REPORT NUMBER 2105 September 2004

RADIO PERFORMANCE MEASUREMENTS

On the TMAB24-H701 Mobile Transceiver

FCC ID: CASTMAH7D

SN: 19020004

In accordance with

FCC 47 CFR Parts 22 and 90

PREPARED BY: Elizabeth Comery _____
Test Technician

CHECKED & APPROVED BY: Hamish Newton _____
Senior Technician

577
new zealand accredited laboratory

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REPORT ON :

Type Approval Testing of the TMAB24-H701 (Serial No 19020004)
in accordance with:

FCC CFR 47 Parts 22 & 90

FCC ID: CASTMAH7D

PREPARED FOR :

Tait Electronics Ltd
PO Box 1645
558 Wairakei Rd
Christchurch
New Zealand

DISTRIBUTION :

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Tait Electronics Ltd	Mr. Des Fox	Copy No 2
Tait Electronics Ltd	Mr. Dereck Fiddes	Copy No 3

APPROVED :

Hamish Newton

Senior Technician

Date :

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

Copy No:

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DECLARATION OF CONFORMITY

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

Equipment:	Mobile Transceiver
Type:	TMAH7D
Product code:	TMAB24-H701
Serial Numbers:	19020004
Quantity:	1

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

FCC CFR 47 Parts 22 & 90

Signature:_____

S. A. Crompton
Compliance Laboratory Manager.

Date:_____

Test Conditions

All testing was performed at the following conditions.

Ambient Temperature	15°C to 35°C
Relative Humidity	20% to 75%
Standard Test Voltage	13.8Vdc

Necessary Bandwidth and Emission Designators

SPECIFICATION: FCC 47 CFR 2.202

The Necessary Bandwidth is the minimum value of the occupied bandwidth sufficient to ensure the transmission of information at the rate and with the quality required for the system employed.
This is calculated using the following formula.

Bn = 2M + 2DK Where: Bn = Necessary Bandwidth
M = Maximum modulation frequency
For Data transmission
M = B/2
Where: B = Modulation rate in Baud
D = Peak deviation
K = Constant
For Analogue transmission this is 1
For Data transmission this is typically 1.2

1. Analogue Voice 12.5kHz Bandwidth

Necessary bandwidth

M = 3kHz
D = 2.5kHz

Bn = 6 + 5 x 1
=11kHz

Emission Designator

11k0F3E

F3E represents a FM voice transmission

2. Analogue Voice 25kHz Bandwidth

Necessary bandwidth

M = 3kHz
D = 5kHz

Bn = 6 + 10 x 1
=16kHz

Emission Designator

16k0F3E

F3E represents a FM voice transmission

3. Fast Frequency Shift Keying (FFSK) 12.5kHz Bandwidth

Necessary bandwidth

M = 0.6 (Baud rate = 1200)
D = 1.5kHz (60% of peak deviation)

Bn = 1.2 + 3 x 1.2
=4.8kHz

Emission Designator

4k80F2D

F2D represents a FM data transmission with the use of a modulating sub carrier

4. Fast Frequency Shift Keying (FFSK) 25kHz Bandwidth

Necessary bandwidth	Emission Designator
M = 0.6 (Baud rate = 1200) D = 3kHz (60% of peak deviation)	**8k40F2D** F2D represents a FM data transmission with the use of a modulating sub carrier

Bn = 1.2 + 6 x 1.2
=8.4kHz

5. Tait High Speed Date (THSD)

THSD uses a 4 level gaussian frequency shift keying (CP-4GFSK) modulation scheme. It can be used when transferring data between two radios. Data is transmitted at a rate of 12000bps for narrow band channels, and 19200bps for wide-band channels.
Due to the difficulties in determining the value of k, the necessary bandwidth has been measured using the 99% energy rule.

12.5kHz Bandwidth

99% bandwidth	Emission Designator
7.7 kHz	**7k70F1D** F1D represents a FM data transmission without the use of a modulating sub carrier

25kHz Bandwidth

99% bandwidth	Emission Designator
12.6 kHz	**12k6F1D** F1D represents a FM data transmission without the use of a modulating sub carrier

Test Results

TRANSMITTER OUTPUT POWER (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1046

GUIDE: TIA/EIA-603B 2.2.1

MEASUREMENT PROCEDURE:
1. Refer Appendix 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: 10 W and 40 W

460.1 MHz	10 W nominal	40 W nominal
POWER (W)	10.6	42.7
Variation from Nominal (%)	6	6.8
Measurement Uncertainty (dB)	+0.63 -0.68	

LIMIT CLAUSE: FCC 47 CFR 90.205

Radio Type: Mobile Transceiver
Frequency Band: 421 MHz ~ 512 MHz

(o) The output power shall not exceed by more than 20% the manufacturer's rated output power for the particular transmitter.

TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS

SPECIFICATION: FCC 47 CFR 2.1047 (a)

GUIDE: TIA/EIA-603B 2.2.6

MEASUREMENT PROCEDURE:
1. Refer Appendix A for Equipment set up.
2. An audio input tone of 1000Hz was applied with the level set to obtain 20% of maximum deviation. This was used as the 0dB reference point.
3. The AF was varied while the audio level was held constant.
4. The response in dB relative to 1000Hz was measured.

MEASUREMENT RESULTS:
See the plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.
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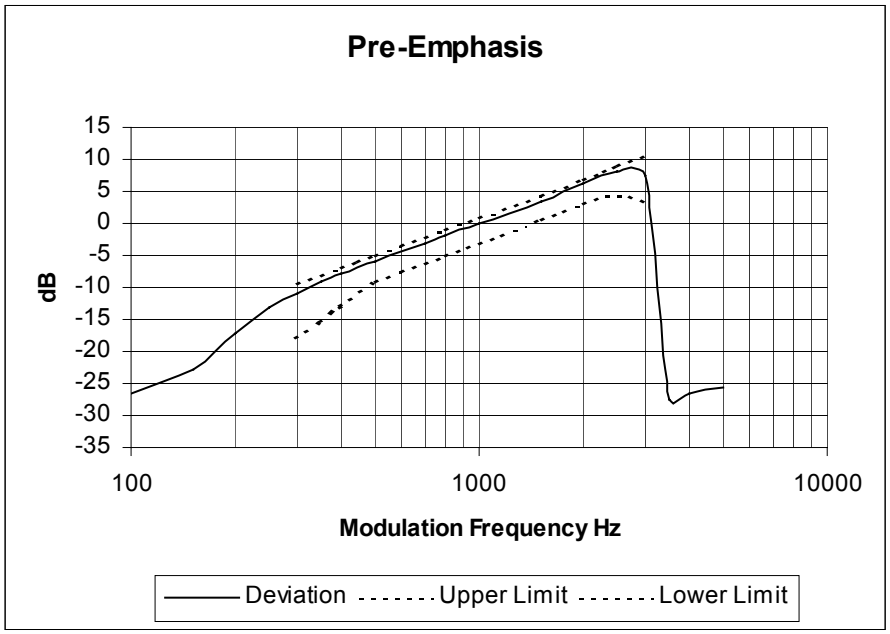
LIMIT CLAUSE: TIA/EIA-603B 3.2.6

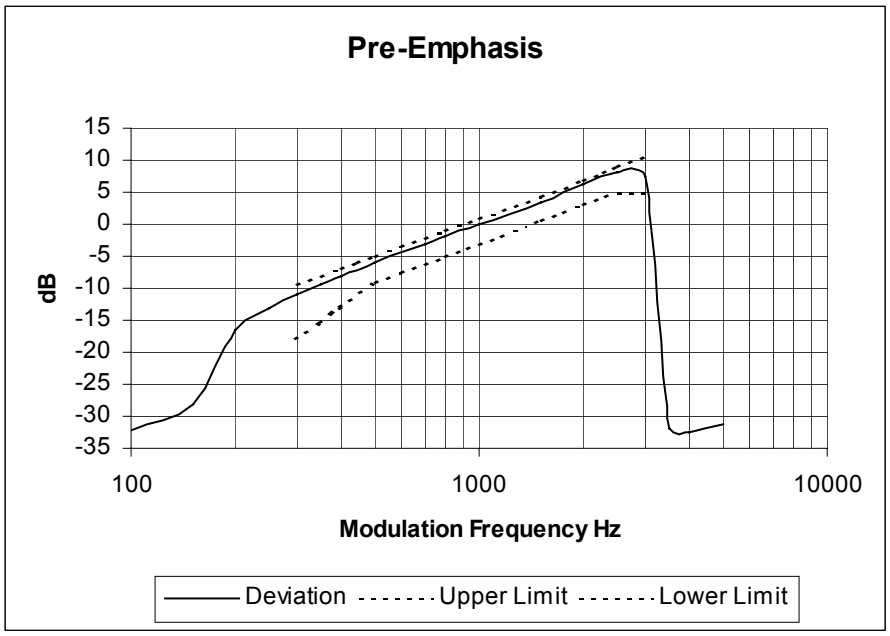
TRANSMITTER AUDIO FREQUENCY RESPONSE - PRE-EMPHASIS

SPECIFICATION: FCC CFR 2.1047 (a)

Tx FREQUENCY: 460.1 MHz 12.5 kHz Channel Spacing



Tx FREQUENCY: 460.1 MHz 25 kHz Channel Spacing



TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC 47 CFR 2.1047 (b)

MEASUREMENT PROCEDURE:
1. Refer Appendix A for Equipment set up.
2. The modulation response was measured at three audio frequencies while varying the input level.
3. Measurements were made for both Positive and Negative Deviation.

