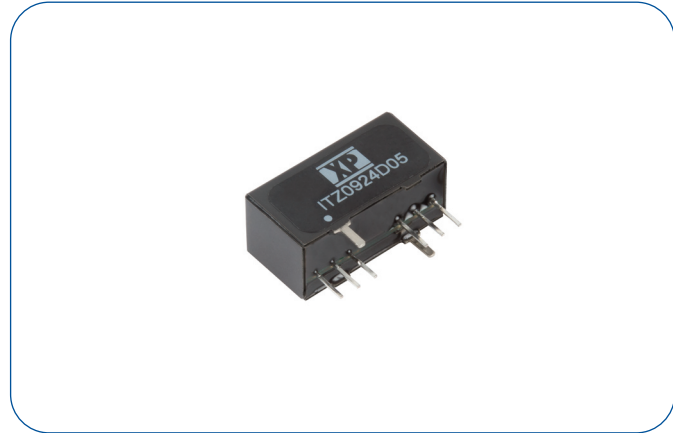


### 9 Watts

- Ultra Compact SIP-8 Package
- Smallest Footprint 9 W Converter
- Single & Dual Outputs
- 4:1 Input Range
- Operating Temperature -40 °C to +85 °C
- 1600 VDC Isolation (Functional Insulation)
- Fully Regulated Output
- No Minimum Load Required
- Remote On/Off
- 3 Year Warranty



#### Dimensions:

ITZ:  
0.86 x 0.38 x 0.44" (21.9 x 9.6 x 11.2 mm)

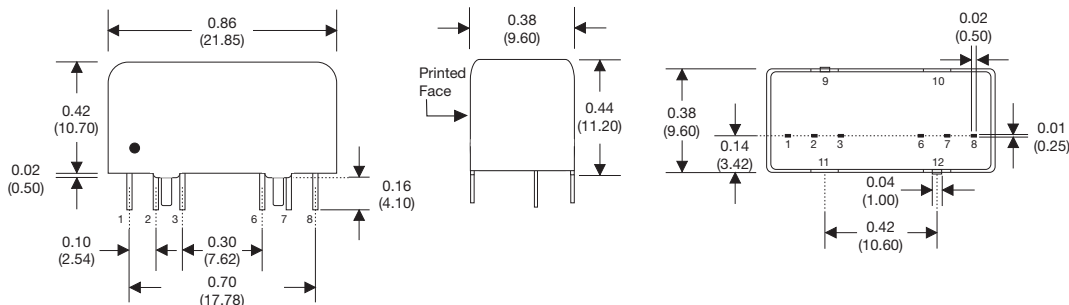
### Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current <sup>(1)</sup>		Maximum Capacitive Load <sup>(2)</sup>	Efficiency	Model Number
			No Load	Full Load			
24V (9-36 V)	3.3 V	2000 mA	9 mA	335 mA	2600 µF	82%	ITZ0924S3V3
	5 V	1600 mA	9 mA	390 mA	1300 µF	85%	ITZ0924S05
	9 V	1000 mA	9 mA	425 mA	800 µF	86%	ITZ0924S09
	12 V	750 mA	9 mA	425 mA	560 µF	88%	ITZ0924S12
	15 V	600 mA	9 mA	420 mA	560 µF	89%	ITZ0924S15
	24 V	375 mA	9 mA	420 mA	200 µF	89%	ITZ0924S24
	±5 V	±800 mA	9 mA	390 mA	±800 µF	85%	ITZ0924D05
	±12 V	±375 mA	9 mA	425 mA	±390 µF	88%	ITZ0924D12
48V (18-75 V)	±15 V	±300 mA	9 mA	430 mA	±200 µF	88%	ITZ0924D15
	3.3 V	2000 mA	5 mA	170 mA	2600 µF	82%	ITZ0948S3V3
	5 V	1600 mA	5 mA	195 mA	1300 µF	85%	ITZ0948S05
	9 V	1000 mA	5 mA	215 mA	800 µF	86%	ITZ0948S09
	12 V	750 mA	5 mA	212 mA	560 µF	89%	ITZ0948S12
	15 V	600 mA	5 mA	210 mA	560 µF	88%	ITZ0948S15
	24 V	375 mA	5 mA	210 mA	200 µF	88%	ITZ0948S24
	±5 V	±800 mA	5 mA	195 mA	±800 µF	85%	ITZ0948D05
±12 V	±375 mA	5 mA	215 mA	±390 µF	87%	ITZ0948D12	
±15 V	±300 mA	5 mA	215 mA	±200 µF	87%	ITZ0948D15	

### Notes

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

### Mechanical Details



Pin Connections		
Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
6	+Vout	+Vout
7	-Vout	Common
8	No Connection	-Vout
9	Case	Case
10	Stand Off	Stand Off
11	Stand Off	Stand Off
12	Case	Case

