

The ITQ06 series is housed in a SIP8 plastic case. Featuring a 4:1 input voltage range of 9 to 36VDC or 18 to 75VDC with both single and dual outputs, singles have 3.3, 5, 9, 12, 15 or 24VDC with duals having  $\pm 5$ ,  $\pm 12$  &  $\pm 15$ VDC.

The 6W ITQ06 provides 1.5kVDC isolation between input and output, with 3kV available as an option. The output has short circuit protection, there is no minimum load requirement. remote On/Off is standard.

The operating temperature range is from  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$ , with derating above  $+70^{\circ}\text{C}$ .



### Features

- ▶ Regulated single & dual outputs
- ▶ 4:1 input range
- ▶ Single outputs 3.3 to 24VDC
- ▶ Dual outputs  $\pm 5.0$  to  $\pm 15$ VDC
- ▶ SIP8 package
- ▶ 1.5kVDC isolation, 3.0kVDC option
- ▶ Remote On/Off
- ▶ No minimum load
- ▶  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$  operating temperature
- ▶ 3 year warranty

### Applications



### Dimensions

21.85 x 9.2 x 11.1mm (0.86" x 0.36" x 0.44" )

### Models & ratings

Model number <sup>(3)</sup>	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		Maximum capacitive load
					No load	Full load	
ITQ2403SA	9-36VDC	3.3VDC	1500mA	79%	6mA	261mA	4700 $\mu$ F
ITQ2405SA		5.0VDC	1200mA	84%		298mA	2200 $\mu$ F
ITQ2409SA		9.0VDC	666mA	86%		290mA	1000 $\mu$ F
ITQ2412SA		12.0VDC	500mA	87%		287mA	470 $\mu$ F
ITQ2415SA		15.0VDC	400mA	87%		287mA	220 $\mu$ F
ITQ2424SA		24.0VDC	250mA	87%		287mA	100 $\mu$ F
ITQ2405S		$\pm 5.0$ VDC	$\pm 600$ mA	84%		298mA	$\pm 330$ $\mu$ F
ITQ2412S		$\pm 12.0$ VDC	$\pm 250$ mA	86%		291mA	$\pm 220$ $\mu$ F
ITQ2415S		$\pm 15.0$ VDC	$\pm 200$ mA	87%		287mA	$\pm 100$ $\mu$ F

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#### Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. For optional 3000VDC isolation add suffix '-H' to model number.

## Models & ratings

Model number <sup>(3)</sup>	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		
					No load	Full load	
ITQ4803SA	18-75VDC	3.3VDC	1500mA	79%	6mA	131mA	4700μF
ITQ4805SA		5.0VDC	1200mA	83%		151mA	2200μF
ITQ4809SA		9.0VDC	666mA	85%		147mA	1000μF
ITQ4812SA		12.0VDC	500mA	87%		144mA	470μF
ITQ4815SA		15.0VDC	400mA	87%		144mA	220μF
ITQ4824SA		24.0VDC	250mA	87%		144mA	100μF
ITQ4805S		±5.0VDC	±600mA	82%		152mA	±330μF
ITQ4812S		±12.0VDC	±250mA	85%		147mA	±220μF
ITQ4815S		±15.0VDC	±200mA	86%		145mA	±100μF

### Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. For optional 3000VDC isolation add suffix '-H' to model number.

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		18		24VDC nominal
	18		36		48VDC nominal
Input filter	Capacitor				
Input reflected ripple			20/40	mA pk-pk	24/48V input. Through 12μH inductor and 47μF capacitor
Input surge			50		12VDC nominal
			100		24VDC nominal

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		24		See models and ratings table
Minimum load	0			%	No minimum load required
Initial set accuracy			±1	%	
Line regulation			±0.2	%	
Load regulation			±0.5	%	Single
			±1		Dual
Cross regulation			±5	%	On dual output models when one load is varied between 25% and 100% and other is fixed at 100%
Transient response			±5/±3	% deviation	For 3V3 & 5V output models / all other models. Recovery within 2% in less than 2ms for a 25% load change
Ripple & noise			125	mV pk-pk	20MHz bandwidth, measured using 0.1μF ceramic capacitor
Short circuit protection	Continuous with auto recovery				
Temperature coefficient			0.02	%/°C	
Maximum capacitive load	See models and ratings table				
Remote on/off	Output is on if remote on/off (pin 3) is open Output turns off if 2-4mA is applied to remote on/off (pin 3). Referenced to -Vin.				

