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ITR03 Series

DC-DC Converter

XP Power

3 Watts

- Unregulated Single Outputs from 5 to 15VDC
- ±10% Input Range, Nominal 5V, 12V and 24VDC
- Compact SIP4 Package
- 3.0kVDC Input/Output Isolation
- High Efficiency
- Complies with EN55032 Class B
- -40°C to +100°C Operating Temperature
- Full Power Operating Temperature up to +85°C
- MTBF >6.7 Mhrs (MIL-HDBK-217F, +25°C GB)
- 3 Year Warranty



Dimensions:

ITR03: 0.46 x 0.38 x 0.29" (11.8 x 9.66 x 7.5mm)

The ITR series offers a 3W compact isolated, cost effective DC-DC module with a practical range of input voltages and output voltages. Features include high efficiency, industrial temperature range and a robust encapsulated construction.

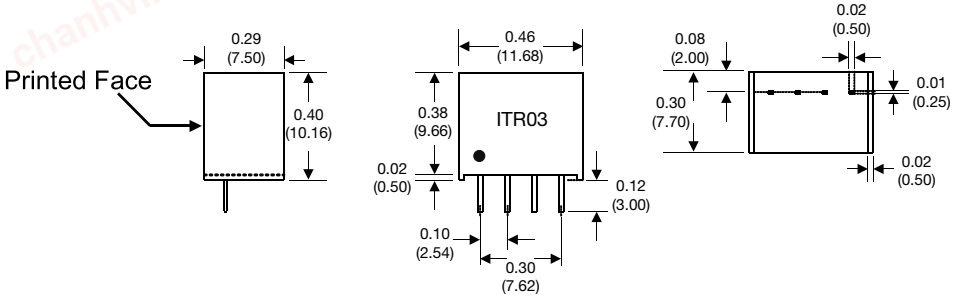
Models & Ratings

Input Voltage	Output Voltage	Output Current (Full Load)	Input Current[1]		Maximum Capacitive Load[2]	Efficiency	Model Number
			No Load	Full Load			
5V (4.5 -5.5V)	5V	600mA	50mA	723mA	3300µF	83%	ITR0305S05
	9V	333mA	60mA	690mA	1200µF	87%	ITR0305S09
	12V	250mA	55mA	682mA	1000µF	88%	ITR0305S12
	15V	200mA	60mA	682mA	820µF	88%	ITR0305S15
12V (10.8 - 13.2V)	5V	600mA	25mA	294mA	3300µF	85%	ITR0312S05
	9V	333mA	30mA	281mA	1200µF	89%	ITR0312S09
	12V	250mA	30mA	278mA	1000µF	90%	ITR0312S12
	15V	200mA	30mA	275mA	820µF	91%	ITR0312S15
24V (21.6 - 26.4V)	5V	600mA	15mA	147mA	3300µF	85%	ITR0324S05
	9V	333mA	15mA	141mA	1200µF	89%	ITR0324S09
	12V	250mA	15mA	139mA	1000µF	90%	ITR0324S12
	15V	200mA	15mA	138mA	820µF	91%	ITR0324S15

Notes

1. Input currents measured at nominal input voltage.
2. All specifications at Ta = 25°C.
3. Standard tube quantity 40 pcs.

Mechanical Details



Pin Connections	
Pin	Single
1	-Vin
2	+Vin
3	-Vout
4	+Vout

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.0048lbs (2.2 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)

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Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5	5	4.5	VDC	ITR0305 Series
	10.8	12	13.2		ITR0312 Series
	21.6	24	26.4		ITR0324 Series
Input Filter	Integrated capacitor.				
Input Reflected Ripple			20	mA pk-pk	Through 27µH inductor and 47µF capacitor
Input Surge			7	VDC for 100ms	ITR0305 Series
			15		ITR0312 Series
			28		ITR0324 Series