### Notes

1. All dimensions are in inches (mm)
2. Weight: 0.257 lbs (7.3 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)

### 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 $\mu$ H inductor and 47 $\mu$ F 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		30	VDC	See Models and Ratings table
Initial Set Accuracy			$\pm 1$	%	At full load
Minimum Load	0			A	No minimum load required
Line Regulation			$\pm 0.2$	%	
Load Regulation			$\pm 0.5$	%	Single output from 0 to full load
			$\pm 1$	%	Dual output and single 3V3 output from 0 to full load
Cross Regulation			$\pm 5$	%	On dual output models when one load is varied between 25% and 100% and other is fixed at 100%
Transient Response			$\pm 5/\pm 3$	% deviation	For 3V3 & 5V output models / all other models. Recovery within 2% in less than 2ms for a 25% load change
Ripple & Noise			75	mV pk-pk	20 MHz bandwidth. Measured using 0.1 $\mu$ F ceramic capacitor
Short Circuit Protection					Continuous, with auto recovery
Over Voltage Protection		130		%	
Over Load Protection		180		%	
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 circuit. Output is off if 2-4 mA current is applied to remote on/off (pin 3) via 1 k $\Omega$ resistor. Maximum pin voltage is 5 V and maximum current into pin 3 is 4 mA. Note: Output may be affected with current into the pin as low as 10 $\mu$ A.				

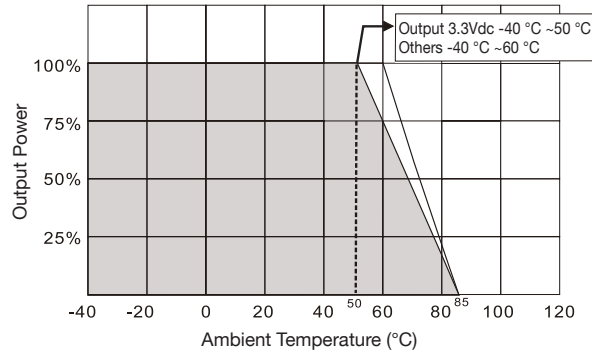
### General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	See Models and Ratings table
Isolation: Input to Output	1600			VDC	For 60 seconds. Insulation: Functional
Isolation: Input/Output to Case	1000			VDC	For 60 seconds. Insulation: Functional
Continuous Working Voltage: Input to Output			500	VDC	200V r.m.s.
Switching Frequency		400/500		kHz	24 V input/48 V input
Isolation Resistance	$10^9$			$\Omega$	
Isolation Capacitance		50		pF	
Power Density			65	Win <sup>3</sup>	
Mean Time Between Failure	900			KHrs	MIL-HDBK-217F, +25 °C GB
Case Material					Copper
Potting Material					Epoxy UL94V-0 rated
Pin Material					Solder coated phosphur bronze C519R-H
Solder Profile					260 °C max, 1.5mm from case 10s max
Weight		0.257 (7.3)		lb (g)	

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+85	°C	Derate from 100% load at +60 °C to no load at +85 °C, and 100% load at 50 °C to no load at 85 °C for 3V3 models
Storage Temperature	-55		+125	°C	
Case Temperature			+100	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection

### Derating Curve



### EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class A	See application note
Radiated	EN55032	Class A	See application note

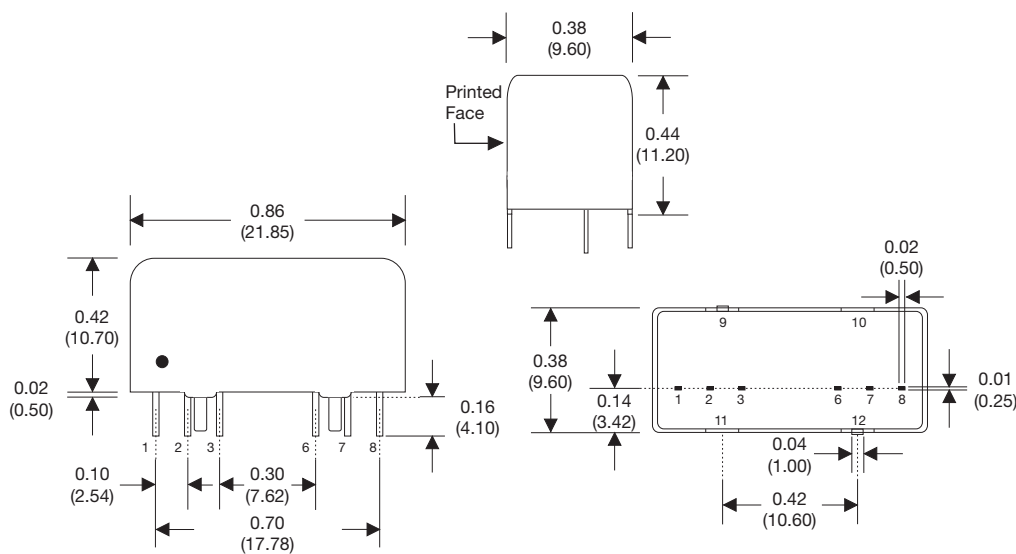
### EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	±6 kV/±8 kV	A	Contact/Air Discharge
Radiated Immunity	EN61000-4-3	20 Vrms	A	
EFT/Burst	EN61000-4-4	±2 kV	A	See application note
Surges	EN61000-4-5	±2 kV	A	See application note
Conducted Immunity	EN61000-4-6	10 V rms	A	
Magnetic Fields	EN61000-4-8	100 A/m	A	