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		87			See models and ratings table
Isolation: input to output	1500			VDC	3000VDC option. Add '-H' to model number
Isolation resistance	10 <sup>9</sup>			Ω	
Isolation capacitance		50		pF	
Switching frequency		580	1.5	kHz	
Power density		2.6 (44.0)		W/cm <sup>3</sup> (W/in <sup>3</sup> )	
Mean time between failure	0.8			Mhrs	MIL-HDBK-217F, +25°C GB
Weight		4.8 (0.011)		g (lb)	

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+100	°C	Derate from 100% load at +70°C to no load at +100°C
Storage temperature	-55		+125	°C	
Case temperature			+100	°C	
Cooling	Natural convection				
Operating humidity			95	%	RH, non condensing

## Safety approvals

Safety agency	Standard	Notes & conditions
UL	UL60950-1, UL62368-1	
Others	CAN/CSA C22.2 No. 60950-1 and CSA-C22.2 No. 62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

## Emissions - EMC

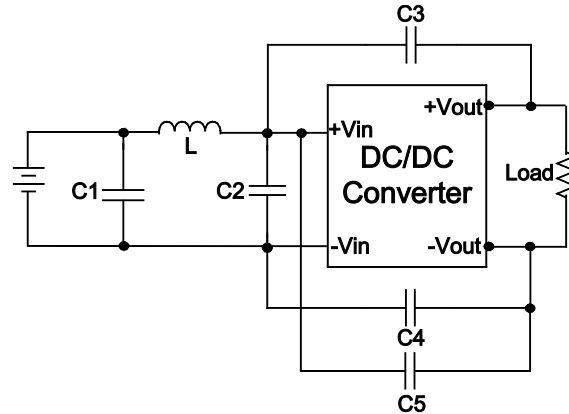
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A	External components required. See application notes.
Radiated	EN55032	Class A	

## Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD Immunity	EN61000-4-2	3	B	
Radiated immunity	EN61000-4-3	20V/m	A	
EFT/Burst	EN61000-4-4	3	B	External input capacitor required, 330μF/100V
Surge	EN61000-4-5	2	B	External input capacitor required, 330μF/100V
Conducted immunity	EN61000-4-6	3Vrms	A	
Magnetic fields	EN61000-4-8	1A/m	A	

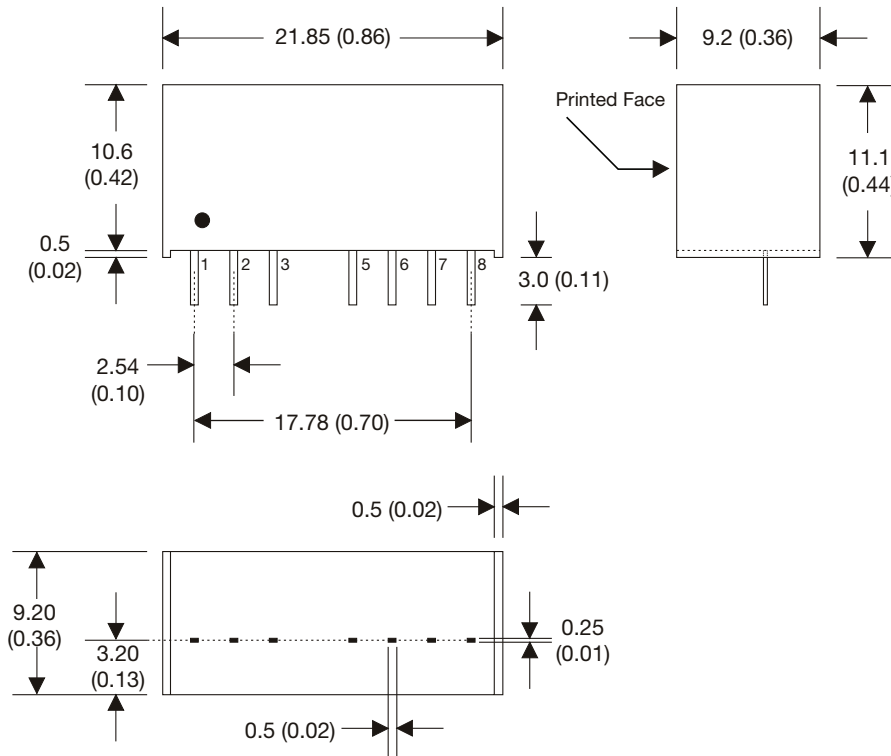
## Application notes

### EMI filter



Model	C1 & C2	L	C3 & C4	C5
ITQ24	10 $\mu$ F (35V)	12 $\mu$ H	470pF (3kV)	n/a
ITQ48	2.2 $\mu$ F (100V)	12 $\mu$ H	1000pF (3kV)	1000pF (3kV)

## Mechanical details



Pin connections		
Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

Pin connections		
Pin	Single -H	Dual -H
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
5	No pin	No pin
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

### Notes:

- All dimensions are in mm (inches)
- Weight: 4.8 (0.011) g (lb) approx.
- Pin pitch tolerance:  $\pm 0.35$  ( $\pm 0.014$ )

- Pin diameter:  $0.5 \pm 0.05$  ( $0.02 \pm 0.002$ )
- Case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )

Specifications subject to change without notice.