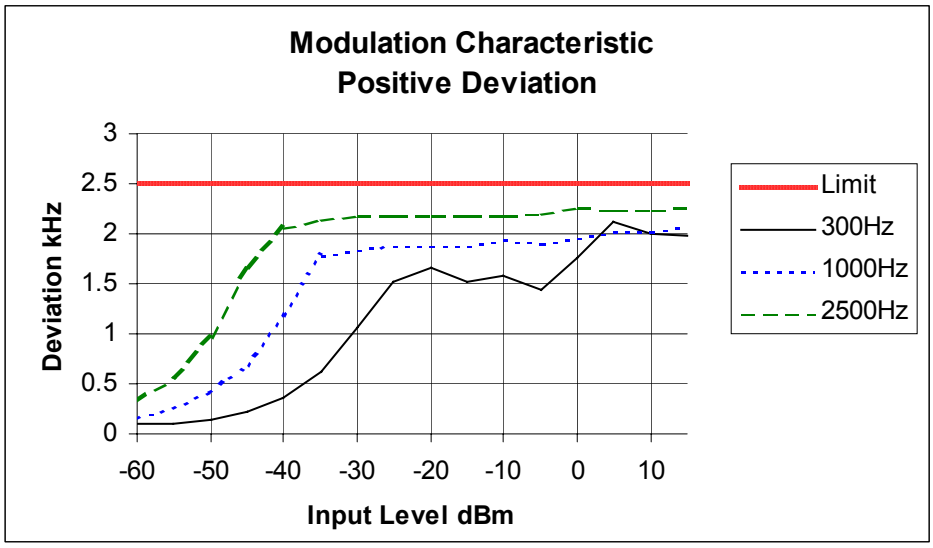
MEASUREMENT RESULTS:
See the plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.

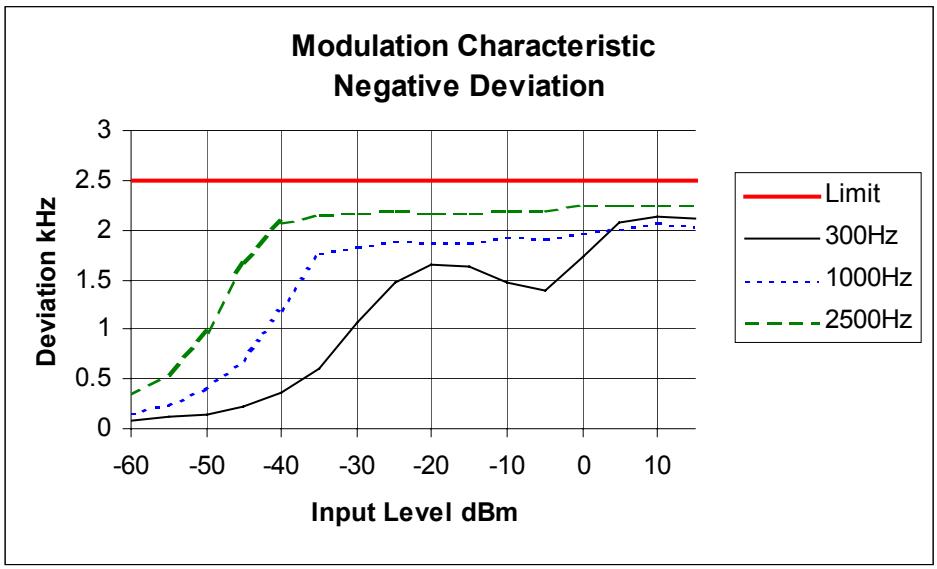
LIMIT CLAUSE: TIA/EIA-603B 1.3.4.4

TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 460.1 MHz 12.5 kHz Channel Spacing

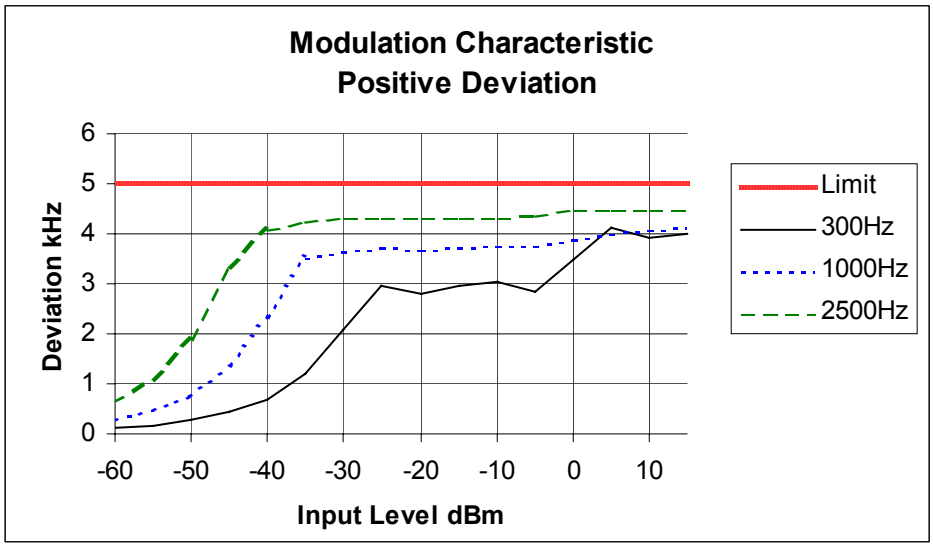


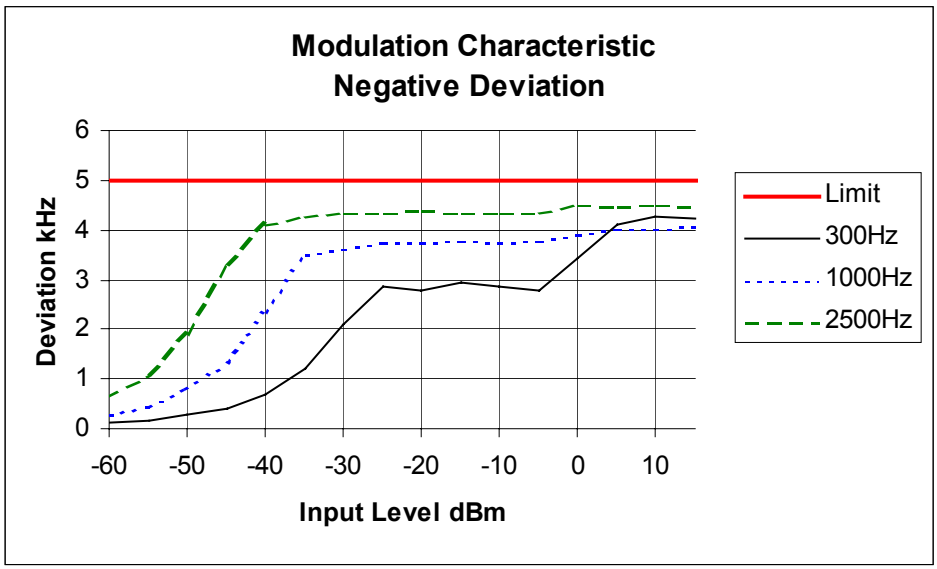


TRANSMITTER MODULATION LIMITING

SPECIFICATION: FCC CFR 2.1047 (b)

Tx FREQUENCY: 460.1 MHz 25.0 kHz Channel Spacing





OCCUPIED BANDWIDTH

SPECIFICATION: FCC 47 CFR 2.1049 (c)

GUIDE: TIA/EIA-603B 2.2.11

MEASUREMENT PROCEDURE:

1. Refer Appendix A for Equipment Set up.
2. For analogue measurements: The EUT was modulated by a 2500Hz tone at an input level 16dB above a level that produced 50% deviation. The input level was established at the frequency of maximum response of the audio modulating circuit.
   For Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rates.
3. The Occupied Bandwidth was measured on the Spectrum Analyser, with bandwidth settings as follows.

   Emission Mask D – Resolution Bandwidth = 100Hz, Video Bandwidth = 1 kHz
   Emission Mask B, and C – Resolution bandwidth = 300Hz, Video Bandwidth = 3 kHz

MEASUREMENT RESULTS:
See the plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.

LIMIT CLAUSE: FCC 47 CFR 90.210

EMISSION MASKS

Emission Mask D	12.5 kHz Channel Spacing	Analog; FFSK; THSD
Emission Mask B	25.0 kHz Channel Spacing	Analog;
Emission Mask C	25.0 kHz Channel Spacing	FFSK; THSD

DATA SPEED

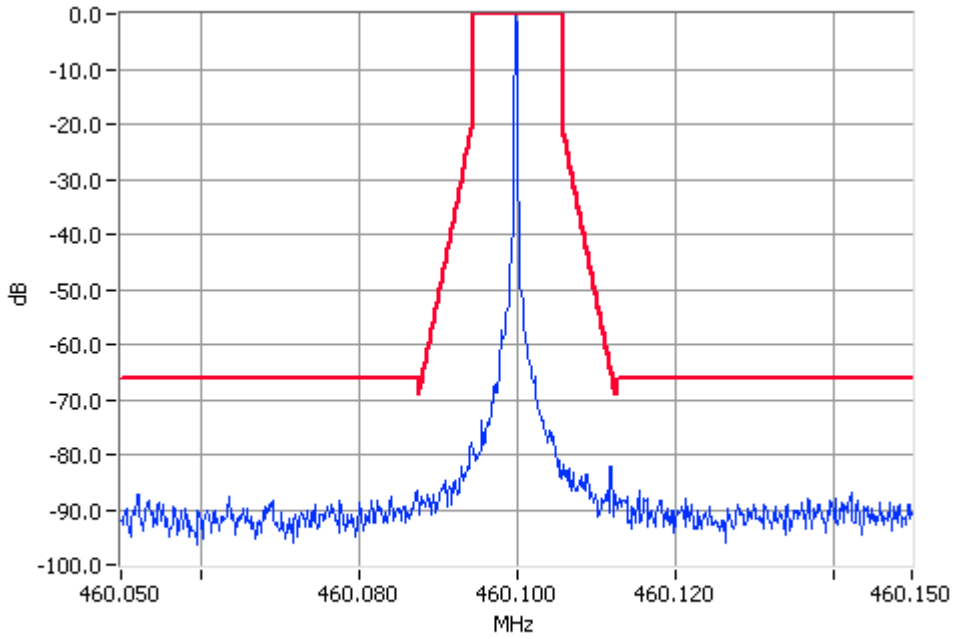
FFSK	1200 bps	12.5 kHz Channel Spacing
FFSK	1200 bps	25.0 kHz Channel Spacing
THSD	12000 bps	12.5 kHz Channel Spacing
THSD	19200 bps	25.0 kHz Channel Spacing

