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[Bel Fuse Inc.](#)
[VRXE-18AS10G](#)

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NON-ISOLATED DC/DC CONVERTERS

12 Vdc Input 1.05 Vdc - 1.825 Vdc/18 A Output



VRXE-18AS10

RoHS Compliant

Rev.A

- Non-Isolated
- High Efficiency
- High Power Density
- Per Intel VRM8.5 VID code
- Power Good Signal
- Remote On/Off
- OCP/SCP



Description

The Bel VRXE-18AS10 is a part of the non-isolated dc/dc converter Power Module series. The modules use a SIP package for ease of layout and space savings. The efficiency is typically 84% at full load.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
1.05 V -1.825 V	12 V	18 A	33 W	84%	VRXE-18AS10

Notes: 1. All part numbers above indicate RoHS 6. Change the second letter "R" to "7" for RoHS 5 part numbers.
2. Add "G" suffix at the end of the model numbers listed above to indicate "Tray Packaging".

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage (continuous)	-0.3 V	-	16 V	
Output Enable Terminal Voltage	-0.3 V	-	16 V	
Input Signal Voltage	-0.3 V	-	7.3 V	
Ambient Temperature	0 °C	-	55 °C	
Storage Temperature	-40 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	10.8 V	-	13.2 V	
Input Current (full load)	-	-	4 A	
Input Current (no load)	-	-	100 mA	
Remote Off Input Current	-	3 mA	30 mA	
Input Reflected Ripple Current (pk-pk)	-	-	150 mA	Tested with a 10 nF ceramic capacitor.
Input Reflected Ripple Current (rms)	-	-	25 mA	
Turn-on Voltage Threshold	-	5.3 V	-	
Turn-off Voltage Threshold	-	5.5 V	-	

Note: All specifications are typical at 12 V input, full load at 25 °C unless otherwise stated.

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Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Range	1.050 V	-	1.825 V	Per Intel VRM8.5 VID code
DC load-line slope	-	-4 mV/A	-	
Output Current	0 A	-	18 A	
Current Limit Threshold	13 A	-	35 A	
Ripple and Noise (rms)	-	2 mV	-	Tested with 0-20 MHz BW, 12x22 uF ceramic capacitors at the output.
Ripple and Noise (pk-pk)	-	15 mV	-	
Turn on Time	-	-	200 mS	
Overshoot at Turn on	-	0%	5%	
Output Capacitance	0 uF	-	1000 uF	
Transient Response				
50% ~ 100% Max Load	All	-	70 mV	Test conditions: di/dt=9 A/us, Vin=12 V, and with 12x 22 uF X5R or X7R ceramic capacitors at the output.
Settling Time		-	30 uS	
100% ~ 50% Max Load		-	60 mV	
Settling Time		-	70 uS	

Note: All specifications are typical at 12 V input, full load at 25 °C unless otherwise stated.

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency Vo=1.825 V Vo=1.325 V Vo=1.050 V	82% 77% 73%	84% 79% 75%	- - -	Measured at Vin=12 V, full load
Switching Frequency	450 kHz	500 kHz	550 kHz	
MTBF	4,023,814 hours			Calculated Per Bell Core SR-332 (Vin=12 V; Vo=1.825 V, Io=80% load; Ta = 25 °C)
Dimensions Inches (L x W x H) Millimeters (L x W x H)	2.5 x 1.0 x 0.41 63.50 x 25.4 x 10.4			
Weight	-	18 g	-	

Note: All specifications are typical at 25 °C unless otherwise stated.

