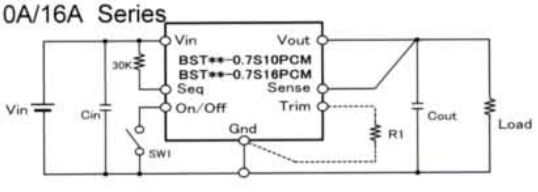
<Standard Connection Circuit Diagram>

BST-6A Series



Cin: BST04=47μF Ceramic capacitor//2×100μF Tantalum capacitor
BST12=2×22μF Ceramic capacitor
Cout: 1μF Ceramic capacitor//10μF Tantalum capacitor
(Common for BST04 and 12)
R1: Vout up Resistor

BST-10A/16A Series



Cin: BST04=47μF Ceramic capacitor//2×100μF Tantalum capacitor
(Common for 10A and 16A series)
BST12 (10A series)=4×22μF Ceramic capacitor
BST12 (16A series)=6×22μF Ceramic capacitor
Cout: 1μF Ceramic capacitor//10μF Tantalum capacitor
(Common for BST04 and 12)
R1 : Vout up Resistor

Small Type, 30W Dual Output POL Converter!

BSD-3A Series

NEW Bellnix RoHS Compliance

Dual Output POL DC-DC Converters/BSD-3A Series

Dual Output, POL Converter

Input: 4.75V-13.6V Output: 1.8V (1.0V-5.0V)

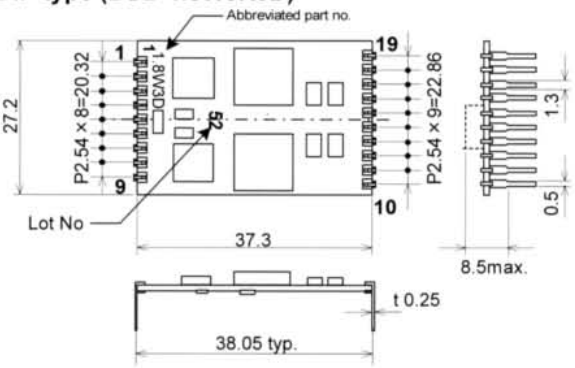
- DIP type (27.2×38×8.5)
- SMD type (27.2×40×8.5)
- Adjustable Output Voltage
- Non-Isolated Type
- No Electrolytic Capacitor, No Tantalum Capacitor
- Convert with High Efficiency 12V→1.8V
- Built-in Over-Current Protection
- Remote ON/OFF Control
- Wide Input Voltage
- Operating Temp. Range -40°C to +70°C
- RoHS Compliance

Models BSD-3A Series	Rating Input V (Voltage range) Vdc	Number of Output	Rating Output V (Adjustable range) Vdc	Rating Output I (Current range) A	Ripple Noise mVpp(typ.)	Package
BSD-1.8W3R0D	5/12 (4.75-13.6)	1ch 2ch	1.8(1.0-5.0) 1.8(1.0-5.0)	3(0-3) 3(0-3)	30 30	DIP
BSD-1.8W3R0M	5/12 (4.75-13.6)	1ch 2ch	1.8(1.0-5.0) 1.8(1.0-5.0)	3(0-3) 3(0-3)	30 30	SMD

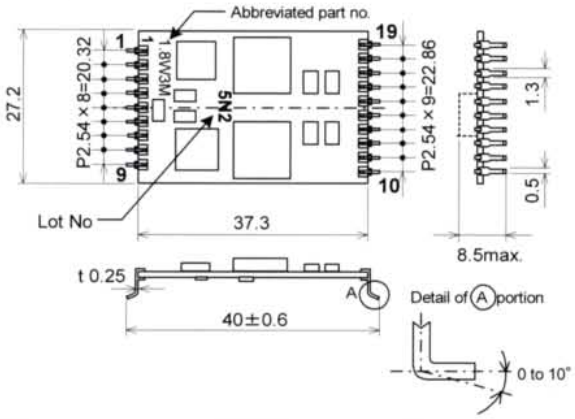
Note 1: Ripple noise value is measured at rating output 1.8V. (Measured at Bw=20MHz)

<Outline>

DIP type (BSD-1.8W3R0D)



SMD type (BSD-1.8W3R0M)



(For DIP, SMD type)

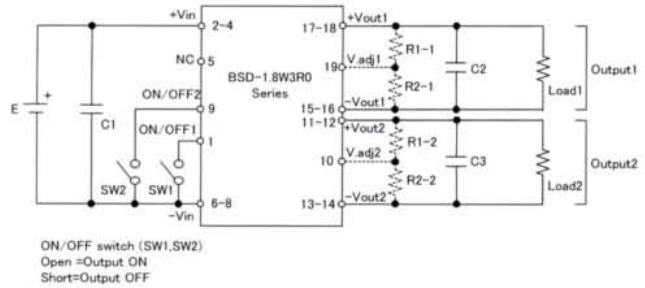
PIN	Function
1	On/Off 1
2	+Vin
3	+Vin
4	+Vin
5	NC
6	-Vin
7	-Vin
8	-Vin
9	On/Off 2
10	V.adj 2
11	+Vout 2
12	+Vout 2
13	-Vout 2
14	-Vout 2
15	-Vout 1
16	-Vout 1
17	+Vout 1
18	+Vout 1
19	V.adj 1

Dimensions: mm Weight: 7.5g typ.
Tolerances unless otherwise specified: ±0.5

Treatment: Soldering (Sn-Ag-Cu) dip
Pin material: Phosphorus bronze (tin plated)

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

<Standard Connection Circuit Diagram>



Note1: Be sure to add the input capacitor (C1) and output capacitor (C2, C3) shown in the left diagram.
Bring the input/ output capacitor to the pin as close as possible, and connect with a thick pattern.
Recommended capacitor C1: 0.47μF-10μF (Multilayer ceramic capacitor)
C2, C3: 22μF-47μF (Multilayer ceramic capacitor)

Note 2: Keep ON/OFF pin (1pin, 9pin) open when ON/OFF control is not being used.

Note 3: Keep V.adj pin (10pin, 19pin) open when output voltage is not being adjusted.

Note 4: Connect external resistors (R1-1 to R2-2) when output voltage is being adjusted.

Note 5: Be sure to add a capacitor of 220-470μF to the output edge, when in using with the output voltage within the range of Vout-Down (1.0V≦Vo<1.8V).

Note 6: Output ripple noise may become big when in using under light load.
Add a low impedance capacitor to the output edge of the converter when in using in a light load application.
Recommended capacitor EKZE10V, 220μF (Nippon Chemi-Con Corp.)

Suggesting the epoch-making combination with Step-Down DC-DC Converter

240-300 Watt BQ48SB, BE48SB Series

Under Evaluation Tentative

RoHS Compliance

High Efficency DC-DC Bus Converters/ BQ48SB, BE48SB 240-300W Series

High Efficiency (96%), Isolated Type DC-DC Bus Converter (Unregulated)

Input: 48V Output: 8V, 9.6V, 10.8V, 12V

- IEC/EN/UL60950 Certified
- High Efficiency 96%
- Over/ Under Input Voltage Shutdown
- Synchronous Rectification Circuit
- Isolation Voltage 2250V (Basic)
- Built-in Over-Heat Protection

Models BQ48/BE48 Series	Input V Vdc	Output V Vdc	Output I A	Output Power W	Efficiency %(typ.)
BQ48SB108S28NR A	36-60	10.8	0-28	300	95.5
BQ48SB120S20NR A	42-53	12	0-20		96
BQ48SB120S25NR A			0-25		96
BE48SB080S25NR A	48	8	0-25	TBD	TBD
BE48SB096S25NR A		9.6		240	96.5
BE48SB120S20NR A		12	0-20		96.3

* Dimensions: **BQ48SB:57.9×36.8×12.7mm** **BE48SB:58.4×22.8×11.3mm**

* When in designing, be sure to refer to the data sheets. This is a product introduction material.

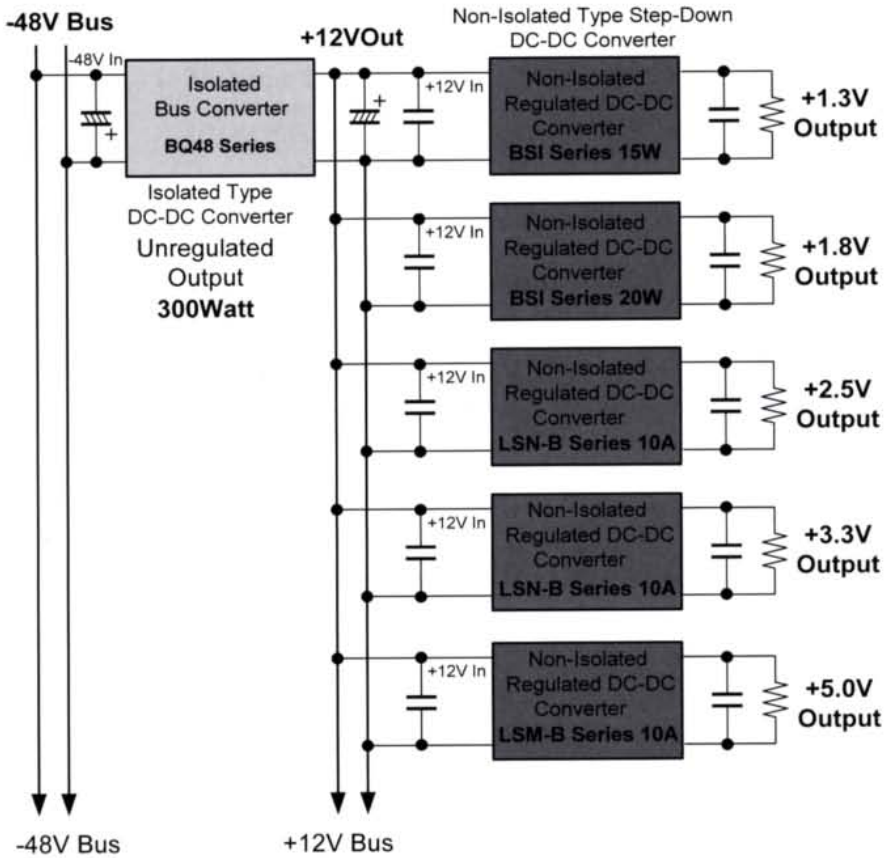
BQ48SB

BE48SB

Concept :

For infracture equipments of the next generation such as telecommunication networks, servers, routers, DSP applications and workstations etc., DC48V series are regarded as the main Bus converter. On the other hand, the minuteness technology of semiconductors have progressed with an amazing speed and has made the high-speed wide bandwidth communication possible. Power supplies to be used in the new generation telecommunication network equipments like this, are required to be multiple output, high efficiency, low voltage large current and also compose ultra small size. BQ48 series is a 300W quarter brick converter which creates a 12V series sub Bus converter from a main Bus 48V converter. Create a 12V Sub Bus voltage from a main Bus (48V) with BQ48 series. And combine a BELLNIX step-down DC-DC converter to compose a multiple output power supply. A stable voltage, low price, ultra small size and high efficiency multiple DC-DC converter will be easily composed.

Application example for a DC-DC Bus converter and non-isolated type step-down DC-DC converters



Note: This circuit is an image of a circuit composition. For details, refer to the respective data sheets before using.

Now is the epoch of low voltage, multiple output and large current. And here is the next generations DC-DC ocnverter which Bellnix is proposing.

Isolated Type DC-DC

Largely Adopted In World Important Electronic Devices.

1.5 Watt BY-L Series

RoHS Compliance

Ultra Low Noise, Small Size Single and Dual Output DC-DC Converters/ BY-L 1.5Watt Series

Ultra Low Noise 8mVpp, Wide Temperature Range -25°C to +71°C, Isolated Type DC-DC Converter

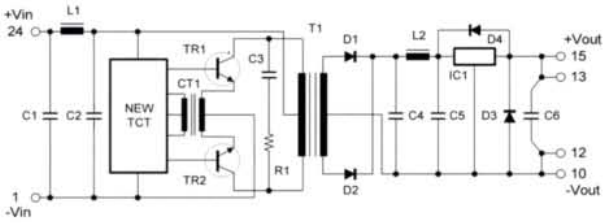
Input: 5V Output: 5V, 9V, 12V, 15V, ±5V, ±12V, ±15V

- 24pin-DIP IC size
- MTBF 1,000,000Hrs
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Heat Protection
- Long-Life with TCT Patent Circuit
- Isolation Voltage DC500V
- Operating Temp. Range -25°C to +71°C (Temp. derating required from 50°C)
- RoHS Compliance

Models BY-L Series	Input V Vdc *1	Output V Vdc	Output I mA	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/Noise mVpp(typ.)	Efficiency %(typ.)
BY05-05S30L	4.75-6	5	0-300	0.3	0.3	10	55
BY05-09S16L		9	0-160				60
BY05-12S12L		12	0-120				
BY05-15S10L		15	0-100				
BY05-05W08L	4.75-6	± 5	±0-80	0.3	0.3	8	45
BY05-12W06L		±12	±0-65				60
BY05-15W05L		±15	±0-53				60

- This model is compatible with the old BY series. Note 1: Output derating required from input voltage above 5.25V.

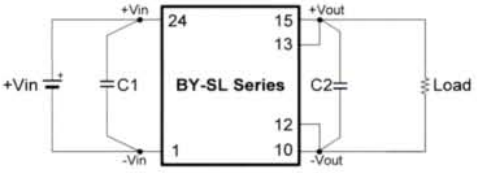
<BY-SL Series> (Favorable for analog, digital with low common mode noise.)

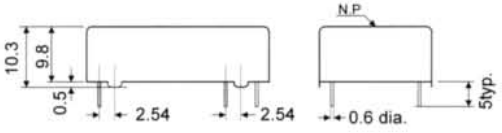


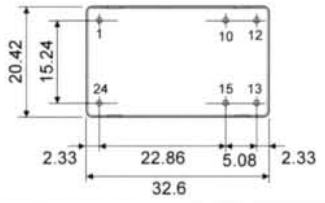
BY-SL

Pin	Function
1	-Vin
10	-Vout
12	-Vout
13	+Vout
15	+Vout
24	+Vin

Dimensions: mm
Weight: 14g typ.

