

V7 - 15W Series



15W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500~3500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 87%
- -40 ~ 85°C Operation Temperature Range
- EMI Complies With EN55022 Class A



The V7 series is a family of cost effective 15W single & dual output DC-DC converters. These converters are made with nickle-coated brass case in a 2"x1" with high performance features such as 1500 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated by using flame retardant resin. Input voltages of 12,24 and 48 with output voltage of 3.3,5,7.2,9,12,15,18,24,±3.3,±5,±7.2,±9,±12,±15,±18,±24 Vdc. High performance features include high efficiency operation up to 87% and output voltage accuracy of ±1% maximum.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

| OUTPUT SPECIFICATIONS | |
|--------------------------------------|--|
| Voltage accuracy | ±1% |
| Line regulation | ±0.5% |
| Load regulation(0% to 100% Load) | (Single Output) ±0.5% (Dual Output) ±1.0% |
| Ripple & noise (20 MHz bandwidth)(1) | 100mV pk-pk |
| Over-current protection | 140% of max. Iout |
| Short circuit protection | Indefinite(Automatic Recovery) |
| Temperature coefficient | ±0.02%/°C |
| Capacitor load(2) | See table |
| Transient Recovery Time(3) | 250us, typ. |
| Transient Response Deviation(3) | ±3%, max. |

| INPUT SPECIFICATIONS | |
|--|------------|
| Voltage Range | See table |
| Start up Time(Nominal Vin and constant resistive load) | 20mS, typ. |
| Max. Input Current | See table |
| No-Load Input Current | See table |
| Input Filter | Pi Type |
| Input Reflected Ripple Current(4) | 35mA pk-pk |

| GENERAL SPECIFICATIONS | |
|---|----------------|
| Efficiency | See table |
| I/O Isolation Voltage(60 sec) | 1500~3500Vdc |
| Input/Output | 1000Vdc |
| Case/Input & Output | 1000Vdc |
| I/O Isolation Capacitance | 500 pF Typ. |
| I/O Isolation Resistance | 1000M Ohm |
| Switching Frequency | Typical 200kHz |
| Humidity | 95% rel H |
| Reliability Calculated MTBF(MIL-HDBK-217 F) | >1.121 Mhrs |
| Safety Standard : (designed to meet) | IEC 60950-1 |

| EMC SPECIFICATIONS | | |
|------------------------|--------------|------------------|
| Radiated Emissions | EN55022 | CLASS A |
| Conducted Emissions(5) | EN55022 | CLASS A |
| ESD | IEC61000-4-2 | Perf. Criteria A |
| RS | IEC61000-4-3 | Perf. Criteria A |
| EFT | IEC61000-4-4 | Perf. Criteria A |
| Surge (6) | IEC61000-4-5 | Perf. Criteria A |
| CS | IEC61000-4-6 | Perf. Criteria A |
| PFMF | IEC61000-4-8 | Perf. Criteria A |

| PHYSICAL SPECIFICATIONS | |
|-------------------------|----------------------------|
| Case Material | Nickel-coated Brass |
| Pin Material | Φ1.0mm Brass Solder-coated |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | 30.0g |
| Dimensions | 2.00"x1.00"x0.40" |

