



QT8A_1.5UP Series

0.25W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated

DC-DC Converter 0.25 Watt

- + 1500VDC isolation
- + Efficiency up to 77%
- + Operating temperature range: -40°C ~ +105°C
- + Low ripple & noise
- + Compact SMD package
- + Internal SMD construction
- + Industry standard pinout
- + RoHS Compliance
- + Short circuit protection (SCP)

The QT8A_1.5UP series is specially designed for applications where an isolated voltage is required in a distributed power supply system.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (Voltage variation $\leq \pm 10\%$)
- 2) Where isolation is necessary between input and output (Isolation voltage $\leq 1500\text{VDC}$)
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding.

Such as: pure digital circuits, low frequency analog circuits, and relay-driven circuits.



Common specifications	
Short circuit protection*:	Continuous, automatic recovery
Temperature rise at full load:	20°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+105°C
Storage temperature range:	-55°C ~+125°C
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec
Reflow Soldering Temperature:	Peak temp. $\leq 245^\circ\text{C}$, maximum duration time $\leq 60\text{s}$ at 217°C . For actual application, please refer to IPC/JEDEC J-STD-020D.1.
Storage humidity range:	< 95%
Case material:	Epoxy Resin [UL94-V0]
MTBF:	>3,500,000 hours
Dimensions:	12.70*11.20*7.25 mm
Weight:	1.5g

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Output voltage accuracy	See tolerance envelope graph					
Line regulation	For V_{in} change of $\pm 1\%$				± 1.5	%
	• 3.3V output				± 1.2	%
	• other output					
Load regulation	10% to 100% load					
	• 3V output		15	20		%
	• 5V/9V output		12	15		%
	• 12V/15V output		7	10		%
Temperature drift	100% full load				± 0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		10&20	120		mVp-p
Switching frequency	Full load, nominal input		100	300		KHz

* Test ripple and noise by "parallel cable" method. See detailed operation instructions at application notes.

* Supply voltage must be discontinued at the end of short circuit duration for QT8A_03xx series.

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Input current (full load/no load)	• 5V input		68/15		mA	
	• 12V input		27/10		mA	
	• 24V input		15/8		mA	
Reflected ripple current	• 5V input		20		mA	
	• 12V/24V input		5		mA	
Input surge voltage (1sec. max.)	• 5V input	-0.7		9	VDC	
	• 12V input	-0.7		18	VDC	
	• 24V input	-0.7		30	VDC	
Input filter	Capacitor filter					

EMC specifications			
EMI	CE	CISPR22/EN55022 CLASS B (see EMC recommended circuit)	
EMI	RE	CISPR22/EN55022 CLASS B (see EMC recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	Contact $\pm 8\text{kV}$ perf. Criteria B

Example SIP4 Case:
QT8A_05051.5UP
Q= 0.25 Watt; T8= SMT8; A= Pinning; 05= 5Vin; 05= 5Vout;
S= Single Output; 1.5= 1.5kVDC Isolation; U= Unregulated Output
P= Short circuit protection

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC	
Isolation resistance	Test at 500VDC	1000			MΩ	
Isolation capacitance	Input-output, 100KHz/0.1V		20		pF	

Note:

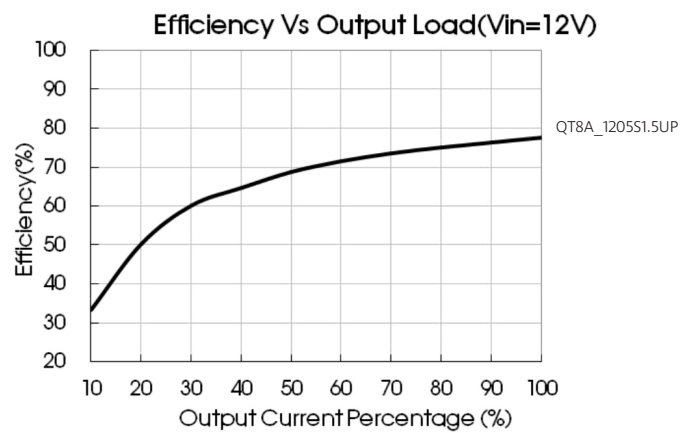
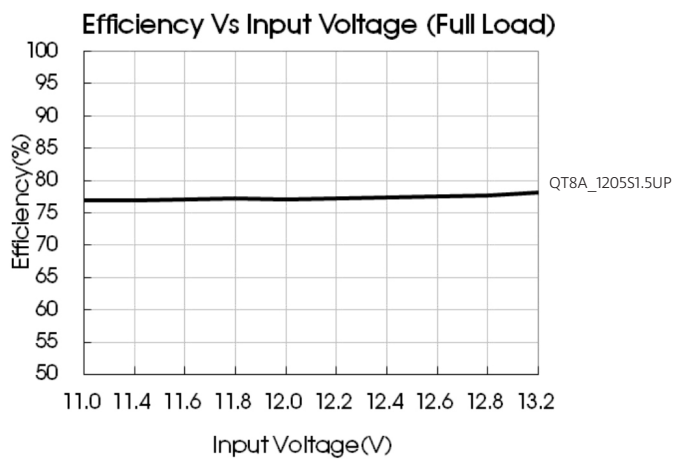
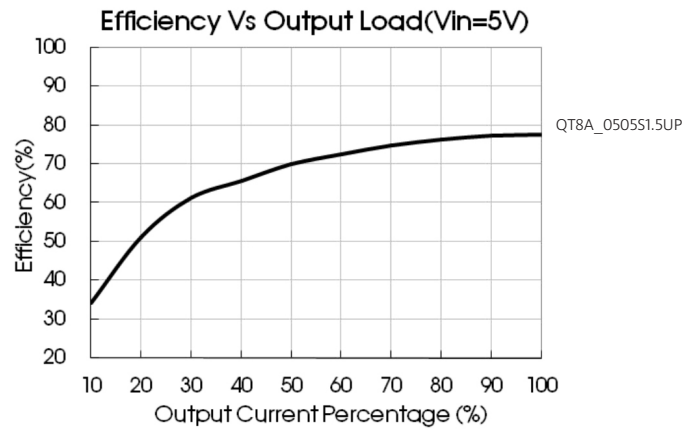
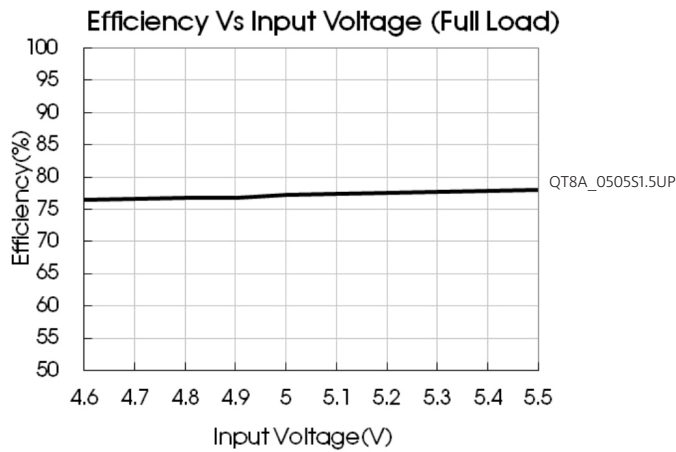
1. Operation under minimum load will not damage the converter; However, they may not meet all specifications.
2. Max. Capacitive Load is tested at nominal input voltage and full load.
3. Unless otherwise noted, All specifications are measured at $T_a=25^\circ\text{C}$, humidity<75%, nominal input voltage and rated output load.
4. In this datasheet, all test methods are based on our corporate standards.
5. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
6. Please contact our technical support for any specific requirement.
7. Specifications of this product are subject to changes without prior notice.

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Part Number	Input Voltage [VDC] Nominal (Range)	Output Voltage [VDC]	Output Current [mA, max/min]	Max. capacitive load [μF]	Efficiency [%, typ.]
QT8A_0303S1.5U	3.3 (2.97-3.63)	3.3	76/8	220	73
QT8A_0305S1.5U	3.3 (2.97-3.63)	5	50/5	220	73
QT8A_0312S1.5U	3.3 (2.97-3.63)	12	21/2	220	73
QT8A_0503S1.5UP	5 (4.5-5.5)	3.3	76/8	220	74
QT8A_0505S1.5UP	5 (4.5-5.5)	5	50/5	220	77
QT8A_0509S1.5UP	5 (4.5-5.5)	9	28/3	220	74
QT8A_0512S1.5UP	5 (4.5-5.5)	12	21/2	220	74
QT8A_0515S1.5UP	5 (4.5-5.5)	15	17/2	220	73
QT8A_1203S1.5UP	12 (10.8-13.2)	3.3	76/8	220	73
QT8A_1205S1.5UP	12 (10.8-13.2)	5	50/5	220	77
QT8A_1209S1.5UP	12 (10.8-13.2)	9	28/3	220	73
QT8A_1212S1.5UP	12 (10.8-13.2)	12	21/2	220	77
QT8A_2405S1.5UP	24 (21.6-26.4)	5	50/5	220	71

