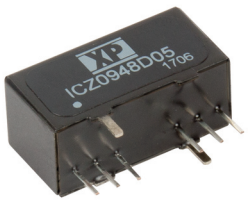
THE DATASHEET OF

ICZ0924D12

9 Watts

- Ultra Compact SIP8 Package
- Smallest Footprint 9W Converter
- Single & Dual Outputs
- 2:1 Input Range
- Operating Temperature -40°C to +85°C
- 1.6kVDC Input to Output Isolation
- Fully Regulated Output
- No Minimum Load Required
- Remote On/Off
- 3 Year Warranty



Dimensions:

ICZ:
0.86 x 0.38 x 0.44" (21.8 x 9.6 x 11.2 mm)

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load[2]	Efficiency	Model Number
			No Load	Full Load			
12V (9-18 V)	3.3 V	2000 mA	15 mA	679 mA	2600 µF	81%	ICZ0912S3V3
	5.0 V	1600 mA	15 mA	784 mA	1300 µF	85%	ICZ0912S05
	9.0 V	1000 mA	15 mA	862 mA	800 µF	87%	ICZ0912S09
	12.0 V	750 mA	15 mA	852 mA	560 µF	88%	ICZ0912S12
	15.0 V	600 mA	15 mA	843 mA	470 µF	89%	ICZ0912S15
	24.0 V	375 mA	15 mA	843 mA	200 µF	89%	ICZ0912S24
	±5.0 V	±800 mA	15 mA	784 mA	±800 µF	85%	ICZ0912D05
	±12.0 V	±375 mA	15 mA	852 mA	±390 µF	88%	ICZ0912D12
	±15.0 V	±300 mA	15 mA	843 mA	±200 µF	89%	ICZ0912D15
24V (18-36 V)	3.3 V	2000 mA	15 mA	344 mA	2600 µF	80%	ICZ0924S3V3
	5.0 V	1600 mA	15 mA	392 mA	1300 µF	85%	ICZ0924S05
	9.0 V	1000 mA	15 mA	426 mA	800 µF	88%	ICZ0924S09
	12.0 V	750 mA	15 mA	421 mA	560 µF	89%	ICZ0924S12
	15.0 V	600 mA	15 mA	417 mA	470 µF	90%	ICZ0924S15
	24.0 V	375 mA	15 mA	417 mA	200 µF	90%	ICZ0924S24
	±5.0 V	±800 mA	15 mA	388 mA	±800 µF	86%	ICZ0924D05
	±12.0 V	±375 mA	15 mA	421 mA	±390 µF	89%	ICZ0924D12
	±15.0 V	±300 mA	15 mA	431 mA	±200 µF	87%	ICZ0924D15
48V (36-75 V)	3.3 V	2000 mA	10 mA	168 mA	2600 µF	82%	ICZ0948S3V3
	5.0 V	1600 mA	10 mA	196 mA	1300 µF	85%	ICZ0948S05
	9.0 V	1000 mA	10 mA	213 mA	800 µF	88%	ICZ0948S09
	12.0 V	750 mA	10 mA	211 mA	560 µF	89%	ICZ0948S12
	15.0 V	600 mA	10 mA	211 mA	470 µF	89%	ICZ0948S15
	24.0 V	375 mA	10 mA	211 mA	200 µF	89%	ICZ0948S24
	±5.0 V	±800 mA	10 mA	194 mA	±800 µF	86%	ICZ0948D05
	±12.0 V	±375 mA	10 mA	216 mA	±390 µF	87%	ICZ0948D12
	±15.0 V	±300 mA	10 mA	216 mA	±200 µF	87%	ICZ0948D15

Notes

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. Standard tube quantity = 20

