

Tx Radiated Emissions - Continued

Open Area Test Site Results:

12.5 kHz Channel Spacing

851.025 MHz @ 15 W

Emission Mask D

Harmonics Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1702.050	-59.95	-101.71
2553.075	-44.05	-85.81
3404.100	-58.60	-100.36
4255.125	-61.55	-103.31
5106.150	-51.65	-93.41
5957.175	-57.55	-99.31
Measurement Uncertainty	± 4.6 dB	

Sample Calculation	Measurement				Result	
	Reference	Substitution			dBm	dBc
Emission Frequency (MHz)	Reference Level (dBm)	Sig-gen Level	Cable and Attenuator Gain	Antenna Gain (dBd)		
1702.05	-100	-47.8	-18.5	+8.5-2.15	-59.95	-101.71
		A	B	C	E	

Result (E) = A+B+C

Photo: OATS Setup



TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

SPECIFICATION: FCC 47 CFR 2.1055, FCC 47 CFR 90.213

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.4

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error from -30°C to $+50^{\circ}\text{C}$ in 10°C increments
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT UNCERTAINTY: $\pm 0.05\text{ppm}$

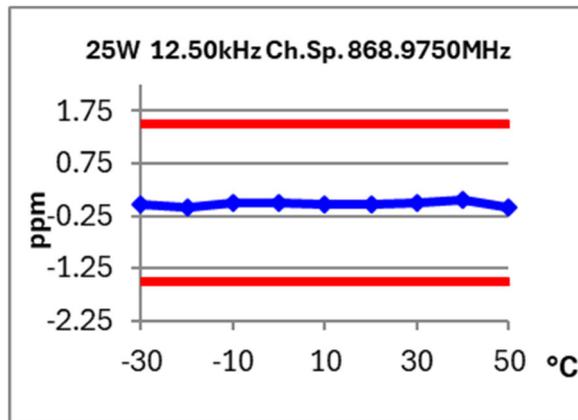
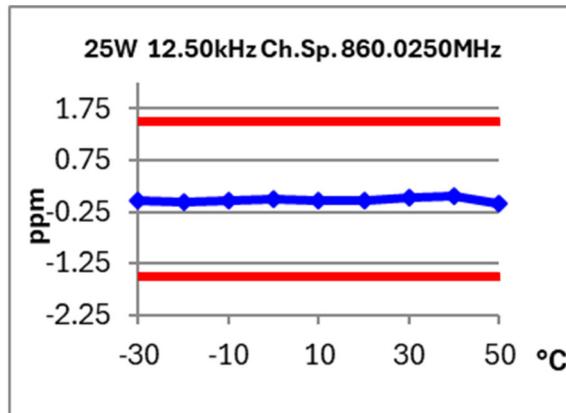
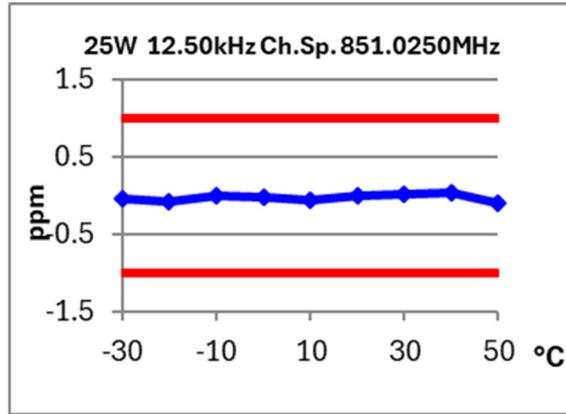
MEASUREMENT RESULTS:

See the plots on the following pages.

Temperature ($^{\circ}\text{C}$)	Error (ppm)		
	851.025 MHz	860.025 MHz	868.975 MHz
-30	-0.04	-0.02	-0.02
-20	-0.07	-0.05	-0.08
-10	-0.01	-0.03	0
0	-0.02	-0.01	-0.01
10	-0.06	-0.04	-0.04
20	-0.01	-0.02	-0.02
30	0.02	0.03	0.01
40	0.03	0.06	0.05
50	-0.09	-0.09	-0.09
Limit PPM	1	1.5	1.5

