

**Centre for Development of Telematics**

**KU-BAND DOWN CONVERTER  
KU-DCN-70/140**

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## OVERVIEW

The CDOT Ku Band Down Converter KU-DCN-70/140 is designed to take in RF frequencies in the range of 10.7 GHz to 11.7 GHz. All parameters of the converter can be monitored and controlled either through the front panel or through a remote terminal (or PC). The converter can be connected to a switchover unit for redundancy support.

Frequency synthesis is in steps of 125 KHz with excellent phase noise specifications. It supports total input power of  $-20$  dBm with nominal signal power of  $-60$  dBm. The KU-DCN-70/140 has a very high P1 dB of 10 dBm and has excellent RF/IF gain of 45 dB. The converter meets QM333 category B2 specifications and the standard EMI/EMC requirements.

The converter is designed to take DC power input of  $-48$ V. Optional AC power input of 110-230V is provided.

## SPECIFICATIONS

• Converter Type	: Dual Conversion
• Frequency Sense	: No Inversion
• Frequency selection	: By frequency synthesizer with 125 KHz step size with key-pad.
• Input Frequency	: 10.7 GHz to 11.7 GHz
• Input Impedance	: 50 Ohms, Unbalanced
• Input Return Loss	: 20 dB minimum
• Input Connector Type	: SMA Female
• Input Level	: $-60$ dBm
• Max. Input Level	: $-20$ dBm
• Output Frequency	: $70 \pm 18$ MHz / $140 \pm 36$ MHz
• Output Impedance	: 75 ohms, Unbalanced
• Output Return Loss	: 23 dB minimum
• Output level	: $-35$ dBm to $+5$ dBm
• 1 dB Compression Point	: $+10$ dBm
• Output Connector type	: BNC Female
• Image Rejection	: 70 dB
• Noise figure	: 14 dB Maximum
• RF/IF Gain	: 45 dB Minimum
• Gain Stability	: $\pm 0.25$ dB/day over $25^\circ\text{C} \pm 10^\circ\text{C}$

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- Gain Response :  $\pm 0.5$  dB p-p /36 MHz
- Gain Adjustment : 20 dB in steps of 0.5 dB
- Inter modulation Products : -40 dBc for two carriers at a level of -3 dBm each at output.
- AM / PM Conversion : 0.2°/Db
- Group Delay : Linear : 0.05 ns/MHz
- : Parabolic : 0.005 ns /MHz<sup>2</sup>
- : Ripple : 1 ns p-p /  $\pm 18$  MHz
- Spurious Output :
  - a. Signal Related : -50 dbc
  - b. Signal Independent : -70 dBm at minimum attenuation
  - c. Harmonics : -25 dBc
- Frequency Stability :  $\pm 0.1$  ppm/day at constant temperature of 25° C
- Phase Noise : - 55 dBc/Hz @ 100 Hz offset  
- 70 dBc/Hz @ 1 KHz offset  
- 80 dBc/Hz @ 10 KHz offset  
- 90 dBc/Hz @ 100 KHz offset  
-100 dBc/Hz @ 1 MHz offset
- Frequency and gain setting : By the front Panel key pad
- Input / Output Connector : At Rear Panel
- Frequency and gain setting : By the front panel key pad.
- Image rejection : 70 dB

## MONITORING & ALARMS

- Power ON Indicator, REF Frequency Monitoring, LO's Phase Lock, Summary Fail Alarm, Potential Free Contact.

## Environmental Specifications :

- As per QM333 category B2 including vibration and corrosion.

## Electromagnetic Compatibility (EMC) :

The equipment conforms to the EMC requirements as per following standards

1. Conducted and radiated emissions : As per CISPR 22, Class A
2. Electrostatic discharge : As per IEC 1000-4-2
3. Fast transients common mode: As per IEC 1000-4-4
4. Immunity : As per 1000-4-3
5. Surges Common and differential mode : As per IEC 1000-4-5
6. Radio frequency common mode : As per IEC 1000-4-6

## Power Supply :

- -48V DC nominal input (-40V to -60V) with reverse polarity protection. (110VAC – 230 VAC optional)
- Over voltage, short circuit and overload protection for derived voltages.