

For Satellite Communications Applications

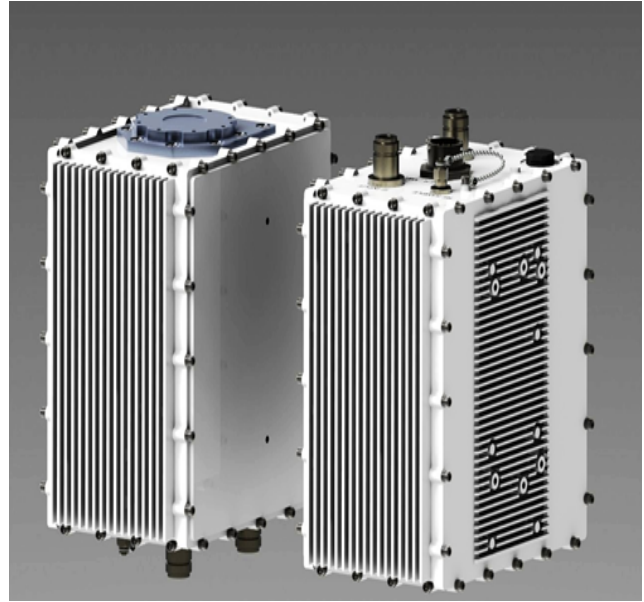
The CPI TR61-1010-0x 10W X-Band GaN transceiver provides a fully integrated X-Band transceiver in a small, lightweight package.

Cost Effective and Easy to Use

Designed to interface directly with the antenna feed, the transceiver includes the OMT, TX filter, GaN power amplifier, BUC, RX filter, LNB, power supply, and control components. This compact unit can be mounted directly on the antenna for maximum efficiency of operation. The transceiver is designed to meet MIL-STD-810G environmental requirements.

Worldwide Support

Backed by over 40 years of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes more than 20 regional factory service centers.



CPI 10 W X-band GaN Transceiver, Model TR61-1010-0X (option W - white, shown)

OPTIONS:

- High Efficiency GaN Power Amplifier
- 10W Watt Linear TX Output Power
- Internal OMT, TX & RX Reject Filtering
- Integrated High-Performance TX BUC
- Integrated Low-Noise RX LNB
- Low Phase Noise TX & RX Local Oscillators

Quality Management System - ISO 9001:2015

| Specification | | CPI 10 W X-Band GaN Transceiver, Model TR61-1010-0X | |
|--------------------------------|--|---|---|
| TRANSMITTER | | RANGE | NOTES |
| Input Frequency | 950 to 1450 MHz | | |
| Output Frequency | 7.9 to 8.4 GHz | | Non-inverting |
| Local Oscillator Frequency | 6.950 GHz | | |
| External Reference Frequency | 10 MHz | | External reference level -5 to +5 dBm |
| Transmit Phase Noise (SSB) | -32 dBc/Hz at 10 Hz offset -62 dBc/Hz at 100 Hz offset -72 dBc/Hz at 1 kHz offset -82 dBc/Hz at 10 kHz offset -92 dBc/Hz at 100 kHz offset -102 dBc/Hz at 1 MHz offset -112 dBc/Hz at 10 MHz offset -112 dBc/Hz at 100 MHz offset | | External Reference Phase Noise: -100 dBc/Hz at 10 Hz -120 dBc/Hz at 100 Hz -145 dBc/Hz at 1 kHz -150 dBc/Hz at 10 kHz -155 dBc/Hz at 100 kHz |
| Input RF Power | -40 to +5 dBm | | -20 dBm typ. at Plinear and max. gain; no damage at +10 dBm input |
| Small Signal Gain | 60 dB min; 64 dB max. | | |
| Gain Flatness | ±1.50 dB across the full band ±0.75 dB over any 40 MHz segment ±0.50 dB over any 10 MHz segment | | |
| Gain Adjust Range | 0-20 dB, in 0.25 dB steps | | |
| Gain Stability vs. Temperature | ±1.5 dB from -40°C to +55°C | | |
| Gain Stability vs. Time | ±0.3 dB at constant temperature | | |
| Linear Output Power (Plinear) | +40 dBm for a single carrier | | O-QPSK modulated carrier |
| Spectral Regrowth | -30 dBc | | O-QPSK modulated carrier, 1/2 rate code at 1 symbol rate offset from carrier freq. |
| Spurious Emissions | -60 dBc, signal related | | 7.9 to 8.4 GHz, and at Plinear |
| Spurious Emissions | -70 dBc, non-signal related | | No TX signal |
| Harmonic Suppression | -60 dBc at Plinear | | |
| Local Oscillator Leakage | -60 dBm at 6950 MHz | | |
| TX Band NPD | -90 dBm/Hz, from 7.9 to 8.4 GHz | | |
| TX NPD in RX Band | -163 dBm/Hz, from 7.25 to 7.75 GHz | | |
| IF to RF Phase Response | +0.2 rad per 2 MHz +0.4 rad per 36 MHz +0.5 rad per 72 MHz +0.7 rad per 120 MHz | | |
| Transmit to Receive Isolation | <0.1 dB increase in RX NPD with TX signal up to Plinear | | Per MIL-STD-188-164B |
| Sample | -47 dBc typ. | | |
| Port VSWR | IF Input: 1.5:1 max. RF Output: 1.67:1 max. TX Sample: 1.67:1 max. | | No damage with infinite VSWR |
| TX Enable Time | 1.0 ns max. | | Keyline compatible |



