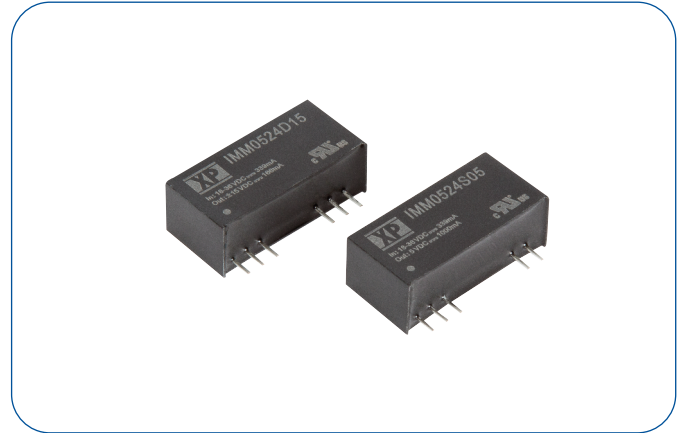


5 Watts

- Regulated Single & Dual Outputs from 3.3 VDC to ± 15 VDC
- World Wide Medical Certification
- 2:1 Input Range
- Ultra Compact SIP9 Package
- 1500 VAC Isolation
- 1 x MOPP at 250VAC
- Remote On/Off
- -20 °C to +100 °C Operation
- Full Load to +60 °C
- 3 Year Warranty



Dimensions:

IMM05:

1.02 x 0.36 x 0.49" (26.0 x 9.3 x 12.5 mm)

The IMM05 series of dc-dc converter offers an ultra compact 5W solution facilitating an isolation barrier between input and output with low leakage current required for medical BF & CF applications.

