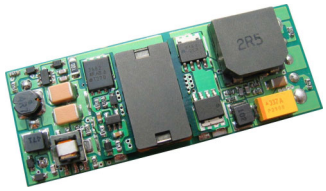
ISOLATED DC/DC CONVERTERS

48V Input 3.3V/15A, 5V/12A, 12V/5A Output, 1/8 Brick

07CY-60T Series

- Isolated
- High Efficiency
- High Power Density
- Fix Frequency (300KHz)
- Low Cost
- Input Under Voltage Lockout
- Output Over Voltage Shutdown
- OCP/SCP
- Over Temperature Protection
- Remote On/Off Logic (Option)
- Output Voltage Trim
- Positive/Negative Remote Sense



Description

The 07CY-60T Series are isolated DC/DC converters that operate from a nominal 48V source. These units provide up to 60W of output power from a nominal 48V input. These units are designed to be highly efficient and low cost. Features include remote on/off, short circuit protection, over current protection, over temperature protection, input under voltage lockout, and output over voltage protection. These converters are provided in an industry standard eighth brick package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active High	Model Number Active Low
12.0V	36V – 75V	5A	60.0W	91%	07CY-60T120	07CY-60T12L
5.0V	36V – 75V	12A	60.0W	91%	07CY-60T050	07CY-60T05L
3.3V	36V – 75V	15A	50.0W	89%	07CY-60T033	07CY-60T03L

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	-2V	-	18V	
I/O Isolation Voltage	-	-	2000V	
Ambient Temperature	-40°C	-	85°C	
Storage Temperature	-55°C	-	125°C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36V	48V	75V	
Input Current (full load) Vo=12.0V Vo=5.0V Vo=3.3V	 - - -	 - - -	 3.0A 2.8A 2.6A	
Input Current (no load) Vo=12.0V Vo=5.0V Vo=3.3V	 - - -	 120mA 80mA 40mA	 240mA 160mA 80mA	
Remote Off Input Current		2mA	5mA	

Input Specifications (Continued)

Parameter	Min	Typ	Max	Notes
Input Reflected Ripple Current [1] (pk-pk)	-	12mA	24mA	
Input Reflected Ripple Current [1] (RMS)	-	2mA	4mA	
I^2t Inrush Current Transient	-	$0.01A^2s$	$0.02A^2s$	
Turn-on Voltage Threshold	32V	34V	35V	
Turn-off Voltage Threshold	30V	32V	33V	

Note: 1. Test conditions: with simulated source impedance of 10uH; use a 100uF/100V electrolytic capacitor with ESR = 1 ohm max. at 5Hz to 20MHz at 25°C.

Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point				
Vo=12.0V	11.820V	12.0V	12.180V	Vin=48V, Io=50% full load, Ta=25°C.
Vo=5.0V	4.925V	5.0V	5.075V	
Vo=3.3V	3.250V	3.3V	3.350V	
Line Regulation				
Vo=12.0V	-	±12mV	±24mV	
Vo=5.0V	-	±5mV	±10mV	
Vo=3.3V	-	±3mV	±7mV	
Load Regulation				
Vo=12.0V	-	±30mV	±60mV	
Vo=5.0V	-	±10mV	±20mV	
Vo=3.3V	-	±7mV	±15mV	
Regulation Over Temperature (-40°C to +85°C)				
Vo=12.0V	-	±60mV	±100mV	
Vo=5.0V	-	±45mV	±75mV	
Vo=3.3V	-	±30mV	±50mV	
Output Current				
Vo=12.0V	0A	-	5A	
Vo=5.0V	0A	-	12A	
Vo=3.3V	0A	-	15A	
Current Limit Threshold				
Vo=12.0V	5.5A	6.5A	8A	
Vo=5.0V	13.5A	16A	19A	
Vo=3.3V	16A	18A	20A	
Short Circuit Surge Transient	-	$3A^2s$	$5A^2s$	
Ripple and Noise (RMS)				
Vo=12.0V	-	25mV	50mV	Test conditions: Vin=48V, Ta=25°C, with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output.
Vo=5.0V	-	25mV	50mV	
Vo=3.3V	-	15mV	30mV	
Ripple and Noise (pk-pk)				
Vo=12.0V	-	100mV	130mV	
Vo=5.0V	-	110mV	150mV	
Vo=3.3V	-	55mV	100mV	
Turn on Time	-	10mS	25mS	
Overshoot at Turn on	-	0%	5%	
Output Capacitance				
Vo=12.0V	0uF	-	1000uF	
Vo=5.0V	0uF	-	10000uF	
Vo=3.3V	0uF	-	18000uF	

