EBVW033A0B DC-DC Power Modules

Eighth Brick, 36-75V_{dc} Input, 12.0V_{dc}, 33A, 400W Output

Description

The EBVW033A0B is a DOSA-standard eighth brick. It operates within an input voltage range of 36 to 75V_{dc} and can provide an output current of up to 33A, or an output power of up to 400W, at a voltage ranging from 10.8V_{dc} to 13.2V_{dc}. This converter integrates analog control, synchronous rectification technology, and innovative packaging techniques to achieve a peak efficiency of 95.0% at a nominal output of V_{dc}. The output is fully isolated from the input, meeting an isolation of 2250V_{dc}.

Features

- Wide input voltage range: 36 to 75V_{dc}
- High and flat efficiency: 95.0% peak
- Constant switching frequency
- Monotonic start-up waveform
- Small size and low profile with base plate:
  58.4 x 22.9 x 12.7 mm (2.30 x 0.90 x 0.50 inch)
- Wide operating temperature range (-40°C to 85°C)
- Remote On/Off
- Remote Sense
- Output Voltage Trim
- Input under-voltage lockout
- Output over-current and over-voltage protection
- Over-temperature protection
- 2250 V_{dc} Isolation tested in compliance with IEEE 802.3¤ PoE stand-ards
- Basic insulation
- ANSI/UL* 62368-1 and CAN/CSA† C22.2 No. 62368-1 Recognized, TÜV ‡ (EN IEC62368-1:2020+A11)
- Compliant to RoHS EU Directive 2011/65/EU and amended Directive (EU) 2015/863. (-Z versions)
- Compliant to REACH Directive (EC) No 1907/2006
- ISO** 9001 and ISO 14001 certified manufacturing facilities

Applications

- Distributed power architectures
- Intermediate bus voltage applications
- Telecommunications equipment
- Wireless Base stations
- Industrial equipment
- LANs/WANs
- Enterprise Networks
- Latest generation IC's (DSP, FPGA, ASIC) and Microprocessor powered applications

* UL is a registered trademark of Underwriters Laboratories, Inc.

† CSA is a registered trademark of Canadian Standards Association.

‡ TÜV is a trademark of the TÜV organizations and the TÜV-Verband.

§ This product is intended for integration into end-user equipment . All of the required procedures of end-use equipment should be followed.

¤ IEEE and 802 are registered trademarks of the Institute of Electrical and Electronics Engineers, Incorporated.

** ISO is a registered trademark of the International Organization of Standards.

Technical Specifications

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

Parameter	Device	Symbol	Min	Max	Unit
Input Voltage					
Continuous		V_{IN}	-0.3	75	V_{dc}
Operating transient ≤ 100mS (*)				100	V_{dc}
Non- operating continuous		V_{IN}	-0.3	100	V_{dc}
Operating Ambient Temperature	All	T_A	-40	85	°C
Storage Temperature	All	T_{stg}	-55	125	°C
Humidity, Non-Condensing	All		20	95	%RH
Altitude, operating	All			5000	m
Isolation Voltage					
Input-Output (100% factory Hi-Pot tested)	All	-	-	2250	V_{dc}
Input to Heat Plate				2250	
Output to Heat Plate				500	

* The input over-voltage shutdown feature is not present on the products with 100V/100ms input transient capability.

General Specifications

Parameter	Device	Symbol	Typ	Unit
Calculated Reliability based upon Telcordia SR-332				
(I_O=80%$I_{O,\ max}$, T_A=40°C, Airflow = 200 LFM), 90% confidence)				
Issue 4: Method I, Case 3	All	MTBF FIT	10,213,401 97.9	Hours 10^9/Hours
Weight – Open Frame			36	g (oz.)
Weight – with Baseplate option			46	g (oz.)

Electrical Specifications (Input)

Unless otherwise indicated, specifications apply at nominal output over all operating input voltage, resistive load, and temperature conditions.

Parameter	Device	Symbol	Min	Typ	Max	Unit
Operating Input Voltage	All	V_{IN}	36	48	75	V_{dc}
Maximum Input Current (VIN =36Vdc, IO =IO, max)	All	$I_{IN,max}$			13	A_{dc}
Input No Load Current (V_{IN} = $V_{IN,\ nom}$, I_O = 0, module enabled)	All	$I_{IN,No\ load}$		80		mA
Input Stand-by Current (V_{IN} = $V_{IN,\ nom}$, module disabled)	All	$I_{IN,stand\text{-}by}$		25		mA
External Input Capacitance	All		220	-	-	µF
Inrush Transient	All	I^2t	-	-	1	A^2s
Input Reflected Ripple Current, peak-to-peak (5Hz to 20MHz, 12µH source impedance; V_{IN}= 48V, I_O= I_{Omax} ; seeFigure 12)	All		-	200	-	mA_{rms}
Input Ripple Rejection (120Hz)	All		-	50	-	dB

Technical Specifications (continued)

Electrical Specifications (Output)

Parameter	Device	Symbol	Min	Typ	Max	Unit
Output Voltage Set-point (V_{IN}=$V_{IN,nom}$, I_O=16.5A, T_A =25°C)	All	$V_{O, set}$	11.88	12.00	12.12	V_{dc}
Output Voltage (Over all operating input voltage(36V to 75V), resistive load, and temperature conditions until end of life)	All	V_O	-3.0	-	+3.0	% $V_{O, set}$
Output Voltage Adjustment range	All	$V_{O, TRIM}$	10.8	12.0	13.2	V_{dc}
Output Regulation						
Line (V_{IN}=$V_{IN, min}$ to $V_{IN, max}$)	All		-	0.2	-	% VO, set
Load (I_O=$I_{O, min}$ to $I_{O, max}$)	All		-	0.2	-	% VO, set
Temperature (TA = -40°C to +85°C)	All		- -	2	-	% VO, set
Output Ripple and Noise (V_{IN}=$V_{IN, nom}$ and I_O=$I_{O, min}$ to $I_{O, max}$, tested with a 200µF ceramic, 400µF aluminum polymer capacitor across the load.)						
RMS (5Hz to 20MHz bandwidth)	All		-	70	-	mV_{rms}
Peak-to-Peak (5Hz to 20MHz bandwidth)	All		-	100	-	mV_{pk-pk}
External Output Capacitance	All	C_{ext}	600	-	4,000	µF
Output Current	All	Io	0		33	A
Output Current Limit Inception	All	$I_{o,ocp}$		42	-	A
Efficiency (VIN=VIN nom, TA=25°C, VO= VO,set)						
I_O=100% IO, max	All	η		94.0		%
Peak Efficiency	All	$η_{pk}$		95.0		%
Switching Frequency		f_{sw}		200		kHz
Dynamic Load Response dI_O/d_t=1A/us; V_{in}=$V_{in,nom}$; T_A=25°C; (Tested with a 10µF ceramic and 3X470µF polymer capacitor across the load.)						
Load Change from I_O = 50% to 75% of $I_{O,max}$:						
Peak Deviation	All	V_{pk}	-	300	-	mV_{pk}
Settling Time (V_O <10% peak deviation)		t_s	-	2	-	ms
Load Change from I_O = 75% to 50% of $I_{O,max}$:						
Peak Deviation	All	V_{pk}	-	300	-	mV_{pk}
Settling Time (V_O <10% peak deviation)		t_s	-	2	-	ms

Technical Specifications (continued)

Isolation Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Isolation Capacitance	C_{iso}	-	4700	-	pF
Isolation Resistance	R_{iso}	10	-	-	MΩ

Feature Specifications

Unless otherwise indicated, specifications apply at nominal output over all operating input voltage, resistive load, and temperature conditions.

