



## LOT\_06R-X Series

6A - Non-Isolated & Regulated, Single output POL power converter

## Switching Regulator

- ⊕ Efficiency up to 94%
- ⊕ Operating temperature range: -40°C ~ +85°C
- ⊕ Short circuit protection (SCP)
- ⊕ Compact SMD package
- ⊕ Input under-voltage, over-current protection
- ⊕ High-speed transient response
- ⊕ EN62368 approved

The LOT\_06R-X is a 6A non-isolated switching regulator. The output voltage is accurately adjustable from 0.75V to 5.0V, and the product is featured with high efficiency, fast transient response, input under-voltage, output short circuit and over-current protection. It meets CLASS B of CISPR32/EN55032 EMI standards by adding the recommended external components.

They are widely used in applications such as communications, computer network industry, power distributed architecture, workstations, servers, LANs/WANs and provide high current with fast transient response for high-speed chips such as FPGA, DSP, and ASIC.



Common specifications	
Short circuit protection:	Continuous, automatic recovery
Cooling:	Nature or forced convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C ~+125°C
Reflow soldering temperature:	Peak temp. Tc ≤245°C, maximum duration time≤60s over 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.
Storage humidity range:	< 95%RH
MTBF (+25°C MIL-HDBK-217F):	1000 K hours MIN
Dimensions:	20.30 x 11.40 x 6.60 mm
Weight:	3.9g

Input specifications					
Item	Test conditions	Min	Typ	Max	Units
Input current	nominal input voltage full load/no load		2660/20		mA
Start-up voltage				8	VDC
Under voltage protection		6			VDC
Reverse polarity input	Avoid/not protected				
Input filter	Capacitance filter				
Hot plug	Unavailable				
Ctrl*	Module on • LOT_06R-P  • LOT_06R-N  Module off • LOT_06R-P  • LOT_06R-N			Ctrl pin open or pulled high (Vin-2.5VDC~Vin) Ctrl pin pulled low to GND (0~0.5VDC)  Ctrl pin pulled low to GND (0~0.5VDC) Ctrl pin open or pulled high (Vin-2.5VDC~Vin)	
The Ctrl pin voltage is referenced to GND.					
	Input current when off			1	mA

Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

### Example:

LOT\_06R-P  
LO= Series; T= SMT; 06 = Output current: 6A; R= Revised; P= positive logic control

Output specifications					
Item	Test conditions	Min	Typ	Max	Units
Voltage accuracy	Full load, nominal input voltage		±1	±2	%
Line regulation	Full load, input voltage range		±0.3		%
Load regulation	nominal input, 0% - 100% load		±0.4		%
Ripple + Noise*	20MHz Bandwidth		35	75	mVp-p
Trim		0.75		5	VDC
Temperature coefficient			±0.02		%/°C
Transient response deviation**			±70		mV
Transient recovery time**			50		µs
External load capacitance	• 1 mΩ ≤ESR <10 mΩ • ESR≥10mΩ			1000 3000	uF uF
Over current protection	Nominal input	140	160		%Io
Switching frequency		350			KHz

Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

\* The "parallel cable" method is used for Ripple and Noise test.

\*\* Nominal input, 50%-100%-50% load step change, di/dt=2.5A/us, with external 2 x 150 µF polymer capacitors.

EMC specifications				
EMI	CE	CISPR32/EN55032	CLASS B	see EMC compliance circuit
EMI	RE	CISPR32/EN55032	CLASS B	see EMC compliance circuit
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria A

### Note:

1. The max. capacitive load was tested at input voltage range and full load.
2. Unless otherwise specified, parameters were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage, 5VDC output voltage and rated output load.
3. All index testing methods in this datasheet are based on our Company's corporate standards.
4. Specifications subject to change without prior notice.