Transmitter Frequency Stability – Temperature Plots

LIMIT:	FCC 47 CFR 90.213	RSS-119 5.3
	Channel Spacing (kHz)	Frequency Error (ppm)
	12.5	1-1.5



TRANSMITTER FREQUENCY STABILITY - VOLTAGE

SPECIFICATION: FCC 47 CFR 2.1055 (d) (1), FCC 47 CFR 90.213

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.5

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error at an input voltage to the radio of 85% to 115%.
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT UNCERTAINTY: $\pm 0.05\text{ppm}$

MEASUREMENT RESULTS:

	FREQUENCY ERROR (ppm) for 12.5 kHz		
	13.8 V _{DC}	11.73 V _{DC}	15.87 V _{DC}
851.025 MHz	0.02	0.01	0.02
860.025 MHz	0.05	0.03	0.05
868.975 MHz	0.01	0.02	0.03

LIMIT CLAUSES: FCC 47 CFR 90.213

RSS-119 5.3

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	1.0

RECEIVER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: FCC 47CFR 15.111

RSS-Gen 7.4

GUIDE: TIA-603-E 2.1.2

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment set up diagram.
2. The frequency range examined was from 30 MHz to 3 times the highest tunable frequency.
3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.
4. A scan is performed with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz
5. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables and attenuator losses allowing the emission levels to be read directly with no further calculation.

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

Example of attenuation correction: (dB)

E3388 10dB 50W AZ0401	9.98	
E5015 3m Blue	0.84	
E5028 1m5 Blue	0.36	
Total Attenuation @ 810.05 MHz	11.18	Sum of component attenuation (a)
Amplitude offset	11.96	(b)
Correction @ 810.05MHz	-0.78	(a-b)

