

**1.- ODU SPECIFICATIONS**

Item	1. Frequency Bands													
Frequency band (GHz)	6U/L	7	8	10	10.5	11	13	15	18	23	26	28	32	38
1.1 Frequency Range (GHz)	5.925 ~ 7.110	7.125 ~ 7.725	7.9 ~ 8.5	10.15 ~ 10.65	10.5 ~ 10.68	10.7 ~ 11.7	12.75 ~ 13.25	14.4 ~ 15.4	17.7 ~ 19.7	21.2 ~ 23.6	24.2 ~ 26.5	27.5 ~ 29.5	31.8 ~ 33.4	38.6 ~ 40.0
1.2 T/R Spacing (MHz)	150 160 170 252.04 300 340 350	154 160 161 168 196 245	119 126 266 311.320 8	350	91	490 500 530	225 266	315 322 420 490 644 728	1092.5 1010 1008	1008 1200 1232	1008	450 1008	812	700 1260
Item	2. Transmitter													
2.1 Max. Power (dBm) QPSK	30	30	30	26.5	24	28	26	26	25.5	25	25	25	23	23
2.2 Max. Power (dBm) 16/32QAM	28	28	28	22.5	20.5	25	24	24	23	23	22	22	21	20
2.3 Max. Power (dBm) 64/128QAM	25	25	25	20.5	18	22	20	20	19	19	19	19	18	17
2.4 Max. Power (dBm) 256QAM	23	23	23	18.5	16	20	18	18	17	17	17	17	16	15
2.5 Min. Pout @ Antenna Port (dBm)	< 0						< -1				< -3			
2.6 TX Power change step size (dB)	0.5													
2.7 TX Power accuracy (dB)	± 2 @ Pout<Max. Pout, +1/-2@ Pout=Max. Pout													
2.8 TX Power Display Accuracy(dB)	± 2, As reported by the ODU's CPU referenced to nominal value													
2.9 TX Power Change Rate (dB/s)	75 to 100													
2.10 Spurious Emission (dBm)	<-50 for 30MHz to 21.2GHz, <-30 for 21.2GHz to 26.5GHz													
2.11 Phase noise @ Offset (dBc/Hz)														
2.11.1 10KHz	-78	-78	-78	-76	-76	-76	-76	-75	-75	-75	-75	-74	-74	-74
2.11.2 100KHz	-104	-104	-104	-100	-100	-100	-100	-100	-100	-100	-100	-98	-98	-98
2.12 Signal to Spur Ratio (dBc)	<-50; Total accumulated level of all spurs over ± 12MHz from center frequency referenced to the max. modulated spectrum power level													
2.13 Frequency Stability (ppm)	± 5 ppm Maximum													
2.14 Instantaneous Stability (KHz)	<± 25													
2.15 Synthesizer Step Size (KHz)	250 (except for 8GHz TR311.32 and 6GHz TR252.04)													
2.16 TX RF Return Loss (dB)	10													
2.17 MAX Channel Bandwidth (MHz)	60													
2.18 Group Delay Variation(ns)	<18													
2.19 Max. Passband Ripple (dB)	2													
2.20 Transmit muted level (dBm)	<-50													
2.21 TX noise figure @ IF input power (dBm)	<10 @ -25dBm; <23 @ -12dBm; <36 @ +1dBm													