See Feature Descriptions for additional information.

Parameter	Device	Symbol	Min	Typ	Max	Unit
Remote On/Off Signal Interface						
(V_{IN}=$V_{IN, min}$ to $V_{IN, max}$, Signal referenced to V_{IN-} terminal)						
Negative Logic: device code suffix "1"						
Logic Low = module On, Logic High = module Off						
Positive Logic: No device code suffix required						
Logic Low = module Off, Logic High = module On						
On/Off Thresholds:						
Remote On/Off Current	All	$I_{on/off}$		10		µA
Logic Low Voltage	All	$V_{on/off}$	-0.3	-	0.8	V_{dc}
Logic High Voltage	All	$V_{on/off}$	2.0	-	5	V_{dc}
Logic High maximum allowable leakage current	All	$I_{on/off}$	-	-	10	µA
Maximum voltage allowed on On/Off pin	All	$V_{on/off}$	-	5	7	V_{dc}
Turn-on Delay and Rise Time (I_O=$I_{O, max}$)						
Tdelay=Time until VO = 10% of VO,set from Remote On/Off set to On (Enable with on/off) with Vin already applied	All	T_{delay}		6		ms
Tdelay=Time until VO = 10% of VO,set from application of Vin with Remote On/Off set to On (Enable with Vin)	All	T_{delay}	-	6		ms
Rise Time (for VO to rise from 10% to 90% of VO,set)	All	T_{rise}	-	5	-	ms
Remote Sense Range	All w/ "9"option	V_{Sense}	-	-	0.5	V_{dc}
Output Overvoltage Protection	All	$V_{O,limit}$		15.4		V_{dc}
Overtemperature Protection (See Feature Descriptions)	All	T_{ref}	-	140	-	°C
Input Undervoltage Lockout						
Turn-on Threshold				34		V_{dc}
Turn-off Threshold				32		V_{dc}

CAUTION: This power module is not internally fused. An input line fuse must always be used.

This power module can be used in a wide variety of applications, ranging from simple standalone operation to an integrated part of sophisticated power architecture. To preserve maximum flexibility, internal fusing is not included, however, to achieve maximum safety and system protection, always use an input line fuse. The safety agencies require a fast-acting fuse with a maximum rating of 15A (see Safety Considerations section). Based on the information provided in this Data Sheet on inrush energy and maximum dc input current, the same type of fuse with a lower rating can be used. Refer to the fuse manufacturer's Data Sheet for further information.

Typical Characteristic Curves

The following figures provide typical characteristics for the EBVW033A0B (12Vout) at 25°C.

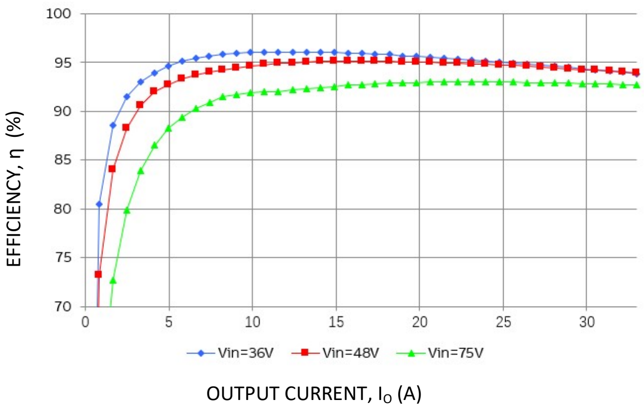


Figure 1. Typical Converter Efficiency Vs. Output current

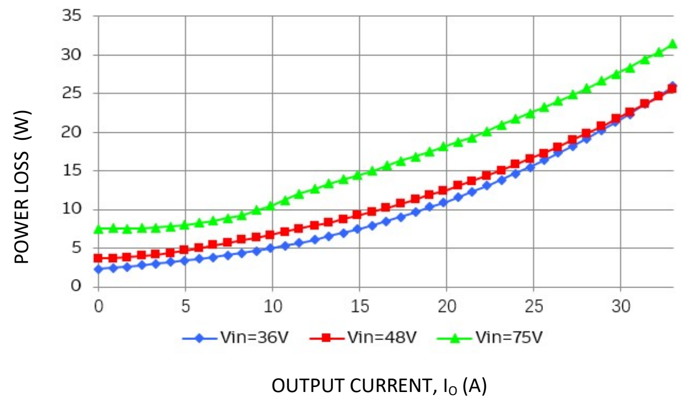


Figure 2. Typical Power Loss Vs. Output current

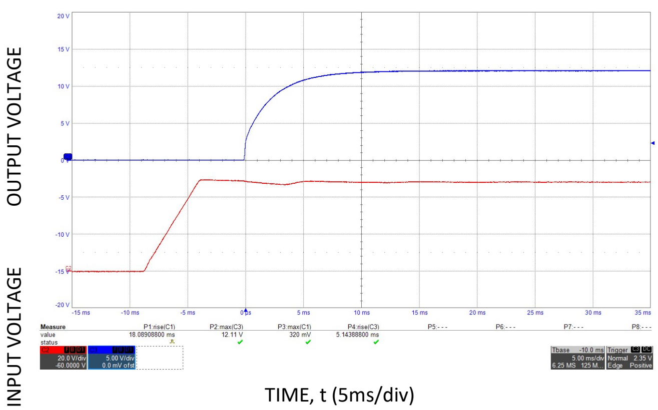


Figure 3. Typical Start-Up Using Vin with Remote On/Off enabled

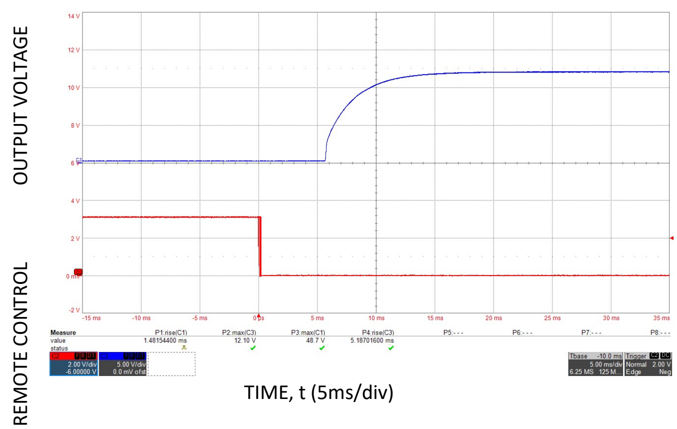


Figure 4. Typical Start-Up Using Remote On/Off enabled, negative logic version shown.

