

FEATURES

- 20 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 5.5A
- STANDARD 2.0 X 1.0 X 0.4 INCH PACKAGE
- HIGH EFFICIENCY UP TO 89%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC



OPTIONS

Negative logic Remote On/Off

DESCRIPTION

The MT20E-W series offer 20 watts of output power from a 2 x 1 x 0.4 inch package. The MT20E-W series with 4:1 ultra wide input voltage of 9-36 and 18-75VDC and features 1600VDC of isolation, short-circuit and over-voltage protection.

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C otherwise noted

| OUTPUT SPECIFICATIONS | | | |
|----------------------------------|---|------------|--------|
| Output power | 20 Watts, max. | | |
| Voltage accuracy | Full load and nominal Vin | ± 1% | |
| Minimum load | 0% | | |
| Voltage adjustability | Single output | ± 10% | |
| Line regulation | LL to HL at Full Load | Single | ± 0.2% |
| | | Dual | ± 0.5% |
| Load regulation | No Load to Full Load | Single | ± 0.5% |
| | | Dual | ± 1% |
| Cross regulation (Dual) | Asymmetrical load 25% / 100% FL | ± 5% | |
| Ripple and noise | 20MHz bandwidth (Measured with a 0.1µF/50V MLCC) | See table | |
| Temperature coefficient | ±0.02% / °C, max. | | |
| Transient response recovery time | 25% load step change | 250µS | |
| Over voltage protection | 3.3V output | 3.9VDC | |
| | 5V output | 6.2VDC | |
| Zener diode clamp | 12V output | 15VDC | |
| | 15V output | 18VDC | |
| Over load protection | % of FL at nominal input | 150%, typ. | |
| Short circuit protection | Hiccup, automatics recovery | | |

| GENERAL SPECIFICATIONS | | | |
|------------------------|---|-----------------------------|--|
| Efficiency | See table | | |
| Isolation voltage | Input to Output | 1600VDC, min. | |
| | Input(Output) to case | 1600VDC, min. | |
| Case grounding | Connect case to -Vin with decoupling Y Cap | | |
| Isolation resistance | 10 ⁵ ohms, min. | | |
| Isolation capacitance | 1500pF, max. | | |
| Switching frequency | 400KHz, typ. | | |
| Case material | Nickel-coated copper | | |
| Base material | FR4 PCB | | |
| Potting material | Epoxy (UL94-V0) | | |
| Dimensions | 2.00 X 1.00 X 0.40 Inch (50.8X 25.4 X 10.2 mm) | | |
| Weight | 27g (0.95oz) | | |
| MTBF (Note 1) | BELLCORE TR-NWT-000332 | 1.620 x 10 ⁵ hrs | |
| | MIL-HDBK-217F | 6.590 x 10 ⁵ hrs | |

| INPUT SPECIFICATIONS | | | |
|--|---|-------------------------|------------|
| Input voltage range | 24V nominal input | 9 – 36VDC | |
| | 48V nominal input | 18 – 75VDC | |
| Input filter | Pi type | | |
| Input surge voltage | 24V input | 50VDC | |
| | 100mS max | 48V input | 100VDC |
| Input reflected ripple current | Nominal Vin and full load | 20mA _{p-p} | |
| Start up time | Nominal Vin and constant resistive load | Power up | 20mS, typ. |
| | | Remote ON/OFF | 20mS, typ. |
| Start-up voltage | 24V input | 9VDC | |
| | 48V input | 18VDC | |
| Shutdown voltage | 24V input | 7.5VDC | |
| | 48V input | 15VDC | |
| Remote ON/OFF (Note 6) (Positive logic)(Standard) | DC-DC ON | Open or 3V < Vr < 12V | |
| | DC-DC OFF | Short or 0V < Vr < 1.2V | |
| (Negative logic)(Option) | DC-DC ON | Short or 0V < Vr < 1.2V | |
| | DC-DC OFF | Open or 3V < Vr < 12V | |
| Input current of remote control pin | Nominal Vin | -0.5mA ~ +0.5mA | |
| Remote off state input current | Nominal Vin | 2.5mA | |