Item	3. Receiver													
Frequency band (GHz)	6U/L	7	8	10	10.5	11	13	15	18	23	26	28	32	38
3.1 RF Input Power Range (dBm)	-90 to -20 (AGC Control Range)													
3.2 Max. Overload Level (dBm)	>-10													
3.3 RX Filter Bandwidth (MHz)	20/60													
3.4 Rejection (dB)														
3.4.1 7MHz Bandwidth (dB)	>10, outside Fc± 7MHz; >30dB, outside Fc± 14MHz													
3.4.2 30 MHz Bandwidth (dB)	>10, outside Fc± 35MHz; >30dB, outside Fc± 60MHz													
3.5 Max. Passband ripple (dB)	2; Max. Peak-peak ripple across 80% x channel bandwidth													
3.6 Group delay variation (ns)	<120, over 80% of 7MHz bandwidth filter; <18, over 80% 30MHz bandwidth filter													
3.7 Frequency stability (ppm)	± 5													
3.8 Synthesizer Step Size(KHz)	250 (except for 8GHz TR311.32 and 6GHz TR252.04)													
3.9 Phase noise @ offset (dBc/Hz)														
3.9.1 10 kHz	-78	-78	-78	-76	-76	-76	-76	-76	-75	-75	-75	-74	-74	-74
3.9.2 100 kHz	-104	-104	-104	-100	-100	-100	-100	-100	-100	-100	-100	-98	-98	-98
3.10 Receiver Noise Figure (dB)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7.0	7.0	7.0	7.0	8.5
3.11 RX gain step size (dB)	Continuous													
3.12 RSSI accuracy (dB)	± 2 for -70dBm<RSL<-30dBm; ± 3 for others													
3.13 TX RF to RX RF isolation (dB)	>75													
3.14 RX RF return loss (dB)	>10													
3.15 RSL indicator (V)	4.5 @ -20dBm RSL, 0.2 @ -90dBm RSL													
3.16 Signal to Spur ratio (dBc)	<-50, total accumulated level of all spurs over 12MHz from the center frequency referenced to the max. modulated spectrum power level													
Item	4. ODU-IDU Interface													
4.1 TX IF Center Frequency(MHz)	350													
4.2 TX IF Power (dBm)	QPSK/16/32QAM = +5 to -22; 64/128/256QAM = +2 to -22													
4.3 TX IF Return Loss (dB)	<-15													
4.4 TX IF Bandwidth (MHz)	60													
4.5 TX IF Power Detection (dBm)	+5 to -22													
4.6 RX IF Center Frequency(MHz)	140													
4.7 RX IF Output Power (dBm)	-10 +2/-4													
4.8 RX IF Return Loss (dB)	<-15													

4.9 RX IF Bandwidth (MHz)		20/60													
4.10 IF TX to RX Isolation (dB)		>65													
<b>Item</b>		<b>5. Telemetry Interface</b>													
5.1 Telemetry input/output		ASK full-duplex													
5.2 Input signal level (mV <sub>p-p</sub> )		100 - 250													
5.3 Input carrier frequency (MHz)		5.5													
5.4 Input data rate (kbps) (Max)		19.2													
5.5 Output signal level (mV <sub>p-p</sub> ) Nom.		200													
5.6 Output carrier frequency (MHz)		10													
5.7 Output data rate (kbps) (Max)		19.2													
5.8 Command/Control Functions		Transmitter Power, Transmitter Carrier Frequency, Transmitter Mute, Receiver Carrier Frequency, Modulation Type, Channel Bandwidth													
5.9 Monitored/Reported Functions		Loss of TXIF Input Alarm, Transmitter Power Range Limits, Transmitter Power, Transmitter Mute, Transmitter Synthesizer PLL Alarm, Receiver Synthesizer PLL Alarm, Common Synthesizer PLL Alarm, Receiver Signal Strength Indication (RSSI), ODU Internal Temp													
<b>Item</b>		<b>6. Primary Power</b>													
6.1 Protection Circuit		Powered and Protected by IDU													
6.2 Voltage Range (VDC)		-20 to -72 or +20 to +72													
6.3 Power Dissipation (Watts)		25 Typical, 35 Maximum													
6.4 Inrush current		ETS 300 132-2													
<b>Item</b>		<b>7. Environmental</b>													
7.1 Safety		Comply with EN60950													
7.2 Operating		ETS 300 019-2-4 Class 4M5 (-33 to +55°C)													
7.3 Cold Start Conditions		Operational at -45°C, not guaranteed to be fully spec compliant													
7.4 Storage		ETS 300-019-2-1													
7.5 Transportation		ETS 300-019-2-2													
<b>Item</b>		<b>8. Mechanical</b>													
8.1 Weight (lbs)		≤ 9.5													
8.2 Size (inch)		10.9 x 9.4 x 3.6													
8.3 Color		Polyester Powder Coat (Gloss Gray)													
8.4 Ground Lug (mm)		M5 x 9LG													
8.5 Antenna Interface	Rectangular WG	WR137	WR112	WR112	WR90	WR90	WR75	WR75	WR62	WR42	WR42	WR42	WR28	WR28	N/A
	Circular WG	N/A	Ø1.025"	Ø1.025"	N/A	N/A	Ø0.740"	Ø0.620"	Ø0.560"	Ø0.455"	Ø0.375"	Ø0.332"	N/A	Ø0.250"	Ø0.219"