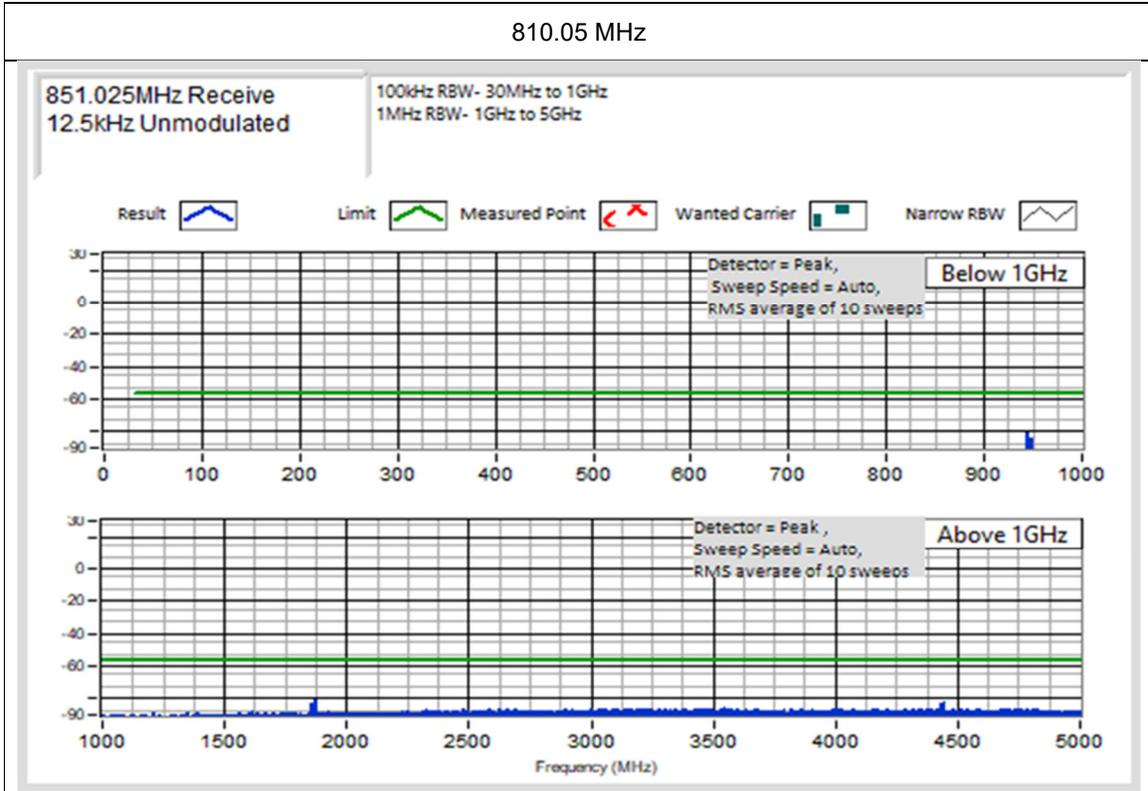
MEASUREMENT UNCERTAINTY: ± 2.8dB

LIMIT CLAUSE: RSS-Gen 7.4

LIMIT	30 → 1000 MHz	2 nW	- 57 dBm
	> 1000 MHz	5 nW	- 53 dBm

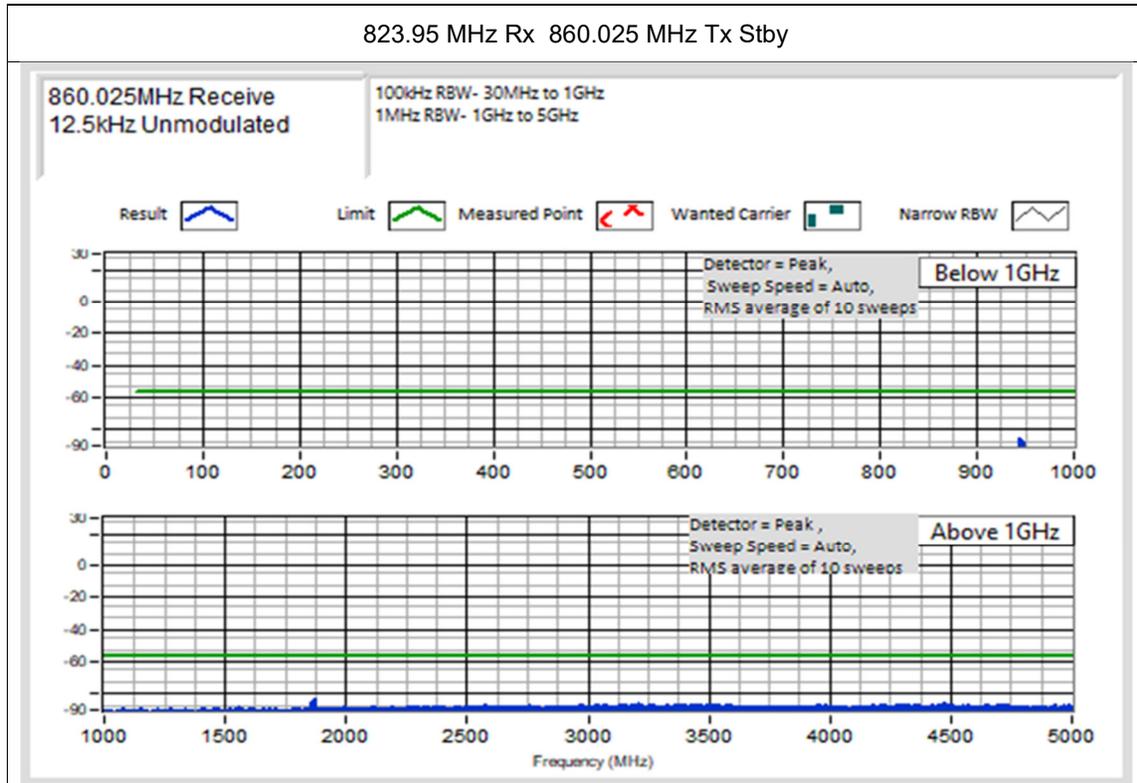
Receiver Spurious Emissions (Conducted) – Continued

810.05 MHz Receive		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		



Receiver Spurious Emissions (Conducted) – Continued

823.95 MHz Receive 860.025MHz Tx Stby		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		



TRANSMITTER STANDBY SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: FCC 47CFR 15.111

RSS-Gen 7.4

GUIDE: TIA-603-E 2.1.2

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment set up diagram.
2. The frequency range examined was from 30 MHz to 3 times the highest tunable frequency.
3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.
4. A scan is performed with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz for frequencies up to 1 GHz, and a resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz for frequencies above 1 GHz
5. For each frequency range the spectrum analyser was loaded with the appropriate calibration figures to compensate for the cables and attenuator losses allowing the emission levels to be read directly with no further calculation.

