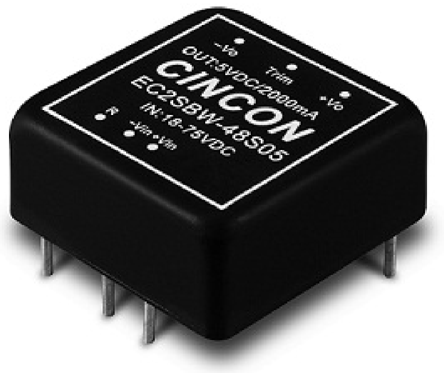
ISOLATED DC-DC Converter
EC2SBW SERIES
APPLICATION NOTE



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EC2SBW 10W Isolated DC-DC Converters

Application Note V11 November 2020

1. Introduction

The EC2SBW series offer 10 watts of output power in a 1.00x1.00x0.4 inches Copper packages. The EC2SBW series has a 4:1 wide input voltage range of 9-36VDC and 18-75VDC and provides a precisely regulated output. This series has features such as high efficiency, 1500VDC of isolation and allows an ambient operating temperature range of –40°C to 85°C (de-rating above 71 °C). The modules are fully protected against input UVLO (under voltage lock out), output short circuit and output overvoltage conditions. Furthermore, the standard control functions include remote on/off and output voltage trimming. All models are very suitable for distributed power architectures, telecommunications, battery operated equipment and industrial applications.

2. DC-DC Converter Features

- 10W Isolated Output
- 1”×1”×0.4” Shielded Metal Case
- Efficiency to 86%
- 4:1 Input Range
- Regulated Outputs
- Input Under-Voltage Protection
- Remote On/Off
- Continuous Short Circuit Protection
- Without Tantalum Capacitors Inside
- Safety Meets IEC/EN/UL 62368-1

3. Electrical Block Diagram

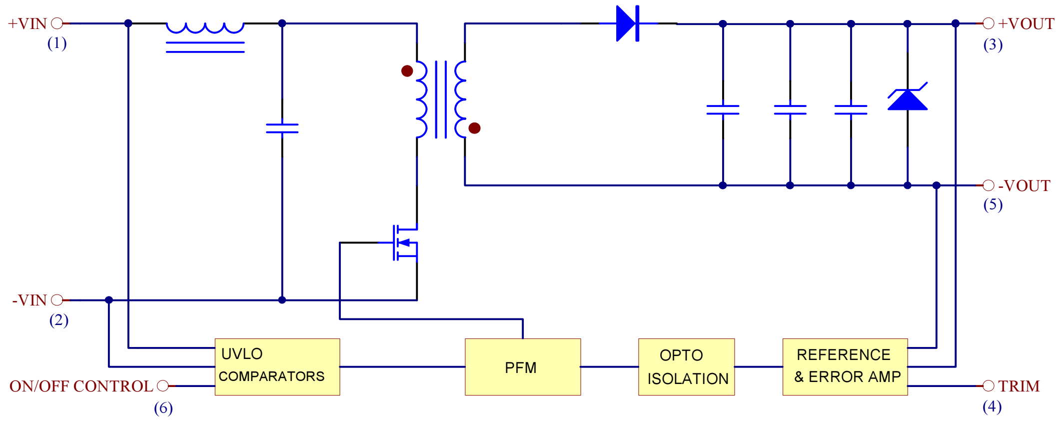


Figure1 Electrical Block Diagram of single output module

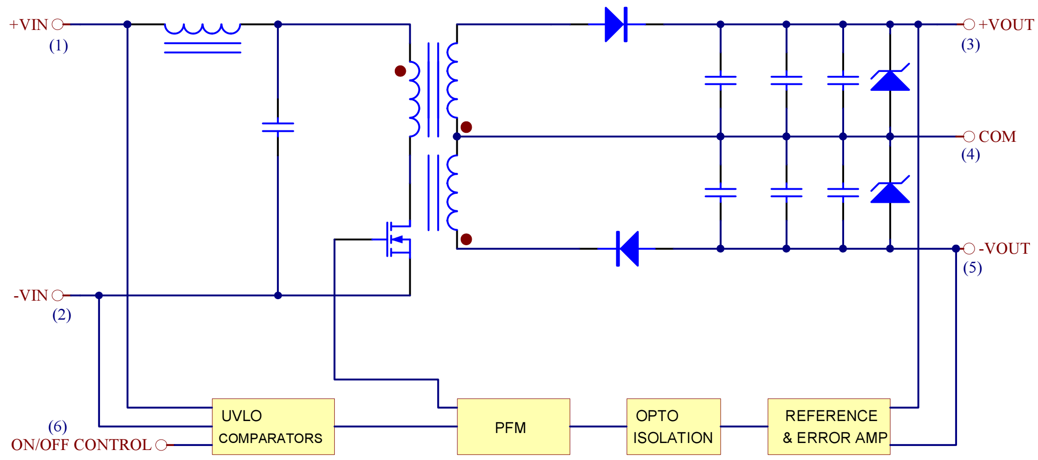


Figure2 Electrical Block Diagram of dual output module

4. Technical Specifications

(All specifications are typical at nominal input, full load at 25℃ unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typical	Max.	Units
Input Voltage						
Continuous		24Vin	-0.3	24	36	Vdc
		48Vin	-0.3	48	75	
Transient	100ms	24Vin			50	Vdc
		48Vin			100	
Operating Ambient Temperature	With de-rating, above 71℃	All	-40		+85	℃
Case Temperature		All			100	℃
Storage Temperature		All	-55		+125	℃
Input/Output Isolation Voltage	1 minute	All			1500	Vdc

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typical	Max.	Units
Operating Input Voltage		24Vin	9	24	36	Vdc
		48Vin	18	48	75	
Turn-On Voltage Threshold		24Vin	8	8.5	8.8	Vdc
		48Vin	16	16.5	17.5	
Turn-Off Voltage Threshold		24Vin	7.7	8	8.3	Vdc
		48Vin	15.5	16	17	
Lockout Hysteresis Voltage		24Vin		0.5		V
		48Vin		1		
Maximum Input Current	100% Load, Vin= 9V for 24XXX	24Vin		1400		mA
	100% Load, Vin=18V for 48XXX	48Vin		700		
No-Load Input Current	Vin=Nominal input	24S33		5		mA
		24S05		5		
		24S12		10		
		24S15		10		
		24D05		10		
		24D12		10		
		24D15		10		
		48S33		5		
		48S05		5		
		48S12		5		
		48S15		5		
		48D05		5		
		48D12		8		
		48D15		8		
Inrush Current (I^2t)	As per ETS300 132-2	All			0.01	A^2s
Input Reflected-Ripple Current	P-P thru 1uH inductor, 5Hz to 20MHz	All		30		mA

OUTPUT CHARACTERISTIC

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typical	Max.	Units
Output Voltage Set Point	Vin=Nominal Vin, Io=Io max., Tc=25℃	Vo=3.3V	3.2505	3.3	3.3495	Vdc
		Vo=5.0V	4.925	5	5.075	
		Vo=12V	11.82	12	12.18	
		Vo=15V	14.775	15	15.225	
		Vo=±5V	±4.925	±5	±5.075	
		Vo=±12V	±11.82	±12	±12.18	
		Vo=±15V	±14.775	±15	±15.225	
Output Voltage Balance	Vin=nominal, Io=Iomax, Tc=25℃	Dual			±1.0	%
Output Voltage Regulation						
Load Regulation	Io=Full Load to 0% Load	Single			±0.5	%
		Dual			±1.0	
Line Regulation	Vin=low line to high line Full Load	All			±0.5	%
Cross Regulation	Asymmetrical Load 25%/100%	Dual			±5	%
Temperature Coefficient	Ta=-40℃ to 85℃	All			±0.03	%/℃
Output Voltage Ripple and Noise						
Peak-to-Peak	Full Load,20MHz bandwidth 10uF tantalum and 1uF Ceramic capacitor	Vo=3.3V Vo=5.0V Vo=12V			75	mV
		Vo=15V Vo=±5V Vo=±12V Vo=±15V			100	
Operating Output Current Range		Vo=3.3V	0		2500	mA
		Vo=5.0V	0		2000	
		Vo=12V	0		835	
		Vo=15V	0		666	
		Vo=±5V	±0		±1000	
		Vo=±12V	±0		±416	
		Vo=±15V	±0		±333	
Output DC Current-Limit Inception	Output Voltage =90% Nominal Output Voltage	All	120			%
Maximum Output Capacitance	Full load, Resistance	Vo=3.3V	0		3300	uF
		Vo=5.0V	0		2200	
		Vo=12V	0		1000	
		Vo=15V	0		680	
		Vo=±5V	0		1200	
		Vo=±12V	0		470	
		Vo=±15V	0		330	

