

ISOLATED DC/DC CONVERTERS

48V Input 3.3V/7A or 5V/5A or 12V/2.5A Output



07LC-25T Series

- Compact Through-hole Package
- Excellent Thermal Performance
- 1500V Isolation
- High Efficiency
- High Power Density
- Wide Input Voltage
- Remote On/Off
- Output Voltage Trim
- Input Under Voltage Lockout
- Over Voltage Protection
- SCP/OCF
- Over Temperature Protection



Description

The 07LC-25Txx0 series converters are isolated DC/DC converters that operate from a nominal 48V source. These converters provide up to 25W of output power. These units are designed to be high efficient and very low cost. Features include remote on/off, output adjust, short circuit protection, over current protection, over-temperature protection, and input under voltage lockout. These converters are provided in a compact, through-hole package that is easy to use and provides good thermal performance, and are pin-to-pin compatible with the Emerson AG25 Series.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
12.0V	36 – 75V	2.5A	30.0W	90%	07LC-25T120
5.0V	36 – 75V	5A	25.0W	90%	07LC-25T050
3.3V	36 – 75V	7A	23.0W	88%	07LC-25T033

Note: Add “G” suffix at the end of the model number to indicate Tray Packaging.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage (continuous)	-0.3V	-	80V	
Remote On/Off	-0.3V	-	12V	
Ambient Temperature	-40°C	-	85°C	
Storage Temperature	-55°C	-	125°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36V	-	75V	
Input Current (no load)	-	25mA	40mA	
Input Current (full load)	-	-	1.1A	
Remote Off Input Current	-	3mA	10mA	
Input Reflected Ripple Current (RMS)	-	10mA	20mA	Tested with simulated source impedance of 10uH, 5Hz to 20MHz and a 100uF/100V electrolytic capacitor with ESR=1 ohm max, at 200KHz
Input Reflected Ripple Current (pk-pk)	-	40mA	60mA	
I ² t Inrush Current Transient	-	0.0012A ² s	0.0024A ² s	
Turn-on Input Voltage	31V	34V	36V	
Turn-off Input Voltage	30V	33V	35V	

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=3.3V	3.234 V	3.3 V	3.366 V	Test condition: Vin=48V, Io=50% full load	
	Vo=5.0V	4.900V	5.0 V	5.100V		
	Vo=12.0V	11.760V	12.0V	12.240V		
Line Regulation						
	Vo=3.3V	-	1mV	3mV		
	Vo=5.0V	-	2mV	5mV		
	Vo=12.0V	-	5mV	10mV		
Load Regulation						
	Vo=3.3V	-	2mV	5mV		
	Vo=5.0V	-	4mV	8mV		
	Vo=12.0V	-	9mV	18mV		
Temperature Regulation (-40°C to +85°C)						
	Vo=3.3V	-	30mV	50mV		
	Vo=5.0V	-	40mV	70mV		
	Vo=12.0V	-	100mV	170mV		
Ripple and Noise (RMS)		-	10mV	20mV	Tested with 0-20MHz BW, with a 0.47uF ceramic capacitor at the output	
Ripple and Noise (pk-pk)		-	40mV	75mV		
Output Current						
	Vo=3.3V	0A	-	7A		
	Vo=5.0V	0A	-	5A		
	Vo=12.0V	0A	-	2.5A		
Current Limit Threshold						
	Vo=3.3V	7.7A	-	12A		
	Vo=5.0V	5.5A	-	8A		
	Vo=12.0V	3A	-	4.2A		
Short Circuit Surge Transient		-	0.5A ² s	1A ² s		
Turn on Time		-	10mS	25mS		
Overshoot at Turn On		-	0%	5%		
Output Capacitance						
	Vo=3.3V	0uF	-	3300uF		
	Vo=5.0V	0uF	-	2200uF		
	Vo=12.0V	0uF	-	330uF		
Transient Response						
50% ~ 75% Max Load	Overshoot	Vo=3.3V	-	75mV	100mV	Tested conditions: di/dt=0.1A/uS, Vin=48V, Ta=25°C, with a 220uF/10V electrolytic capacitor at the output.
	Settling Time		-	150uS	200uS	
50% ~ 25% Max Load	Overshoot		-	75mV	100mV	
	Settling Time		-	150uS	200uS	
50% ~ 75% Max Load	Overshoot	Vo=5.0V	-	100mV	150mV	
	Settling Time		-	150uS	200uS	
50% ~ 25% Max Load	Overshoot		-	100mV	150mV	
	Settling Time		-	150uS	200uS	
50% ~ 75% Max Load	Overshoot	Vo=12.0V	-	150mV	200mV	
	Settling Time		-	150mV	200mV	
50% ~ 25% Max Load	Overshoot		-	150mV	200mV	
	Settling Time		-	150mV	200mV	

