

1 Watt

- World Wide Medical Approvals
- Single and Dual Outputs
- SIP7 Package
- -40 °C to +75 °C Operation
- Full Load at 75 °C Ambient
- 4000 VAC Isolation, 1 x MOPP at 250 VAC
- 2 µA Patient Leakage Current
- MTBF 2.5 Mhrs
- 3 Year Warranty

Dimensions:

IMA01:
0.77 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 | Efficiency | Model Number |
|---------------|----------------|----------------|---------------|-----------|-------------------------|------------|--------------|
| | | | No Load | Full Load | | | |
| 4.5-5.5 V | 3V3 | 300mA | 50mA | 285mA | 1000uF | 70% | IMA0105S3V3 |
| | 5V | 200mA | 50mA | 260mA | 470uF | 77% | IMA0105S05 |
| | 9V | 111mA | 50mA | 255mA | 470uF | 78% | IMA0105S09 |
| | 12V | 83.3mA | 50mA | 250mA | 220uF | 80% | IMA0105S12 |
| | 15V | 66.7mA | 60mA | 260mA | 220uF | 77% | IMA0105S15 |
| | ±3V3 | ±150mA | 50mA | 285mA | ±470uF | 70% | IMA0105D03 |
| | ±5V | ±100mA | 50mA | 260mA | ±220uF | 77% | IMA0105D05 |
| | ±9V | ±55.5mA | 50mA | 255mA | ±220uF | 78% | IMA0105D09 |
| | ±12V | ±41.6mA | 50mA | 250mA | ±100uF | 80% | IMA0105D12 |
| 10.8-13.2 V | ±15V | ±33.3mA | 60mA | 260mA | ±100uF | 77% | IMA0105D15 |
| | 3V3 | 300mA | 25mA | 111mA | 1000uF | 75% | IMA0112S3V3 |
| | 5V | 200mA | 30mA | 111mA | 470uF | 75% | IMA0112S05 |
| | 9V | 111mA | 30mA | 110mA | 470uF | 76% | IMA0112S09 |
| | 12V | 83.3mA | 30mA | 108mA | 220uF | 77% | IMA0112S12 |
| | 15V | 66.7mA | 30mA | 111mA | 220uF | 75% | IMA0112S15 |
| | ±3V3 | ±150mA | 25mA | 111mA | ±470uF | 75% | IMA0112D03 |
| | ±5V | ±100mA | 30mA | 111mA | ±220uF | 75% | IMA0112D05 |
| | ±9V | ±55.5mA | 30mA | 110mA | ±220uF | 76% | IMA0112D09 |
| 13.5-16.5 V | ±12V | ±41.6mA | 30mA | 108mA | ±100uF | 77% | IMA0112D12 |
| | ±15V | ±33.3mA | 30mA | 111mA | ±100uF | 75% | IMA0112D15 |
| | 3V3 | 300mA | 15mA | 91mA | 1000uF | 73% | IMA0115S3V3 |
| | 5V | 200mA | 25mA | 93mA | 470uF | 72% | IMA0115S05 |
| | 9V | 111mA | 25mA | 90mA | 470uF | 74% | IMA0115S09 |
| | 12V | 83.3mA | 25mA | 88mA | 220uF | 76% | IMA0115S12 |
| | 15V | 66.7mA | 25mA | 89mA | 220uF | 75% | IMA0115S15 |
| | ±3V3 | ±150mA | 15mA | 91mA | ±470uF | 73% | IMA0115D03 |
| | ±5V | ±100mA | 25mA | 93mA | ±220uF | 72% | IMA0115D05 |
| 21.6-26.4 V | ±9V | ±55.5mA | 25mA | 90mA | ±220uF | 74% | IMA0115D09 |
| | ±12V | ±41.6mA | 25mA | 88mA | ±100uF | 76% | IMA0115D12 |
| | ±15V | ±33.3mA | 25mA | 89mA | ±100uF | 75% | IMA0115D15 |
| | 3V3 | 300mA | 20mA | 62mA | 1000uF | 68% | IMA0124S3V3 |
| | 5V | 200mA | 20mA | 62mA | 470uF | 68% | IMA0124S05 |
| | 9V | 111mA | 20mA | 58mA | 470uF | 72% | IMA0124S09 |
| | 12V | 83.3mA | 20mA | 58mA | 220uF | 72% | IMA0124S12 |
| | 15V | 66.7mA | 20mA | 58mA | 220uF | 72% | IMA0124S15 |
| | ±3V3 | ±150mA | 20mA | 62mA | ±470uF | 68% | IMA0124D03 |
| 21.6-26.4 V | ±5V | ±100mA | 20mA | 62mA | ±220uF | 68% | IMA0124D05 |
| | ±9V | ±55.5mA | 20mA | 58mA | ±220uF | 72% | IMA0124D09 |
| | ±12V | ±41.6mA | 20mA | 58mA | ±100uF | 72% | IMA0124D12 |
| | ±15V | ±33.3mA | 20mA | 58mA | ±100uF | 72% | IMA0124D15 |

Notes

Input currents measured at nominal input voltage.

Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------------|---------|---------|---------|----------------|--|
| Input Voltage Range | 4.5 | | 5.5 | VDC | 5 V nominal |
| | 10.8 | | 13.2 | | 12 V nominal |
| | 13.5 | | 16.5 | | 15 V nominal |
| | 21.6 | | 26.4 | | 24 V nominal |
| Input Reflected Ripple Current | | 20 | | mA pk-pk | Through 12 μ H inductor and 47 μ F capacitor |
| Input Surge | | | 7 | VDC for 100 ms | 5 V models |
| | | | 15 | | 12 V models |
| | | | 18 | | 15 V nominal |
| | | | 28 | | 24 V nominal |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------|---------|---------|-----------|----------|---|
| Output Voltage | 3.3 | | 30 | VDC | See Models and Ratings table |
| Initial Set Accuracy | | | ± 5 | % | At full load |
| Minimum Load | 10 | | | % | Minimum load required to meet specified regulation |
| Line Regulation | | | ± 1.2 | %/1% | Output changes by max of 1.2% for each 1% change in input voltage |
| Load Regulation | | 10 | | % | From 10% to full load, see application note |
| Cross Regulation | | ± 4 | | % | On dual output models, when one output is at 25% load and other is varied from 10% load to full load |
| Ripple & Noise | | | 150 | mV pk-pk | 20 MHz bandwidth. Measured using 10 μ F electrolytic in parallel with 0.1 μ F ceramic capacitor |
| Short Circuit Protection | | | | | Continuous |
| Maximum Capacitive Load | | | | | See Models and Ratings table |
| Temperature Coefficient | | | 0.03 | %/°C | |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|----------------------------|-----------------|-------------|---------|-------------------|--|
| Efficiency | | 75 | | % | |
| Isolation: Input to Output | 4000 | | | VAC | 1 x MOPP at 250 VAC working voltage, 2 x MOPP at 125 VAC working voltage |
| Patient Leakage Current | | | 2 | μ A | |
| Isolation Resistance | 10 ⁹ | | | Ω | |
| Isolation Capacitance | | 10 | 20 | pF | |
| Switching Frequency | 50 | | 100 | kHz | |
| Power Density | | | 8.2 | W/in ³ | |
| Mean Time Between Failure | 2.5 | | | MHrs | MIL-HDBK-217F, +25 °C GB |
| Weight | | 0.008 (3.6) | | lb (g) | |

Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|---------|---------|---------|-------|--------------------|
| Operating Temperature | -40 | | +75 | °C | No derating |
| Storage Temperature | -40 | | +125 | °C | |
| Case Temperature | | | +100 | °C | |
| Humidity | 2.5 | | 95 | %RH | Non-condensing |
| Cooling | | | | | Natural convection |

EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & Conditions |
|------------|----------|------------|----------------------|
| Conducted | EN55011 | Class B | See Application Note |
| Radiated | EN55011 | Class B | |

