# QLT POWER DC/DC Converter QDC 1W/2W Series
Isolated & Unregulated, Single Output

FEATURES

- Efficiency to 85%
- MTBF > 3,500,000 hours
- High Power Density
- Small Footprint
- SIL and DIL Package Style
- Single Output Voltage
- Industrial Standard Pin-out
- UL94-VO Package
- No Heat Sink Required
- 1kVDC Isolation
- Fixed Input Voltage
- Unregulated Output Voltage

- Temperature Rang:-40°C~+85°C
- PCB Mounting
- No External Components Required
- Custom Service Available
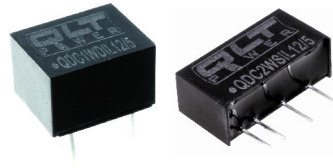
COMMON SPECIFICATIONS

Short circuit protection	1 second
Temperature rise at full load	25°C (maximum), 15°C (typical)
Cooling condition	Free air convection
No-load power consumption	10% nominal power (typical)
Operating temperature range	-40°C~+85°C
Storage temperature range	-55°C~+125°C
Lead temperature*	300°C Max
Storage humidity range	≤95%
Case material	Plastic (UL94-VO)
MTBF (Mean Time Between Failure)	> 1000,000 hours
Isolation Voltage and Resistance	1kVDC and 1GΩ
*Lead temperature 1.5mm from case for 10 seconds	

INPUT SPECIFICATIONS

Part number	Nominal input voltage	Input voltage range	Absolute max input voltage **
QDC1WSIL5 QDC2WSIL5 QDC1WDIL5 QDC2WDIL5	5VDC	4.5~5.5 VDC	7VDC
QDC1WSIL12 QDC2WSIL12 QDC1WDIL12 QDC2WDIL12	12VDC	10.8~13.2 VDC	15VDC
QDC1WSIL24 QDC2WSIL24 QDC1WDIL24 QDC2WDIL24	24VDC	21.6~26.4 VDC	28VDC
**Input voltage higher than the max value may cause permanent damage to the device.			

OUTPUT SPECIFICATIONS

Item	Test condition	MIN	TYP	MAX	Units
0.25W Output power	See below products program	0.025		0.25	W
0.5W Output power	See below products program	0.05		0.5	W
1W Output power	See below products program	0.1		1	W
2W Output power	See below products program	0.2		2	W
Linear voltage regulation	Nominal voltage ±5%			±1.2	%
Output voltage accuracy	100% full load	See tolerance envelope graph			
Efficiency at full load	Nominal input voltage	65	75	85	%
Temperature drift	See below recommended circuit			0.03	%/°C
0.25W,0.5W, 1W output ripple and noise	20Hz-300KHz bandwidth See below recommended circuit		75	150	mVp-p
2W Output ripple and noise			100	200	
Switching frequency	Full load, nominal input voltage	80	100	150	KHz

Linear voltage regulation:

$$v = \frac{\Delta V_{out}}{\Delta V_{in}} \quad \text{with} \quad \Delta V_{out} = \frac{V_{out+5\%} - V_{out-5\%}}{V_{out-nom}} \qquad \Delta V_{in} = \frac{V_{in+5\%} - V_{in-5\%}}{V_{in-nom}}$$

Note: All specification are measured at AT=25°C, humidity<75%, nominal input voltage an rated output load unless other specific conditions are given.

PRODUCTS PROGRAM

Vin	SIL Package Style			
	0.25W (Po=0.25W)	0.5W (Po=0.5W)	1W (Po=1W)	2W (Po=2W)
5 VDC	QDC0.25WSIL5/5 QDC0.25WSIL5/9 QDC0.25WSIL5/12 QDC0.25WSIL5/15	QDC0.5WSIL5/5 QDC0.5WSIL5/9 QDC0.5WSIL5/12 QDC0.5WSIL5/15	QDC1WSIL5/5 QDC1WSIL5/9 QDC1WSIL5/12 QDC1WSIL5/15	QDC2WSIL5/5 QDC2WSIL5/9 QDC2WSIL5/12 QDC2WSIL5/15
12 VDC	QDC0.25WSIL12/5 QDC0.25WSIL12/9 QDC0.25WSIL12/12 QDC0.25WSIL12/15	QDC0.5WSIL12/5 QDC0.5WSIL12/9 QDC0.5WSIL12/12 QDC0.5WSIL12/15	QDC1WSIL12/5 QDC1WSIL12/9 QDC1WSIL12/12 QDC1WSIL12/15	QDC2WSIL12/5 QDC2WSIL12/9 QDC2WSIL12/12 QDC2WSIL12/15
24 VDC	QDC0.25WSIL24/5 QDC0.25WSIL24/9 QDC0.25WSIL24/12 QDC0.25WSIL24/15	QDC0.5WSIL24/5 QDC0.5WSIL24/9 QDC0.5WSIL24/12 QDC0.5WSIL24/15	QDC1WSIL24/5 QDC1WSIL24/9 QDC1WSIL24/12 QDC1WSIL24/15	QDC2WSIL24/5 QDC2WSIL24/9 QDC2WSIL24/12 QDC2WSIL24/15