DYNAMIC CHARACTERISTICS

PARAMETER	**NOTES and CONDITIONS**	Device	Min.	Typical	Max.	Units
Output Voltage Current Transient						
Step Change in Output Current	75% to 100% of Io.max di/dt=0.1A/us	All			±5	%
Setting Time (within 1% Vout nominal)		All			500	us
Turn-On Delay and Rise Time						
Turn-On Delay Time, From On/Off Control	Von/off to 10%Vo,set	All		2		ms
Turn-On Delay Time, From Input	Vin,min. to 10%Vo,set	All		2		ms
Output Voltage Rise Time	10%Vo,set to 90%Vo,set	All		1.5		ms

EFFICIENCY

PARAMETER	**NOTES and CONDITIONS**	Device	Min.	Typical	Max.	Units
100% Load	Vin=Nominal Vin, Io=Io.max, Tc=25℃	24S33		81		%
		24S05		84		
		24S12		86		
		24S15		86		
		24D05		84		
		24D12		86		
		24D15		86		
		48S33		82		
		48S05		84		
		48S12		86		
		48S15		86		
		48D05		84		
		48D12		86		
		48D15		86		

ISOLATION CHARACTERISTICS

PARAMETER	**NOTES and CONDITIONS**	Device	Min.	Typical	Max.	Units
Isolation Voltage	Input to Output 1 minutes	All	1500			Vdc
Isolation Resistance	Input to Output	All			1000	MΩ
Isolation Capacitance	Input to Output	All		1000		pF

FEATURE CHARACTERISTICS

PARAMETER	**NOTES and CONDITIONS**	Device	Min.	Typical	Max.	Units
Switching Frequency	Vin=Nominal Vin, Io=Io.max	All		280		KHz
On/Off Control, Positive Remote On/Off logic						
Logic Low (Module Off)	Von/off at Ion/off=1.0mA	All	0		1.2	V
Logic High (Module On)	Von/off at Ion/off=0.1uA	All	3.5 or Open Circuit		36	V

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typical	Max.	Units
On/Off Control, Negative Remote On/Off logic						
Logic Low (Module On)	Von/off at Ion/off=1.0mA	All	0		1.2	V
Logic High (Module Off)	Von/off at Ion/off=0.1uA	All	3.5 or Open Circuit		36	V
On/Off Current (for both remote on/off logic)	Ion/off at Von/off=0V	All		0.3	1	mA
Leakage Current (for both remote on/off logic)	Logic High, Von/off=15V	All			30	uA
Off Converter Input Current	Shutdown input idle current	All		4	10	mA
Output Voltage Trim Range	Pout=max rated power	All	-10		+10	%
Output Over Voltage Protection	Zener or TVS Clamp	Vo=3.3V Vo=5.0V Vo=12V Vo=15V Vo=±5V Vo=±12V Vo=±15V		3.9 6.2 15 18 6.2 15 18		V

GENERAL SPECIFICATIONS

MTBF	Io=100%of Io.max;Ta=25℃ per MIL-HDBK-217F	All		1.3		M hours
Weight		All		18		grams

5. Main Features and Functions

5.1 Operating Temperature Range

The EC2SBW series converters can be operated by a wide ambient temperature range from -40℃ to 85℃ (de-rating above 71 °C). The standard model has a Copper case and case temperature can not over 105℃ at normal operating.

5.2 UVLO (Undervoltage Lock Out)

Input under voltage lockout is standard on the EC2SBW unit. The unit will shut down when the input voltage drops below a threshold, and the unit will operate when the input voltage goes above the upper threshold.

5.3 Over Current Protection

All different voltage models have full continuous short-circuit protection. To provide protection in a fault condition, the unit is equipped with internal over-current protection. The unit operates normally once the fault condition is removed. At the point of current-limit inception, the converter will go into over current protection.

5.4 Over Voltage Protection

The output over voltage protection uses the zener clamp.

5.5 Remote On/Off

The EC2SBW series allows the user to switch the module on and off electronically with the remote on/off feature. All models are available in "positive logic" and "negative logic" (optional) versions. The converter turns on if the remote on/off pin is high (>3.5Vdc or open circuit). Setting the pin low (0 to <1.2Vdc) will turn the converter off. The signal level of the remote on/off input is defined with respect to ground. If not using the remote on/off pin, leave the pin open (converter will be on). Models with part number suffix "N" are the "negative logic" remote on/off version. The unit turns off if the remote on/off pin is high (>3.5Vdc or open circuit). The converter turns on if the on/off pin input is low (0 to <1.2Vdc). Note that the converter is off by default.

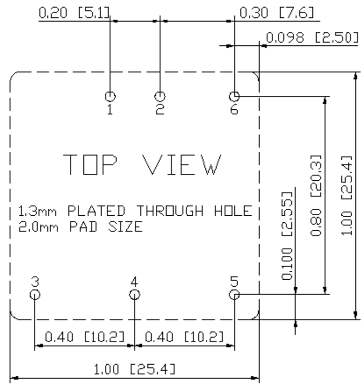
5.6 Output Voltage Adjustment

Section 6.6 describes in detail how to trim the output voltage with respect to its set point. The output voltage on all models is adjustable within the range of +10% to –10%.

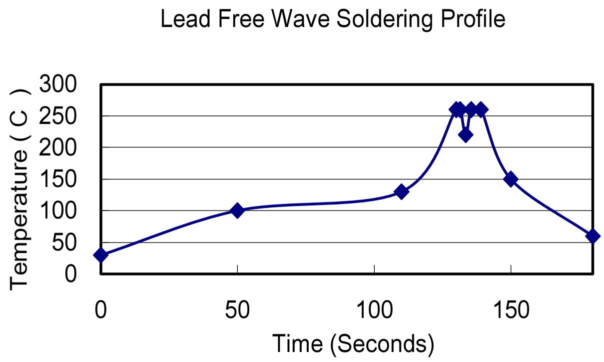
6. Applications

6.1 Recommended Layout PCB Footprints and Soldering Information

The system designer or the end user must ensure that other components and metal in the vicinity of the converter meet the spacing requirements to which the system is approved. Low resistance and low inductance PCB layout traces are the norm and should be used where possible. Due consideration must also be given to proper low impedance tracks between power module, input and output grounds. The recommended footprints and soldering profiles are shown as Figure 3.



Note: Dimensions are in inches (millimeters)



Note：

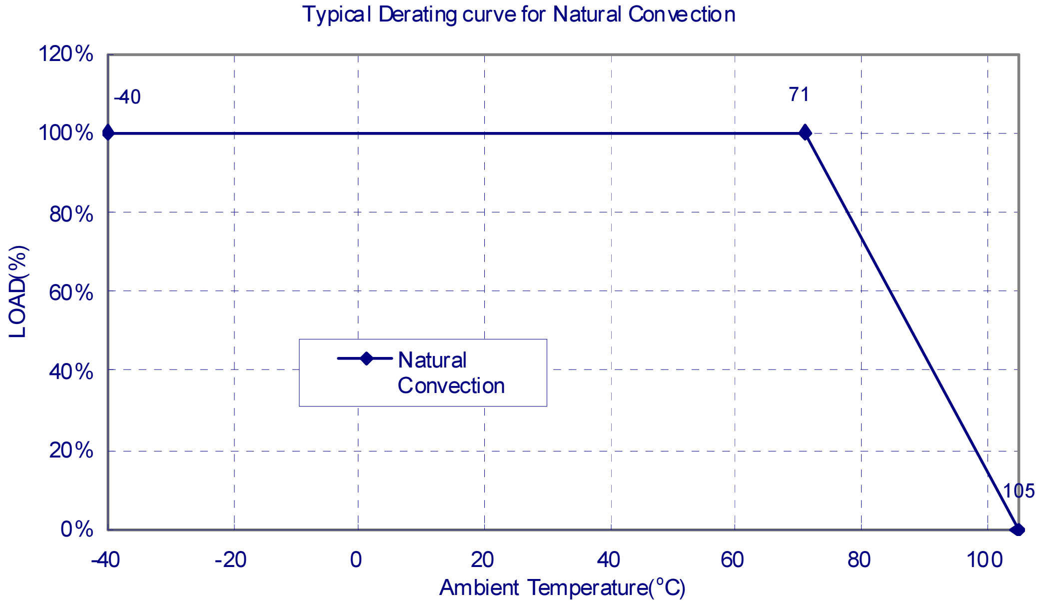
1. Soldering Materials: Sn/Cu/Ni
2. Ramp up rate during preheat: 1.4 ℃/Sec (From 50℃ to 100℃)
3. Soaking temperature: 0.5 ℃/Sec (From 100℃ to 130℃), 60±20 seconds
4. Peak temperature: 260℃, above 250℃ 3~6 Seconds
5. Ramp up rate during cooling: -10.0 ℃/Sec (From 260℃ to 150℃)

