

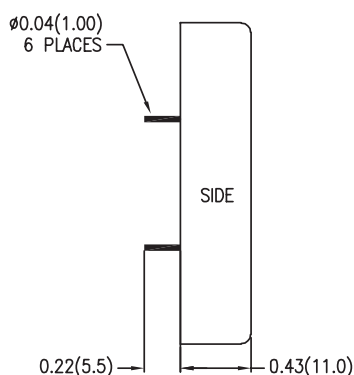
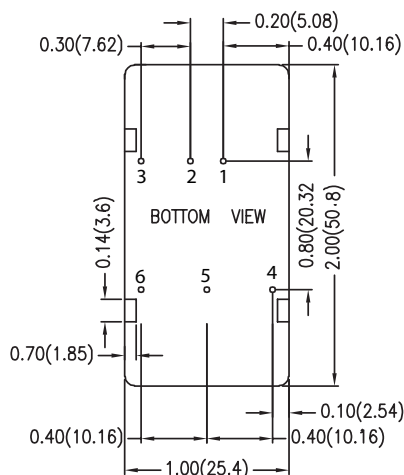
## 20 Watt RQT Single Series



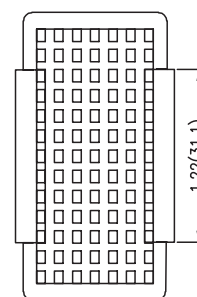
- Designed specifically for Railway Applications
- Input voltages of 24 (9-36)VDC, 48(18-75)VDC or 110 (40-160)VDC
- Efficiency up to 88%
- 2250VDC Isolation
- Overload Protection
- Short Circuit Protection
- Over Voltage Protection
- Remote On/Off
- Voltage Trim
- Optional Heatsink
- RoHS Compliant



| Model Number | Voltage    |             |        | Current        |                 |          | Overvoltage Protection | Efficiency         | Capacitive Load        |
|--------------|------------|-------------|--------|----------------|-----------------|----------|------------------------|--------------------|------------------------|
|              | Input      |             | Output | Input          |                 | Output   |                        |                    |                        |
|              | Nom. (VDC) | Range (VDC) | (VDC)  | @ No Load (mA) | @ Max Load (mA) | Max (mA) | (VDC)                  | @ Max Load (% Typ) | Max (Dual each output) |
| RQT20R24S5   | 24         | 9 - 36      | 5      | 25             | 980             | 4000     | 6.2                    | 85                 | 6800μF                 |
| RQT20R24S12  | 24         | 9 - 36      | 12     | 25             | 960             | 1670     | 15                     | 87                 | 1200μF                 |
| RQT20R24S15  | 24         | 9 - 36      | 15     | 25             | 955             | 1330     | 18                     | 87                 | 750μF                  |
| RQT20R24S24  | 24         | 9 - 36      | 24     | 25             | 957             | 833      | 27                     | 87                 | 300μF                  |
| RQT20R48S5   | 48         | 18 - 75     | 5      | 15             | 490             | 4000     | 6.2                    | 85                 | 6800μF                 |
| RQT20R48S12  | 48         | 18 - 75     | 12     | 15             | 474             | 1670     | 15                     | 88                 | 1200μF                 |
| RQT20R48S15  | 48         | 18 - 75     | 15     | 15             | 472             | 1330     | 18                     | 88                 | 750μF                  |
| RQT20R48S24  | 48         | 18 - 75     | 24     | 15             | 473             | 833      | 27                     | 88                 | 300μF                  |
| RQT20R110S5  | 110        | 40 - 160    | 5      | 10             | 219             | 4000     | 6.2                    | 83                 | 6800μF                 |
| RQT20R110S12 | 110        | 40 - 160    | 12     | 10             | 212             | 1670     | 15                     | 86                 | 1200μF                 |
| RQT20R110S15 | 110        | 40 - 160    | 15     | 10             | 211             | 1330     | 18                     | 86                 | 750μF                  |
| RQT20R110S24 | 110        | 40 - 160    | 24     | 10             | 213             | 833      | 27                     | 85                 | 300μF                  |