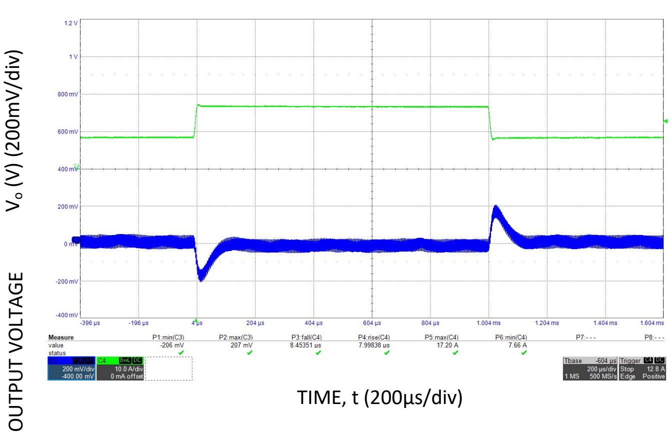


Figure 5. Typical Transient Response to Step change in Load from 25% to 50% to 25% of Full Load at 48 Vdc Input and C_O=1500uF.

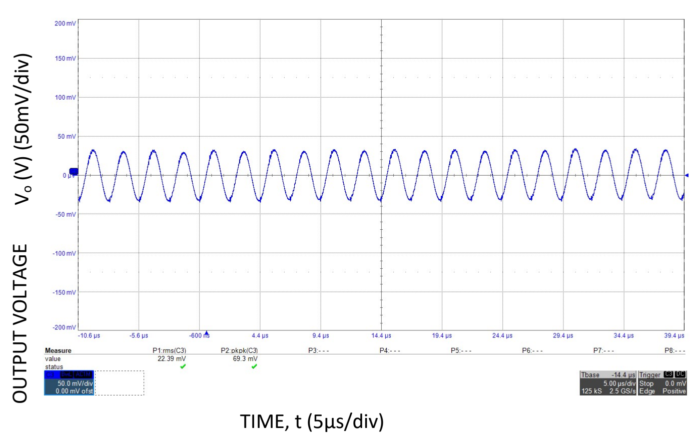


Figure 6. Typical Output Ripple

Test Setup Descriptions

Input Reflected Ripple Current

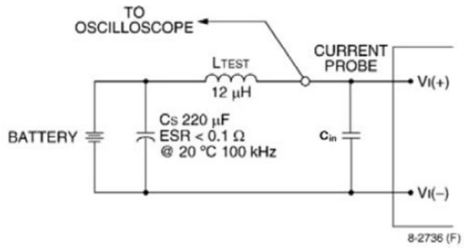


Figure 7. Input Reflected Ripple Current Test Setup.

Measure input reflected-ripple current with a simulated source inductance (LTEST) of 12µH. Capacitor C_S offsets possible battery impedance.

Output Ripple and Noise

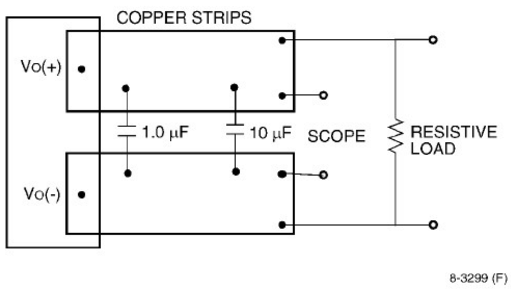
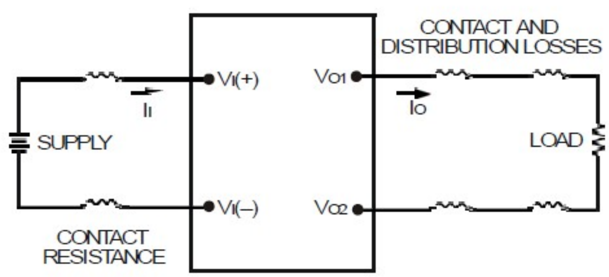


Figure 8. Output Ripple and Noise Test Setup

Use a 1.0 µF ceramic capacitor and a 10 µF aluminum or tantalum capacitor. Scope measurement should be made using a BNC socket. Position the load between 51 mm and 76 mm (2 in. and 3 in.) from the module.

Efficiency Measurement



$$\eta = \left(\frac{(V_o(+) - V_o(-)) \cdot I_o}{(V_i(+) - V_i(-)) \cdot I_{in}}\right) \times 100$$

Figure 9. Efficiency Test Setup

All measurements are taken at the module terminals. When socketing, place Kelvin connections at module terminals to avoid measurement errors due to socket contact resistance.

Feature Description

Overcurrent Protection

To provide protection in a fault output overload condition, the module is equipped with internal current-limiting circuitry and can endure current limiting continuously. If the output overload condition still exists when the module restarts, it will shut down again. This operation will continue indefinitely until the overcurrent condition is corrected.

An auto-restart feature continually attempts to restore the operation until fault condition is cleared.

Remote On/Off

The module contains a standard on/off control circuit reference to the V_{IN}(-) terminal. Two remote on/off logic options are available. Positive logic remote on/off turns the module on during a logic-high voltage on the ON/OFF pin, and off during a logic low. Negative logic remote on/off turns the module off during a logic high, and on during a logic low. Negative logic, device code suffix "1," is the preferred configuration.

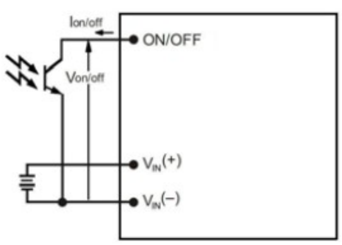


Figure 10. Remote On/Off Implementation.

The On/Off circuit is powered from an internal bias supply, derived from the input voltage terminals. To turn the power module on and off, the user must supply a switch to control the voltage between the On/Off terminal and the V_{IN}(-) terminal ($V_{on/off}$). The switch can be an open collector or equivalent. A logic low is $V_{on/off}$ = -0.3V to 0.8V. During a logic high, the maximum Von/off generated by the power module is 5V. If using an external voltage source, the maximum voltage $V_{on/off}$ on the pin is 7V with respect to the V_{IN}(-) terminal.

If not using the remote on/off feature, perform one of the following to turn the unit on:

For negative logic, short ON/OFF pin to V_{IN}(-).

For positive logic: leave ON/OFF pin open.

Output Overvoltage Protection

The module contains circuitry to detect and respond to output overvoltage conditions. If the overvoltage condition causes the output voltage to rise above the limit in the Specifications, the module will shut down. An auto-restart feature continually attempts to restore the operation until fault condition is cleared.

Overtemperature Protection

These modules feature an overtemperature protection circuit to safeguard against thermal damage. The circuit shuts down the module when the maximum device reference temperature is exceeded. The module will automatically restart once the reference temperature cools by ~25°C.

Input Under Voltage Lockout

At input voltages above or below the input under/over voltage lockout limits, module operation is disabled. The module will begin to operate when the input voltage level changes to within the under and overvoltage lockout limits.

Remote Sense (“9” Option Code)

Remote sense minimizes the effects of distribution losses by regulating the voltage at the remote-sense connections. The voltage between the remote-sense pins and the output terminals must not exceed the output voltage sense range given in the Feature Specifications table:

$$[VO(+) - VO(-)] - [SENSE(+) - SENSE(-)] \le 0.5\ V$$

The amount of power delivered by the module is defined as the voltage at the output terminals multiplied by the output current. When using remote sense and trim, the output voltage of the module can be increased, which at the same output current would increase the power output of the module. Care should be taken to ensure that the maximum output power of the module remains at or below the maximum rated power (Maximum rated power= $V_{o,set}$ x $I_{o,max}$).