Figure3 Recommended PCB Layout Footprints and Wave Soldering Profiles for SB packages

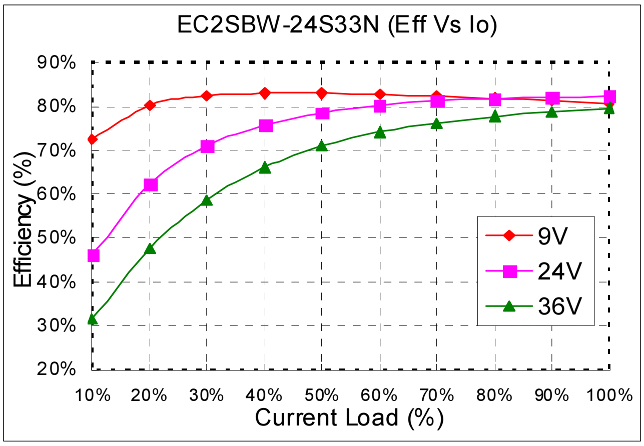
6.2 Power De-Rating Curves for EC2SBW Series

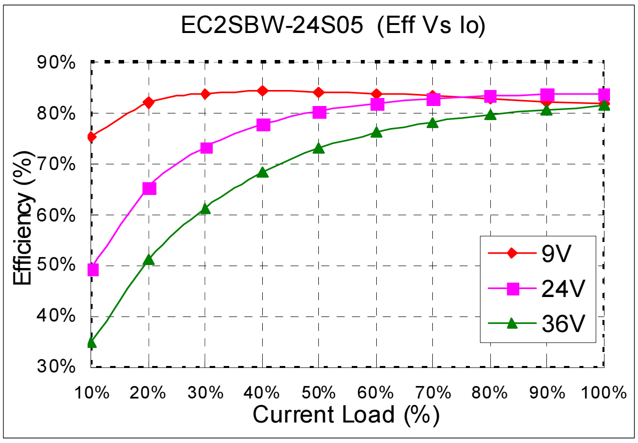
Operating Ambient temperature Range: -40℃ ~ 85℃ with de-rating.

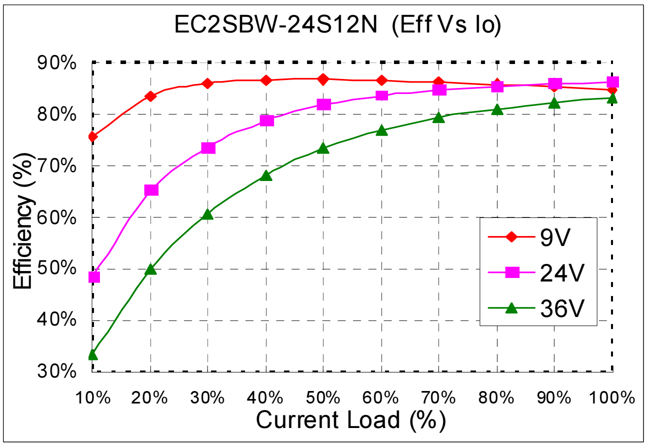
Maximum case temperature under any operating condition should not exceed 105℃.