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	5		15	VDC	See Models and Ratings table
Initial Set Accuracy			±3	%	See load regulation curves
Minimum Load	10			%	Minimum load required for regulation
Line Regulation			±1.2	%	Per 1% change in input voltage
Load Regulation			±10	%	From 0 to 100% load
Transient Response Deviation			±5	% deviation	Recovery time 500µs, 25% load step change
Ripple & Noise			100	mV pk-pk	Single Output. 20MHz bandwidth. Measured using 0.1µF ceramic capacitor and 10µF electrolytic capacitor
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.02	%/°C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	See Models and Ratings table
Isolation: Input to Output	3000			VDC	Functional insulation. Working voltage 100Vrms
Switching Frequency	40		70	kHz	From 10% to full load
Isolation Resistance	10^9			Ω	
Isolation Capacitance			65	pF	
Power Density			59	Win^3	
Mean Time Between Failure	6.7			Mhrs	MIL-HDBK-217F, +25°C GB
Case Material	Non conductive black plastic (UL94V-0 rated)				
Potting Material	Silicon (UL94V-0 rated))				
Pin Material	C5191R-H Solder-coated				
Solder Process	JEDEC J-STD 020D.1. 260°C max. 1.5mm from case 10s max.				
Weight		0.0048 (2.2)		lb (g)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+100	°C	See derating curve
Storage Temperature	-55		+125	°C	
Case Temperature			+115	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	External components required. See application notes.
Radiated	EN55032	Class B	

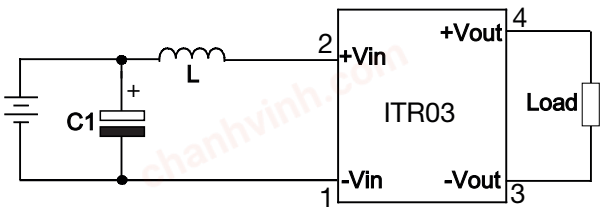
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EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±8 kV	A	Air Discharge
Radiated	EN61000-4-3	10V/M	A	
EFT/Burst	EN61000-4-4	±2kV	A	External input capacitors required 100µF/250V
Surge	EN61000-4-5	±2kV	A	External input capacitors required 100µF/250V
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic Fields	EN61000-4-8	100A/m	A	

