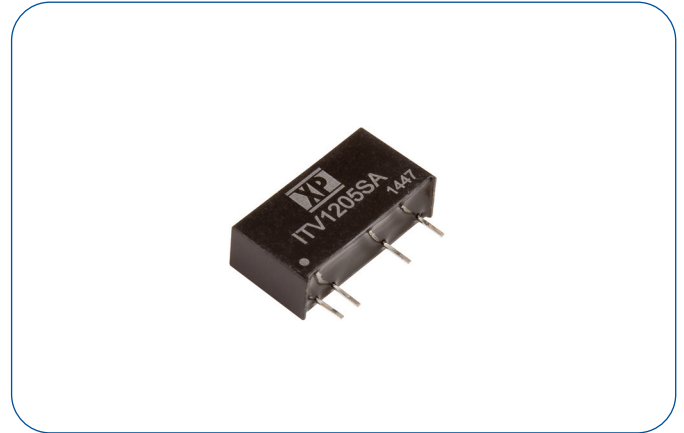


### 1 Watts

- Single & dual output, unregulated
- -40 °C to +105 °C operation
- SIP7 package
- Full load at 95 °C ambient
- 3000 VDC isolation, functional
- Class B radiated emissions
- MTBF >3.5 MHrs
- 3 year warranty



#### Dimensions:

ITV:  
0.76 x 0.24 x 0.39" (19.5 x 6.0 x 10.0 mm)

The ITV series of unregulated DC-DC modules provides an exceptional high operating temperature range while remaining cost effective. Features include short circuit protection and a robust encapsulated package.

### Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current <sup>(1)</sup>		Maximum Capacitive Load <sup>(2)</sup>	Efficiency <sup>(3)</sup>	Model Number
			No Load	Full Load			
5 V	5 V	200 mA	30 mA	253 mA	220 µF	80%	ITV0505SA
	12 V	83.3 mA	30 mA	253 mA	100 µF	80%	ITV0512SA
	15 V	66.7 mA	30 mA	253 mA	100 µF	80%	ITV0515SA
	±5 V	±100 mA	30 mA	253 mA	±100 µF	80%	ITV0505S
	±12 V	±41.6 mA	30 mA	250 mA	±47 µF	81%	ITV0512S
	±15 V	±33.3 mA	30 mA	250 mA	±47 µF	81%	ITV0515S
12 V	5 V	200 mA	15 mA	106 mA	220 µF	80%	ITV1205SA
	12 V	83.3 mA	15 mA	106 mA	100 µF	80%	ITV1212SA
	15 V	66.7 mA	15 mA	104 mA	100 µF	81%	ITV1215SA
	±5 V	±100 mA	15 mA	106 mA	±100 µF	80%	ITV1205S
	±12 V	±41.6 mA	15 mA	106 mA	±47 µF	80%	ITV1212S
	±15 V	±33.3 mA	15 mA	104 mA	±47 µF	81%	ITV1215S
24 V	5 V	200 mA	7 mA	53 mA	220 µF	80%	ITV2405SA
	12 V	83.3 mA	7 mA	53 mA	100 µF	80%	ITV2412SA
	15 V	66.7 mA	7 mA	53 mA	100 µF	80%	ITV2415SA
	±5 V	±100 mA	7 mA	53 mA	±100 µF	80%	ITV2405S
	±12 V	±41.6 mA	7 mA	53 mA	±47 µF	80%	ITV2412S
	±15 V	±33.3 mA	7 mA	53 mA	±47 µF	80%	ITV2415S

### Notes

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. Measured at nominal input voltage and full load.

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5		5.5	VDC	5 V nominal
	10.8		13.2	VDC	12 V nominal
	21.6		26.4	VDC	24 V nominal
Input Filter	Capacitor				
Input Reflected Ripple			15	mA pk-pk	Through 12 $\mu$ H inductor and 47 $\mu$ F capacitor
Input Surge			9	VDC for 1000 ms	5 V models
			18	VDC for 1000 ms	12 V models
			30	VDC for 1000 ms	24 V models

### Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	5		15	VDC	See Models and Ratings table
Initial Set Accuracy			$\pm 5$	%	At 70% load
Minimum Load	10			%	Minimum load required to meet specification. Operation at no load will not cause damage.
Line Regulation			$\pm 1.2$	%/1%Vin	
Load Regulation			+5, -2.5	%	From 10% to full load from 70% load point
Cross Regulation			$\pm 5$	%	On dual output models when one load is varied between 25% and 100% and other is fixed at 100%
Ripple & Noise			60	mV pk-pk	20 MHz bandwidth. Measured using 0.1 $\mu$ F ceramic capacitor
Short Circuit Protection					Continuous, with auto recovery
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.02	%/°C	

### General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		80		%	See Models and Ratings table
Isolation: Input to Output	3000			VDC	60s qualification. Functional insulation.
Working Voltage			100	VAC	
Switching Frequency	40/50		50/70	kHz	5 V/12-24 V input
Isolation Resistance	10 <sup>9</sup>			$\Omega$	
Isolation Capacitance		50		pF	
Power Density			14	Win <sup>3</sup>	
Mean Time Between Failure	3.6			MHrs	MIL-HDBK-217F, +25 °C GB
Pin Type	Solder coated phosphor bronze				C5191R-H
Case Material	Non conductive black plastic				UL94V-0 rated
Potting Material	Epoxy				UL94V-0 rated
Solder Profile	260°C maximum				1.5mm from case, up to 10s max
Weight		0.0053 (2.4)		lb (g)	

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+105	°C	Derate from 100% load at +95 °C to 90% at +105 °C
Storage Temperature	-55		+125	°C	
Case Temperature			+115	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection

### Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

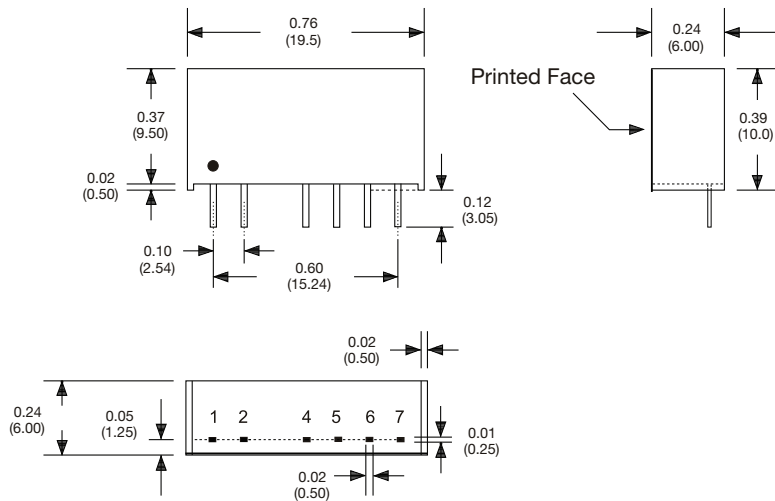
### EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55022	Class B	See Application Note
Radiated	EN55022	Class B	

### EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	3	A	
Radiated Immunity	EN61000-4-3	10 Vrms	A	
EFT/Burst	EN61000-4-4	3	A	External input capacitor required 330 $\mu$ F/100 V
Surges	EN61000-4-5	1	A	External input capacitor required 330 $\mu$ F/100 V
Conducted Immunity	EN61000-4-6	3 V rms	A	
Magnetic Fields	EN61000-4-8	1 A/m	A	

### Mechanical Details



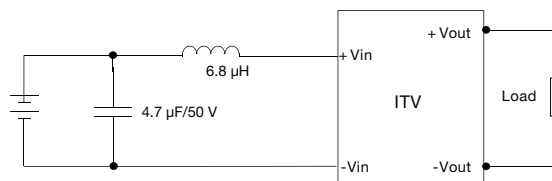
Pin Connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	No Pin	No Pin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

### Notes

- All dimensions are in inches (mm)
- Weight: 0.0053lbs (2.4 g) approx.
- Pin diameter: 0.02 $\pm$ 0.002 (0.5 $\pm$ 0.05)
- Pin pitch tolerance:  $\pm$ 0.014 ( $\pm$ 0.35)
- Case tolerance:  $\pm$ 0.02 ( $\pm$ 0.5)

### Application Note

#### EMI Filter



1206 Chip Capacitor, placed as close as possible to the input pins

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