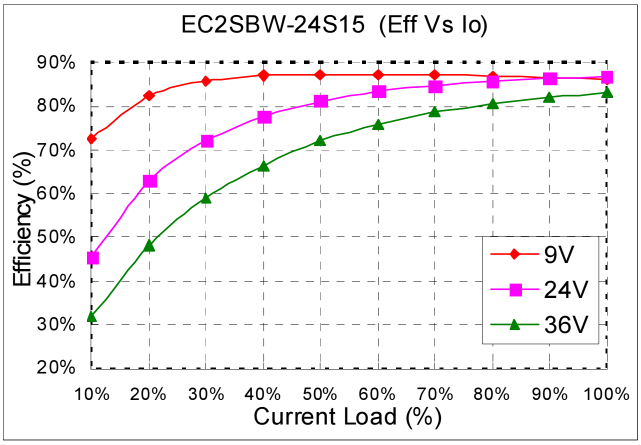


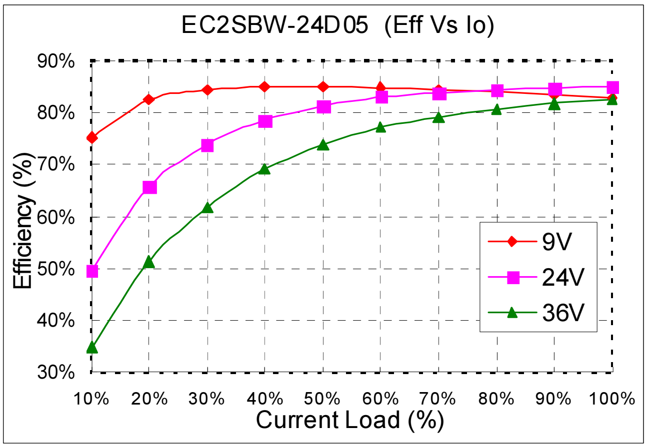
6.3 Efficiency vs. Load Curves

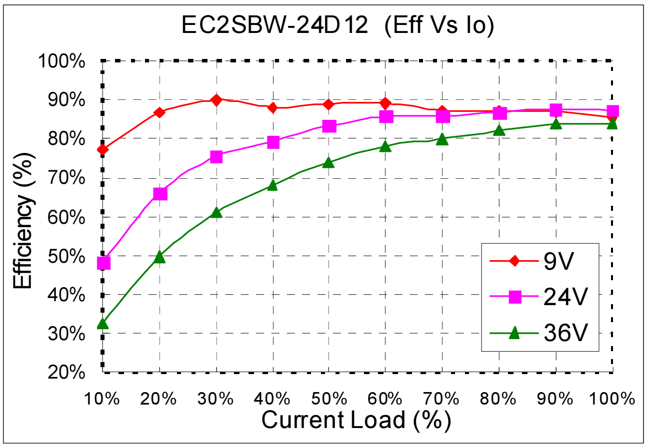


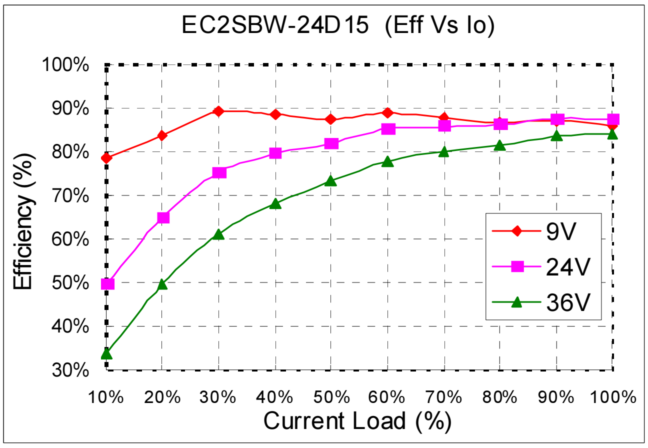




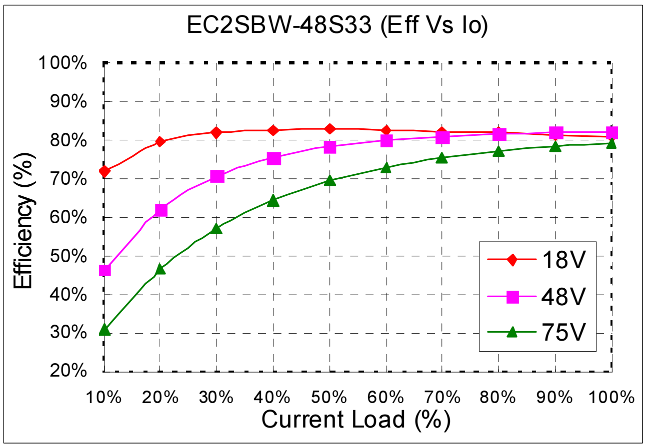




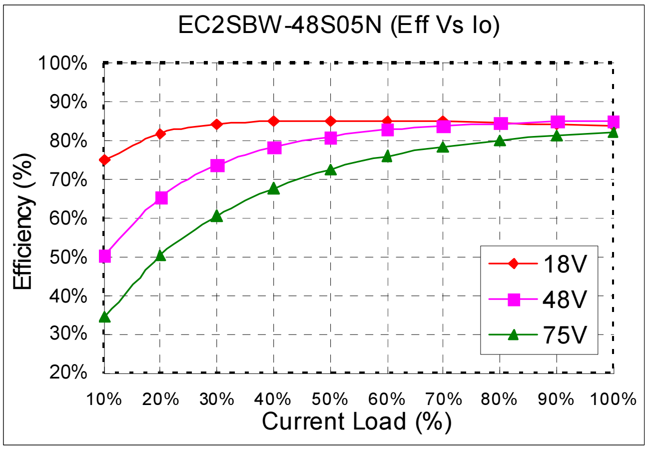




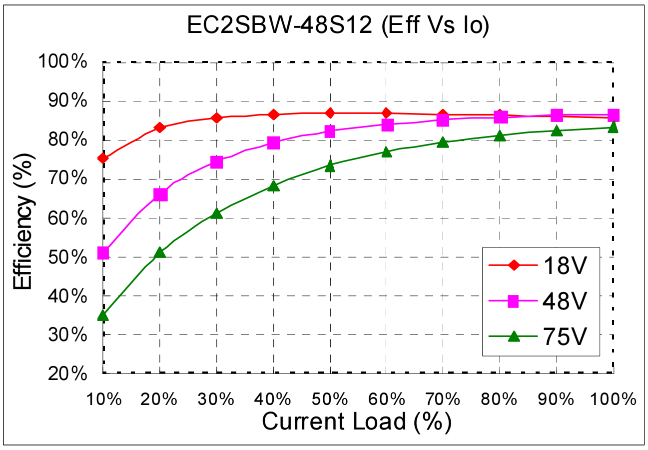
EC2SBW-24D15 (Eff Vs Io)
Efficiency (%)
Current Load (%)
9V
24V
36V



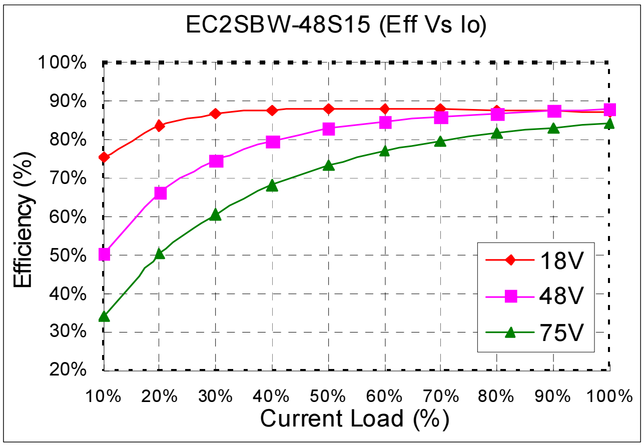
EC2SBW-48S33 (Eff Vs Io)
Efficiency (%)
Current Load (%)
18V
48V
75V



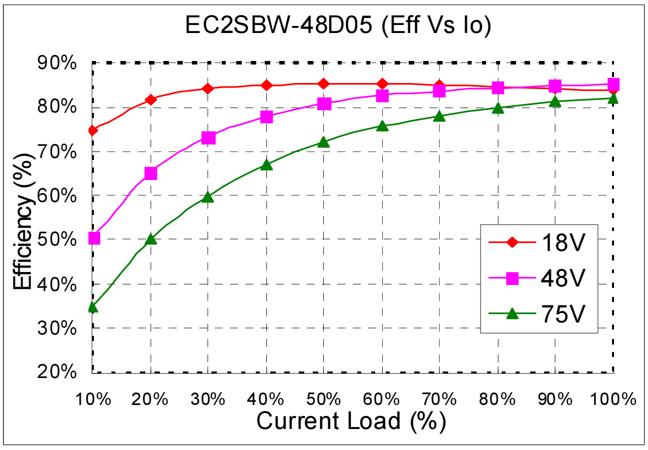
EC2SBW-48S05N (Eff Vs Io)
Efficiency (%)
Current Load (%)
18V
48V
75V



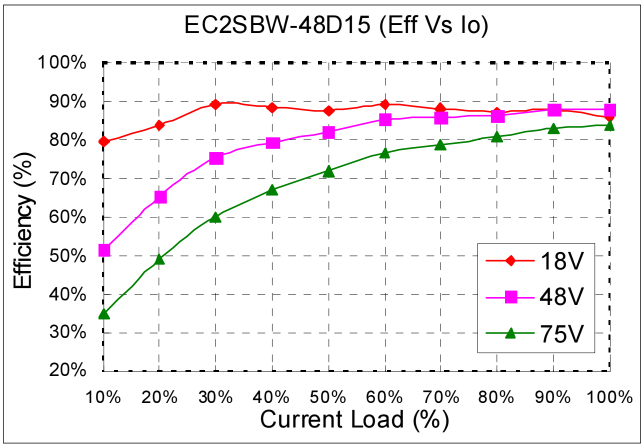
EC2SBW-48S12 (Eff Vs Io)
Efficiency (%)
Current Load (%)
18V
48V
75V



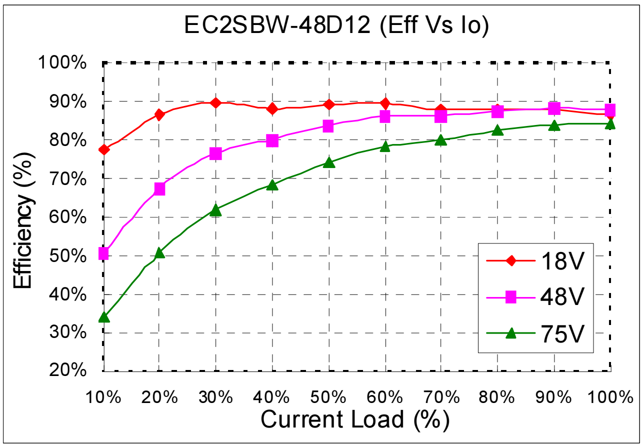
EC2SBW-48S15 (Eff Vs Io)
Efficiency (%)
Current Load (%)
18V
48V
75V



EC2SBW-48D05 (Eff Vs Io)
Efficiency (%)
Current Load (%)
18V
48V
75V



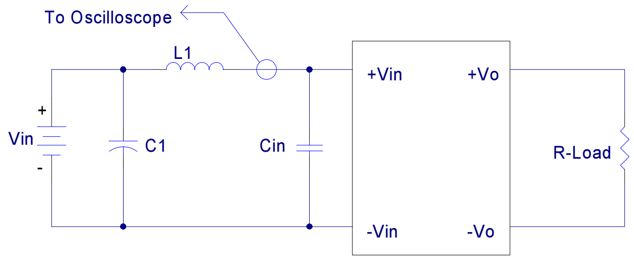
EC2SBW-48D15 (Eff Vs Io)
Efficiency (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Current Load (%)
18V
48V
75V



EC2SBW-48D12 (Eff Vs Io)
Efficiency (%)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Current Load (%)
18V
48V
75V

6.4 Input Capacitance at the Power Module

The converters must be connected to low AC source impedance. To avoid problems with loop stability source inductance should be low. Also, the input capacitors (Cin) should be placed close to the converter input pins to de-couple distribution inductance. However, the external input capacitors are chosen for suitable ripple handling capability. Low ESR capacitors are good choice. Circuit as shown in Figure4 represents typical measurement methods for reflected ripple current. C1 and L1 simulate a typical DC source impedance. The input reflected-ripple current is measured by current probe to oscilloscope with a simulated source Inductance (L1).