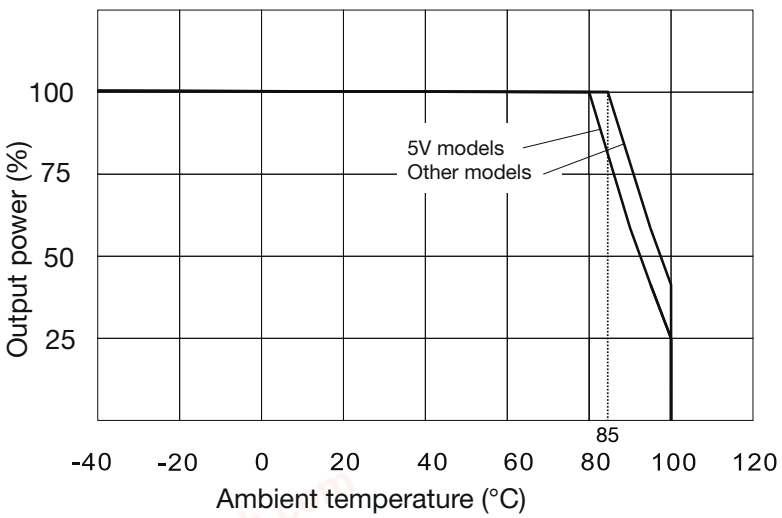
Application Notes

EMI Filter

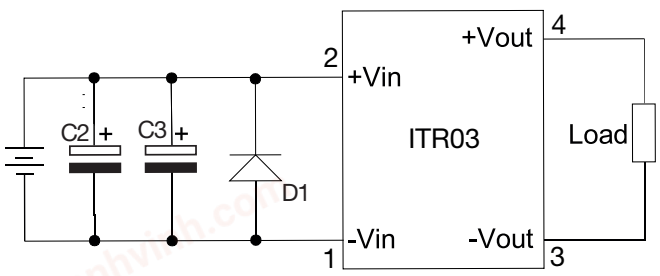


Model	C1	L
ITR0305	1206, 2.2µF, 50V	2.2µH
ITR0312	1206, 4.7µF, 50V	4.7µH
ITR0324		

Derating Curve



EFT/Surge Filter



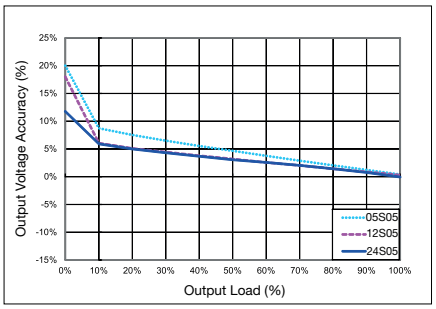
Model	C2 & C3	D1
ITR0305	100µF, 250V	SMDJ8.0A
ITR0312	100µF, 250V	SMDJ16A
ITR0324	100µF, 250V	SMDJ30A

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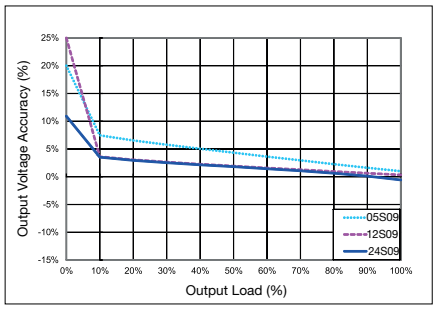
Application Notes

Voltage Regulation Curves

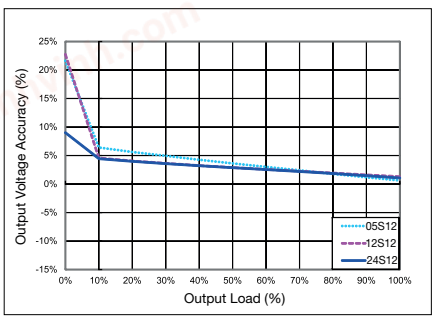
ITR03xxS05



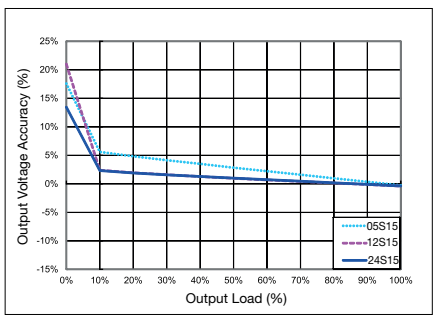
ITR03xxS09



ITR03xxS12

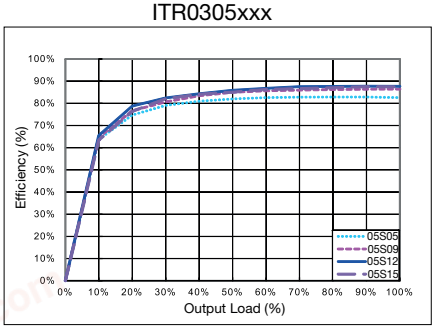


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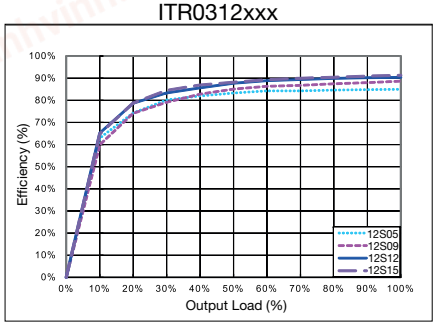


Efficiency Curves

ITR0305xxx



ITR0312xxx



ITR0324xxx