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For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. Specifications may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

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| CPI 10 W X-Band GaN Transceiver, Model TR61-1010-0X | | |
|---|--|---|
| RECEIVER | RANGE | NOTES |
| Input Frequency | 7.25 to 7.75 GHz | |
| Output Frequency | 950 to 1450 MHz | Non-inverting |
| Local Oscillator Frequency | 6.30 GHz | |
| External Reference Frequency | 10 MHz | External reference level -5 to +5 dBm |
| Receive Phase Noise (SSB) | -32 dBc/Hz at 10 Hz offset -62 dBc/Hz at 100 Hz offset -72 dBc/Hz at 1 kHz offset -82 dBc/Hz at 10 kHz offset -92 dBc/Hz at 100 kHz offset -102 dBc/Hz at 1 MHz offset -112 dBc/Hz at 10 MHz offset -112 dBc/Hz at 100 MHz offset | External Reference Phase Noise: -100 dBc/Hz at 10 Hz -120 dBc/Hz at 100 Hz -145 dBc/Hz at 1 kHz -150 dBc/Hz at 10 kHz -155 dBc/Hz at 100 kHz |
| Input RF Power | -135 to 0 | no damage at +5 dBm input |
| Small Signal Gain | 60 dB min; 64 dB max. | |
| Gain Flatness | ±1.50 dB across the full band ±0.75 dB over any 40 MHz segment ±0.50 dB over any 10 MHz segment | |
| Gain Adjust Range | 0-20 dB, in 0.5 dB steps | |
| Gain Stability vs. Temperature | ±1.5 dB from -40°C to +55°C | |
| Gain Stability vs. Time | ±0.3 dB at constant temperature | |
| Output Compression Point | +10.0 dBm at P1dB | At IF output |
| Output Intercept Point | +20 dBm, with two equal carriers at -3 dBm IF output power | |
| Spurious Emissions | -60 dBc, signal related | IF output 950-1450 MHz 0 dBm output power |
| Local Oscillator Leakage | -60 dBm | 6.30 GHz at IF output |
| IF Harmonic Suppression | -50 dBc | 0 dBm IF output power |
| TX NPD in RX Band | -163 dBm/Hz, from 7.25 to 7.75 GHz | |
| IF to RF Phase Response | +0.2 rad per 2 MHz +0.4 rad per 36 MHz +0.5 rad per 72 MHz +0.7 rad per 120 MHz | |
| Noise Figure | 1.3 dB at 23°C | |
| Port VSWR | IF Input: 1.67:1 max. RF Output: 1.5:1 max. | No damage with infinite VSWR |



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| CPI 10 W X-Band GaN Transceiver, Model TR61-1010-0X | | |
|--|---|--------------------------------|
| MECHANICAL/POWER/ ENVIRONMENTAL | RANGE | NOTES |
| Power Source | 22 to 56 volts | |
| Power Consumption | 120 W max, 96 W typ. at Plinear | |
| Connectors | OMT: Custom flange TX IF: Type N (female) RX IF: Type N (female) Power/M&C: PT07E14-12P Sample: Type SMA (female) | |
| Dimensions | 6.85" L x 6.71" W x 4.29" H | 174.0 mm x 170.5 mm x 109.0 mm |
| Weight | 7.0 lbs nom. | 3.18 kg |
| Operating Temperature Range | -40°C to +55°C | |
| Relative Humidity | 95% at +30°C | Per MIL-STD-810G Method 506.5 |
| Vibration | MIL-STD-810G Method 514.6 Category 5; Profile per MIL-STD-810G Appendix C | Note 1 |
| Salt Fog | MIL-STD-810G Method 509.5; 5 ±1% salt atmosphere | Four 24-hour cycles |
| Sand and Dust | MIL-STD-810G Method 510.5 Procedures I and II | |
| Shock | MIL-STD-810G Method 516.6 Procedure I | Note 1 |
| Rain | MIL-STD-810G Method 506.5 Procedure I | At IF output |
| Altitude | MIL-STD-810G Method 500.5 | Note 1 |
| Reliability | 50,000 hours per Telcordia SR332, 40C | |
| NOTE 1: Specification applies only when packed for transport or storage, Truck/Trailer loose cargo. | | |