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

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General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency Vo=3.3V Vo=5.0V Vo=12.0V	85% 87% 87%	88% 90% 90%	- - -	Measured at Vin=48V, Io=Io, max
Switching Frequency	200kHz	230kHz	260kHz	
Output Trim Range	90% Vo	-	110% Vo	
I/O Isolation Voltage	1500V	-	-	
Isolation Capacitance	-	1500pF	-	
Output Voltage Trim Range	90%	-	110%	
Over Temperature Protection	-	110°C	-	
Over Voltage Protection Vo=3.3V Vo=5.0V Vo=12.0V	3.9V 5.7V 13.6V	- - -	5V 7V 14.2V	
MTBF	2,602,427 hours			Calculated Per Bell Core TR-332 (Io = Io max; Ta = 25°C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.0 x 1.0 x 0.438 50.8 x 25.4 x 11.14			
Weight	-	20g	-	

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

Control Specifications

Parameter		Min	Typ	Max	Notes
Remote On/Off					
Signal Low (Unit On)	Active Low	-0.3V	-	0.8V	The remote On/Off pin open, Unit On.
Signal High (Unit Off)		3.5V	-	12V	
Signal Low (Unit Off)	Active High	-0.3V	-	0.8V	
Signal High (Unit On)		3.5V	-	12V	
Current Sink		0.3mA	-	0.75mA	

ISOLATED DC/DC CONVERTERS

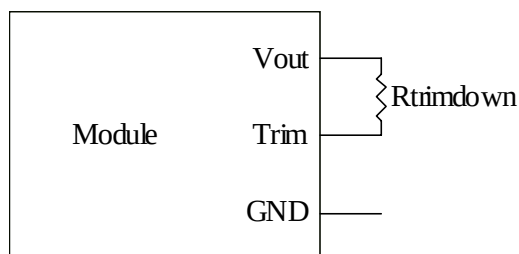
48V Input 3.3V/7A or 5V/5A or 12V/2.5A Output



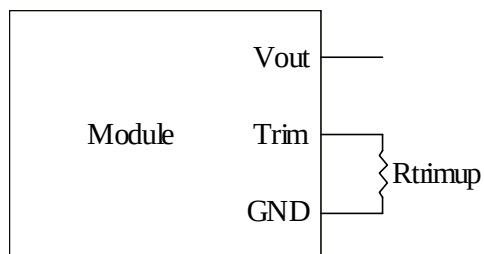
Output Trim Equations

Equations for calculating the trim resistor (in kΩ) given the desired adjusted voltage (V_{adj}) and the nominal output voltage of the converter (V_{nom}) are shown below. The Trim Down resistor should be connected between the Trim pin and Vout. The Trim Up resistor should be connected between the Trim pin and Ground. Only one of the resistors should be used for any given application.

$$R_{trimdown} = \frac{A}{V_{nom} - V_{adj}} - B$$



$$R_{trimup} = \frac{C}{V_{adj} - V_{nom}} - D$$



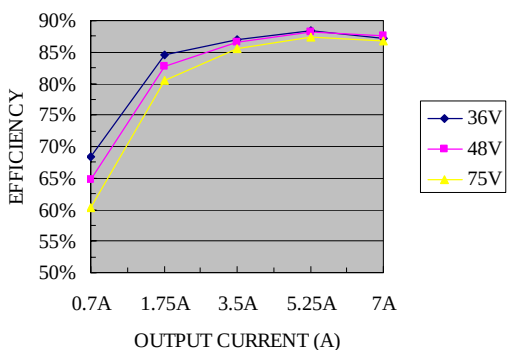
Vnom	A	B	C	D
12	53.320	9.260	14.025	3.650
5	19.300	15.120	6.350	10.000
3.3	21.711	40.610	13.032	30.100

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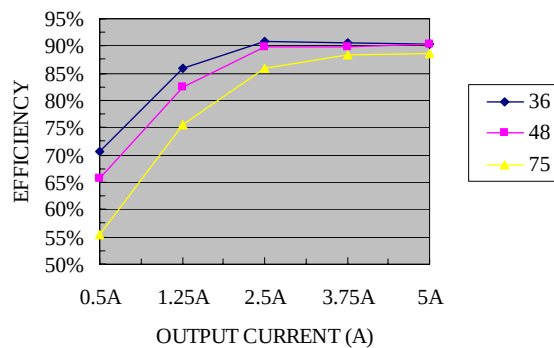
48V Input 3.3V/7A or 5V/5A or 12V/2.5A Output



