

LABORATORY TEST REPORT

RADIO PERFORMANCE MEASUREMENTS

for the

TBCL0E Base Station Transceiver

Tested in accordance with:

FCC 47 CFR Parts 22 and 90

RSS-119 Issue 11
RSS-Gen Issue 3

Report Revision: 1

Issue Date: 10-November-2014

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Laboratory Technical Manager



OATS FCC LISTING REGISTRATION: 837095
OATS IC LISTING REGISTRATION: SITE# 737A-1

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

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REVISION

Date	Revision	Comments
10-November-2014	1	Initial test report

INTRODUCTION

REASON FOR REPORT

This report covers the requirements of FCC 47 Parts 22 & 90, and RSS-119 Issue 11 & RSS-Gen Issue 3.

Type Approval Testing of the TBCL0E
Frequency range 896 → 941 MHz

in accordance with:

FCC 47 CFR Parts 22 and 90
RSS-119 Issue 11 & RSS-Gen Issue 3

REPORT PREPARED FOR

Tait Communications
PO Box 1645
558 Wairakei Road
Christchurch
New Zealand

DESCRIPTION OF SAMPLE

Manufacturer Tait Limited
Equipment: Base Station Transceiver
Type: TBCL0E

Product Description

Description	Product Code	Serial Number	Firmware Version	Hardware Version
Power Amplifier	T01-01136-QBAA	18203257	0314	01.00
Reciter	T01-01105-QAZZ	18203339	Dmr-trunk.20140429T094912	00.10
PMU	TBA30A0-0100	18203735	0316	01.00
Front Panel	T01-01110-CCAA	18203907	0.01.00.trunk.338466.2014...	00.04

TEST CONDITIONS

All testing was performed between 26th September → 10th November 2014, and under the following conditions:

Ambient temperature: 15°C → 30°C
Relative Humidity: 20% → 75%
Standard Test Voltage 120 V_{AC}

STATEMENT OF COMPLIANCE

We, TELTEST LABORATORIES of 558 Wairakei Road, Christchurch, New Zealand, declare under our sole responsibility that the product:

Equipment: Base Station Transceiver

Description	Product Code	Serial Number	Firmware Version	Hardware Version
Power Amplifier	T01-01136-QBAA	18203257	0314	01.00
Reciter	T01-01105-QAZZ	18203339	Dmr-trunk.20140429T094912	00.10
PMU	TBA30A0-0100	18203735	0316	01.00
Front Panel	T01-01110-CCAA	18203907	0.01.00.trunk.338466.2014...	00.04

to which this declaration relates, is in conformity with the following standards:

FCC 47 CFR Parts 22 and 90

RSS-119 Issue 11 & RSS-Gen Issue 3

Signature: _____

Mike James
Technical Manager

Date: _____

MODULATION TYPES, NECESSARY BANDWIDTH & EMISSION DESIGNATORS

MODULATION TYPES:

FXD	Digital Data	4800 symbols/sec	9600 bps
FXW	Digital Voice / Data	4800 symbols/sec	9600 bps

CHANNEL SPACINGS: 12.5 kHz

EMISSION DESIGNATORS:

DMR Digital Voice / Data	7K60FXW
DMR Digital Data	7K60FXD

Digital Mobile Radio (DMR) 4 level FSK (as per ETSI TS 102 361-1)
4800 symbols/sec 9600 bps

Digital Data 12.5 kHz Channel Spacing – 7K60FXW
99% bandwidth Emission Designator
= 7.6 kHz 7K60FXW
FXW represents FM combination of data and telephony.

Digital Data 12.5 kHz Channel Spacing – 7K60FXD
99% bandwidth Emission Designator
= 7.6 kHz 7K60FXD
FXD represents FM data only

TEST RESULTS

TRANSMITTER OUTPUT POWER (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1046
RSS-119 5.4

GUIDE: TIA-102.CAAA-C 2.2.1

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment set up.
2. The coaxial attenuator has an impedance of 50 Ohms.
3. The unmodulated output power was measured with an RF Power meter.

MEASUREMENT RESULTS:

Manufacturer's Rated Output Power:

Switchable: 100 W and 10 W

Nominal 100W	928.1000 MHz	931.5125 MHz	935.0125 MHz	939.9875 MHz
Measured	87.6	87.0	88.2	90.3
Variation (%)	-12.4	-13.0	-11.8	-9.7
Variation (dB)	-0.6	-0.6	-0.5	-0.4
Nominal 10W	928.1000 MHz	931.5125 MHz	935.0125 MHz	939.9875 MHz
Measured	8.64	8.77	8.80	8.92
Variation (%)	-13.6	-12.3	-12.0	-10.8
Variation (dB)	-0.6	-0.6	-0.6	-0.5
Measurement Uncertainty		± 0.6 dB		

LIMIT CLAUSES:

FCC 47 CFR 90.205 (s)

The output power shall not exceed by more than 20%... the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

RSS-119 5.4

The output power shall be within ± 1.0 dB of the manufacturer's rated power.

TRANSMITTER OCCUPIED BANDWIDTH AND SPECTRUM MASKS

SPECIFICATION: FCC 47 CFR 2.1049 (c) RSS-119 5.5

GUIDE: TIA-102.CAAA-C 2.2.5

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment Set up.
The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates.
2. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as follows.
Emission Mask D – Resolution Bandwidth = 100 Hz, Video Bandwidth = 1 kHz
Emission Mask G – Resolution Bandwidth = 300 Hz, Video Bandwidth = 3 kHz
Emission Mask J – Resolution Bandwidth = 300 Hz, Video Bandwidth = 3 kHz

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz channel spacing.

LIMIT CLAUSE: FCC 47 CFR 90.210 RSS-119 5.5

EMISSION MASKS

Emission Mask D	12.5 kHz Channel Spacing	DMR	928.1000 MHz
Emission Mask G	12.5 kHz Channel Spacing	DMR	931.5125 MHz
Emission Mask J	12.5 kHz Channel Spacing	DMR	935.0125 MHz
Emission Mask J	12.5 kHz Channel Spacing	DMR	939.9875 MHz

DATA SPEED

Digital Voice/Data	12.5 kHz Channel Spacing	9600 bps
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NOTE:

Mask-G was used for 931.5125 MHz tested at 12.5 kHz channel spacing.

RSS-119 Table-3 designates the 931–932 MHz band as 25.0 kHz channel spacing.