L1: 1uH.
C1: None
Cin: 6.8uF Ceramic capacitor.

Figure4 Input Reflected-Ripple Test Setup

6.5 Test Set-Up

The basic test set-up to measure parameters such as efficiency and load regulation is shown in Figure5. When testing the modules under any transient conditions please ensure that the transient response of the source is sufficient to power the equipment under test. We can calculate the

- Efficiency
- Load regulation and line regulation.

The value of efficiency is defined as:

$$\eta = \frac{Vo \times Io}{Vin \times Iin} \times 100\%$$

Where

Vo is output voltage,
Io is output current,
Vin is input voltage,
Iin is input current.

The value of load regulation is defined as:

$$Load.reg = \frac{V_{FL} - V_{NL}}{V_{NL}} \times 100\%$$

Where

V_{FL} is the output voltage at full load

V_{NL} is the output voltage at 10% load

The value of line regulation is defined as:

$$Line.reg = \frac{V_{HL} - V_{LL}}{V_{LL}} \times 100\%$$

Where: V_{HL} is the output voltage of maximum input voltage at full load. V_{LL} is the output voltage of minimum input voltage at full load.

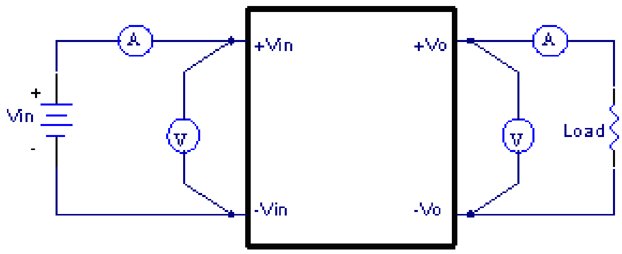


Figure5 EC2SBW Series Test Setup

6.6 Output Voltage Adjustment

In order to trim the voltage up or down one needs to connect the trim resistor either between the trim pin and -Vo for trim-up and between trim pin and +Vo for trim-down. The output voltage trim range is ±10%. This is shown in Figures 1 and 2:

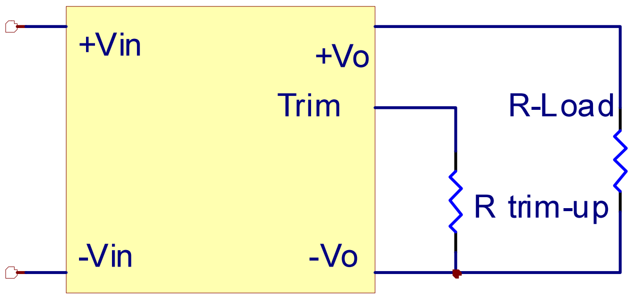


Figure 1. Trim-up Voltage Setup

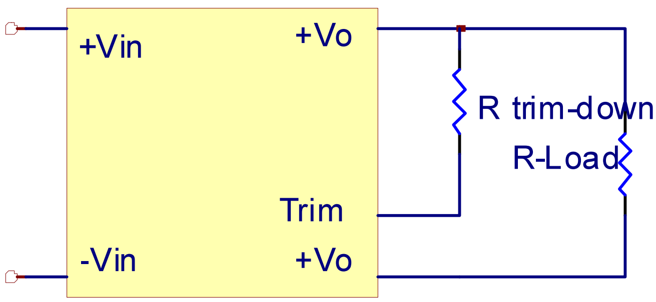


Figure 2. Trim-down Voltage Setup

$$R_{trim-up} = (\frac{Vr \times R1 \times (R2 + R3)}{(Vo - V_{o,nom}) \times R2}) - Rt \quad (K\Omega)$$

1. The value of Rtrim-up defined as:

Where

R trim-up is the external resistor in Kohm.
Vo,nom is the nominal output voltage.
Vo is the desired output voltage.
R1, Rt, R2, R3 and Vr are internal to the unit and are defined in Table 1.

Model Number	Output Voltage(V)	R1 (Kohm)	R2 (Kohm)	R3 (Kohm)	Rt (Kohm)	Vr (v)
EC2SBW24S33 EC2SBW48S33	3.3	2.74	1.8	0.27	9.1	1.24
EC2SBW24S05 EC2SBW48S05	5.0	2.32	2.32	0	8.2	2.5
EC2SBW24S12 EC2SBW48S12	12.0	6.8	2.4	2.32	22	2.5
EC2SBW24S15 EC2SBW48S15	15.0	8.06	2.4	3.9	27	2.5

Table 1 – Trim up and Trim down Resistor Values

For example, to trim-up the output voltage of 5.0V module (EC2SBW24S05) by 10% to 5.5V, R trim-up is calculated as follows:

Vo – Vo, nom = 5.5 – 5.0 = 0.5V
R1 = 2.32 Kohm
R2 = 2.32 Kohm
R3 = 0 Kohm
Rt = 8.2 Kohm, Vr= 2.5V

$$R_{trim-up} = (\frac{2.5 \times 2.32 \times (2.32 + 0)}{0.5 \times 2.32}) - 8.2 = 3.4 (K\Omega)$$

2. The value of R trim-down defined as:

$$R_{trim-down} = R1 \times (\frac{Vr \times R1}{(V_{o,nom} - Vo) \times R2} - 1) - Rt \quad (K\Omega)$$

Where:

R trim-down is the external resistor in Kohm.
Vo, nom is the nominal output voltage.
Vo is the desired output voltage.
R1, Rt, R2, R3 and Vr are internal to the unit and are defined in Table 1

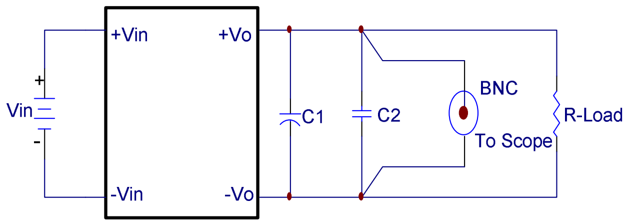
For example, to trim-down the output voltage of 5.0V module (EC2SBW24S05) by 10% to 4.5V, R trim-down is calculated as follows:

Vo,nom – Vo = 5.0 – 4.5 = 0.5V
R1 = 2.32 Kohm
R2 = 2.32 Kohm
R3 = 0 Kohm
Rt = 8.2 Kohm, Vr= 2.5V

$$R_{trim-down} = 2.32 \times (\frac{(2.5 \times 2.32)}{0.5 \times 2.32} - 1) - 8.2 = 1.08 \ (K\Omega)$$

6.7 Output Ripple and Noise Measurement

The test set-up for noise and ripple measurements is shown in Figure6. A coaxial cable was used to prevent impedance mismatch reflections disturbing the noise readings at higher frequencies. Measurements are taken with output appropriately loaded and all ripple/noise specifications are from D.C. to 20MHz Band Width.



Note: C1: 10uF tantalum capacitor
C2: 1uF Ceramic capacitor

Figure6 Output Voltage Ripple and Noise Measurement Set-up

6.8 Output Capacitance

The EC2SBW series converters provide unconditional stability with or without external capacitors. For good transient response low ESR output capacitors should be located close to the point of load. These series converters are designed to work with load capacitance to see technical specifications.

7. Safety & EMC

7.1 Input Fusing and Safety Considerations.

The EC2SBW series converters have not an internal fuse. However, to achieve maximum safety and system protection, always use an input line fuse. We recommended a time delay fuse 3A for 24Vin models and 1.5A for 48Vin modules. Figure7 circuit is recommended by a Transient Voltage Suppressor diode across the input terminal to protect the unit against surge or spike voltage and input reverse voltage.

