

### 1 Watt

- World Wide Medical Approvals
- Single and Dual Outputs
- 2  $\mu$ A Patient Leakage Current
- SIP7 Package
- -20 °C to +100 °C Operation
- Full Load at 60 °C Ambient
- 1500 VAC Isolation, 1 MOPP
- MTBF 1 Mhrs
- 3 Year Warranty



#### Dimensions:

##### IMM01:

0.76 x 0.36 x 0.44" (19.5 x 9.2 x 11.1 mm)

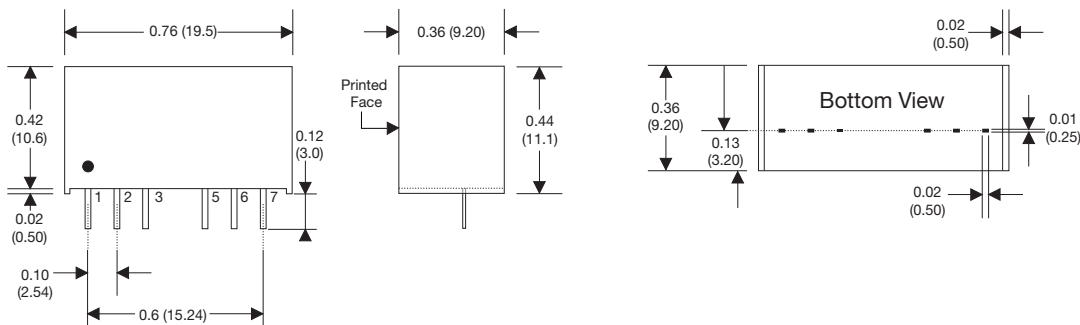
### Models & Ratings

Input Voltage	Output Voltage	Output Current	Input current		Maximum capacitive load	Model Number
			No Load	Full Load		
4.5-9.0 V	3V3	303 mA	75 mA	337 mA	2200 $\mu$ F	IMM0105S3V3
	5V	200 mA	75 mA	337 mA	2200 $\mu$ F	IMM0105S05
	12V	83 mA	75 mA	327 mA	470 $\mu$ F	IMM0105S12
	15V	67 mA	75 mA	327 mA	470 $\mu$ F	IMM0105S15
	$\pm$ 3.3V	$\pm$ 150 mA	55 mA	337 mA	$\pm$ 1000 $\mu$ F	IMM0105D03
	$\pm$ 5V	$\pm$ 100 mA	55 mA	337 mA	$\pm$ 1000 $\mu$ F	IMM0105D05
	$\pm$ 12V	$\pm$ 42 mA	75 mA	327 mA	$\pm$ 220 $\mu$ F	IMM0105D12
	$\pm$ 15V	$\pm$ 33 mA	75 mA	327 mA	$\pm$ 220 $\mu$ F	IMM0105D15
9.0-18.0V	3V3	303 mA	25 mA	163 mA	2200 $\mu$ F	IMM0112S3V3
	5V	200 mA	25 mA	163 mA	2200 $\mu$ F	IMM0112S05
	12V	83 mA	25 mA	150 mA	470 $\mu$ F	IMM0112S12
	15V	67 mA	25 mA	150 mA	470 $\mu$ F	IMM0112S15
	$\pm$ 3.3V	$\pm$ 150 mA	55 mA	163 mA	$\pm$ 1000 $\mu$ F	IMM0112D03
	$\pm$ 5V	$\pm$ 100 mA	55 mA	163 mA	$\pm$ 1000 $\mu$ F	IMM0112D05
	$\pm$ 12V	$\pm$ 42 mA	30 mA	150 mA	$\pm$ 220 $\mu$ F	IMM0112D12
	$\pm$ 15V	$\pm$ 33 mA	30 mA	150 mA	$\pm$ 220 $\mu$ F	IMM0112D15

### Notes

Input currents measured at low input voltage.