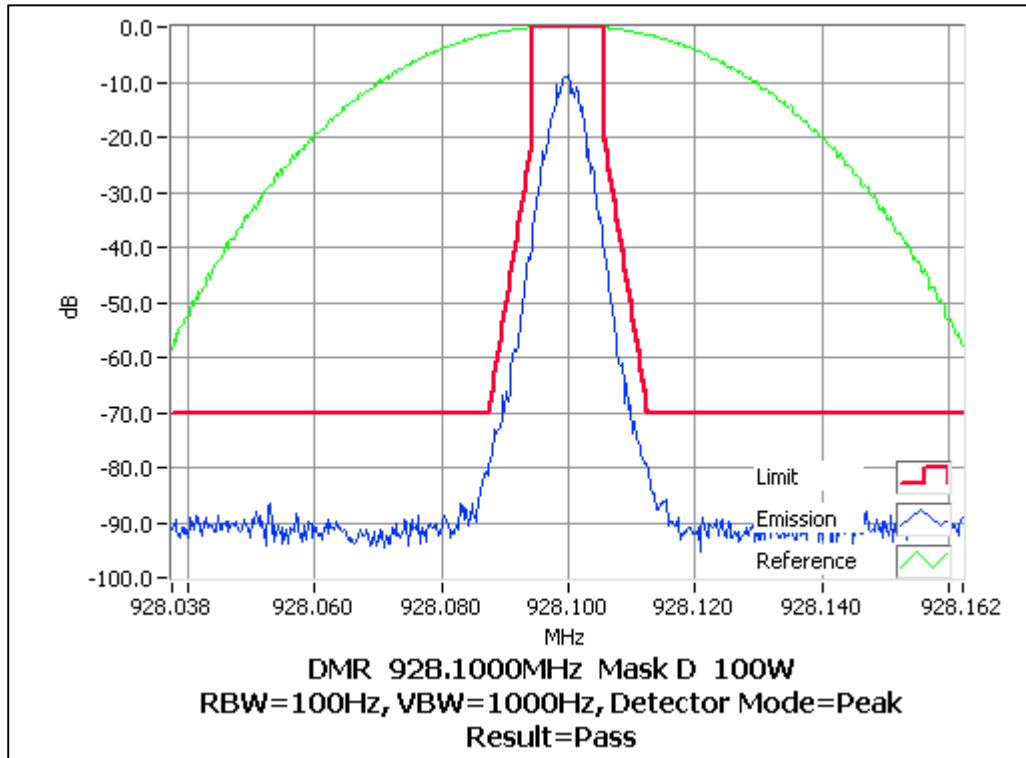
Occupied Bandwidth and Spectrum Masks

SPECIFICATION: FCC CFR 2.1049 (c)

RSS-119 5.5

Tx FREQUENCY: 928.1000 MHz 100 W

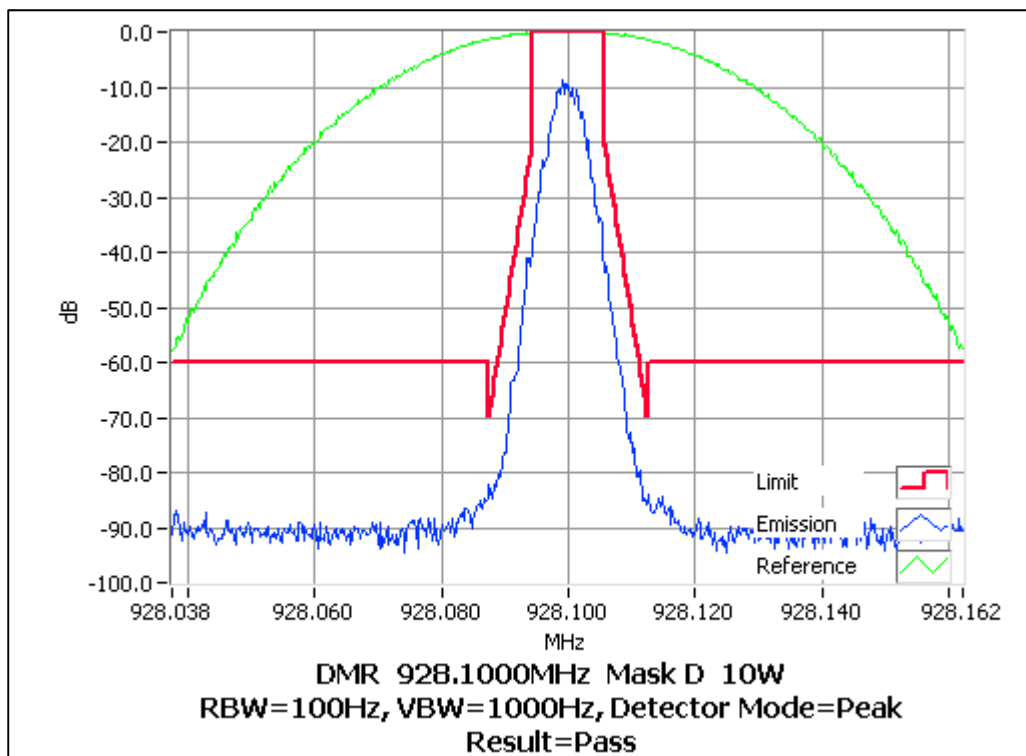
12.5 kHz Channel Spacing



Tx FREQUENCY: 928.1000 MHz

10 W

12.5 kHz Channel Spacing



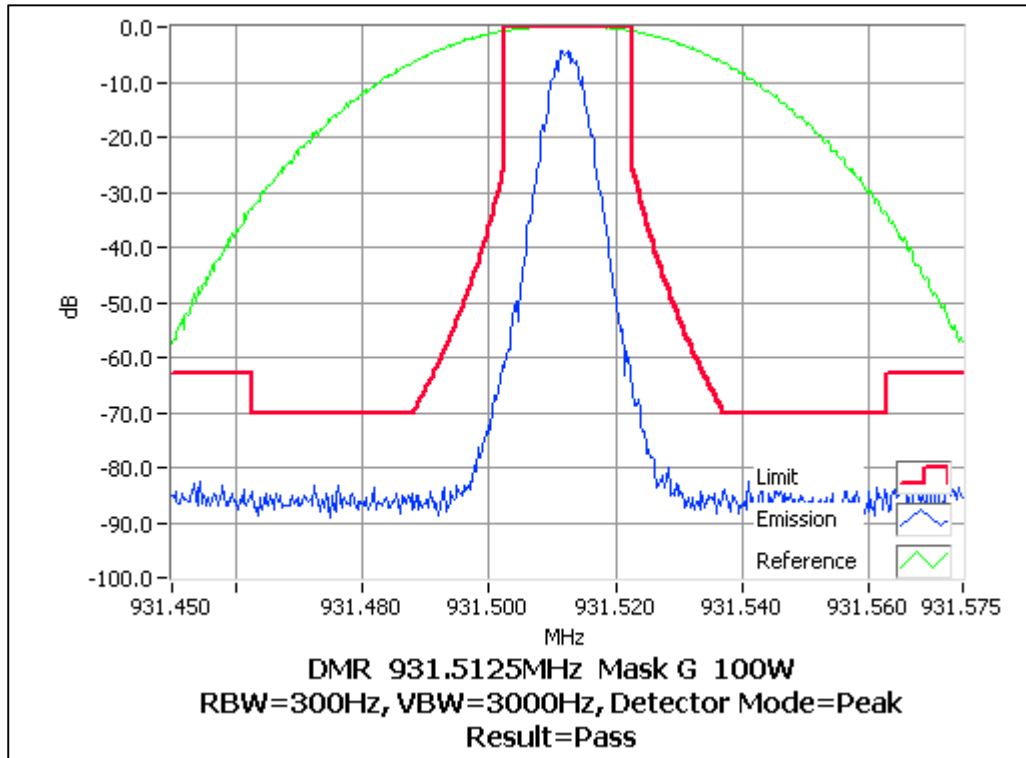
Occupied Bandwidth and Spectrum Masks

SPECIFICATION: FCC CFR 2.1049 (c)