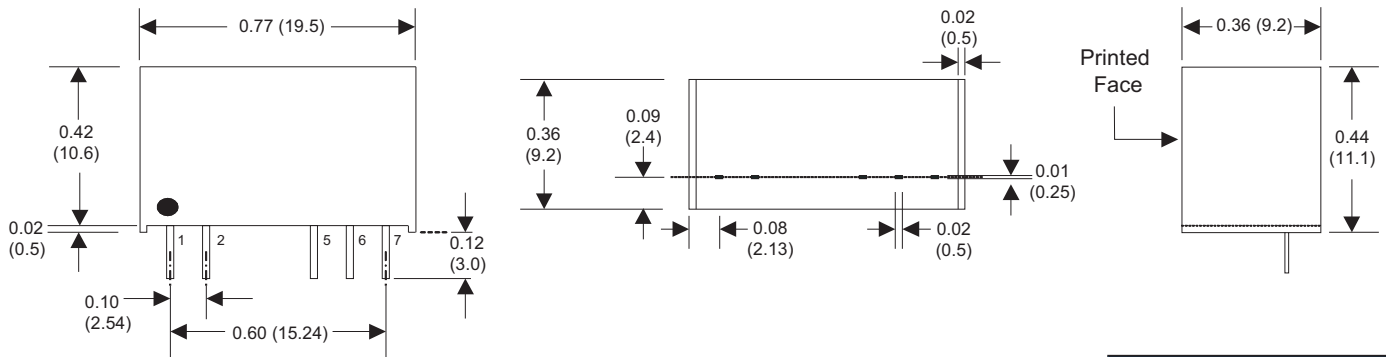
EMC: Immunity

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|--------------------|-------------|------------|----------|---|
| ESD Immunity | EN61000-4-2 | ±15 kV | A | Air Discharge |
| Radiated Immunity | EN61000-4-3 | 10 Vrms | A | |
| EFT/Burst | EN61000-4-4 | 2 kV | A | |
| Surge | EN61000-4-5 | 2 kV | A | External components 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



Notes

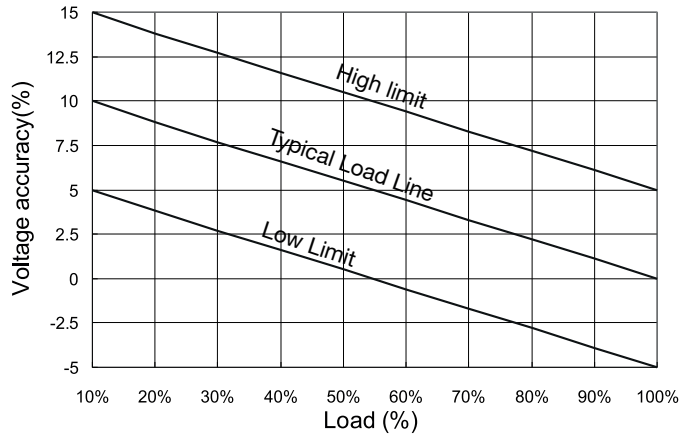
- All dimensions are in inches (mm)
- Weight: 0.008 lbs (3.6 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)

- Pin pitch tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

| Pin Connections | | |
|-----------------|--------|--------|
| Pin | Single | Dual |
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 5 | -Vout | -Vout |
| 6 | No Pin | Common |
| 7 | +Vout | +Vout |

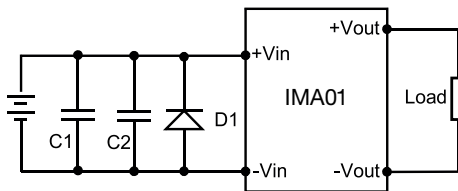
Application Note

Regulation



Surge Filter

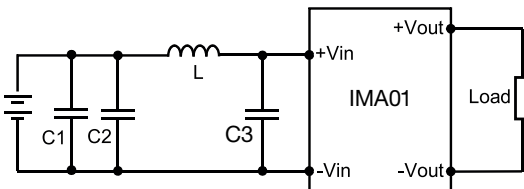
Input components (C1, C2, D1) are used to help meet surge test requirement for the module.



| | C1 | C2 | D1 |
|-------------|-------------------|-------------|----------|
| IMA0105XXXX | 1000 μ F/35 V | 330 pF/50 V | SMDJ9.0A |
| IMA0112XXXX | 1000 μ F/35 V | 330 pF/50 V | SMDJ13A |
| IMA0115XXXX | 1000 μ F/35 V | 330 pF/50 V | SMDJ18A |
| IMA0124XXXX | 1000 μ F/35 V | 330 pF/50 V | SMDJ28A |

EMI Filter

Input filter components (C1, C2, C3 and L) are used to help meet conducted emissions requirements for the module. These components should be mounted as close as possible to the module, and all leads should be minimised to decrease radiated noise.



| | C1 | C2 | C3 | L |
|-------------|-------------------------|-------------------------|------------------------|-------------|
| IMA0105XXXX | 1206, 4.7 μ F/ 50 V | | | 6.8 μ H |
| IMA0112XXXX | 1206, 4.7 μ F/ 50 V | 1206, 4.7 μ F/ 50 V | | 6.8 μ H |
| IMA0115XXXX | 1206, 4.7 μ F/ 50 V | 1206, 4.7 μ F/ 50 V | | 6.8 μ H |
| IMA0124XXXX | 1206, 4.7 μ F/ 50 V | 1206, 4.7 μ F/ 50 V | 1206, 4.7 μ F/50 V | 6.8 μ H |