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	9		18	VDC	12 V nominal
	18		36	VDC	24 V nominal
	36		75	VDC	48 V nominal
Input Filter	Capacitor				
Input Reflected Ripple			30	mA pk-pk	Through 12 µH inductor and 47 µF capacitor
Input Surge			25	VDC for 100 ms	12 V models
			50	VDC for 100 ms	24 V models
			100	VDC for 100 ms	48 V models
Undervoltage Lockout	On at >8.9 V, Off at <7.1 V				12 V models
	On at >16 V, Off at <13.1 V				24 V models
	On at >33 V, Off at <30.1 V				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			±1	%	At full load
Minimum Load	0			A	No minimum load required
Line Regulation			±0.2	%	
Load Regulation			±0.5	%	Single output from 0 to full load
			±1	%	3V3 and dual output from 0 to full load
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 output models / all other models. Recovery within 2% in less than 250 µs for a 25% load change
Ripple & Noise			75	mV pk-pk	3.3-9V/12-24V. 20 MHz bandwidth. Measured using 1 µF ceramic and 10 µF electrolytic capacitors
Overload Protection		150		%	
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 an open circuit or if the voltage on pin 3 is ≤0.1VDC Output is OFF if a voltage (max 5VDC) is applied to the remote On / Off (pin 3) with a maximum current of 4mA Note: For correct operation ensure pin 3 current is >11µA.				

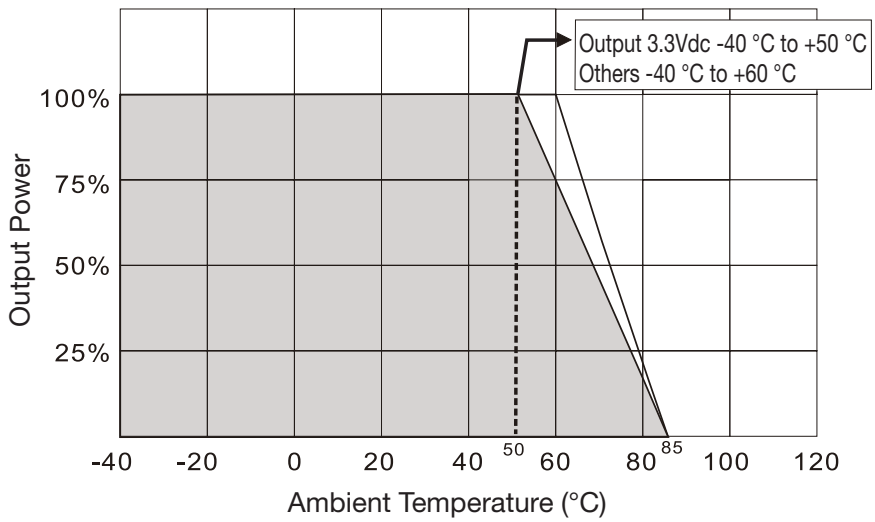
General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	See Models and Ratings table
Isolation: Input to Output	1600			VDC	For 60s. Insulation: Functional
Isolation: Input to Case	1000				For 60s. Insulation: Functional
Continuous Working Voltage: Input to Output			500	VDC	200V r.m.s.
Switching Frequency		400/500		kHz	12 and 24 Vin/48 Vin
Isolation Resistance	10^9			Ω	
Isolation Capacitance		50		pF	
Power Density			65	W/in³	
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 phosphor bronze C519R-H
Solder Profile					260 °C max, 1.5mm from case 10s max
Water Washing					Use de-ionised water only, dry thoroughly
Weight		0.016 (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. Derate from 100% load at +50 °C to no load at +85 °C for 3V3 output 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