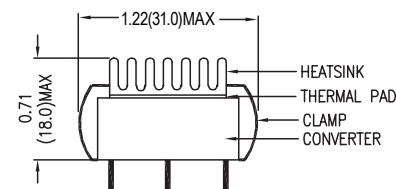
**Optional Heatsink**  
For heatsink order HS01.  
Comes with thermal pad and clamps



| Pin Connections |               |
|-----------------|---------------|
| Pin             | Function      |
| 1               | + Vin         |
| 2               | - Vin         |
| 3               | Remote On/Off |
| 4               | +Vout         |
| 5               | Trim          |
| 6               | -Vout         |

Dimensions are inches (mm) unless noted

| Tolerance: | Inches      | Millimeters |
|------------|-------------|-------------|
|            | X.XX ±0.02  | X.X ±0.5    |
|            | X.XXX ±0.01 | X.XX ±0.25  |
| Pin        | ±0.002      | ±0.05       |



Black Anodized Aluminum  
Weight: 9 grams

See Model Selection Table for Model Specific Parameters

| Input Parameters                                                                                          | Min                                                 | Typ                    | Max                     | Units  |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------|-------------------------|--------|
| Input Surge Voltage<br>(100ms max.)<br>24 Vin<br>48 Vin<br>110 Vin                                        | -0.7<br>-0.7<br>-0.7                                |                        | 50<br>100<br>170        | VDC    |
| Startup Threshold Voltage<br>24 Vin<br>48 Vin<br>110 Vin                                                  |                                                     |                        | 9<br>18<br>40           | VDC    |
| Under Voltage Shutdown<br>24 Vin<br>48 Vin<br>110 Vin                                                     |                                                     | 7.5<br>16<br>37        |                         | VDC    |
| Start-up Time                                                                                             |                                                     | 50                     |                         | mS     |
| Switching Frequency                                                                                       |                                                     | 320                    |                         | kHz    |
| Input Filter                                                                                              | Internal Pi Network                                 |                        |                         |        |
| Conducted EMI                                                                                             | Meets EN 55022, EN55011, FCC part 15, Class A       |                        |                         |        |
| Output Parameters                                                                                         | Min                                                 | Typ                    | Max                     | Units  |
| Output Voltage Accuracy                                                                                   |                                                     |                        | ±1.0                    | %      |
| Load Regulation<br>Min. Load to Full Load                                                                 |                                                     |                        | ±0.5                    | %      |
| Line Regulation<br>Vin=Min. to Max. @ Full Load                                                           |                                                     |                        | ±0.2                    | %      |
| Minimum Load                                                                                              | No Minimum Load Required                            |                        |                         |        |
| Ripple & Noise (20MHz) See Note 2.<br>5 Vo Models<br>12 Vo, 15 Vo<br>24 Vo                                |                                                     |                        | 50<br>100<br>150        | mV P-P |
| Transient Recovery Time<br>25% Load Step Change                                                           |                                                     |                        | 300                     | µs     |
| Transient Response Deviation                                                                              |                                                     | ±3                     | ±5                      | %      |
| Temperature Coefficient                                                                                   |                                                     |                        | ±0.02                   | % / °C |
| Over Current Protection                                                                                   | Current limitation at 150% typ of Iout max., Hiccup |                        |                         |        |
| Short Circuit Protection                                                                                  | Hiccup mode 0.7Hz typ.                              |                        |                         |        |
| General Specifications                                                                                    | Min                                                 | Typ                    | Max                     | Units  |
| Isolation Voltage,<br>60 seconds (reinforced insulation)                                                  | 2250                                                |                        |                         | VDC    |
| Insulation Voltage Input/Output<br>to case                                                                | 1500                                                |                        |                         | VDC    |
| Isolation Resistance<br>500VDC                                                                            | 1000                                                |                        |                         | Mohms  |
| Isolation Capacitance,<br>100kHz, 1V                                                                      |                                                     | 1500                   |                         | pF     |
| Temperature                                                                                               | Min                                                 | Max<br>w/o<br>heatsink | Max<br>with<br>Heatsink | Units  |
| Operating Temperature Natural Convection, Vin nom, Load 100% Inom.<br>Power derating see derating curves. |                                                     |                        |                         |        |
| XX.48S12, XX.48S15, XX.48S24                                                                              | -40                                                 | +72                    | +78                     | °C     |
| XX.24S12, XX.24S15, XX.24S24                                                                              | -40                                                 | +69                    | +76                     | °C     |
| XX.110S12 XX.110S15                                                                                       | -40                                                 | +66                    | +73                     | °C     |
| XX.24S5, XX.48S5, XX.110S24                                                                               | -40                                                 | +62                    | +70                     | °C     |

