IMM01 series

1W

DC-DC converters

The 1W IMM01 series is designed for medical applications with 1 x MOPP @250VAC 1.5kVAC isolation and 2µA patient leakage current, it is housed in a SIP7 PCB mount plastic case.

Featuring a 2:1 input voltage range of 4.5 to 9VDC or 9 to 18VDC with regulated single outputs of 3.3, 5, 12 & 15VDC, dual outputs ±3.3, ±5, ±12 & ±15VDC.

Remote On/Off, short circuit & overload protection are standard. Operating temperature range is from -20°C to +100°C, with derating above +60°C.

Features

- Regulated single & dual outputs
- 2:1 input range
- Single outputs 3.3 to 15VDC
- Dual outputs ±3.3 to ±15VDC
- SIP7 package
- International medical safety approvals
- 1.5kVAC isolation
- 1 x MOPP at 250VAC
- 2µA patient leakage current
- -20°C to +100°C operating temperature
- Full power to +60°C
- 3 year warranty

Applications

Autonomous equipment

Healthcare

Industrial

Robotics

Technology

Dimensions

19.5 x 9.2 x 11.2mm (0.77" x 0.36" x 0.42")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number	Input voltage	Output voltage	Output current	Input current		Maximum capacitive load
				No load	Full load	
IMM0105S3V3	4.5-9.0VDC	3V3	303mA	75mA	337mA	2200µF
IMM0105S05		5VDC	200mA	75mA	337mA	2200µF
IMM0105S12		12VDC	83mA	75mA	327mA	470µF
IMM0105S15		15VDC	67mA	75mA	327mA	470µF
IMM0105D03		±3.3VDC	±150mA	55mA	337mA	±1000µF
IMM0105D05		±5VDC	±100mA	55mA	337mA	±1000µF
IMM0105D12		±12VDC	±42mA	75mA	327mA	±220µF
IMM0105D15		±15VDC	±33mA	75mA	327mA	±220µF

Continued on page 2

Notes:

Input currents measured at low input voltage.

IMM01 series

Models & ratings

Model number	Input voltage	Output voltage	Output current	Input current		Maximum capacitive load
				No load	Full load	
IMM0112S3V3	9.0-18.0VDC	3V3	303mA	25mA	163mA	2200µF
IMM0112S05		5VDC	200mA	25mA	163mA	2200µF
IMM0112S12		12VDC	83mA	25mA	150mA	470µF
IMM0112S15		15VDC	67mA	25mA	150mA	470µF
IMM0112D03		±3.3VDC	±150mA	55mA	163mA	±1000µF
IMM0112D05		±5VDC	±100mA	55mA	163mA	±1000µF
IMM0112D12		±12VDC	±42mA	30mA	150mA	±220µF
IMM0112D15		±15VDC	±33mA	30mA	150mA	±220µF

Notes:

Input currents measured at nominal input voltage.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	4.5		9	VDC	5 VDC nominal
	9.0		18		12VDC nominal
Inrush let-through energy			0.05	A^2s	
Input reflected ripple		30		mA pk-pk	Through 12µH inductor and 47µF capacitor
Input surge			16	VDC for 100ms	5VDC models
			25		12VDC models

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		30	VDC	See models and ratings table
Patient leakage current			2	µA	
Initial set accuracy			±2	%	3.3VDC & 5.0VDC at full load
			±1		12.0VDC & 15.0VDC at full load
Minimum load	No minimum load required				
Line regulation			±0.5	%	From minimum to maximum input
Load regulation			2.0	%	From 10% to full load (2% from 0% to 10% load)
Cross regulation			±5	%	On dual output models, when one output is at 25% load and other is varied from 10% load to full load
Ripple & noise			1	% pk-pk	For 12VDC & 15VDC, 20MHz bandwidth, measured using 0.1µF ceramic capacitor
			2		3.3VDC & 5VDC models, 20MHz bandwidth, measured using 0.1µF ceramic capacitor
Short circuit protection					Continuous fold-back mode, with auto recovery
Maximum capacitive load	See models and ratings table				
Temperature coefficient			0.03	%/°C	
Overload protection	190	250	310	%	Of nominal output current at nominal input voltage
Remote on/off	Output is on if remote on/off (pin 3) is open Output turns off if 2-4mA is applied to remote on/off (pin 3)				

IMM01 series

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	64	78	81	%	Typical value is for IMM0112S12
Isolation: input to output	1500			VAC	At 250VAC working voltage, 1 x MOPP
Switching frequency	175		1000	kHz	May enter burst mode frequency of 12-28kHz at light load
Isolation resistance	10^9			mΩ	
Isolation capacitance			27	pF	
Power density			0.5 (8.31)	W/cm^3 (W/in^3)	
Mean time between failure	1			Mhrs	MIL-HDBK-217F, +25°C GB
Weight		3.6 (0.008)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating altitude			3048	m	
Transport altitude			10,000	m	
Operating temperature	-20		+100	°C	Derate linearly from 100% load at +60°C to 0% at +100°C
Storage temperature	-40		+125	°C	
Case temperature			+105	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55011	Class A	See application notes.
Radiated	EN55011	Class A	

Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
Medical device EMC	IEC60601-1-2	Ed 4.0:2014	As below	
ESD immunity	EN61000-4-2	±15kV	A	Air discharge
Radiated immunity	EN61000-4-3	10V/m	A	80% mod, 80MHz - 2.7GHz plus discrete communcation proximity field frequencies
EFT/burst	EN61000-4-4	2kV	A	External input filter required, see applications note
Surge	EN61000-4-5	2kV	A	External input filter required, see applications note
Conducted immunity	EN61000-4-6	10Vrms	A	
Magnetic fields	EN61000-4-8	30A/m	A	

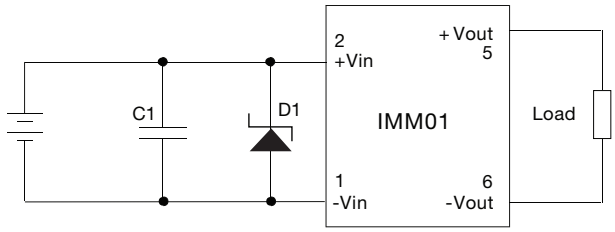
Safety approvals

Safety agency	Standard	Notes & conditions
UL	ANSI/AMMI ES60601-1	
CSA	CSA C22.2 No. 60601-1	
EN	EN60601-1	
CB	IEC60601-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Application notes

EFT and surge filter

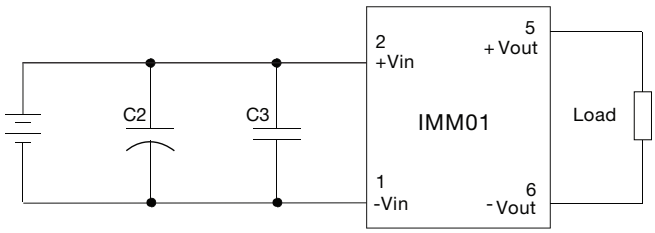
C1 is 220µF, 100VDC electrolytic capacitor, D1 is 18VDC, 3kW TVS for 5VDC input or 28VDC, 3kW TVS for 12VDC input



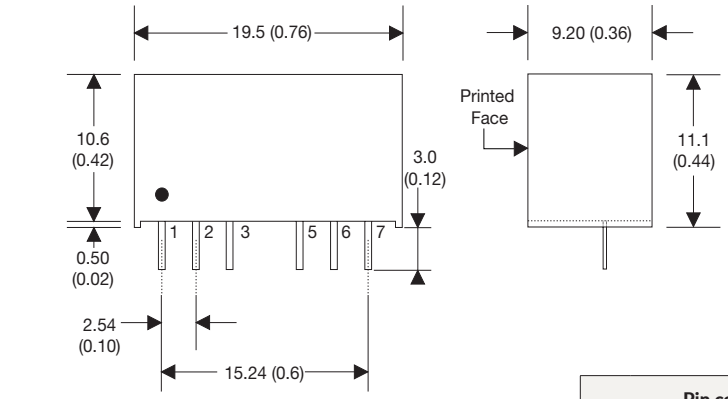
C1 is 220 µF, 100 V electrolytic capacitor
D1 is 18 V, 3 kW TVS for 5 V input or 28 V, 3 kW TVS for 12 V input

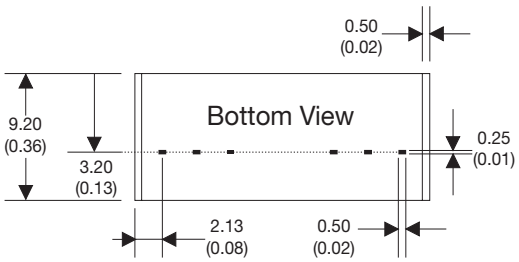
EMI filter conducted emissions

C1 & C2 are 10µF, 35VDC multilayer ceramic chip capacitors, placed as close as possible to the input pins L1 is 12µH inductor



Mechanical details





Pin connections		
Pin	**Single**	**Dual**
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
5	+Vout	+Vout
6	-Vout	Common
7	No Pin	-Vout

Notes:

1. All dimensions are in mm (inches)
2. Weight: 3.6 (0.008) g (lb) approx.
3. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
4. Pin pitch tolerance: ±0.35 (±0.014)
5. Case tolerance: ±0.5 (±0.02)