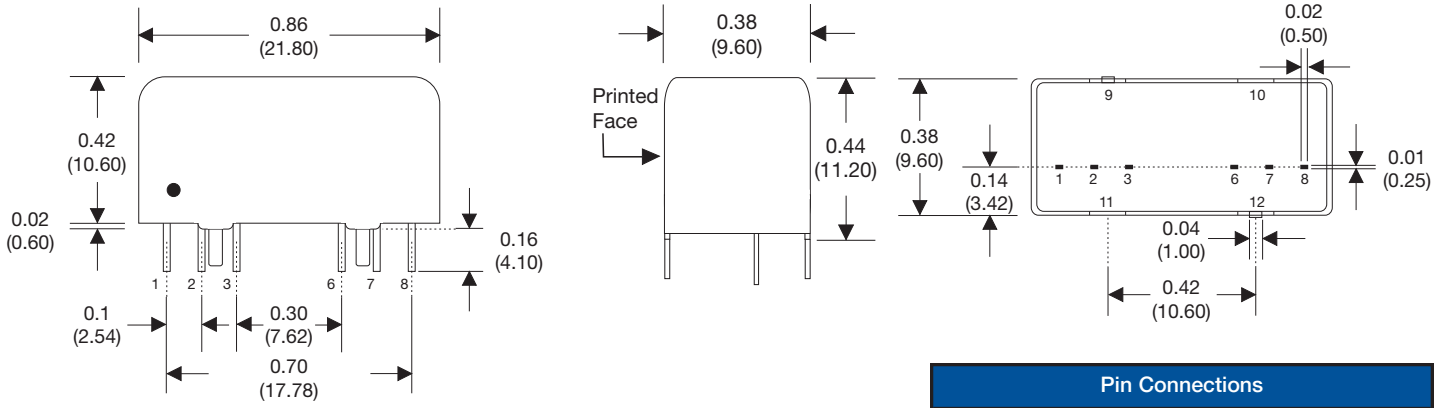
EMC: Immunity

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

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

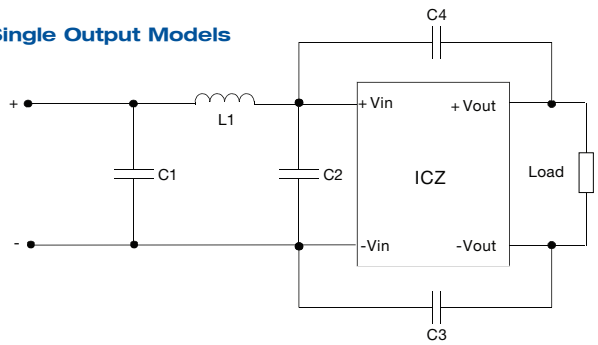
Notes

1. All dimensions are in inches (mm)
2. Weight: 0.016 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)

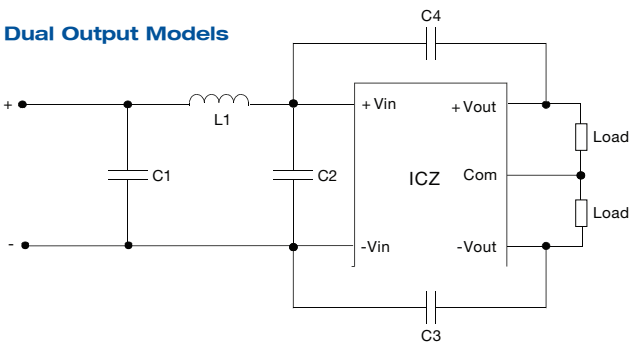
Application Notes

EMI Filter

Single Output Models

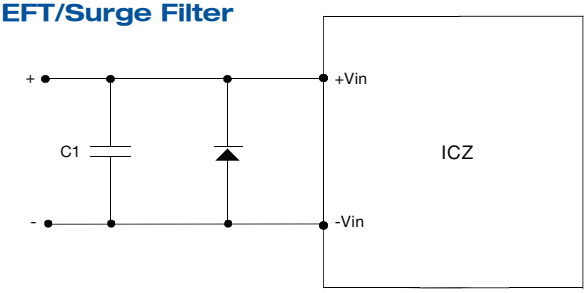


Dual Output Models



Models	C1	C2	C3, C4	L1
12 Vin	1210, 10µF/35 V		1808, 1000 pF/ 3kV	3.3µH
24 Vin & 48 Vin	1210, 4.7µF /100 V	1210, 4.7µF/100 V	1808, 1000 pF/ 3kV	10µH

EFT/Surge Filter



Models	C1	D1
12 Vin	330 µF, 100 V	TVS, 3 kW, 26 V
24 Vin	330 µF, 100 V	TVS, 3 kW, 70 V
48 Vin	330 µF, 100 V	TVS, 3 kW, 120 V

C1 suggested series Nippon Chemicon KY

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