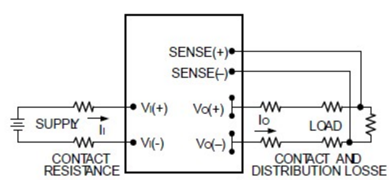


Figure 11. Circuit Configuration for remote sense.

Output Voltage Programming (Trim)

Trimming allows the output voltage set point to be increased or decreased; this is accomplished by connecting an external resistor between the TRIM pin and either the V_O(+) pin or the V_O(-) pin.

Feature Description (continued)

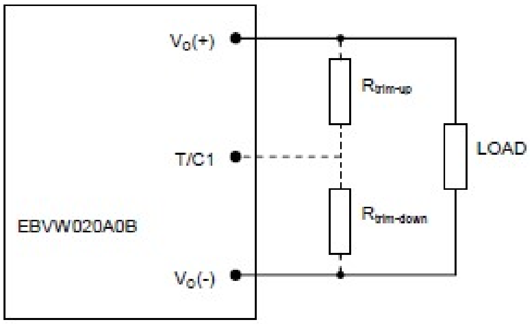


Figure 12. Circuit Configuration to Trim Output Voltage

Connecting an external resistor ($R_{trim-down}$) between the TRIM pin and the Vo(-) (or Sense(-)) pin decreases the output voltage set point. To maintain set point accuracy, the trim resistor tolerance should be ±1.0%.

The following equation determines the required external resistor value to obtain a percentage output voltage change of Δ%

$$R_{trim-down} = \left[\frac{511}{\Delta\%} - 10.22 \right] k\Omega$$

Where

$$\Delta\% = \left(\frac{V_{o,set} - V_{desired}}{V_{o,set}} \right) x100$$

Connecting an external resistor (Rtrim-up) between the TRIM pin and the VO(+) (or Sense (+)) pin increases the output voltage set point. The following equations determine the required external resistor value to obtain a percentage output voltage change of Δ%:

$$R_{trim-up} = \left[\frac{5.11x\, V_{o,set} x(100+\Delta\%)}{1.225x\Delta\%} - \frac{511}{\Delta\%} - 10.22 \right] K\Omega$$

Where

$$\Delta\% = \left(\frac{V_{o,desired} - V_{o,set}}{V_{o,set}} \right) x100$$

Although the output voltage can be increased by both the remote sense and by the trim, the maximum increase for the output voltage is not the sum of both. The maximum increase is the larger of either the remote sense or the trim. The amount of power delivered by the module is defined as the voltage at the output terminals multiplied by the output current. When using remote sense and trim, the output voltage of the module can be increased, which at the same output current would increase the power output of the module. Care should be taken to ensure that the maximum output power of the module remains at or below the maximum rated power (Maximum rated power = $V_{O,set}$ x $I_{O,max}$).

Resistor Example for Trim Up

Δ%	Rtrim-up (Kohm)	Vout(V)
1	4535	12.12
3	1538	12.36
5	939	12.60
10	489	13.20

Resistor Example for Trim Down

Δ%	Rtrim-down (Kohm)	Vout(V)
10	41	10.80
7	63	11.16
5	92	11.40
3	160	11.64

Design Considerations

Input Source Impedance

The power module should be connected to a low ac-impedance source. A highly inductive source impedance can affect the stability of the power module. For the test configuration in Figure 12, a 220µF electrolytic capacitor, C_{in}, (ESR<0.7Ω at 100kHz), mounted close to the power module helps ensure the stability of the unit. If the module is subjected to rapid on/off cycles, a 1000µF input capacitor is required.

Safety Considerations

For safety agency approval the power module must be installed in compliance with the spacing and separation requirements of the end-use safety agency standards, i.e., UL ANSI/UL* 62368-1 and CAN/CSA+ C22.2 No. 62368-1 Recognized, TÜV ‡ (EN IEC62368-1:2020+A11)

If the input source is non-SELV (ELV or a hazardous voltage greater than 60 V_{dc} and less than or equal to 75V_{dc}), for the module's output to be considered as meeting the requirements for safety extra-low voltage (SELV) or ES1, all of the following must be true:

- The input source is to be provided with reinforced insulation from any other hazardous voltages, including the ac mains.
- One V_{IN} pin and one V_{OUT} pin are to be grounded, or both the input and output pins are to be kept floating.
- The input pins of the module are not operator accessible.
- Another SELV or ES1 reliability test is conducted on the whole system (combination of supply source and subject module), as required by the safety agencies, to verify that under a single fault, hazardous voltages do not appear at the module's output.

Note: Do not ground either of the input pins of the module without grounding one of the output pins. This may allow a non-SELV/ES1 voltage to appear between the output pins and ground.

The power module has safety extra-low voltage (SELV) or ES1 outputs when all inputs are SELV or ES1.

The input to these units is to be provided with a maximum 15 A fast-acting (or time-delay) fuse in the unearthed lead.

The power module has internally generated voltages exceeding safety extra-low voltage. Consideration should be taken to restrict operator accessibility.

Layout Considerations

The EBVW033 power module series are low profile in order to be used in fine pitch system card architectures. As such, component clearance between the bottom of the power module and the mounting board is limited. Avoid placing copper areas on the outer layer directly underneath the power module. Also avoid placing via interconnects underneath the power module.

Through-Hole Lead-Free Soldering Information

The RoHS-compliant, Z version, through-hole products use the SAC (Sn/Ag/Cu) Pb-free solder and RoHS-compliant components. The non-Z version products use lead-tin (Pb/Sn) solder and RoHS-compliant components. Both version modules are designed to be processed through single or dual wave soldering machines. The pins have an RoHS-compliant, pure tin finish that is compatible with both Pb and Pb-free wave soldering processes. A maximum preheat rate of 3°C/s is suggested. The wave preheat process should be such that the temperature of the power module board is kept below 210°C. For Pb solder, the recommended pot temperature is 260°C, while the Pb-free solder pot is 270°C max. Not all RoHS- compliant through-hole products can be processed with paste-through-hole Pb or Pb-free reflow process. If additional information is needed, please consult with your OmniOn Power representative for more details.

Storage and Handling

The recommended storage environment and handling procedures for moisture-sensitive surface mount packages is detailed in J-STD-033 Rev. A (Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices).

Moisture barrier bags (MBB) with desiccant are required for MSL ratings of 2 or greater. These sealed packages should not be broken until time of use. Once the original package is broken, the floor life of the product at conditions of ≤30°C and 60% relative humidity varies according to the MSL rating (see J-STD-025A). The shelf life for dry packed SMT packages will be a minimum of 12 months from the bag seal date, when stored at the following conditions: < 40° C, < 90% relative humidity.

Design Considerations (continued)

Post Solder Cleaning and Drying Considerations

Post solder cleaning is usually the final circuit-board assembly process prior to electrical board testing. The result of inadequate cleaning and drying can affect both the reliability of a power module and the testability of the finished circuit-board assembly. For guidance on appropriate soldering, cleaning and drying procedures, refer to Omnion Power Board Mounted Power Modules: Soldering and Cleaning Application Note (AP01-056EPS).

Thermal Design Considerations

The power modules operate in a variety of thermal environments and sufficient cooling should be provided to help ensure reliable operation. Thermal considerations include ambient temperature, airflow, module power dissipation, and the need for increased reliability. A reduction in the operating temperature of the module will result in an increase in reliability.

