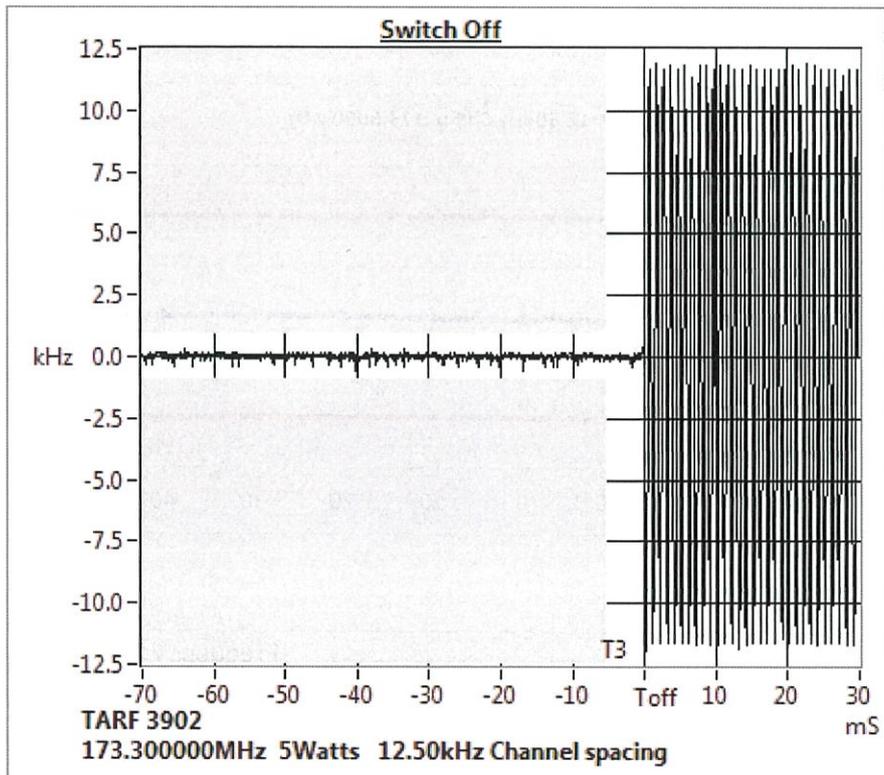
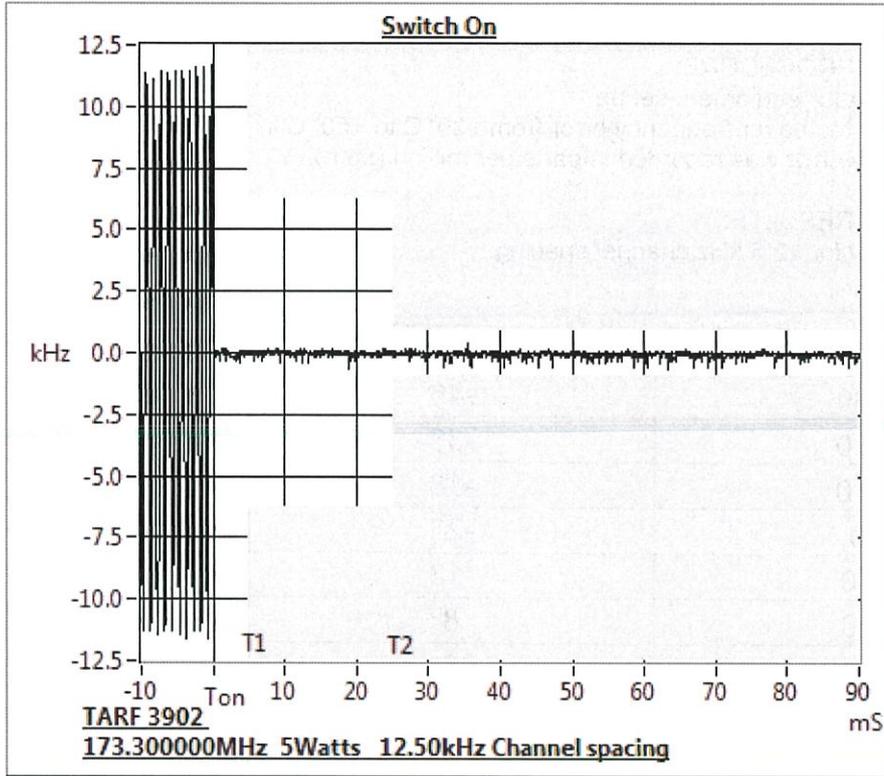


Transient Frequency Behaviour

SPECIFICATION: FCC 47 CFR 90.214

Tx FREQUENCY: 173.3 MHz 5 W 12.5 kHz Channel Spacing



TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

SPECIFICATION: FCC 47 CFR 2.1055 (a) (1)

GUIDE: TIA/EIA-603D 2.2.2

MEASUREMENT PROCEDURE:

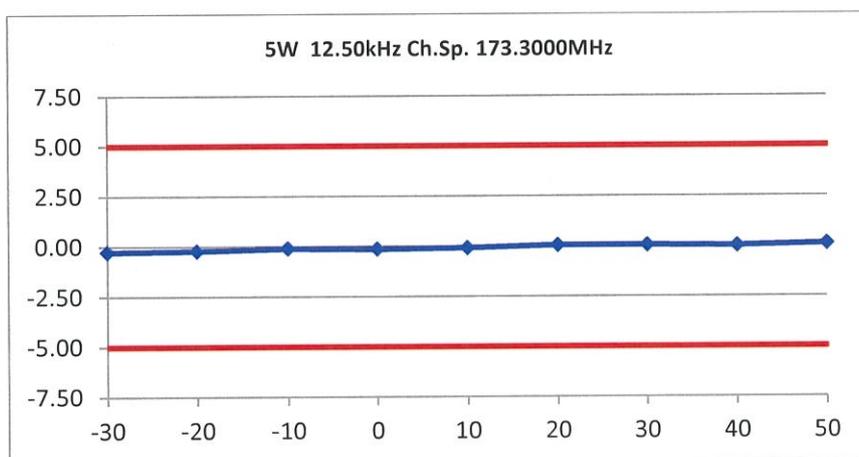
1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error from -30°C to $+50^{\circ}\text{C}$ in 10°C increments
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

See the plot below for 12.5 kHz channel spacing.

173.3 MHz

Temperature ($^{\circ}\text{C}$)	Frequency (Hz)	Error (ppm)
-30	-46	-0.27
-20	-38	-0.22
-10	-18	-0.10
0	-23	-0.13
10	-13	-0.08
20	8	0.05
30	8	0.05
40	3	0.02
50	19	0.11
Measurement Uncertainty	$\pm 7 \times 10^{-8}$	



LIMIT: FCC 47 CFR 90.213

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	5.0

TRANSMITTER FREQUENCY STABILITY - VOLTAGE

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

GUIDE: TIA/EIA-603D 2.2.2

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 100%.
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

Voltage	FREQUENCY ERROR (ppm) for 12.5 kHz
6.375 V _{DC}	0.00
7.500 V _{DC}	0.01
Measurement Uncertainty	$\pm 7 \times 10^{-8}$

