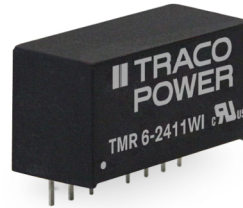




THE DATASHEET OF QBLP595-IG



- Highest power density in SIP package
- Wide 4:1 input voltage range
- Ultra-compact SIP-8 package
- Smallest footprint 6 W converter
- Temperature range -40° to $+84^{\circ}\text{C}$
- High efficiency up to 88%
- Indefinite short-circuit protection
- I/O isolation 1600 VDC
- Remote On/Off control
- 3-year product warranty



The TMR 6WI series is a new family of isolated 6 W DC/DC converter modules with regulated output, featuring wide 4:1 input voltage ranges. The product comes in a ultra-compact SIP-8 plastic package with a small footprint occupying only 2.0 cm² (0.3 square inch) of board space. An excellent efficiency allows -40° to $+84^{\circ}\text{C}$ operation temperatures. Further features include remote On/Off control and continuous short circuit protection. The very compact dimensions of these converters make them an ideal solution for many space critical applications in communication equipment, instrumentation and industrial electronics.

Models

| Order Code | Input Voltage Range | Output 1 | | Output 2 | | Efficiency typ. |
|--------------|-----------------------------|------------------------------|------------------|----------|------------------|-----------------|
| | | Vnom | I _{max} | Vnom | I _{max} | |
| TMR 6-2410WI | 9 - 36 VDC (24 VDC nom.) | 3.3 VDC | 1'500 mA | | | 81 % |
| TMR 6-2411WI | | 5 VDC | 1'200 mA | | | 84 % |
| TMR 6-2419WI | | 9 VDC | 666 mA | | | 86 % |
| TMR 6-2412WI | | 12 VDC | 500 mA | | | 87 % |
| TMR 6-2413WI | | 15 VDC | 400 mA | | | 88 % |
| TMR 6-2415WI | | 24 VDC | 250 mA | | | 87 % |
| TMR 6-2421WI | | +5 VDC | 600 mA | -5 VDC | 600 mA | 84 % |
| TMR 6-2422WI | | +12 VDC | 250 mA | -12 VDC | 250 mA | 87 % |
| TMR 6-2423WI | | +15 VDC | 200 mA | -15 VDC | 200 mA | 87 % |
| TMR 6-4810WI | | 18 - 75 VDC (48 VDC nom.) | 3.3 VDC | 1'500 mA | | |
| TMR 6-4811WI | 5 VDC | | 1'200 mA | | | 84 % |
| TMR 6-4819WI | 9 VDC | | 666 mA | | | 85 % |
| TMR 6-4812WI | 12 VDC | | 500 mA | | | 87 % |
| TMR 6-4813WI | 15 VDC | | 400 mA | | | 87 % |
| TMR 6-4815WI | 24 VDC | | 250 mA | | | 87 % |
| TMR 6-4821WI | +5 VDC | | 600 mA | -5 VDC | 600 mA | 84 % |
| TMR 6-4822WI | +12 VDC | | 250 mA | -12 VDC | 250 mA | 87 % |
| TMR 6-4823WI | +15 VDC | | 200 mA | -15 VDC | 200 mA | 87 % |

Input Specifications

| | | |
|------------------------|--------------|---|
| Input Current | - At no load | 24 Vin models: 6 mA typ. 48 Vin models: 6 mA typ. |
| Surge Voltage | | 24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.) |
| Recommended Input Fuse | | 24 Vin models: 1'600 mA (slow blow) 48 Vin models: 1'000 mA (slow blow) (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | Internal Capacitor |