(FFSK is Fast Frequency Shift Keying; THSD is Tait High Speed Data – CP4GFSK)

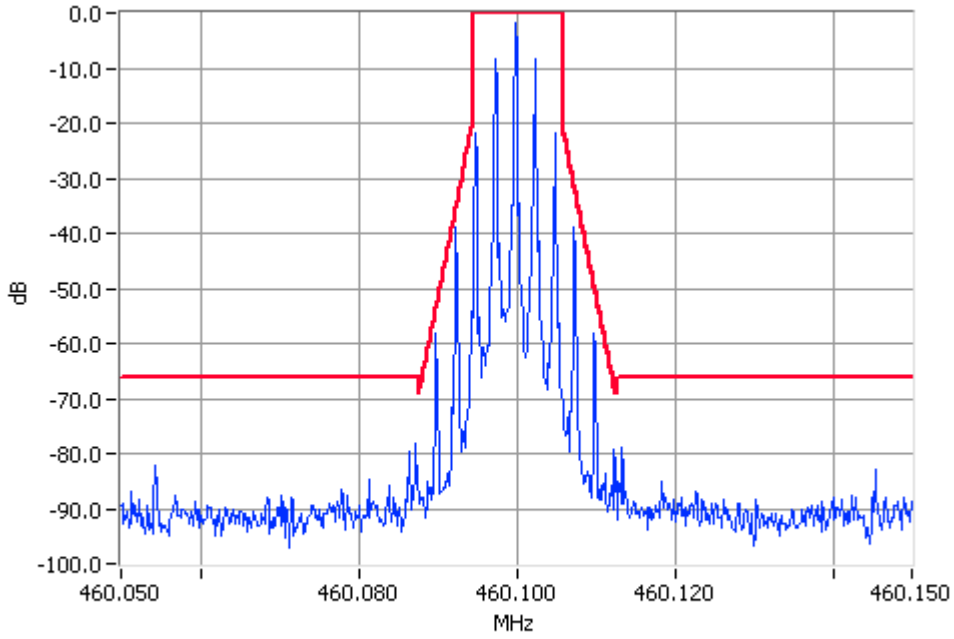
NAME OF TEST: OCCUPIED BANDWIDTH VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40 W 12.5 kHz Channel Spacing



Unmodulated 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

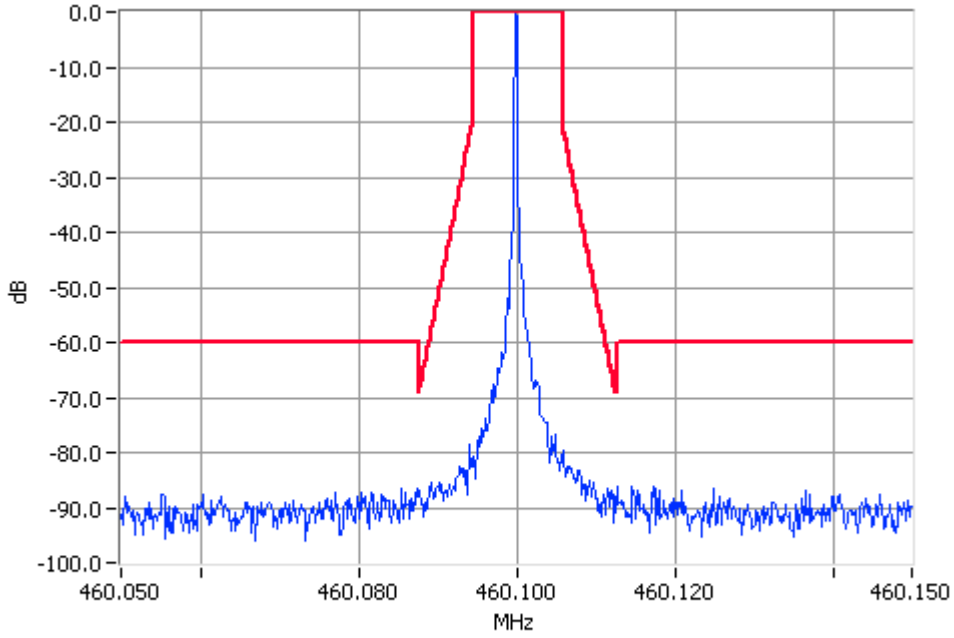


Analogue Modulation 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

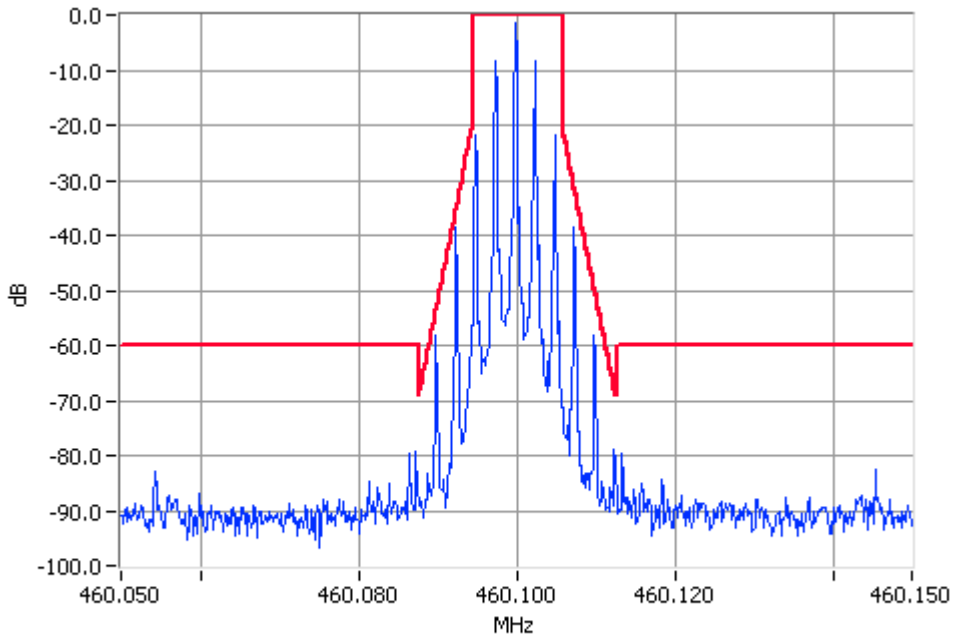
NAME OF TEST: OCCUPIED BANDWIDTH VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 10 W 12.5 kHz Channel Spacing



Unmodulated 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

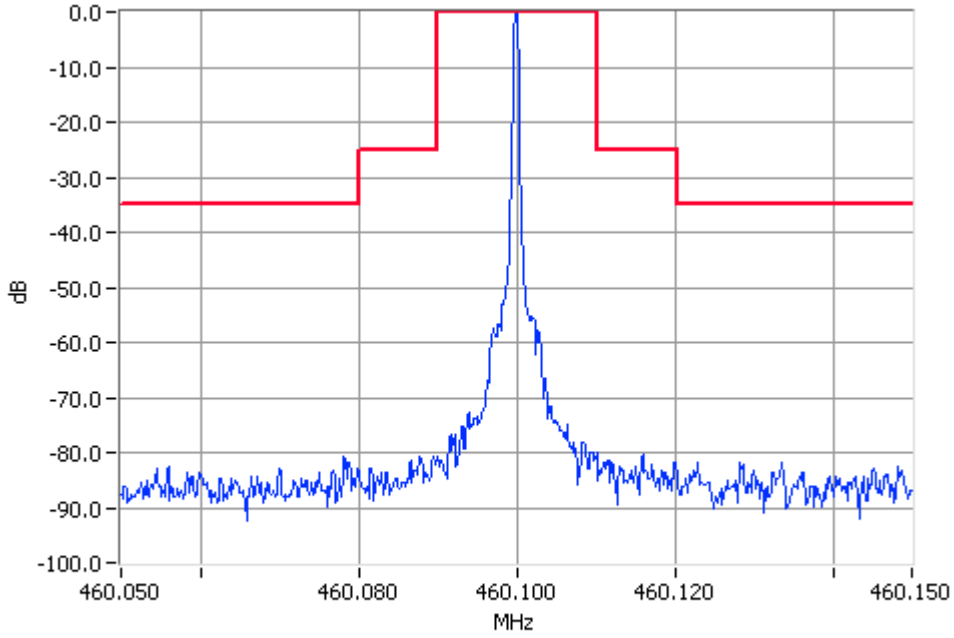


Analogue Modulation 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

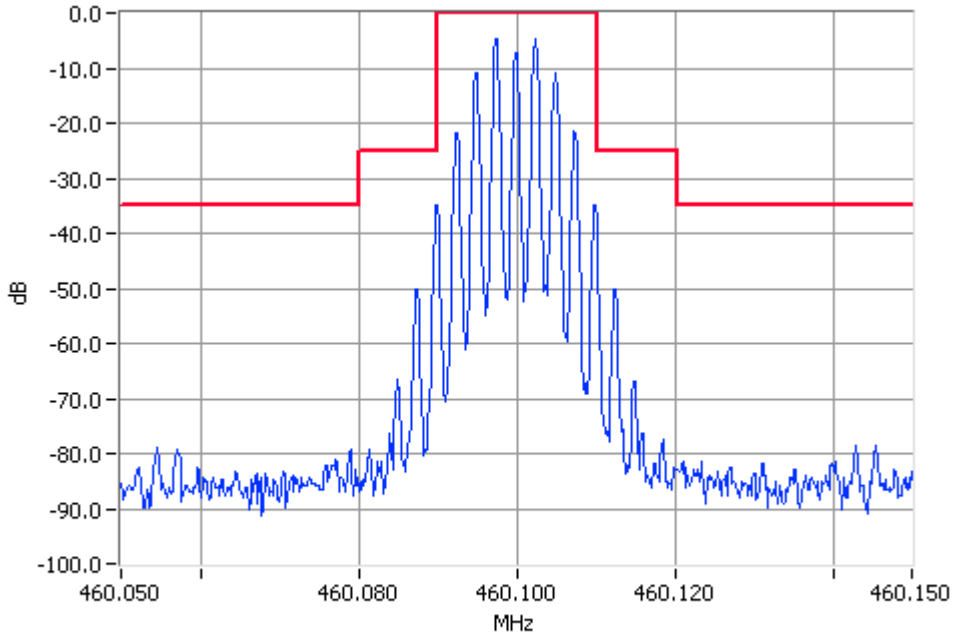
NAME OF TEST: OCCUPIED BANDWIDTH VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40 W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask B 40W Pass
RBW=300Hz VBW=3000Hz

