

NON-ISOLATED DC/DC CONVERTERS

3.0V-5.5V Input -5V/1A & -12V/0.5A Output



x7AH-01FxxN Series

- Non-Isolated
- Fixed Frequency
- High Efficiency
- High Power Density
- Low Cost
- Excellent Thermal Performance
- OCP/SCP
- Industrial Temperature Range



Description

The Bel x7AH-01FxxN modules are non-isolated, step down DC/DC converters that operate from a 3V-5.5V source. Output voltage are -5V,-12V. They are packaged in a compact, overmolded package rated at 1A, 0.5A. Optional lead forming provides a vertical mount product for minimal footprint or a surface mount option for a very low profile. The output is closely regulated and the efficiency is typically 88% at 1A, -5V output at full load.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Part Number Surface Mount	Part Number Vertical Mount
-5V	3.0V – 5.5V	1A	5W	88%	S7AH-01F50N	V7AH-01F50N
-12V	3.0V – 5.5V	0.5A	6W	88%	S7AH-01FX2N	V7AH-01FX2N

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	-	7V	
Ambient Temperature	-40°C	-	85°C	
Storage Temperature	-40°C	-	125°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	3V	-	5.5V	
Input Current (full load)				
Vo=-5V	-	-	2.1A	
Vo=-12V	-	-	2.5A	
Input Current (no load)				
Vo=-5V	-	-	150mA	
Vo=-12V	-	-	200mA	
Input Reflected Ripple Current (pk-pk)	-	80mA	160mA	For -5V output, use a 680uF/6.3V Oscon capacitor; For -12V output, use 1000uF electrolytic capacitor & 22uF/10V ceramic at the input.
Input Reflected Ripple Current (RMS)	-	20mA	50mA	
I ² t Inrush Current Transient	-	-	0.01A ² s	
Turn-on Voltage Threshold	-	2.63V	-	
Turn-off Voltage Threshold				
Vo=-5V	0.4V	-	2.0V	
Vo=-12V	1.0V	-	2.3V	

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

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Output Specifications

Parameter	Min	Typ	Max	Notes	
Output Voltage Set Point Vo=-5V Vo=-12V	-5.1V -12.24V	-5V -12V	-4.9V -11.76V	Test conditions: Vin=5.0V, Iout=half load; with 220uF/10V Tantalum Capacitor & 0.1uF ceramic Capacitor (Vo=-5V) or 47uF/25V tantalum capacitor & 0.1uF ceramic Capacitor (Vo=-12V).	
Line Regulation Vo=-5V Vo=-12V	-20mV -120mV	- -	20mV 120mV		
Load Regulation Vo=-5V Vo=-12V	-60mV -120mV	- -	60mV 120mV		
Regulation Over Temperature (-40°C to +85 °C) Vo=-5V Vo=-12V	-80mV -240mV	- -	80mV 240mV		
Ripple and Noise (RMS) Vo=-5V Vo=-12V	- -	25mV 40mV	40mV 70mV	Test conditions: BW = 0-20MHz; with 220uF/10V Tan Cap & 0.1uF ceramic capacitor (Vo=-5V) or 47uF/25V tantalum capacitor & 0.1uF ceramic Capacitor (Vo=-12V).	
Ripple and Noise (pk-pk) Vo=-5V Vo=-12V	- -	90mV 120mV	120mV 240mV		
Output Current Range Vo=-5V Vo=-12V	0A 0A	- -	1A 0.5A		
Output DC Current Limit	-	200%	-		
Short Circuit Surge Transient	-	-	0.01A ² s		
Turn on Time	-	10mS	30mS		
Overshoot at Turn on	-	0%	3%		
Output Capacitance Vo=-5V Vo=-12V	220uF 47uF	- -	470uF 150uF		
Transient Response					
50% ~ 100% Max Load	Overshoot	Vo=-5V	-	80mV	Test Conditions: di/dt = 0.1A/uS; Vin = 5.0V; Ta = 25°C and with 220uF/10V Tantalum Cap & 0.1uF ceramic Capacitor (Vo=-5V) or 47uF/25V tantalum Cap & 0.1uF ceramic Capacitor (Vo=-12V).
	Settling Time		-	40uS	
100% ~ 50% Max Load	Overshoot		-	80mV	
	Settling Time		-	40uS	
50% ~ 100% Max Load	Overshoot	Vo=-12V	-	130mV	
	Settling Time		-	50uS	
100% ~ 50% Max Load	Overshoot		-	130mV	
	Settling Time		-	50uS	

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

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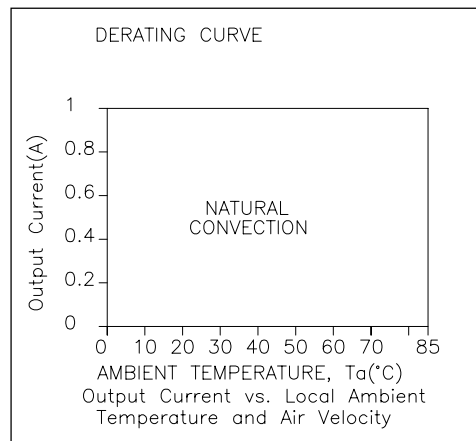