The thermal data presented here is based on physical measurements taken in a wind tunnel, using automated thermo-couple instrumentation to monitor key component temperatures: FETs, diodes, control ICs, magnetic cores, ceramic capacitors, opto-isolators, and module pwb conductors, while controlling the ambient airflow rate and temperature. For a given airflow and ambient temperature, the module output power is increased, until one (or more) of the components reaches its maximum derated operating temperature, as defined in IPC-9592. This procedure is then repeated for a different airflow or ambient temperature until a family of module output derating curves is obtained.

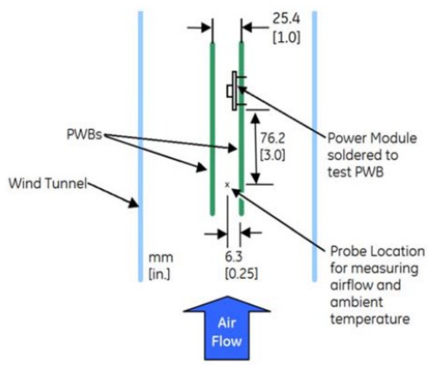


Figure 13 Test Setup for thermal derating curves

Heat-dissipating components are mounted on the top side of the module. Heat is removed by conduction, convection and radiation to the surrounding environment. Proper cooling can be verified by measuring the thermal reference temperature (TH_x). Peak temperature (TH_x) occurs at the position indicated in Figure 18 and 19. For reliable operation this temperature should not exceed the listed temperature threshold.

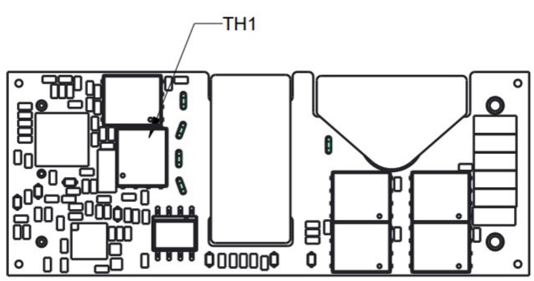


Figure 14. Location of the thermal reference temperature TH1. Open frame version. Do not exceed 121.8°C.

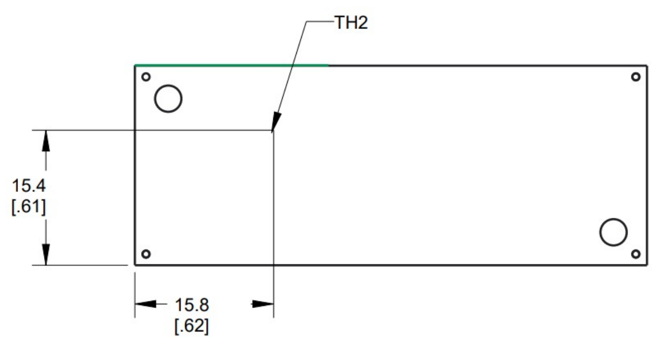


Figure 15. Location of the thermal reference temperature TH_2. Base Plate version. Do not exceed 110 °C

Although the maximum temperature of the power modules is THx, you can limit this temperature to a lower value for extremely high reliability.

Thermal Design Considerations (continued)

Increased airflow over the module enhances the heat transfer via convection. The thermal derating of figures 20 through 22 show the maximum output current that can be delivered by each module in the indicated orientation without exceeding the maximum TH_x temperature versus local ambient temperature (T_A) for air flows of, Natural Convection, 1 m/s (200 ft./min), 2 m/s (400 ft./min).

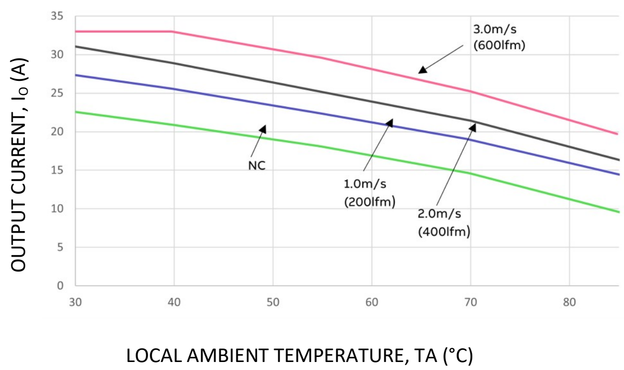


Figure 17. Output Current Derating for the Open Frame EBVW033A0B in the Transverse Orientation; Airflow Direction from Vin(+) to Vin(-); V_{in} = 48V.

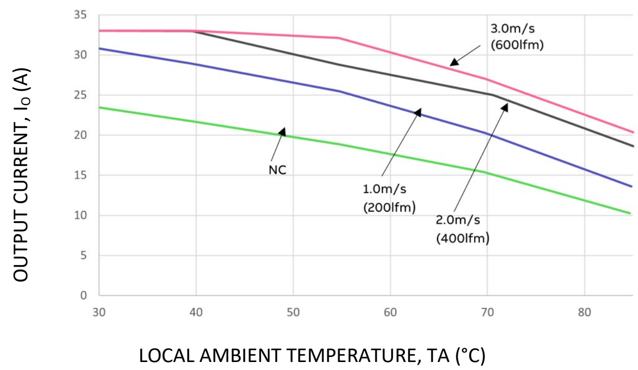


Figure 18. Output Current Derating for the Base Plate EBVW033A0Bxx-H in the Transverse Orientation; Airflow Direction from Vin(+) to Vin(-); V_{in} = 48V

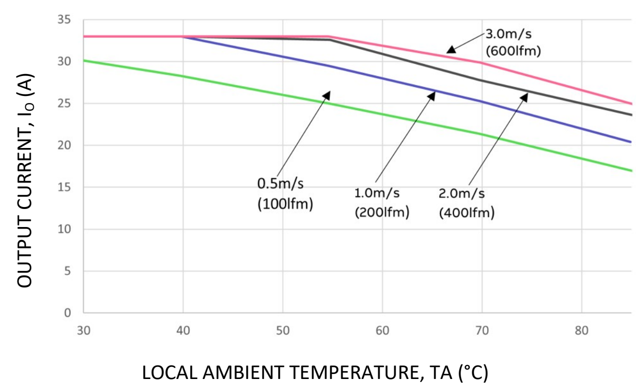


Figure 19. Output Current Derating for the Base Plate EBVW033A0Bxx-H and 0.5" heat sink in the Transverse Orientation; Airflow Airflow Direction from Vin(+) to Vin(-); V_{in}= 48V.

EMC Considerations

The circuit and plots in Figure 19 shows a suggested configuration to meet the conducted emission limits of EN55022 Class A.