Output Specifications

| | | |
|-------------------------------------|--|---|
| Voltage Set Accuracy | | ±1% max. |
| Regulation | - Input Variation (Vmin - Vmax) | single output models: 0.2% max. dual output models: 0.2% max. |
| | - Load Variation (0 - 100%) | single output models: 0.5% max. dual output models: 1% max. (Output 1) 1% max. (Output 2) |
| | - Cross Regulation (25% / 100% asym. load) | dual output models: 5% max. |
| Ripple and Noise (20 MHz Bandwidth) | - single output | 3.3 Vout models: 50 mVp-p max. 5 Vout models: 50 mVp-p max. 9 Vout models: 50 mVp-p max. 12 Vout models: 75 mVp-p max. 15 Vout models: 75 mVp-p max. 24 Vout models: 75 mVp-p max. |
| | - dual output | 5 / -5 Vout models: 50 / 50 mVp-p max. 12 / -12 Vout models: 75 / 75 mVp-p max. 15 / -15 Vout models: 75 / 75 mVp-p max. |
| Capacitive Load | - single output | 3.3 Vout models: 2'200 µF max. 5 Vout models: 1'100 µF max. 9 Vout models: 680 µF max. 12 Vout models: 470 µF max. 15 Vout models: 470 µF max. 24 Vout models: 180 µF max. |
| | - dual output | 5 / -5 Vout models: 680 / 680 µF max. 12 / -12 Vout models: 330 / 330 µF max. 15 / -15 Vout models: 180 / 180 µF max. |
| Minimum Load | | Not required |
| Temperature Coefficient | | ±0.02 %/K max. |
| Start-up Time | | 30 ms typ. |
| Short Circuit Protection | | Continuous, Automatic recovery |
| Output Current Limitation | | 180% typ. of Iout max. |
| Transient Response | - Response Time | 250 µs typ. (25% Load Step) |

Safety Specifications

| | | |
|-----------------------|-----------------------------|--|
| Standards | - IT / Multimedia Equipment | EN 62368-1 IEC 62368-1 UL 62368-1 www.tracopower.com/tmr6wi-safety-cert |
| | - Certification Documents | |
| Energy Source | - Output, acc. to 62368-1 | ES1 |
| Power Source | - Output, acc. to 62368-1 | PS1 |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | Not mains connected |

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

EMC Specifications

| | | |
|-----------------|-----------------------------|--|
| EMI (Emissions) | - Conducted Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | - Radiated Emissions | EN 55032 class A (with external filter) EN 55032 class B (with external filter) |
| | | External filter proposal: www.tracopower.com/tmr6wi-emc-filter |
| EMS (Immunity) | - Electrostatic Discharge | Air: EN 61000-4-2, ± 8 kV, perf. criteria A Contact: EN 61000-4-2, ± 6 kV, perf. criteria A |
| | - RF Electromagnetic Field | EN 61000-4-3, 20 V/m, perf. criteria A |
| | - EFT (Burst) / Surge | EN 61000-4-4, ± 2 kV, perf. criteria A EN 61000-4-5, ± 2 kV, perf. criteria A |
| | - Conducted RF Disturbances | Ext. input component: 24 VDC models: KY 220 μ F TVS (SMDJ70A) 48 VDC models: KY 220 μ F TVS (SMDJ120A) |
| | - PF Magnetic Field | Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A EN 61000-4-8, 100 A/m, perf. criteria A |

General Specifications

| | | |
|---------------------------|--|---|
| Relative Humidity | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | -40°C to +84°C |
| | - Case Temperature | +100°C max. |
| | - Storage Temperature | -55°C to +125°C |
| Power Derating | - High Temperature | Depending on model |
| | | See application note: www.tracopower.com/tmr6wi-cc |
| Cooling System | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) | On: 0 to 0.5 VDC or open circuit Off: 3 to 12 VDC |
| | - Off Idle Input Current | Refers to 'Remote' and '-Vin' Pin 2.5 mA typ. |
| | - Remote Pin Input Current | 0.5 to 3.5 mA |
| Altitude During Operation | | 5'000 m max. |
| Regulator Topology | | Flyback Converter |
| Switching Frequency | | 522 - 638 kHz (PWM) 580 kHz typ. (PWM) |
| Insulation System | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | 1'600 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | 1'000 M Ω min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 50 pF max. |
| Reliability | - Calculated MTBF | 2'930'000 h (MIL-HDBK-217F, ground benign) |
| Washing Process | | According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf |
| Environment | - Vibration | MIL-STD-810F |
| | - Thermal Shock | MIL-STD-810F |
| Housing Material | | Non-conductive Plastic (UL 94 V-0 rated) |
| Potting Material | | Silicone (UL 94 V-0 rated) |
| Pin Material | | Copper |
| Pin Foundation Plating | | Nickel (2 - 3 μ m) |
| Pin Surface Plating | | Tin (3 - 5 μ m), matte |
| Housing Type | | Plastic Case |
| Mounting Type | | PCB Mount |
| Connection Type | | THD (Through-Hole Device) |
| Footprint Type | | SIP8 |
| Soldering Profile | | Lead-Free Wave Soldering |
| | | 260°C / 6 s max. |
| Weight | | 4.8 g |

