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, 12×22 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 12× 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

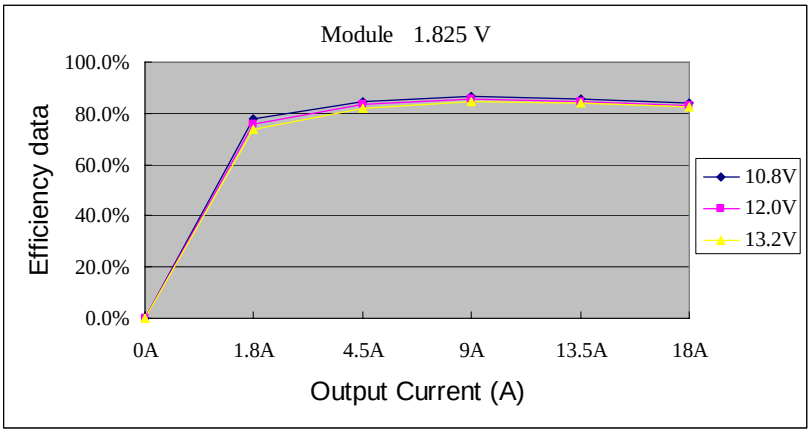
Parameter	Min	Typ	Max	Notes
Efficiency Vo=1.825 V Vo=1.325 V Vo=1.050 V	 82% 77% 73%	 84% 79% 75%	 - - -	Measured at Vin=12 V, full load
Switching Frequency	450 kHz	500 kHz	550 kHz	
MTBF	4,023,814 hours			Calculated Per Bell Core SR-332 (Vin=12 V; Vo=1.825 V, Io=80% load; Ta = 25 °C)
Dimensions Inches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

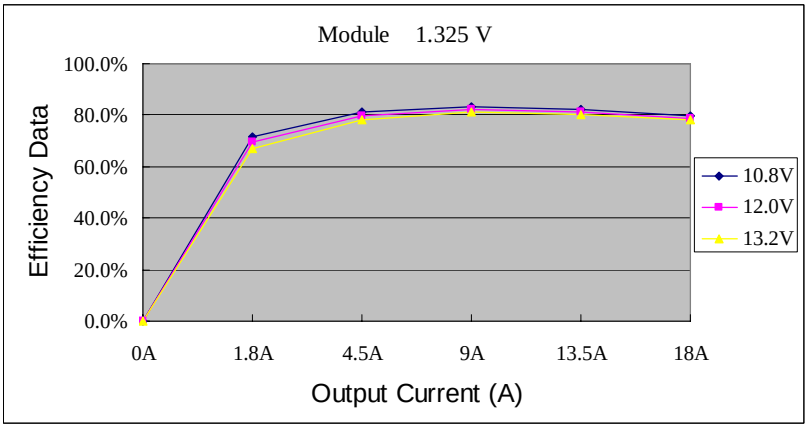
Note: All specifications are typical at 25 °C unless otherwise stated.