RSS-119 5.5

Tx FREQUENCY: 931.5125 MHz 100 W

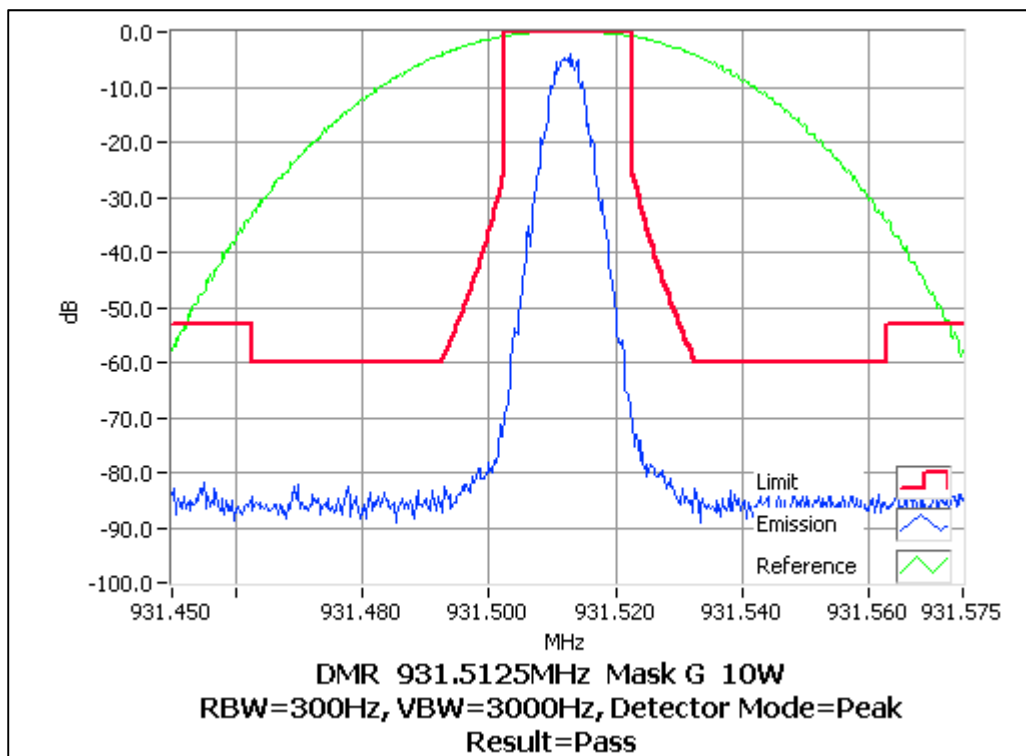
12.5 kHz Channel Spacing



Tx FREQUENCY: 931.5125 MHz

10 W

12.5 kHz Channel Spacing



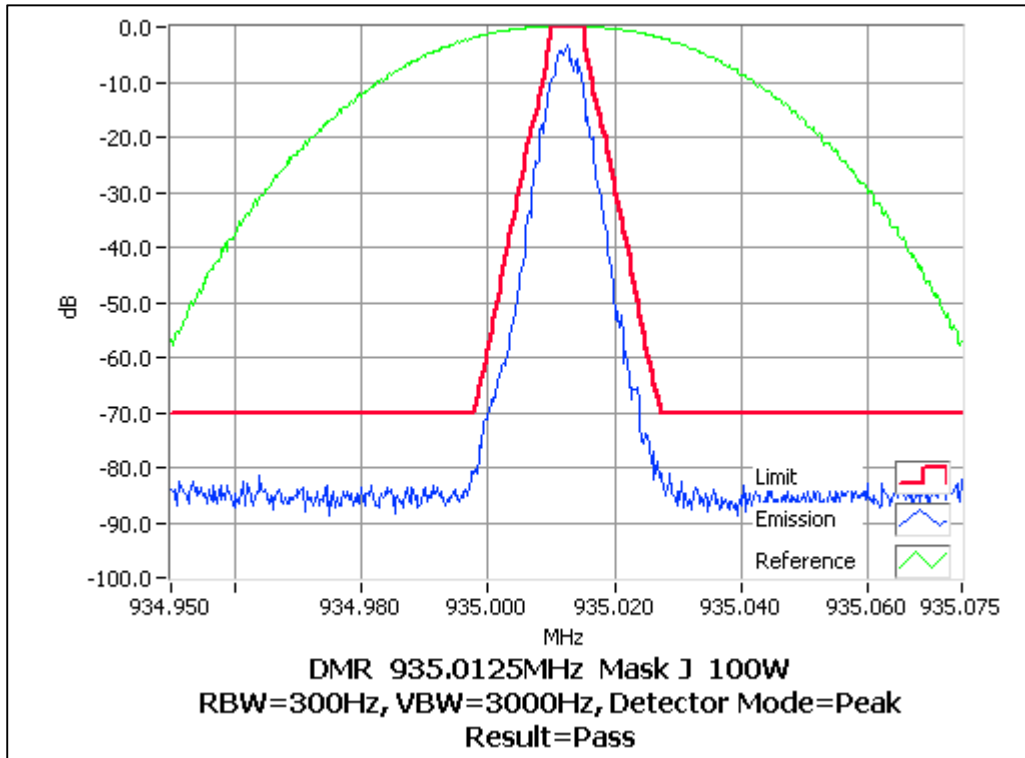
Occupied Bandwidth and Spectrum Masks

SPECIFICATION: FCC CFR 2.1049 (c)

