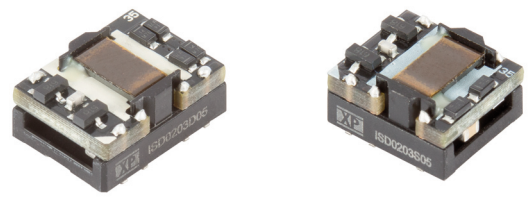
ISD02 Series

DC-DC Converter

XP Power

2 Watt

- Single & dual outputs
- ±10% input range
- Ultra-compact SMD package
- 4.2kV isolation qualification tested
- 250VAC/400VDC working voltage
- Class B conducted emissions (with minimal additional components)
- Tape & reel package available
- -40°C to +105°C operating temperature
- Full power to +85°C
- MTBF >6.5MHrs at 25°C (MIL-HDBK-21F, +25°C GB)
- 3 year warranty



Dimensions:

ISD02xxS: 0.5 x 0.44 x 0.27″ (12.7 x 11.2 x 6.85 mm)
ISD02xxD: 0.6 x 0.44 x 0.27″ (15.24 x 11.2 x 6.85 mm)

The ISD02 series is a compact SMD, open frame construction providing a cost effective DC-DC converter with high performance features such as 4.2kV isolation, full load operating temperature to 85 °C, high reliability and short circuit protection. Available in single or dual output variants this product family is ideal for signal conditioning and voltage matching.

Models & Ratings

Input voltage	Output voltage	Output current	Input current[1,2]		Maximum capacitive load[3]	Efficiency	Model number[3]
			No load	Full load			
3V3 (2.97-3.63 V)	3.3 V	500 mA	60 mA	650 mA	470 µF	77%	ISD0203S3V3
	5.0 V	400 mA		780 mA	470 µF	78%	ISD0203S05
	±3.3 V	±303 mA		780 mA	±220 µF	78%	ISD0203D03
	±5.0 V	±200 mA		760 mA	±220 µF	80%	ISD0203D05
5V (4.5-5.5 V)	3.3 V	500 mA	45 mA	440 mA	470 µF	76%	ISD0205S3V3
	5.0 V	400 mA		515 mA	470 µF	78%	ISD0205S05
	±3.3 V	±303 mA		540 mA	±220 µF	76%	ISD0205D03
	±5.0 V	±200 mA		495 mA	±220 µF	81%	ISD0205D05

Notes

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. For optional tape & reel package version, add suffix '-TR' e.g. ISD0205S05-TR. Reel size 500 pcs.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	2.97		3.63	VDC	3V3 nominal
	4.50		5.50		5 V nominal
Input Filter	Internal Capacitor				
Input Surge			5	VDC for 1s	3V3 nominal
			9		5 V nominal
Input Reflected Ripple Current		20		mA pk-pk	Measured with 12 µH inductance with 47 µF input capacitor

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Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		5	VDC	See Models and Ratings table
Initial Set Accuracy					See output tolerance curve
Output Voltage Balance			±0.3	%	For dual output with balanced loads
Minimum Load	10			%	Minimum load required for voltage regulation
Line Regulation			±1.2	% / 1%	Output changes by max of 1.2% for each 1% change in input voltage
Load Regulation					See output tolerance curve
Ripple & Noise			150/±150	mV pk-pk	Single/Dual Output. 20 MHz bandwidth. Measured using 10 µF electrolytic capacitor in parallel with 0.1 µF ceramic capacitor
Short Circuit Protection			500	ms	Auto recovery
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.03	%/˚C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		78		%	See Models and Ratings table
Isolation: Input to Output	4200			VDC	60s qualification test, 3s production test. Working voltage 250 VACrms/400 VDC insulation designation for safety approvals: functional
Isolation Resistance	10^9			Ω	At 1000 VDC
Isolation Capacitance		25		pF	
Switching Frequency	40		80	kHz	Variable
Power Density			33.6	W/in³	
Mean Time Between Failure	6.5			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.003 (1.52) 0.004 (1.80)		lb (g)	For single output For dual output
Moisture Sensitivity Level	Level 1				IPC/JEDEC J-STD-020D.1
PCB Pad Material	Copper				
PCB Pad Solder Coating	Lead free HASL				
Vibration	Tested to MIL-STD 810F Cat 24, 514. 5C-17 Random Vibration				
Case Flammability	UL94V-0 Rated				Non conductive black plastic
Lead-Free Reflow Solder Process	IPC/JEDEC J-STD-020D.1				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+105	°C	See Derating Curve.
Storage Temperature	-55		+125	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See application notes
Radiated	EN55032	Class B	See application notes