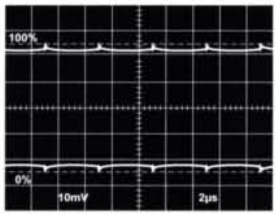






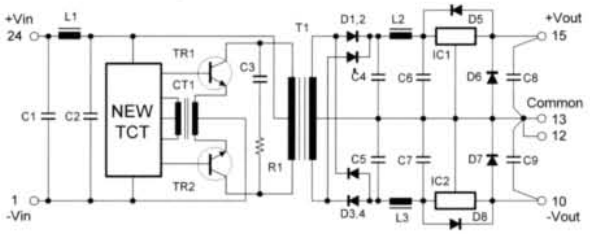
- Recommended Capacitor
  C1=22μF-33μF (Electrolytic or multilayer ceramic capacitor)
  C2=0.47μF (Multilayer ceramic capacitor)

BY05-12W06L Output Noise



+12V65mA/-12V65mA
3.3mVp-p
10mV/div,2μs/div

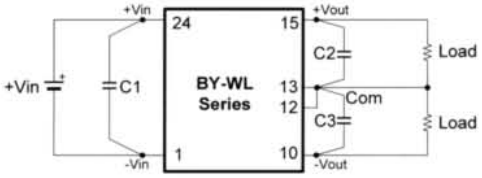
<BY-WL Series> (The most suitable ultra low noise for analog circuits.)

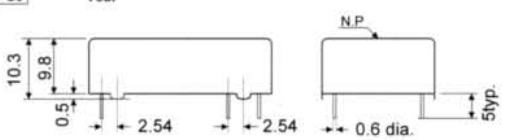


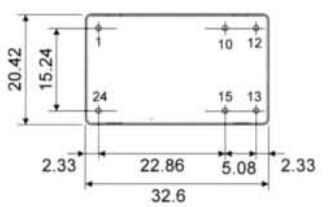
BY-WL

Pin	Function
1	-Vin
10	-Vout
12	Common
13	Common
15	+Vout
24	+Vin

Dimensions: mm
Weight: 14g typ.







- Recommended Capacitor
  C1=22μF-33μF (Electrolytic or multilayer ceramic capacitor)
  C2,C3=0.47μF (Multilayer ceramic capacitor)

- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

1.5 Watt BY-C Series

RoHS Compliance

P-S Low Capacitance Size Single and Dual Output DC-DC Converters/ BY-C 1.5Watt Series

Between Primary-Secondary Low Capacitance 20pF, Isolated Type DC-DC Converter

Input: 5V Output: 5V, 9V, 12V, 15V, ±12V, ±15V

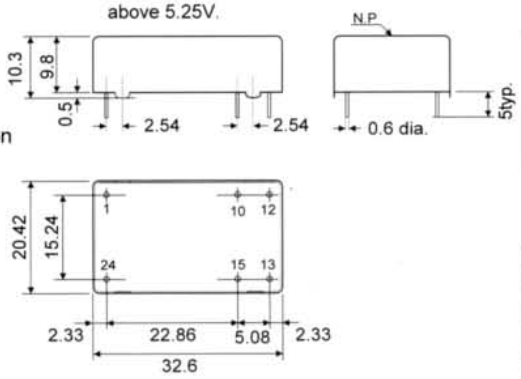
- Between Primary-Secondary combination capacitance 20pF
- Long-Life with TCT Patent Circuit
- 24pin IC Size
- Built-in Over-Heat Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Floating Type between Input and Output
- 5-Side Shield Structure (Electromagnetic Shield)
- Built-in EMI Line Filter
- Isolation Voltage DC500V
- Built-in Over-Current Protection
- Low Drift 50mV/8H
- Temp. Coefficient ±0.02%/°C
- RoHS Compliance

Models BY-C Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg % (max.)	Load Reg % (max.)	Ripple/Noise mVpp(typ.)	Efficiency % (typ.)
BY05-05S20C	4.75-6	5	0-200	0.2	0.2	100	60
BY05-09S16C Note 1		9	0-160				
BY05-12S12C		12	0-120				
BY05-15S10C		15	0-100				
BY05-12W06C		±12	0-65	0.5	0.5		
BY05-15W05C		±15	0-53				

Note 1: BY05-09S16C is an order-received product.

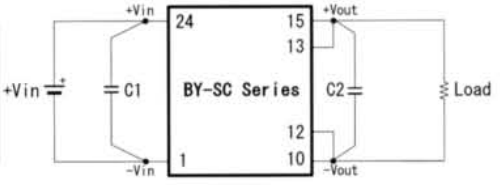
Note 2: Derating required from input voltage above 5.25V.

- Operating Temp. Range: -20°C to +70°C (Derating required from 50°C)
- Additional capacitors are the same as those of BY-SL, BY-WL series.



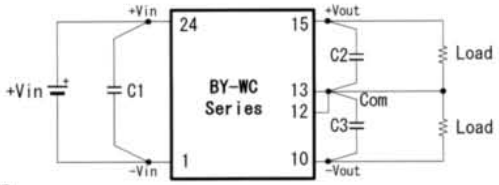
BY-SC

Pin	Function
1	-Vin
10	-Vout
12	-Vout
13	+Vout
15	+Vout
24	+Vin



BY-WC

Pin	Function
1	-Vin
10	-Vout
12	Common
13	Common
15	+Vout
24	+Vin



Dimensions: mm Weight: 15g typ.

1.5 Watt BY-H Series

RoHS Compliance

High Isolation Small Size Single and Dual Output DC-DC Converters/BY-H 1.5Watt Series

AC1500V High Isolated Type DC-DC Converter

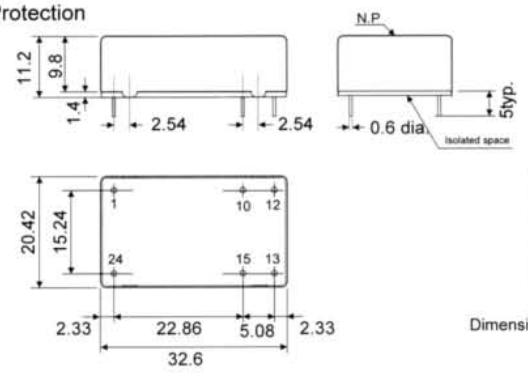
Input: 5V Output: 5V, 12V, 15V, ±12V, ±15V

- Isolation Voltage AC1500V
- Long-Life with TCT Patent Circuit
- 24pin IC Size
- Built-in Over-Heat Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- Floating Type between Input and Output
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Current Protection
- RoHS Compliance

Models BY-H Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/Noise mVpp(typ.)	Efficiency % (typ.)
BY05-05S20H	4.75-6	5	0-200	0.3	0.3	100	60
BY05-12S12H		12	0-120				
BY05-15S10H		15	0-100				
BY05-12W06H		±12	0-65				
BY05-15W05H		±15	0-53				

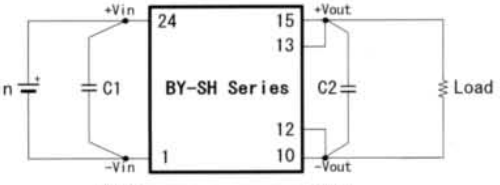
Note 1: Derating required from input voltage above 5.25V.

- Operating Temp. Range: -20°C to +70°C (Derating required from 50°C)
- Additional capacitors are the same as those of BY-SL, BY-WL series.



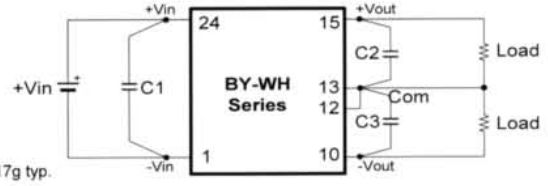
BY-SH

Pin	Function
1	-Vin
10	-Vout
12	-Vout
13	+Vout
15	+Vout
24	+Vin



BY-WH

Pin	Function
1	-Vin
10	-Vout
12	Common
13	Common
15	+Vout
24	+Vin



Dimensions: mm Weight: 17g typ.

-40°C Startup (-25°C to +71°C Guarantee)

2 Watt BX-L Series

RoHS Compliance

Ultra Low Noise, Small Size Dual Output DC-DC Converters/ BX-L 2Watt Series

Ultra Low Noise 8mVpp, Wide Temperature Operation, Isolated Type DC-DC Converter

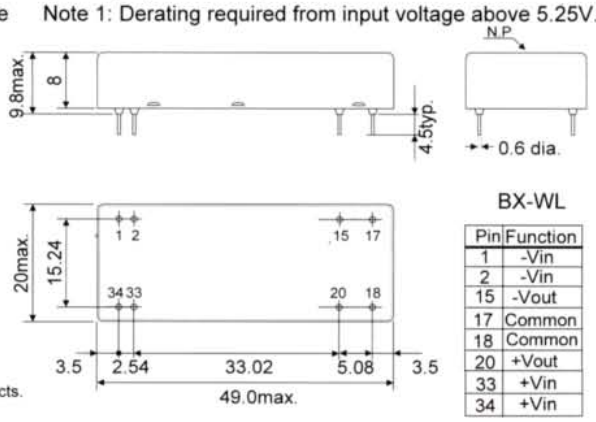
Input: 5V Output: ±12V, ±15V

- Analog, Digital Optimum
- MTBF 1,000,000Hrs
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Heat Protection
- Long-Life with TCT Patent Circuit
- Isolation Voltage DC500V
- Low Drift 30mV/8H
- RoHS Compliance

Models BX-L Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/Noise mVpp(typ.)	Efficiency % (typ.)
BX05-12W08L	4.75-6	±12	0-80	0.3	0.3	8	60
BX05-15W07L		±15	0-70				

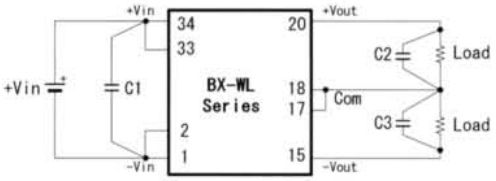
- Operating Temp. Range: -25°C to +71°C (Derating required from 50°C)
- This model is compatible with the old BX series.

Note 1: Derating required from input voltage above 5.25V.



BX-WL

Pin	Function
1	-Vin
2	-Vin
15	-Vout
17	Common
18	Common
20	+Vout
33	+Vin
34	+Vin



- Recommended Capacitor

C1=22μF-33μF (Electrolytic or multilayer ceramic capacitor)

C2, C3=0.47μF (Multilayer ceramic capacitor)

Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.

Dimensions: mm
Weight: 11gtyp.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

2 Watt BJ-H Series

RoHS Compliance

Ultra High Isolation Small Size Dual Output DC-DC Converters/ BJ-H 1.5Watt Series

AC4000V High Isolated Type DC-DC Converter

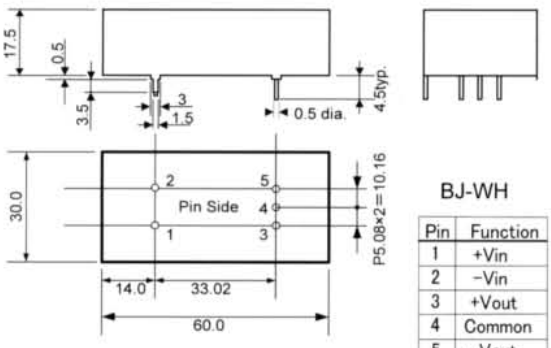
Input: 5V Output: ±12V, ±15V

- Isolation Voltage AC4000V
- Between Primary-Secondary combination capacitance 20pF
- IEC601-1 Conformed Designing
- No Electrolytic Capacitor, No Tantalum Capacitor
- Floating Type between Input and Output
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Current Protection
- RoHS Compliance

Models BJ-H Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/Noise mVpp(typ.)	Efficiency % (typ.)
BJ05-12W08H	4.75-6	±12	0-80	0.5	0.5	50	55
BJ05-15W07H		±15	0-67				

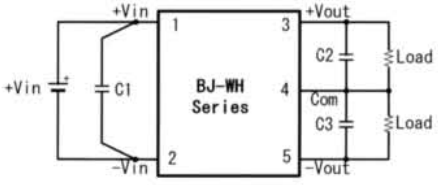
- Operating Temp. Range: -10°C to +60°C (Derating required from 50°C)

Note 1: Derating required from input voltage above 5.25V.



BJ-WH

Pin	Function
1	+Vin
2	-Vin
3	+Vout
4	Common
5	-Vout



- Recommended Capacitor

C1=33μF-47μF (Electrolytic or multilayer ceramic capacitor)

C2, C3=1μF-2.2μF (Multilayer ceramic capacitor)

Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.

Dimensions: mm Weight: 68g typ.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

3.6 Watt BZ Series

RoHS Compliance

Ultra Low Noise, Small Size Single and Dual Output DC-DC Converters/ BZ 3.6Watt Series

Ultra Low Noise 12mVpp, Wide Temp. -20°C to +70°C, Isolated Type DC-DC Converter

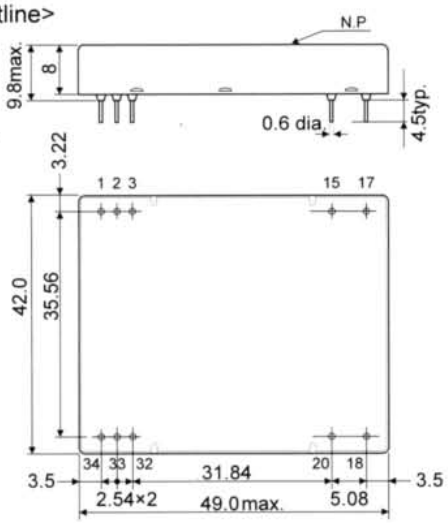
Input: 5V Output: 5V, 12V, 15V, ±12V, ±15V

- Analog, Digital Optimum
- MTBF 1,000,000Hrs
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Heat Protection
- Long-Life with TCT Patent Circuit
- Isolation Voltage DC500V
- Low Drift 50mV/8H
- Operating Temp. Range -20°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

Models BZ Series	Input V *2 Vdc	Output V Vdc	Output I mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/ Noise mVpp(typ.)	Efficiency % (typ.)
BZ05-12W15	4.75-6	±12	0-150	0.3	0.3	12	60
BZ05-15W12	4.75-6	±15	0-120	0.3	0.3	12	60
BZ05-05S-40	4.75-6	5	0-400	0.3	0.3	20	60
BZ05-12S-30	4.75-6	12	0-300	0.3	0.3	20	60
BZ05-15S-24	4.75-6	15	0-240	0.3	0.3	20	60

Note 1: Derating required from input voltage above 5.25V.

<Outline>



BZ-S

Pin	Function
1	-Vin
2	-Vin
3	-Vin
15	-Vout
17	-Vout
18	+Vout
20	+Vout
32	+Vin
33	+Vin
34	+Vin

BZ-W

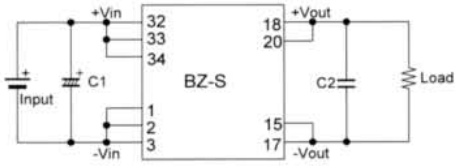
Pin	Function
1	-Vin
2	-Vin
3	-Vin
15	-Vout
17	Common
18	Common
20	+Vout
32	+Vin
33	+Vin
34	+Vin

Dimensions: mm Weight: 20g typ.

- Note!