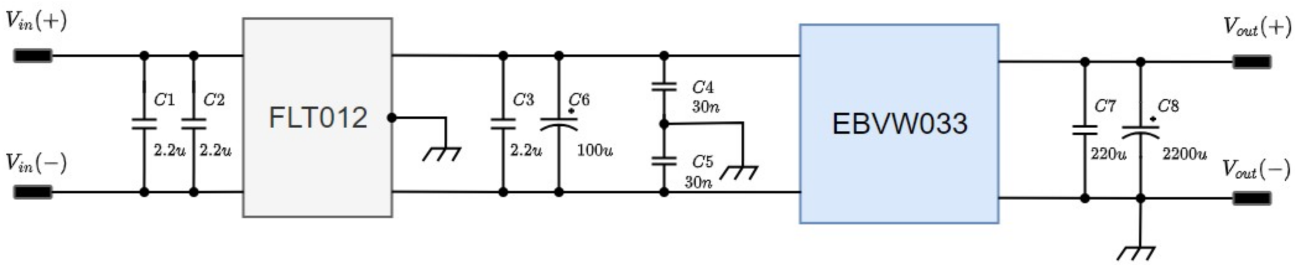


Figure 19. EBVW033 Conducted EMI test setup

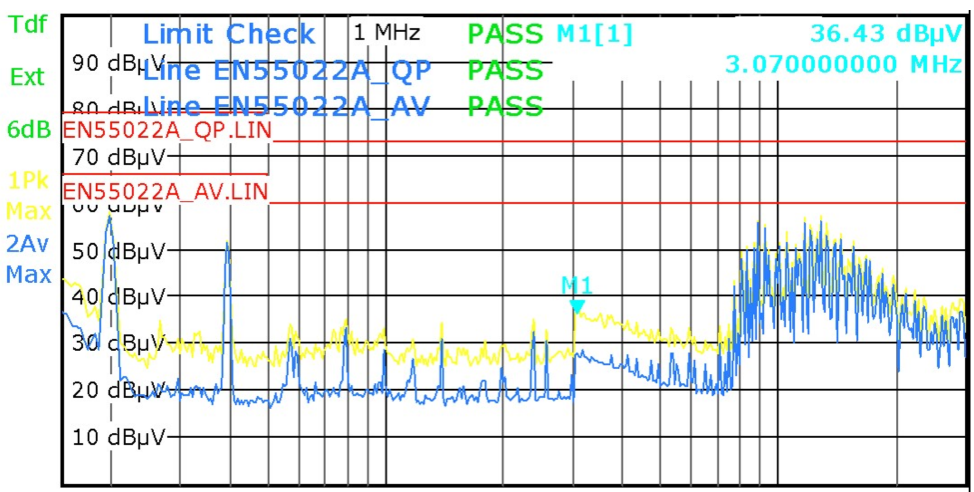


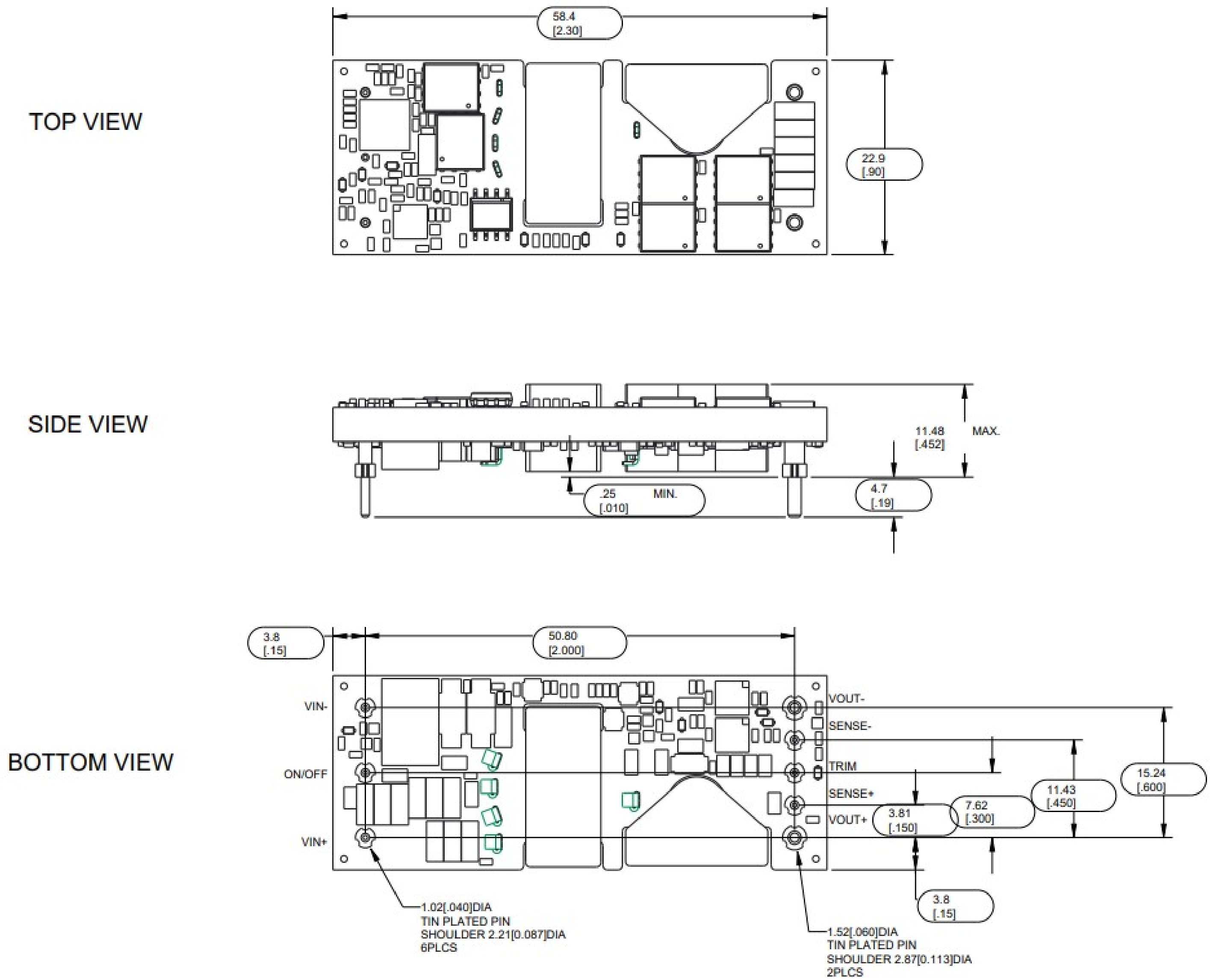
Figure 20. EBVW033 Conducted EMI test result

Mechanical Outline (Open Frame)

Dimensions are in millimeters and (inches).

Tolerances: x.x mm ±0.5 mm (x.xx in. ± 0.02 in.) [Unless otherwise indicated]

x.xx mm ± 0.25 mm (x.xxx in ± 0.010 in.)