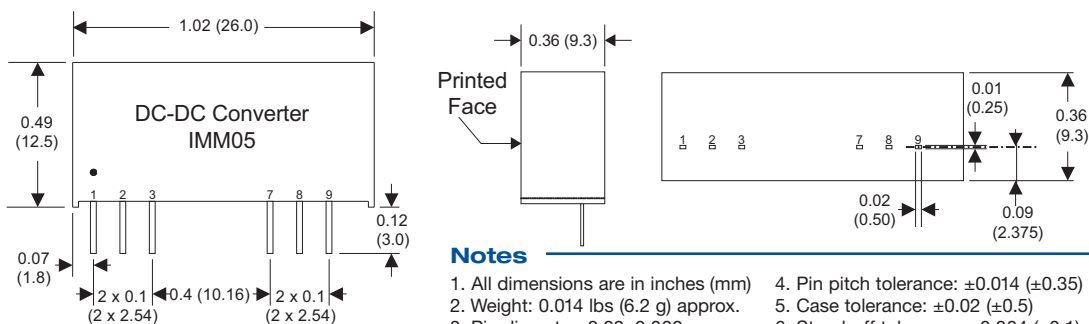
Models & Ratings

| Input Voltage VDC | Output Voltage VDC | Output Current mA | Input current | | Maximum capacitive load μ F | Model Number |
|-------------------|--------------------|-------------------|---------------|-----------|---------------------------------|--------------|
| | | | No Load | Full Load | | |
| 4.5-9.0 V | 3.3 V | 1200 mA | 105 mA | 1100 mA | 2200 μ F | IMM0505S3V3 |
| | 5.0 V | 1000 mA | 105 mA | 1372 mA | 1000 μ F | IMM0505S05 |
| | 12.0 V | 416 mA | 105 mA | 1353 mA | 470 μ F | IMM0505S12 |
| | 15.0 V | 333 mA | 105 mA | 1354 mA | 330 μ F | IMM0505S15 |
| | ± 12.0 V | ± 208 mA | 105 mA | 1387 mA | ± 220 μ F | IMM0505D12 |
| | ± 15.0 V | ± 166 mA | 105 mA | 1383 mA | ± 168 μ F | IMM0505D15 |
| 9.0-18.0 V | 3.3 V | 1200 mA | 55 mA | 550 mA | 2200 μ F | IMM0512S3V3 |
| | 5.0 V | 1000 mA | 55 mA | 678 mA | 1000 μ F | IMM0512S05 |
| | 12.0 V | 416 mA | 55 mA | 676 mA | 470 μ F | IMM0512S12 |
| | 15.0 V | 333 mA | 55 mA | 677 mA | 330 μ F | IMM0512S15 |
| | ± 12.0 V | ± 208 mA | 55 mA | 676 mA | ± 220 μ F | IMM0512D12 |
| | ± 15.0 V | ± 166 mA | 55 mA | 675 mA | ± 168 μ F | IMM0512D15 |
| 18.0-36.0 V | 3.3 V | 1200 mA | 30 mA | 275 mA | 2200 μ F | IMM0524S3V3 |
| | 5.0 V | 1000 mA | 30 mA | 339 mA | 1000 μ F | IMM0524S05 |
| | 12.0 V | 416 mA | 30 mA | 334 mA | 470 μ F | IMM0524S12 |
| | 15.0 V | 333 mA | 30 mA | 334 mA | 330 μ F | IMM0524S15 |
| | ± 12.0 V | ± 208 mA | 30 mA | 338 mA | ± 220 μ F | IMM0524D12 |
| | ± 15.0 V | ± 166 mA | 30 mA | 337 mA | ± 168 μ F | IMM0524D15 |

Notes

Full load input current measured at minimum input voltage.

Mechanical Details



Notes

1. All dimensions are in inches (mm)
2. Weight: 0.014 lbs (6.2 g) approx.
3. Pin diameter: 0.02 \pm 0.002 (0.5 \pm 0.05)
4. Pin pitch tolerance: ± 0.014 (± 0.35)
5. Case tolerance: ± 0.02 (± 0.5)
6. Stand-off tolerance: ± 0.004 (± 0.1)

Pin Connections

| Pin | Single | Dual |
|-----|---------------|---------------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | Remote On/Off | Remote On/Off |
| 7 | No Pin | -Vout |
| 8 | -Vout | Common |
| 9 | +Vout | +Vout |

Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------------|---------|---------|---------|----------------|--|
| Input Voltage Range | 4.5 | | 9 | VDC | 5 V nominal |
| | 9 | | 18 | | 12 V nominal |
| | 18 | | 36 | | 24 V nominal |
| Inrush Current | | 3.5 | | A | 5 V nominal |
| | | 1.5 | | | 12 V nominal |
| | | 0.7 | | | 24 V nominal |
| Input Reflected Ripple Current | | 30 | | mA pk-pk | Through 12 μ H inductor and 47 μ F capacitor |
| Input Surge | | | 15 | VDC for 100 ms | 5 V nominal |
| | | | 25 | | 12 V nominal |
| | | | 50 | | 24 V nominal |
| Input Current Remote On/Off | | 2.5 | | mA | Idle current at V_{in} nominal |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|------------------------------|--|---------|-----------|-----------------|--|
| Output Voltage | 3.3 | | 30 | VDC | See Models and Ratings table |
| Initial Set Accuracy | | | ± 2 | % | At full load |
| Minimum Load | 0 | | | % | No minimum load required |
| Line Regulation | | | ± 0.5 | % | From min to max input voltage |
| Load Regulation | | | ± 2.0 | % | From 0-100% 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 |
| Transient Response Deviation | | | 4 | % | Deviation recovering to within 1% in 500 μ s for 25% load change at 0.1 A/ μ s |
| Ripple & Noise | | | 75 | mV, pk-pk | 20 MHz bandwidth. Measured using 0.1 μ F ceramic capacitor |
| Short Circuit Protection | | | | | Continuous fold-back mode, with auto recovery |
| Maximum Capacitive Load | | | | | See Models and Ratings table |
| Temperature Coefficient | | | 0.03 | %/ $^{\circ}$ C | |
| Overload Protection | | 140 | | % | 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). See application note. | | | | |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|----------------------------|------------------------------|-------------|---------|-------------------|--|
| Efficiency | | 82 | | % | |
| Isolation: Input to Output | 1500 | | | VAC | At 250 VAC working voltage, basic insulation, 1 x MOPP, 60 s |
| Switching Frequency | 177 | | 1300 | kHz | |
| Isolation Resistance | 10^9 | | | Ω | |
| Isolation Capacitance | | | 27 | pF | |
| Leakage Current | | | 2 | μ A | |
| Power Density | | | 28 | W/in ³ | |
| Mean Time Between Failure | 630 | | | KHrs | MIL-HDBK-217F, +25 $^{\circ}$ C GB |
| Weight | | 0.014 (6.2) | | lb (g) | |
| Case Material | Non conductive black plastic | | | | |
| Potting Material | Epoxy (UL94V-0 rated) | | | | |
| Pin Material | C5191R-H matte tin coated | | | | |
| Solder Process | | | 260 | $^{\circ}$ C | Waveflow. 0.05" (1.5mm) from case, 10 seconds max. |

Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-------------------------|---------|------------|---------|-----------------|--|
| Operating Temperature | -20 | | +100 | $^{\circ}$ C | Derate from 100% load at +60 $^{\circ}$ C to 50% at +80 $^{\circ}$ C |
| Storage Temperature | -40 | | +125 | $^{\circ}$ C | |
| Case Temperature | | | +105 | $^{\circ}$ C | |
| Humidity Op and Store | 5 | | 95 | %RH | Non-condensing |
| Cooling | | | | | Natural convection |
| Altitude | | | 3000 | m | Transport altitude 10 km |
| Temperature Coefficient | | ± 0.03 | | %/ $^{\circ}$ C | |

EMC: Emissions

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

EMC: Immunity

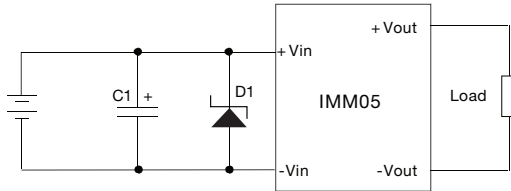
| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|--------------------|-------------|------------|----------|---|
| Medical Device EMC | EN60601-1-2 | 2015 | | |
| ESD Immunity | EN61000-4-2 | ±15 kV | A | Air Discharge |
| Radiated Immunity | EN61000-4-3 | 10 Vrms | A | |
| EFT/Burst | EN61000-4-4 | 2 kV | A | 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 | IEC/EN60601-1 | |

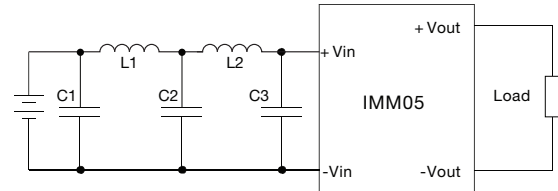
Application Note

External Filter for Surge and EFT



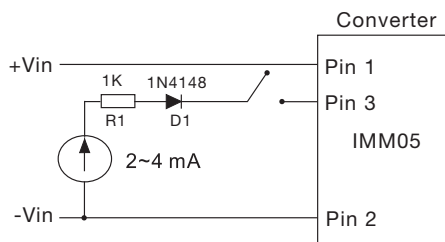
| Model | C1 | D1 |
|---------|-------------------|-----------------|
| IMM0505 | 220 μ F/100 V | TVS, 16 V, 3 kW |
| IMM0512 | 220 μ F/100 V | TVS, 26 V, 3 kW |
| IMM0524 | 220 μ F/100 V | TVS, 51 V, 3 kW |

EMI Filter Conducted Emissions



| Model | C1 | C2 | C3 | L1 | L2 |
|---------|-----------------------|-----------------------|-----------------------|------------|------------|
| IMM0505 | 1210, 22 μ F/25 V | 1210, 22 μ F/25 V | 1210, 22 μ F/25 V | 10 μ H | 10 μ H |
| IMM0512 | 2220, 22 μ F/50 V | 2220, 22 μ F/50 V | | 12 μ H | 12 μ H |
| IMM0524 | 2220, 22 μ F/50 V | 2220, 22 μ F/50 V | | 22 μ H | 22 μ H |

Remote On/Off



Derating Curve