This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

<Standard Connection Circuit Diagram>

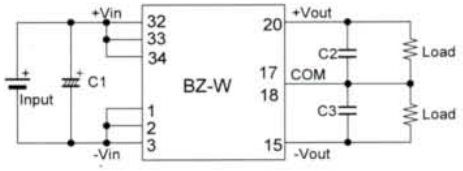


- Recommended Capacitor

C1=47μF-100μF (Electrolytic or multilayer ceramic capacitor)

C2=1μF (Multilayer ceramic capacitor)

Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.



- Recommended Capacitor

C1=47μF-100μF (Electrolytic or multilayer ceramic capacitor)

C2, C3=0.47μF-1μF (Multilayer ceramic capacitor)

Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.

4.5 Watt BR Series

RoHS Compliance

Low Noise Single Output DC-DC Converters/ BR 4.5Watt Series

Low Noise 25mVpp, Isolated Type DC-DC Converter

Input: 5V Output: 5V, 12V, 15V

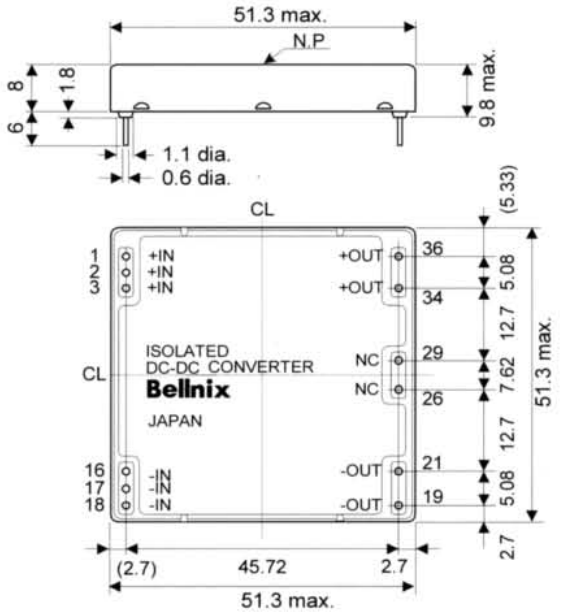
- Analog, Digital Optimum
- Floating Type between Input and Output
- Low Noise 25mVp-p
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Heat Protection
- Long-Life with TCT Patent Circuit
- Isolation Voltage DC500V
- Low Drift 50mV/8H
- Operating Temp. Range -20°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Models BR-S Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/ Noise mVpp(typ.)	Efficiency % (typ.)
BR05-05S-60	4.75-6	5	0-600	0.5	0.5	25	60
BR05-12S-38		12	0-380				
BR05-15S-30		15	0-300				

Note 1: Derating required from input voltage above 5.25V.

<Outline>

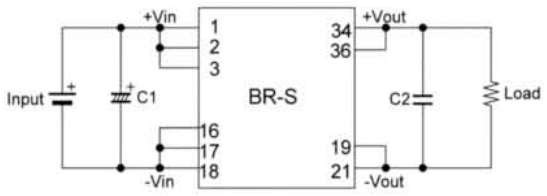


BR-S Series

Pin	Function
1	+Vin
2	+Vin
3	+Vin
16	-Vin
17	-Vin
18	-Vin
19	-Vout
21	-Vout
26	NC
29	NC
34	+Vout
36	+Vout

Dimensions: mm Weight: 25g typ.

<Standard Connection Circuit Diagram>



- Recommended Capacitor
  C1=47μF-100μF (Electrolytic or multilayer ceramic capacitor)
  C2=1μF (Multilayer ceramic capacitor)
  Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.

Succeeded in Japan's First SMD Standardization!

3 Watt BSM Series

SMD type, Small Size DC-DC Converters/ BSM 3Watt Series

RoHS Compliance

24pin SMD (Surface Mount Type), High Isolated Type DC-DC Converter

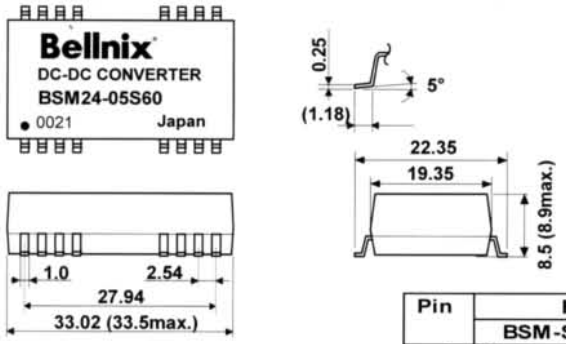
Input: 5V, 12V, 24V, 48V Output: 3.3V, 5V, 12V, 15V, ±12V, ±15V

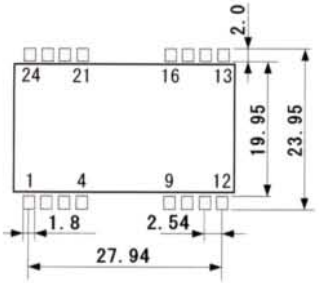
- Isolation Voltage
  DC1500V (48V Input)
  DC750V (Other Input)
- High Efficiency 74%-81%
- Operating Temp. Range
  -40°C to +85°C
  (Startup guarantee between -40°C to -25°C)
  (Derating required from 71°C)
- Lightweight 5g
- Low Ripple Noise
- Short Circuit, Over-Current Protection
- Floating Type between Input and Output
- MTBF 1,000,000Hrs
- Over-Input Protection
- World Standard (2:1) Input Voltage
- 24pin SMD Type
- High Reliability, Long-Life
- BSM 3W Series most suitable for telecommunication and industrial equipment, because of the wide operating temp. range. Lightweight of 5g and able to mount with a high-speed mounter.

- Note!
  This catalogue is an outline of the products.
  When designing, be sure to refer to the data sheets.

Models BSM 3W Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg %(typ.)	Load Reg %(typ.)	Ripple/ Noise mVpp(typ.)	Efficiency %(typ.)
BSM05-03S60	4.5-9	3.3	0-600	0.5	0.8	45	74
BSM05-05S60		5	0-600				77
BSM05-12S25		12	0-250				79
		15	0-200				79
BSM05-12W12		±12	0-125				78
		±15	0-100				78
BSM12-03S60	9-18	3.3	0-600	0.5	0.8	45	74
BSM12-05S60		5	0-600				80
BSM12-12S25		12	0-250				80
		15	0-200				80
BSM12-12W12		±12	0-125				80
		±15	0-100				80
BSM24-03S60	18-36	3.3	0-600	0.5	0.8	45	77
BSM24-05S60		5	0-600				80
BSM24-12S25		12	0-250				81
		15	0-200				81
BSM24-12W12		±12	0-125				81
		±15	0-100				81
BSM48-03S60	36-72	3.3	0-600	0.5	0.8	45	76
BSM48-05S60		5	0-600				80
BSM48-12S25		12	0-250				81
		15	0-200				81
BSM48-12W12		±12	0-125				80
		±15	0-100				80

<Outline>





Recommended Land Dimension

Dimensions: mm Weight: 5g

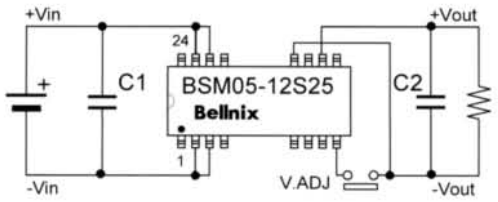
Refer to the data sheet for the soldering conditions.

Pin	Function	
	BSM-S	BSM-W
1	No Function	No Function
2	-Vin	-Vin
3	-Vin	-Vin
4	No Function	No Function
9	No Function	COMMON
10	No Function	No Function
11	No Function	-Vout
12	V.adj	V.adj
13	No Function	No Function
14	+Vout	+Vout
15	No Function	No Function
16	-Vout	COMMON
21	No Function	No Function
22	+Vin(Vcc)	+Vin(Vcc)
23	+Vin(Vcc)	+Vin(Vcc)
24	No Function	No Function

The V. adj. function of 12pin is limited to 12V, ±12V output. For 3.3V, 5V output, the output is not adjustable.

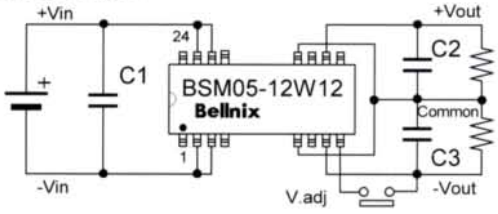
<Application Circuit Ex.>

BSM-S Series



- Add a capacitor to the input and output.
- C1=22-47μF C2=0.47-4.7μF (Multilayer Ceramic)
- Output voltage is selectable at 12pin and 16pin.
  Open: Vout=12V Short: Vout=15V
- When short between 12pin (V.adj) and (-Vout), 12V→15V.

BSM-W Series



- Add a capacitor to the input and output.
- C1=22-47μF C2, C3=0.47-4.7μF (Multilayer Ceramic)
- Output voltage is selectable at 11pin and 12pin.
  Open: Vout=±12V Short: Vout=±15V
- When short between 12pin (V.adj) and (-Vout), ±12V→±15V.

Wide Input Voltage Range. Save Mounting Space!

1.5 Watt BTA Series

NEW Bellnix

RoHS Compliance

Small Size Single and Dual Output DC-DC Converters/BTA 1.5Watt Series

The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

Input: 5V, 12V, 24V, 48V Output: 3.3V, 5V, 12V, 15V, ±12V, ±15V

- Adjustable Output Voltage
- Remote ON/OFF Control
- Dual Power Supply Usable As Single Power Supply
- Isolation Voltage AC500V
- Built-in Over-Current Protection
- Built-in Low Input Voltage Protection
- Built-in Over Input Current Protection Element
- No Electrolytic Capacitor, No Tantalum Capacitor
- MTTF 2,000,000Hrs
- Metallic Shield Cover
- Halogen-Free PCB Used
- Between Primary and Secondary combination capacitance approx. 60-140pF
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance
- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

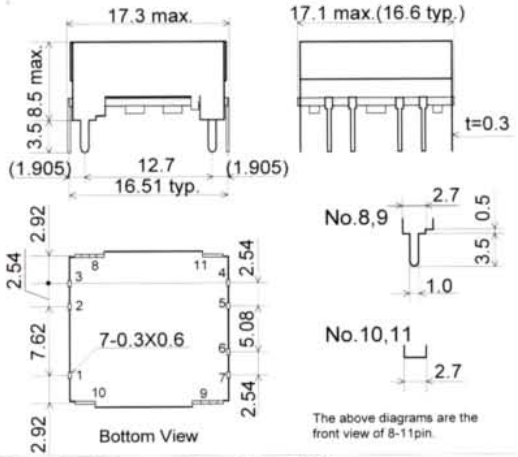
Models BTA Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg. mV(max.)	Load Reg. mV(max.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BTA05-03S40□	4.5-9	3.3	0-400	20	40	40	71
BTA05-05S30□		5	0-300				77
BTA05-12S12□		12(15)	0-125 (100)	40	100	30	80
BTA05-12W06□		±12(±15)	0-60 (50)	80	600		79
BTA12-03S40□	9-18	3.3	0-400	20	40	40	73
BTA12-05S30□		5	0-300				78
BTA12-12S12□		12(15)	0-125 (100)	40	100	30	82
BTA12-12W06□		±12(±15)	0-60 (50)	80	600		81
BTA24-03S40□	18-36	3.3	0-400	20	40	40	72
BTA24-05S30□		5	0-300				77
BTA24-12S12□		12(15)	0-125 (100)	40	100	30	81
BTA24-12W06□		±12(±15)	0-60 (50)	80	600		79
BTA48-03S40□	36-76	3.3	0-400	20	40	40	70
BTA48-05S30□		5	0-300				75
BTA48-12S12□		12(15)	0-125 (100)	40	100	30	80
BTA48-12W06□		±12(±15)	0-60 (50)	80	600		79

Note 1: Specify the type in the □ column of the model name. D: DIP type, S: SMD type
Ex.) DIP type: BTA05-03S40D, SMD type: BTA05-03S40S

Note 2: The output voltage inside ( ) is when it is short between Vadj and -Vout. The output voltage adjustable range are 3.15-3.6V (3.3V products), 4.75-6V (5V products), 11.4-15V (12V products) respectively.

Note 3: The output current inside ( ) is when adjusted to the max. output voltage.

<Outline> (DIP type)



BTA-S Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	NC
5	-Vout
6	Vadj
7	+Vout
8, 9	Case Connection
10,11	Stand Off

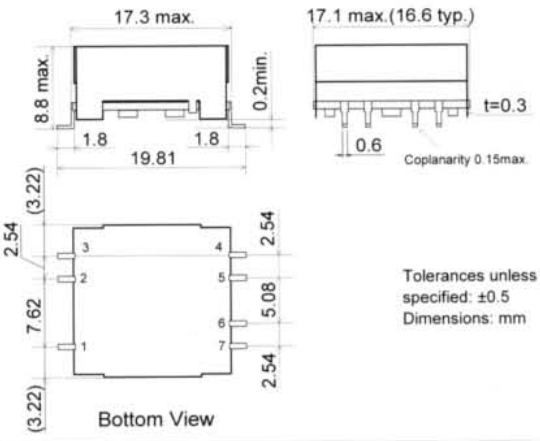
*8-11pin are only available for DIP type.

BTA-W Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	-Vout
5	Common
6	Vadj
7	+Vout
8, 9	Case Connection
10,11	Stand Off

*8-11pin are only available for DIP type.

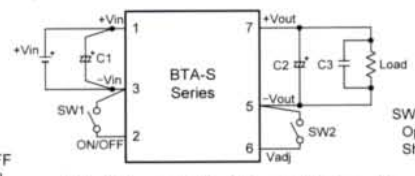
<Outline> (SMD type)



Tolerances unless otherwise specified: ±0.5
Dimensions: mm

<Standard Connection Circuit Diagram>

BTA-S Series (3.3V, 5V, 12V, 15V)

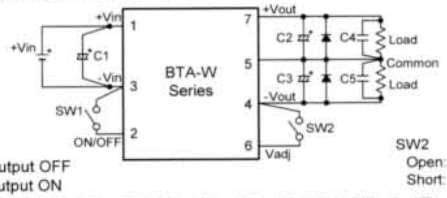


SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = 3.3V, 5V, 12V
Short: Vout = 3.3V→3.6V
= 5V→6V
= 12V→15V

C1=4.7 μF / C2=4.7 μF / C3=0.47 μF

BTA-W Series (±12V, ±15V)



SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = ±12V
Short: Vout = ±15V

C1=4.7 μF / C2,C3=4.7 μF / C4,C5=0.47 μF

- External output capacitors have limit of capacitance. Please refer to data sheets.
- Rated output voltage, with 6pin open. Output voltage is changeable as shown here above, with Vadj and -Vout short.