## LOT\_06R-X Series

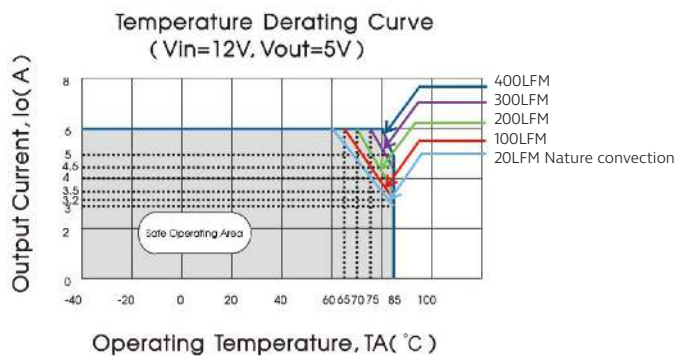
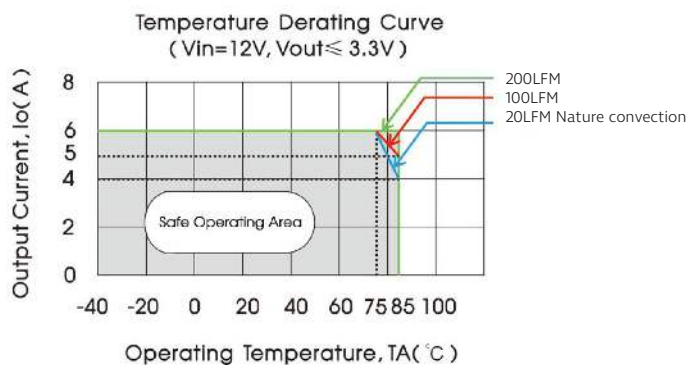
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Part Number	Input Voltage [VDC]		Output Voltage Range <sup>2</sup> [VDC]	Output Current [A; min/max]	Efficiency [%; min/typ]
	nominal (range)	Max. <sup>1</sup>			
LOT_12-06R-X	12 (8.3~14)	15	0.75 ~ 5.0	0/6	90/94

X: Suffix "P" indicates that the Ctrl pin is positive logic control, "N" indicates that the Ctrl pin is negative logic control.  
Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

- Exceeding the maximum input voltage may cause permanent damage.
- The default output voltage is 0.75VDC, which can be adjusted to 1.2VDC, 1.8VDC, 2.5VDC, 3.3VDC, 5VDC. See Trim instructions for specific output voltage adjustment.

## Typical characteristics



## Typical application

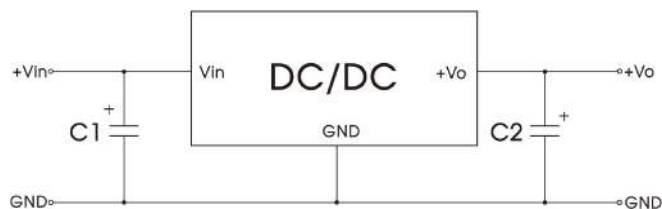


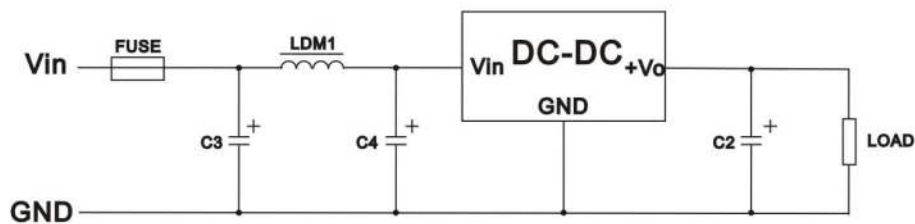
Table 1

Part No.	C1	C2
LOT-06R-X	100 $\mu$ F/35V	22 $\mu$ F/16V

Note:

- 100  $\mu$ F polymer capacitors (C1) is required and should be connected close to the pin terminal, to ensure the stability of the converter;
- To reduce the output ripple furtherly, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
- Refer to Table 1 for C1 and C2 capacitor values;
- Converter cannot be used for hot swap and with output in parallel.