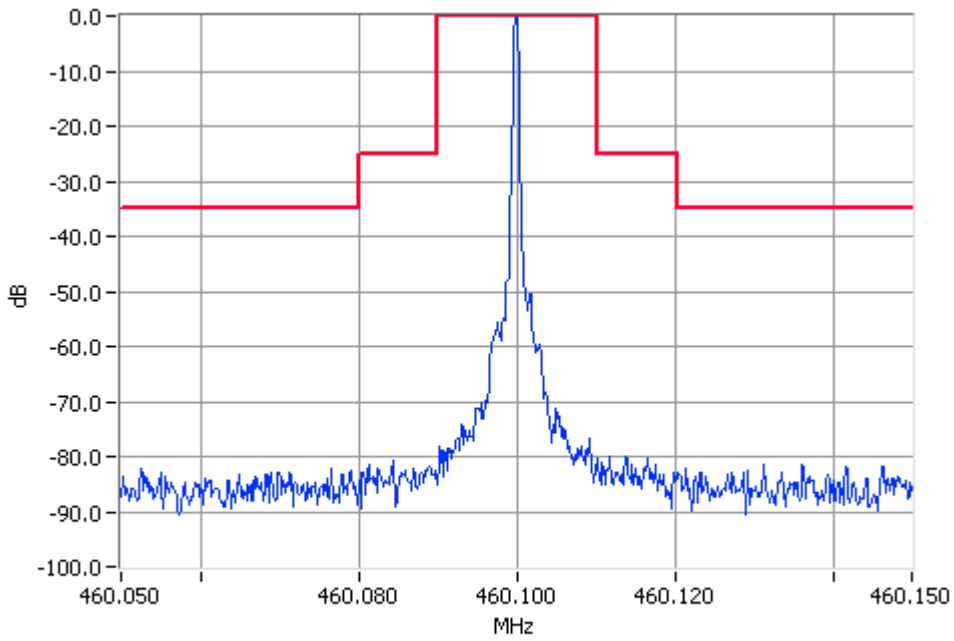


Analogue Modulation 460.1000MHz Mask B 40W Pass
RBW=300Hz VBW=3000Hz

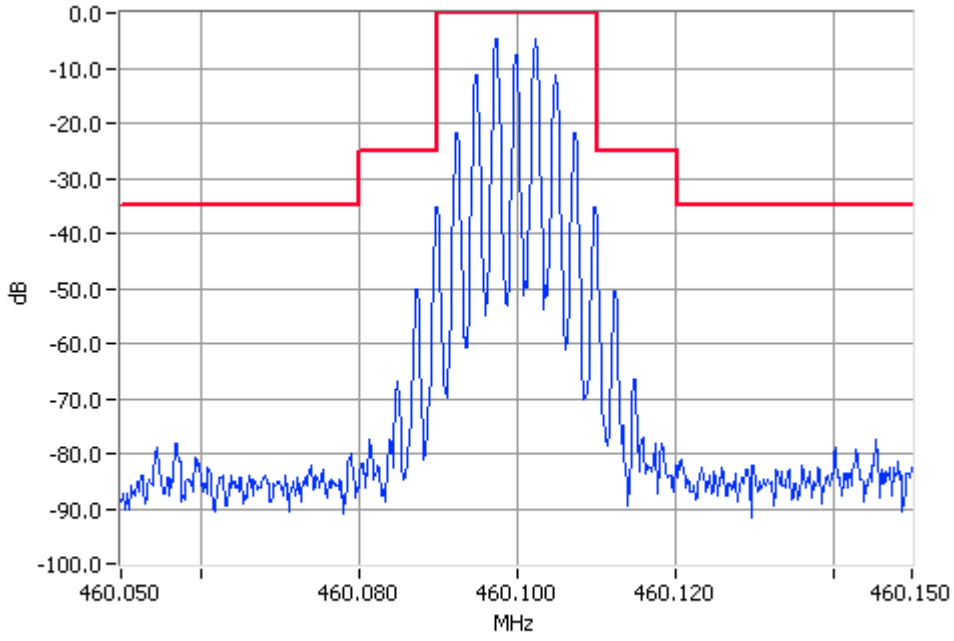
NAME OF TEST: OCCUPIED BANDWIDTH VOICE

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 10W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz

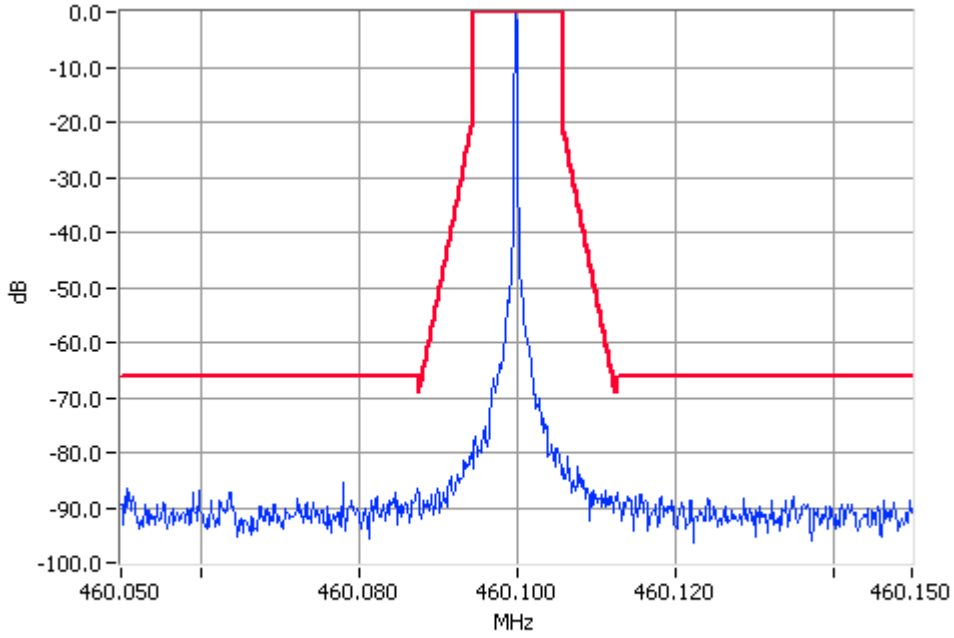


Analogue Modulation 460.1000MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz

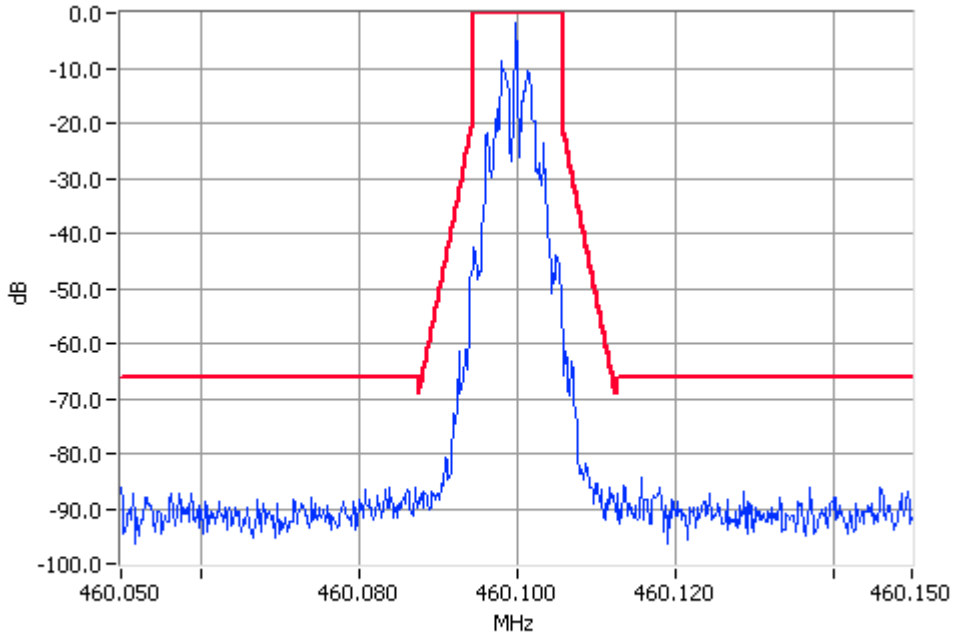
NAME OF TEST: OCCUPIED BANDWIDTH FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40W 12.5 kHz Channel Spacing