Wide Input Voltage Range. Save Mounting Space! NEW Bellnix RoHS Compliance

3 Watt BTB Series

Small Size Single and Dual Output DC-DC Converters/BTB 3Watt Series

The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

Input: 5V, 12V, 24V, 48V Output: 3.3V, 5V, 12V, 15V, ±12V, ±15V

- Adjustable Output Voltage
- Remote ON/OFF Control
- Dual Power Supply Usable As Single Power Supply
- Isolation Voltage AC500V
- Built-in Over-Current Protection
- Built-in Low Input Voltage Protection
- Built-in Over Input Current Protection Element
- No Electrolytic Capacitor, No Tantalum Capacitor
- MTTF 2,000,000Hrs
- Metallic Shield Cover
- Halogen-Free PCB Used
- Between Primary and Secondary combination capacitance approx. 40-140pF
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance
- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

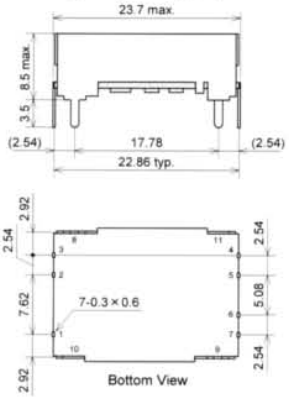
Models BTB Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg. mV(max.)	Load Reg. mV(max.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BTB05-03S80□	4.5-9	3.3	0-800	20	40	40	73
BTB05-05S60□		5	0-600				77
BTB05-12S25□		12(15)	0-250 (200)	40	100	30	82
BTB05-12W12□		±12(±15)	0-125 (100)	80	600		80
BTB12-03S80□	9-18	3.3	0-800	20	40	40	74
BTB12-05S60□		5	0-600				79
BTB12-12S25□		12(15)	0-250 (200)	40	100	30	82
BTB12-12W12□		±12(±15)	0-125 (100)	80	600		81
BTB24-03S80□	18-36	3.3	0-800	20	40	40	73
BTB24-05S60□		5	0-600				78
BTB24-12S25□		12(15)	0-250 (200)	40	100	30	82
BTB24-12W12□		±12(±15)	0-125 (100)	80	600		81
BTB48-03S80□	36-76	3.3	0-800	20	40	40	73
BTB48-05S60□		5	0-600				79
BTB48-12S25□		12(15)	0-250 (200)	40	100	30	81
BTB48-12W12□		±12(±15)	0-125 (100)	80	600		80

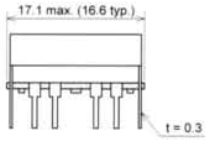
Note 1: Specify the type in the □ column of the model name. D: DIP type, S: SMD type
Ex.) DIP type: BTB05-03S80D, SMD type: BTB05-03S80S

Note 2: The output voltage inside ( ) is when Vadj. and -Vout is short. The output voltage adjustable range are 3.15-3.6V (3.3V products), 4.75-6V (5V products), 11.4-15V (12V products) respectively.

Note 3: The output current inside ( ) is when adjusted to the max. output voltage.

<Outline> (DIP type)

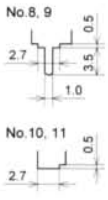




BTB-S Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	NC
5	-Vout
6	Vadj
7	+Vout
8, 9	Case Connection
10,11	Stand Off

*8-11pin are only available for DIP type.



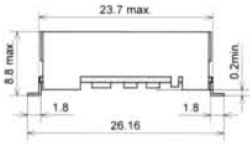
The above diagrams are the front view of 8-11pin.

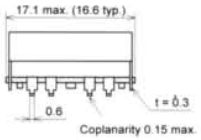
BTB-W Series

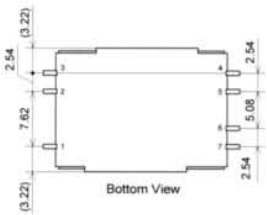
Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	-Vout
5	Common
6	Vadj
7	+Vout
8, 9	Case Connection
10,11	Stand Off

*8-11pin are only available for DIP type.

<Outline> (SMD type)



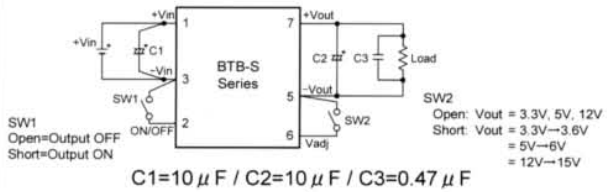




Tolerances unless otherwise specified: ±0.5
Dimensions: mm

<Standard Connection Circuit Diagram>

BTB-S Series (3.3V,5V,12V,15V)

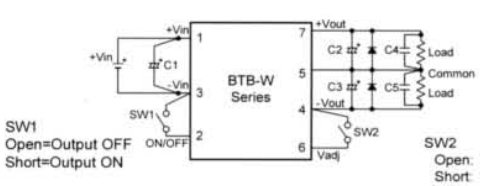


SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = 3.3V, 5V, 12V
Short: Vout = 3.3V→3.6V
= 5V→6V
= 12V→15V

C1=10μF / C2=10μF / C3=0.47μF

BTB-W Series (±12V,±15V)



SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = ±12V
Short: Vout = ±15V

C1=10μF / C2,C3=10μF / C4,C5=0.47μF

- External output capacitors have limit of capacitance. Please refer to data sheets.
- Rated output voltage, with 6pin open. Output voltage is changeable as shown here above, with Vadj and -Vout short.

Wide Input Voltage Range. Save Mounting Space !

6 Watt BTC Series

NEW Bellnix RoHS Compliance

Small Size Single and Dual Output DC-DC Converters/BTC 6Watt Series

The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

Input: 5V, 12V, 24V, 48V Output: 3.3V, 5V, 12V, 15V, ±12V, ±15V

- Adjustable Output Voltage
- Remote ON/OFF Control
- Dual Power Supply Usable As Single Power Supply
- Isolation Voltage AC500V
- Built-in Over-Current Protection
- Built-in Low Input Voltage Protection
- Built-in Over Input Current Protection Element
- No Electrolytic Capacitor, No Tantalum Capacitor
- MTTF 2,000,000Hrs
- Metallic Shield Cover
- Halogen-Free PCB Used
- Between Primary and Secondary combination capacitance approx. 30-110pF
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance
- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

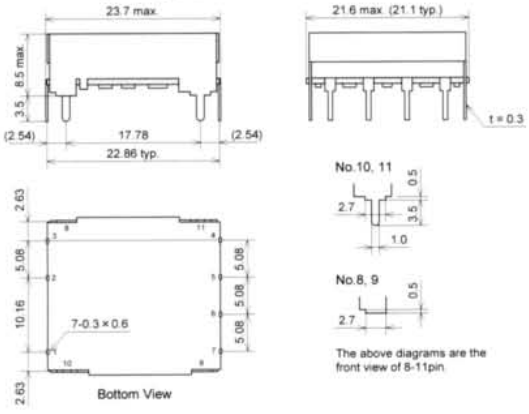
Models BTC Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg. mV(max.)	Load Reg. mV(max.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BTC05-03S120□	4.5-9	3.3	0-1200	20	40	40	76
BTC05-05S100□		5	0-1000				79
BTC05-12S50□		12(15)	0-500(400)	40	100	30	82
BTC05-12W25□		±12(±15)	0-250(200)	80	600		82
BTC12-03S120□	9-18	3.3	0-1200	20	40	40	78
BTC12-05S120□		5	0-1200				82
BTC12-12S50□		12(15)	0-500(400)	40	100	30	85
BTC12-12W25□		±12(±15)	0-250(200)	80	600		85
BTC24-03S120□	18-36	3.3	0-1200	20	40	40	77
BTC24-05S120□		5	0-1200				81
BTC24-12S50□		12(15)	0-500(400)	40	100	30	87
BTC24-12W25□		±12(±15)	0-250(200)	80	600		86
BTC48-03S120□	36-76	3.3	0-1200	20	40	40	77
BTC48-05S120□		5	0-1200				81
BTC48-12S50□		12(15)	0-500(400)	40	100	30	86
BTC48-12W25□		±12(±15)	0-250(200)	80	600		86

Note 1: Specify the type in the □ column of the model name. D: DIP type, S: SMD type
Ex.) DIP type: BTC05-03S120D, SMD type: BTC05-03S120S

Note 2: The output voltage inside ( ) is when Vadj. and -Vout is short. The output voltage adjustable range are 3.15-3.6V (3.3V products), 4.75-6V (5V products), 11.4-15V (12V products) respectively.

Note 3: The output current inside ( ) is when adjusted to the max. output voltage.

<Outline> (DIP type)



BTC-S Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	NC
5	-Vout
6	Vadj
7	+Vout
8, 9	Stand Off
10,11	Case Connection

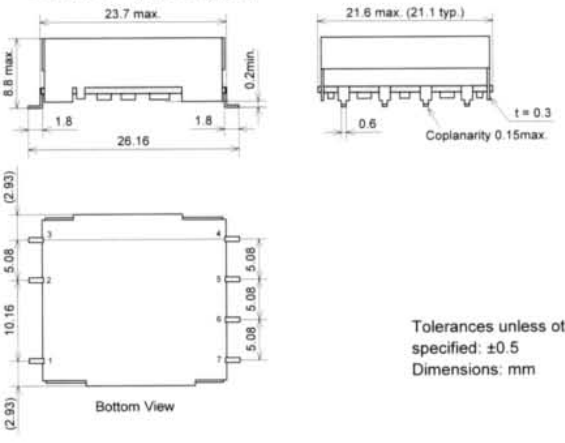
*8-11pin are only available for DIP type.

BTC-W Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	-Vout
5	Common
6	Vadj
7	+Vout
8, 9	Stand Off
10,11	Case Connection

*8-11pin are only available for DIP type.

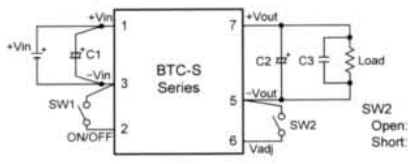
<Outline> (SMD type)



Tolerances unless otherwise specified: ±0.5
Dimensions: mm

<Standard Connection Circuit Diagram>

BTC-S Series (3.3V,5V,12V,15V)

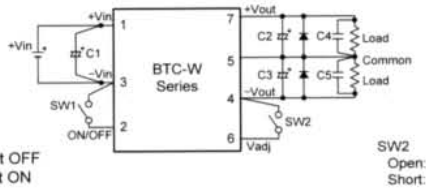


SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = 3.3V, 5V, 12V
Short: Vout = 3.3V→3.6V
= 5V→6V
= 12V→15V

C1=22 μF / C2=22 μF / C3=0.47 μF

BTC-W Series (±12V,±15V)



SW1
Open=Output OFF
Short=Output ON

SW2
Open: Vout = ±12V
Short: Vout = ±15V

C1=22 μF / C2,C3=22 μF / C4,C5=0.47 μF

- External output capacitors have limit of capacitance. Please refer to data sheets.
- Rated output voltage, with 6pin open. Output voltage is adjustable as shown here above, with Vadj and -Vout short.

Wide Input Voltage Range. Save Mounting Space !

10 Watt BTD Series

NEW Bellnix

RoHS Compliance

Small Size Single and Dual Output DC-DC Converters/BTD 10Watt Series

The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

Input: 5V, 12V, 24V, 48V Output: 3.3V, 5V, 12V, 15V, ±12V, ±15V

- Adjustable Output Voltage
- Remote ON/OFF Control
- Dual Power Supply Usable As Single Power Supply
- Isolation Voltage AC500V
- Built-in Over-Current Protection
- Built-in Low Input Voltage Protection
- Built-in Over Input Current Protection Element
- No Electrolytic Capacitor, No Tantalum Capacitor
- Metallic Shield Cover
- Halogen-Free PCB Used
- Between Primary and Secondary combination capacitance approx. 1100pF
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

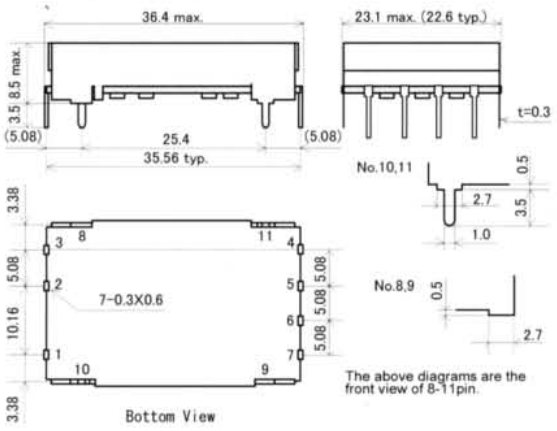
Models BTD Series	Input V Vdc	Output V Vdc	Output I mA	Line Reg. mV(max.)	Load Reg. mV(max.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BTD05-03S250□	4.5-9	3.3	0-2500	20	40	40	84
BTD05-05S200□		5	0-2000				84
BTD05-12S80□		12(15)	0-800(640)	40	100	30	84
BTD05-12W40□		±12(±15)	0-400(320)	80	600		83
BTD12-03S250□	9-18	3.3	0-2500	20	40	40	84
BTD12-05S200□		5	0-2000				86
BTD12-12S100□		12(15)	0-1000(800)	40	100	30	88
BTD12-12W45□		±12(±15)	0-450(360)	80	600		86
BTD24-03S250□	18-36	3.3	0-2500	20	40	40	84
BTD24-05S200□		5	0-2000				86
BTD24-12S100□		12(15)	0-1000(800)	40	100	30	87
BTD24-12W45□		±12(±15)	0-450(360)	80	600		86
BTD48-03S250□	36-76	3.3	0-2500	20	40	40	84
BTD48-05S200□		5	0-2000				86
BTD48-12S100□		12(15)	0-1000(800)	40	100	30	88
BTD48-12W45□		±12(±15)	0-450(360)	80	600		86

Note 1: Specify the type in the □ column of the model name. D: DIP type, S: SMD type
Ex.) DIP type: BTD05-03S250D, SMD type: BTD05-03S250S

Note 2: The output voltage inside ( ) is when Vadj. and -Vout is short. The output voltage adjustable range are 3.15-3.6V (3.3V products), 4.75-6V (5V products), 11.4-15V (12V products) respectively.

Note 3: The output current inside ( ) is when adjusted to the max. output voltage.

<Outline> (DIP type)



BTD-S Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	NC
5	-Vout
6	Vadj
7	+Vout
8, 9	Stand Off
10,11	Case Connection

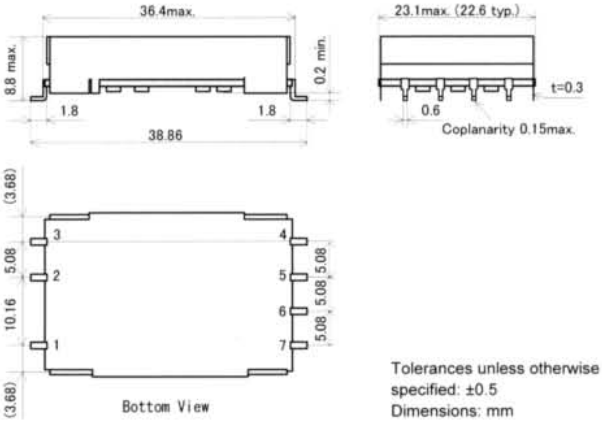
*8-11pin are only available for DIP type.

