

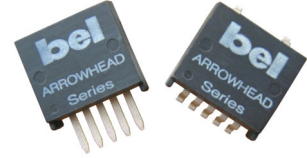
NON-ISOLATED DC/DC CONVERTER

5V Input $V_{ref}/2$ / 5A Output

bel
POWER PRODUCTS

x7AH-05BT50

- Non-Isolated
- Fixed frequency (300kHz)
- Under-voltage lockout (UVLO)
- Remote On/Off
- OCP/SCP
- Low Profile Package (7.82mm)



Description

The Bel x7AH-05BT50 is part of the low cost non-isolated DC/DC converter series. The converter is designed specifically to provide bus termination voltage in application such as DDR (double data rate) memory where the bus termination voltage must closely track the I/O bus voltage. The converter accepts a reference input and programs its output voltage to 50% of the reference. The modules use a SMD or vertical mount package for ease of layout and space savings.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Part Number Surface Mount	Part Number Vertical Mount
$V_{ref}/2$	5V	5A	6.25W	82%	S7AH-05BT50	V7AH-05BT50

Note: Add "0" suffix at the end of the model number to indicate "Tube Packaging", and "R" for "Reel Packaging", and "G" for "Tray Packaging".

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage (continuous)	-0.3V	-	6V	
Output Enable Terminal Voltage	-0.3V	-	6V	
Ambient Temperature	-40°C	-	85°C	
Storage Temperature	-55°C	-	125°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	4.5V	5.0V	5.5V	
Input Current	-	-	2A	
Input Current (No load)	-	-	60mA	
Remote Off Input Current	-	9mA	15mA	
Input Reflected Ripple Current (RMS)	-	30mA	50mA	Measured with simulated source impedance of 500nH, 5Hz to 20MHz; & one 270uF/16V capacitor with ESR = 0.018 ohm max. at 100KHz
Input Reflected Ripple Current (pk-pk)	-	110mA	140mA	
I^2t Inrush Current Transient	-	0.02A ² s	0.05A ² s	
Turn-on Voltage Threshold	4.19V	4.3V	4.5V	
Turn Off Voltage threshold	-	3.8V	4.49V	

- Notes:** 1. All tests are measured at $V_{ref} = 2.5V$.
2. All specifications are typical at 25°C unless otherwise stated.

NON-ISOLATED DC/DC CONVERTER

5V Input Vref/2 / 5A Output



Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point	0.99* (Vref/2) V	Vref/2	1.01* (Vref/2) V	Vin=5V, Iout=full load.
Load Regulation	-	3mV	6mV	
Line Regulation	-	1mV	3mV	
Regulation Over Temperature (-40°C to +85°C)	-	15mV	20mV	
Output Current	0A	-	5A	
Output Current Threshold	6.5A	-	12.5A	
Short Circuit Surge Transient	-	0.04A ² s	0.08A ² s	
Ripple and Noise (RMS)	-	12mV	20mV	Tested at: 0-20MHz BW; with 1uF ceramic capacitor at the output
Ripple and Noise (pk-pk)	-	45mV	90mV	
Turn On Time	-	12mS	20mS	
Overshoot at Turn on	-	0%	5%	
Output Capacitance	-	-	2200uF	

- Notes:**
1. All specifications are typical at nominal input, full load at 25°C unless otherwise stated.
 2. The modules track the transient response of the reference input. See the figure in TR data on Page 3.
 3. The turn-off undershoot of the module is below 100mV if a 220uF aluminum cap is added at the output.
 4. All tests are measured at Vref=2.5V.

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	79%	82%	-	Measured at Vin=5V, full load
Switching Frequency	250KHz	300KHz	340KHz	
MTBF	8,841,119 hours			Calculated Per Bell Core TR-332 (Io =4A, Vin=5V, Vref=2.5V; Ta = 25°C)
Dimensions (surface mount)				
Inches (L x W x H)	0.78 x 0.7 x 0.32			
Millimeters (L x W x H)	19.812 x 17.78 x 8.128			
Dimensions (vertical)				
Inches (L x W x H)	0.7 x 0.308 x 0.65			
Millimeters (L x W x H)	17.78 x 7.82 x 16.51			
Weight	-	4.7g	-	

Note: All specifications are typical at nominal input, full load at 25°C unless otherwise stated. All tests are measured at Vref=2.5V

Control Specifications

Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal Low (Unit Off)	-0.3V	-	1.35V (Vin=4.5V)	Remote on/off pin open, unit on
	-0.3V	-	1.65V (Vin=5.5V)	
Signal High (Unit On)	3.15 V(Vin=4.5V)	-	5.5V	
	3.85 V(Vin=5.5V)	-	5.5V	