Output Specifications (Continued)

Parameter			Min	Typ	Max	Notes
Transient Response						
25% ~ 50% Max Load	Overshoot	Vo=12.0V	-	300mV	400mV	Test conditions: di/dt = 0.1A/uS, Vin=48V, with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output.
	Settling Time		-	400uS	500uS	
50% ~ 25% Max Load	Overshoot		-	300mV	400mV	
	Settling Time		-	400uS	500uS	
25% ~ 50% Max Load	Overshoot	Vo=5.0V	-	200mV	300mV	
	Settling Time		-	300uS	400uS	
50% ~ 25% Max Load	Overshoot		-	200mV	300mV	
	Settling Time		-	300uS	400uS	
25% ~ 50% Max Load	Overshoot	Vo=3.3V	-	150mV	200mV	
	Settling Time		-	150uS	200uS	
50% ~ 25% Max Load	Overshoot		-	150mV	200mV	
	Settling Time		-	150uS	200uS	

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

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency Vo=12.0V Vo=5.0V Vo=3.3V	 88% 88% 87%	 91% 91% 89%	 - - -	Vin=48V, full load
Switching Frequency	270KHz	300KHz	330KHz	
Isolation capacitance	-	1500pF	-	
Output Voltage Trim Range	80%Vo	-	110%Vo	
Over Temperature Protection	-	125°C	-	
Over Voltage Protection	117%Vo	122%Vo	127%Vo	
MTBF	2,410,000 hours			Calculated Per Bell Core TR-332 (Io = 12A, Vin=48V, Vo=3.3V, Ta = 25°C, No forced air)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	 2.30 x 0.896 x 0.395 58.42 x 22.86 x 10.04			
Weight	-	20g	-	

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

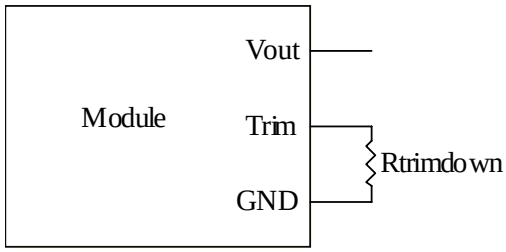
Control Specifications

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)		2.4V	-	18V	
Signal Low (Unit Off)	Active High	-0.3V	-	0.8V	
Signal High (Unit On)		2.4V	-	18V	
Current Sink		0mA	-	0.75mA	

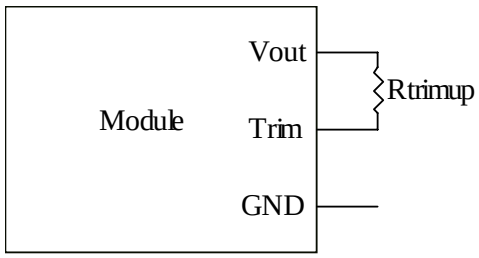
Output Trim Equations

Equations for calculating the trim resistor (in kΩ) are shown below. The Trim Down resistor should be connected between the Trim pin and Ground pin. The Trim Up resistor should be connected between the Trim pin and the Vout. Only one of the resistors should be used for any given application.

$$Rtrimdown = \frac{511}{|delta|} - 10.22$$



$$Rtrimup = \frac{(100 + delta) \cdot Vo \cdot 5.11 - 626}{1.225 \cdot delta} - 10.22$$