BTD-W Series

Pin	Function
1	+Vin
2	ON/OFF
3	-Vin
4	-Vout
5	Common
6	Vadj
7	+Vout
8, 9	Stand Off
10,11	Case Connection

*8-11pin are only available for DIP type.

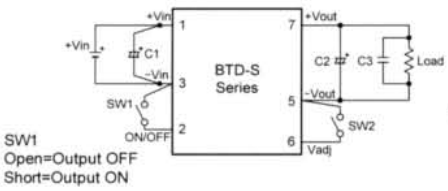
<Outline> (SMD type)



Tolerances unless otherwise specified: ±0.5
Dimensions: mm

<Standard Connection Circuit Diagram>

BTD-S Series (3.3V, 5V,12V,15V)

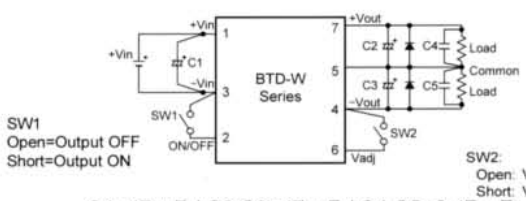


SW1
Open=Output OFF
Short=Output ON

SW2:
Open: Vout = 3.3V, 5V, 12V
Short: Vout = 3.3V→3.6V
= 5V→6V
= 12V→15V

C1=47 μF / C2=47 μF / C3=0.47 μF

BTD-W Series (±12V,±15V)



SW1
Open=Output OFF
Short=Output ON

SW2:
Open: Vout = ±12V
Short: Vout = ±15V

C1=47 μF / C2,C3=47 μF / C4,C5=0.47 μF

- External output capacitors have limit of capacitance. Please refer to data sheets.
- Rated output voltage, with 6pin open. Output voltage is adjustable as shown here above, with Vadj and -Vout short.

Wide Input Voltage Range. Save Mounting Space !

15 Watt BTE Series

NEW Bellnix

RoHS Compliance

Small Size Single Output DC-DC Converters/BTE 15Watt Series

The Fifth Generation, Ultra Small Size, Isolated Type DC-DC Converter

Input: 24V

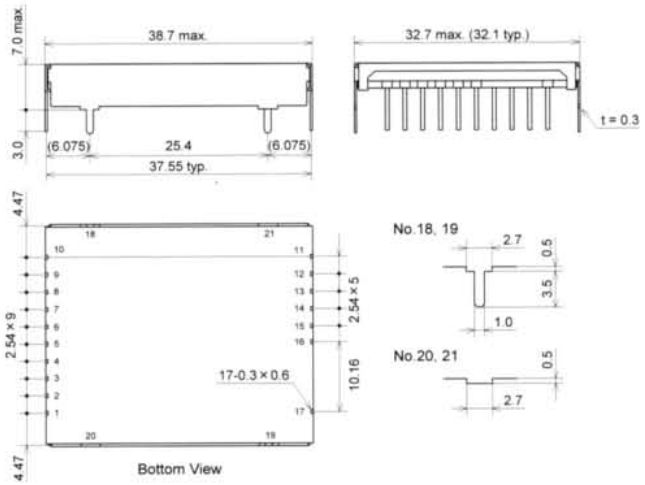
Output: 3.3V, 5V

- High Efficiency 89%
- Remote ON/OFF Control
- Isolation Voltage AC500V
- Built-in Over-Current Protection
- Built-in Low Input Voltage Protection
- Built-in Over Input Current Protection Element
- No Electrolytic Capacitor, No Tantalum Capacitor
- Metallic Shield Cover
- Between Primary and Secondary combination capacitance approx. 80pF
- Operating Temp. Range -40°C to +85°C (Temp. Derating required)
- RoHS Compliance

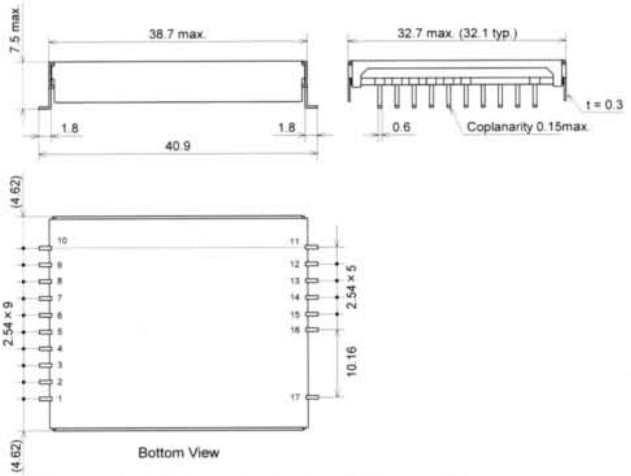
Models BTE Series	Input V Vdc	Output V Vdc	Output I A	Line Reg. mV(max.)	Load Reg. mV(max.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BTE24-03S450□	18-36	3.3	0-4.5	65	120	40	89
BTE24-05S300□		5	0-3.0	100	200		89

Note 1: Specify the type in the □ column of the model name. D: DIP type, S: SMD type
Ex.) DIP type: BTE24-05S300D, SMD type: BTE24-05S300S

<Outline> (DIP type)



<Outline> (SMD type)



BTE-S Series

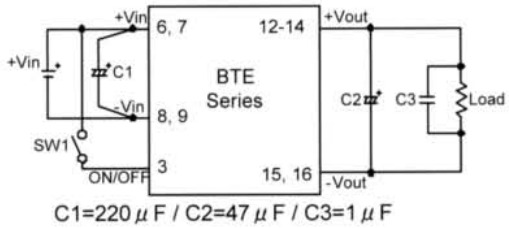
Pin	Function	Pin	Function	Pin	Function
1	NC	8	-Vin	15	-Vout
2	NC	9	-Vin	16	-Vout
3	ON/OFF	10	NC	17	NC
4	NC	11	NC	18	Case Connection
5	NC	12	+Vout	19	Case Connection
6	+Vin	13	+Vout	20	Stand Off
7	+Vin	14	+Vout	21	Stand Off

*18-21pin are only available for DIP type.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Tolerances unless otherwise specified: ±0.5
Dimensions: mm

<Standard Connection Circuit Diagram>



SW1:
Open =Output ON
Short =Output OFF

C1=220 μ F / C2=47 μ F / C3=1 μ F

- External capacitors have limit of capacitance. Please refer to data sheets.

High Reliability Converter Usable in Natural Convection!

60 Watt BFP Series
120 Watt BFP Series

NEW Bellnix

RoHS Compliance

High Reliability DC-DC Converter/BFP 60Watt, 120Watt Series

High Reliability, 24V Input, Isolated Type DC-DC Converter

Input: 24V Output: 3.3V, 5V, 12V, 15V, 24V

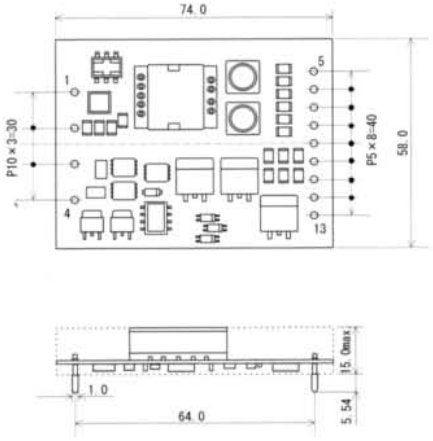
- High Efficiency 86%-88%
- Adjustable Output Voltage
- Floating Type between Input and Output
- Built-in Over-Current, Over-Voltage Protection
- Remote ON/OFF Control
- Long Life, High Reliability
- Isolation Voltage AC500V
- Frequency Synchronous Operation Possible
- Parallel Operation Possible (Except BFP24-05S12D)
- Operating Temp. Range -25°C to +70°C (Temp. Derating required)
- RoHS Compliance

Models 60W BFP Series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BFP24-05S12D	18-35	5	0-12	0.5	1	100	88
BFP24-12S05D		12	0-5				87
BFP24-15S04D		15	0-4				
BFP24-24S2R5D		24	0-2.5			200	

Models 120W BFP Series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BFP24-03S20D	18-35	3.3	0-20	0.5	1	100	86
BFP24-05S24D		5	0-24				87

<Outline>

60Watt BFP Series

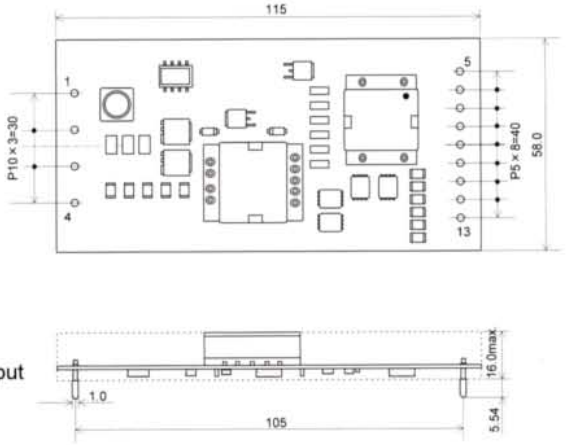


Pin	Function
1	+Vin
2	-Vin
3	ON/OFF
4	SYNC
5	VD
6	+S
7,8	+Vout
9,10	-Vout
11	-S
12	CS1 *1
13	CS2 *1

Dimensions: mm

*1: "NC" for 5V output products.

120Watt BFP Series

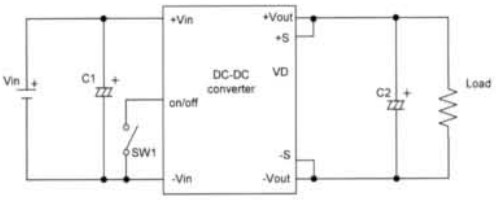


Pin	Function
1	+Vin
2	-Vin
3	ON/OFF
4	SYNC
5	VD
6	+S
7,8	+Vout
9,10	-Vout
11	-S
12	CS1
13	CS2

Dimensions: mm

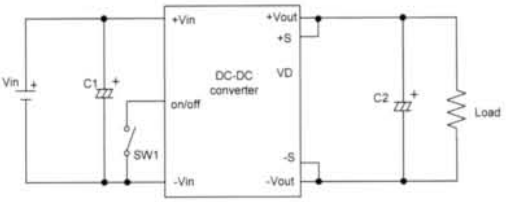
<Standard Connection Circuit Diagram>

60Watt BFP Series



SW1: Short→Output ON
Open→Output OFF
C1 : 100μF min.
C2 : 5V→680μF min.
12V,15V,24V→100μF min.

120Watt BFP Series



SW1: Short→Output ON
Open→Output OFF
C1 : 100μF min.
C2 : 680μF min.

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Low Price. 1/16 Brick!

30～66 Watt BV48SR Series

Under Evaluation Tentative

RoHS Compliance

Sixteenth Brick DIP Package Single Output DC-DC Converters/BV48SR Series

World's Standard, 1/16 Brick, Isolated Type DC-DC Converter

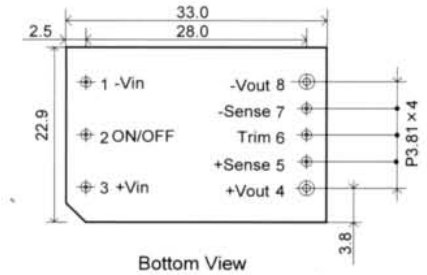
Input: 36V-75V　　Output: 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V, 12V, 15V

- High Efficiency 85%-91%
- Adjustable Output Voltage (±10% of Output voltage)
- Remote ON/OFF Control
- Built-in Low Input Voltage Protection
- Built-in Over-Current Protection
- Built-in Over-Heat Protection
- Built-in Over-Voltage Protection
- Remote Sensing
- Heat Sink Not Required
- Ultra Small Size (1/16 Brick)
- World Standard Pin Type
- No Electrolytic Capacitor, No Tantalum Capacitor
- Isolation Voltage DC2250V
- Applying for UL Standard
- RoHS Compliance

Models BV48SR series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Ripple Noise mVpp(typ.)	Efficiency %(typ.)
BV48SR012S25PR A	36-75	1.2	25	±0.1	±0.1	50	84
BV48SR015S25PR A		1.5	25				85
BV48SR018S25PR A		1.8	25				87
BV48SR025S20PR A		2.5	20				89
BV48SR033S20PR A		3.3	20				90.5
BV48SR050S13PR A		5	13				
BV48SR120S05PR A		12	5.5				91
BV48SR150S04PR A		15	4.4				

Note 1: Listed hereabove are the standard models ON/Off Logic=P (Positive), Pin Length=R (4.3mm). Correspondence is possible to be custom-designed for ON/Off Logic=N (Negative), Pin Length=N (3.68mm), K (2.79mm), and M (SMD). (Please inquire us for MOQ.)

<Outline> (DIP type)



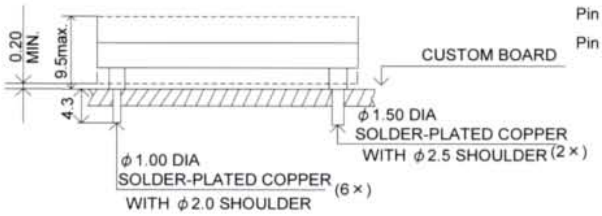
Bottom View

Pin	Function
1	-Vin
2	ON/OFF
3	+Vin
4	+Vout
5	+Sense
6	Trim
7	-Sense
8	-Vout

Dimensions: mm

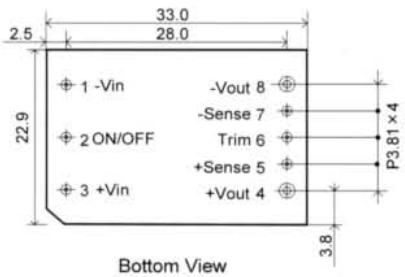
Pin 1-3, 5-7 1.02mm(0.040")

Pin 4 and 8 1.50mm(0.060"

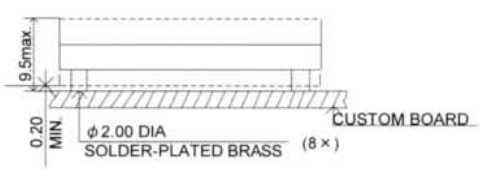


Side View

<Outline> (SMD type)

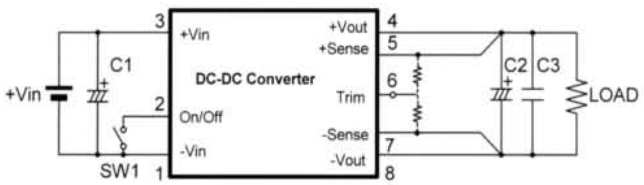


Bottom View



Side View

<Standard Connection Circuit Diagram>



- Note!
  This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

NEW Bellnix RoHS Compliance

Low Price. 1/8 Brick!