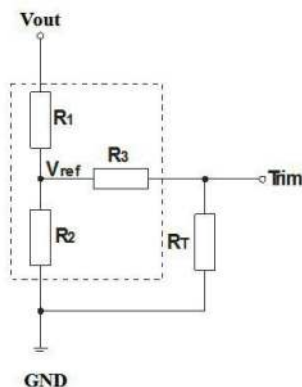
## EMC compliance circuit



FUSE	C3/C4	LDM1	C2
Selected based on the actual input current in application	100µF /35V	6.8µH	Refer to the Cout in typical application

## Trim function

Trim function for output voltage adjustment (open if unused)



Vo(VDC)	R <sub>T</sub> (kΩ)
0.7525	Open
1.2	15.089
1.8	5.873
2.5	3.120
3.3	1.826
5	0.695

Calculating Trim resistor (R<sub>T</sub>) values:

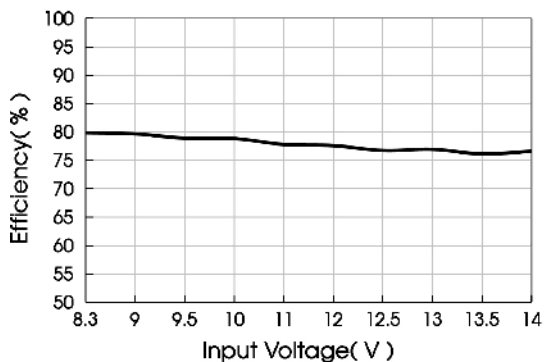
$$R_T (\Omega) = \frac{7200}{V_o - 0.7525} - 1000$$

TRIM resistor connection (dashed line shows internal resistor network)

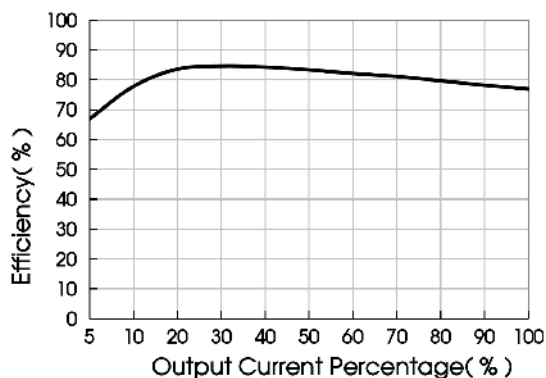
- Notes: 1. R<sub>T</sub> : Resistance of Trim; V<sub>o</sub>: The trim up voltage;  
 2. If R<sub>T</sub> = ∞ or Trim pin open, V<sub>o</sub> = 0.7525 VDC.

Efficiency

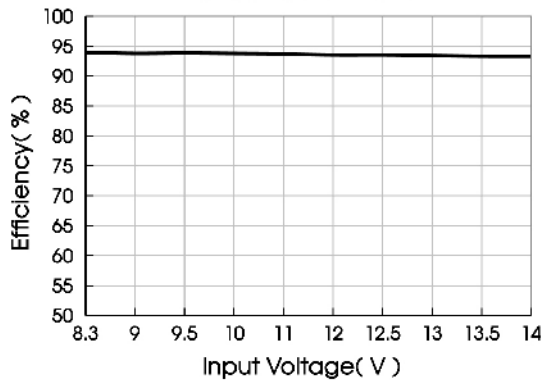
Efficiency Vs input Voltage  
( $V_{out}=0.75V, I_o=6A$ )



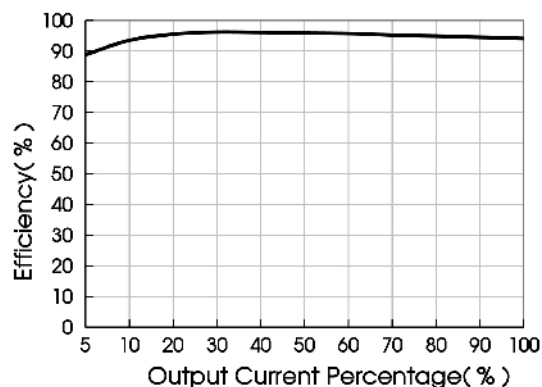
Efficiency Vs Output Load  
( $V_{in}=12V, V_{out}=0.75V$ )