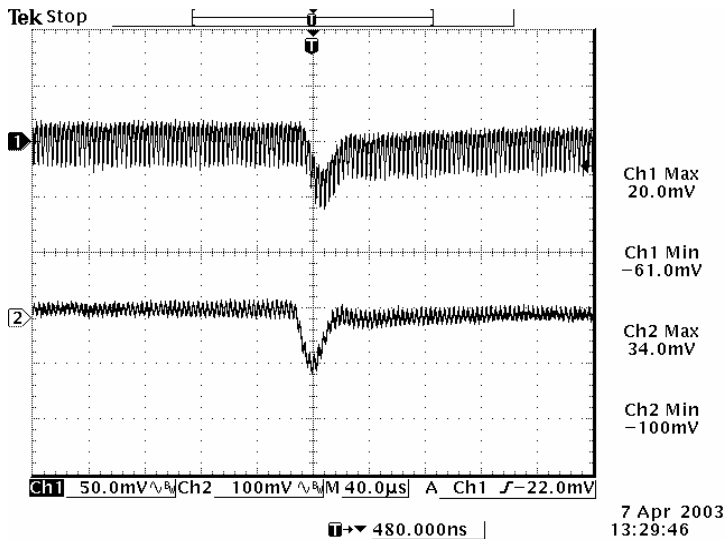
Note: All tests are measured at Vref=2.5V.

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5V Input $V_{ref}/2$ / 5A Output



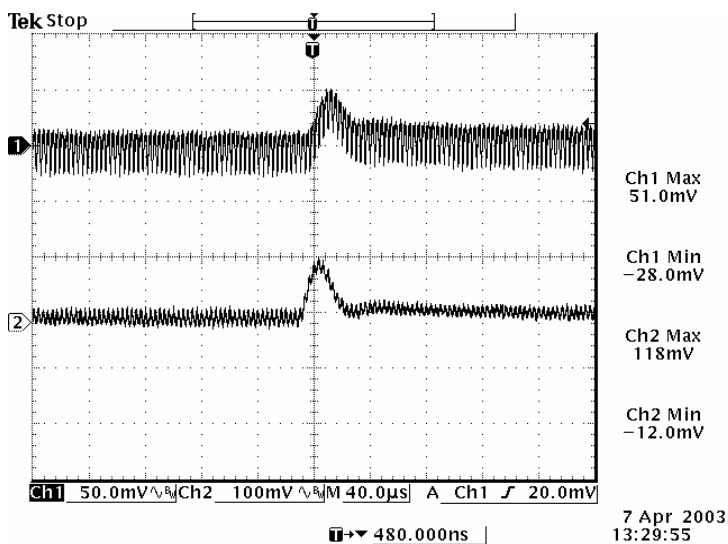
Transient Response: track the transient response of the reference input. No External Load Capacitance.



Channel 1: Transient response tracking.

Channel 2: Transient response of the reference input.

$T_a = 25^\circ\text{C}$

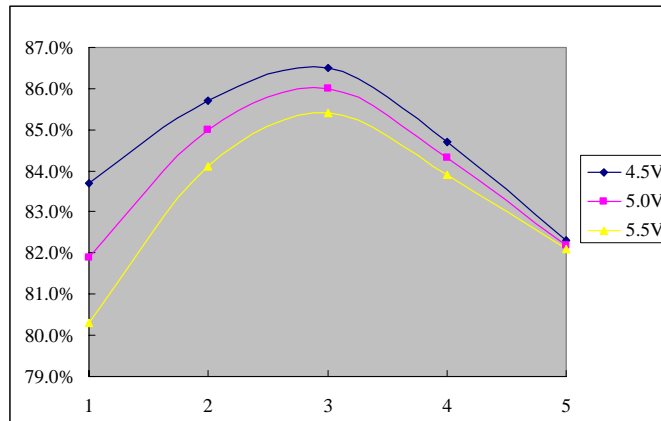


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5V Input $V_{ref}/2$ / 5A Output