30 - 84 Watt BE24SR, BE48SR Series

Eighth Brick DIP Package Single Output DC-DC Converters/BE24SR, BE48SR Series

World's Standard, 1/8 Brick, Isolated Type DC-DC Converter

Input: 18V-36V
: 36V-75V

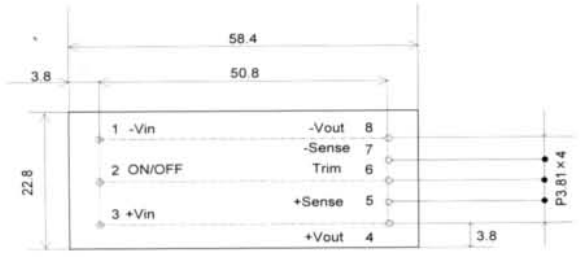
Output: 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V, 6.5V, 12V, 15V

- High Efficiency 88%-93%
- Adjustable Output Voltage (±10% of Output voltage)
- Remote ON/OFF Control
- Built-in Low Input Voltage Protection
- Built-in Over-Current Protection
- Built-in Over-Heat Protection
- Built-in Over-Voltage Protection
- Remote Sensing
- Heat Sink Not Required
- World Standard Pin Type
- Isolation Voltage DC2250V (1.2V,3.3V,12V (7A) type)
- No Electrolytic Capacitor No Tantalum Capacitor
- Applying for UL Standard
- Operating Temp. Range -40°C to +85°C
- RoHS Compliance

Models BE24/48SR series	Input V Vdc	Output V Vdc	Output I A	Line Reg. %(typ.)	Load Reg. %(typ.)	Ripple Noise mVpp(typ.)	Efficiency % (typ.)
BE24SR012S25NR A	18-36	1.2	25	±0.1	±0.1	40	87.5
BE24SR015S25NR A		1.5	25			40	89
BE24SR018S25NR A		1.8	25			40	90
BE24SR025S20NR A		2.5	20			50	88.5
BE24SR033S20NR A		3.3	20			60	90
BE24SR050S12NR A		5	12			60	91
BE24SR065S08NR A		6.5	8			50	90.5
BE24SR120S07NR A		12	7			80	92
BE24SR120S05NR A		12	5			60	92
BE24SR150S04NR A		15	4			70	92
BE48SR012S25PR A	36-75	1.2	25	±0.1	±0.1	40	88
BE48SR015S25PR A		1.5	25			40	89.5
BE48SR018S25PR A		1.8	25			40	90.5
BE48SR025S20PR A		2.5	20			50	89
BE48SR033S20PR A		3.3	20			60	90.5
BE48SR050S12PR A		5	12			60	91.5
BE48SR120S05PR A		12	5			80	92
BE48SR120S07PR A		12	7			60	93
BE48SR150S04PR A		15	4			70	91.5

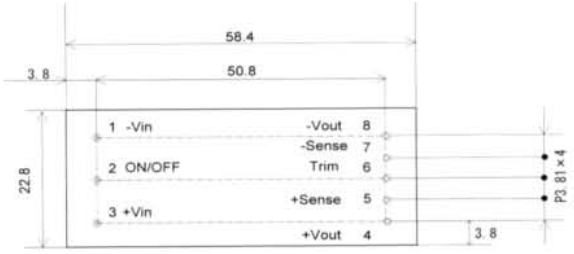
Note 1: Listed hereabove are the standard models ON/Off Logic=P (Positive) N (Negative), Pin Length=R (4.3mm).
Correspondence is possible to be custom-designed for ON/Off Logic=N or P,
Pin Length=N (3.68mm), K (2.79mm), and M (SMD). (Please inquire us for MOQ.)

<Outline> (SMD type)



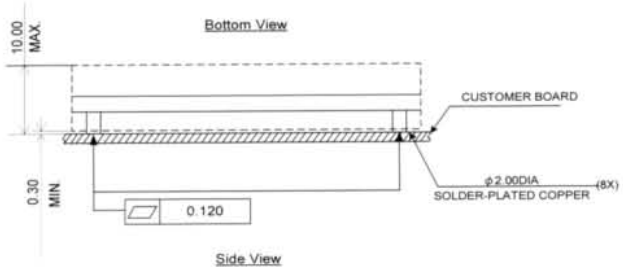
Pin	Function
1	-Vin
2	ON/OFF
3	+Vin
4	+Vout
5	+Sense
6	Trim
7	-Sense
8	-Vout

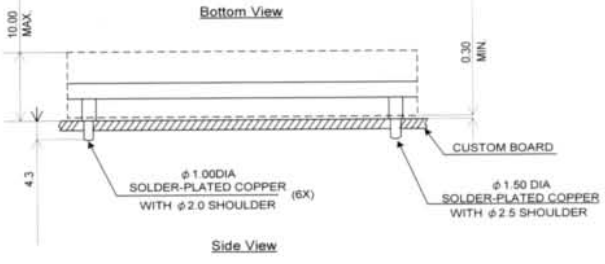
<Outline> (DIP type)



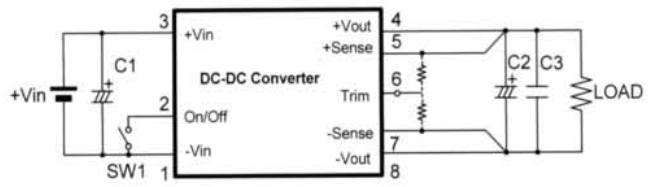
Tolerances unless otherwise specified:
X.Xmm±0.5mm
X.XXmm±0.25mm
Dimensions: mm

Pin 1-3, 5-7 1.00mm (0.040")
Pin 4 and 8 1.50mm (0.060")





<Standard Connection Circuit Diagram>



- Note!
This catalogue is an outline of the products.
When designing, be sure to refer to the data sheets.

NEW Bellnix RoHS Compliance

Low Price. 1/4 Brick!

82.5 - 175 Watt BQ48SX Series

Quarter Brick DIP Package Single Output DC-DC Converters/BQ48SX Series

World's Standard, 1/4 Brick, Isolated Type DC-DC Converter

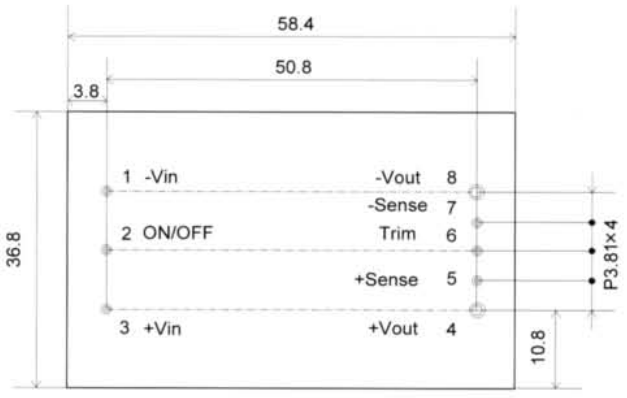
Input: 36V-75V Output: 3.3V, 5.0V

- High Efficiency 91%
- Adjustable Output Voltage (±10% of Output voltage)
- Remote ON/OFF Control
- Built-in Low Input Voltage Protection
- Built-in Over-Current Protection
- Built-in Over-Heat Protection
- Built-in Over-Voltage Protection
- Remote Sensing
- Heat Sink Not Required
- World Standard Pin Type
- No Electrolytic Capacitor No Tantalum Capacitor
- Applying for UL Standard
- Operating Temp. Range -40°C to +85°C
- RoHS Compliance

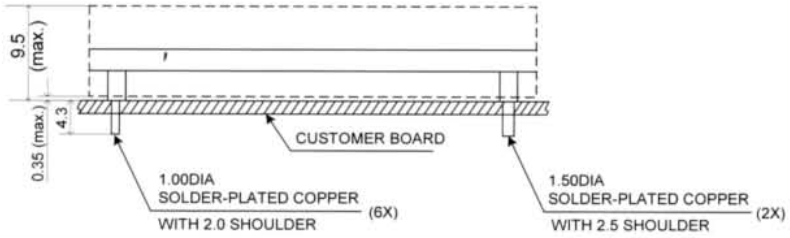
Models BQ48SX Series	Input V Vdc	Output V Vdc	Output I A	Line Reg. mV(typ.)	Load Reg. mV(typ.)	Ripple Noise mVpp(typ.)	Efficiency % (typ.)
BQ48SX033S35PR A	36-75	3.3	35	±0.5	±1.0	20	90.5
BQ48SX050S25PR A		5.0	25	±2.0	±2.0	35	91

Note 1: Listed hereabove are the standard models ON/Off Logic=P (Positive), Pin Length=R (4.3mm). Correspondence is possible to be custom-designed for ON/Off Logic=N (Negative), Pin Length=N (3.68mm), K (2.79mm), and M (SMD). (Please inquire us for MOQ.)

<Outline> (DIP type)



Bottom View



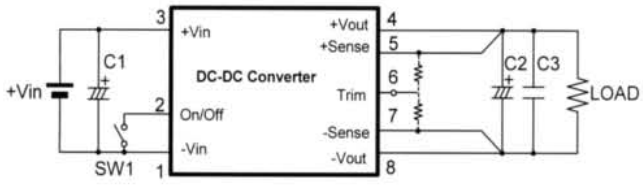
Side View

Pin	Function
1	-Vin
2	ON/OFF
3	+Vin
4	+Vout
5	+Sense
6	Trim
7	-Sense
8	-Vout

Tolerances unless otherwise specified:
X.Xmm±0.5mm
X.XXmm±0.25mm
Dimensions: mm

Pin 1-3, 5-7 1.00mm
Pin 4 and 8 1.50mm

<Standard Connection Circuit Diagram>



- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

0.2 Watt BYH Series

RoHS Compliance

Ultra Small Size, High Voltage Output DC-DC Converters/ BYH 0.2 Watt Series

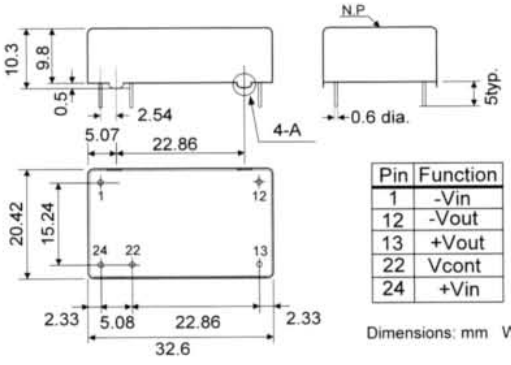
High Voltage, Isolated-Type DC-DC Converter

Input: 5V, 12V Output: 100V, 200V

- Low Ripple Noise 10mV
- Minimum Size 1/7-1/9
- Output Voltage 0%-100% Adjustable
- Control Voltage
  BYH05=0-3V
  BYH12=0-10V
- Floating Output
- Short Circuit, Over-Current Protection
- Isolation Voltage DC250V
- MTBF 1,400,000Hrs
- Operating Temp. Range
  -10°C to +60°C
  (Derating required from 50°C)
- RoHS Compliance

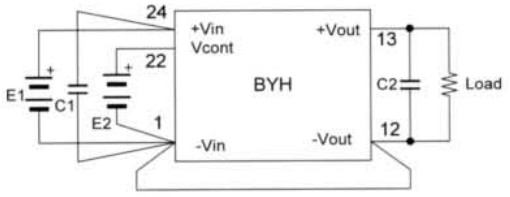
Models BYH Series	Input V Vdc	Input I mA(typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)	V Cont Vdc
BYH05-100S02	4.75-5.25	90	0-100	0-2	0.3	10	0-3
BYH12-100S02	11.0-16.0	34					0-10
BYH05-200S01	4.75-5.25	98	0-200	0-1			0-3
BYH12-200S01	11.0-16.0	41					0-10

- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.



Pin	Function
1	-Vin
12	-Vout
13	+Vout
22	Vcont
24	+Vin

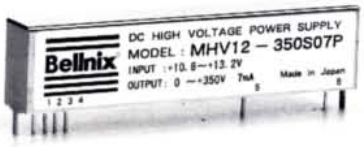
Dimensions: mm Weight: 14g typ.



C1=33uF-47uF C2=0.1uF

2.5-3 Watt MHV Series

RoHS Compliance



Ultra Small Size, High Voltage Output DC-DC Converters/ MHV 2.5-3Watt Series

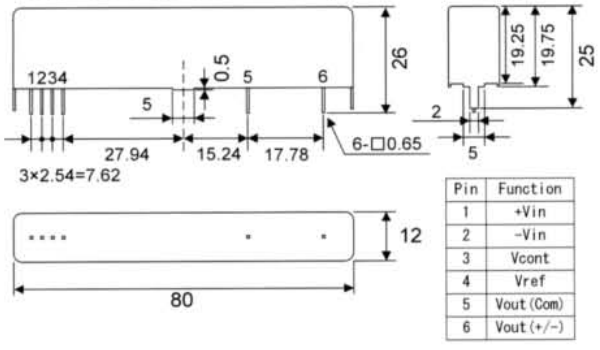
High Voltage DC-DC Converter

Input: 12V Output: 180V, 300V, 350V

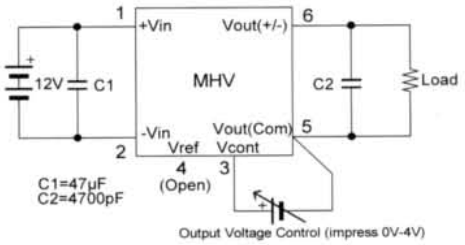
- Low Ripple Noise 30mV
- Minimum Size 1/7-1/9
- Output Voltage 0%-100% Adjustable
- Control Voltage 0-4V
- Control Resistor 5k ohm Adjustable Resistor
- 5-Side Metallic Shield Case
- High Reliability, Long-life
- Short Circuit, Over-Current Protection
- Non-Isolated Type
- MTBF 400,000Hrs
- Operating Temp. Range
  -10°C to +60°C
  (Derating required from 50°C)
- RoHS Compliance

Models MHV Series	Input V Vdc	Input I mA(typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)	Load k ohm(min.)
MHV12-180S15P	10.8-13.2	350	0 to +180	0-15	0.02	30	12
MHV12-180S15N			0 to -180				
MHV12-300S10P	10.8-13.2	395	0 to +300	0-10	0.02	30	30
MHV12-300S10N			0 to -300				
MHV12-350S07P	10.8-13.2	330	0 to +350	0-7	0.02	30	50
MHV12-350S07N			0 to -350				

- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.



Pin	Function
1	+Vin
2	-Vin
3	Vcont
4	Vref
5	Vout (Com)
6	Vout (+/-)



Dimensions: mm Weight: 46g typ.