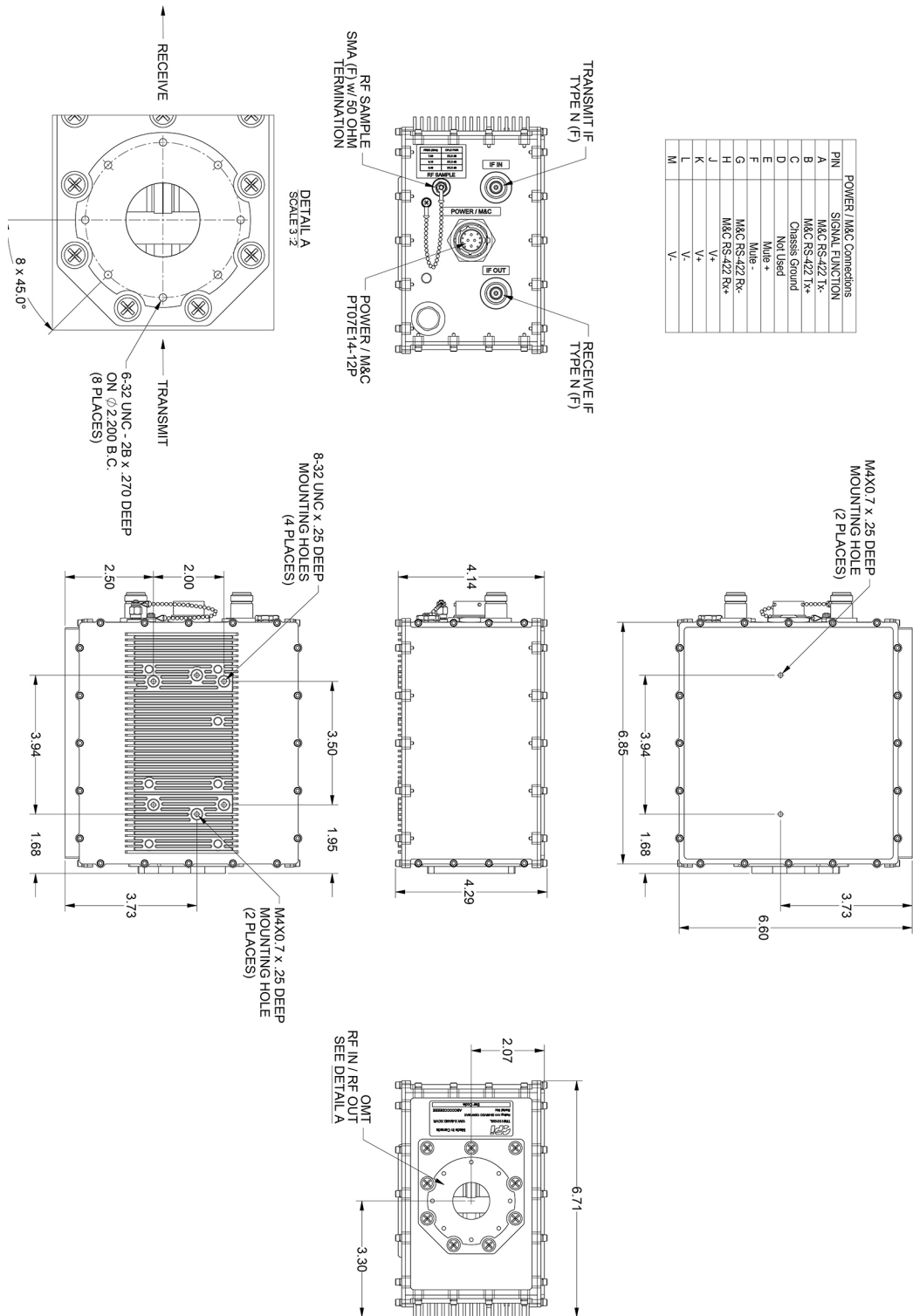
| MODEL NUMBER - CONFIGURATION | | |
|------------------------------|--------------|---|
| Model Number | TR61-1010-0X | To specify color, replace X with: L = Sand T = Tan W = White |



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| PIN | SIGNAL FUNCTION | POWER / MAC CONNECTIONS |
|-----|-----------------|-------------------------|
| A | MAC RS-422 Tx- | MAC RS-422 Tx- |
| B | MAC RS-422 Tx+ | MAC RS-422 Tx+ |
| C | Chassis Ground | Chassis Ground |
| D | Not Used | Not Used |
| E | Not Used | Not Used |
| F | MAC RS-422 Rx- | MAC RS-422 Rx- |
| G | MAC RS-422 Rx+ | MAC RS-422 Rx+ |
| H | V+ | V+ |
| J | V+ | V+ |
| K | V- | V- |
| L | V- | V- |
| M | V- | V- |



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