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Environmental Compliance - REACH Declaration

www.tracopower.com/info/reach-declaration.pdf

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

www.tracopower.com/info/rohs-declaration.pdf

Exemptions: 7(a), 7(c)-I

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))

- SCIP Reference Number

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Additional Information

Supporting Documents

www.tracopower.com/overview/tmr6wi

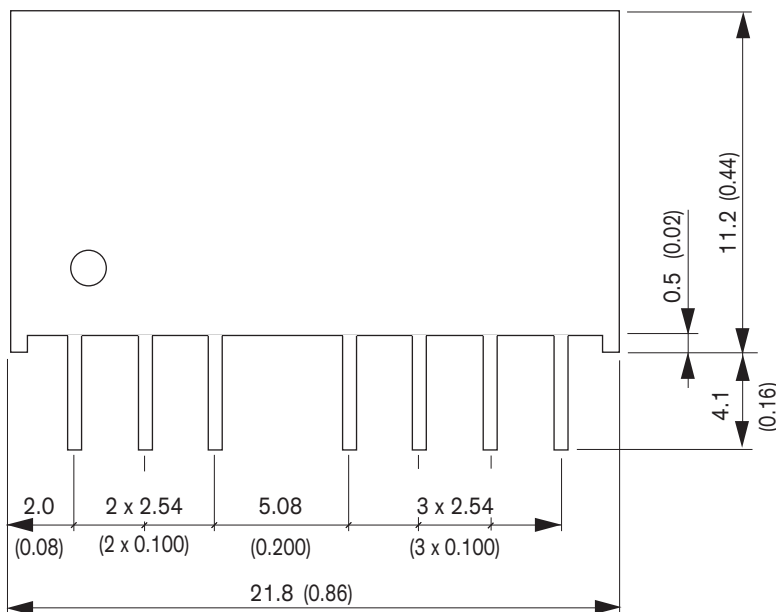
Frequently Asked Questions

www.tracopower.com/glossary-faq

Glossary

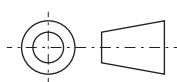
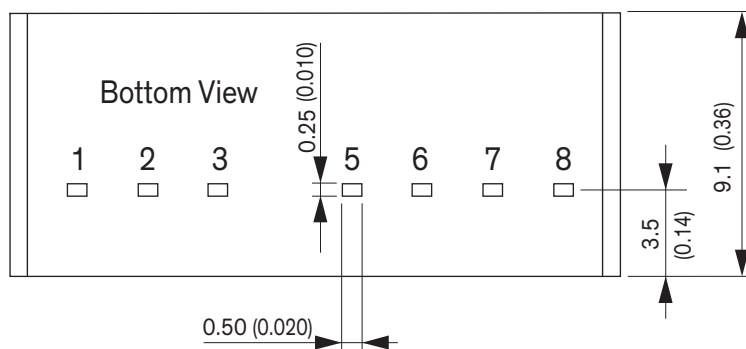
www.tracopower.com/info/glossary.pdf

Outline Dimensions



| Pinout | | |
|--------|---------------|-------------|
| Pin | Single Output | Dual Output |
| 1 | -Vin (GND) | -Vin (GND) |
| 2 | +Vin (Vcc) | +Vin (Vcc) |
| 3 | Remote | Remote |
| 5 | NC | NC |
| 6 | +Vout | +Vout |
| 7 | -Vout | Common |
| 8 | NC | -Vout |

NC: Not connected



Dimensions in mm (inch)
 Tolerances: x.x ±0.5 (x.xx ±0.02)
 x.xx ±0.25 (x.xxx ±0.01)
 Pin dimension tolerance: ±0.1 (±0.004)

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 [QT Brightek \(QTB\) Information](#)

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