Control Specifications

Parameter	Min	Typ	Max	Notes
Signal Low (Unit Off)	-0.3 V	-	0.3 V	Remote on/off pin open, unit on.
Signal High (Unit On)	1.5 V	-	13.2 V	
Signal Low	-	-	0.5 V	
Current Sink	-	-	6 mA	
Signal High	-	-	5.5 V	

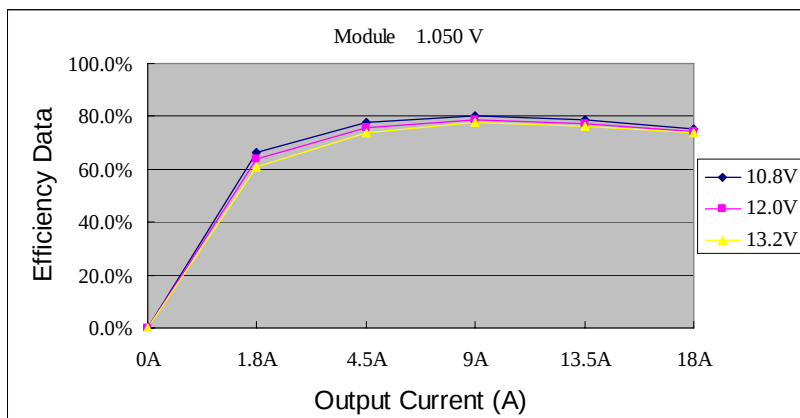
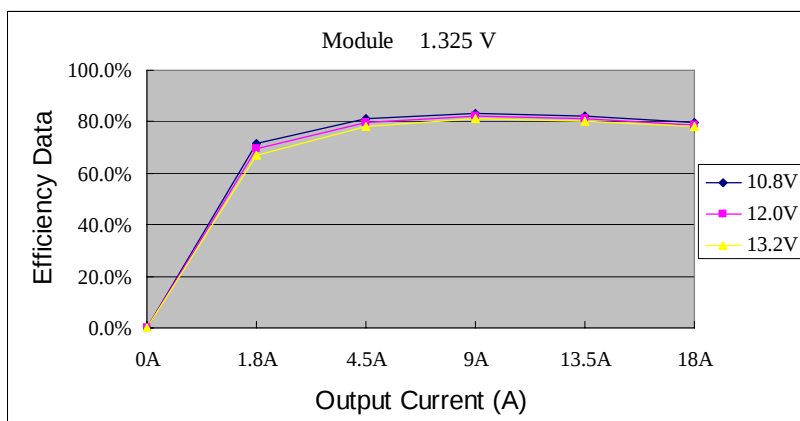
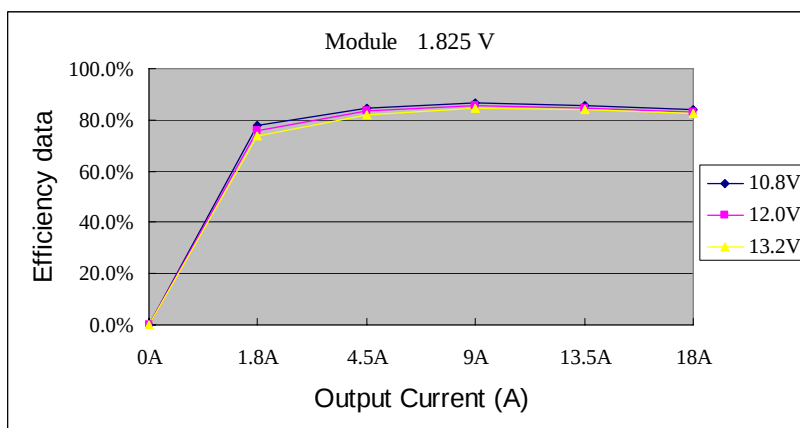
NON-ISOLATED DC/DC CONVERTERS