|                                                                           |                                                    |     |      |         |
|---------------------------------------------------------------------------|----------------------------------------------------|-----|------|---------|
| XX.110S5                                                                  | -40                                                | +55 | +65  | °C      |
|                                                                           | Min                                                | Typ | Max  | Units   |
| Thermal Impedance Natural Convection<br>without heatsink<br>with heatsink | 12.1<br>9.8                                        |     |      | °C/W    |
| Case Temperature                                                          | -40                                                |     | +105 |         |
| Storage Temperature                                                       | -50                                                |     | +125 | °C      |
| Humidity (Operating)                                                      |                                                    |     | 95   | %       |
| MTBF MIL-HDBK-217F @25°C,<br>Ground Benign                                | TBD                                                |     |      | k Hours |
| Cooling                                                                   | Free-Air Convection                                |     |      |         |
| Case Size                                                                 | 1.00 x 2.00 x 0.43 inches<br>50.8 x 25.4 x 11.0 mm |     |      |         |
| Case Material                                                             | Black Anodized Aluminum Alloy                      |     |      |         |
| Weight (Converter only)                                                   | TBD                                                |     |      |         |
| Vibration and Thermal Shock                                               | Meets EN61373                                      |     |      |         |
| Railway Standard                                                          | Meets EN50155                                      |     |      |         |
| Railway EMC Standard                                                      | Meets EN50121-3-2                                  |     |      |         |
| Agency Approvals (Pending)                                                | UL60950-1                                          |     |      |         |

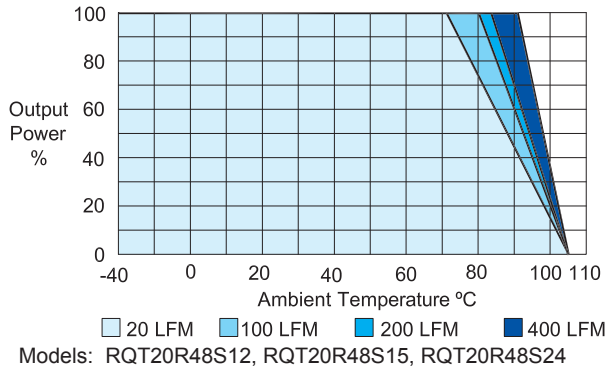
| Remote On/Off Control                               | Min                                 | Typ  | Max | Units |
|-----------------------------------------------------|-------------------------------------|------|-----|-------|
| DC/DC On                                            | 3.5V - 12V or Open Circuit          |      |     |       |
| DC/DC Off                                           | 0V - 1.2V or Short Circuit          |      |     |       |
| Control Input Current (on)<br>Vctrl = 5.0V          |                                     | 0.5  |     | mA    |
| Control Input Current (off)<br>Vctrl = 0 V          |                                     | -0.5 |     | mA    |
| Control Common                                      | Referenced to Negative Input        |      |     |       |
| Standby Input Current<br>Nominal Vin                |                                     | 2.5  |     | mA    |
| Output Voltage Trim                                 | Min                                 | Typ  | Max | Units |
| Trim Up / Down Range<br>% of nominal output voltage | % of nominal output voltage<br>±10% |      |     |       |

Notes:

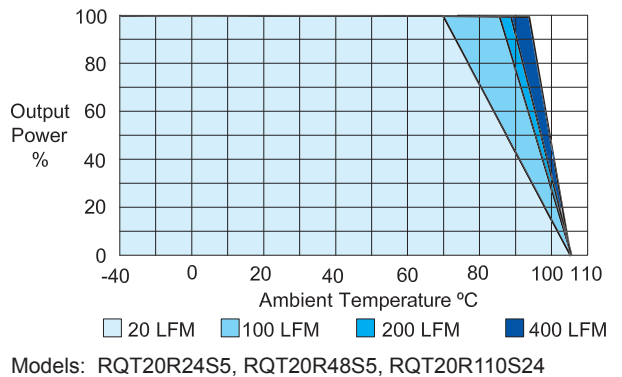
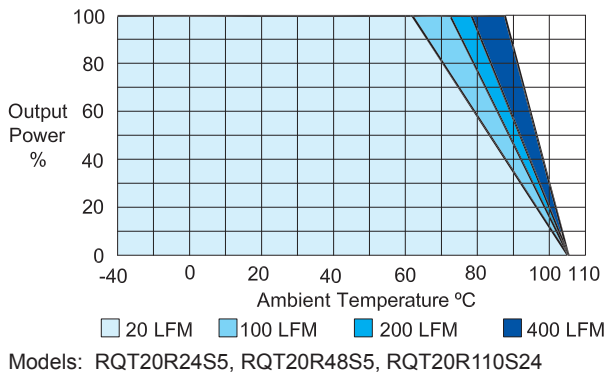
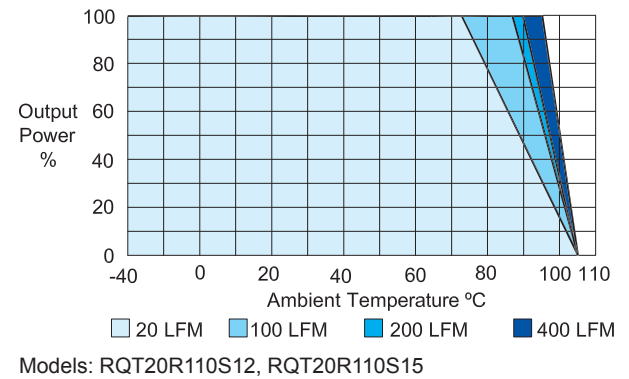
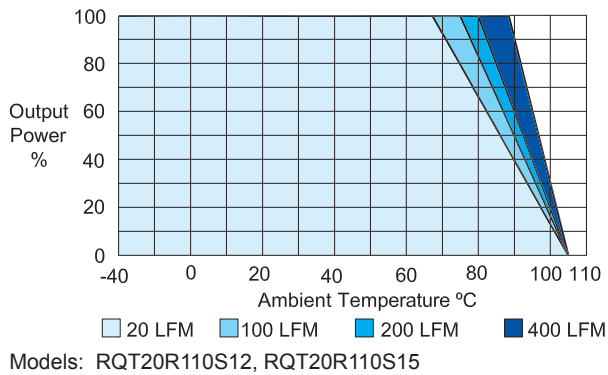
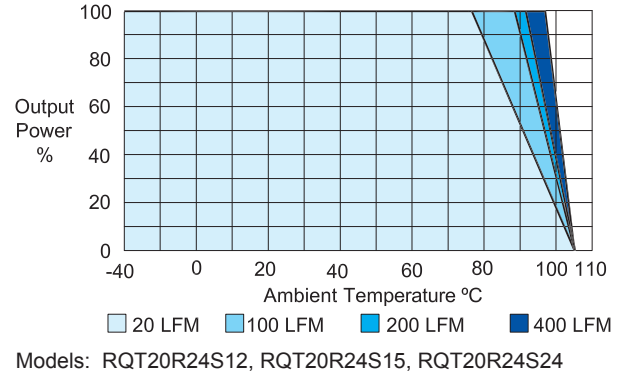
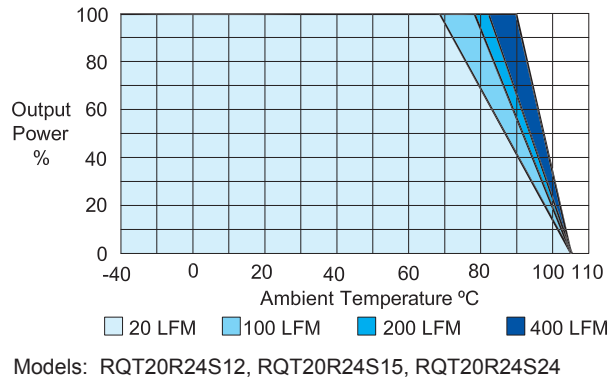
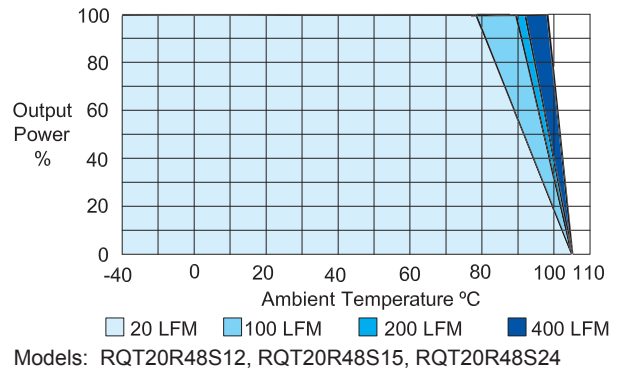
- Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
- Ripple & Noise measurement with a 10µF/25V MLCC (5Vo, 12Vo and 15 Vo) and a 4.7µF 50V MLCC (24Vo).
- Transient recovery time is measured to within 1% error band for a step change in output load 75% to 100%.
- Water washability - ConTech DC/DC converters are designed to withstand most solder/wash processes. Careful attention should be used when assessing the applicability in your specific manufacturing process. Converters are not hermetically sealed.
- Natural Convection is about 20 LFM but is not equal to still air. (0 LFM)
- See ConTech website for Definition of Terms, Application Notes, and Test Setups and Parameters. [www.ConTech-us.com/appnotes.html](http://www.ConTech-us.com/appnotes.html).
- Specifications subject to change without notice.
- See ConTech website [www.ConTech-us.com/pdf/rohs.pdf](http://www.ConTech-us.com/pdf/rohs.pdf) for RoHS Statement.