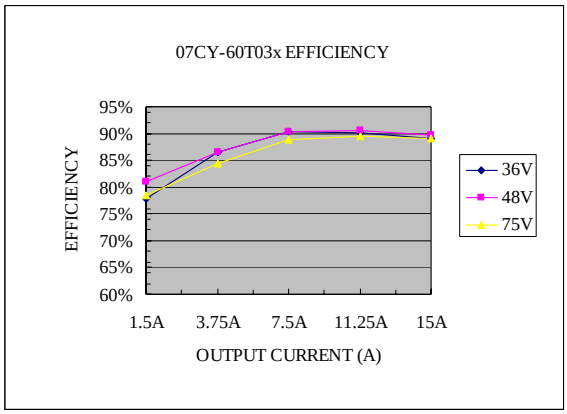
Notes:

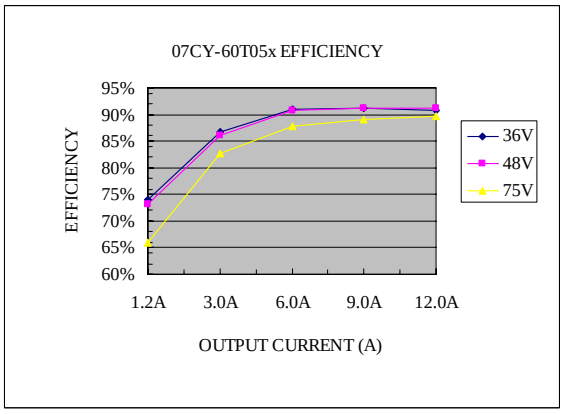
$$delta = \frac{(Vo\_req - Vo)}{Vo} \times 100[\%]$$

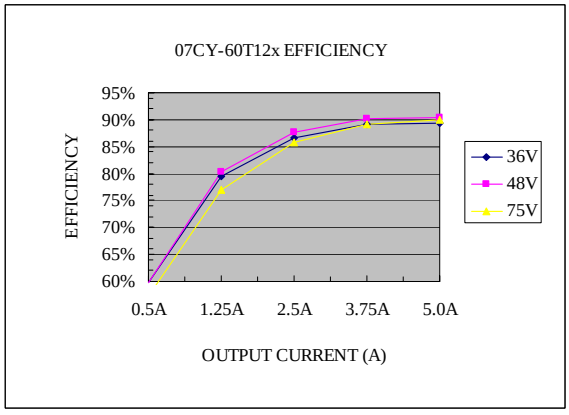
Vo_req=Desired (trimmed) output voltage [V]

Output voltage Vo=3.308V for 3.3V output; Vo=5.002V for 5.0V; Vo=12.007V for 12V output