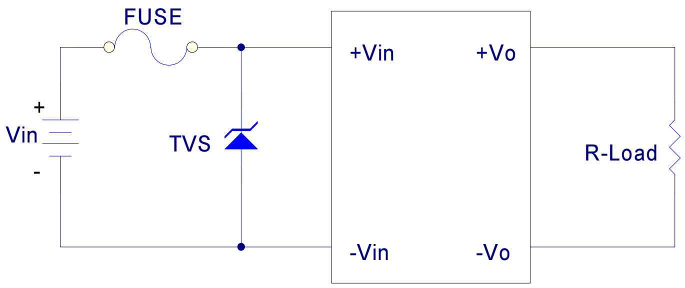


Figure7 Input Protection

7.2 EMC Considerations

EMI Test standard: EN55032 Class A and Class B Conducted Emission
Test Condition: Input Voltage: Nominal, Output Load: Full Load

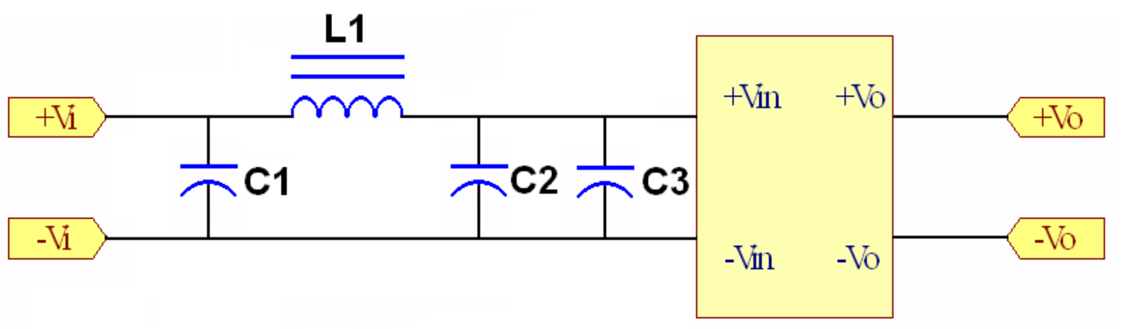
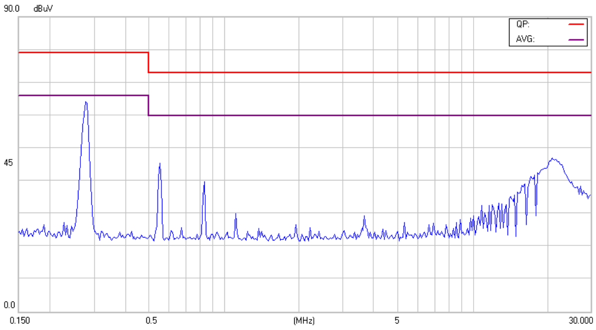


Figure8 Connection circuit for conducted EMI testing

Model No.	EN55032 Class A				EN55032 Class B			
	C1	C2	C3	L1	C1	C2	C3	L1
EC2SBW-24S33	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24S05	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24S12	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24S15	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24D05	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24D12	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-24D15	NC	10uF/50V	10uF/50V	SHORT	10uF/50V	NC	10uF/50V	3.3uH
EC2SBW-48S33	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48S05	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48S12	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48S15	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48D05	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48D12	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH
EC2SBW-48D15	NC	4.7uF/100V	4.7uF/100V	SHORT	4.7uF/100V	NC	4.7uF/100V	3.3uH

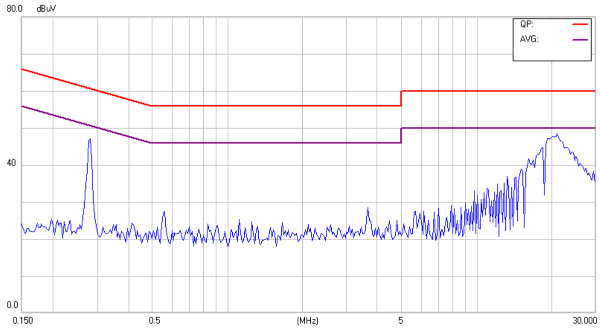
Note: All of capacitors are ceramic capacitors and 1812 size.

