

### 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)

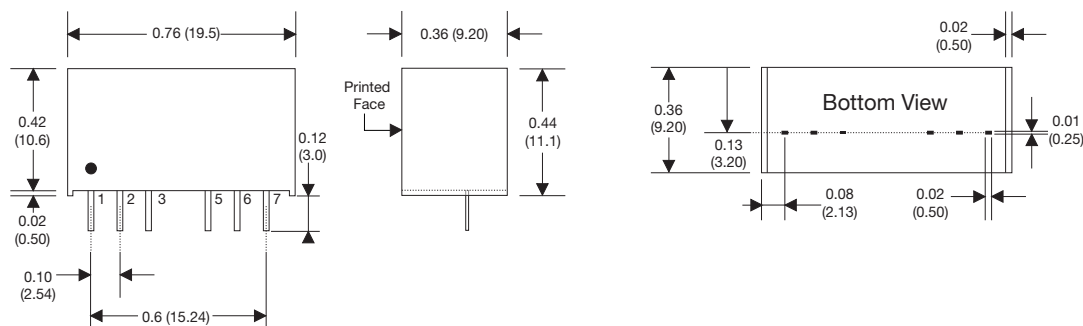
### Models & Ratings

| 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  |
|               | 5 V            | 200 mA         | 75 mA         | 337 mA    | 2200 $\mu$ F            | IMM0105S05   |
|               | 12 V           | 83 mA          | 75 mA         | 327 mA    | 470 $\mu$ F             | IMM0105S12   |
|               | 15 V           | 67 mA          | 75 mA         | 327 mA    | 470 $\mu$ F             | IMM0105S15   |
|               | $\pm 3.3$ V    | $\pm 150$ mA   | 55 mA         | 337 mA    | $\pm 1000$ $\mu$ F      | IMM0105D03   |
|               | $\pm 5$ V      | $\pm 100$ mA   | 55 mA         | 337 mA    | $\pm 1000$ $\mu$ F      | IMM0105D05   |
|               | $\pm 12$ V     | $\pm 42$ mA    | 75 mA         | 327 mA    | $\pm 220$ $\mu$ F       | IMM0105D12   |
|               | $\pm 15$ V     | $\pm 33$ mA    | 75 mA         | 327 mA    | $\pm 220$ $\mu$ F       | IMM0105D15   |
| 9.0-18.0 V    | 3V3            | 303 mA         | 25 mA         | 163 mA    | 2200 $\mu$ F            | IMM0112S3V3  |
|               | 5 V            | 200 mA         | 25 mA         | 163 mA    | 2200 $\mu$ F            | IMM0112S05   |
|               | 12 V           | 83 mA          | 25 mA         | 150 mA    | 470 $\mu$ F             | IMM0112S12   |
|               | 15 V           | 67 mA          | 25 mA         | 150 mA    | 470 $\mu$ F             | IMM0112S15   |
|               | $\pm 3.3$ V    | $\pm 150$ mA   | 55 mA         | 163 mA    | $\pm 1000$ $\mu$ F      | IMM0112D03   |
|               | $\pm 5$ V      | $\pm 100$ mA   | 55 mA         | 163 mA    | $\pm 1000$ $\mu$ F      | IMM0112D05   |
|               | $\pm 12$ V     | $\pm 42$ mA    | 30 mA         | 150 mA    | $\pm 220$ $\mu$ F       | IMM0112D12   |
|               | $\pm 15$ V     | $\pm 33$ 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<br>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    |                      |

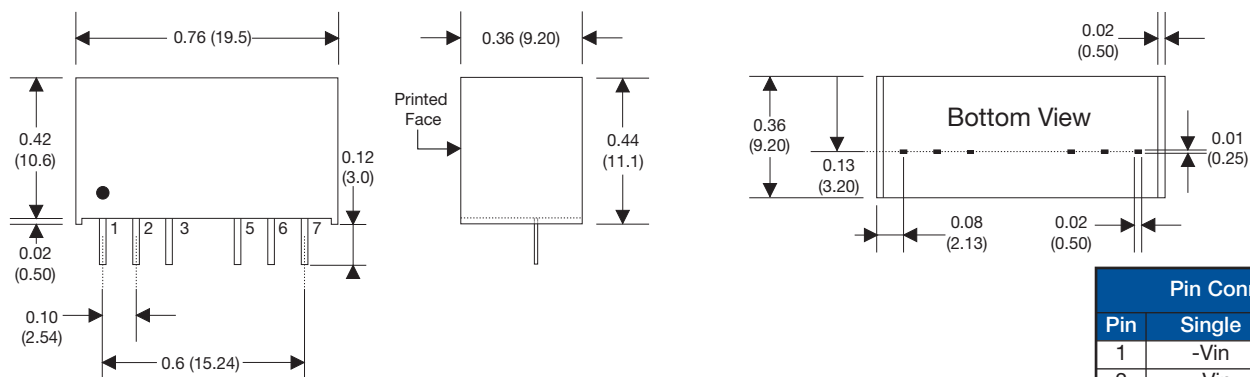
## EMC: Immunity

| 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 V/m      | 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



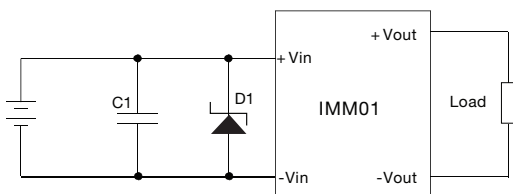
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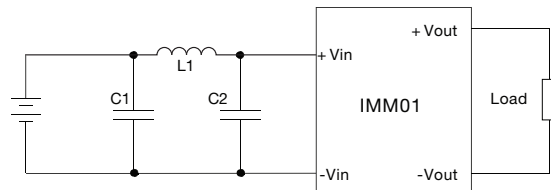
## Application Note

## External Filter for Surge and EFT



C1 is 220  $\mu$ F, 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  $\mu\text{F}$ , 35 V multilayer ceramic chip capacitors, placed as close as possible to the input pins  
L1 is 12  $\mu\text{H}$  inductor



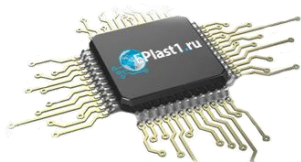
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.