Spurious emissions which were attenuated by more than 20 dB below the limit were not recorded.

Example of attenuation correction:

E3388 10dB 50W AZ0401	9.98	
E5015 3m Blue	0.86	
E5028 1m5 Blue	0.37	
Total Attenuation @ 851.025 MHz	11.21	Sum of component attenuation (a)
Amplitude offset	11.96	(b)
Correction @ 851.025 MHz	-0.75	(a-b)

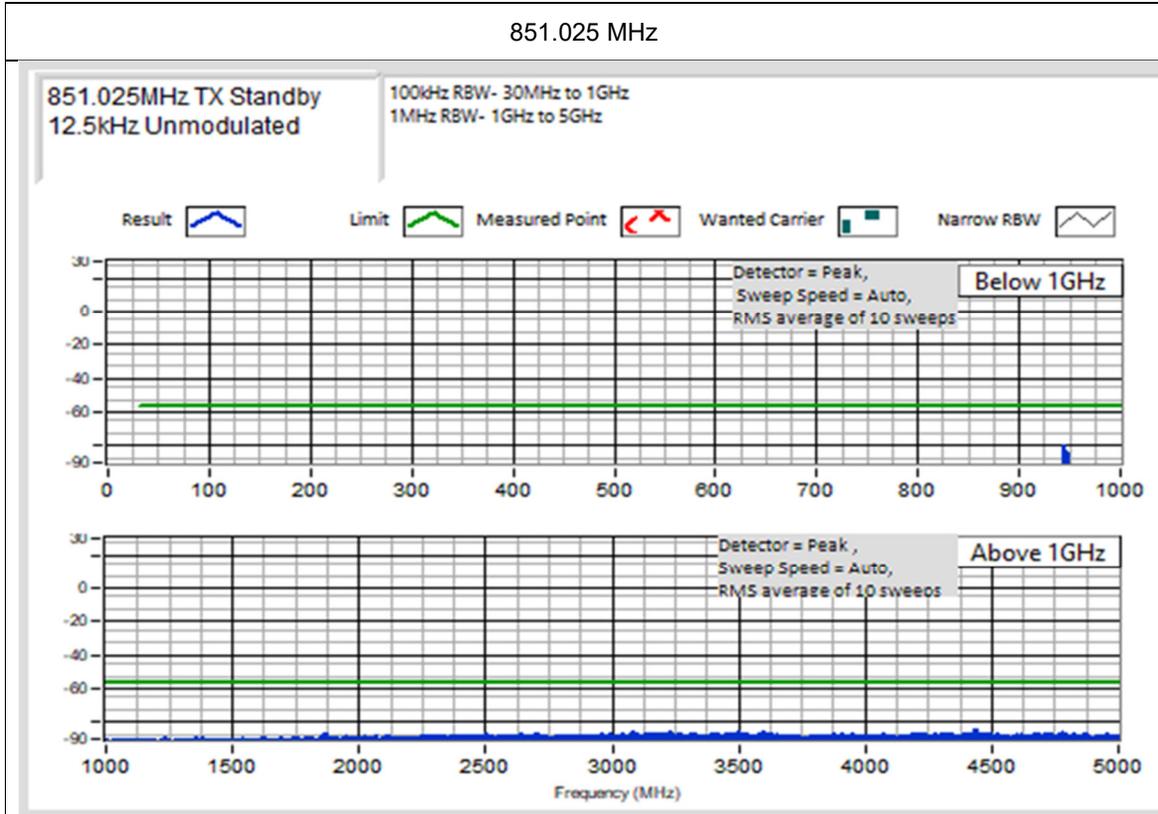
MEASUREMENT UNCERTAINTY: ± 2.8dB

LIMIT CLAUSE: RSS-Gen 7.4

LIMIT	30 → 1000 MHz	2 nW	- 57 dBm
	> 1000 MHz	5 nW	- 53 dBm

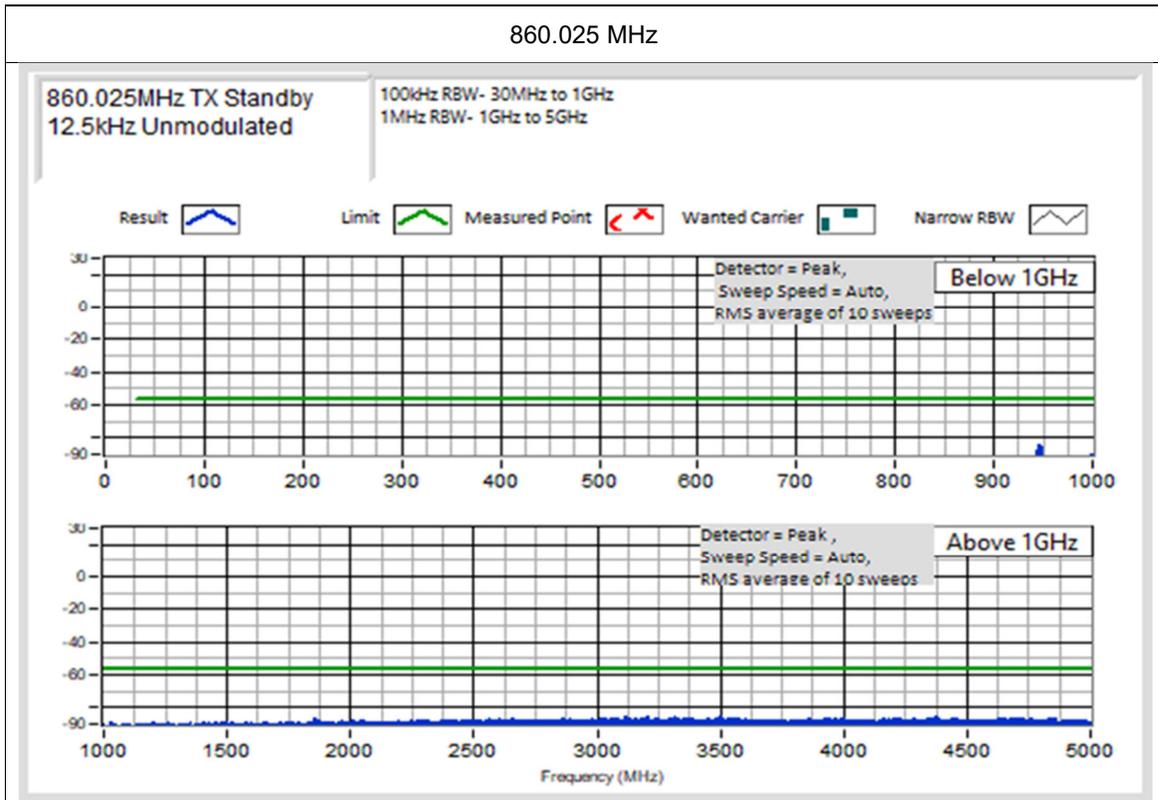
Transmitter Standby Spurious Emissions (Conducted) – Continued