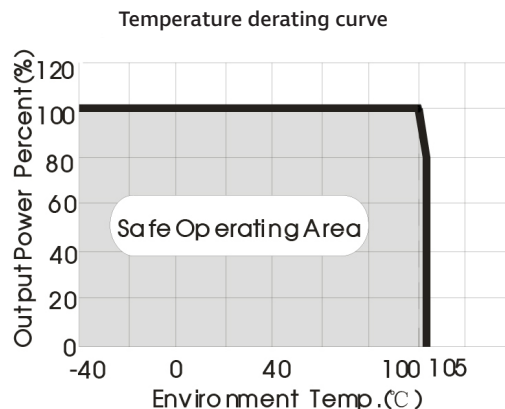
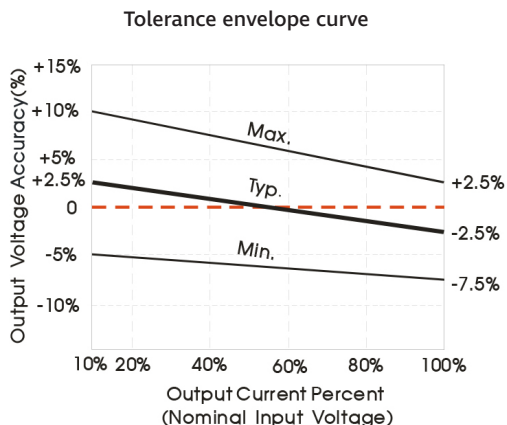
Efficiency



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Typical characteristics



Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig. 1.

Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the

modules running well, the recommended capacitive load values as shown in Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 2).



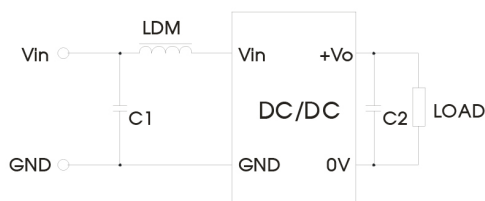
Figure 1



Figure 2

Vin (VDC)	Cin (μF)	Vo (VDC)	Cout (μF)
3.3/5	4.7	3.3/5	10
12	2.2	12	2.2
24	1	15	1

EMC typical recommended circuit



Input voltage (VDC)		3.3/5/12/24
EMI	C1	4.7μF /50V
EMI	C2	Refer to the Cout in Fig. 1
EMI	LDM	6.8μH

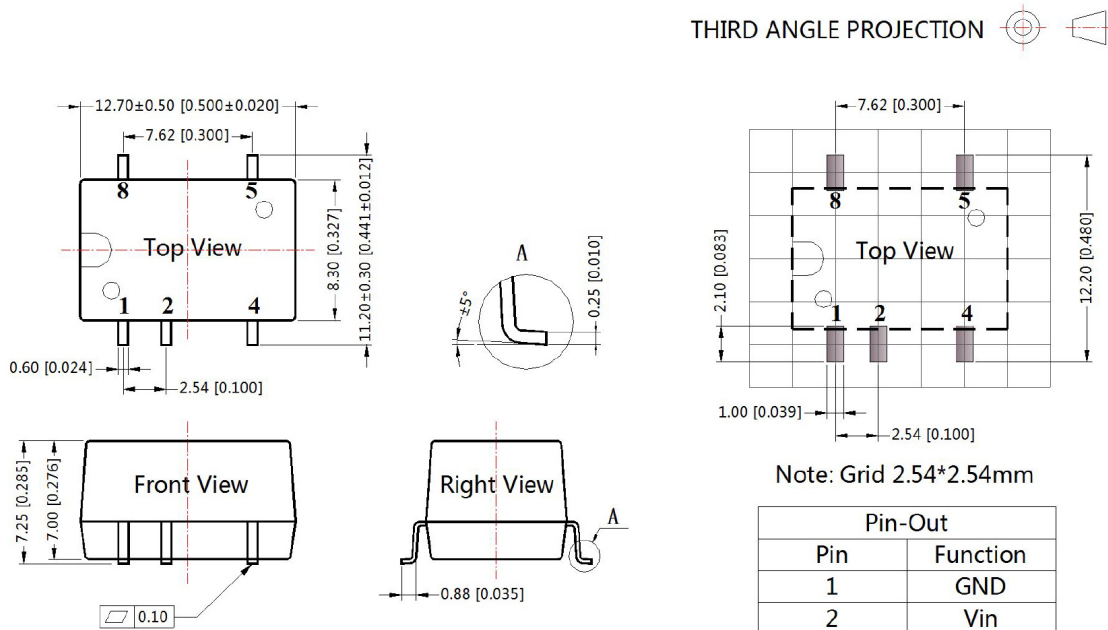
Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (the sum of the efficient power and resistor consumption power is not less than 10%).

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Mechanical dimensions



Note:
 Unit: mm[inch]
 Pin section tolerances: ± 0.10mm [± 0.004inch]
 General tolerances: ± 0.25mm [±0.010inch]

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: Pin to be isolated from circuitry