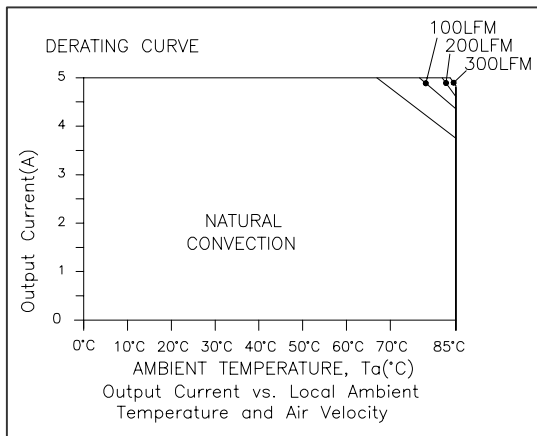


Efficiency Data

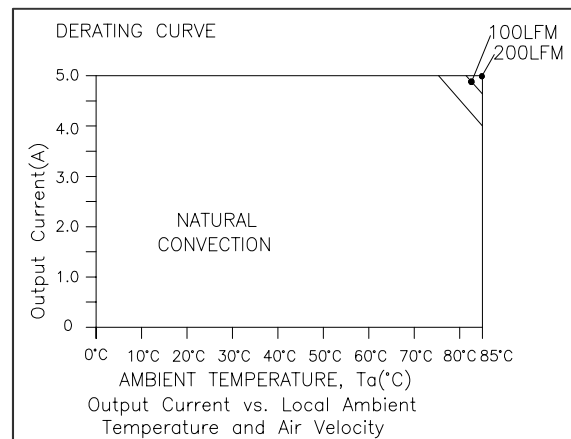


Efficiency is tested at $V_{ref}=2.5V$.

Thermal Derating Curves



V7AH-05BT50



S7AH-05BT50

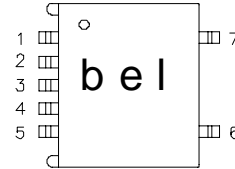
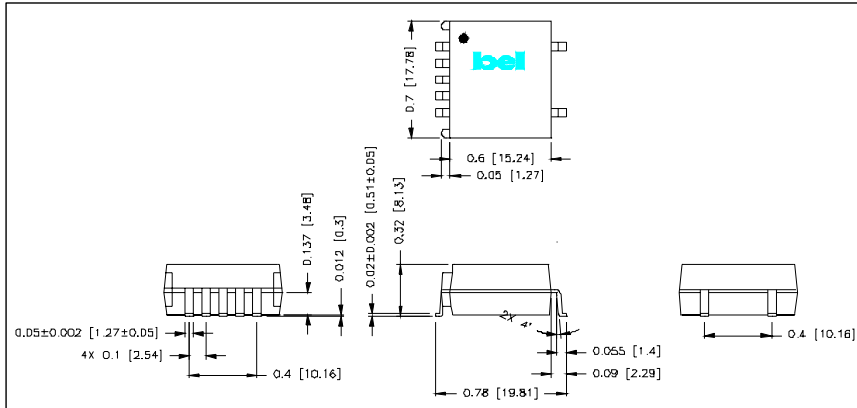
Test Condition: Derating curves are tested at nominal input voltage and $V_{ref}=2.5V$.

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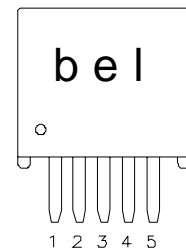
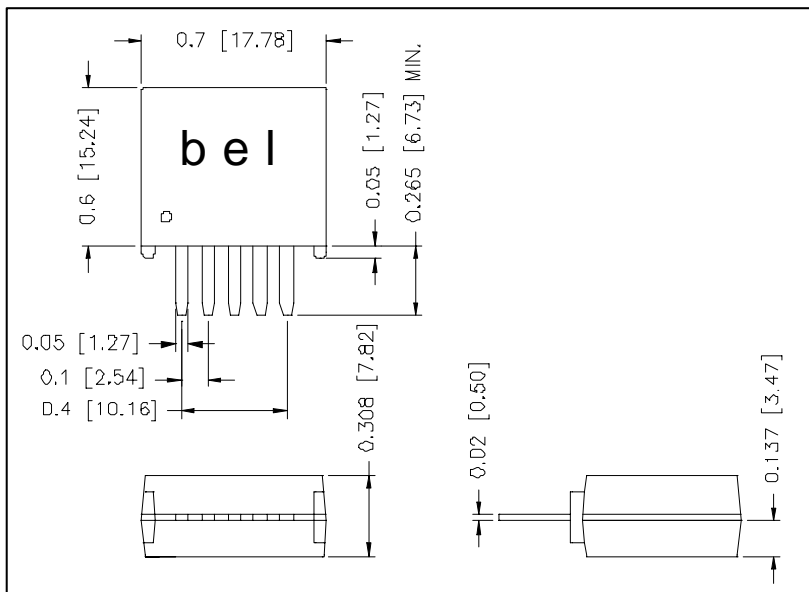
S7AH-05BT50



Pin Connections

Pin	Function
1	Remote On/Off (option)
2	Vin
3	Ground
4	Vout
5	Vref
6	N/A
7	N/A

V7AH-05BT50



Pin Connections

Pin	Function
1	Remote On/Off (option)
2	Vin
3	Ground
4	Vout
5	Vref

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