851.025 MHz Transmitter Standby		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		



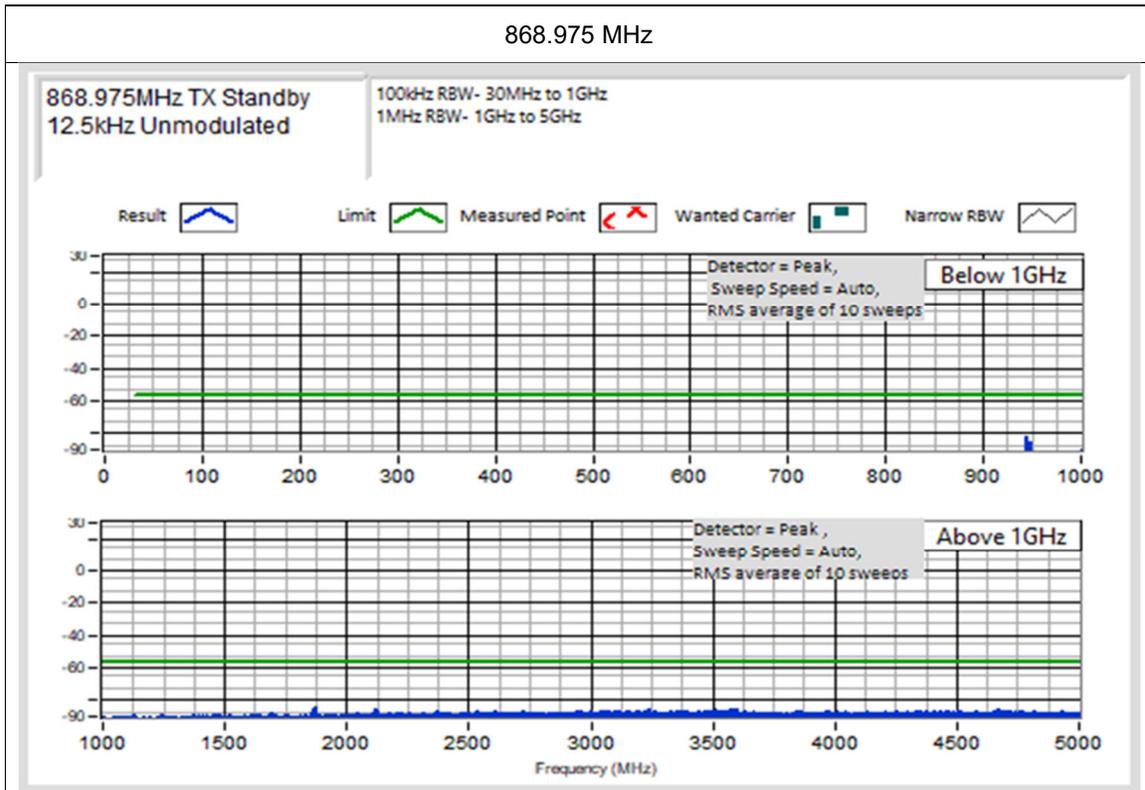
Transmitter Standby Spurious Emissions (Conducted) – Continued

860.025 MHz Transmitter Standby		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
Measurement Uncertainty	≤12.75 GHz ± 2.8 dB	
No emissions were detected within 20 dB of Limit.		



Transmitter Standby Spurious Emissions (Conducted) – Continued

868.975 MHz Transmitter Standby		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
Measurement Uncertainty	≤12.75 GHz ± 2.8 dB	
No emissions were detected within 20 dB of Limit.		



TEST EQUIPMENT LIST

Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Antenna	18GHz DRG	Emco	DRG3115	2084	E3076	
Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	20-Aug-27
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-885	E4857	
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-884	E4858	
Audio Analyser	TREVA2	Hewlett Packard	HP8903B	2818A04275	E3710	10-Oct-25
Audio Analyser	TREVA1	Hewlett Packard	HP8903A	2437A04625	E4986	5-Oct-25
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	18-Sep-25
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	18-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack2	E4623	10-Sep-25
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack3	E4624	10-Sep-25
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	12-Sep-25
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	11-Sep-25
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	11-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	12-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	13-Sep-25
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	11-Sep-25
Coax Cable	OATS Turntable Cable 2	Intelcom	RG215	OATS3	E4995	12-Sep-25
Coax Cable	3m Blue	Suhner	Sucoflex 126EA	503429/126EA	E5015	11-Sep-25
Coax Cable	1.5m Blue	Suhner	Sucoflex 126EA	502868/126EA	E5028	11-Sep-25
Environ. Chamber	Upright	Contherm	5400 RHSLT.M	1416	E4051	5-Jan-29
Filter High Pass/ Notch	550 to 885MHz	Tait		N/A	E3785	22-May-25
Modulation Analyser	TREVA2	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	11-Oct-25
Modulation Analyser	TREVA1	Hewlett Packard	HP8901B (Opt 002)	3704A05837	E3786	9-Oct-25
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
OATS	NSA	Tait				1-Nov-25
Power Meter	TREVA2 Power Head for HP8901	Hewlett Packard	HP11722A	2716A02037	1575	10-Oct-25
Power Meter	Power Sensor	Rohde & Schwarz	URV5- Z4 395.1619. 55	841498/003	E3557	11-Oct-25
Power Meter	Reverb - USB interface for NRT Z44	Rohde & Schwarz	NRT Z5	100586	E4852	
Power Meter	Reverb - 0.2 - 4GHz directional power meter	Rohde & Schwarz	NRT Z44	105151	E4853	8-Oct-26
Power Meter	Power Sensor- 6GHz Reverb FWD	Raditeq	RPR2006C	2201014	E11366	9-Oct-25