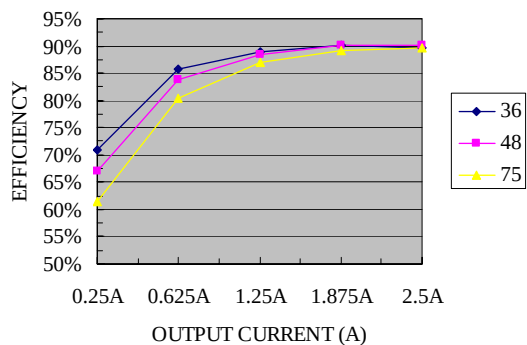
Efficiency Data



07LC-25T033



07LC-25T050



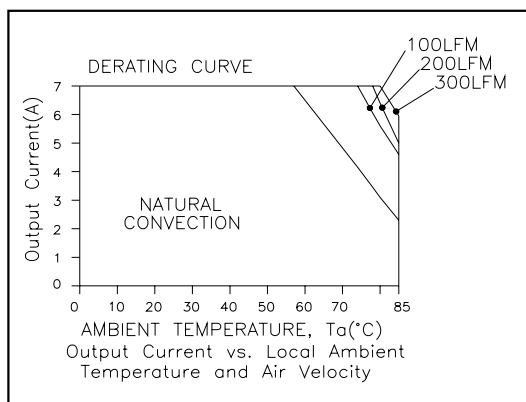
07LC-25T120

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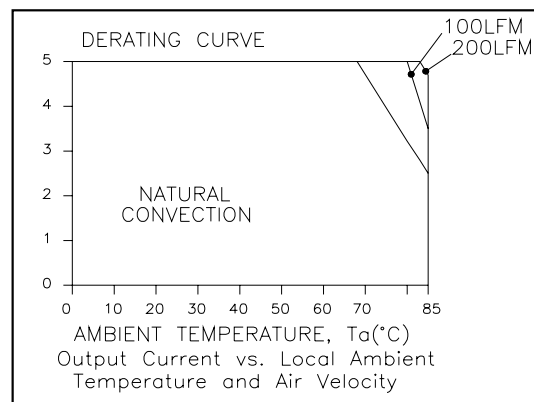
48V Input 3.3V/7A or 5V/5A or 12V/2.5A Output



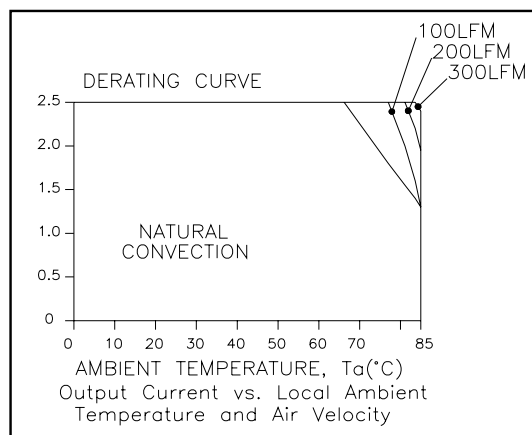
Thermal Derating Curves



07LC-25T033



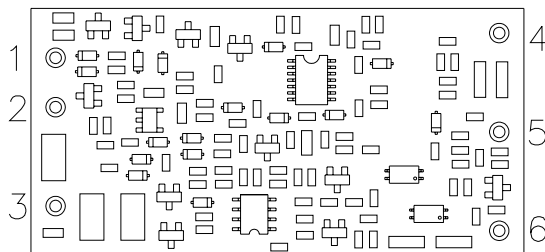
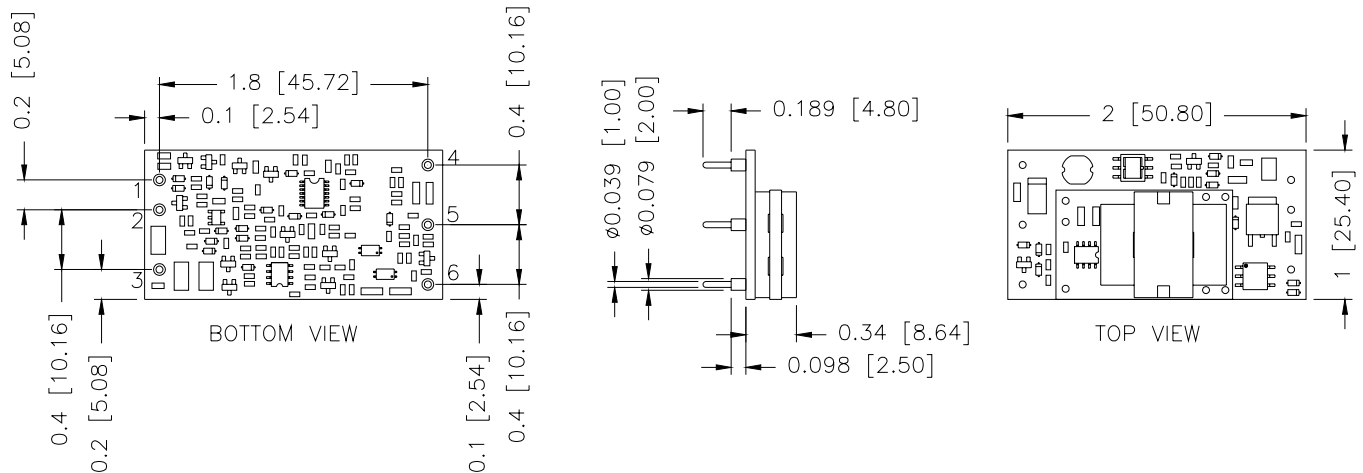
07LC-25T050



07LC-25T120

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Pin Connections

Pin	Function
1	Vin+
2	Vin-
3	Remote On/Off
4	Vo+
5	Vo-
6	Trim

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