Unmodulated 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

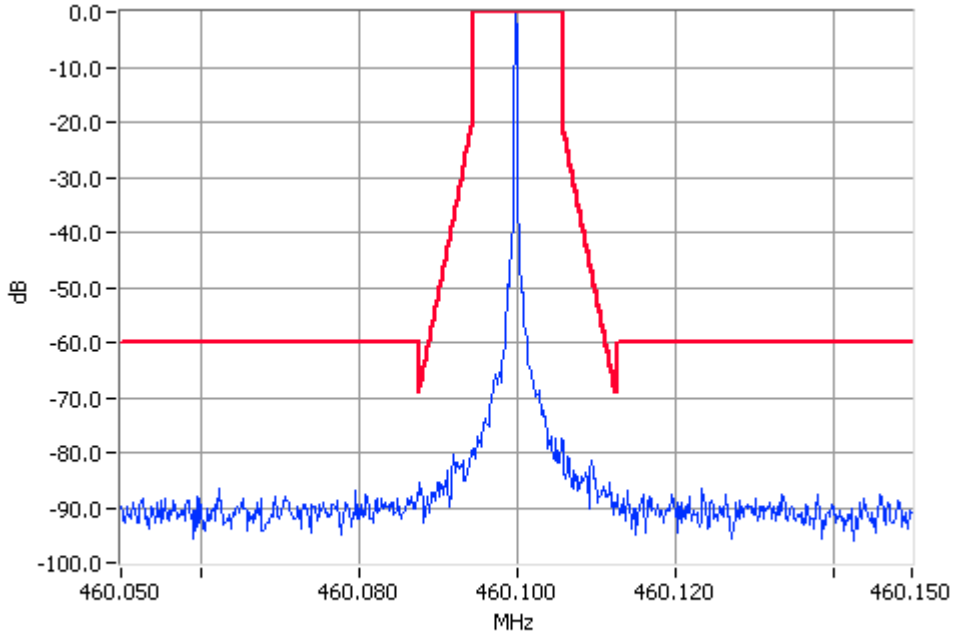


Digital Modulation 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

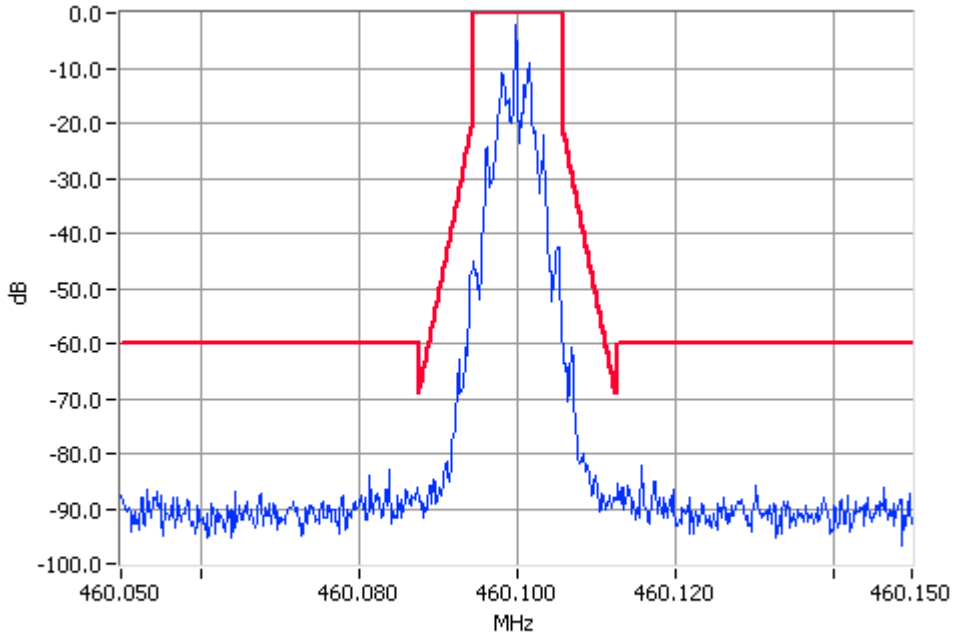
NAME OF TEST: OCCUPIED BANDWIDTH FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 10W 12.5 kHz Channel Spacing



Unmodulated 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

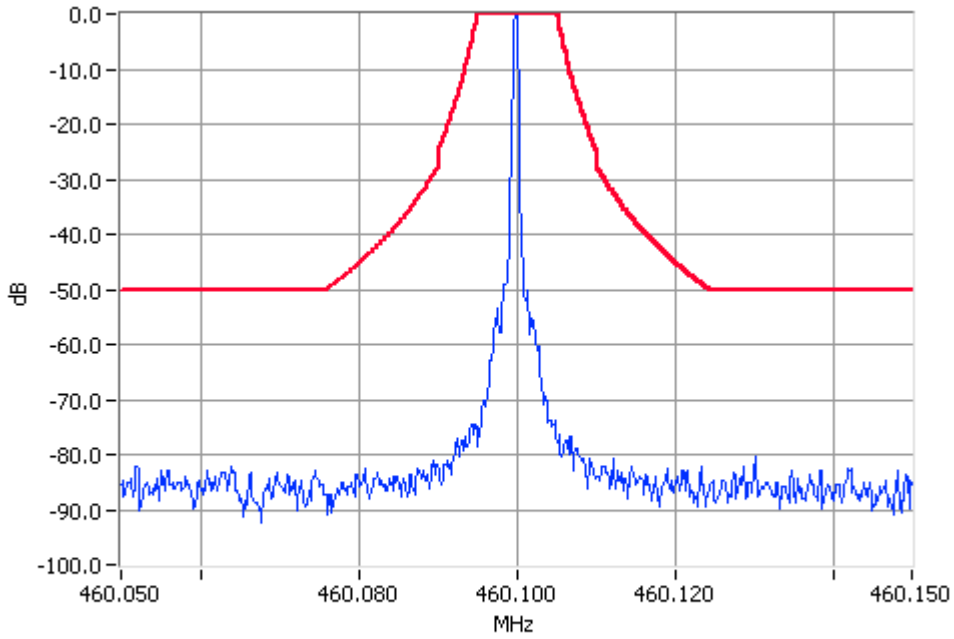


Digital Modulation 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

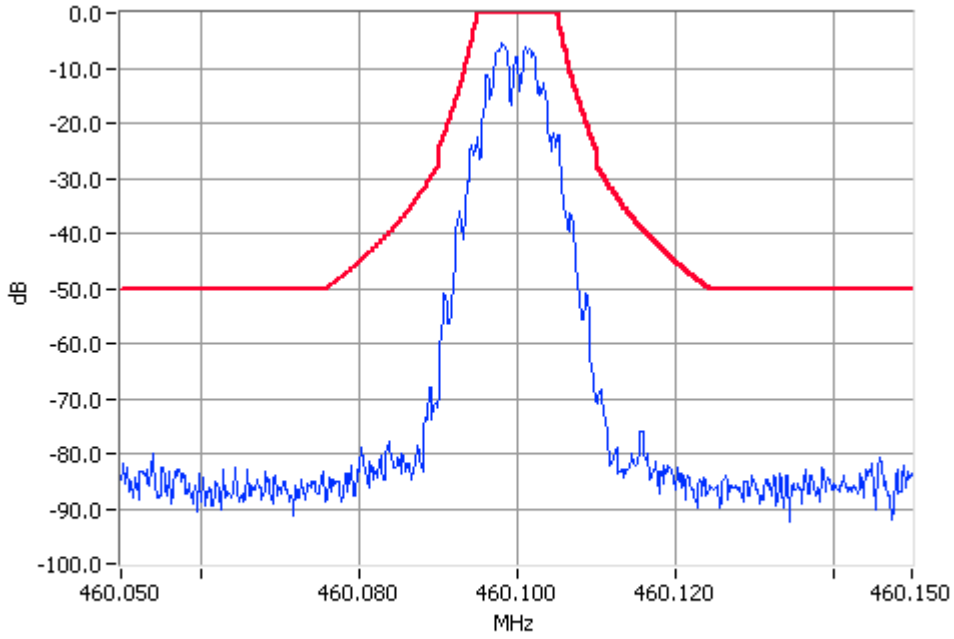
NAME OF TEST: OCCUPIED BANDWIDTH FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40 W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask C 40W Pass
RBW=300Hz VBW=3000Hz

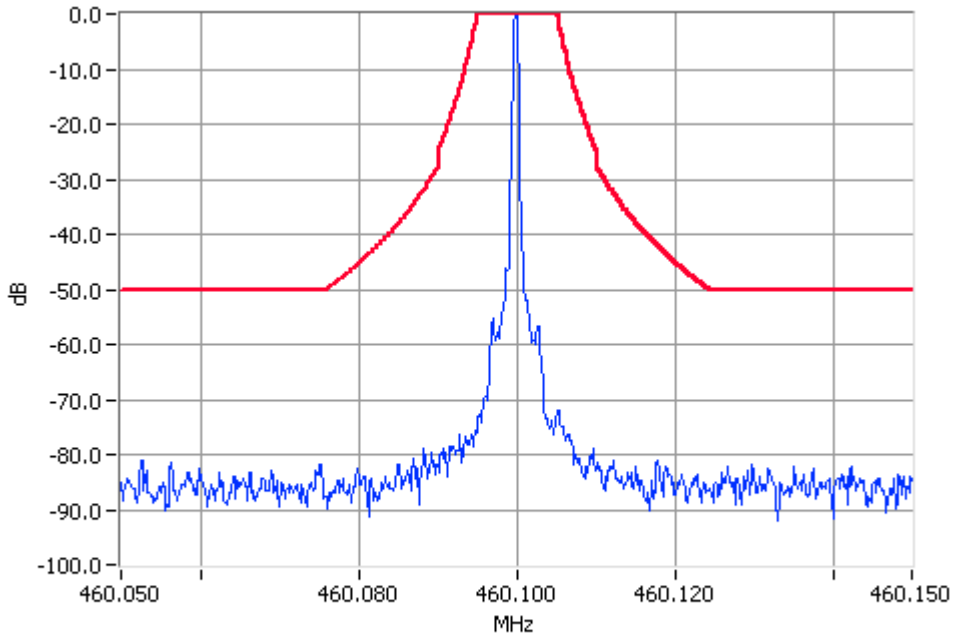


Digital Modulation 460.1000MHz Mask C 40W Pass
RBW=300Hz VBW=3000Hz

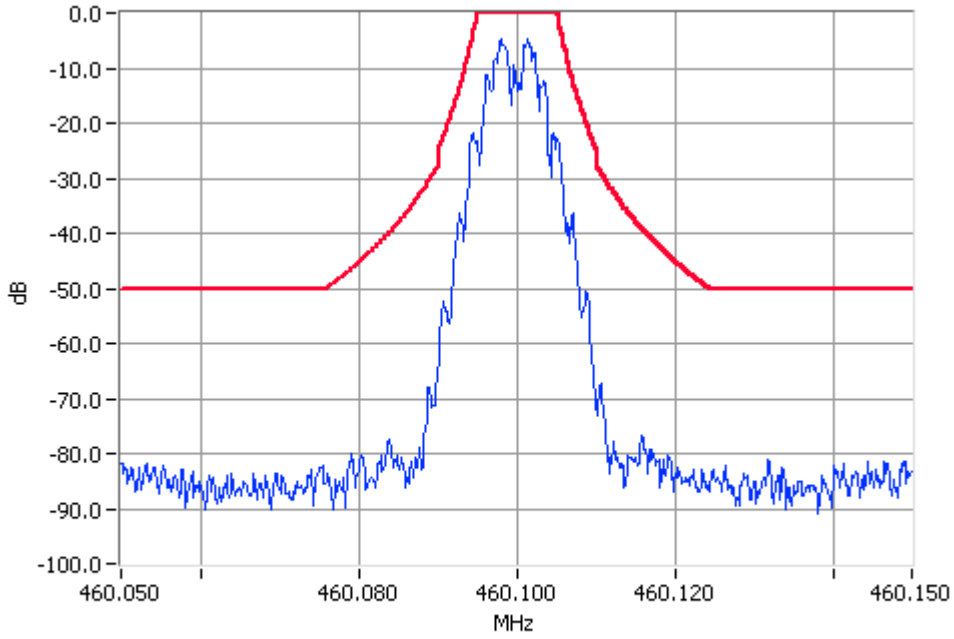
NAME OF TEST: OCCUPIED BANDWIDTH FFSK

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 10 W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask C 10W Pass
RBW=300Hz VBW=3000Hz