2-3 Watt MHV Series

RoHS Compliance

Ultra Small Size, High Voltage Output DC-DC Converters/ MHV 2-3Watt Series

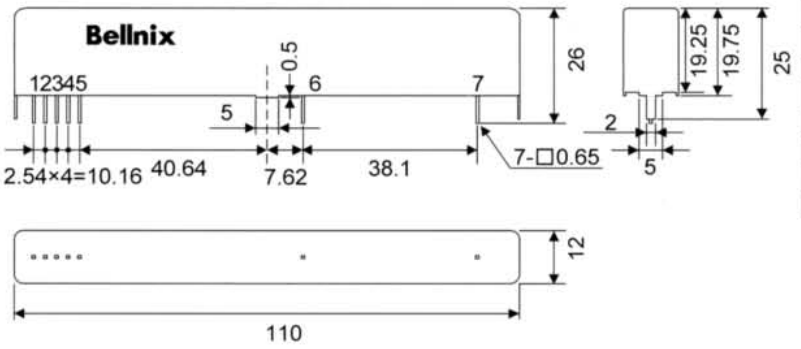
High Voltage DC-DC Converter

Input: 12V Output: 500V, 1000V, 1500V, 2000V

- Low Ripple Noise 30mV
- Minimum Size 1/7-1/9
- Output Voltage 0%-100% Adjustable
- Control Voltage 0-4V
- Control Resistor 5k ohm Adjustable Resistor
- 5-Side Metallic Shield Case
- High Reliability, Long-life
- Short Circuit, Over-Current Protection
- Non-Isolated Type
- MTBF 400,000Hrs
- Operating Temp. Range -10°C to +60°C (Derating required from 50°C)
- RoHS Compliance

Models MHV Series	Input V Vdc	Input I mA(typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)	Load k ohm(min.)
MHV12-470S06P	10.8-13.2	390	0 to +500	0-6.0	0.03	40	83.3
MHV12-470S06N			0 to -500				
MHV12-1.0K2000P	10.8-16.5	280	0 to +1000	0-2.0	0.03	30	500
MHV12-1.0K2000N			0 to -1000				
MHV12-1.5K1300P	10.8-16.5	290	0 to +1500	0-1.3	0.03	30	1150
MHV12-1.5K1300N			0 to -1500				
MHV12-2.0K1000P	10.8-16.5	340	0 to +2000	0-1.0	0.03	50	2000
MHV12-2.0K1000N			0 to -2000				

<Outline>

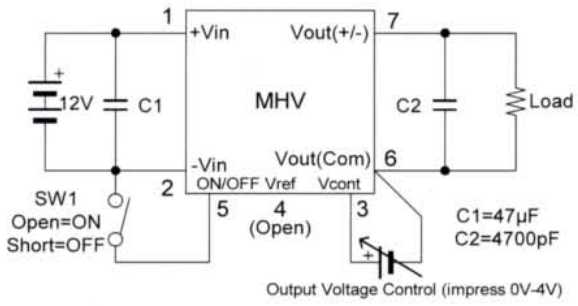


Pin	Function
1	+Vin
2	-Vin
3	Vcont
4	Vref
5	ON/OFF
6	Vout(Com)
7	Vout(+/-)

Weight: 65g typ.

Dimensions: mm

<Standard Connection Circuit Diagram>



- Note!

This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

2-3 Watt SHV Series

Ultra Small Size, High Voltage Output DC-DC Converters/ SHV 2-3Watt Series

High Voltage DC-DC Converter

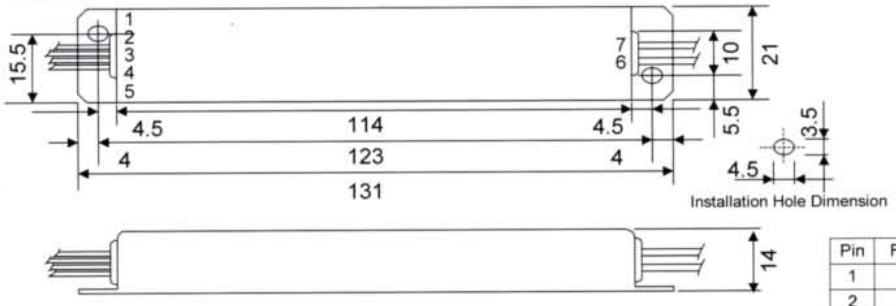
Input: 12V Output: 500V, 1000V, 1500V, 2000V

- Low Ripple Noise 30mV
- Minimum Size 1/6-1/8
- Output Voltage 0%-100% Adjustable
- 5-Side Metallic Shield Case
- Remote ON/OFF Control
- High Reliability, Long-life
- Short Circuit, Over-Current Protection
- Non-Isolated Type
- Easy Mounting Chassis Installed Type
- Operating Temp. Range -10°C to +60°C (Derating required from 50°C)

- Note!
This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Models SHV Series	Input V Vdc	Input I mA(typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)	Load k ohm(min.)
SHV12-0.5K6000P	10.8-13.2	390	0 to +500	0-6.0	0.03	30	83.3
SHV12-0.5K6000N			0 to -500				
SHV12-1.0K2000P	10.8-16.5	290	0 to+1000	0-2.0	0.03	30	500
SHV12-1.0K2000N			0 to -1000				
SHV12-1.5K1300P	10.8-16.5	290	0 to +1500	0-1.3	0.03	30	1150
SHV12-1.5K1300N			0 to -1500				
SHV12-2.0K1000P	10.8-16.5	340	0 to +2000	0-1.0	0.03	50	2000
SHV12-2.0K1000N			0 to -2000				

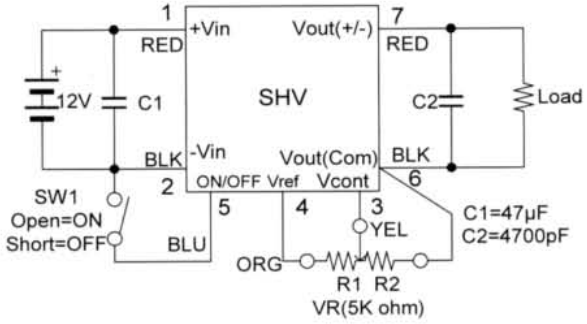
<Outline>



Pin	Function	Lead Color
1	+Vin	RED
2	-Vin	BLACK
3	Vcont	YELLOW
4	Vref	ORANGE
5	ON/OFF	BLUE
6	Vout (Com)	BLACK
7	Vout (+/-)	RED

Weight: 98g typ.
Dimensions: mm

<Standard Connection Circuit Diagram>



3.5 Watt PHV Series

Ultra Small Size, High Voltage Output DC-DC Converters/ PHV 3.5Watt Series

High Voltage DC-DC Converter

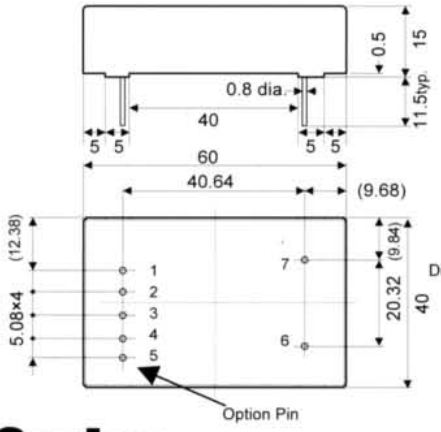
Input: 12V Output: 350V

- Low Ripple Noise
- Minimum Size 1/5-1/6
- Output Voltage 0%-100% Adjustable
- 5-Side Metallic Shield Case
- Remote ON/OFF Control (option)
- High Reliability, Long-life
- Short Circuit, Over-Current Protection
- Non-Isolated Type
- Operating Temp. Range -10°C to +50°C (Derating required from 40°C)

Models 3.5W PHV Series	Input V Vdc	Input I mA (typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)
PHV12-350S10P	10.8-16.5	430	0 to +350	0-10	0.01	100
PHV12-350S10N			0 to -350			

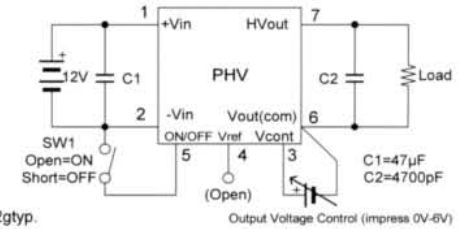
- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Note: ON/OFF Control is optional. Please add suffix "R" when placing orders.



Pin	Function
1	+Vin
2	-Vin
3	Vcont
4	Vref
5	On/Off
6	Vout(Com)
7	HVout

Dimensions: mm Weight: 72gtyp.



ON/OFF is optional

5 Watt PHV Series

Ultra Small Size, High Voltage Output DC-DC Converter/ PHV 5Watt Series

High Voltage DC-DC Converter

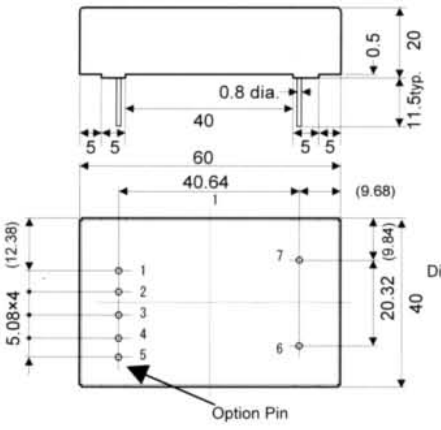
Input: 12V Output: 500V, 1000V, 2000V

- Low Ripple Noise
- Minimum Size 1/7-1/9
- Output Voltage 0%-100% Adjustable
- 5-Side Metallic Case
- Remote ON/OFF Control (option)
- High Reliability, Long-life
- Short Circuit, Over-Current Protection
- Non-Isolated Type
- MTBF 380,000Hrs
- Operating Temp. Range -10°C to +50°C (Derating required from 40°C)

Models 5W PHV Series	Input V Vdc	Input I mA (typ.)	Output V Vdc	Output I mA	Line Reg % (typ.)	Ripple/ Noise mVpp(typ.)
PHV12-0.5K10000P	10.8-16.5	580	0 to +500	0-10	0.01	60
PHV12-0.5K10000N			0 to -500			
PHV12-1.0K5000P			0 to +1000	0-5		80
PHV12-1.0K5000N			0 to -1000			
PHV12-2.0K2500P			0 to +2000	0-2.5		160
PHV12-2.0K2500N			0 to -2000			

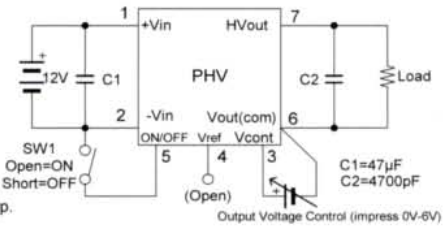
- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Note: ON/OFF Control is optional. Please add suffix "R" when placing orders.



Pin	Function
1	+Vin
2	-Vin
3	Vcont
4	Vref
5	On/Off
6	Vout(Com)
7	HV out

Dimensions: mm Weight: 94gtyp.



ON/OFF is optional

Use in Low Noise required for Medical. Measurements. Analysis. Control etc. !

15, 30, 60 Watt BLN Series

RoHS Compliance

Ultra Low Noise, Small Size Single and Dual Output AC-DC Power Supply/ BLN Series

Ultra Low Noise (10mVpp), High Isolated-Type (AC4000V) AC-DC Resonant Type Switching Power Supply

Input: AC85V-264V Output: 5V, 12V, 15V, ±15V, 24V

Ultra Low Noise Power Supply as Series Regulators !

- EN60601-1 Approved (Corresponds to Medical Equipment)
- Low Ripple Voltage (5mVpp), Noise (10mVpp)
- Input Voltage (AC85V-AC264V)
- Corresponds to CE Marking (CE Marking Performed to Low Voltage Directive)
- UL1950,CSA950,EN60950 Approved
- Latest Current Resonant Circuit Method (SMZ Resonant Circuit)
- Isolation Voltage AC4000V, Leakage Current 50μA or less
- Parallel Operation (By 60W Series OCP adjustment)
- Low Noise Terminal Voltage (VCCI, FCC, CISPR, there is 20dB margin from Class B regulations)
- Low Noise Field Intensity (Conforms to VCCI Class B, FCC Class B, CISPR Class B)
- Operationg Temp. Range -10°C to +60°C (Derating Required from -10 to 0°C, 50 to 60°C)
- RoHS Compliance

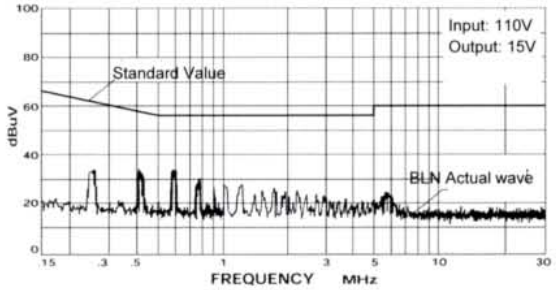
Capacity	Models	Input Voltage	Output Voltage, Current	Outline(W×D×H)	I/O Isolation	Ripple(Noise)
15W	BLN-05S3R0-M BLN-15S1R3-M BLN-15WR65-M	AC85V-264V Continuance	5V 3A 15V 1.3A ±15V 0.65A	34×140×92	AC4000V	10mVpp
30W	BLN-05S6R0-M BLN-12S3R0-M BLN-15S2R6-M BLN-15W1R3-M	AC85V-264V Continuance	5V 6A 12V 3A 15V 2.6A ±15V 1.3A	34×166×92	AC4000V	10mVpp
60W	BLN-05S10R0-M BLN-12S5R2-M BLN-15S5R2-M BLN-24S3R5-M	AC85V-132V AC170V-264V Automatically changes	5V 10A 12V 5.2A 15V 5.2A 24V 3.5A	38×200×92	AC4000V	10mVpp

Ultra Low Noise Power Supply Usage

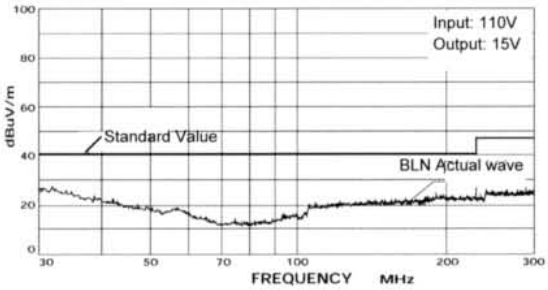
- Medical Equipment
- Measurement Equipment
- Analysis Equipment
- Broadcasting Equipment
- Semiconductor Equipment
- Sound Equipment
- Control Equipment

- Note! This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.
- Cover: For the standard product, there is no metallic cover. To have a cover attached, put suffix "C" to the model. Ex) BLN-05S3R0-MC

BLN Series, Noise Terminal Voltage



BLN Series, Noise Field Intensity

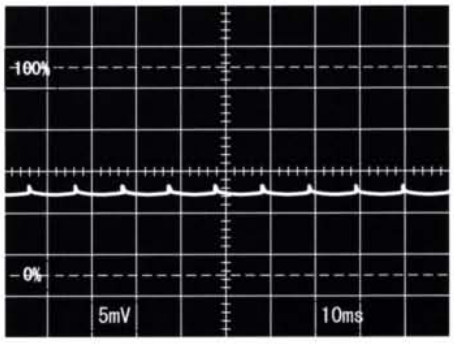


Acquired UL.CSA.EN Regulation

Adopted the latest SMZ circuit.
It is noiseless with the new resonant circuit.