RSS-119 5.5

Tx FREQUENCY: 935.0125 MHz 100 W

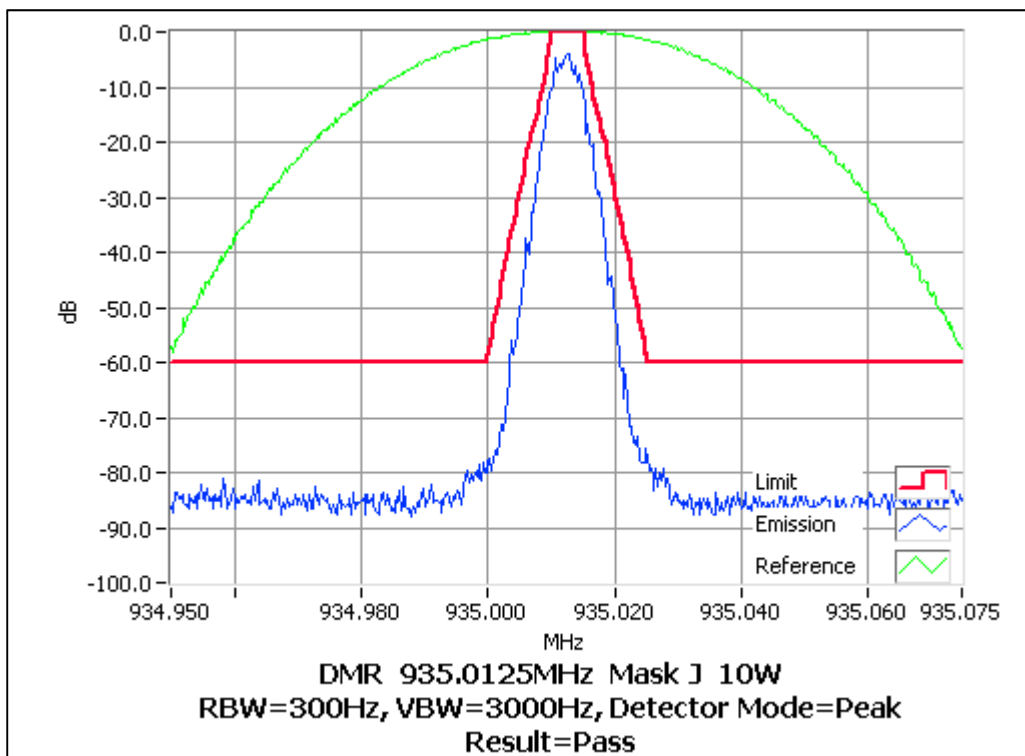
12.5 kHz Channel Spacing



Tx FREQUENCY: 935.0125 MHz

10 W

12.5 kHz Channel Spacing



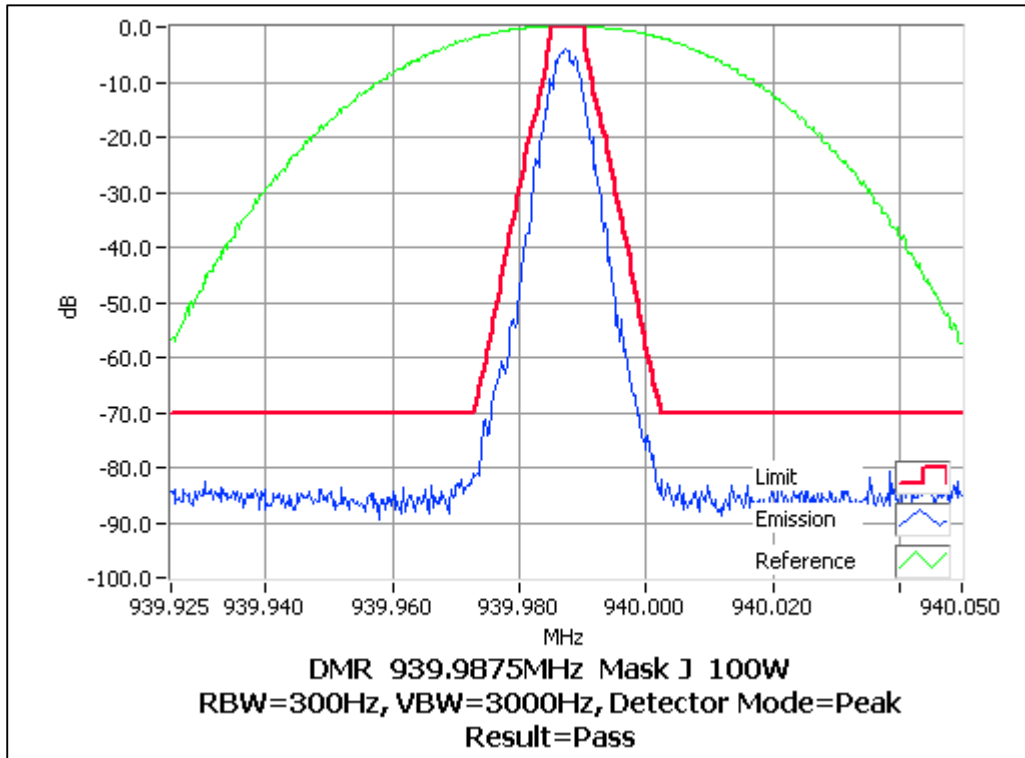
Occupied Bandwidth and Spectrum Masks

SPECIFICATION: FCC CFR 2.1049 (c)

RSS-119 5.5

Tx FREQUENCY: 939.9875 MHz 100 W

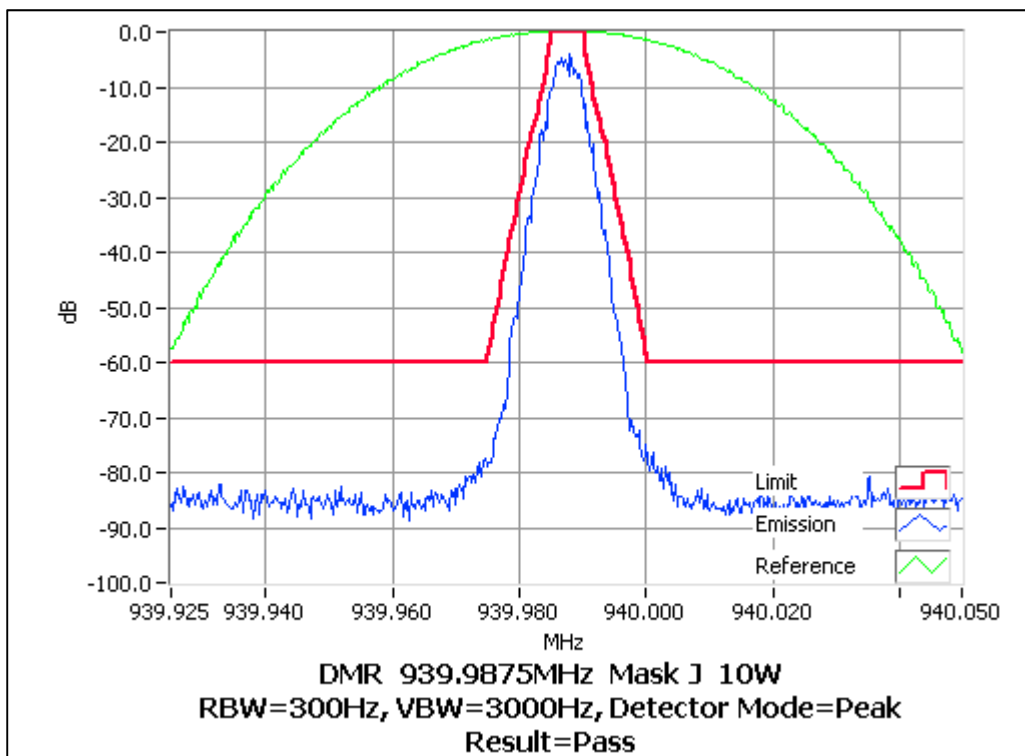
12.5 kHz Channel Spacing



Tx FREQUENCY: 939.9875 MHz

10 W

12.5 kHz Channel Spacing



TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATIONS: FCC 47 CFR 2.1051

RSS-119 5.8

GUIDE: TIA-102.CAAA-C 2.2.7

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The frequency range examined was from the lowest frequency generated within the EUT, to a frequency higher than the 10th Harmonic: 100 kHz to Fc-BW
Fc+ BW to 10Fc GHz
3. A Pre-scan is performed with a resolution bandwidth of 1 kHz, and a video bandwidth of 3 kHz. If any emissions are found to be within 20 dB of the limit a second measurement is made with the carrier modulated, and a resolution bandwidth of 10 kHz, and a video bandwidth of 30 kHz.

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

A photograph of the test set-up is included below.