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	±8 kV	A	Air Discharge
Radiated Immunity	EN61000-4-3	3 V/m	A	
EFT/Burst	EN61000-4-4	2 kV	A	External components required, see application notes.
Surge	EN61000-4-5	2 kV	A	External components required, see application notes
Conducted Immunity	EN61000-4-6	10 V rms	A	
Magnetic Fields	EN61000-4-8	100 A/m	A	

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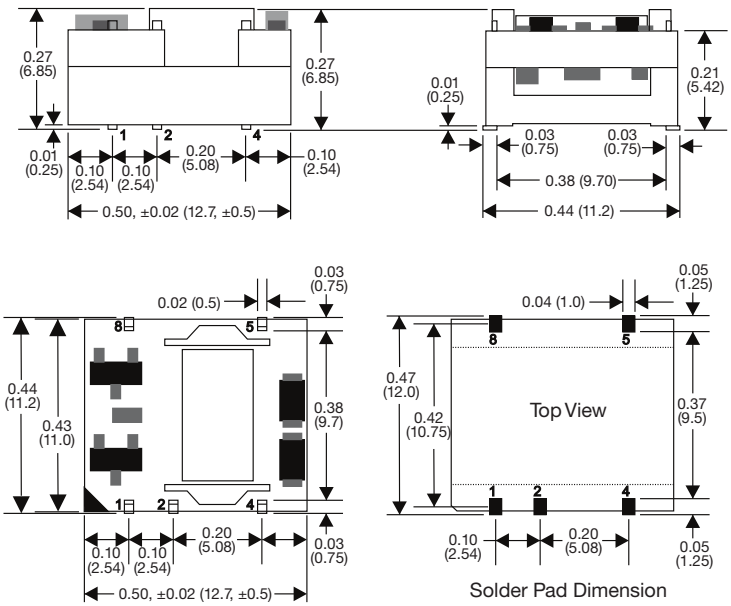
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	UL60601-1, UL62368-1	Designed to meet
TUV	EN60601-1, EN62368-1	
CB	IEC60601-1, IEC62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

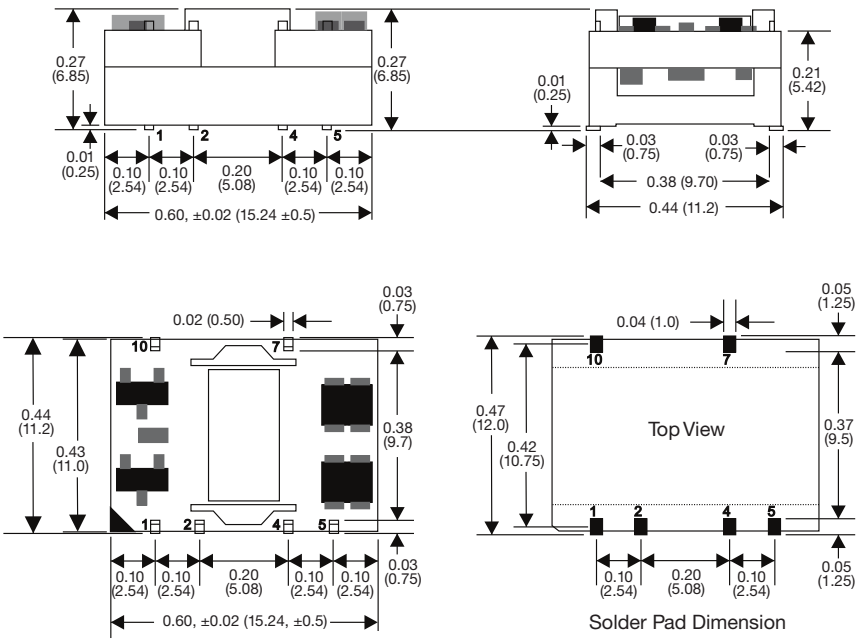
Mechanical Details

Single Output



Pin Connections	
Pin	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout
8	N/C

Dual Output



Pin Connections	
Pin	Dual
1	-Vin
2	+Vin
4	Common
5	-Vout
7	+Vout
10	N/C

Notes

1. All dimensions are in inches (mm)
2. Tolerance: X.XX±0.01 (X.X±0.25)

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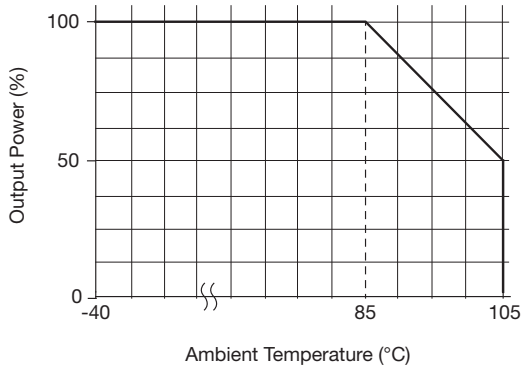
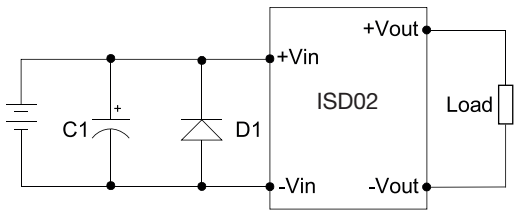
Application Notes