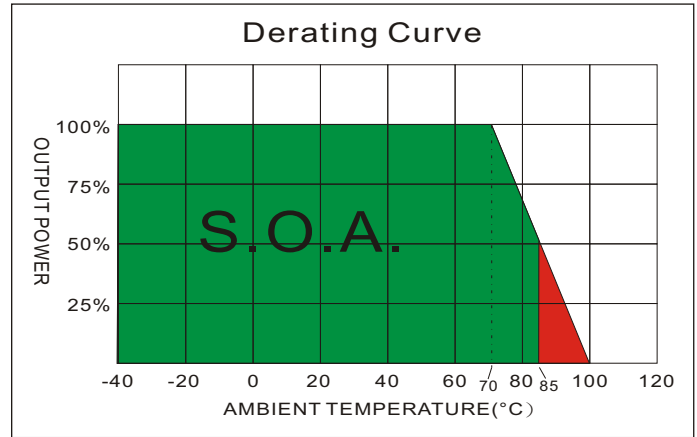
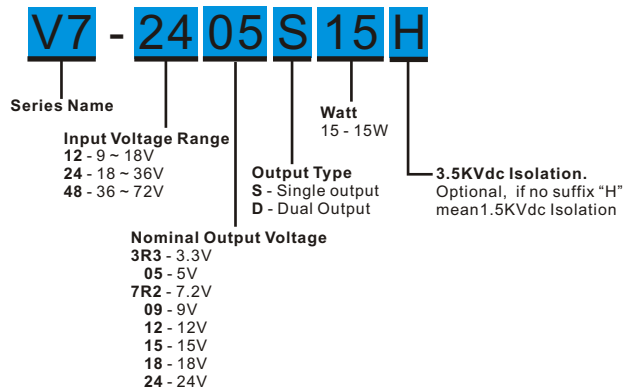
| ENVIRONMENT SPECIFICATIONS | |
|----------------------------|---|
| Operating Temperature | -40°C~85°C(See Derating Curve) -40°C~70°C(For 100% load) |
| Maximum Case Temperature | 100°C |
| Storage Temperature | -40°C~125°C |
| Cooling | Nature Convection |

| ABSOLUTE MAXIMUM RATINGS(7) | |
|--|---------------|
| These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. | |
| Input Surge Voltage(100mS) | |
| 12 Models | 25 Vdc, max. |
| 24 Models | 50 Vdc, max. |
| 48 Models | 100 Vdc, max. |
| Soldering Temperature (1.5mm from case 10 sec.max.) | 260°C |

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V7 - 15W 2:1 Regulated Single & Dual output

PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

| MODEL NUMBER | INPUT Voltage Range (Vdc) | INPUT Current | | OUTPUT Voltage (Vdc) | OUTPUT Current | | EFFICIENCY @FL(%) | Capacitor Load(uF) |
|--------------|---------------------------|---------------|----------------|----------------------|----------------|----------------|-------------------|--------------------|
| | | No Load (mA) | Full Load (mA) | | Min Load (mA) | Full Load (mA) | | |
| V7-123R3S15 | 9-18 | 30 | 1031 | 3.3 | 0 | 3000 | 80 | 3300 |
| V7-1205S15 | 9-18 | 30 | 1524 | 5 | 0 | 3000 | 82 | 3300 |
| V7-127R2S15 | 9-18 | 30 | 1506 | 7.2 | 0 | 2083 | 83 | 2200 |
| V7-1209S15 | 9-18 | 30 | 1470 | 9 | 0 | 1666 | 85 | 1000 |
| V7-1212S15 | 9-18 | 30 | 1470 | 12 | 0 | 1250 | 85 | 1000 |
| V7-1215S15 | 9-18 | 30 | 1470 | 15 | 0 | 1000 | 85 | 680 |
| V7-1218S15 | 9-18 | 30 | 1470 | 18 | 0 | 833 | 85 | 470 |
| V7-1224S15 | 9-18 | 30 | 1453 | 24 | 0 | 625 | 86 | 470 |
| V7-123R3D15 | 9-18 | 30 | 1562 | ±3.3 | 0 | ±1500 | 80 | ±1000 |
| V7-1205D15 | 9-18 | 30 | 1524 | ±5 | 0 | ±1500 | 82 | ±1000 |
| V7-127R2D15 | 9-18 | 30 | 1506 | ±7.2 | 0 | ±1041 | 83 | ±680 |
| V7-1209D15 | 9-18 | 30 | 1488 | ±9 | 0 | ±833 | 84 | ±470 |
| V7-1212D15 | 9-18 | 30 | 1488 | ±12 | 0 | ±625 | 84 | ±470 |
| V7-1215D15 | 9-18 | 30 | 1488 | ±15 | 0 | ±500 | 84 | ±330 |
| V7-1218D15 | 9-18 | 30 | 1470 | ±18 | 0 | ±416 | 85 | ±220 |
| V7-1224D15 | 9-18 | 30 | 1470 | ±24 | 0 | ±312 | 85 | ±220 |
| V7-243R3S15 | 18-36 | 25 | 515 | 3.3 | 0 | 3000 | 80 | 3300 |
| V7-2405S15 | 18-36 | 25 | 744 | 5 | 0 | 3000 | 84 | 3300 |
| V7-247R2S15 | 18-36 | 25 | 744 | 7.2 | 0 | 2083 | 84 | 2200 |
| V7-2409S15 | 18-36 | 25 | 735 | 9 | 0 | 1666 | 85 | 1000 |
| V7-2412S15 | 18-36 | 25 | 735 | 12 | 0 | 1250 | 85 | 1000 |
| V7-2415S15 | 18-36 | 25 | 726 | 15 | 0 | 1000 | 86 | 680 |
| V7-2418S15 | 18-36 | 25 | 726 | 18 | 0 | 833 | 86 | 470 |
| V7-2424S15 | 18-36 | 25 | 718 | 24 | 0 | 625 | 87 | 470 |
| V7-243R3D15 | 18-36 | 25 | 515 | ±3.3 | 0 | ±1500 | 80 | ±1000 |
| V7-2405D15 | 18-36 | 25 | 753 | ±5 | 0 | ±1500 | 83 | ±1000 |
| V7-247R2D15 | 18-36 | 25 | 744 | ±7.2 | 0 | ±1041 | 84 | ±680 |
| V7-2409D15 | 18-36 | 25 | 735 | ±9 | 0 | ±833 | 85 | ±470 |
| V7-2412D15 | 18-36 | 25 | 726 | ±12 | 0 | ±625 | 86 | ±470 |
| V7-2415D15 | 18-36 | 25 | 726 | ±15 | 0 | ±500 | 86 | ±330 |
| V7-2418D15 | 18-36 | 25 | 718 | ±18 | 0 | ±416 | 87 | ±220 |
| V7-2424D15 | 18-36 | 25 | 718 | ±24 | 0 | ±312 | 87 | ±220 |

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

V7 - 15W 2:1 Regulated Single & Dual output

| MODEL NUMBER | INPUT Voltage Range (Vdc) | INPUT Current | | OUTPUT Voltage (Vdc) | OUTPUT Current | | EFFICIENCY @FL(%) | Capacitor Load(uF) |
|--------------|---------------------------|---------------|----------------|----------------------|----------------|----------------|-------------------|--------------------|
| | | No Load (mA) | Full Load (mA) | | Min Load (mA) | Full Load (mA) | | |
| V7-483R3S15 | 36-72 | 20 | 257 | 3.3 | 0 | 3000 | 80 | 3300 |
| V7-4805S15 | 36-72 | 20 | 372 | 5 | 0 | 3000 | 84 | 3300 |
| V7-487R2S15 | 36-72 | 20 | 372 | 7.2 | 0 | 2083 | 84 | 2200 |
| V7-4809S15 | 36-72 | 20 | 367 | 9 | 0 | 1666 | 85 | 1000 |
| V7-4812S15 | 36-72 | 20 | 363 | 12 | 0 | 1250 | 86 | 1000 |
| V7-4815S15 | 36-72 | 20 | 359 | 15 | 0 | 1000 | 87 | 680 |
| V7-4818S15 | 36-72 | 20 | 359 | 18 | 0 | 833 | 87 | 470 |
| V7-4824S15 | 36-72 | 20 | 359 | 24 | 0 | 625 | 87 | 470 |
| V7-483R3D15 | 36-72 | 20 | 257 | ±3.3 | 0 | ±1500 | 80 | ±1000 |
| V7-4805D15 | 36-72 | 20 | 372 | ±5 | 0 | ±1500 | 84 | ±1000 |
| V7-487R2D15 | 36-72 | 20 | 372 | ±7.2 | 0 | ±1041 | 84 | ±680 |
| V7-4809D15 | 36-72 | 20 | 367 | ±9 | 0 | ±833 | 85 | ±470 |
| V7-4812D15 | 36-72 | 20 | 363 | ±12 | 0 | ±625 | 86 | ±470 |
| V7-4815D15 | 36-72 | 20 | 359 | ±15 | 0 | ±500 | 87 | ±330 |
| V7-4818D15 | 36-72 | 20 | 359 | ±18 | 0 | ±416 | 87 | ±220 |
| V7-4824D15 | 36-72 | 20 | 359 | ±24 | 0 | ±312 | 87 | ±220 |