General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency Vo=-5V Vo=-12V	84% 84%	88% 88%	- -	Vin=5V; Io=Io, max
Switching Frequency	250KHz	300KHz	350KHz	
MTBF	4,883,163 hours			Calculated Per Bell Core TR-332 (Io = 80%Io,max; Ta = 25°C)
Dimensions (surface mount) Inches (L x W x H) Millimeters (L x W x H)	0.78 x 0.7 x 0.32 19.812 x 17.78 x 8.128			
Dimensions (vertical) Inches (L x W x H) Millimeters (L x W x H)	0.7 x 0.308 x 0.65 17.78 x 7.82 x 16.51			
Weight	-	4.9g	-	

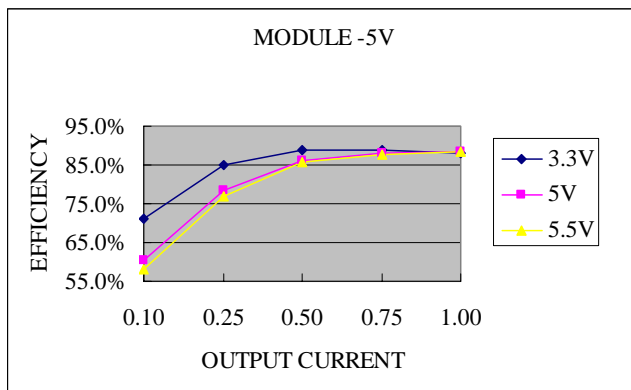
Note: All specifications are typical at 25°C unless otherwise stated.

Thermal Derating Curve

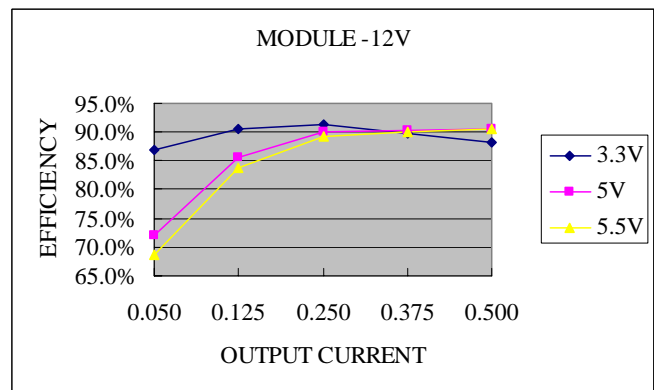


x7AH-01F50N

Efficiency Data



x7AH-01F50N



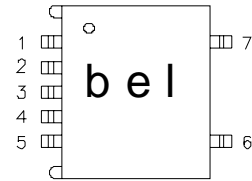
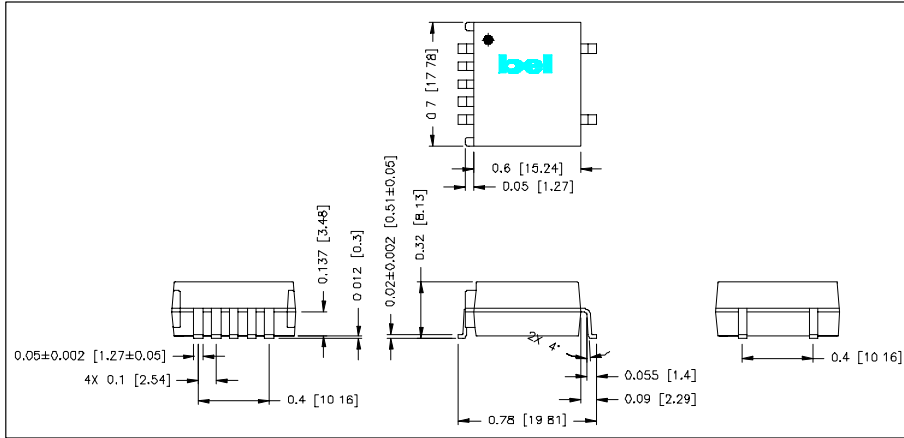
x7AH-01FX2N

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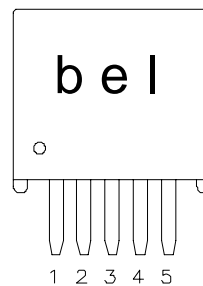
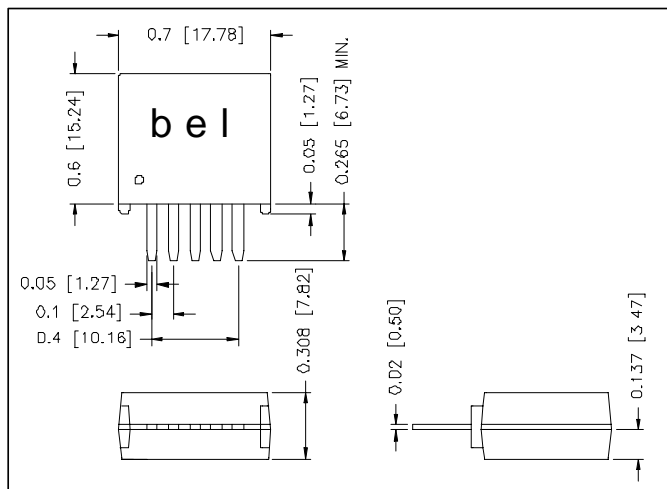
S7AH-01FxxN



Pin Connections

Pin	Function
1	N/A
2	Vin
3	Ground
4	Vout
5	N/A
6	N/A
7	N/A

V7AH-01FxxN



Pin Connections

Pin	Function
1	N/A
2	Vin
3	Ground
4	Vout
5	N/A

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