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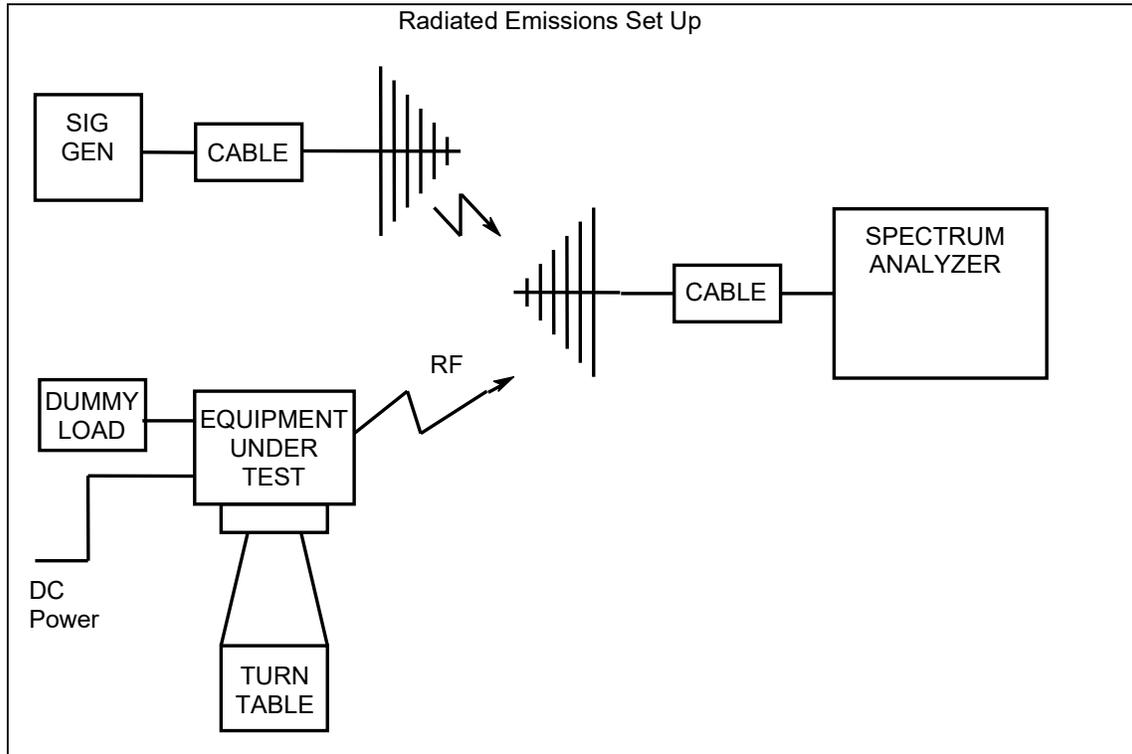
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Power Meter	Power Sensor- 6GHz Reverb REV	Raditeq	RPR2006C	2201015	E11367	9-Oct-25
Power Meter	TREVA1 Power Head for HP8901	Hewlett Packard	HP11722A	3111A05573	E7054	7-Oct-25
Power Supply	AC Variac	Yamabishi	S-260-5	TX-533	E1737	
Power Supply		Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	20-May-25
Power Supply	TREVA 1 60V/25A	Agilent	N5767A	US23D6941R	E11372	5-Oct-25
Power Supply	TREVA2 60V/25A	Agilent	N5767A	US09F4901H	E4656	9-Oct-25
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	7-Aug-25
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	16-Oct-25
RF Attenuator	10dB 50W	Weinschel	24-10-34	AZ0401	E3388	13-Sep-25
RF Attenuator	TREVA2 20dB 150W	Weinschel	40-20-33	CJ405	E3733	13-Sep-25
RF Attenuator	30+3dB 350W	Weinschel	67-30-33 & BW-N3W5+	CK9178	E5023	17-Sep-25
RF Attenuator	TREVA2 3dB	Weinschel	Model 1	BL9950	E4080	13-Sep-25
RF Attenuator	TREVA1 3dB	Weinschel	Model 1	BL9958	E4081	13-Sep-25
RF Attenuator	TREVA1 20dB 150W	Weinschel	40-20-23	MF817	E4082	13-Sep-25
RF Attenuator	3dB 0.5W	Weinschel	Model 1	CH6863	E5013	13-Sep-25
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	7-May-25
RF Chamber	Reverb - Stirrer controller for reverb chamber	Teseq	Stirrer Controller	29765.1	E4854	
RF Chamber	Reverb - 0.5 - 18GHz Reverberation Chamber	Teseq	RVC XS	29765	E4855	
RF Combiner	TREVA1	Minicircuits	ZFSC-4-1	-	E4083	
RF Combiner	TREVA2	Minicircuits	ZFSC-4-1	-	E4084	
RF Load	150W	Bird	8166	524	E3625	17-Sep-25
Signal Generator	Digital 4GHz	Agilent	E4437B	US39260389	E4764	15-Oct-25
Signal Generator	Analog 12.75GHz	Rohde & Schwarz	SMB100A	183236	E11369	28-Mar-25
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	2-Mar-25
Temp & Humidity datalogger		TP-Link TAPO	T315	22383M6000671	E11377	8-Feb-25
TREVA 1		Teltest	-	1	-	23-Apr-25
TREVA 2		Teltest	-	2	-	23-Apr-25
Testware	Frequency Vs Temperature		TTEL_FREQTEMP_1.02.00	-	-	
Testware	Occupied Bandwidth		TTEL_OCCBW_2.01.00	-	-	
Testware	Reverb Emissions		TTEL_REVEMIS_2.01.00	-	-	
Testware	Sideband Spectrum		TTEL_SBSPEC_1.01.00	-	-	
Testware	S-Line Radiated Emissions		TTEL_SLINERADEM_2.01.00	-	-	

