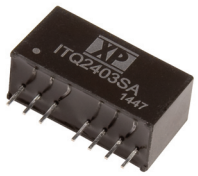
ITQ Series

DC-DC Converter

XP Power

6 Watts

- Regulated Single & Dual Outputs
- Wide 4:1 Input Range
- SIP 8 Package
- Operating Temperature -40 °C to +100 °C
- 1.5 kVDC Isolation
- Optional 3.0 kVDC Version
- UL62368-1 Safety Approved
- No Minimum Load Required
- Remote On/Off
- 3 Year Warranty



Dimensions:

ITQ:
0.86 x 0.36 x 0.44" (21.9 x 9.2 x 11.1 mm)

The ITQ Series offers a compact 6W, cost effective DC-DC module with wide 4:1 input ranges. Outputs are regulated single or dual options. Features include short circuit protection, no minimum load, high efficiency, remote on/off control.

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load[2]	Efficiency	Model Number[3]
			No Load	Full Load			
24V (9-36 V)	3.3 V	1500 mA	6 mA	261 mA	4700 µF	79%	ITQ2403SA
	5 V	1200 mA	6 mA	298 mA	2200 µF	84%	ITQ2405SA
	9 V	666 mA	6 mA	290 mA	1000 µF	86%	ITQ2409SA
	12 V	500 mA	6 mA	287 mA	470 µF	87%	ITQ2412SA
	15 V	400 mA	6 mA	287 mA	220 µF	87%	ITQ2415SA
	24 V	250 mA	6 mA	287 mA	100 µF	87%	ITQ2424SA
	±5 V	±600 mA	6 mA	298 mA	±330 µF	84%	ITQ2405S
	±12 V	±250 mA	6 mA	291 mA	±220 µF	86%	ITQ2412S
	±15 V	±200 mA	6 mA	287 mA	±100 µF	87%	ITQ2415S
48V (18-75 V)	3.3 V	1500 mA	6 mA	131 mA	4700 µF	79%	ITQ4803SA
	5 V	1200 mA	6 mA	151 mA	2200 µF	83%	ITQ4805SA
	9 V	666 mA	6 mA	147 mA	1000 µF	85%	ITQ4809SA
	12 V	500 mA	6 mA	144 mA	470 µF	87%	ITQ4812SA
	15 V	400 mA	6 mA	144 mA	220 µF	87%	ITQ4815SA
	24 V	250 mA	6 mA	144 mA	100 µF	87%	ITQ4824SA
	±5 V	±600 mA	6 mA	152 mA	±330 µF	82%	ITQ4805S
	±12 V	±250 mA	6 mA	147 mA	±220 µF	85%	ITQ4812S
	±15 V	±200 mA	6 mA	145 mA	±100 µF	86%	ITQ4815S

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		36	VDC	24 V nominal
	18		75	VDC	48 V nominal
Input Filter	Capacitor				
Input Reflected Ripple			20/40	mA pk-pk	24/48 V input. Through 12 µH inductor and 47 µF capacitor
Input Surge			50	VDC for 100 ms	24 V models
			100	VDC for 100 ms	48 V models

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		24	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	
Minimum Load	0			A	No minimum load required
Line Regulation			±0.2	%	
Load Regulation			±0.5	%	Single output
			±1	%	Dual output
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	20 MHz bandwidth. Measured using 0.1 µF ceramic capacitor
Short Circuit Protection					Continuous, with auto recovery
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.02	%/°C	
Remote On/Off	Output is on if Remote On/Off (pin 3) is open Output turns off if 2-4 mA is applied to Remote On/Off (pin 3). Referenced to -Vin. Maximum voltage 15VDC.				

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		87		%	See Models and Ratings table
Isolation: Input to Output	1500			VDC	3000 VDC option. Add '-H' to model number
Switching Frequency		580		kHz	
Isolation Resistance	10^9			Ω	
Isolation Capacitance		50		pF	
Power Density			44	Win^3	
Mean Time Between Failure	0.8			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.01 (4.8)		lb (g)	

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	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class A	External components required. See suggested filter below.
Radiated	EN55032	Class A	

EMC: Immunity

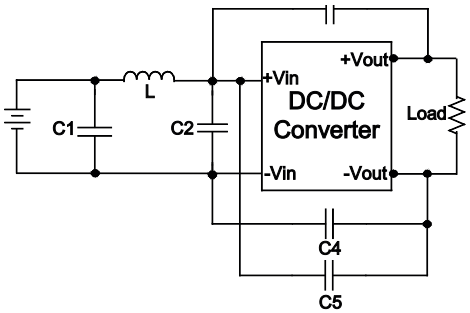
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	3	A	
Radiated Immunity	EN61000-4-3	20 Vrms	A	
EFT/Burst	EN61000-4-4	3	A	External input capacitor required 330 µF/100 V
Surges	EN61000-4-5	Installation class 2	A	External input capacitor required 330 µF/100 V
Conducted Immunity	EN61000-4-6	3 V rms	A	
Magnetic Fields	EN61000-4-8	1 A/m	A	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	UL60950-1, UL62368-1	
CSA	CAN/CSA C22.2 No. 60950-1 and CSA-C22.2 No. 62368-1	

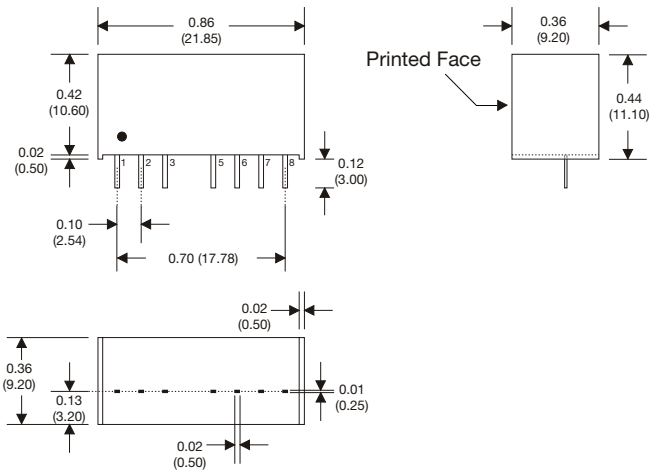
Application Notes

EMI Filter



	C1 & C2	L	C3 & C4	C5
ITQ24	10 µF (35 V)	12 µH	470 pF (3 kV)	n/a
ITQ48	2.2 µF (100 V)	12 µH	1000 pF (3 kV)	1000 pF (3 kV)

Mechanical Details



Pin Connections		
Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
5	N/C	N/C
6	+Vout	+Vout
7	-Vout	Common
8	N/C	-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	N/C	-Vout

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.01lbs (4.8 g) approx.
3. Pin diameter: 0.02±0.002 (0.5±0.05)
4. Pin pitch tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)