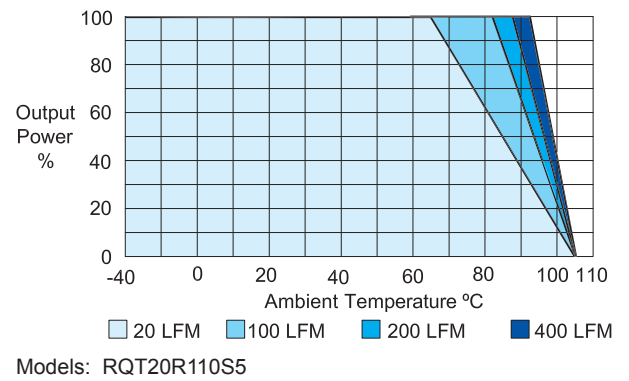
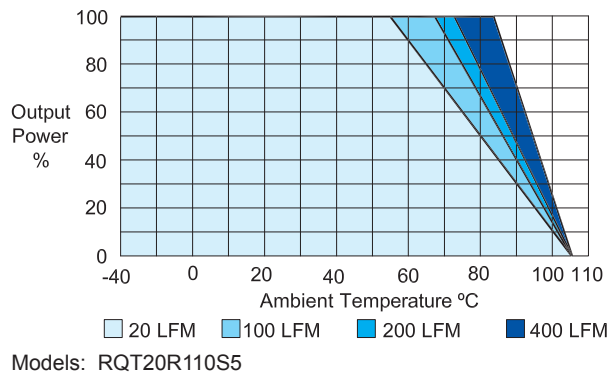
## Derating Curves

Without Heatsink



With Heatsink





## External Output Trimming:

Output can be trimmed using the method below.