12 Vdc Input

1.05 Vdc - 1.825 Vdc/18 A Output



Efficiency Data



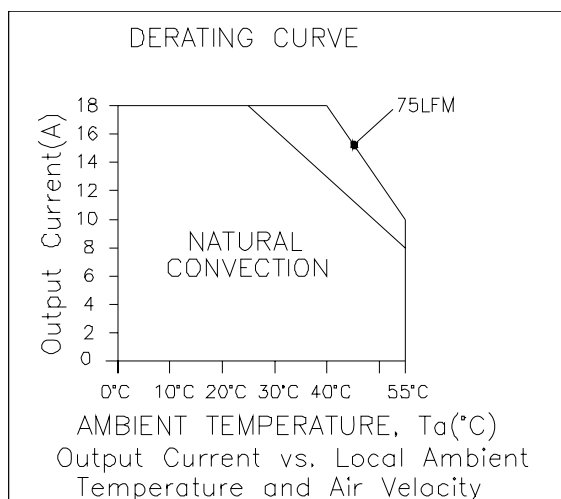
NON-ISOLATED DC/DC CONVERTERS

12 Vdc Input

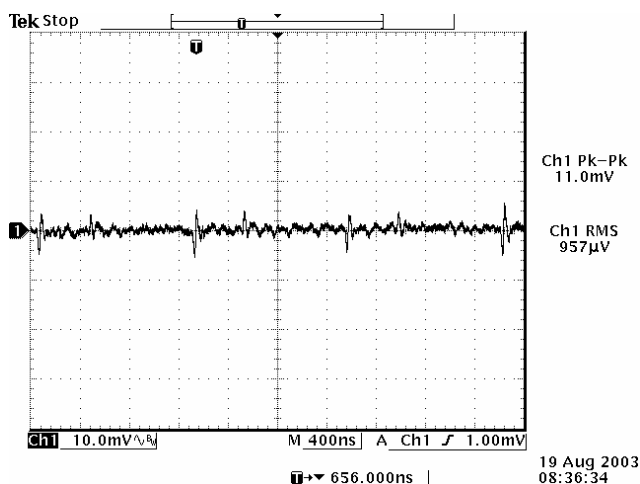
1.05 Vdc - 1.825 Vdc/18 A Output



Thermal Derating Curve



Ripple and Noise Waveform



12 Vdc input, 1.825 V output

Note: Output ripple and noise at full load with an external 12x22 uF ceramic cap at the output and $T_a=25^{\circ}\text{C}$.

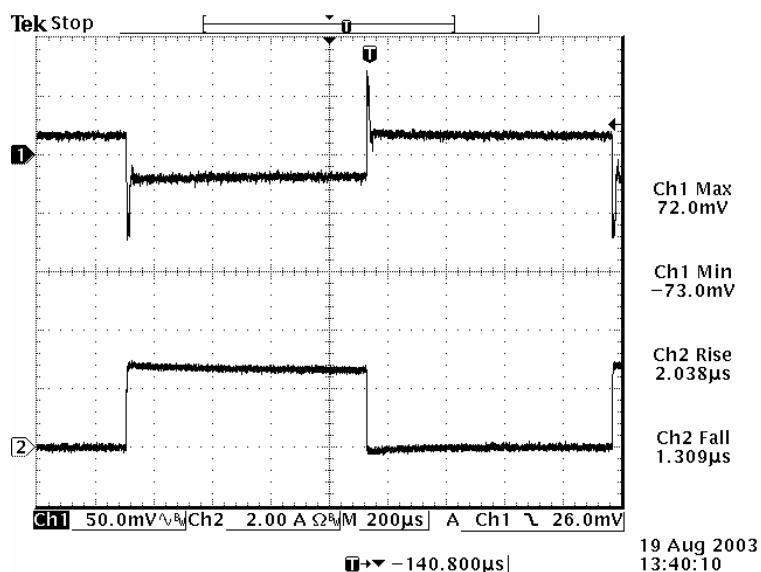
NON-ISOLATED DC/DC CONVERTERS

12 Vdc Input

1.05 Vdc - 1.825 Vdc/18 A Output



Transient Response Waveform



9 A to 18 A load and 18 A to 9 A transient at 12 V input/1.825 V output

Note: Transient Response at $di/dt=9 \text{ A}/\mu\text{S}$, with external load capacitance $C_o=264 \text{ }\mu\text{F}$ (12x22 μF ceramic cap) and $T_a=25^\circ\text{C}$.

