NON-ISOLATED DC/DC CONVERTERS

12V Input Vref/2 / 10A Output

V7PC-10AT5x

- Non-Isolated
- High Efficiency
- High Power Density
- Low Cost
- Remote On/Off
- Under-voltage Lockout (UVLO)
- OCP/SCP
- Remote Sense



Description

The V7PC-10AT5x is a non-isolated step down DC/DC converter that operates from a nominal 12V source. This converter is designed specifically to provide bus termination voltages in applications 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 uses this to program its output voltage to 50% of the reference. The unit is packaged in an industry-standard single-in-line footprint and provides a maximum 10A output. Standard features include remote on/off, input under-voltage lockout, over current protection and remote sense. Replace "x" in the part number with "S" or "A" depending on your specific application and specific external capacitor bank.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
Vref/2	12V	10A	25W	82%	V7PC-10AT5S
Vref/2	12V	10A	25W	82%	V7PC-10AT5A

Note: Add "G" suffix at the end of the model number to indicate "Tray Packaging". See page 5 for model number differences.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage (continuous)	-0.3V	-	15V	
Output Enable Terminal Voltage	-0.3V	-	15V	
Ambient Temperature	0°C	-	70°C	
Storage Temperature	-40°C	-	100°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	10.8V	-	13.2V	
Input Current (full load)	-	-	2.1A	
Input Reference Voltage	-	-	<3.5V	
Input Current (no load)	-	-	50mA	
Remote Off Input Current	-	3	15mA	
Input Reflected Ripple Current (pk-pk)	-	-	180mA	Tested with a 470uF/16V input capacitor with ESR=0.03 ohm max at 100KHz & simulated source impedance of 500nH, 5Hz to 20MHz.
Input Reflected Ripple Current (RMS)	-	-	50mA	
I^2t Inrush Current Transient	-	$0.08A^2s$	$0.16A^2s$	
Turn-on Voltage Threshold	-	9.7V	-	
Turn-off Voltage Threshold	8.0V	8.8V	10V	

Note: All specifications are tested at Vref =2.5V.

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Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point	0.985 (Vref/2) V	Vref/2 V	1.015(Vref/2) V	Test conditions: Vin=12V, Iout= full load
Load Regulation	-	3mV	10mV	
Line Regulation	-	3mV	10mV	
Regulation Over Temperature (0°C to 70°C)	-	5mV	20mV	
Output Current	0A	-	10A	
Current Limit Threshold	13A	-	22A	
Short Circuit Surge Transient	-	$0.35A^2s$	$0.7A^2s$	
Output Ripple and Noise (pk-pk)	-	45mV	100mV	Test conditions: 0-20MHz BW, 0.1uF ceramic capacitor at the output
Output Ripple and Noise (RMS)	-	11mV	25mV	
Turn on Time	-	50mS	80mS	
Overshoot at Turn on	-	0%	3%	
Output Capacitance	470uF	-	5600uF	

Notes: 1. All specifications are typical at nominal input, full load at 25°C unless otherwise stated.
2. All specifications are tested at Vref=2.5V.
3. The modules track the transient response of the reference input. See the figure in TR data on Page 3.