Suffix "H" means 3.5KVdc isolation

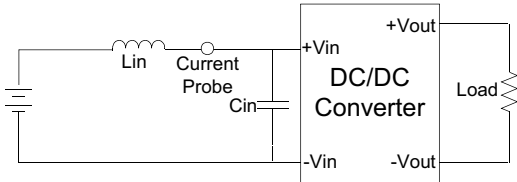
NOTE

1. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
2. Tested by minimal Vin and constant resistive load.
3. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
4. Measured input reflected ripple current with a simulated source inductance of 12uH.
5. Input filter components (C1,L,C2,C3) are used to help meet conducted emissions requirement for the module, which application refer to the EMI Filter of design & feature configuration..
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated Noise.
6. An external filter capacitor is required if the module has to meet IEC61000-4-5.
The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
7. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
8. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

TEST CONFIGURATIONS

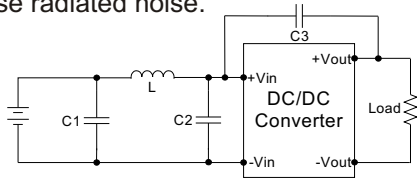
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100KHz) at nominal input and full load.



EMI Filter

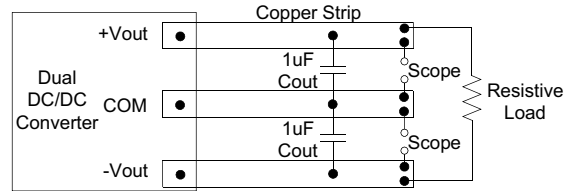
Input filter components (C_1, L, C_2, C_3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



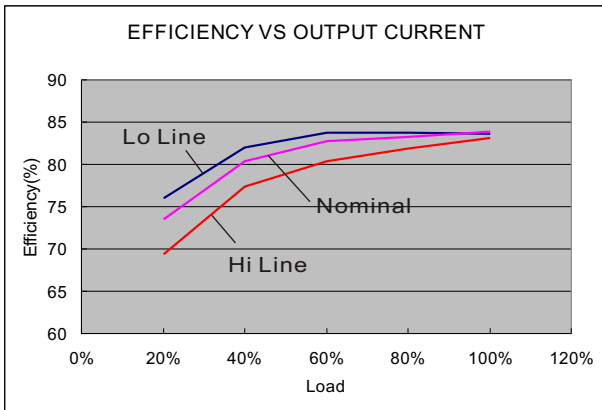
| | C1 | L | C2 | C3 |
|-------------|------------------|------------|------------------|---------------|
| V7-12XXXXXX | 330 μ F/100V | 12 μ H | 100 μ F/100V | 1808,102K/3KV |
| V7-24XXXXXX | 330 μ F/100V | 12 μ H | 100 μ F/100V | 1808,102K/3KV |
| V7-48XXXXXX | 330 μ F/100V | 12 μ H | 100 μ F/100V | 1808,102K/3KV |