Thermal Derating Curve



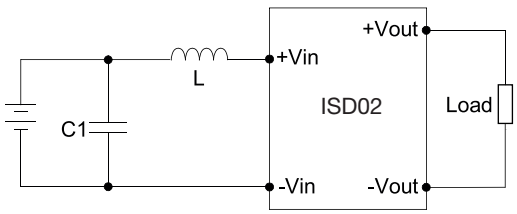
EFT & Surge Filter



	C1	D1
Input 3.3 V	220 µF/35 V	SMDJ6.0A
Input 5.0 V	330 µF/50 V	SMDJ9.0A

D1: Transient Voltage Suppression Diode

EMI Filter



C1	L
1206, 22 µF	6.8 µH

Protection

For UL compliance an input anti-surge line fuse must be fitted: Input 3V3, 2A slow burn fuse
Input 5V, 1A slow burn fuse

UL recognised fuses are recommended and should be rated to the maximum input voltage as a minimum

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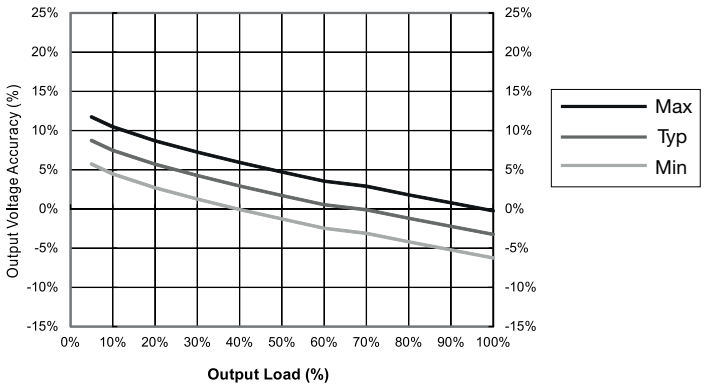
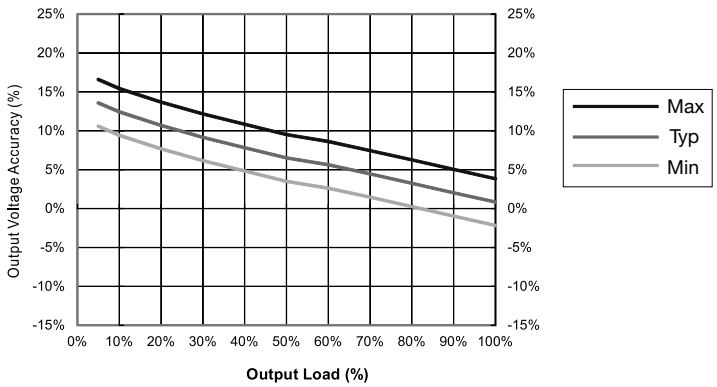
Application Notes

Output Voltage Tolerance

ISD0203S3V3



ISD0203S05



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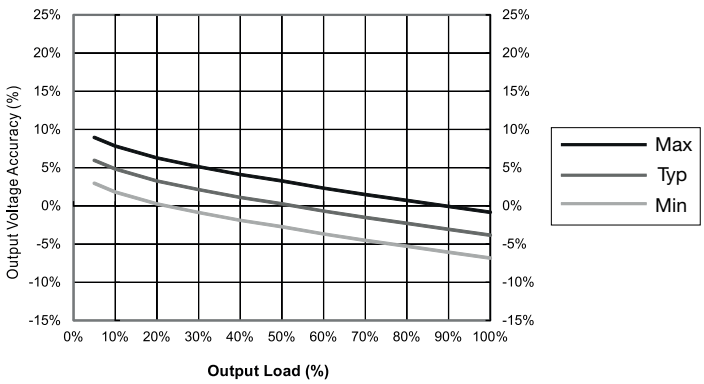

