



## EC4SBW SERIES 20 WATT 4:1 INPUT DC-DC CONVERTERS



### FEATURES

- \* 20W Isolated Output
- \* 1"x1"x0.4" Shielded Metal Case
- \* Very High Efficiency Up to 90.5%
- \* Low No Load Power Consumption
- \* 4:1 Input Range
- \* Regulated Outputs
- \* Fixed Switching Frequency
- \* Input Under Voltage Protection
- \* Over Current Protection
- \* Remote On/Off
- \* Continuous Short Circuit Protection
- \* Without Tantalum Capacitors Inside
- \* Safety Meets IEC/EN/UL 62368-1



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT		INPUT CURRENT		% Eff.		CAPACITIVE LOAD MAX.
			MIN.	MAX.	NO LOAD	FULL LOAD	(2)	(3)	
EC4SBW-24S33	9-36 VDC	3.3 VDC	0 mA	4500 mA	10 mA	699 mA	88	88.5	5000uF
EC4SBW-24S05	9-36 VDC	5 VDC	0 mA	4000 mA	10 mA	920 mA	90	90.5	4000uF
EC4SBW-24S12	9-36 VDC	12 VDC	0 mA	1670 mA	10 mA	938 mA	89	89	1650uF
EC4SBW-24S15	9-36 VDC	15 VDC	0 mA	1330 mA	10 mA	933 mA	89	89	1300uF
EC4SBW-24D12	9-36 VDC	±12 VDC	0 mA	±830 mA	10 mA	938 mA	88.5	88.5	800uF
EC4SBW-24D15	9-36 VDC	±15 VDC	0 mA	±660 mA	10 mA	926 mA	89	89	650uF
EC4SBW-48S33	18-75 VDC	3.3 VDC	0 mA	4500 mA	8 mA	349 mA	89	88.5	5000uF
EC4SBW-48S05	18-75 VDC	5 VDC	0 mA	4000 mA	8 mA	460 mA	90.5	90.5	4000uF
EC4SBW-48S12	18-75 VDC	12 VDC	0 mA	1670 mA	8 mA	466 mA	89.5	89.5	1650uF
EC4SBW-48S15	18-75 VDC	15 VDC	0 mA	1330 mA	8 mA	467 mA	89	89	1300uF
EC4SBW-48D12	18-75 VDC	±12 VDC	0 mA	±830 mA	8 mA	469 mA	89.5	88.5	800uF
EC4SBW-48D15	18-75 VDC	±15 VDC	0 mA	±660 mA	8 mA	466 mA	89.5	88.5	650uF

#### NOTE:

1. Nominal Input Voltage 24 or 48 VDC
2. Measure at 12VDC for 24 Vin, 24VDC for 48 Vin
3. Measure at Nominal Input Voltage

# SPECIFICATIONS

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

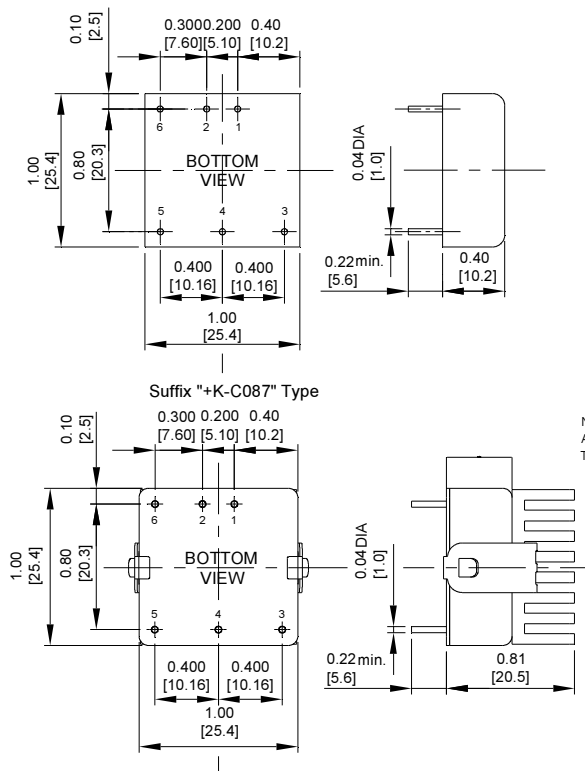
## INPUT SPECIFICATIONS:

