



## EC2SB SERIES 10 WATT 2:1 INPUT DC-DC CONVERTERS



### FEATURES

- \* 10W Isolated Output
- \* Efficiency to 87%
- \* 2:1 Input Range
- \* Regulated Outputs
- \* Fixed Switching Frequency
- \* Input Under Voltage Protection
- \* Over Current Protection
- \* Remote On/Off
- \* Continuous Short Circuit Protection
- \* Conductive EMI Meets EN55022 Class A
- \* Without Tantalum Capacitors Inside
- \* CE Mark Meets 2014/30/EU
- \* Safety Meets UL60950-1, EN60950-1, and IEC60950-1



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD		
EC2SB-05S33	4.7-9 VDC	3.3 VDC	0 mA	2500 mA	120 mA	1897 mA	87	2470uF
EC2SB-05S05	4.7-9 VDC	5 VDC	0 mA	2000 mA	120 mA	2299 mA	87	2000uF
EC2SB-05S12	4.7-9 VDC	12 VDC	0 mA	833 mA	50 mA	2298 mA	87	940uF
EC2SB-05S15	4.7-9 VDC	15 VDC	0 mA	666 mA	50 mA	2297 mA	87	690uF
EC2SB-05D05	4.7-9 VDC	±5 VDC	0 mA	±1000 mA	50 mA	2353 mA	85	1000uF
EC2SB-05D12	4.7-9 VDC	±12 VDC	0 mA	±416 mA	50 mA	2295 mA	87	440uF
EC2SB-05D15	4.7-9 VDC	±15 VDC	0 mA	±333 mA	50 mA	2297 mA	87	330uF
EC2SB-12S33	9-18 VDC	3.3 VDC	0 mA	2500 mA	30 mA	838 mA	82	2470uF
EC2SB-12S05	9-18 VDC	5 VDC	0 mA	2000 mA	30 mA	980 mA	85	2000uF
EC2SB-12S12	9-18 VDC	12 VDC	0 mA	833 mA	35 mA	957 mA	87	940uF
EC2SB-12S15	9-18 VDC	15 VDC	0 mA	666 mA	35 mA	956 mA	87	690uF
EC2SB-12D05	9-18 VDC	±5 VDC	0 mA	±1000 mA	45 mA	980 mA	85	1000uF
EC2SB-12D12	9-18 VDC	±12 VDC	0 mA	±416 mA	45 mA	957 mA	87	440uF
EC2SB-12D15	9-18 VDC	±15 VDC	0 mA	±333 mA	45 mA	957 mA	87	330uF
EC2SB-24S33	18-36 VDC	3.3 VDC	0 mA	2500 mA	25 mA	419 mA	82	2470uF
EC2SB-24S05	18-36 VDC	5 VDC	0 mA	2000 mA	25 mA	490 mA	85	2000uF
EC2SB-24S12	18-36 VDC	12 VDC	0 mA	833 mA	25 mA	478 mA	87	940uF
EC2SB-24S15	18-36 VDC	15 VDC	0 mA	666 mA	25 mA	478 mA	87	690uF
EC2SB-24D05	18-36 VDC	±5 VDC	0 mA	±1000 mA	25 mA	490 mA	85	1000uF
EC2SB-24D12	18-36 VDC	±12 VDC	0 mA	±416 mA	25 mA	478 mA	87	440uF
EC2SB-24D15	18-36 VDC	±15 VDC	0 mA	±333 mA	25 mA	478 mA	87	330uF
EC2SB-48S33	36-75 VDC	3.3 VDC	0 mA	2500 mA	20 mA	212 mA	81	2470uF
EC2SB-48S05	36-75 VDC	5 VDC	0 mA	2000 mA	20 mA	245 mA	85	2000uF
EC2SB-48S12	36-75 VDC	12 VDC	0 mA	833 mA	20 mA	239 mA	87	940uF
EC2SB-48S15	36-75 VDC	15 VDC	0 mA	666 mA	20 mA	239 mA	87	690uF
EC2SB-48D05	36-75 VDC	±5 VDC	0 mA	±1000 mA	20 mA	245 mA	85	1000uF
EC2SB-48D12	36-75 VDC	±12 VDC	0 mA	±416 mA	20 mA	239 mA	87	440uF
EC2SB-48D15	36-75 VDC	±15 VDC	0 mA	±333 mA	20 mA	239 mA	87	330uF

NOTE: 1. Nominal Input Voltage 5, 12, 24 or 48 VDC

# SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

## INPUT SPECIFICATIONS:

Input Voltage Range	5V	4.7 - 9V
	12V	9 - 18V
	24V	18 - 36V
	48V	36 - 75V
Under voltage lockout	5Vin power up: 4.4V,	power down: 4.2V
	12Vin power up: 8.8V,	power down: 8V
	24Vin power up: 17V,	power down: 16V
	48Vin power up: 34V,	power down: 32V
Input Surge Voltage (100mS max.)	EC2SB-05Sxx/05Dxx	12Vdc max.
	EC2SB-12Sxx/12Dxx	25Vdc max.
	EC2SB-24Sxx/24Dxx	50Vdc max.
	EC2SB-48Sxx/48Dxx	100Vdc max.
Input Filter	Standard	PI Type
	SMD	LC Type
Positive Logic Remote on/off Control:		
Logic Compatibility	CMOS or Open Collector	TTL
Module On	>+5.5V to 75VDC	or Open Circuit
Module Off	0 to <1.2VDC	