### 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 inches (mm)
2. Weight: 0.008 lbs (3.6 g) approx.
3. Pin diameter: 0.02 $\pm$ 0.002 (0.5 $\pm$ 0.05)
4. Pin pitch tolerance:  $\pm$ 0.014 ( $\pm$ 0.35)
5. Case tolerance:  $\pm$ 0.02 ( $\pm$ 0.5)

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5		9	VDC	5 V nominal
	9		18	VDC	12 V nominal
Inrush Current			0.05	A <sup>2</sup> s	
Input Reflected Ripple Current		30		mA pk-pk	Through 12 µH inductor and 47 µF capacitor
Input Surge			16	VDC for 100 ms	5 V models
			25	VDC for 100 ms	12 V 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	%	3.3 V & 5.0 V at full load
			±1		12.0 V & 15.0 V at full load
Minimum Load	0			%	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			1/2	% pk-pk	For 12 V & 15 V/ 3.3 V & 5 V models. 20 MHz bandwidth. Measured using 0.1 µF 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 2-4 mA is applied to remote on/off (pin 3)				

### General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	64	78	81	%	Typical value is for IMM0112S12
Isolation: Input to Output	1500			VAC	At 250 VAC working voltage, 1 MOPP
Switching Frequency	175		1000	kHz	May enter burst mode frequency of 12-28 kHz at light load
Isolation Resistance	10 <sup>9</sup>			Ω	
Isolation Capacitance			27	pF	
Power Density			8.31	W/in <sup>3</sup>	
Mean Time Between Failure	1			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.008 (3.6)		lb (g)	

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Altitude			3048	M	
Transport Altitude			10,000		
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

### EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011	Class A	See Application Note
Radiated	EN55011	Class A	

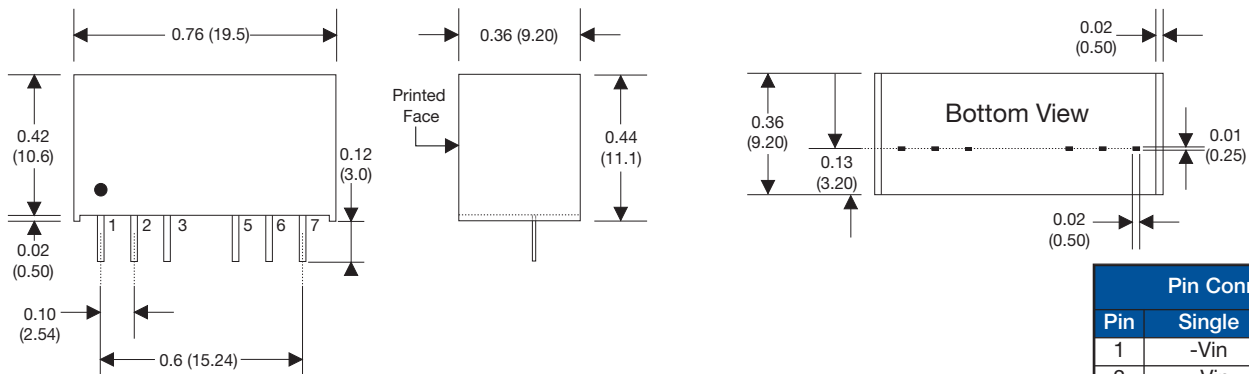
### EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Medical Device EMC	IEC60601-1-2	Ed 4.0:2014	As below	
ESD Immunity	EN61000-4-2	±15 kV	A	Air Discharge
Radiated Immunity	EN61000-4-3	10 Vrms	A	80% mod, 80 MHz - 2.7 GHz plus discrete communication proximity field frequencies
EFT/Burst	EN61000-4-4	2 kV	A	External input filter required, see applications note
Surge	EN61000-4-5	2 kV	A	External input filter required, see applications note
Conducted Immunity	EN61000-4-6	10 V rms	A	
Magnetic Fields	EN61000-4-8	30 A/m	A	

### Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	ANSI/AMMI ES60601-1	
CSA	CSA C22.2 No. 60601-1	
TUV	EN60601-1	
CB	IEC60601-1	

### Mechanical Details



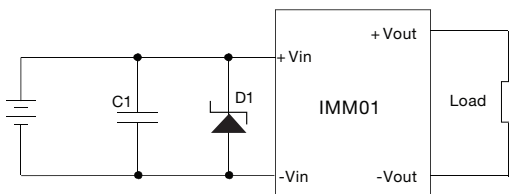
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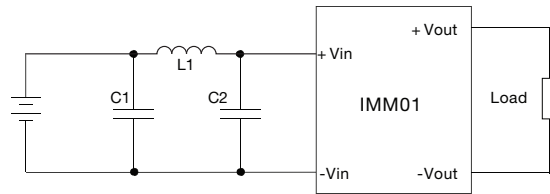
### Application Note

#### External Filter for Surge and EFT



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 10 µF, 35 V multilayer ceramic chip capacitors, placed as close as possible to the input pins  
L1 is 12 µH inductor