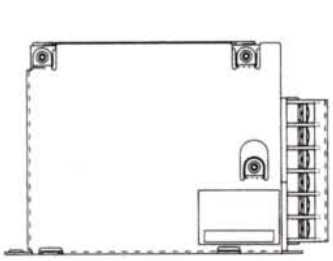
BLN Series Output Ripple Noise Wave Form

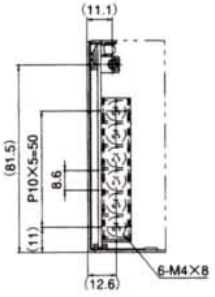
Input: AC100V Output: 15V2.6A +25°C

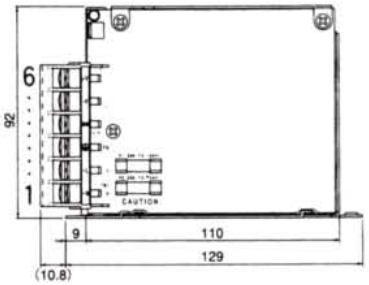


BLN-15S2R6

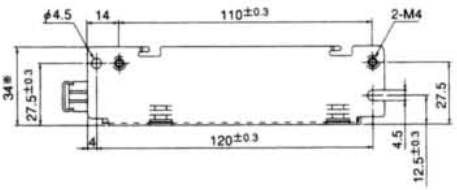
BLN-S(15W) Outline







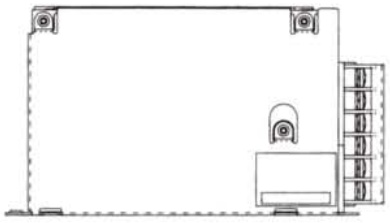
PIN
1:AC Input(N)
2:AC Input(L)
3:FG
4:N.C
5:-Vout
6:+Vout

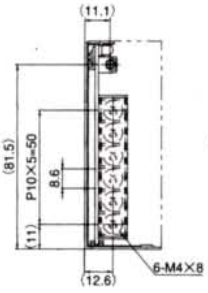


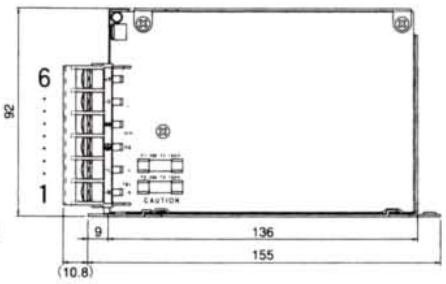
*with a cover 35

Note: Do not connect N. C pin to anywhere.

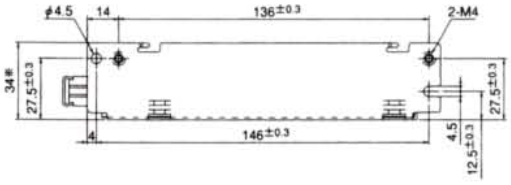
BLN-S(30W) Outline







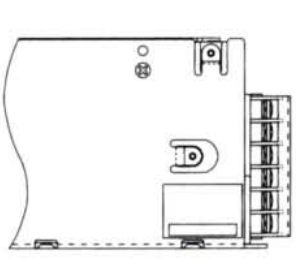
PIN
1:AC Input(N)
2:AC Input(L)
3:FG
4:N.C
5:-Vout
6:+Vout

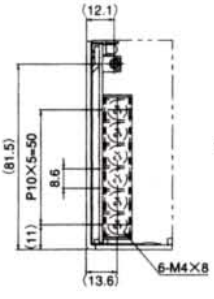


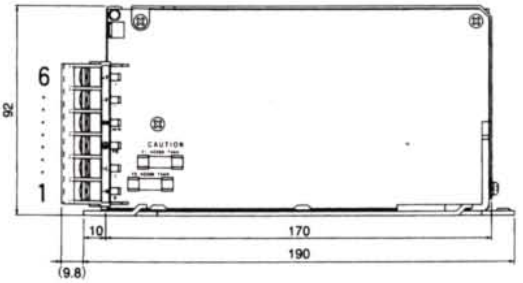
*with a cover 35

Note: Do not connect N.C pin to anywhere.

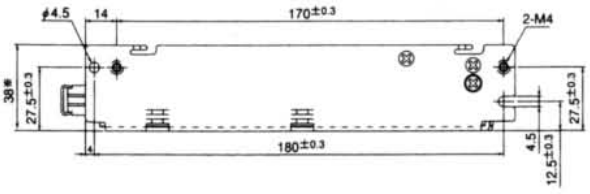
BLN-S(60W) Outline







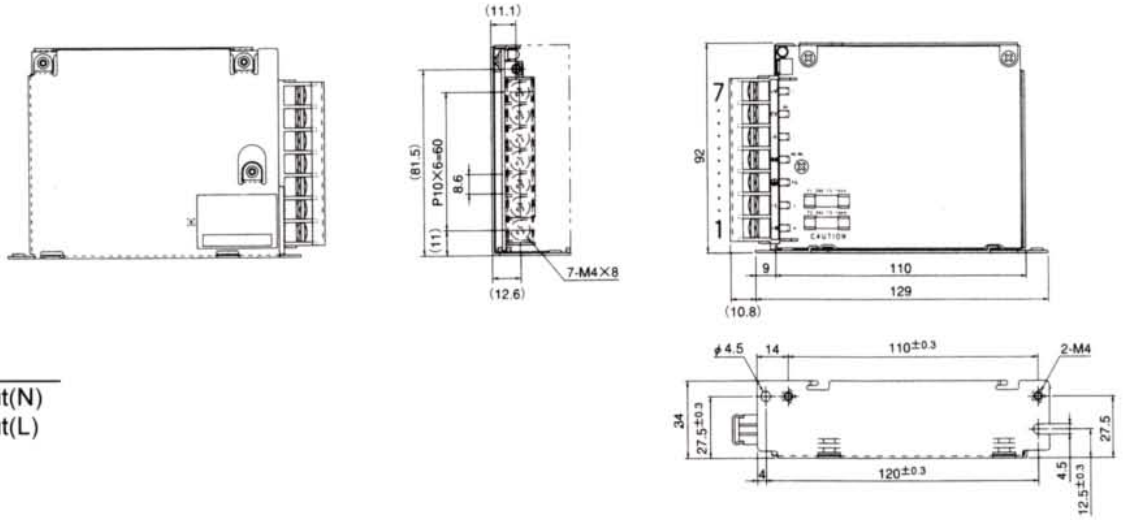
PIN
1:AC Input(N)
2:AC Input(L)
3:FG
4:N.C
5:-Vout
6:+Vout



*with a cover 39

Note: Do not connect N.C pin to anywhere.

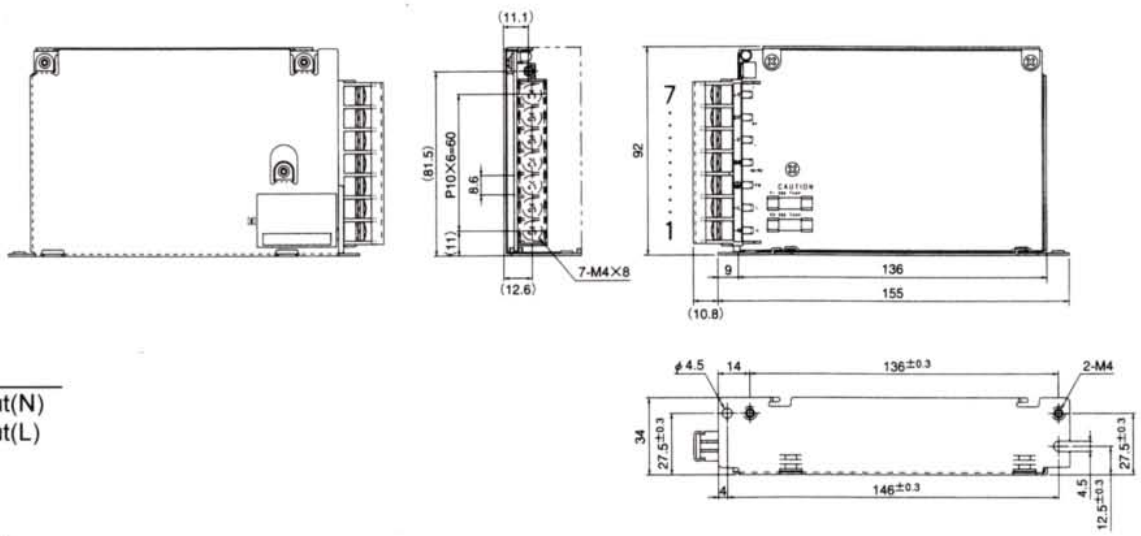
BLN-W(15W) Outline



PIN
1:AC Input(N)
2:AC Input(L)
3:FG
4:N.C
5:-Vout
6:Common
7:+Vout

Note: Do not connect N.C pin to anywhere.

BLN-W(30W) Outline



PIN
1:AC Input(N)
2:AC Input(L)
3:FG
4:N.C
5:-Vout
6:Common
7:+Vout

Note: Do not connect N.C pin to anywhere.

World Standard Analog Equipment

5 Watt BR-LB Series

RoHS Compliance

Ultra Low Noise Dual Output DC-DC Converters/ BR-LB 5Watt Series

Ultra Low Noise 3mVpp, Isolated Type DC-DC Converter

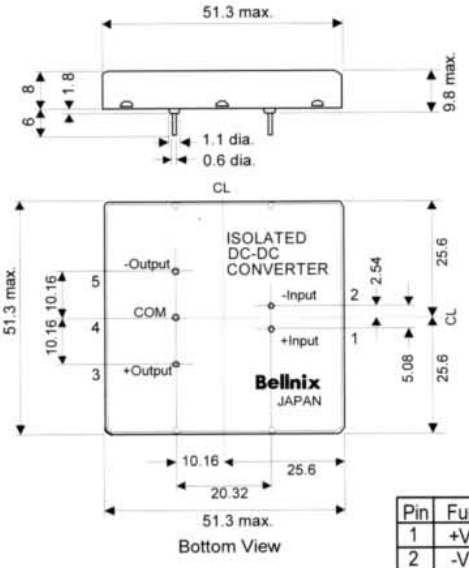
Input: 5V Output: ±12V, ±15V

- Ultra Low Noise 3mVp-p
- Analog, Digital Optimum
- Short Circuit, Over-Current Protection
- No Electrolytic Capacitor, No Tantalum Capacitor
- 5-Side Metallic shield structure
- Built-in EMI Line Filter
- Built-in Over-Heat Protection
- Long-Life with TCT Patent Circuit
- Isolation Voltage DC500V
- Low Drift 50mV/8H
- Temp. Coefficient ±0.02%/°C
- Operating Temp. Range -20°C to +70°C (Temp. derating required from 50°C)
- RoHS Compliance

Models BR-LB Series	Input V Vdc	Output +V/I, -V/I +Vdc/mA, -Vdc/mA	Line Reg % (typ.)	Load Reg % (typ.)	Ripple/ Noise mVpp(max.)	Efficiency % (typ.)
BR05-1220LB	4.75-6	+12/208, -12/-208	0.03	0.18	3	64
BR05-1225LB		+12/250, -12/-125				
BR05-1516LB		+15/167, -15/-167				
BR05-1520LB		+15/200, -15/-100				

Note 1: Derating required from input voltage above 5.25V.

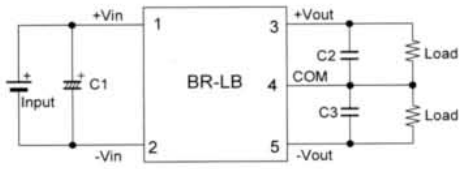
<Outline>



Pin	Function
1	+Vin
2	-Vin
3	+Vout
4	Common
5	-Vout

Dimensions: mm Weight: 31g typ.

<Standard Connection Circuit Diagram>

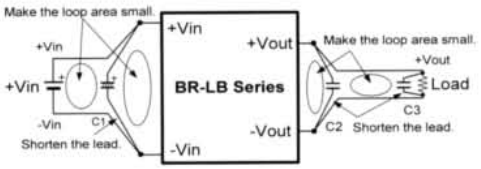


- Recommended Capacitor

C1=100μF

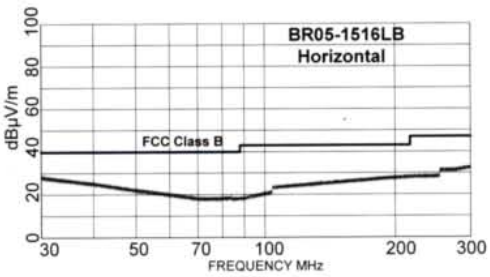
C2,C3=1μF

Basically, external capacitors are not required, but noise can be lowered by reducing power line impedance and load line impedance.



RADIATED EMISSION FCC Class B <3m>

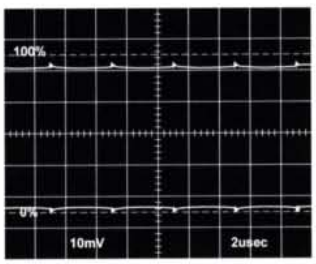
Model Name	**BR05-1516LB**
Serial No.	ES1
Input	+5V
Load	±15V 167mA
DET.Mode	Peak
Limits	30MHz - 1000MHz
Band Number	3 Meas Mode : D
Antenna Mode	Horizontal , Vertical
Test Equip.	TR4172,TR14307



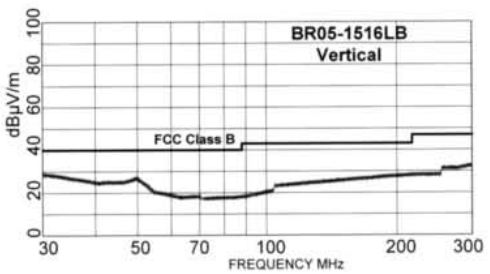
< **BR05-1516LB>** Output Noise

+15V167mA
1.4mVp-p
10mV/div
2μs/div

-15V167mA
1.7mVp-p
10mV/div
2μs/div



BR05-1516LB



- Note!

This catalogue is an outline of the products. When designing, be sure to refer to the data sheets.

Bellnix®

Bellnix Co.,Ltd.

5-7-8 NEGISHI MINAMI-KU SAITAMA-SHI
SAITAMA JAPAN Postcode: 336-0024
TEL:81-48-864-7733 FAX:81-48-861-6402
E-mail:info@bellnix.co.jp
URL http://www.bellnix.co.jp/

PRINTED IN JAPAN 2006.2.10.2000

This catalogue is made of recycled paper of R100

Dream & Creation