Vin = 24Vdc



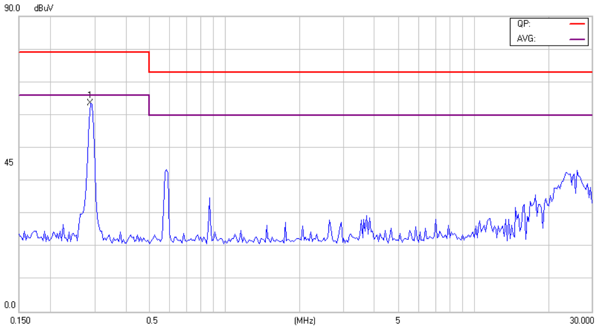
Conducted Class A of EC2SBW-24S33

Vin = 24Vdc



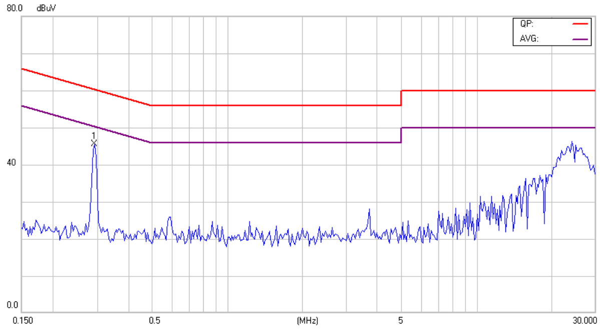
Conducted Class B EC2SBW-24S33

Vin = 24Vdc



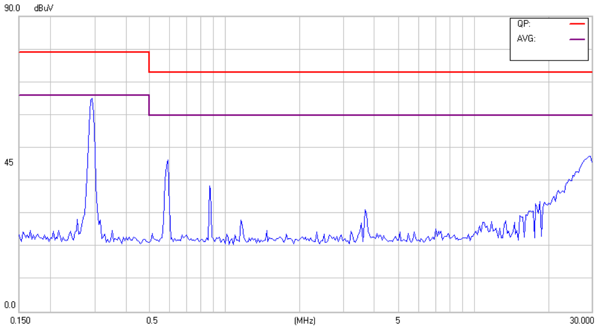
Conducted Class A of EC2SBW-24S05

Vin = 24Vdc



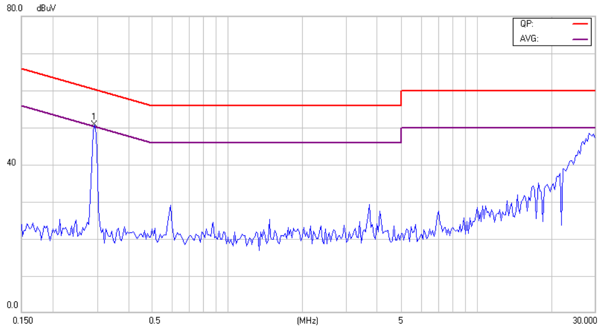
Conducted Class B of EC2SBW-24S05

Vin = 24Vdc



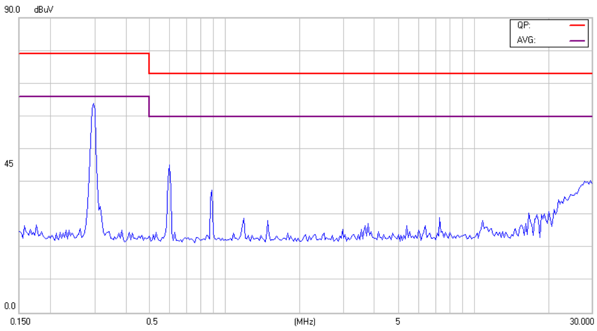
Conducted Class A of EC2SBW-24S12

Vin = 24Vdc



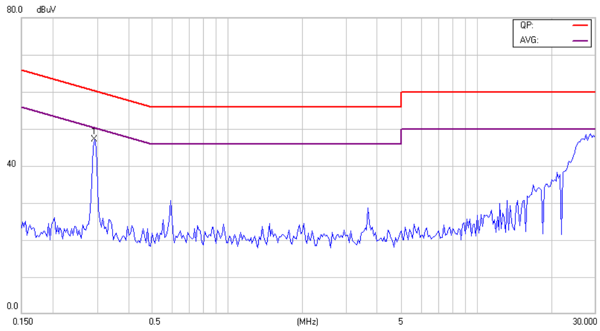
Conducted Class B of EC2SBW-24S12

Vin = 24Vdc



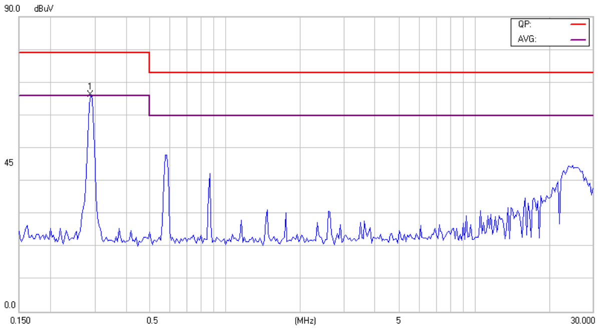
Conducted Class A of EC2SBW-24S15

Vin = 24Vdc



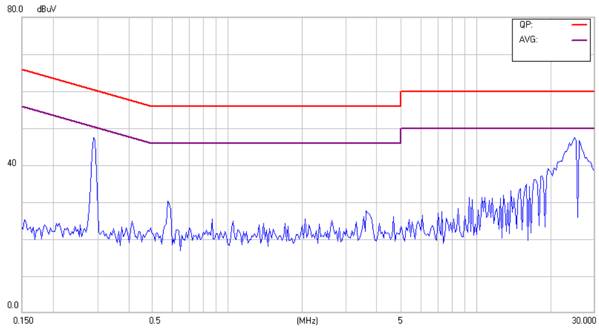
Conducted Class B of EC2SBW-24S15

Vin = 24Vdc



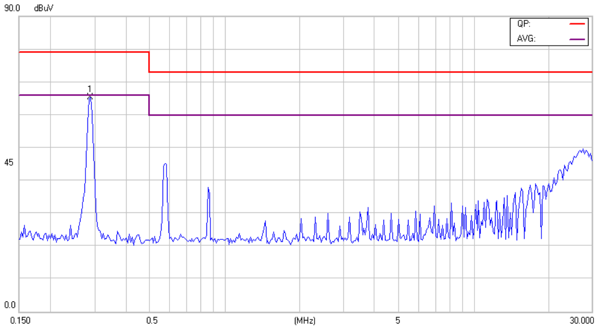
Conducted Class A of EC2SBW-24D05

Vin = 24Vdc



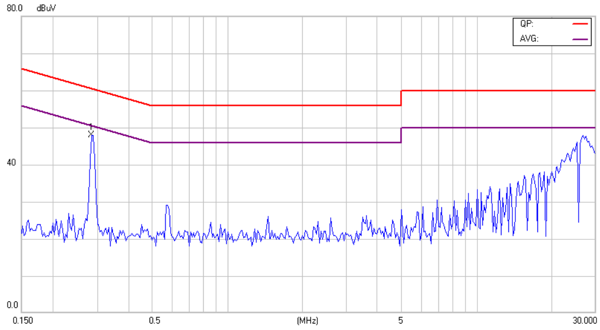
Conducted Class B of EC2SBW-24D05

Vin = 24Vdc



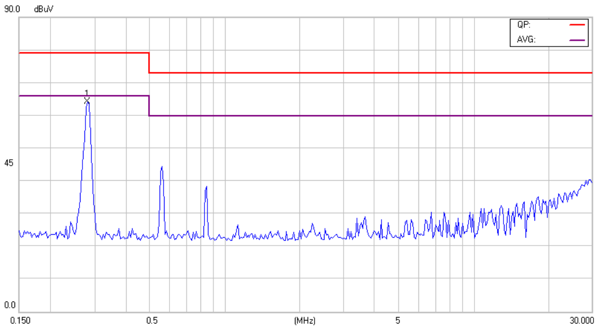
Conducted Class A of EC2SBW-24D12

Vin = 24Vdc



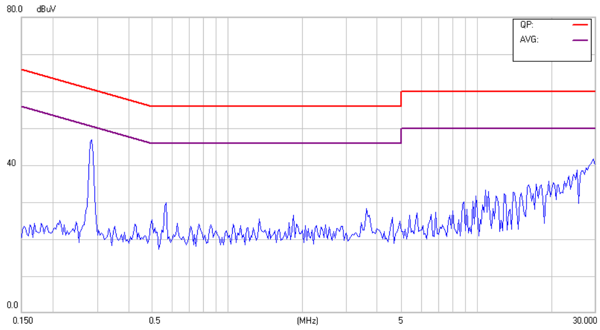
Conducted Class B of EC2SBW-24D12

Vin = 24Vdc



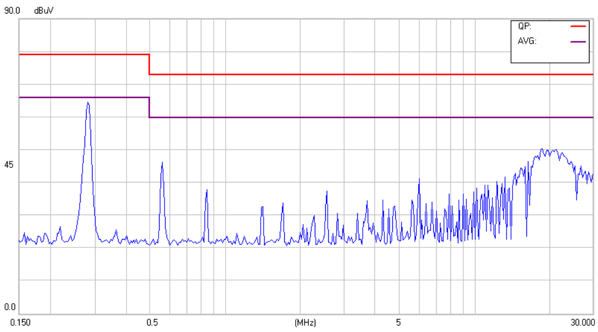
Conducted Class A of EC2SBW-24D15

Vin = 24Vdc



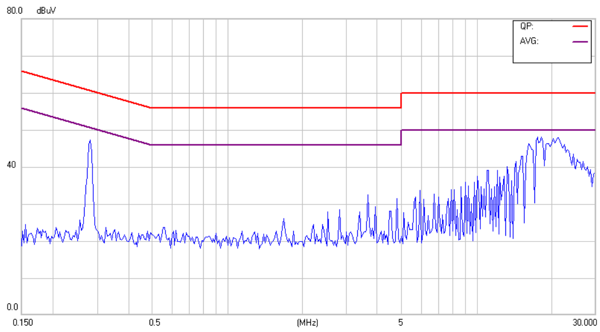
Conducted Class B of EC2SBW-24D15

Vin = 48Vdc



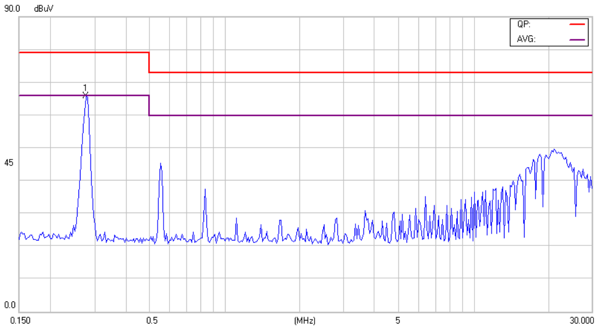
Conducted Class A of EC2SBW-48S33

Vin = 48Vdc



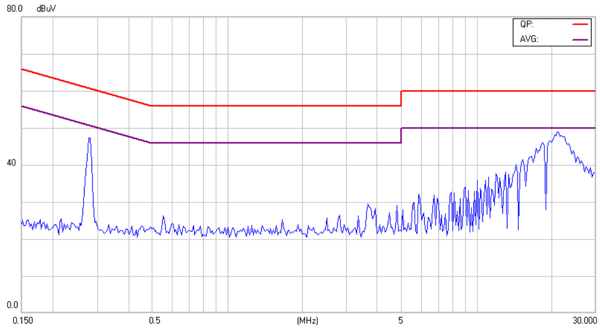
Conducted Class B of EC2SBW-48S33

Vin = 48Vdc



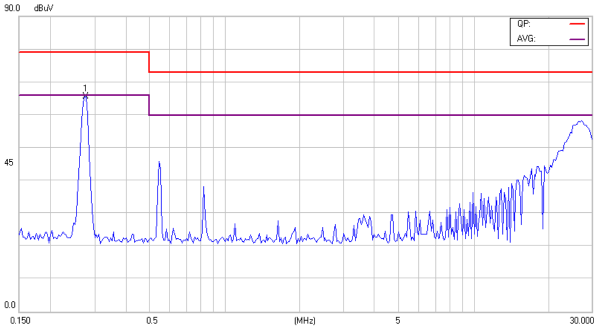
