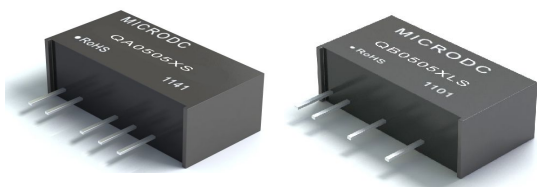


### 0.25W, FIXED INPUT, ISOLATED&UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



### FEATURES

- ◆ Small Footprint
- ◆ 1KVDC Isolation
- ◆ SIP Package
- ◆ Internal SMD Construction
- ◆ Temperature Range: -40°C to +85°C
- ◆ No Heat sink Required
- ◆ No External Component Required
- ◆ Industry Standard Pin out

### MODEL SELECTION

**QB<sup>①</sup>05<sup>②</sup>05<sup>③</sup>X<sup>④</sup>LS<sup>⑤</sup>**

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Fixed Input
- ⑤ SIP-7 Package

### APPLICATIONS

The QA-XS&QB-XLS Series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\pm 10\%$ );
- 2) Where isolation is necessary between input and output (isolation voltage  $\pm 1000\text{VDC}$ );
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding.

Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.



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### PRODUCT PROGRAM

Part Number	Input		Output		Efficiency (% Typ)		
	Voltage (VDC)		Voltage (VDC)	Current (mA) Max			
	Nominal	Nominal					
QB0303XLS	3.3	3.0-3.6	3.3	75.8	62		
QB0305XLS			5	50	65		
QA0505XS	5	4.5-5.5	$\pm 5$	$\pm 25$	62		
QA0509XS			$\pm 9$	$\pm 13.8$	64		
QA0512XS			$\pm 12$	$\pm 10.4$	66		
QA0515XS			$\pm 15$	$\pm 8.3$	65		
QB0505XLS			5	50	64		
QB0509XLS			9	27.8	65		
QB0512XLS			12	20.8	67		
QB0515XLS			15	16.7	65		
QA1205XS			12	10.8-13.2	$\pm 5$	$\pm 25$	62
QA1209XS					$\pm 9$	$\pm 13.8$	63
QA1212XS	$\pm 12$	$\pm 10.4$			64		
QA1215XS	$\pm 15$	$\pm 8.3$			65		
QB1203XLS	3.3	75.8			62		
QB1205XLS	5	50			65		
QB1209XLS	9	27.8			66		
QB1212XLS	12	20.8			67		
QB1215XLS	15	16.7			66		
QA2405XS	24	21.6-26.4			$\pm 5$	$\pm 25$	63
QA2409XS			$\pm 9$	$\pm 13.8$	64		
QA2412XS			$\pm 12$	$\pm 10.4$	65		
QA2415XS			$\pm 15$	$\pm 8.3$	65		
QB2405XLS			5	50	63		
QB2409XLS			9	27.8	63		
QB2412XLS			12	20.8	65		
QB2415XLS			15	16.7	65		
QB2424XLS			24	10.4	64		

### COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Storage humidity				95	%
Operating Temperature		-40		85	°C
Storage Temperature		-55		125	
Temp. rise at full load			15	25	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection*				1	s
Cooling		Free air convection			
Case material		Plastic (UL94-V0)			
MTBF		3500			K hours
Weight			2.1		g

\*Supply voltage must be discontinued at the end of short circuit duration.

### ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

### OUTPUT SPECIFICATIONS

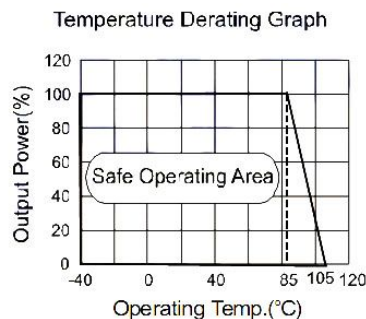
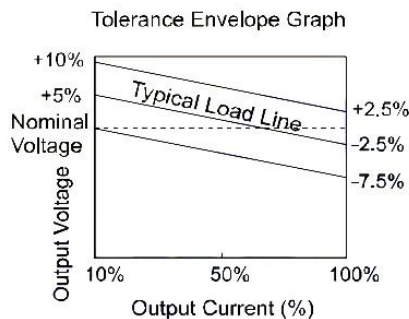
Item	Test conditions		Min	Typ	Max	Units
Output power					0.25	W
Line regulation	For Vin change of ±1%	(3.3V input)			±1.5	
		(Others input)			±1.2	
Load regulation	10% to 100% load	(3.3V output)		12	20	%
		(5V output)		10.5	15	
		(9V output)		8.3	15	
		(12V output)		6.8	15	
		(15V output)		6.3	15	
Output voltage accuracy	See tolerance envelope graph					
Temperature drift	100% full load				0.03	%/°C
Ripple & Noise*	20MHz Bandwidth			50	75	mVp-p
Switching frequency	Full load, nominal input			100		KHz

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

Note:

- All specifications measured at T A =25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- See below recommended circuits for more details.
- Dual output models unbalanced load: ±5%.

### TYPICAL CHARACTERISTICS



### APPLICATION NOTE

#### Requirement on output load

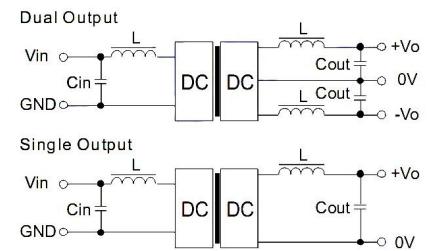
To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load.

#### Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

#### Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).

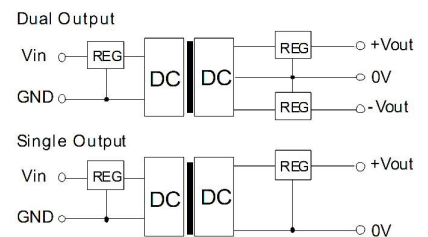


(Figure 1)

It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. It's not recommended to connect any external capacitor in the application field.

#### Output Voltage Regulation and Over-voltage Protection Circuit

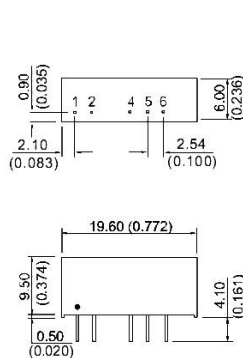
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).



(Figure 2)

No parallel connection or plug and play.

### OUTLINE DIMENSIONS & PIN CONNECTIONS



#### FOOTPRINT DETAILS

Pin	Single	Dual
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo

Note:  
 Unit:mm (inch)  
 Pin section: 0.50\*0.30mm(0.020\*0.012inch)  
 Pin section tolerances: ±0.10mm(±0.004inch)  
 General tolerances: ±0.25mm(±0.010inch)