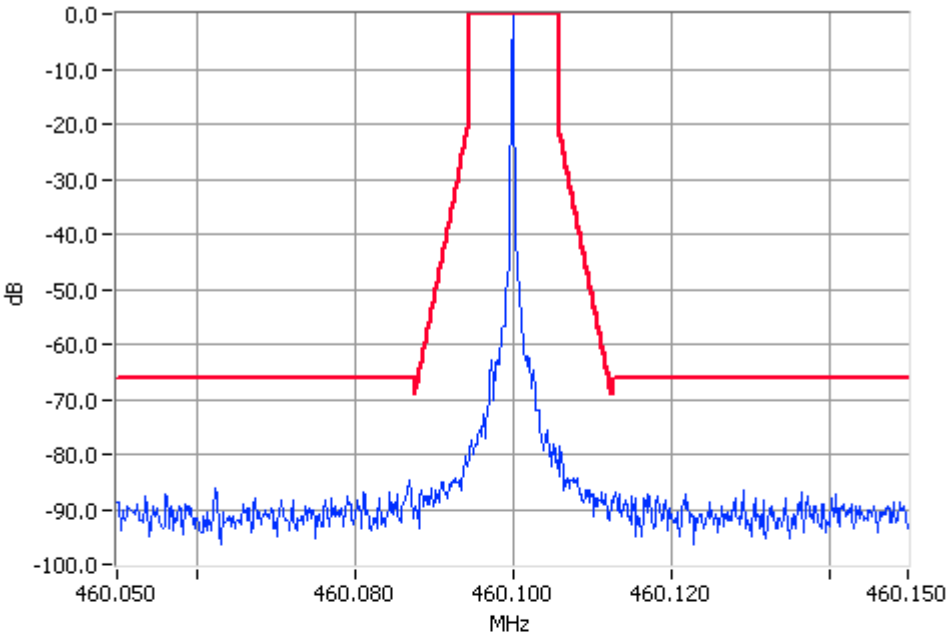


Digital Modulation 460.1000MHz Mask C 10W Pass
RBW=300Hz VBW=3000Hz

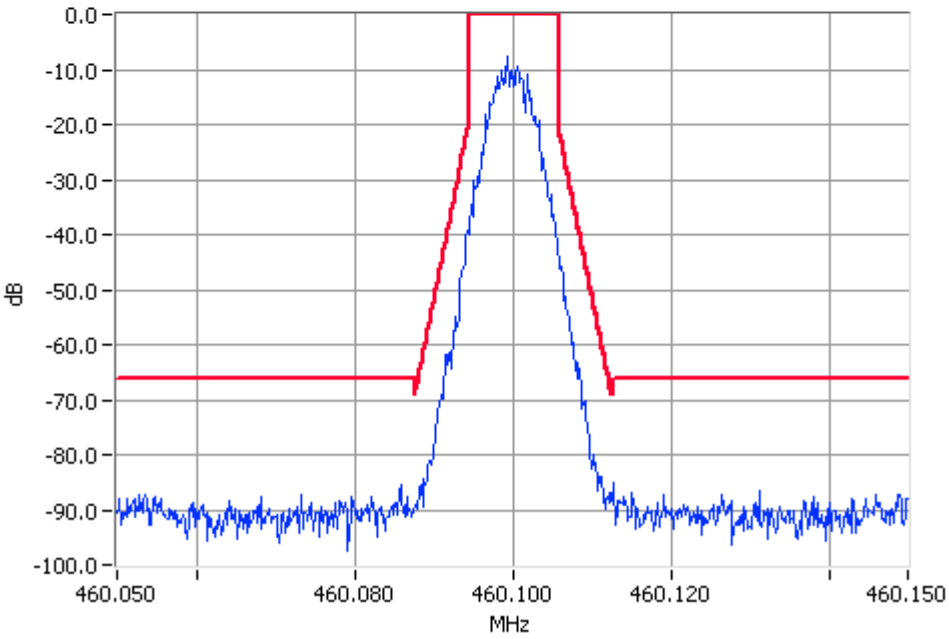
NAME OF TEST: OCCUPIED BANDWIDTH THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40 W 12.5 kHz Channel Spacing

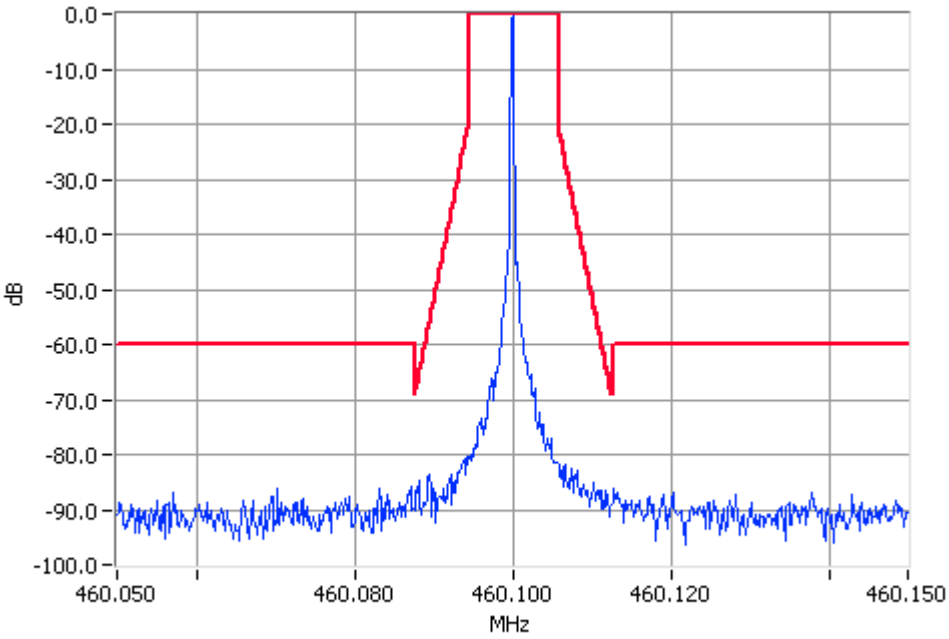


Unmodulated 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

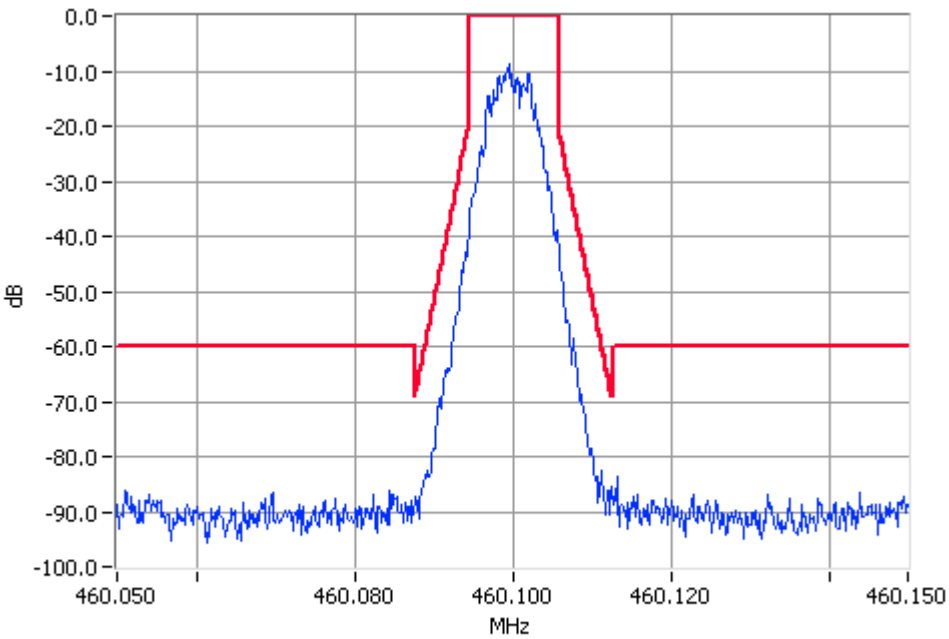


Digital Modulation 460.1000MHz Mask D 40W Pass
RBW=100Hz VBW=1000Hz

NAME OF TEST:	OCCUPIED BANDWIDTH		THSD
SPECIFICATION:	FCC CFR 2.1049 (c)		
Tx FREQUENCY:	460.1 MHz	10W	12.5 kHz Channel Spacing