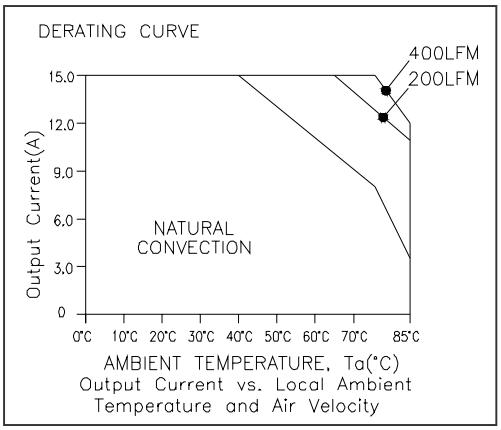
Efficiency Data



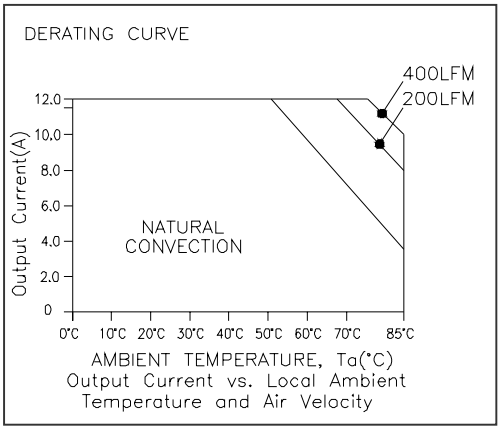




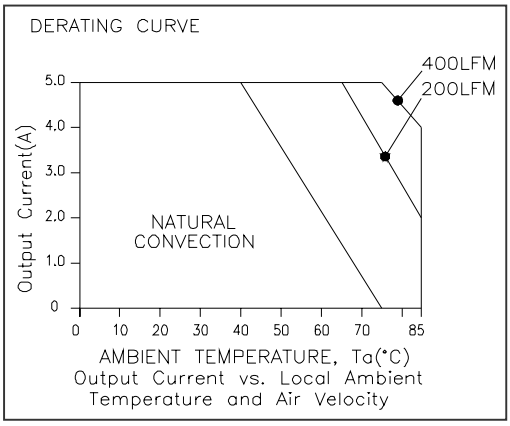
Thermal Derating Curves (Vin=48V)



07CY-60T03x



07CY-60T05x



07CY-60T12x

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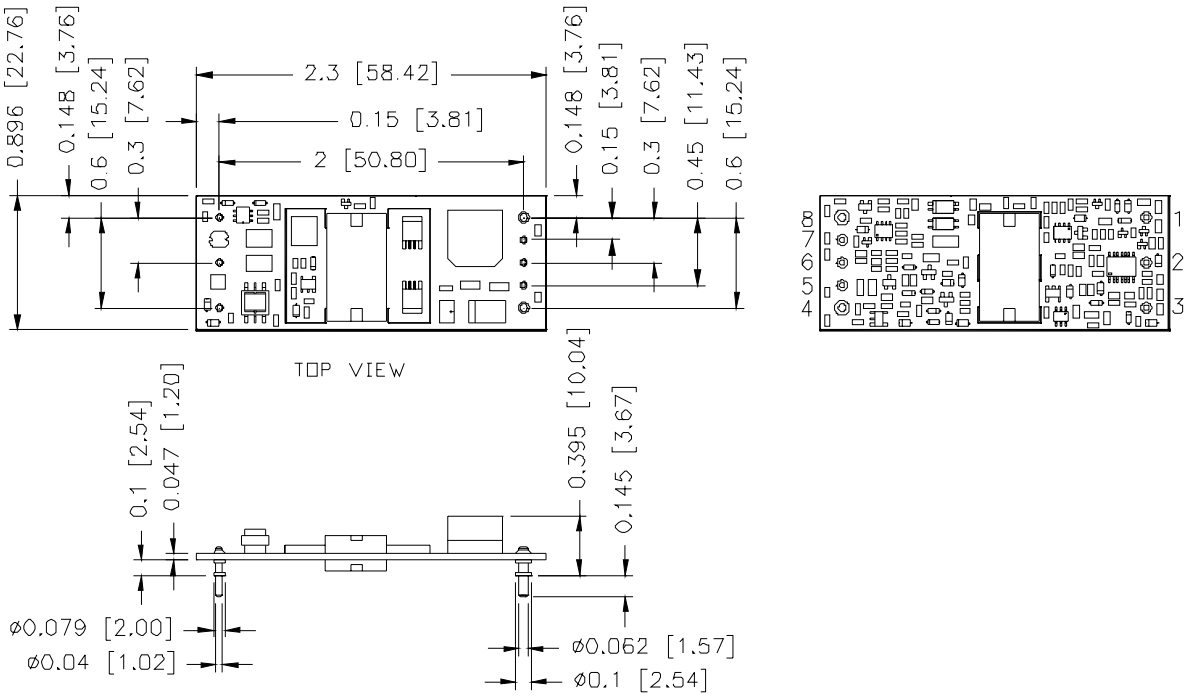

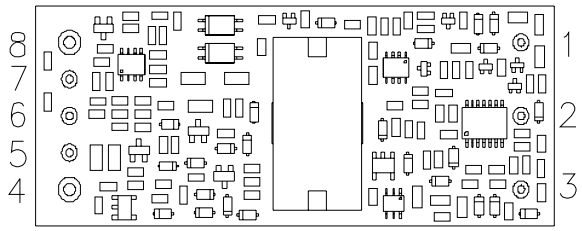

Pin Connections

Pin	Function
1	Vin+
2	Remote On/Off
3	Vin-
4	Vout-
5	Sense-
6	Trim
7	Sense+
8	Vout+

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