LIMIT CLAUSE: FCC 47 CFR 90.213

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	5.0

TEST EQUIPMENT LIST

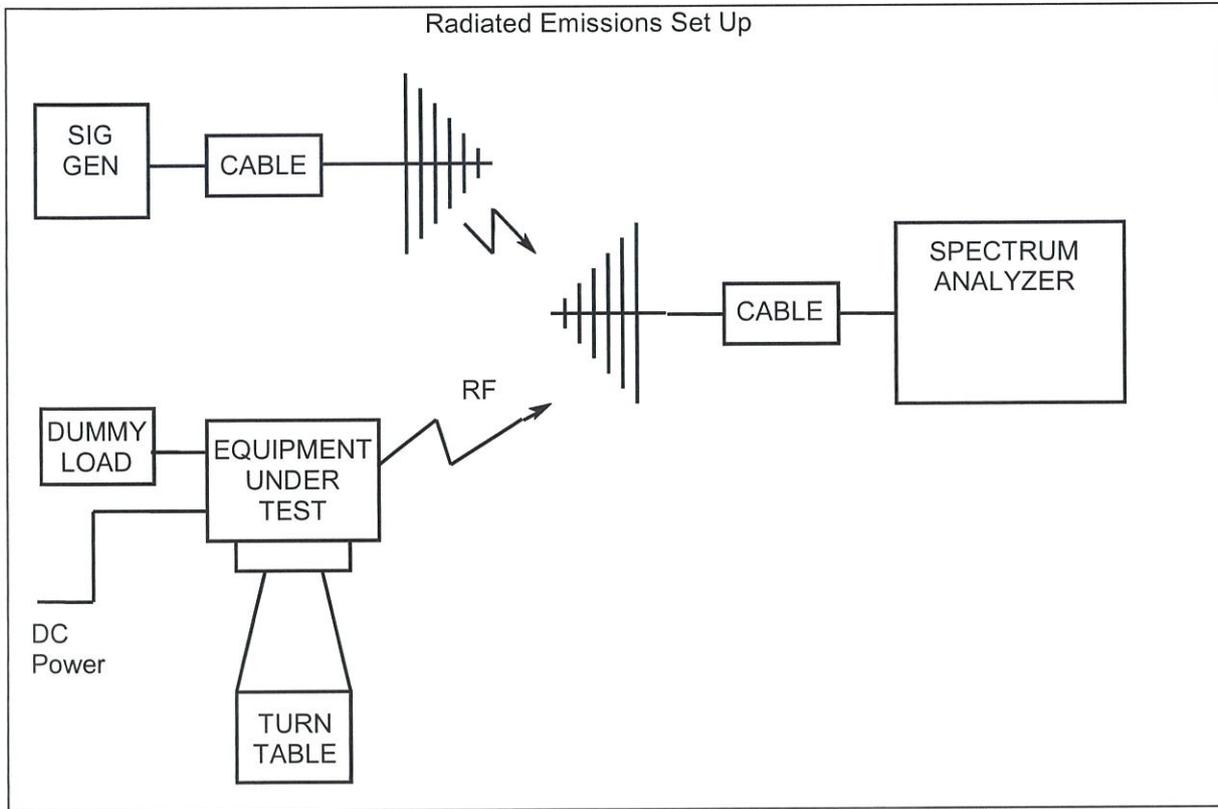
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Antenna	Reference Dipoles	Emco	3121C DB1	9510-1164	E3559	14-Apr-19
Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	15-May-20
Antenna	Log Periodic	Schwarzbeck	VUSLP	9111-219	E4617	
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 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	6-Oct-18
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack2	E4623	20-Dec-18
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack3	E4624	20-Dec-18
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	1-Jan-19
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	1-Jan-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack5	E4850	20-Dec-18
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack6	E4849	20-Dec-18
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	20-Dec-18
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	20-Dec-18
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	20-Dec-18
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	20-Dec-18
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	20-Dec-18
Coax Cable	OATS Turntable Cable 2	Intelcom	RG215	OATS3	E4995	1-Jan-19
Coax Cable	2m Black	Suhner	RG214HF/Nm/ Nm/2000	TeltestBlack8	E5005	1-Jan-19
Environ. Chamber	Chest	Contherm	Chest	E3397	E3397	1-Aug-18
Modulation Analyser	TREVA2	Hewlett Packard	HP8901B (Opt 002)	3704A05837	E3786	4-Oct-18
Multimeter		Fluke	77	35069359	E3237	26-Sep-18
OATS	NSA	Tait				9-Jul-18
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	FCC Listing Registration			837095		8-May-19
Oscilloscope	100MHz Digital	Tektronics	TDS340	B013611	E3585	28-Sep-19
Power Meter	TREVA2 Power Head for HP8901	Hewlett Packard	HP11722A	2716A02037	1575	5-Oct-18
Power Supply		Rohde & Schwarz	NGS M32/10 192.0810.31	Fnr 434	E3556	20-Apr-18
Power Supply	TREVA2 60V/25A	Agilent	N5767A	US09F4901H	E4656	7-Oct-19
Power Supply	60V/50A/1000W	Hewlett Packard	HP6012B	2524A00616	E3712	30-Sep-19
Power Supply	60V/25A	Agilent	N5767A	3111A05573	E4979	10-Oct-18
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	17-Apr-19
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	9-Oct-18
RF Attenuator	30dB 250W	Weinschel	45-30-34	JW663	E3386	20-Dec-18
RF Attenuator	10dB 150W	Weinschel	57-10-34	LB590	E3674	20-Dec-18
RF Attenuator	10dB 50W	Weinschel	24-10-34	AZ0401	E3388	20-Dec-18
RF Attenuator	20dB 50W	Weinschel	24-20-44	AW1266	E3562	20-Dec-18

TELTEST Laboratories
Tait Ltd
Report Number 3902

RF Attenuator	20dB 25W	Weinschel	33-20-33	BD5871	E3673	20-Dec-18
RF Attenuator	TREVA2 20dB 150W	Weinschel	40-20-33	CJ405	E3733	20-Dec-18
RF Attenuator	30dB 350W	Weinschel	67-30-33	BR0531	E4280	20-Dec-18
RF Attenuator	10dB 50W	Weinschel	24-10-34	BC3293	E4364	21-Dec-18
RF Attenuator	TREVA2 3dB	Weinschel	Model 1	BL9950	E4080	20-Dec-18
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	
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	TREVA2	Minicircuits	ZFSC-4-1	-	E4084	
RF Combiner	Three port resistive	Weinschel	1506A	MD719	E5008	22-Aug-18
RF Load	50W	Weinschel	F1426	AE2490	E3624	20-Dec-18
Signal Generator	Analog 4GHz	Agilent	E4422B	GB40050320	E3788	28-Sep-18
Signal Generator	Analog 3.2GHz	Hewlett Packard	HP8648C	3443U00543	E3558	26-Sep-18
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	18-Oct-18
Spectrum Analyser	13.2GHz	Hewlett Packard	HP8562E	3821A00779	E3715	2-Oct-18
Spectrum Analyser	13.2GHz	Agilent	E4445A	MY42510072	E4139	15-Oct-18
Temp & Humidity Datalogger		Hobo	U21-011	10134275	E4980	
Testware	Conducted Emissions		16/12/2015	-	-	
Testware	Radiated Emissions		September 2015	-	-	
Testware	Reverb Emissions		28 May 2015	-	-	
Testware	Sideband Spectrum		February 2017	-	-	
Testware	S-Line Radiated Emissions		May 2016	-	-	
Testware	TREVA		December 2015	-	-	

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 EVALuation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, and Occupied Bandwidth.