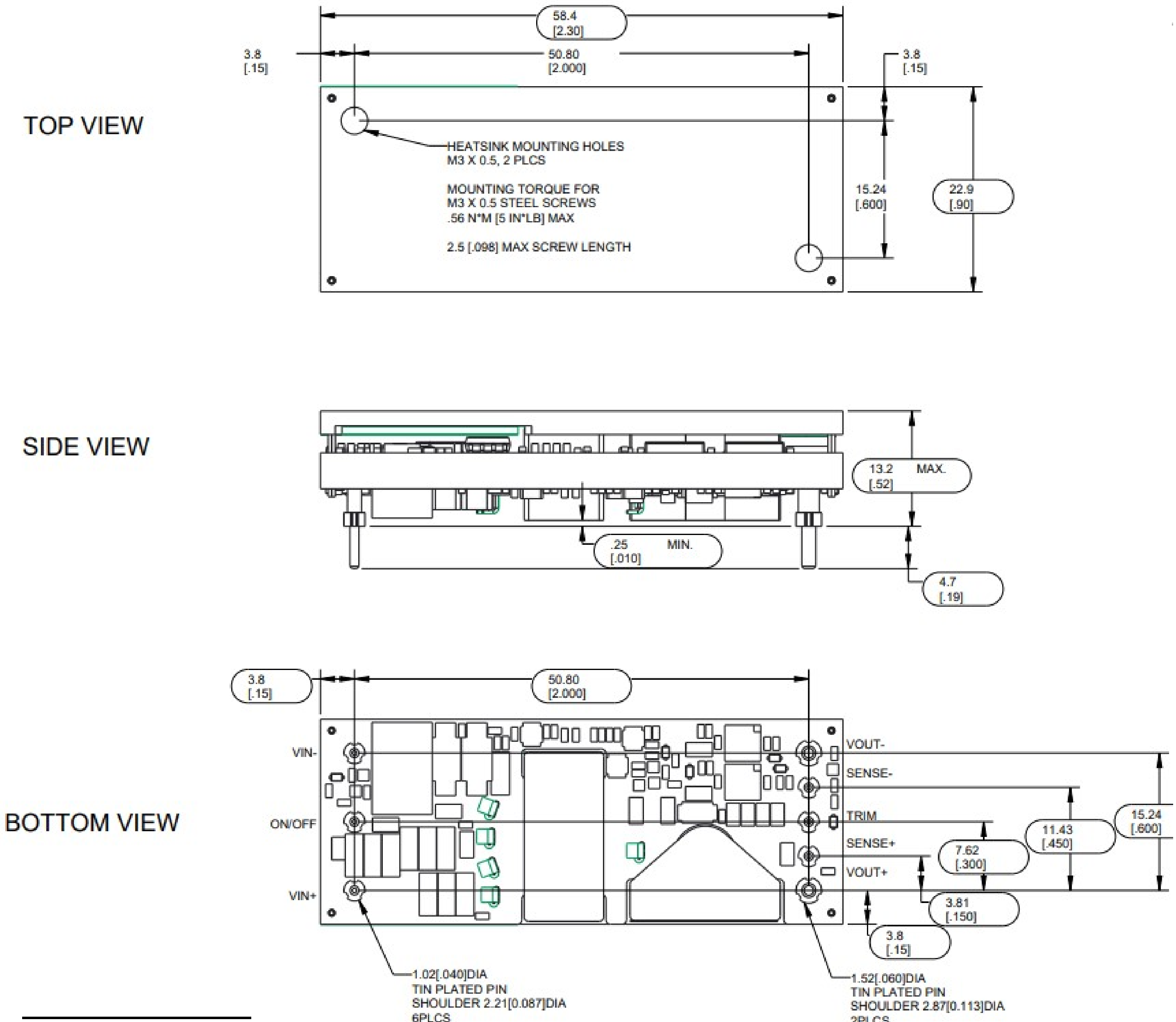
Pin	Function
1	VIN(+)
2	ON/OFF
3	VIN(-)
4	VOUT(-)
5	SENSE(-)
6	TRIM
7	SENSE(+)
8	VOUT(+)

Mechanical Outline (With Base plate)

Dimensions are in millimeters and (inches).

Tolerances: x.x mm ±0.5 mm (x.xx in. ± 0.02 in.) [Unless otherwise indicated]

x.xx mm ± 0.25 mm (x.xxx in ± 0.010 in.)



Pin	Function
1	VIN(+)
2	ON/OFF
3	VIN(-)
4	VOUT(-)
5	SENSE(-)
6	TRIM
7	SENSE(+)
8	VOUT(+)

Recommended PCB Footprint

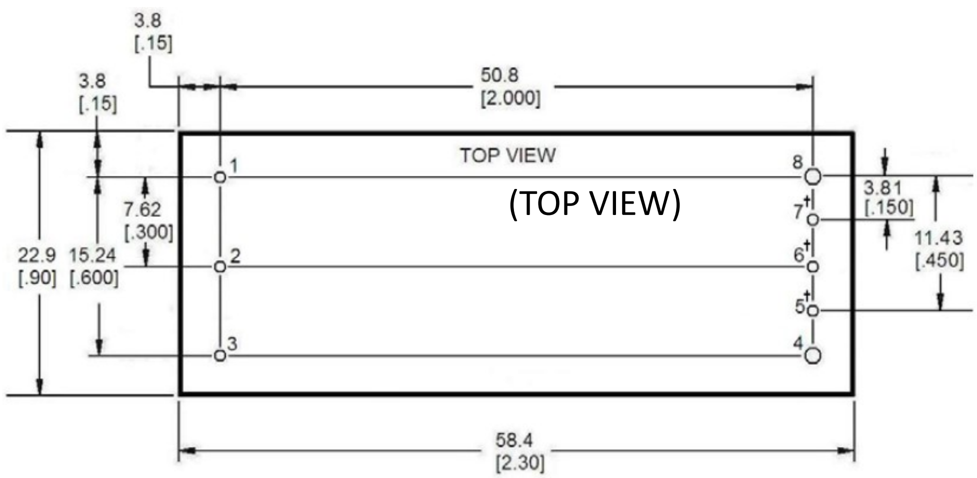
Dimensions are in millimeters and (inches).

Tolerances: x.x mm ±0.5 mm (x.xx in. ± 0.02 in.) [Unless otherwise indicated]

x.xx mm ± 0.25 mm (x.xxx in ± 0.010 in.)

Through-Hole Modules

Pin	Function
1	VIN(+)
2	ON/OFF
3	VIN(-)
4	VOUT(-)
5	SENSE(-)
6	TRIM
7	SENSE(+)
8	VOUT(+)



Hole and Pad diameter recommendations:

Pin Number	Hole Dia mm [in]	Pad Dia mm [in]
1, 2, 3, 5, 6, 7	1.6 [.063]	2.1 [.083]
4, 8	2.2 [.087]	3.2 [.126]

Delivery Packaging Information

Tray Specification (For Open-Frame Module)

Material	PET (1mm)
Max surface resistivity	10^5 -10^{11}Ω/PET Color Clear
Capacity	15 power modules
Min order quantity	45 pcs (1 box of 3 full trays + 1 empty top tray)