Conducted Class A of EC2SBW-48S05

Vin = 48Vdc



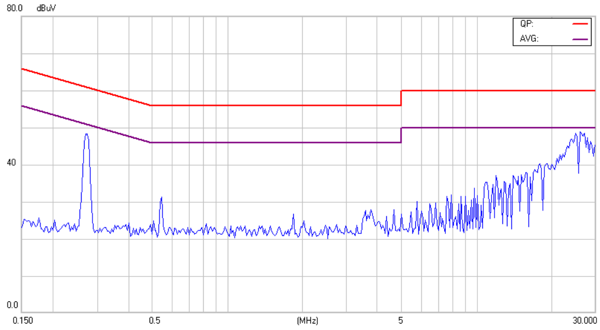
Conducted Class B of EC2SBW-48S05

Vin = 48Vdc



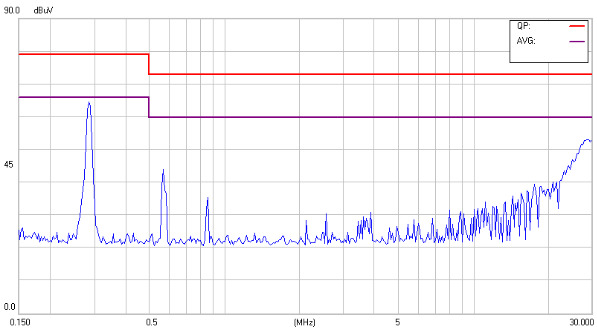
Conducted Class A of EC2SBW-48S12

Vin = 48Vdc



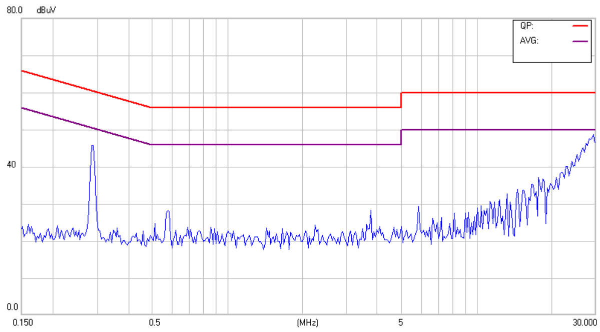
Conducted Class B of EC2SBW-48S12

Vin = 48Vdc



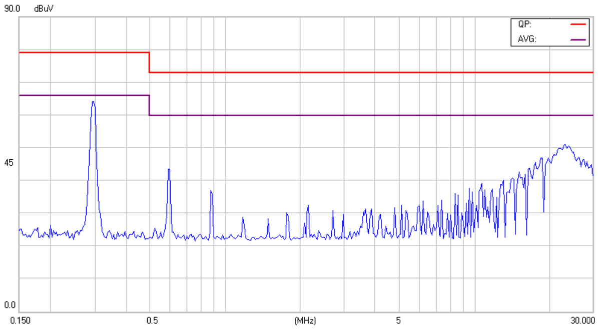
Conducted Class A of EC2SBW-48S15

Vin = 48Vdc



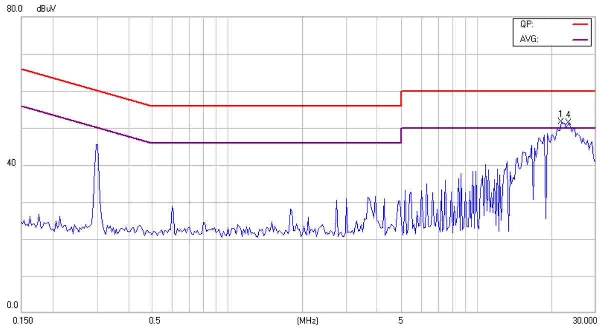
Conducted Class B of EC2SBW-48S15

Vin = 48Vdc



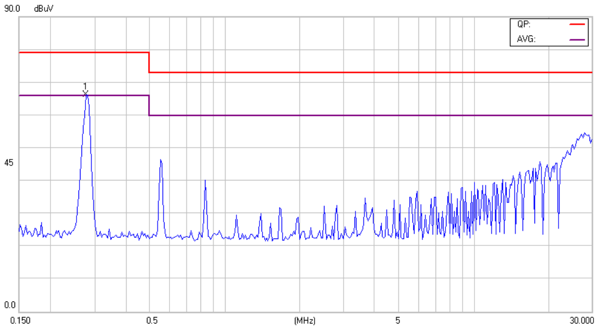
Conducted Class A of EC2SBW-48D05

Vin = 48Vdc



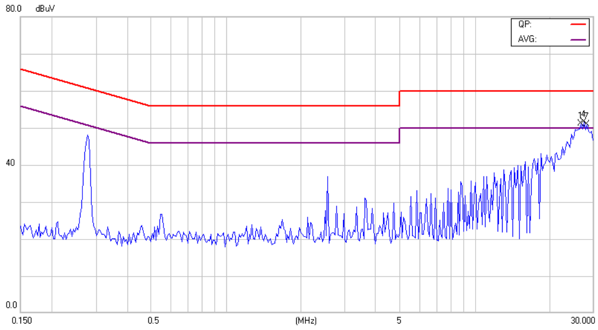
Conducted Class B of EC2SBW-48D05

Vin = 48Vdc



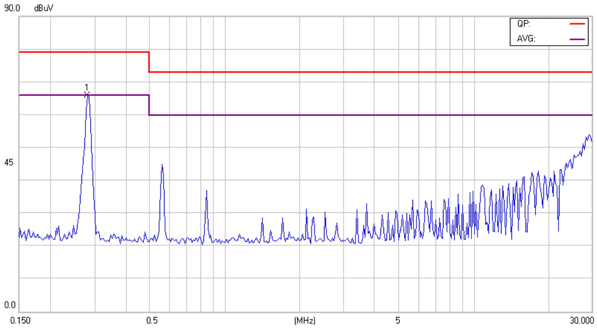
Conducted Class A of EC2SBW-48D12

Vin = 48Vdc



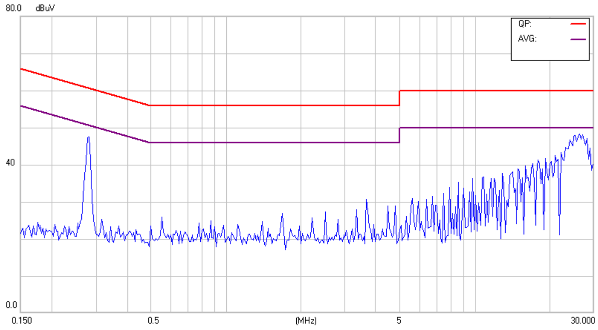
Conducted Class B of EC2SBW-48D12

Vin = 48Vdc



Conducted Class A of EC2SBW-48D15

Vin = 48Vdc



Conducted Class B of EC2SBW-48D15

8. Part Number

EC2SBW – XX S XX

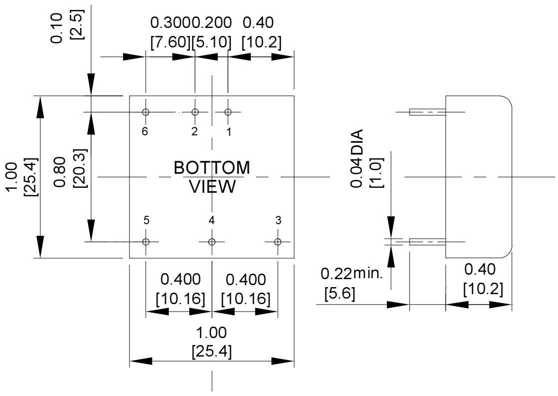
EC2SBW SERIES

24 : Nominal Input Voltage 24VDC
48 : Nominal Input Voltage 48VDC

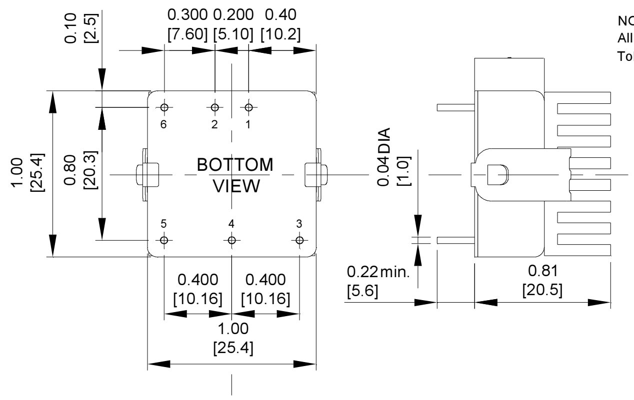
S : Single Output
D : Dual Output

33 : Output Voltage 3.3 VDC
05 : Output Voltage 5 VDC
12 : Output Voltage 12 VDC
15 : Output Voltage 15 VDC

9. Mechanical Specifications



Suffix "+K-C087" Type



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

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

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