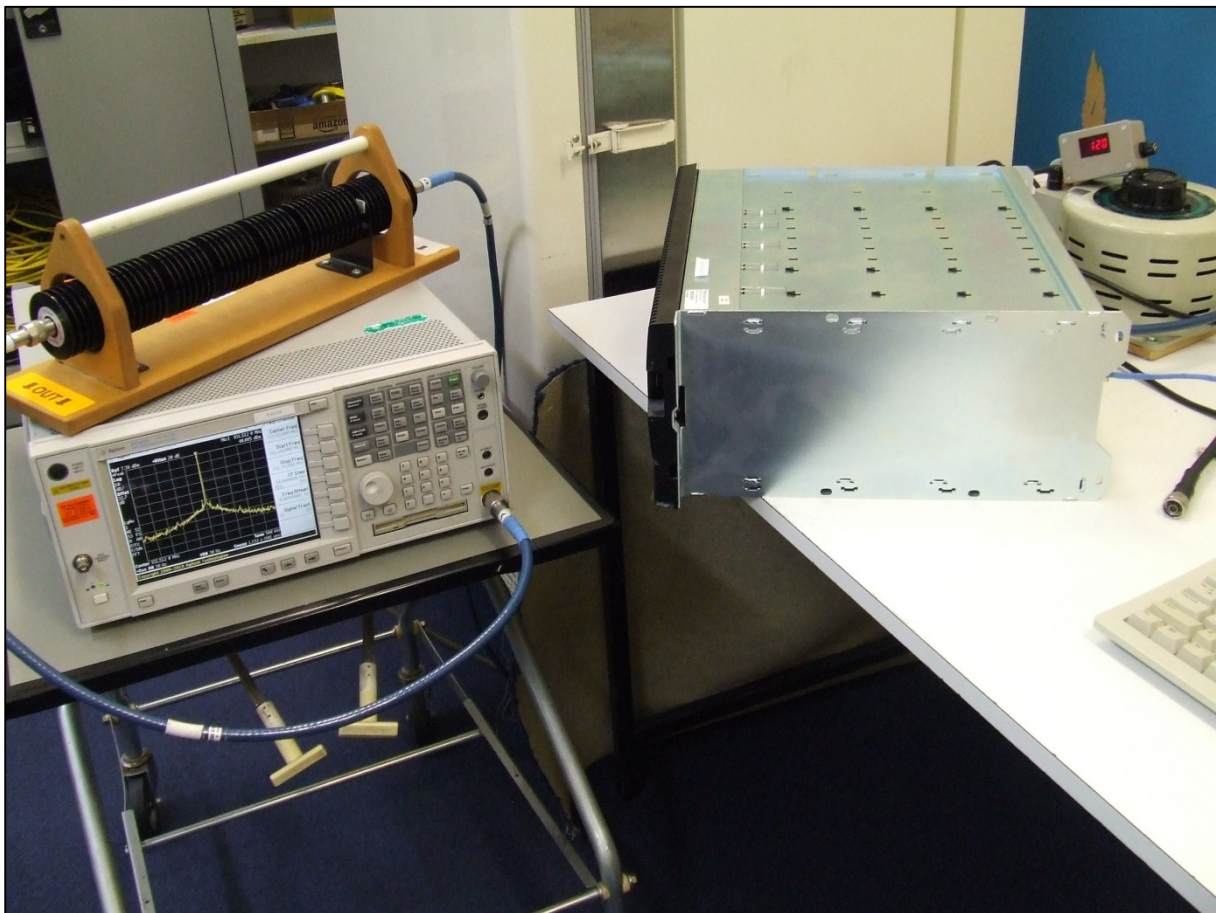
MEASUREMENT RESULTS:

See the tables and plots on the following pages for 12.5 kHz channel spacings.

LIMIT CLAUSES: FCC 47 CFR 90.210

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Photo: Conducted Emissions Test Setup



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC CFR 22.355

RSS-119 5.8

Tx FREQUENCY: 928.1000 MHz

12.5 kHz Channel Spacing

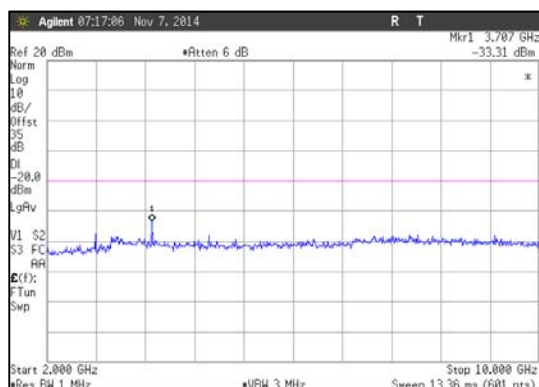
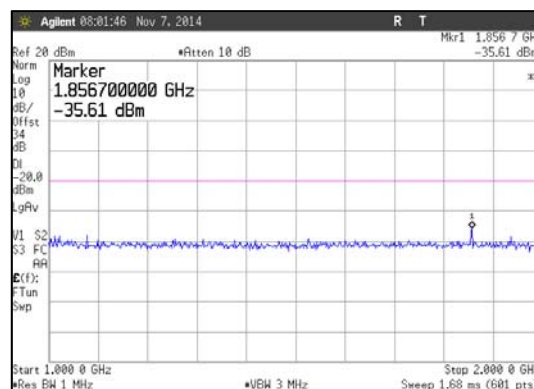
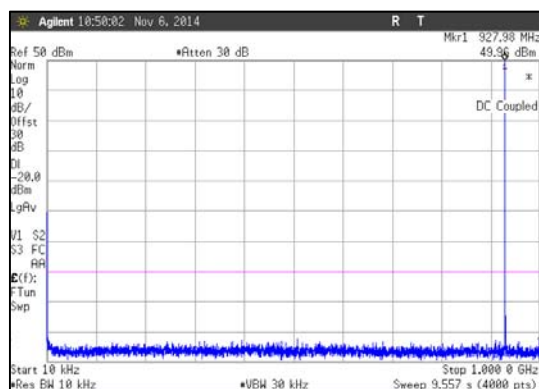
Emission Mask D

928.100 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1856.200	-33.8	-83.8
3712.400	-35.1	-85.1
928.100 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

LIMITS: FCC 47 CFR 22.355

RSS-119 5.8

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \log_{10}(P_{\text{Watts}})$	
	-20 dBm	-70 dBc
100 W	-20 dBm	-70 dBc
10 W	-20 dBm	-60 dBc



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC CFR 22.355

RSS-119 5.8

Tx FREQUENCY: 931.5125 MHz

12.5 kHz Channel Spacing

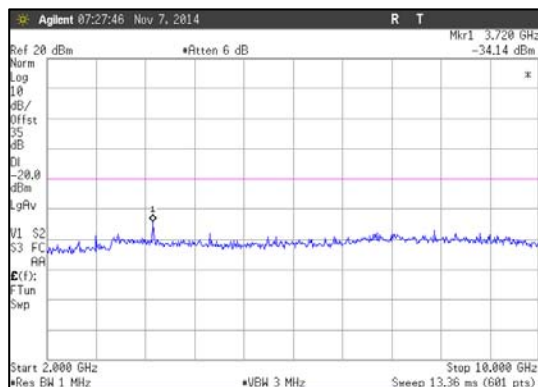
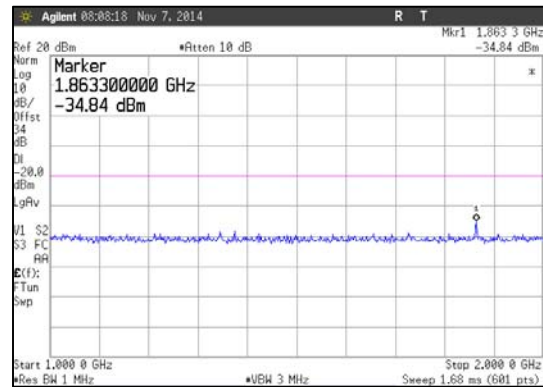
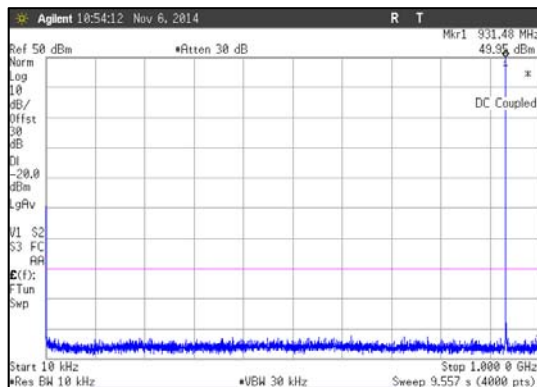
Emission Mask G