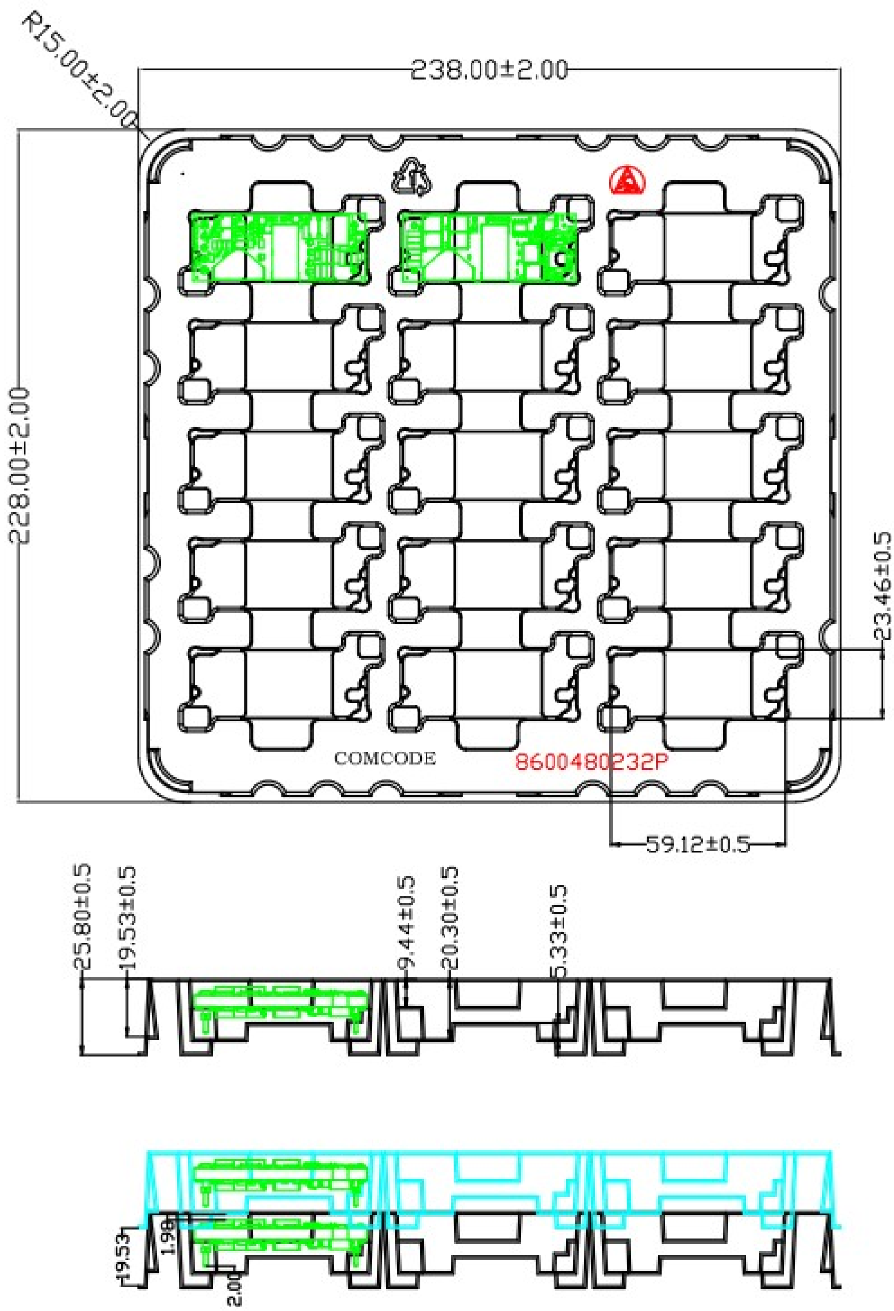


Figure 25. EBVW033 Packaging Tray For Open Frame Module

Delivery Packaging Information

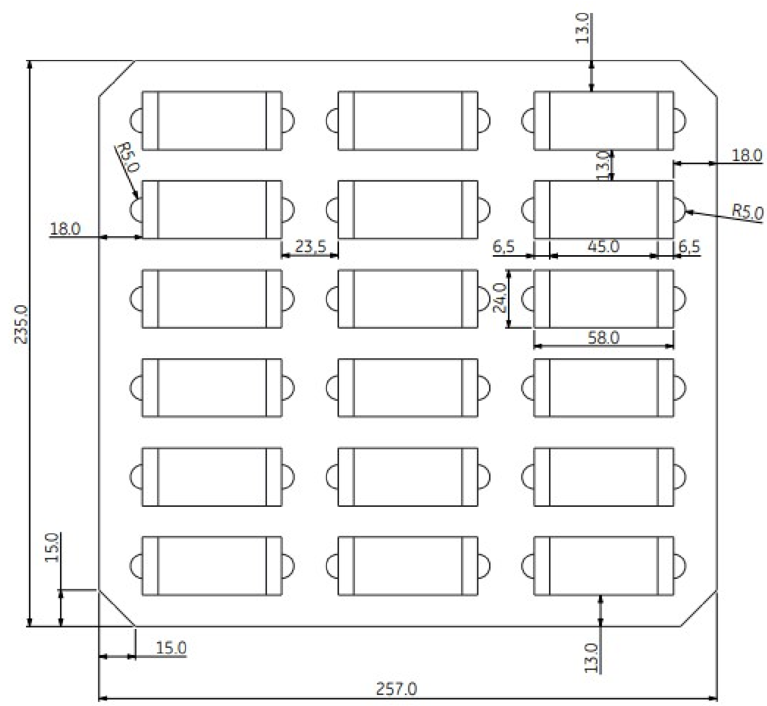
Tray Specification (For Base Plate Module, “-H”)

Material ANTI-STATIC EPE FOAM 27KG/CUBIC METER

Max surface resistivity 10^9 -10^{11}Ω/Color PINK

Capacity 18 power modules

Min order quantity 54 pcs (1 box of 3 full trays + 1 empty top tray)



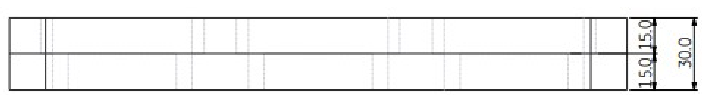


Figure 26. EBVW033 Packaging Tray For Base Plate Module

Ordering Information

Please contact your Omnion Power Sales Representative for pricing, availability and optional features.

Product Code	Input Voltage	Output Voltage	Output Current	Efficiency	Trim & Remote Sense	MSL Rating	Ordering codes
EBVW033A0B941Z	48V (36-75Vdc)	12V	33A	94.0%	Yes	2A	1600482042A
EBVW033A0B941-HZ	48V (36-75Vdc)	12V	33A	94.0%	Yes	2A	1600459372A
EBVW033A0B9641-HZ	48V (36-75Vdc)	12V	33A	94.0%	Yes	2A	1600489245A

Table 1. Device Codes

Part Number Naming Convention

	Characteristic	Character and position	Definition
Ratings	Form Factor	E	E= Eight Brick
	Family Designator	BV	BV = BARRACUDA Series, without PMBus interface
	Input Voltage	W	W = Wide Range, 36V-75V
	Output Current	033A0	033A0 = 33.0 Amps Maximum Output Current
	Output Voltage	B	B = 12.0V nominal
Options	Trim and Remote Sense Pins	9	Omit = Exclude Trim & Sense Feature and Pins 9 = Include Trim and Sense Feature and Pins (not avail. With P option)
	Pin Length	8 6	Omit= Default Pin Length shown in mechanical Outline Figures 8 = Pin Length: 2.79 mm ±0.25mm (0.110 in.±0.010 in.) 6 = Pin Length: 3.68 mm ±0.25mm (0.145 in.÷0.010 in.)
	Action following Protective Shutdown	4	Omit = Latching Mode 4 = Auto– restart following shutdown (Overcurrent/Overvoltage)
	On/Off Logic	1	Omit = Positive Logic 1 = Negative Logic
		–	
	Modified Version	XY	XY = Specific Modified Code, Omit for Standard Code
	Optional Features	P H	Omit = Standard open Frame Module P = Forced Droop Output for use in parallel applications (not avail. With 9 option) H= Heat plate, for use with heat sinks or cold-walls
	RoHS	Z	Z = RoHS Complaint

Table 2. Device Options

Revision History

Revision	Date	Description of the change
1.0	01/22/2024	Revised draft for review
1.1	11/12/2024	Release version
1.2	9/24/2025	Added pin length variant EBVW033A0B9641-HZ

Contact Us

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