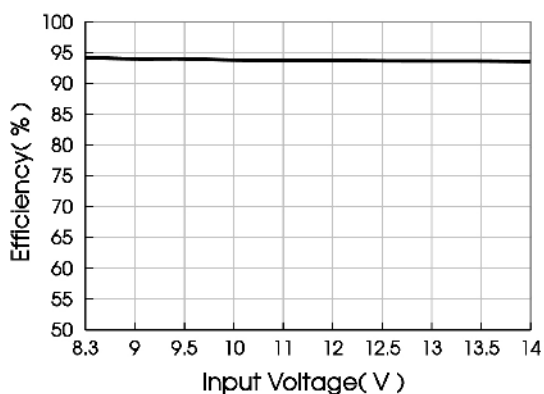
Efficiency Vs input Voltage  
( $V_{out}=3.3V, I_o=6A$ )



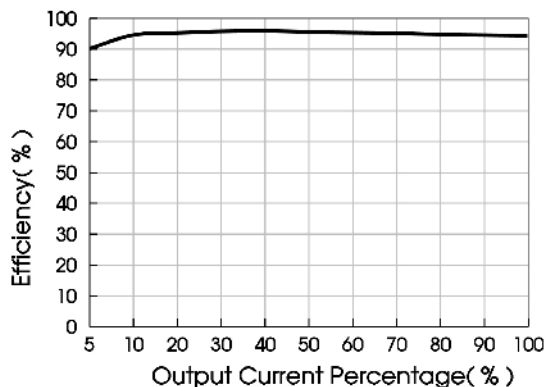
Efficiency Vs Output Load  
( $V_{in}=12V, V_{out}=3.3V$ )



Efficiency Vs input Voltage  
( $V_{out}=5V, I_o=6A$ )



Efficiency Vs Output Load  
( $V_{in}=12V, V_{out}=5V$ )

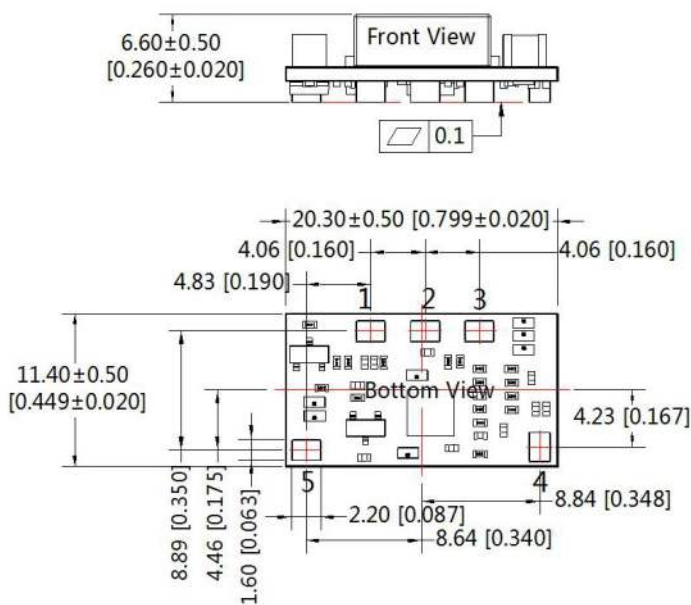


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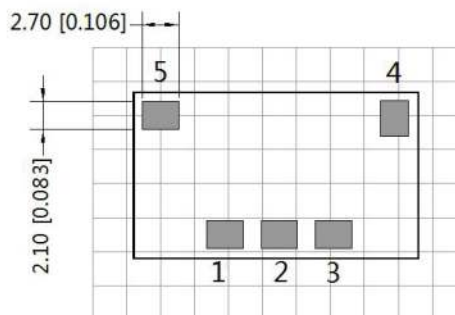
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### Mechanical dimensions

THIRD ANGLE PROJECTION 



Note :  
 Unit: mm[inch]  
 General tolerances:  $\pm 0.25[\pm 0.010]$   
 The layout of the device is for reference only ,  
 please refer to the actual product



Note : Grid: 2.54\*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Trim
3	+Vo
4	Ctrl
5	Vin