Input Voltage Range	24V	9 – 36V
	48V	18 – 75V
Input Surge Voltage (100ms max.)	24V	50Vdc max.
	48V	100Vdc max.
Under Voltage Lockout	24Vin Power up	8.8V typ.
	24Vin Power down	8.0V typ.
	48Vin Power up	17V typ.
	48Vin Power down	16V typ.
Input Filter		Pi Type
Positive Logic Remote On/Off Control (note4):		
Logic Compatibility		CMOS or Open Collector TTL, ref. to -Vin
Module On		>+3.5 to 75VDC or Open Circuit
Module Off		0 to <1.2VDC

## OUTPUT SPECIFICATIONS:

Voltage Accuracy		±1.5% max.
Voltage Balance (Dual)		±1.5% max.
Transient Response: 75% - 100% Step Load Change.		
Error Band		±5% Vout Nominal, Recovery Time < 250µs
Ripple & Noise, 20MHz BW(note3)		
Vo=3.3 & 5V		75mVpk-pk max.
Vo=12 & 15V		100mVpk-pk max.
Temperature Coefficient		±0.03%/°C max.
Short Circuit Protection		Continuous
Line Regulation (note1)	Single	±0.2% max.
	Dual	±0.5% max.
Load Regulation (note2)	Single	±0.2% 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	24S33/24S05	110% - 200% Nominal Output
	Others	110% - 170% Nominal Output
Start up Time		20ms max.

## SIZE SB Dimensions:



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

## GENERAL SPECIFICATIONS:

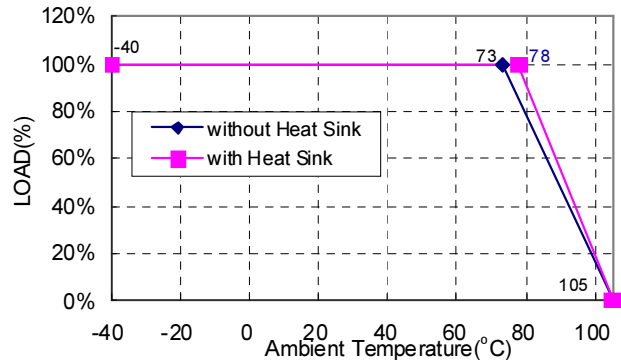
Efficiency		See Table
Isolation Voltage		1500 VDC min.
Isolation Resistance		10 <sup>9</sup> Ohms min.
Isolation Capacitance		1500pF typ.
Switching Frequency	Vo=3.3V/5V	270KHz typ.
	Others	330KHz typ.
Operating Ambient Temperature Range		-40°C to +85°C
Derating, Above 65°C (note7)		Linearly to Zero Power at +105°C
Case Temperature (note5)		105°C
Cooling		Natural Convection
Storage Temperature Range		-55°C to +125°C
Humidity		95% RH max. Non Condensing
MTBF	MIL-HDBK -217F, GB, 25°C, Full Load	Others: 1290Khrs tv.
		Vo: 3.3V/5V: 925Khrs typ.

Dimensions	1.00x1.00x0.40 inches (25.4x25.4x10.2 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. Suffix "N" to the model number with negative logic remote on/off  
Module on ..... 0 to <1.2VDC  
Module off ..... >3.5VDC to 75VDC or open circuit
5. Maximum case temperature under any operating condition should not be exceeded 105°C.
6. Suffix "+K-C087" type with heat sink.
7. Others Model refer to application note.

EC4SBW-24S05 Derating curve for Natural Convection



## EXTERNAL OUTPUT TRIM