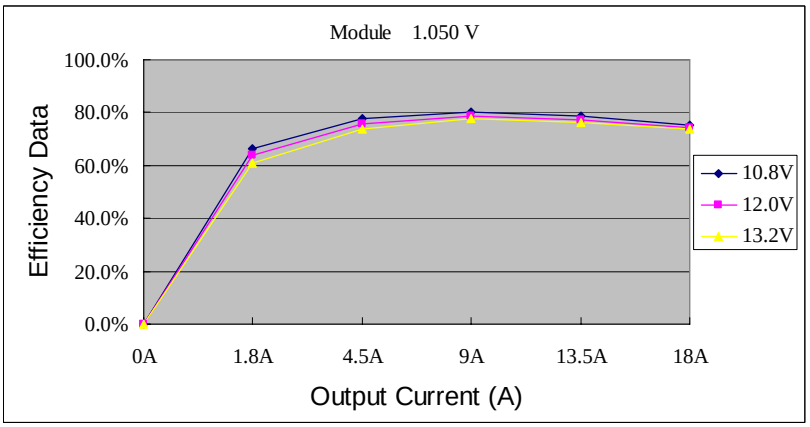
Control Specifications

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	

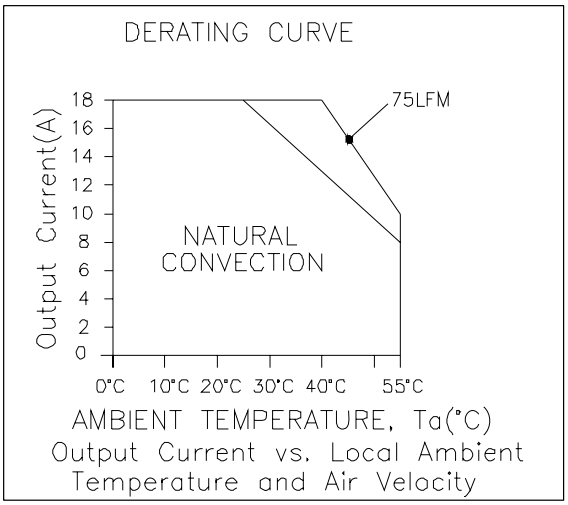
Efficiency Data



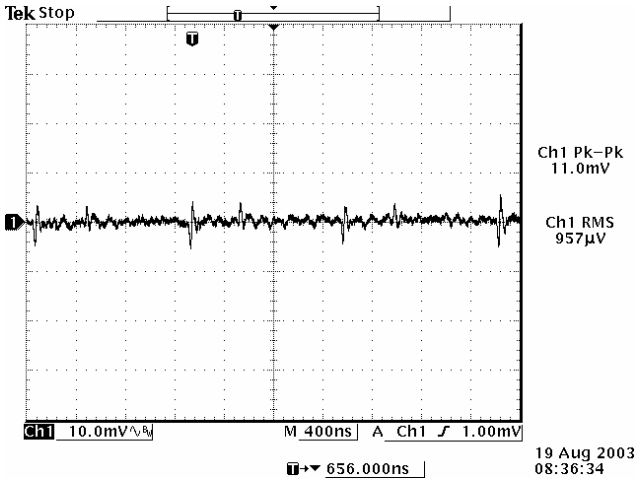




Thermal Derating Curve



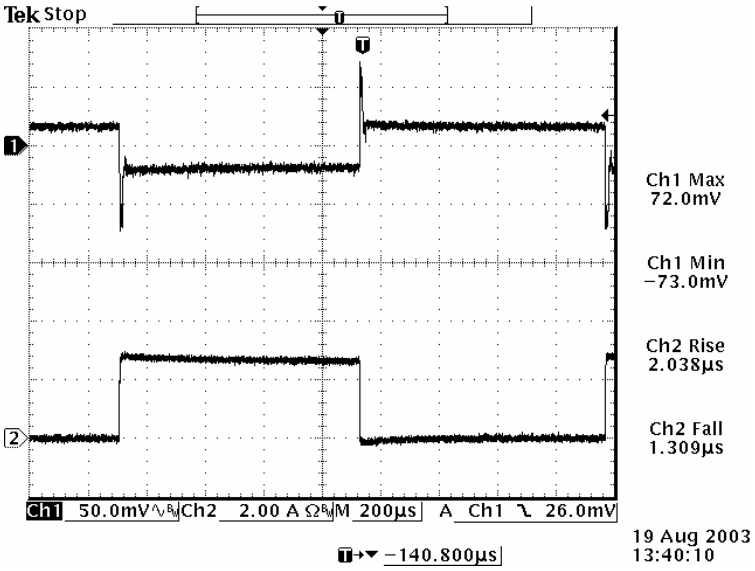
Ripple and Noise Waveform



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 Ta=25°C.

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 A/uS, with external load capacitance Co=264 uF (12x22 uF ceramic cap) and Ta=25°C.

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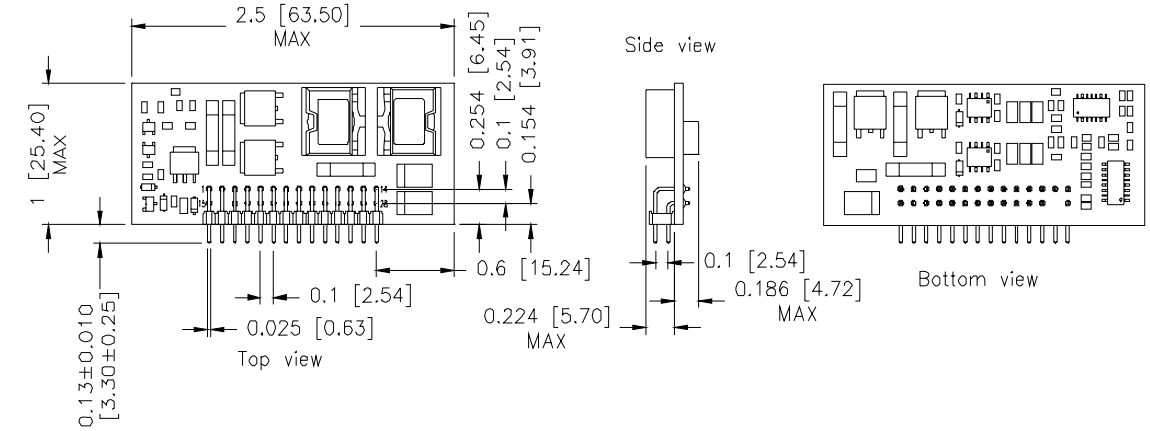
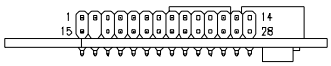
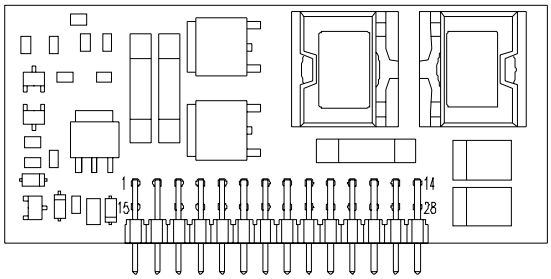
Mechanical Outline







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.

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	I_{SHARE}
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

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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