# CSAT-5060 C-Band Transceivers

Transceivers

**5 to 25 W $P_{1dB}$**
**(6 to 32 W $P_{sat}$)**

**50 W $P_{1dB}$**
**(63 W $P_{sat}$)**

**100 & 125 W $P_{1dB}$**
**(125 & 150 W $P_{sat}$)**

## Introduction

The CSAT-5060 C-Band Transceiver provides superior performance, long-term reliability, and ease of installation.

A very price competitive product, the CSAT-5060 embodies the best design efforts of Comtech EF Data's highly experienced RF engineering team.

## Full Rated Power

The CSAT-5060 delivers the full rated power, or more, measured at the 1 dB compression point and at the output flange. You will know the useable output power you are paying for, and can receive full value for your investment.

## Phase Noise

The dual synthesizers in the CSAT-5060 deliver superior phase noise performance, exceeding Intelsat specifications by a substantial margin. Your applications will benefit from outstanding spectral purity and the ability to operate in multi-carrier environments with less worry.

### Typical Users

- Cellular Providers
- Maritime
- Oil & Gas

### Common Applications

- VSAT point-to-point applications – TDMA, DAMA, SCPC/MCPC

## Third Order Intercept (TOI)

The design of the CSAT-5060 provides a high TOI that allows multi-carrier applications without the issues normally encountered in low power environments. The CSAT-5060 delivers performance usually found only in split converter SSPA systems.

## Small, Compact Design

The CSAT-5060 transceiver is enclosed in a single unit chassis. This design allows quick, easy installation for all models in this family of transceivers.

## Full Monitor and Control (M&C)

A variety of full monitor and control methods are designed into the CSAT-5060:

- Convenient connection using an optional small, hand-held terminal
- Easy access via EIA-232 or EIA-485 connections
- Remote management via the CDM modem family or the PC-based SatMac proprietary M&C software

## Redundancy

The CSAT-5060 is available in a 1:1 redundant configuration.

## 10 dBm Option

This transceiver is designed to mate with an external high power SSPA (Example: CEFD HPODS) or TWTA to provide even higher output power.

## Specifications

***Transmit***

| | | |
|---|---|---|
| Frequency RF | 5845 to 6425 MHz Standard<br>6425 to 6725 MHz (Optional Extended)<br>5850 to 6650 MHz (Optional Wide)<br>5845 to 6725 MHz (Optional Super Wide) | |
| Frequency IF | 70 MHz ± 18 MHz<br>140 MHz ± 36 MHz (Optional) | |
| Output Power<br>10 dBm<br>5 W<br>10 W<br>25 W<br>50 W<br>100 W<br>125 W | $P_{1dB}$<br>10 dBm<br>5 W (37dBm)<br>10 W (40 dBm)<br>25 W (44 dBm)<br>50 W (47 dBm)<br>100 W (50 dBm)<br>125 W (51 dBm) | $P_{sat}$ Typical<br><br>38 dBm (6 W)<br>41 dBm (12 W)<br>45 dBm (32 W)<br>48 dBm (63 W)<br>51 dBm (125 W)<br>51.8 dBm (150 W) |
| Gain<br>10 dBm<br>5 W<br>10 W<br>25 W<br>50 W<br>100 & 125 W | <br>25 dB<br>65 dB<br>68 dB<br>71 dB<br>74 dB<br>77 dB | |
| Attenuator Range | 25 dB in 0.25 dB steps | |
| Gain Flatness | ± 0.75 dB full RF band<br>± 0.75 dB per 36 MHz | |
| Gain Stability | ± 0.25 dB at constant C<br>± 1.00 dB from -40º to +55ºC (-40º to 131ºF) | |
| Carrier Mute | -70 dBc | |
| Inter-Modulation | -28 dBc typical for two carriers each at 6 dB OPBO from rated power (3 dB total OPBO) | |
| Second Harmonic | -55 dBc | |
| Spurious | AC line harmonics<br>Carrier related, <500 kHz<br>All other in-band | -45 dBc<br>-60 dBc<br>-65 dBc |
| AM to PM Conversion | 3.0 Degrees at 6 dB OPBO from rated power | |
| RF Output VSWR | 1.25:1 | |
| RF Output Connector<br>10 dBm, 5 W, 10 W, & 25 W<br>50 W, 100 W, & 125 W | <br>Type N Female<br>CPR-137G | |
| IF Input Impedance | 50 Ω | |
| IF Input VSWR | 1.25:1 | |
| IF Input Connector | Type N Female | |

