

## 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 <sup>2</sup> t Inrush Current Transient	-	-	0.01A <sup>2</sup> 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 <sup>2</sup> s		
Turn on Time	-	10mS	30mS		
Overshoot at Turn on	-	0%	3%		
Output Capacitance Vo=-5V Vo=-12V	220uF 47uF	- -	470uF 150uF		
<b>Transient Response</b>					
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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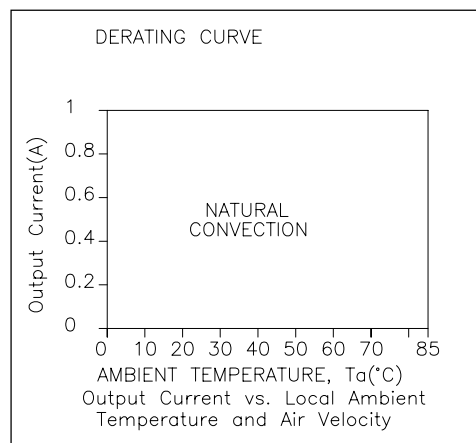


## General Specifications

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	-	

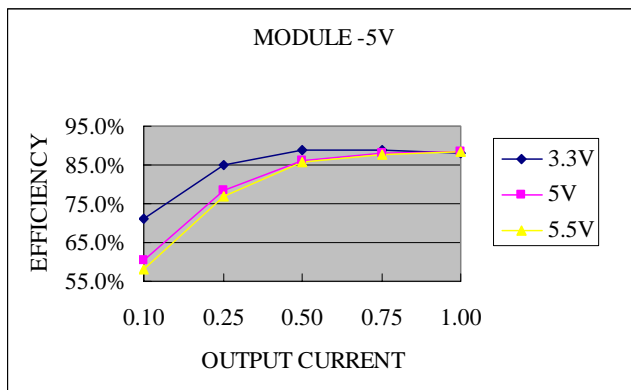
**Note:** All specifications are typical at 25°C unless otherwise stated.

## Thermal Derating Curve

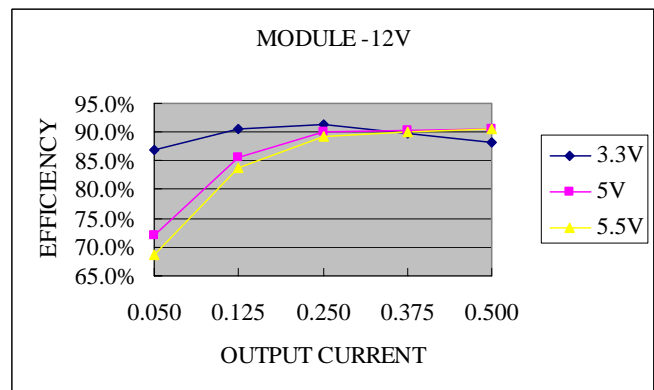


x7AH-01F50N

## Efficiency Data



x7AH-01F50N



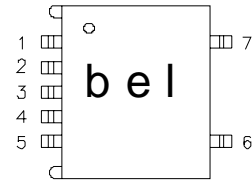
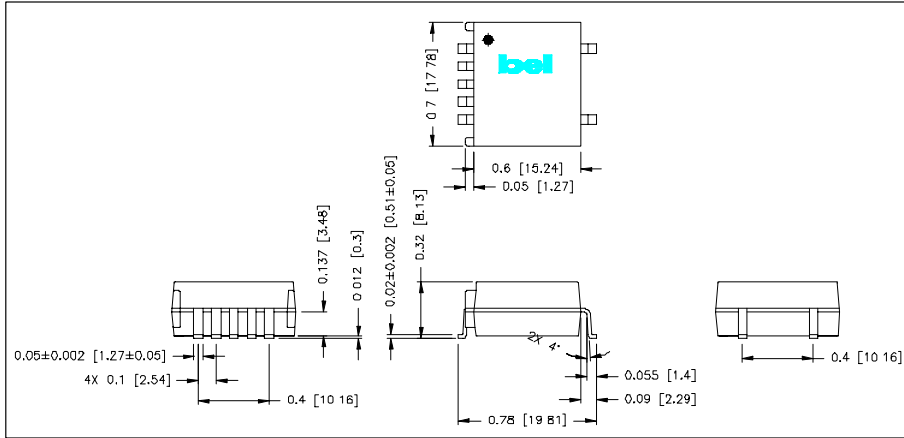
x7AH-01FX2N

# NON-ISOLATED DC/DC CONVERTERS

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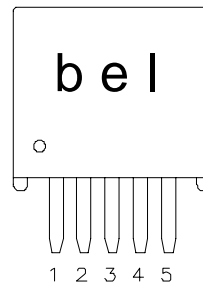
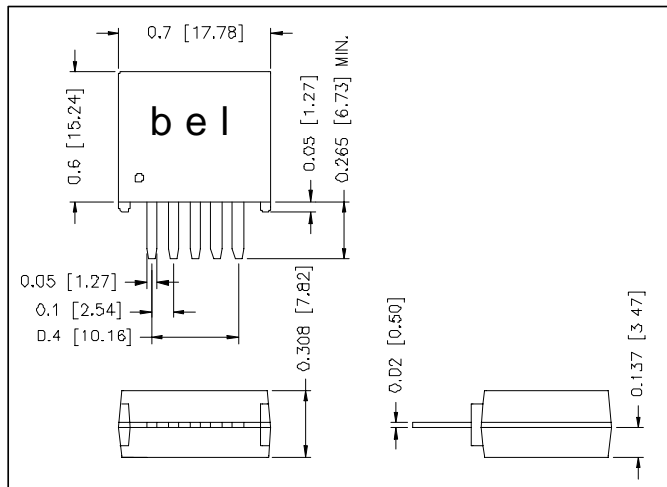
## S7AH-01FxxN



### 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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