931.5125 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1863.025	-30.6	-80.6
931.5125 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

LIMITS: FCC 47 CFR 2.1051

RSS-119 5.8

Carrier Output Power	Emission Mask G 12.5 kHz Channel Spacing $43 + 10 \log_{10}(P_{\text{Watts}})$	
100 W	-13 dBm	-63 dBc
10 W	-13 dBm	-53 dBc



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC CFR 2.1051

RSS-119 5.8

Tx FREQUENCY: 935.0125 MHz

12.5 kHz Channel Spacing

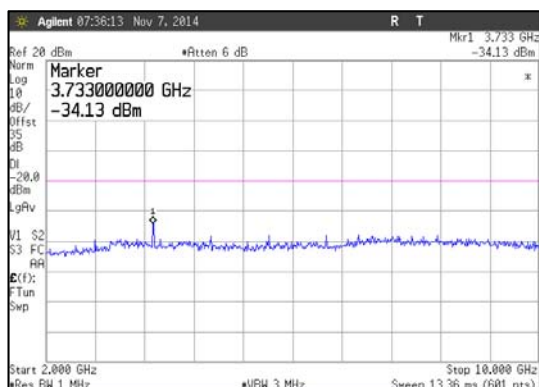
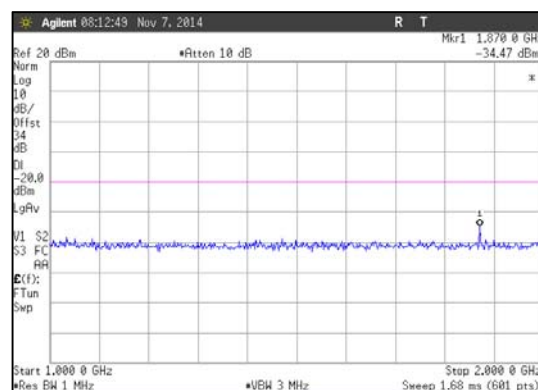
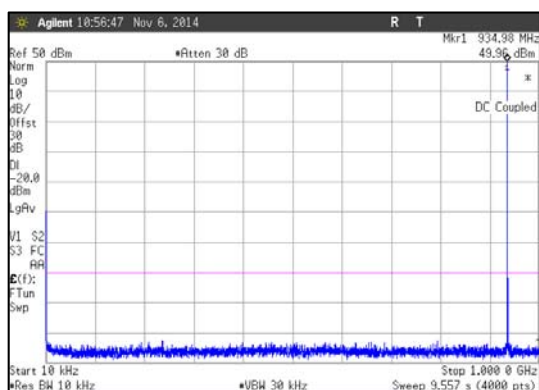
Emission Mask J

935.0125 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1870.025	-32.5	-82.5
3740.050	-35.2	-85.2
935.0125 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

SPECIFICATION: FCC CFR 2.1051

RSS-119 5.8

Carrier Output Power	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \log_{10}(P_{\text{Watts}})$	
100 W	-20 dBm	-70 dBc
10 W	-20 dBm	-60 dBc



Spurious Emissions (Tx Conducted)

SPECIFICATION: FCC CFR 2.1051

RSS-119 5.8

Tx FREQUENCY: 939.9875 MHz

12.5 kHz Channel Spacing

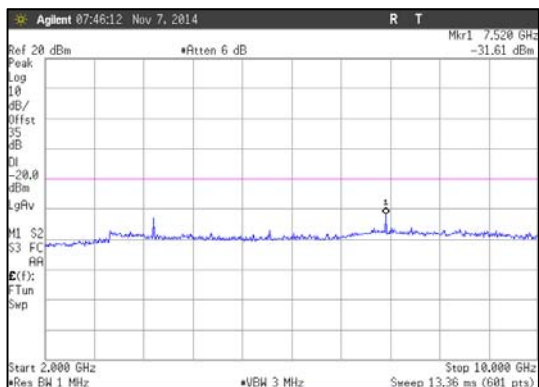
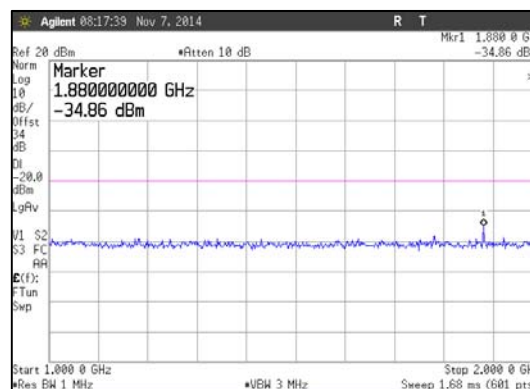
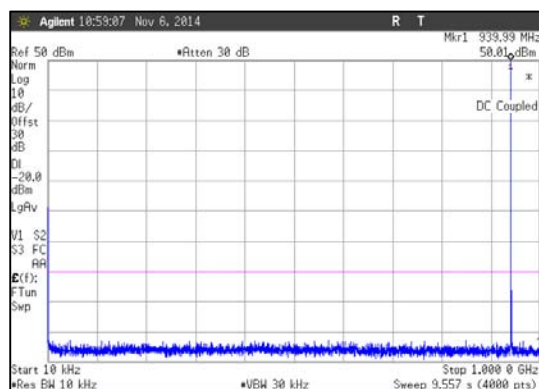
Emission Mask J

939.9875 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1879.975	-33.2	-83.2
3759.950	-34.9	-84.9
5639.925	-39.2	-89.2
7519.900	-31.3	-81.3
939.9875 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

SPECIFICATION: FCC CFR 2.1051

RSS-119 5.8

Carrier Output Power	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \log_{10}(P_{\text{Watts}})$	
100 W	-20 dBm	-70 dBc
10 W	-20 dBm	-60 dBc



TRANSMITTER SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC 47 CFR 2.1053

GUIDE: TIA-102.CAAA-C 2.2.6

MEASUREMENT PROCEDURE:

Initial Scan:

1. The EUT is placed in the S-Line TEM cell and emissions are measured from 30 MHz to 1000 MHz. Any emission within 20 dB of the limit is then re-tested on the OATS along with measurements from 1000 MHz to the 10th harmonic of the fundamental frequency.
2. The EUT is placed in the reverberation chamber and emissions are measured from 1000 MHz to the upper frequency required. Any emission within 20 dB of the limit is then re-tested on the OATS.
3. The harmonics emissions up to the 6th harmonic of the fundamental frequency are measured on the OATS

OATS Measurement:

1. The EUT is placed on a wooden turntable at a distance of three metres from the test antenna. The output terminal is connected to an RF dummy load.
2. The test antenna is raised from 1 m to 4 m to obtain a maximum reading; the turntable is then rotated through 360° to obtain the maximum response of each spurious emission. Valid emissions are determined by switching the EUT on and off.
3. The EUT is then replaced by a signal generator and substitution antenna to make measurements by the substitution method.

MEASUREMENT RESULTS: See the tables on the following pages.