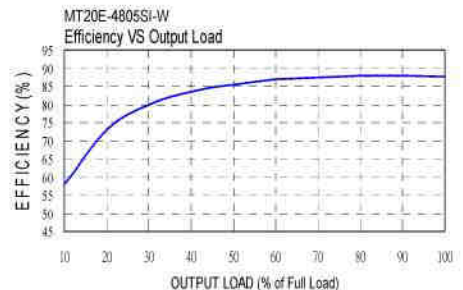
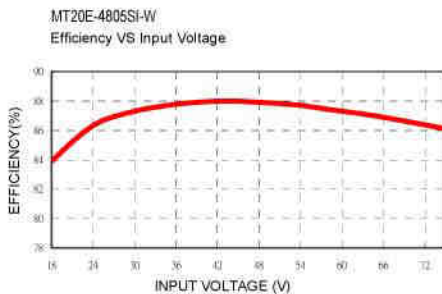
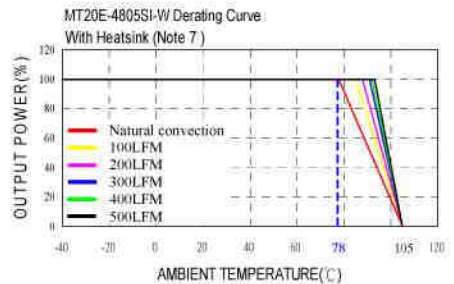
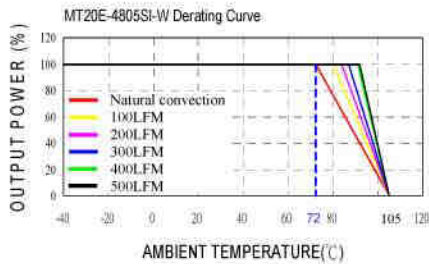
| ENVIRONMENTAL SPECIFICATIONS | | | |
|-------------------------------|----------------------------------|--|-----------|
| Operating ambient temperature | -40°C ~ +66°C (without derating) | | |
| | +66°C ~ +105°C (with derating) | | |
| Maximum case temperature | 105°C | | |
| Storage temperature range | -55°C ~ +125°C | | |
| Thermal impedance (Note 7) | Nature convection | | 12°C/Watt |
| | Nature convection with heat-sink | | 10°C/Watt |
| Thermal shock | MIL-STD-810F | | |
| Vibration | MIL-STD-810F | | |
| Relative humidity | 5% to 95% RH | | |

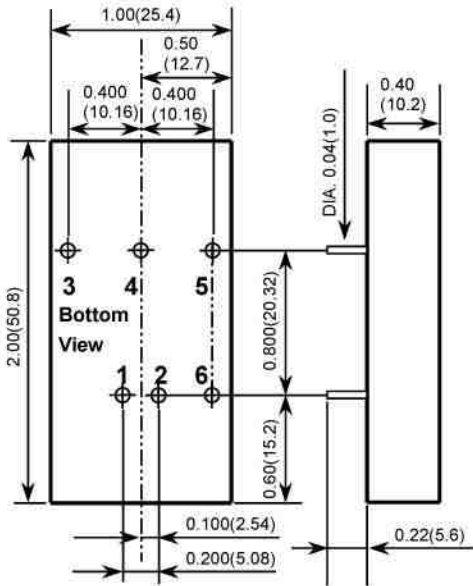
| EMC CHARACTERISTICS | | | |
|-------------------------|-------------|-----------|------------------|
| EMI (Note 8) | EN55022 | Class A | |
| ESD | EN61000-4-2 | Air | ± 8KV |
| | | Contact | ± 6KV |
| Radiated immunity | EN61000-4-3 | 10 V/m | Perf. Criteria A |
| Fast transient (Note 9) | EN61000-4-4 | ± 2KV | Perf. Criteria B |
| Surge (Note 9) | EN61000-4-5 | ± 1KV | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 | 10 Vr.m.s | Perf. Criteria A |