Unmodulated 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

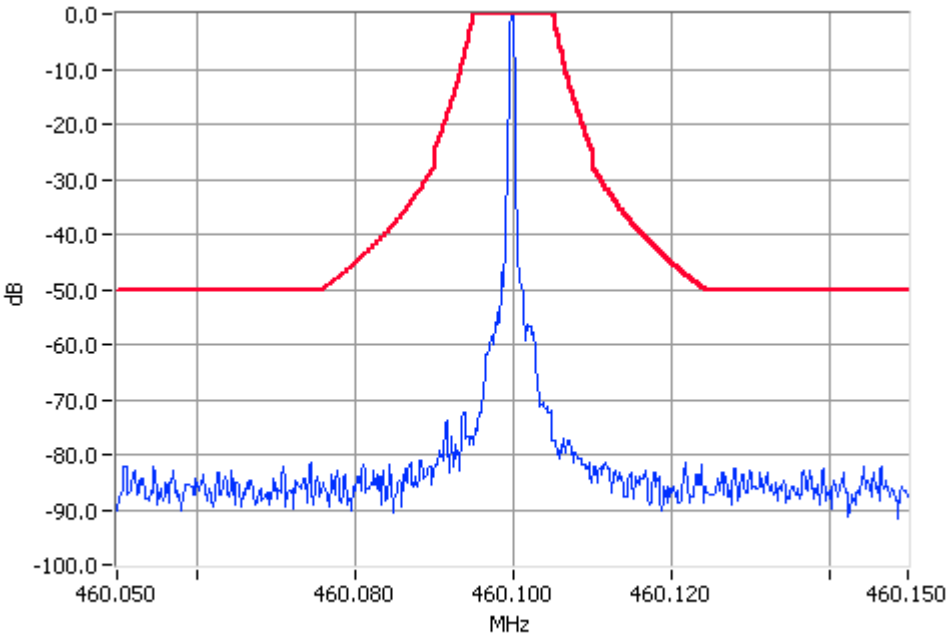


Digital Modulation 460.1000MHz Mask D 10W Pass
RBW=100Hz VBW=1000Hz

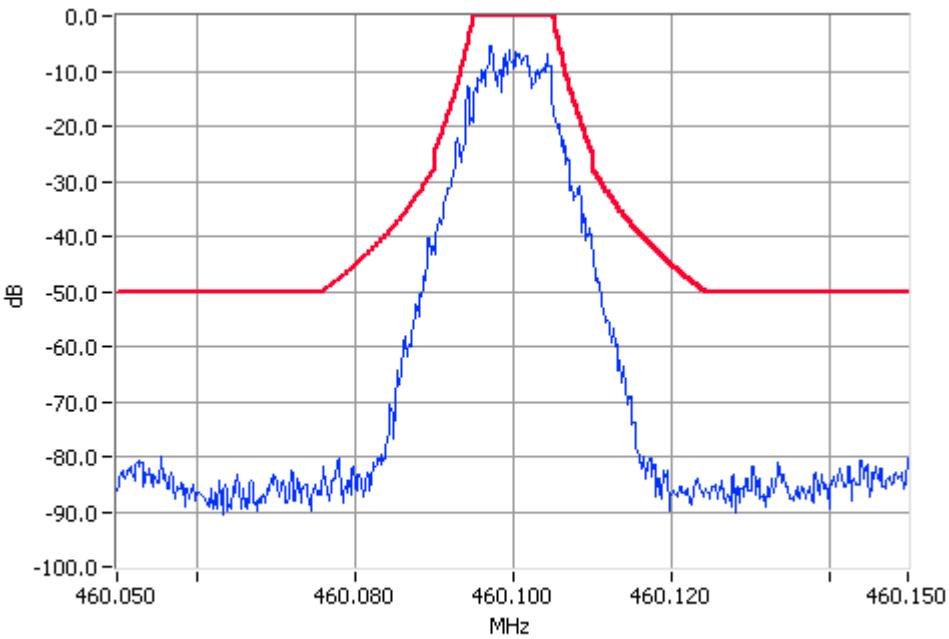
NAME OF TEST: OCCUPIED BANDWIDTH THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 40W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask C 40W Pass
RBW=300Hz VBW=3000Hz

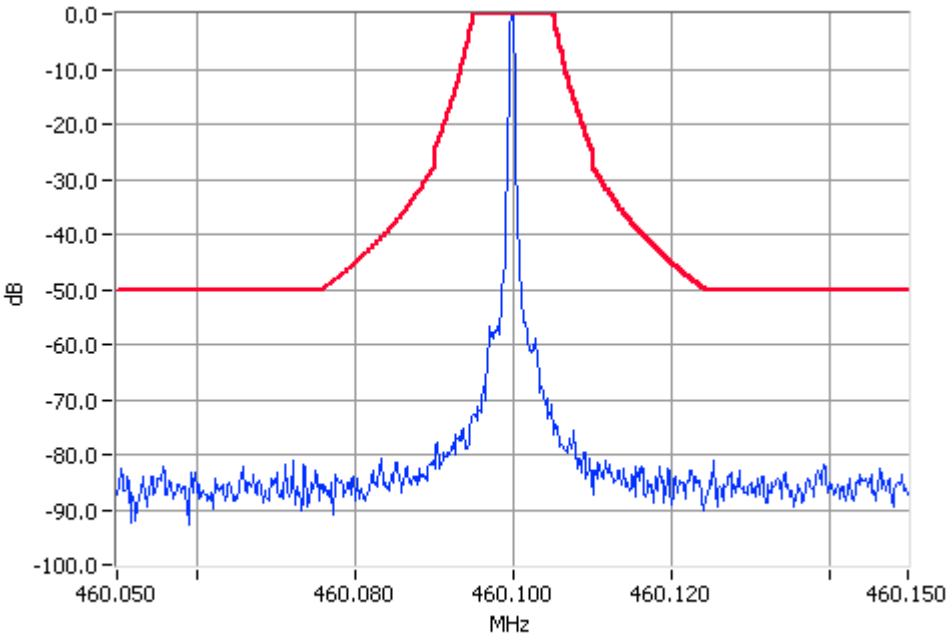


Digital Modulation 460.1000MHz Mask C 40W Pass
RBW=300Hz VBW=3000Hz

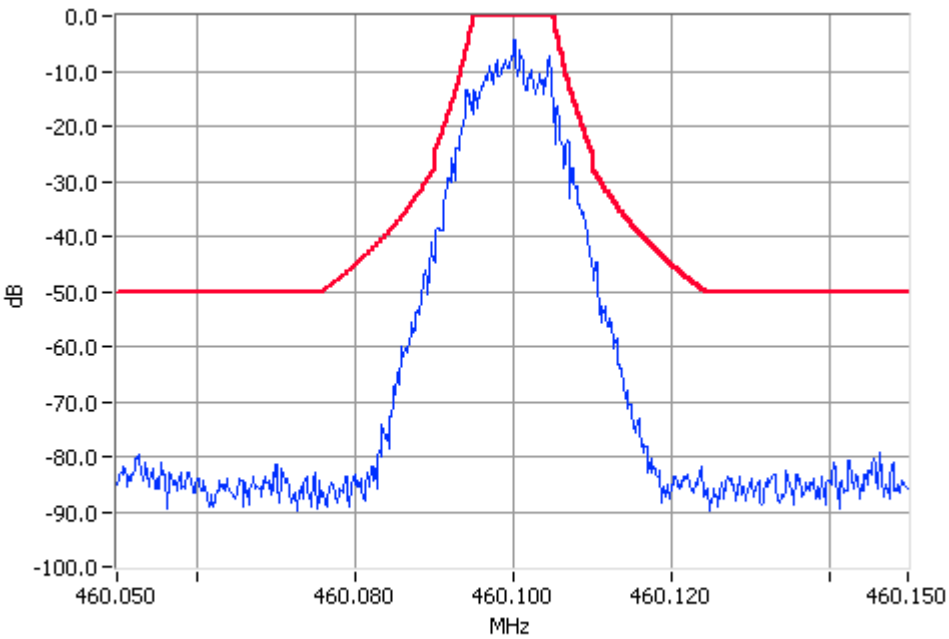
NAME OF TEST: OCCUPIED BANDWIDTH THSD

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 460.1 MHz 10W 25 kHz Channel Spacing



Unmodulated 460.1000MHz Mask C 10W Pass
RBW=300Hz VBW=3000Hz



Digital Modulation 460.1000MHz Mask C 10W Pass
RBW=300Hz VBW=3000Hz

SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: FCC 47 CFR 2.1051

GUIDE: TIA/EIA-603B 2.2.13

MEASUREMENT PROCEDURE:

1. Refer Appendix 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: 100kHz to Fc-BW
   Fc+BW to 4.7 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 20dB of the limit a second measurement is made with the carrier modulated, and a resolution bandwidth of 10 kHz, and a video bandwidth of 30kHz.
4. Spurious emissions which were attenuated more than 20dB below the limit were not recorded.

MEASUREMENT RESULTS:
See the tables on the following pages.

LIMIT CLAUSE: FCC 47 CFR 90.210

SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 460.1 MHz

	460.1 MHz @ 40 W	Emission Mask D
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No emissions were detected at a level greater than 20 dB below the limit.		

LIMITS:

Carrier Output Power Watts	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{Watts})$	
10 W	-20 dBm	60 dBc
40 W	-20 dBm	66 dBc

SPURIOUS EMISSIONS (CONDUCTED)

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 460.1 MHz

	460.1 MHz @ 10 W	Emission Mask D
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
1380.2997	-35.2	75.2
No other emissions were detected at a level greater than 20 dB below the limit.		

LIMITS:

Carrier Output Power Watts	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{Watts})$	
10 W	-20 dBm	60 dBc
40 W	-20 dBm	66 dBc

SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC 47 CFR 2.1053

GUIDE: TIA/EIA-603B 2.2.12

MEASUREMENT PROCEDURE:
1. Refer Appendix A for equipment set up.
1. The EUT was placed on a wooden turntable at a distance of three metres from the test antenna. The output terminal was connected to an RF dummy load.
2. The turntable was rotated through 360^{o} to obtain the maximum response of each spurious emission. Valid emissions were determined by switching the EUT on and off.
3. The EUT was 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

SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 460.1 MHz

	460.1 MHz @ 40 W	Emission Mask D
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No emissions were detected at a level greater than 20 dB below the limit.		