LIMIT CLAUSE: FCC 47 CFR 90.210

Tx FREQUENCY: 928.1000 MHz

12.5 kHz Channel Spacing

928.1000 MHz @ 100 W

Emission Mask D

928.1000 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
2784.300	-37.1	-87.1
4640.500	-29.3	-79.3
8352.900	-29.6	-79.6
928.1000 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

LIMITS: FCC CFR 2.1053

Carrier Output Power	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \log_{10} (P_{\text{Watts}})$	
100 W	-20 dBm	-70 dBc
10 W	-20 dBm	-60 dBc

Spurious Emissions (Tx Radiated)

SPECIFICATION: RSS-119

12.5 kHz Channel Spacing

931.5125 MHz @ 100 W

Emission Mask G

931.5125 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
8383.6125	-26.1	-76.1
931.5125 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

LIMITS: FCC CFR 2.1053

Carrier Output Power	Emission Mask G 12.5 kHz Channel Spacing $43 + 10 \log_{10} (P_{\text{Watts}})$	
100 W	-13 dBm	-63 dBc
10 W	-13 dBm	-53 dBc

Note: RSS-119 Table-3 designates 931~932 MHz band as 25.0 kHz channel spacing.

Spurious Emissions (Tx Radiated)

SPECIFICATION: FCC CFR 2.1053

12.5 kHz Channel Spacing

935.0125 MHz @ 100 W

Emission Mask J

935.0125 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
2805.0375	-37.7	-87.7
4675.0625	-28.6	-78.6
5610.0750	-36.9	-86.9
6545.0875	-39.1	-89.1
8415.1125	-24.1	-74.1
935.0125 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 20 dB below the limit.		

12.5 kHz Channel Spacing

939.9875 MHz @ 100 W

Emission Mask J

939.9875 MHz @ 100 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
2819.9625	-39.0	-89.0
4699.9375	-29.5	-79.5
8459.8875	-28.2	-78.2
939.9875 MHz @ 10 W		
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No other emissions were detected at a level greater than 10 dB below the limit.		

LIMITS: FCC CFR 2.1053

Carrier Output Power	Emission Mask J 12.5 kHz Channel Spacing $50 + 10 \log_{10} (P_{\text{Watts}})$	
100 W	-20 dBm	-70 dBc
10 W	-20 dBm	-60 dBc

Tx Radiated Emissions - Continued

Open Area Test Site Results:

12.5 kHz Channel Spacing

935.0125 MHz @ 100 W

Emission Mask J

Harmonics Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1870.0250	-44.5	-94.5
2805.0375	-37.7	-87.7
3740.0500	-47.4	-97.4
4675.0625	-28.6	-78.6
5610.0750	-36.9	-86.9
6545.0875	-39.1	-89.1

Photo: OATS Setup



TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

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

RSS-119 5.3

GUIDE: TIA-102.CAAA-C 2.2.2

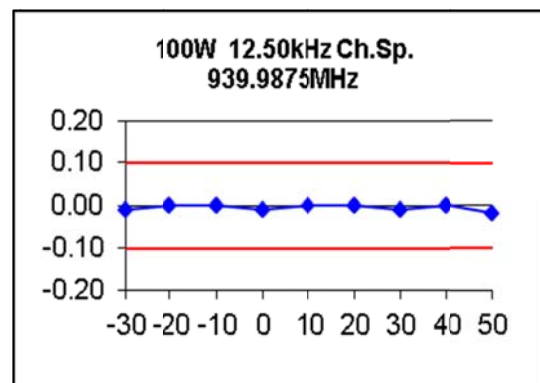
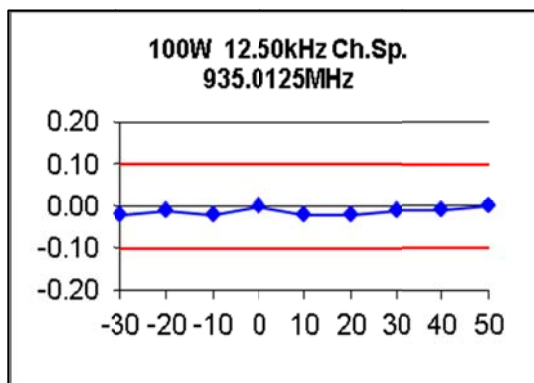
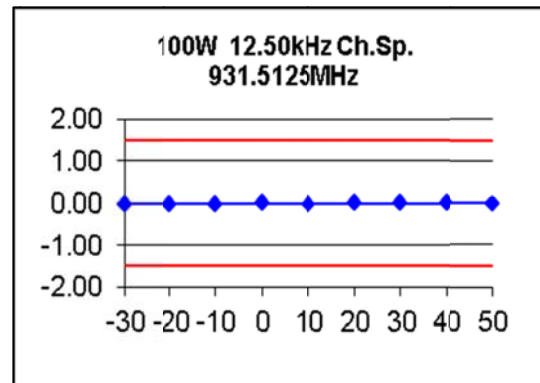
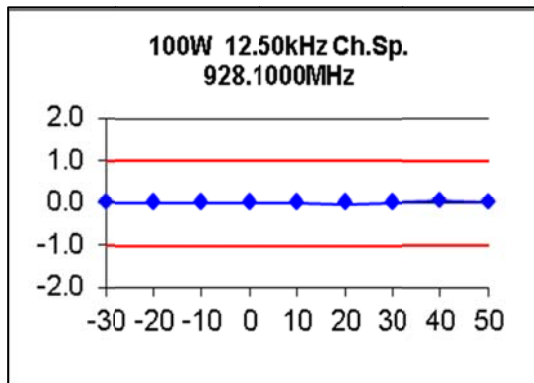
MEASUREMENT PROCEDURE:

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 plots on the following pages for 12.5 kHz channel spacing.

NOTE: All measurements were taken with external 10MHz reference active.

$^{\circ}\text{C}$	928.1000 MHz		931.5125 MHz		935.0125 MHz		939.9875 MHz	
	Hz	ppm	Hz	ppm	Hz	ppm	Hz	ppm
-30	-4	0.00	-10	-0.01	-21	-0.02	-9	-0.01
-20	-3	0.00	-9	-0.01	-11	-0.01	-4	0.00
-10	-3	0.00	-7	-0.01	-23	-0.02	-3	0.00
0	-9	-0.01	2	0.00	-3	0.00	-9	-0.01
10	-3	0.00	-14	-0.02	-16	-0.02	0	0.00
20	-16	-0.02	-1	0.00	-19	-0.02	-4	0.00
30	0	0.00	0	0.00	-14	-0.01	-10	-0.01
40	19	0.02	-4	0.00	-8	-0.01	-2	0.00
50	-1	0.00	-9	-0.01	-3	0.00	-15	-0.02
Limit (ppm)		1.0		1.5		0.1		0.1



Transmitter Frequency Stability - Temperature

LIMIT CLAUSES: FCC 47 CFR 22.355
FCC 47 CFR 90.213

RSS-119 5.3

Channel Spacing (kHz)	Frequency Error (ppm)	Channel Frequency
12.5	1.0	928.1000 MHz
	1.5	931.5125 MHz
	0.1	935.0125 MHz 939.9875 MHz

TRANSMITTER FREQUENCY STABILITY - VOLTAGE

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

RSS-119 5.3

GUIDE: TIA-102.CAAA-C 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 115%.
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT RESULTS:

NOTE: All measurements were taken with external 10MHz reference active.

Voltage	FREQUENCY ERROR (ppm)			
	928.1000 MHz	931.5125 MHz	935.0125 MHz	939.9875 MHz
120 V _{AC}	0.00	0.00	-0.01	0.01
102 V _{AC}	-0.01	0.00	0.00	0.00
138 V _{AC}	0.00	0.00	0.00	0.00

LIMIT CLAUSES: FCC 47 CFR 22.355
FCC 47 CFR 90.213

RSS-119 5.3

Channel Spacing (kHz)	Frequency Error (ppm)	Channel Frequency
12.5	1.0	928.1000 MHz
	1.5	931.5125 MHz
	0.1	935.0125 MHz 939.9875 MHz

RECEIVER SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: RSS-119 5.11

GUIDE: TIA-102.CAAA-C 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 highest tunable frequency.
3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.