General Specifications

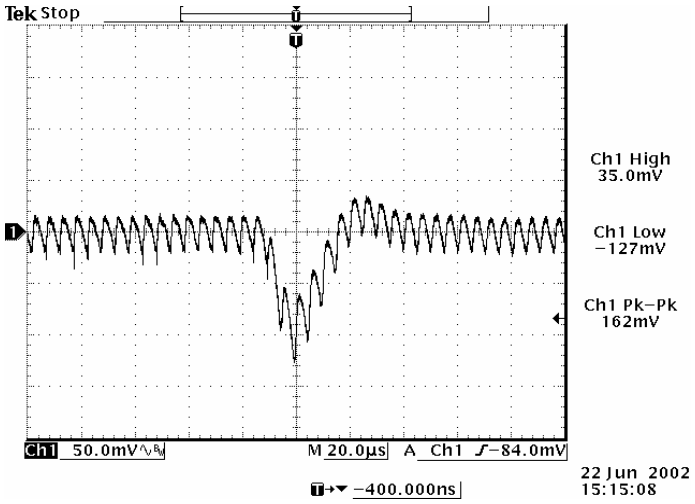
Parameter	Min	Typ	Max	Notes
Efficiency (Vin=12V, Io=Io-max)	80%	82%	-	
Switching Frequency	180KHz	200KHz	220KHz	
MTBF	3,403,119 hours			Calculated Per Bell Core TR-332 (Io = 80% load; Vin=12V; Ta = 25°C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.5 x 0.55 x 0.37 63.5 x 13.97 x 9.4			
Remote sense compensation	-	-	0.5V	
Weight	-	9.5g	-	

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

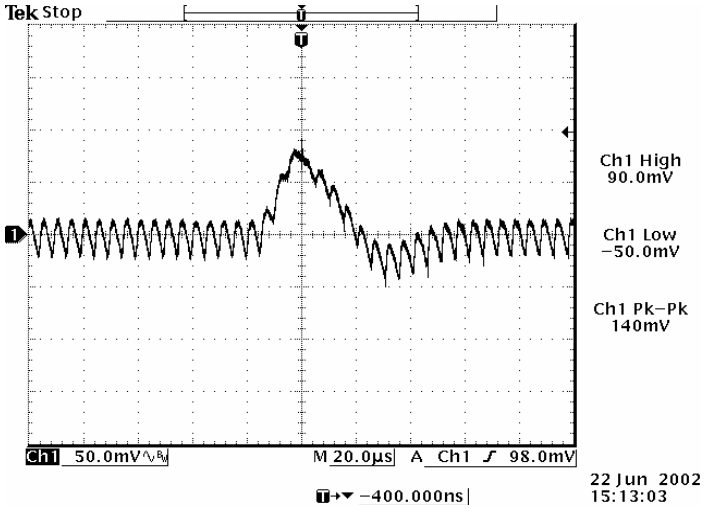
Control Specifications

Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal Low (Unit Off)	-0.3V	-	0.3V	
Signal High (Unit On)	2.8V	-	13.2V	

Transient Response: di/dt=0.5A/uS, External Load Capacitance Co=470uF (electrolytic) V7PC-10AT5S and V7PC-10AT5A.