Output Ripple & Noise Measurement Test

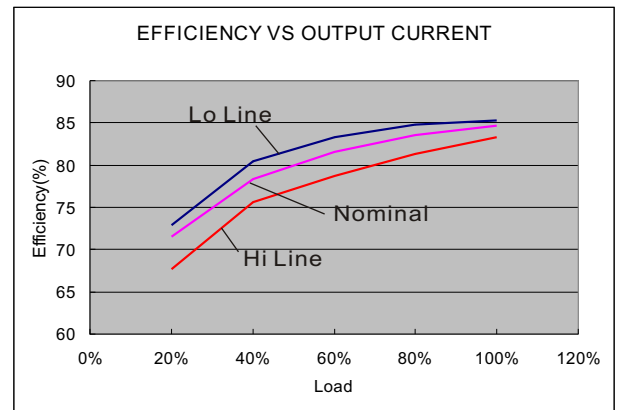
Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20MHz.



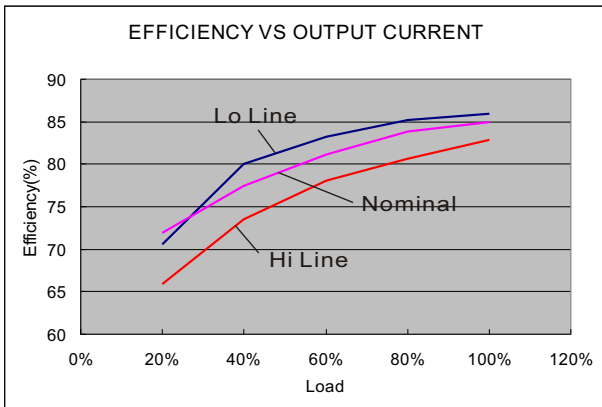
ELECTRICAL CHARACTERISTIC CURVES



12 Models



24 Models

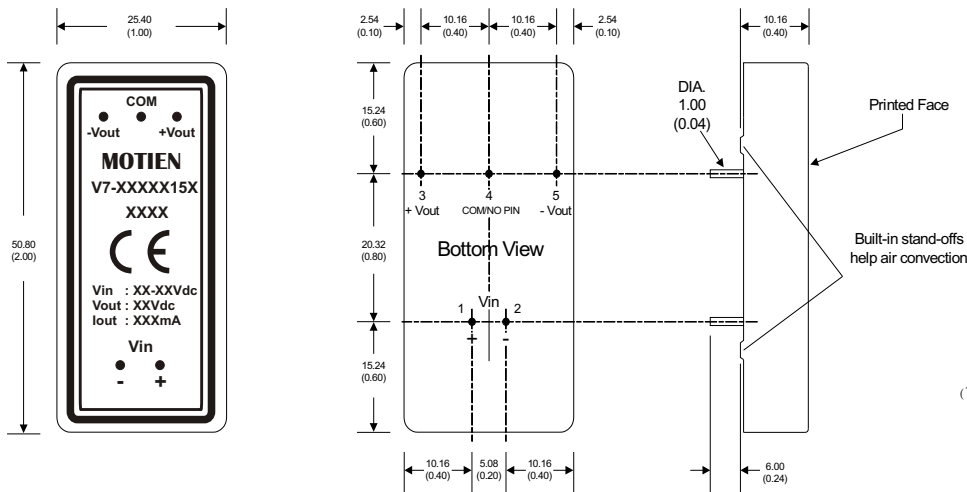


48 Models

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MECHANICAL SPECIFICATIONS



| PIN CONNECTIONS | | |
|-----------------|-----------|-----------|
| PIN NUMBER | SINGLE | DUAL |
| 1 | +V Input | +V Input |
| 2 | -V Input | -V Input |
| 3 | +V Output | +V Output |
| 4 | N.P. | Common |
| 5 | -V Output | -V Output |

(The Pin Connection of high isolation one is the same with normal one.)

- All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)