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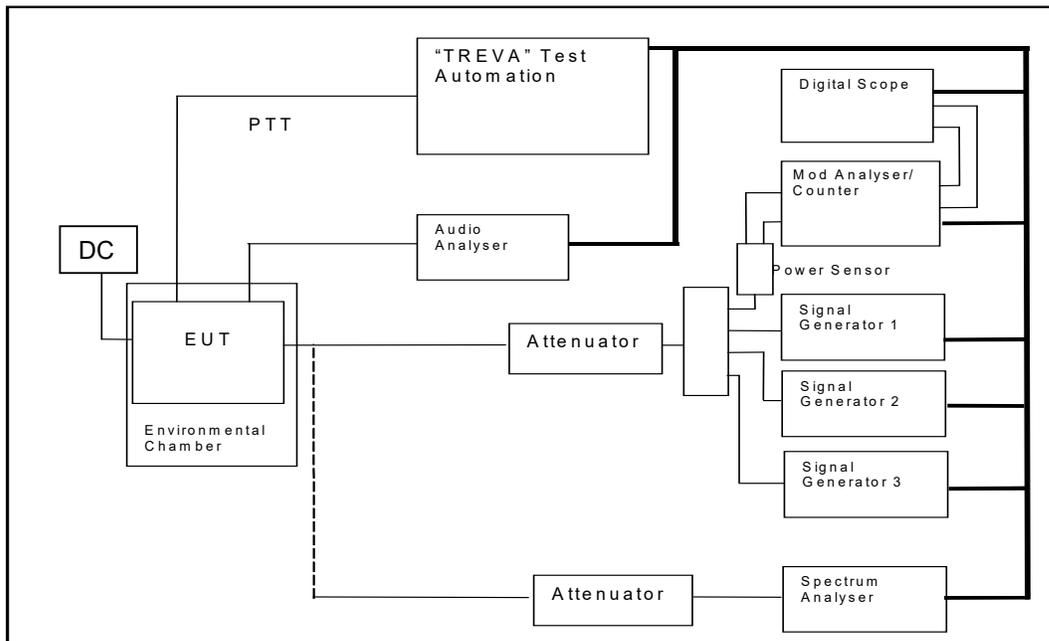
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Testware	TREVA		TTEL_TREVA_2.03.00	-	-	
Testware	Radio Conducted Emissions		TTEL_RADIOCOND_1.02.01	-	-	

NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments.

ANNEX A – TEST SETUP DETAILS



All other testing is performed using the Teltest Radio **EVAL**uation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, Spectrum Masks, and Occupied Bandwidth.



END OF REPORT