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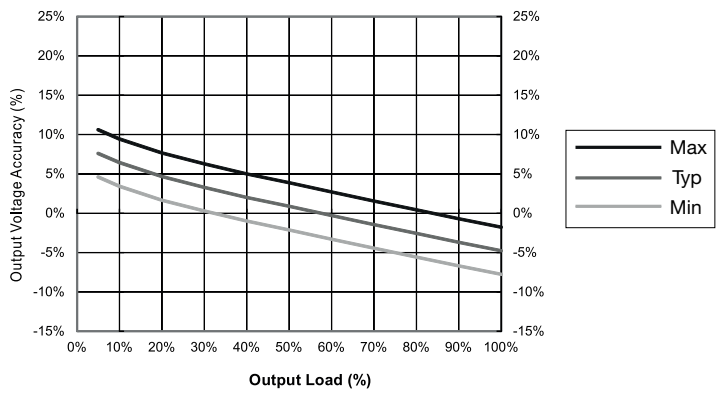

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Application Notes

Output Voltage Tolerance

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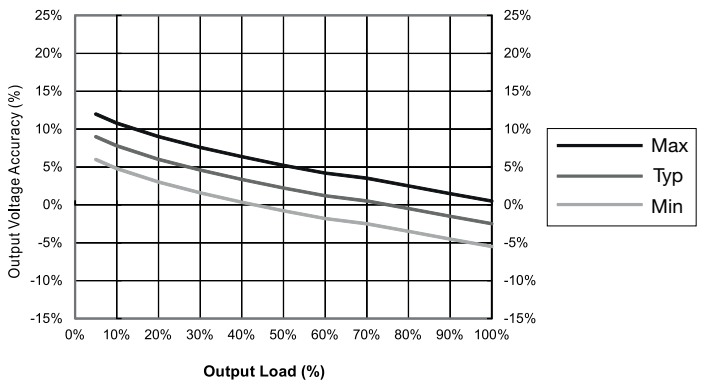

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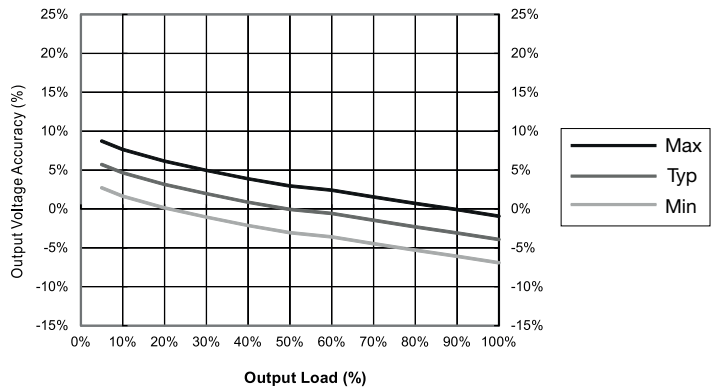

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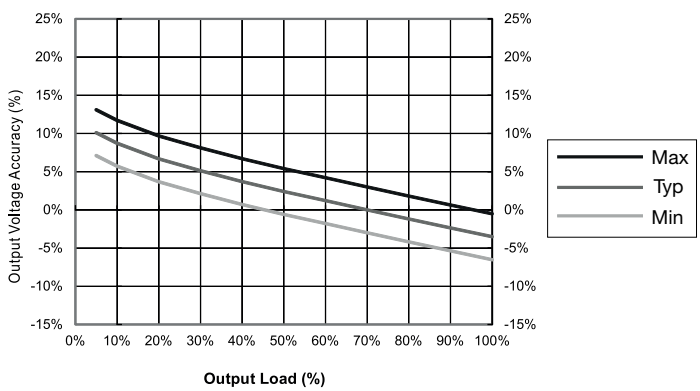

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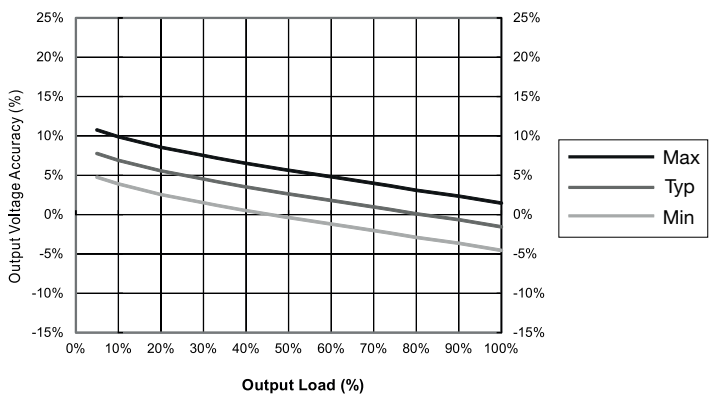

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