

1. Electrical Specifications		
1.1	Transmit Section	
1.1.1	IF Input Frequency Range	52MHz to 88MHz
1.1.2	RF Output Frequency Range	5850MHz to 6425MHz
1.1.3	(Blank)	
1.1.4	Conversion Type	Dual
1.1.5	Tuning Resolution	5.0 MHz steps
1.1.6	Frequency Stability	Locked to an external reference, 10MHz -10dBm to 0 dBm at IF input connector.
1.1.7	Phase Noise	-35 dBc/Hz max. at 10Hz (SSB) -65 dBc/Hz max. at 100Hz (SSB) -75 dBc/Hz max. at 1kHz (SSB) -80 dBc/Hz max. at 10kHz (SSB) -90 dBc/Hz max. at 100kHz (SSB)
1.1.8	Spectrum Sense	Non Inverting.
1.1.9	Output Power at 1dB G.C.P.	+39.5 dBm min. (Freq. & Temp.)
1.1.10	2tone 3rd Order Intercept Point	+47.5 dBm min. (Freq. & Temp.) Input Power ; -33dBm / Each tone
1.1.11	(a) Small Signal Gain	+57 dB min., +63dB max. (Freq. & Temp.) (@ Tx IF : 52 to 88MHz)
	(b) Small Signal Gain Stability	2.5 dB _{P-P} (Temp., @ any fixed Freq.)
	(c) Small Signal Gain Flatness	4.0 dB _{P-P} max. over 575MHz band. (@fixed Temp., @Tx IF 52 to 88 MHz) 2.5 dB _{P-P} max. over 575MHz band. (@fixed Temp., @Tx IF 70 MHz) 2.5 dB _{P-P} max. over any 36MHz band (@ Tx IF : 52 to 88MHz)
1.1.12	(Blank)	
1.1.13	Group Delay Variation	50 nsec _{P-P} max. over any 36MHz (@ Tx IF :52 to 88MHz)
1.1.14	Spurious	-50 dBc max. within 20 MHz from carrier -55 dBc max. from the offset higher than 20 MHz
1.1.15	Noise Figure	18 dB max. (absolute minimum vs. Freq. & Temp.)
1.1.16	Harmonics	-55 dBc max. (absolute maximum vs. Freq. & Temp. for IF input power level from (1dB G.C.P. -10dB) up to 1dB G.C.P.)
1.1.17	Image Rejection	55 dB min.
1.1.18	(Blank)	
1.1.19	IF Input Nominal Impedance	75 ohm
1.1.20	Return Loss In / Out	RF Output : 12dB min. IF Input : 12dB min.
1.1.21	(Blank)	
1.1.22	AM to PM conversion	$\leq \pm 2$ deg/dB @+37.5dBm $\leq \pm 4$ deg/dB @+38.5dBm $\leq \pm 5$ deg/dB @+39.5dBm
1.1.23	Stability	The RFT Tx section should not be made unstable or damaged with any combination of input/output loading, including short- or open- circuit with or without input power up to maximum allowed input power. This statement shall hold true at any frequency.
1.1.24	Out of Band Gain	Should be not higher than in-band gain should monotonically decrease as a function of the absolute frequency difference from band edges. At 5650MHz and 6625MHz points, the gain should be lower by 2.0dB min. than minimum in band gain.
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1.2	Receive Section	
1.2.1	RF Input Frequency Range	3625MHz to 4200MHz
1.2.2	IF Output Frequency Range	52MHz to 88MHz
1.2.3	RF Power Input Level Per Carrier	-120 dBm min. -100 dBm max.
	Multi Carrier	-75 dBm max.
1.2.4	Conversion Type	Dual
1.2.5	Tuning Resolution	5.0 MHz steps
1.2.6	Frequency Stability	Locked to an external reference, 10MHz, -10dBm to 0 dBm at IF input connector.
1.2.7	Phase Noise	-35 dBc/Hz max. at 10Hz (SSB) -65 dBc/Hz max. at 100Hz (SSB) -75 dBc/Hz max. at 1kHz (SSB) -80 dBc/Hz max. at 10kHz (SSB) -90 dBc/Hz max. at 100kHz (SSB)
1.2.8	Spectrum Sense	Non inverting.
1.2.9	Output Power at 1 dB G.C.P.	+15 dBm min. (vs. Freq. & Temp.)
1.2.10	2 tone 3rd Order Intercept Point	25 dBm min. (vs. Freq. & Temp.) Input Power ; -63 dBm / Each tone
1.2.11	(a) Small Signal Gain	61.5 dB min. (vs. Freq. & Temp.) 68.5 dB max. (vs. Freq. & Temp.) (@ Rx IF : 70MHz)
	(b) Small Signal Gain Stability	2.0 dB _{P-P} max. (Temp, @ any fixed Freq.)
	(c) Small Signal Gain Flatness	5.0 dB _{P-P} max. over 575MHz band. (@ fixed Temp.) (@ Rx IF : 52 to 88MHz) 4.0 dB _{P-P} max. over 575MHz band. (@ fixed Temp., Rx IF : 70MHz) 3.0 dB _{P-P} max. over any 36MHz band. (@ fixed Temp., Rx IF : 52 to 88MHz)
1.2.12.	(Blank)	
1.2.13	Group Delay Variation	50 nsec _{P-P} max. over any 36MHz BW
1.2.14	Spurious	-40dBc max.
1.2.15	Noise Figure	0.9dB max. vs. Frequency @+25°C Ambient
1.2.16	Harmonics	-50dBc max. vs. Temp., DC Supply voltage & RF Input Power at any Frequency
1.2.17	Image Rejection	50 dB min.
1.2.18	IF Output Nominal Impedance	75 ohm
1.2.19	Return Loss	
	RF Input (VSWR)	6 dB min. (vs. Freq. And Temp.)
	IF Output	12 dB min. (vs. Freq. And Temp.)
1.2.20	AM to PM conversion	2 deg/dB max.
1.2.21	Stability	The RFT Rx section should not be made unstable or damaged with or without any combination of input / output loading, including short- or open- circuit with or without input power up to the maximum allowed input power. This statement shall hold true at any temperature.
1.2.22	Out of Band Gain	Should be not higher than in-band gain and should monotonically decrease as a function of absolute frequency difference from band edges.
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1.3	Power Supply	
1.3.1	Connector	Tx IF Connector (F type Female)
1.3.2	Voltage	-36V to -60V DC
1.3.3	Power consumption	150W max.
1.4	Electrostatic Discharge	
	The unit should withstand a +/- 15kV surge from a protection 500 pF capacitor via a 150 ohm resistor, four times, at optionally selected exterior points.	
1.5	Lightning Protection	
	The unit should withstand a +/- 5kV of input surge, 1.2 μ sec Rise / Fall time, 50 μ sec duration, every 10 seconds.	
1.6	Control & Status	
1.6.1	Modulation	Half duplex on / off keying (OOK)
1.6.2	Carrier Frequency	250 kHz ± 25kHz
1.6.3	Transmit Amplitude (to IDU)	-10 dBm ± 3dB
1.6.4	Receive Amplitude	-20dBm to 0dBm at IF Rx output Connector
1.6.5	Baud Rate	2400 Baud ± 2%
1.6.6	Monitor & Control	
	Monitor :	Output Power Monitor Tx Mute Revision Number Temperature Frequency Channel M & C Communication
	Faults :	DC Input Voltage High Temperature Fault PLL#1 Fault (L band Local OSC for Tx chain) PLL#2 Fault (C band Synthesized Local OSC) PLL#3 Fault (L band Local OSC for Rx chain) PLL#4 Fault (Reference Recovery)
	Control :	Tx / RX Frequency Tx Mute Transceiver Address Reset (System)
1.7	Protections	Included Protections : • Reverse Voltage Protection (Serial Power Diode) • Over Current (Serial Fuse) • Thermal Runaway (Temperature Sensor etc.)
1.8	DBS Output	Not Applicable