## OUTPUT SPECIFICATIONS:

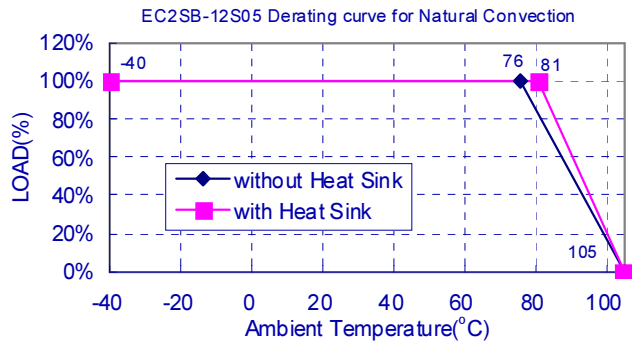
Voltage Accuracy	±1.5% max.
Voltage Balance (Dual)	±2.0% max.
Transient Response: 25% Step Load Change	<500us.
Ripple and Noise, 20MHz BW (note3)	50mV pk-pk max.
	SMD 100mV pk-pk max.
Temperature Coefficient	±0.03%/°C max.
Short Circuit Protection	Continuous
Line Regulation (note1)	Single ±0.2% max.
	SMD ±0.3% max.
	Dual ±0.5% max.
Load Regulation (note2)	Single ±0.2% max.
	SMD ±0.5% max.
	Dual ±1.0% max.
Cross Regulation (Dual output) Load cross variation 10%/100%	±5% max.
Over Voltage Protection	Zener or TVS Clamp
External Trim Adj. Range (single output models only)	±10%
Current Limit	110% - 140% Nominal Output
Start up time	20ms max.

## GENERAL SPECIFICATIONS:

Efficiency	See Table
Isolation Voltage	1500 VDC min.
Isolation Resistance	10 <sup>9</sup> ohm min.
Isolation Capacitance	1000pF typ.
Switching Frequency	350KHz typ.
EMI/RFI	(Standard) Conductive EMI Meets EN55022 Class A
Operating Ambient Temperature Range	-40°C to +85°C
Derating, Above 71°C (note7)	Linearly to Zero Power at +105°C
Case Temperature (note4)	105°C max.
Cooling	Natural Convection
Storage Temperature Range	-55°C to +125°C
Humidity	95% RH max. Non condensing
MTBF	MIL-HDBK-217-F, GB, 25°C, Full Load 1200Khrs typ.
Dimensions	Standard 1.00x1.00x0.4 inches (25.4x25.4x10.2 mm)
	SMD 1.00x1.00x0.36 inches (25.4x25.4x9.2 mm)
Case Material	Black Coated Copper with Non-Conductive Base
Weight	18g

## NOTE:

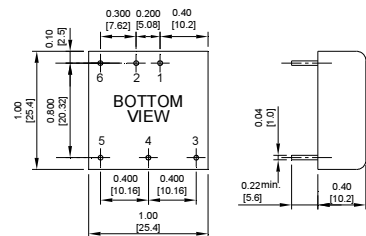
1. Measured from high line to low line.
2. Measured from full load to min. load.
3. The output ripple and noise is measured with 10uF tantalum and 1uF ceramic capacitor across output.
4. Maximum case temperature under any operating condition should not be exceeded 105°C.
5. Suffix "S" to the model number with SMD packages.
6. Suffix "+K-C087" type with heat sink.
7. Others Model refer to application note.



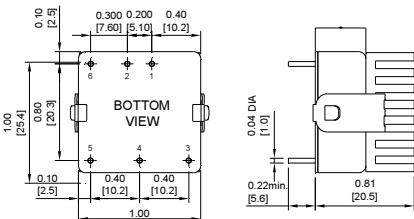
## SIZE SB Dimensions:

NOTE: Pin Size is 0.04±0.004 Inch (1.0±0.1 mm) DIA  
 All Dimensions In Inches (mm)  
 Tolerances Inches: X.XX= ±0.02, X.XXX= ±0.010  
 Millimeters: X.X= ±0.5, X.XX= ±0.25

### THROUGH-HOLE PACKAGE

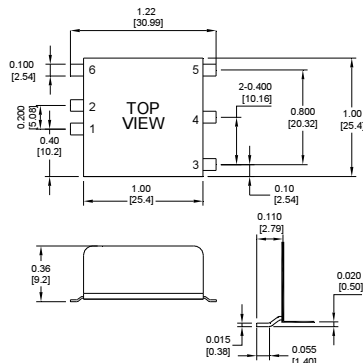


### Suffix "+K-C087" Type

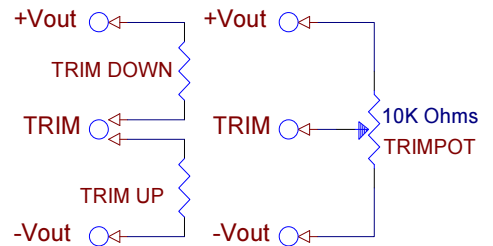


PIN CONNECTION		
Pin	Function	
	Single	Dual
1	+Input	+Input
2	-Input	-Input
3	+V Output	+V Output
4	Trim	Common
5	-V Output	-V Output
6	Remote	Remote

### SMD- PACKAGE



## EXTERNAL OUTPUT TRIM



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