***Receive***

| | |
|---|---|
| Frequency RF | 3625 to 4200 MHz<br>3400 to 4200 MHz (Optional) |
| Frequency IF | 70 MHz ±18 MHz<br>140 MHz ± 36 MHz (Optional) |
| Gain, without LNA | 45 dB |
| Gain Flatness, without LNA | ± 0.75 dB full RF band<br>± 0.75 dB per 36 MHz |
| Gain Stability, without LNA | ± 0.25 dB constant temperature<br>± 1.00 dB -40º to +55ºC (-40º to 131ºF) |
| Output Power, P1dB | +13 dBm |
| Two Tone Inter-Modulation | -50 dBc for two tones at 0 dBm each, 1 MHz apart |
| Image Rejection | -60 dBc |
| RF Input VSWR | 1.25:1 |
| RF Input Connector | Type N Female |
| IF Output Impedance | 50 Ω |
| IF Output VSWR | 1.25:1 |
| IF Output Connector | Type N Female |

***Common***

| | |
|---|---|
| Conversion | Dual, no spectral inversion |
| Frequency Step Size | 1.0 and 2.5 MHz automatic |
| Frequency Stability | $1x10^{-9}$/day<br>$1x10^{-7}$/year<br>40º to +55ºC $1x10^{-8}$/Temperature |
| Attenuation Steps | TX: 0 to 25dB in 0.25 dB steps<br>RX: 0 to 20dB in 0.25 dB steps |
| Phase Noise | 100 Hz -66 dBc/Hz<br>1 kHz -76 dBc/Hz<br>10 kHz -86 dBc/Hz<br>100 kHz -96 dBc/Hz |
| Group Delay | Linear 0.1 ns/MHz<br>Parabolic 0.02 ns/$MHz^2$<br>Ripple 1 ns p-p |

***Monitor & Control***

| | |
|---|---|
| Methods | Both RS-485 and RS-232 Serial Interface<br>Handheld controller, optional |
| Commands | Set TX frequency<br>Set RX frequency<br>Set TX attenuation<br>Set RX attenuation<br>Report TX output power<br>Mute TX<br>Report internal temperature<br>Report power supply voltages<br>Set time<br>Set date |
| Faults | Up converter functions<br>Down converter functions<br>Up converter synthesizers<br>Down converter synthesizers<br>Internal reference oscillator<br>LNA current fault<br>Over temperature condition |

***Environmental***

| | |
|---|---|
| Operating Temperature | -40º to +55ºC (-40º to 131ºF) Operating |
| Storage Temperature | -50º to +75ºC (-58º to 167ºF) Storage |
| Altitude | 15,000 ft, mean sea level |
| Humidity | 0 to 100 Percent, Relative |
| Prime Power | 90 to 260 VAC Standard<br>47 to 63 Hz Standard<br>48 VDC Optional |
| Dimensions<br>10 dBm to 25 W<br><br>50 W<br><br>100 & 125 W | (height x width x depth)<br>8” x 8” x 11”<br>(20 x 20 x 28 cm)<br><br>9.75” x 10” x 23”<br>(24.77 x 25.4 x 58.42 cm)<br><br>10” x 12.5” x 26”<br>(25.4 x 31.75 x 66.04 cm) |
| Weight<br>5 W to 25 W<br>50 W<br>100 & 125 W | <br>36 lbs (16 kg)<br>65 lbs (29 kg)<br>80 lbs (40 kg) |
| Low Noise Amplifier | Customer defined |
| RF Power | 10 dBm, 5 W, 10 W, 25 W, 50 W, 100 W, 125 W |
| AC Power | 120 W, 150 W, 200 W, 250 W, 410 W, 759 W, 850 W |
| | Steady-State True AC Power Requirement (110 VAC) |

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