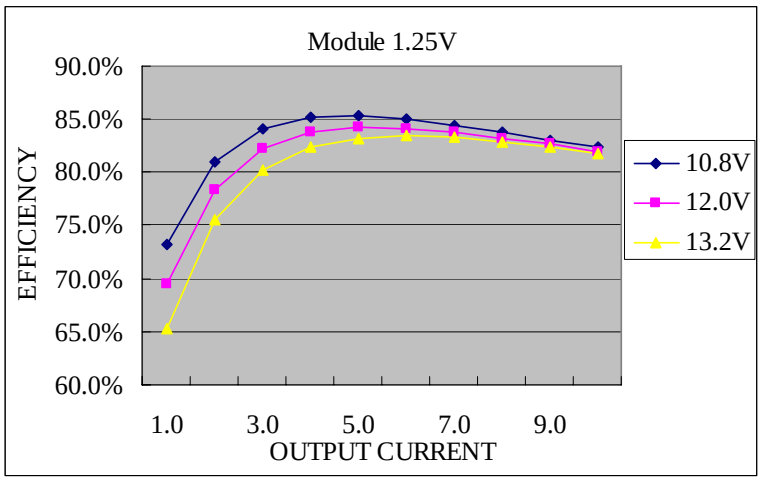


-50% to 50% load
Transient at 12V input and
Ta=25°C

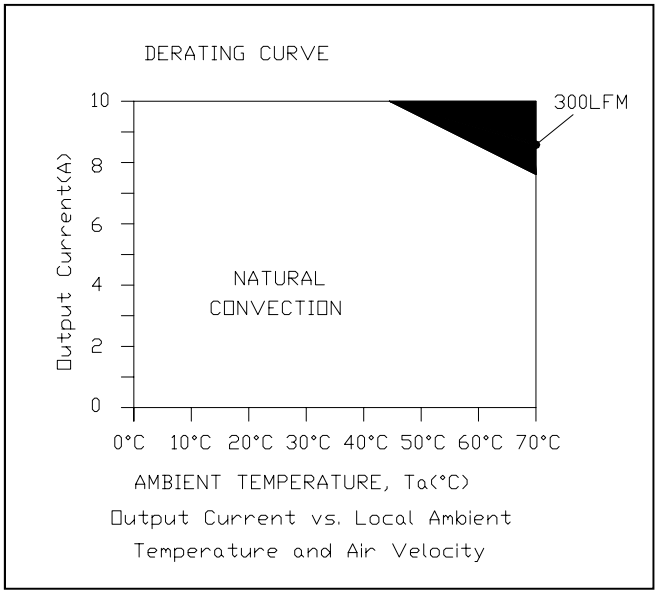


50% to -50% load
Transient at 12V input and
Ta=25°C

Efficiency Data



Thermal Derating Curve



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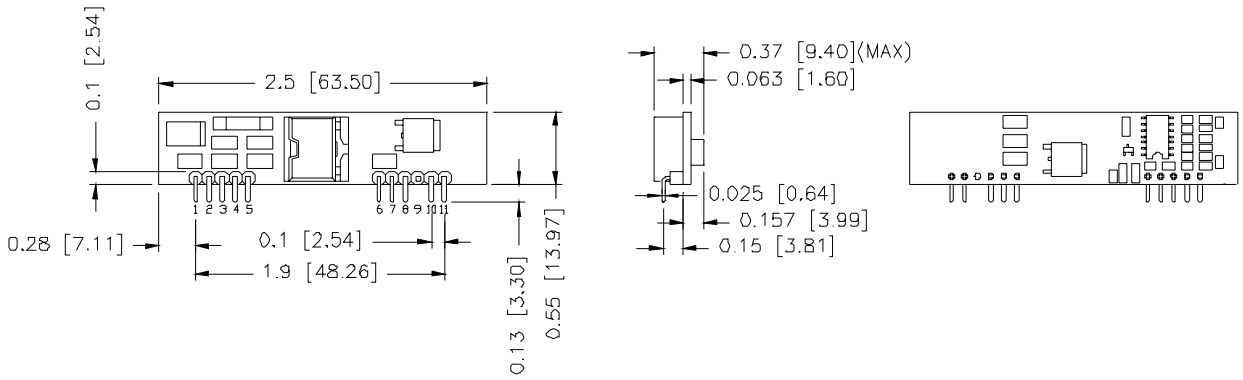

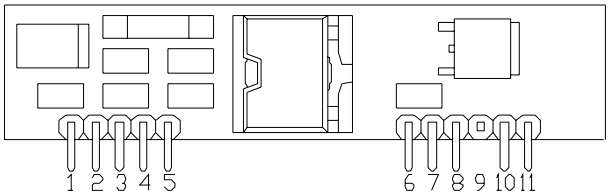

Pin Connections

Pin	Function
1	Vo+
2	Vo+
3	Opt. Remote Sense (+)
4	Vo+
5	Ground
6	Ground
7	Vin+
8	Vin+
9	Not used
10	Vref
11	Remote On/Off

Model Number Description

V7PC-10AT5S: Designed to accept its reference input from a G7NB-81A180. For use with other reference inputs, consult factory. Compensated for 1 X 560uF Oscon external capacitor.

V7PC-10AT5A: Designed to accept its reference input from a V7XE-20AS20. For use with other reference inputs, consult factory. Compensated for 12 X 100uF ceramic in parallel with 2 X 820uF Oscon in parallel with 16 X 4.7uF ceramic.

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