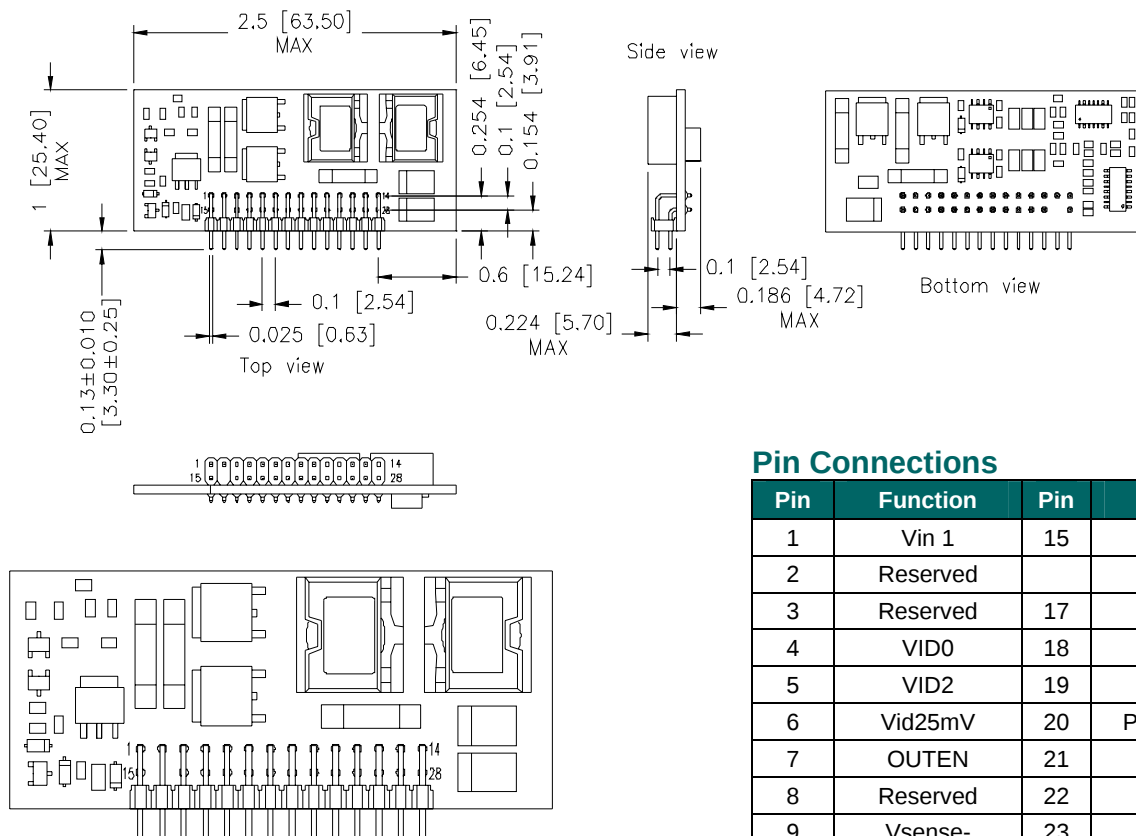
NON-ISOLATED DC/DC CONVERTERS

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Mechanical Outline



Pin Connections

Pin	Function	Pin	Function
1	Vin 1	15	Vin 2
2	Reserved		No pin
3	Reserved	17	Reserved
4	VID0	18	VID1
5	VID2	19	VID3
6	Vid25mV	20	Power Good
7	OUTEN	21	ISHARE
8	Reserved	22	Reserved
9	Vsense-	23	Vsense+
10	Ground	24	Ground
11	Ground	25	Ground
12	Ground	26	Ground
13	Vout	27	Vout
14	Vout	28	Vout

Module leads, header, and any portion of the component that is exposed directly to molten solder will withstand a temperature of 260 degrees C for a minimum of 10 seconds. Component sections not exposed directly to the solder will withstand 150 degrees C. Lead solderability meets ANSI/J-STD-002.

Note: This product closely follows the Intel VRM8.5 specification.

RoHS Compliance

Complies with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.



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