896.0125 MHz Receive (Receiver Input Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

900.9875 MHz Receive (Receiver Input Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

LIMIT CLAUSE: RSS-Gen 6(b)

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

TRANSMITTER STANDBY SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: RSS-119 5.11

GUIDE: TIA-102.CAAA-C 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 highest tunable frequency.
3. Spurious emissions which were attenuated more than 20 dB below the limit were not recorded.

928.1000 MHz Transmitter Standby (Transmitter RF Output Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

931.5125 MHz Transmitter Standby (Transmitter RF Output Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

935.0125 MHz Transmitter Standby (Transmitter RF Output Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

939.9875 MHz Transmitter Standby (Transmitter RF Output Port)		
Emission Frequency (MHz)	Level (nW)	Level (dBm)
~	~	~
No emissions were detected within 20 dB of Limit.		

LIMIT CLAUSE: RSS-Gen 6(b)

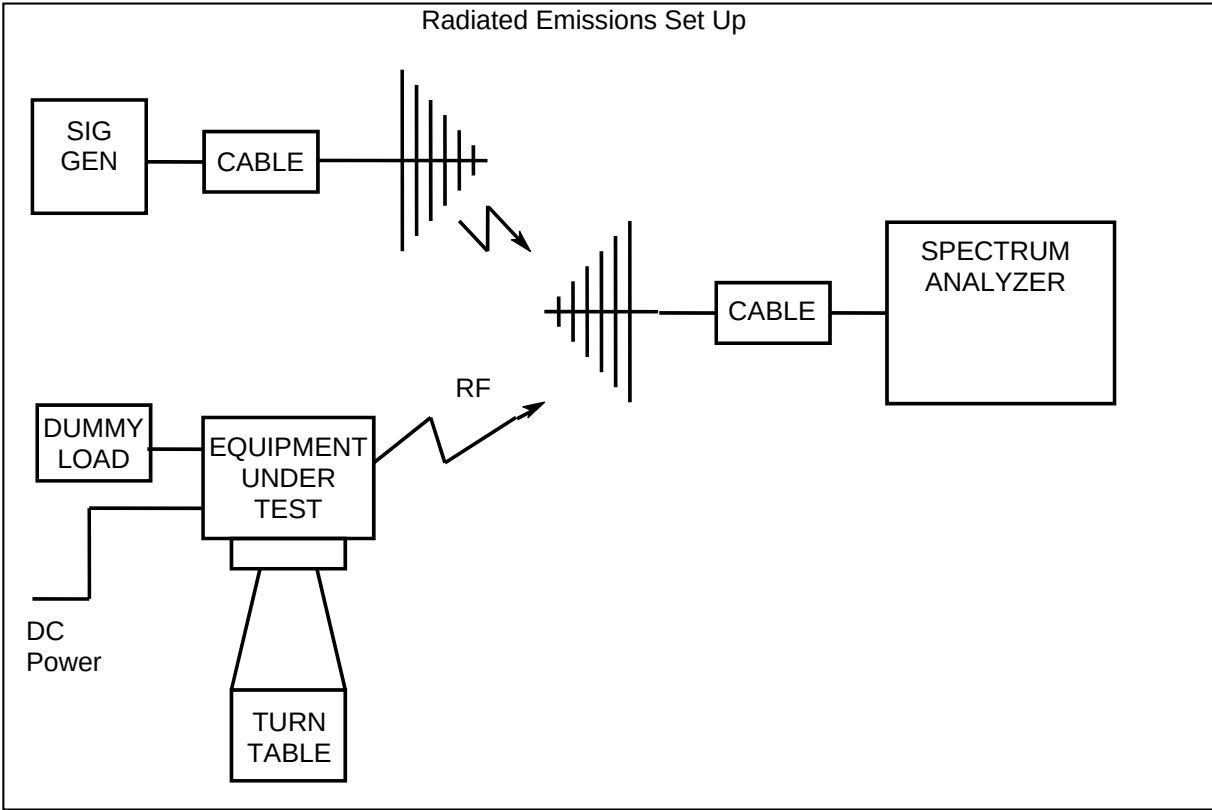
LIMIT	30 → 1000 MHz	2 nW	- 57 dBm
	> 1000 MHz	5 nW	- 53 dBm

TEST EQUIPMENT LIST

No#	Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
8	Modulation Analyser	TREVA1	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	18-Oct-15
27	Power Supply	AC Variac	Yamabishi	S-260-5	TX-533	E1737	
31	Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	6-Mar-16
32	Antenna	18GHz DRG	Emco	DRG3115	2084	E3076	6-Mar-16
33	Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	6-Jul-16
35	RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	31-Aug-15
44	RF Attenuator	30dB 250W	Weinschel	45-30-34	JW663	E3386	16-Oct-15
45	RF Attenuator	TREVA1 20dB 150W	Weinschel	40-20-33	QT968	E4842	17-Oct-15
48	RF Attenuator	10dB 50W	Weinschel	24-10-34	AZ0401	E3388	17-Oct-15
50	RF Attenuator	20dB 25W	Weinschel	33-20-33	BD5871	E3673	14-Oct-15
55	RF Load	20W	Deltec		118.001	E3626	
56	RF Load	2W	MCL	NTRM-50	951215	E3574	16-Jan-15
60	Coax Cable	1m Blue	Suhner	Sucoflex 104A	44610/4A	E4619	16-Oct-15
61	Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack2	E4623	14-Oct-15
63	Coax Cable	3m Blue	Suhner	Sucoflex 104A	44611/4A	E4620	16-Oct-15
66	Spectrum Analyser	13.2GHz	Hewlett Packard	HP8562E	3821A00779	E3715	22-Oct-15
91	Signal Generator	Digital 4GHz	Agilent	E4433B	US38440446	E4147	22-Oct-16
100	RF Combiner	TREVA1	Minicircuits	ZFSC-4-1	-	E4083	
103	Spectrum Analyser	13.2GHz	Agilent	E4445A	MY42510072	E4139	22-Oct-16
106	OATS	NSA	Tait				4-Jun-15
107	Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS1	E4621	23-Oct-15
108	Coax Cable	OATS Turntable Cable	Intelcom	RG215	OATS2	E4622	23-Oct-15
109	OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
110	OATS	Controller	Electrometrics	EM-4700	119	E4445	
111	OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
115	RF Attenuator	30dB 350W	Weinschel	67-30-33	BR0531	E4280	18-Oct-15
132	TREVA 1		Teltest	-	1	-	23-Apr-15
134	Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	13-Oct-16
135	Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	14-Oct-15
136	Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	14-Oct-15
137	Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	14-Oct-15
138	Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	14-Oct-15
145	RF Chamber	Reverb - Stirrer controller for reverb chamber	Teseq	Stirrer Controller	29765.1	E4854	
146	RF Chamber	Reverb - 0.5 - 18GHz Reverberation Chamber	Teseq	RVC XS	29765	E4855	
148	Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-885	E4857	
149	Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-884	E4858	
150	RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	16-Oct-15
159	OATS	FCC Listing Registration			837095		12-May-16

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 **R**adio **E**VAuation 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.