### Safety Approvals

Agency	Standard	Notes & Conditions
UL	UL/cUL 60950-1, 62368-1	ITE
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

### Mechanical Details



Pin Connections		
Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
6	+Vout	+Vout
7	-Vout	Common
8	No Connection	-Vout
9	Case	Case
10	Stand Off	Stand Off
11	Stand Off	Stand Off
12	Case	Case

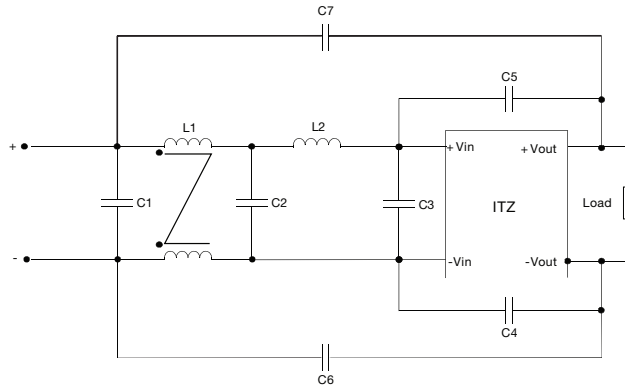
### Notes

- All dimensions are in inches (mm)
- Weight: 0.013 lbs (5.9 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)
- Pin pitch tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

### Application Notes

#### EMI Filter

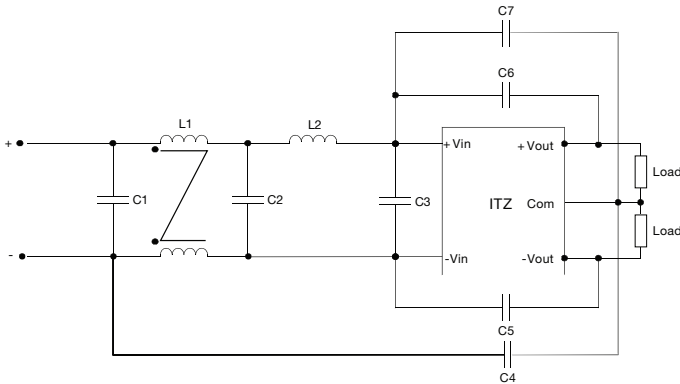
##### Single Output Models



Models	C1,C2,C3	C4, C5, C6, C7	L1	L2
24 Vin	1210, 10 $\mu$ F/35 V	1808, 220pF/3 kV	20 $\mu$ H	20 $\mu$ H
48 Vin	1210, 4.7 $\mu$ F/100 V	1808, 1000pF/3 kV	133 $\mu$ H	10 $\mu$ H

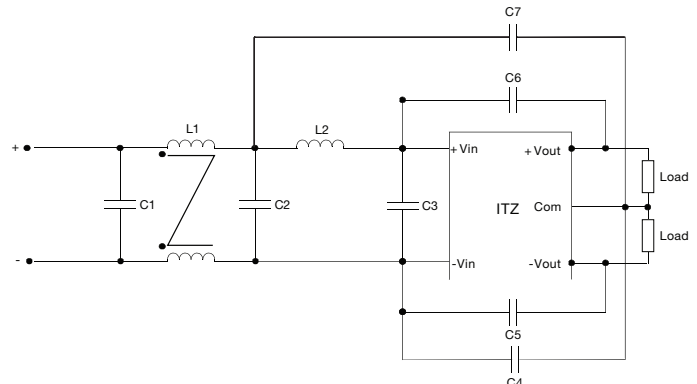
##### Dual Output Models

##### 24 V Version



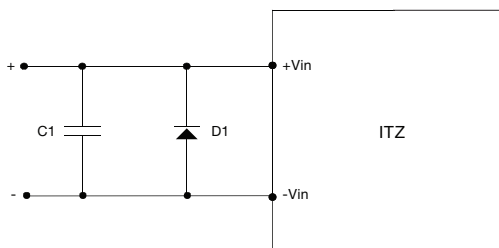
Models	C1,C2,C3	C4, C5, C6	C7	L1	L2
24 Vin	1210, 10 $\mu$ F/35 V	1808, 220pF/3 kV	1808, 1000pF/3 kV	20 $\mu$ H	20 $\mu$ H

##### 48 V Version



Models	C1,C2,C3	C5, C6	C4, C7	L1	L2
48 Vin	1210, 4.7 $\mu$ F/100 V	1808, 1000pF/3 kV	1808, 220pF/3 kV	133 $\mu$ H	10 $\mu$ H

#### EFT/Surge Filter



Models	C1	D1
24 Vin	330 $\mu$ F, 100 V	TVS, 3 kW, 70 V
48 Vin	330 $\mu$ F, 100 V	TVS, 3 kW, 120 V

C1 suggested series Nippon Chemicon KY