| Model Number | Input Range | Output Voltage | Output Current | | Output ⁽⁴⁾ Ripple & Noise | Input Current | | Eff ⁽⁴⁾ (%) | Capacitor ⁽⁵⁾ Load max |
|----------------|-------------|----------------|----------------|--------------|---|------------------------|--------------------------|---------------------------|--------------------------------------|
| | | | Min. load | Full load | | No Load ⁽³⁾ | Full Load ⁽²⁾ | | |
| MT20E-2433SI-W | 9 – 36 VDC | 3.3 VDC | 0mA | 5500mA | 60mVp-p | 50mA | 934mA | 85 | 18000 μ F |
| MT20E-2405SI-W | 9 – 36 VDC | 5 VDC | 0mA | 4000mA | 75mVp-p | 65mA | 992mA | 88 | 9600 μ F |
| MT20E-2412SI-W | 9 – 36 VDC | 12 VDC | 0mA | 1670mA | 75mVp-p | 22mA | 1018mA | 86 | 1650 μ F |
| MT20E-2415SI-W | 9 – 36 VDC | 15 VDC | 0mA | 1330mA | 75mVp-p | 22mA | 1014mA | 86 | 1050 μ F |
| MT20E-2405WI-W | 9 – 36 VDC | \pm 5 VDC | 0mA | \pm 2000mA | 100mVp-p | 55mA | 992mA | 88 | \pm 4800 μ F |
| MT20E-2412WI-W | 9 – 36 VDC | \pm 12 VDC | 0mA | \pm 833mA | 100mVp-p | 30mA | 1004mA | 87 | \pm 825 μ F |
| MT20E-2415WI-W | 9 – 36 VDC | \pm 15 VDC | 0mA | \pm 667mA | 100mVp-p | 30mA | 1005mA | 87 | \pm 525 μ F |
| MT20E-4833SI-W | 18 – 75 VDC | 3.3 VDC | 0mA | 5500mA | 60mVp-p | 35mA | 467mA | 85 | 18000 μ F |
| MT20E-4805SI-W | 18 – 75 VDC | 5 VDC | 0mA | 4000mA | 75mVp-p | 35mA | 496mA | 88 | 9600 μ F |
| MT20E-4812SI-W | 18 – 75 VDC | 12 VDC | 0mA | 1670mA | 75mVp-p | 15mA | 503mA | 87 | 1650 μ F |
| MT20E-4815SI-W | 18 – 75 VDC | 15 VDC | 0mA | 1330mA | 75mVp-p | 15mA | 501mA | 87 | 1050 μ F |
| MT20E-4805WI-W | 18 – 75 VDC | \pm 5 VDC | 0mA | \pm 2000mA | 100mVp-p | 35mA | 490mA | 89 | \pm 4800 μ F |
| MT20E-4812WI-W | 18 – 75 VDC | \pm 12 VDC | 0mA | \pm 833mA | 100mVp-p | 17mA | 496mA | 88 | \pm 825 μ F |
| MT20E-4815WI-W | 18 – 75 VDC | \pm 15 VDC | 0mA | \pm 667mA | 100mVp-p | 17mA | 496mA | 88 | \pm 525 μ F |

Note:

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment)
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- The ON/OFF control pin voltage is referenced to -Vin.
To order negative logic ON/OFF control add the suffix-N (Ex: MT20E-4805SI-W-N)
- Heat sink is optional and P/N: 7G-0020C-F.
- The MT20E-W series can meet EN55022 Class A with parallel an external capacitor to the input pins.
Recommend : 24Vin : NA.
48Vin : 1 μ F/100V 1210 MLCC.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Kaga USA suggest: Nippon chemi-con KY series, 220 μ F/100V, ESR 48m Ω .





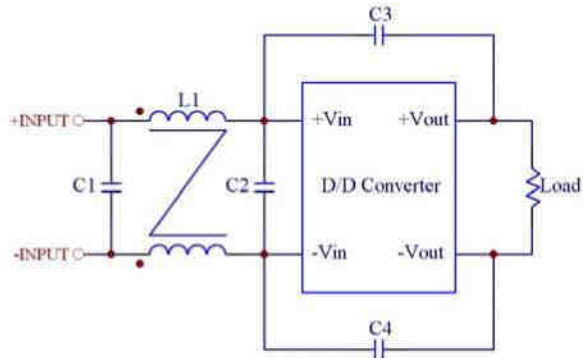
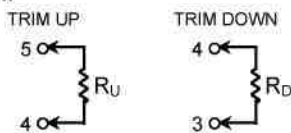
1. All dimensions in Inches (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION

| PIN | SINGLE | DUAL |
|-----|----------|----------|
| 1 | + INPUT | + INPUT |
| 2 | - INPUT | - INPUT |
| 3 | + OUTPUT | + OUTPUT |
| 4 | TRIM | COMMON |
| 5 | - OUTPUT | - OUTPUT |
| 6 | CTRL | CTRL |

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

| | C1 | C2 | C3 | C4 | L1 |
|---------------|-------------------------|-------------------------|--------------------|--------------------|----------------------------------|
| MT20E-24xxx-W | 4.7µF/50V 1812 MLCC | N/A | 1000pF/2KV MLCC | 1000pF/2KV MLCC | 450µH Common Choke PMT-048 |
| MT20E-48xxx-W | 2.2µF/100V 1812 MLCC | 2.2µF/100V 1812 MLCC | 1000pF/2KV MLCC | 1000pF/2KV MLCC | 325µH Common Choke PMT-050 |