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2. Mechanical Specifications		
2.1	Outline	see attached Outline Drawings
2.2	Weight	15.0 kg max.
2.3	Surface Finish	
	a. Alodyne treatment	Alodyne #1200
	b. Basic Paint	Epoxy
	c. Finish Paint	Epoxy
	d. Color	White (Approximate N-9.5 ; Munsell Color System)
2.4	Connectors	
2.4.1	Tx IF Input, Reference and DC Power	F-female
	Rx IF Output / M&C	F-female (Inside diameter of contact to meet VSWR, mating characteristics and connector durability when mated with a 0.8mm ± 0.05mm diameter male contact.)
2.4.2	Tx RF Output	N-female(50ohm)
	Rx RF Input	WR229 (CPR229G)

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3. Environmental Specifications

3.1 (Blank)

3.2 Environmental Service Conditions

Unless otherwise stated the unit should perform as specified, during and after exposure to any combination of the environmental conditions detailed herein.

3.2.1 Operating Temperature -40 to +60

3.2.2 Storage Temperature -50 to +80

3.2.3 Altitude

The operating device should withstand barometric pressure ranging from sea level to 10,000 ft. The non-operating device should withstand barometric pressure ranging from sea level to 50,000 ft.

3.2.4 Fungus

The unit shall be designed to meet requirement 4 of MIL-STD-454. Test method will be limited to sealed units.

3.2.5 Vibration (All 3 axis)

Non Operating 1mm_{P-P} constant @5Hz to 50Hz
5G constant @50Hz to 500Hz

3.2.6 Mechanical Shock (All 3 axis)

Non Operating 30G, saw tooth wave form, 11msec duration.

3.2.7 Sealing

The unit should be hermetically sealed (connectors, covers, etc.) against rain, wind dust, salt air and humidity levels from 0% to 100%. Sealing design should also avoid moisture absorption within the unit.

3.2.8 (Blank)

3.2.9 Solar Heat Load

360 BTU / hour / square foot horizontal surface.

No cleaning treatment of units is available except natural weather (rain etc.)

3.2.10 Rainfall

5 inches per hour with wind to 50 mph, gusts to 65 mph.

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