Vin	DIL Package Style			
	0.25W (Po=0.25W)	0.5W (Po=0.5W)	1W (Po=1W)	2W (Po=2W)
5 VDC	QDC0.25WDIL5/9 QDC0.25WDIL5/12	QDC0.5WDIL5/9 QDC0.5WDIL5/12	QDC1WDIL5/9 QDC1WDIL5/12	QDC2WDIL5/9 QDC2WDIL5/12
12 VDC	QDC0.25WDIL12/9 QDC0.25WDIL12/12 QDC0.25WDIL12/15	QDC0.5WDIL12/9 QDC0.5WDIL12/12 QDC0.5WDIL12/15	QDC1WDIL12/9 QDC1WDIL12/12 QDC1WDIL12/15	QDC2WDIL12/9 QDC2WDIL12/12 QDC2WDIL12/15
24 VDC	QDC0.25WDIL24/5 QDC0.25WDIL24/9 QDC0.25WDIL24/15	QDC0.5WDIL24/5 QDC0.5WDIL24/9 QDC0.5WDIL24/15	QDC1WDIL24/5 QDC1WDIL24/9 QDC1WDIL24/15	QDC2WDIL24/5 QDC2WDIL24/9 QDC2WDIL24/15

APPLICATION NOTE

The QDC 1W/2W Series is specially designed for applications where a group of polar power supplies is highly isolated form the input power supply in a distributed power supply system on a circuit board.
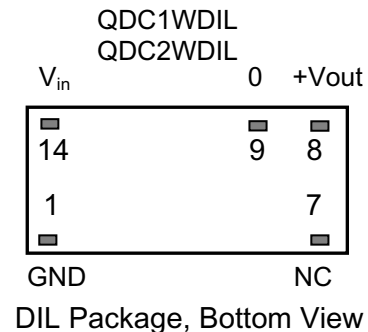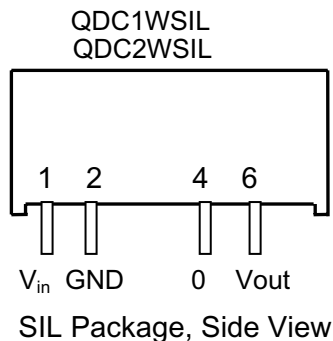
These products can be applied to:
1) Where the voltage of the input power supply is fixed (voltage variation≤±10%);
2) Where an isolation is necessary between input and output (isolation voltage≤1000VDC);
3) Where the output voltage and the output ripple noise are not demanded to regulate, for instance purely digital circuits, ordinary low frequency analog circuits, etc.
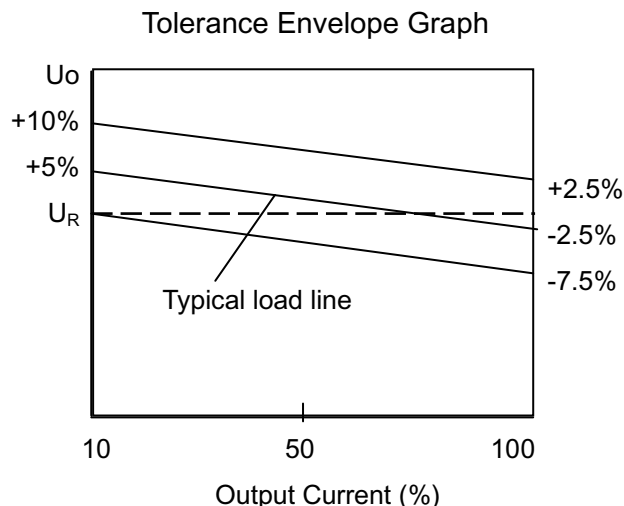
These products cannot be applied to:
1) Where the input supply voltage is unfixed (variation ≥±10%);
2) Where the isolation voltage between input and output is required to be higher than 1000VDC;
3) Circuits, in which the output voltage is demanded to regulate;
4) Circuits, where the actual power consumption of the output load is less than 0.25W.
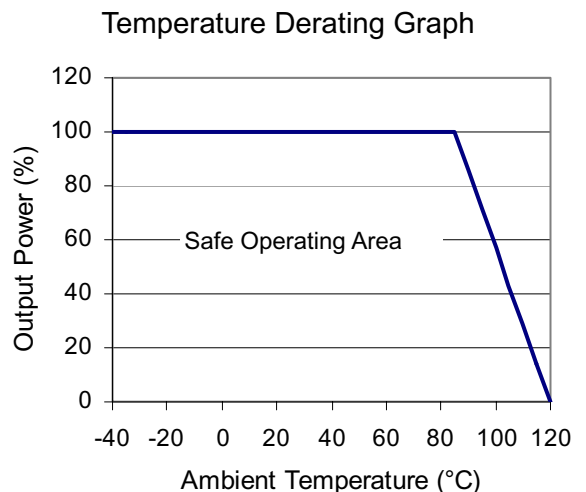
PINCONNECTONS

QDC1WSIL
QDC2WSIL

| 1 | 2 | | 4 | 6 |

V_{in} GND 0 Vout

SIL Package, Side View

QDC1WDIL
QDC2WDIL

V_{in} 0   +Vout

| 14 | | 9 | 8 |
| 1 | | | 7 |

GND   NC

DIL Package, Bottom View

NOTE: The NC terminal is for internal use of the DC/DC converter. Be sure to suspend it without any peripheral circuits

TYPICAL CHARACTERISTICS

Tolerance Envelope Graph

Uo
+10%
+5%
U_R
+2.5%
-2.5%
-7.5%
Typical load line
10   50   100
Output Current (%)

Temperature Derating Graph

120
100
80
60 Safe Operating Area
40
20
0
-40 -20 0 20 40 60 80 100 120
Output Power (%)
Ambient Temperature (°C)

U_0: Output voltage, U_R Nominal Voltage

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