LIMITS:

Carrier Output Power Watts	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{Watts})$	
10 W	-20 dBm	60 dBc
40 W	-20 dBm	66 dBc

SPURIOUS EMISSIONS (RADIATED)

SPECIFICATION: FCC CFR 2.1051

Tx FREQUENCY: 460.1 MHz

	460.1 MHz @ 10 W	Emission Mask D
Emission Frequency (MHz)	Level (dBm)	Level (dBc)
~	~	~
No emissions were detected at a level greater than 20 dB below the limit.		

LIMITS:

Carrier Output Power Watts	Emission Mask D 12.5 kHz Channel Spacing $50 + 10 \text{ Log}_{10} (P_{Watts})$	
10 W	-20 dBm	60 dBc
40 W	-20 dBm	66 dBc

TRANSMITTER FREQUENCY STABILITY (TEMPERATURE)

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

GUIDE: TIA/EIA-603B 2.2.2

MEASUREMENT PROCEDURE:
1. Refer Appendix A for equipment set up.
2. The EUT was tested for frequency error from –30 °C to +50°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 & 25.0 kHz channel spacings.

LIMIT CLAUSE: FCC 47 CFR 90.213

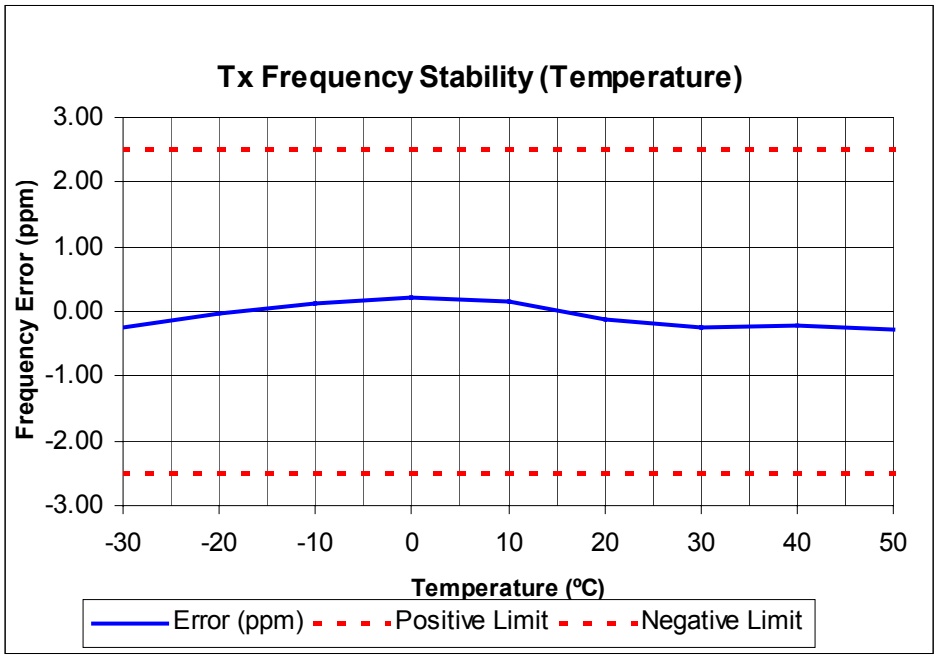
Frequency Range: 421 MHz to 512 MHz

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	2.5
25.0	5.0

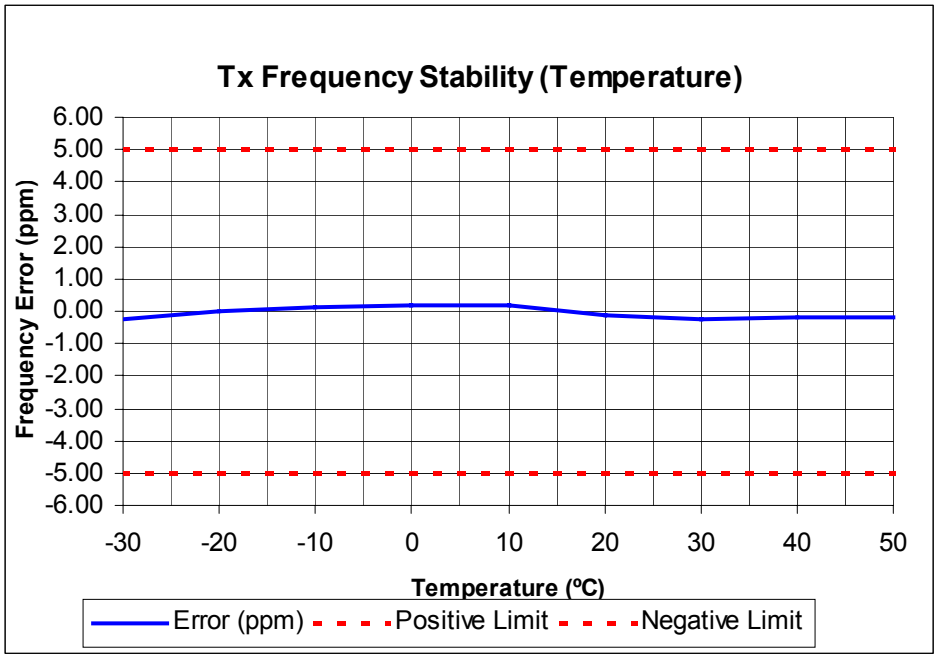
TRANSMITTER FREQUENCY STABILITY (TEMPERATURE)

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

Tx FREQUENCY: 460.1 MHz 40 W 12.5 kHz channel Spacing



Tx FREQUENCY: 460.1 MHz 40 W 25.0 kHz channel Spacing



TRANSMITTER FREQUENCY STABILITY (VOLTAGE)

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

GUIDE: TIA/EIA-603B 2.2.2

MEASUREMENT PROCEDURE:
1. The Equipment Under Test was set up as shown in the following diagram.
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:

Channel Spacing (kHz)	FREQUENCY ERROR (ppm) @ 460.1 MHz		
	11.7 V DC	13.8 V DC	15.9 V DC
12.5	-0.35	-0.35	-0.31
25.0	-0.31	-0.29	-0.30

LIMIT CLAUSE: FCC 47 CFR 90.213

Frequency Range: 421 MHz – 512 MHz

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	2.5
25.0	5.0

TRANSIENT FREQUENCY BEHAVIOR

SPECIFICATION: FCC 47 CFR 90.214

GUIDE: TIA/EIA-603B 2.2.19

MEASUREMENT PROCEDURE:
1. Refer Appendix A for equipment set up.
2. Measurements and plots were made following the TIA/EIA procedure.

MEASUREMENT RESULTS:
See the tables and plots on the following pages for 12.5 kHz & 25.0 kHz channel spacings.

LIMIT CLAUSE: FCC 47 CFR 90.214

TRANSIENT FREQUENCY BEHAVIOUR

SPECIFICATION: FCC 47 CFR 90.214

Tx FREQUENCY: 460.1 MHz 40 W 12.5 kHz Channel Spacing

FREQUENCY	460.1 MHz @ 40 W Tx	
TRANSIENT RESPONSE PERIOD	CARRIER PEAK VARIATION FROM NORMAL	
	Key ON (kHz)	Key OFF (kHz)
t_1	-0.4	N/A
t_2	-0.4	N/A
t_3	N/A	-0.6
$t_2 \rightarrow t_3$ ppm	1.0	
ERROR LIMIT ($t_2 \rightarrow t_3$) ppm	2.5	

Confirm that during periods t_1 and t_3 the frequency difference does not exceed the value of one channel separation.	YES	NO
	Y	
Confirm that during the period t_2 the frequency difference does not exceed half a channel separation.	YES	NO
	Y	
Confirm that during the period t_2 to t_3 the frequency difference does not exceed the frequency error limit.	YES	NO
	Y	

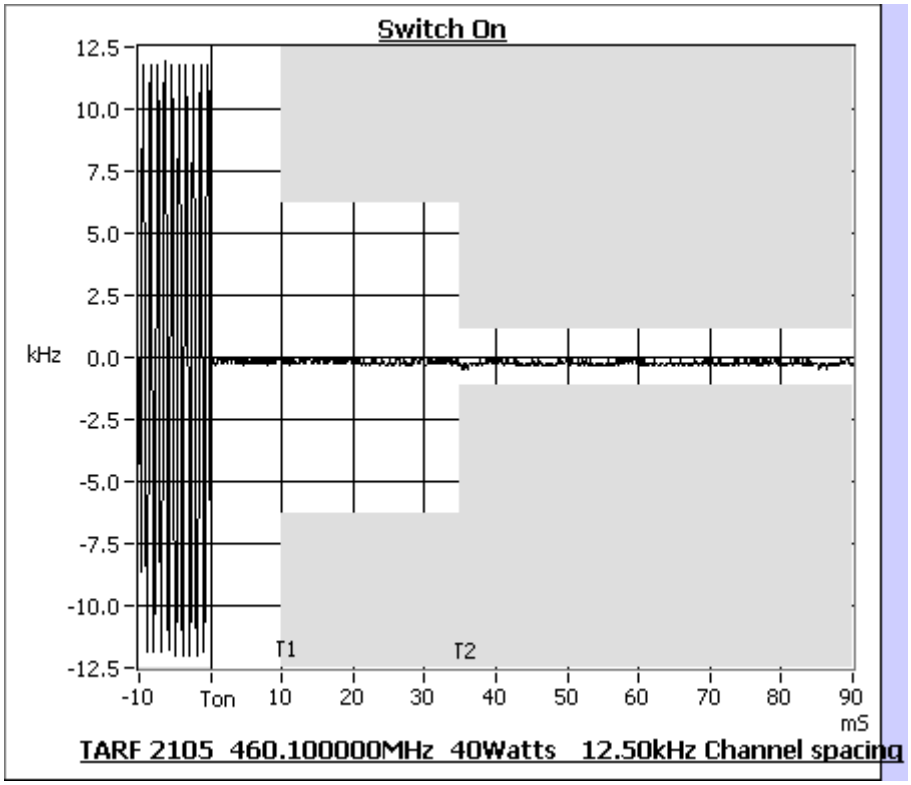
LIMIT:

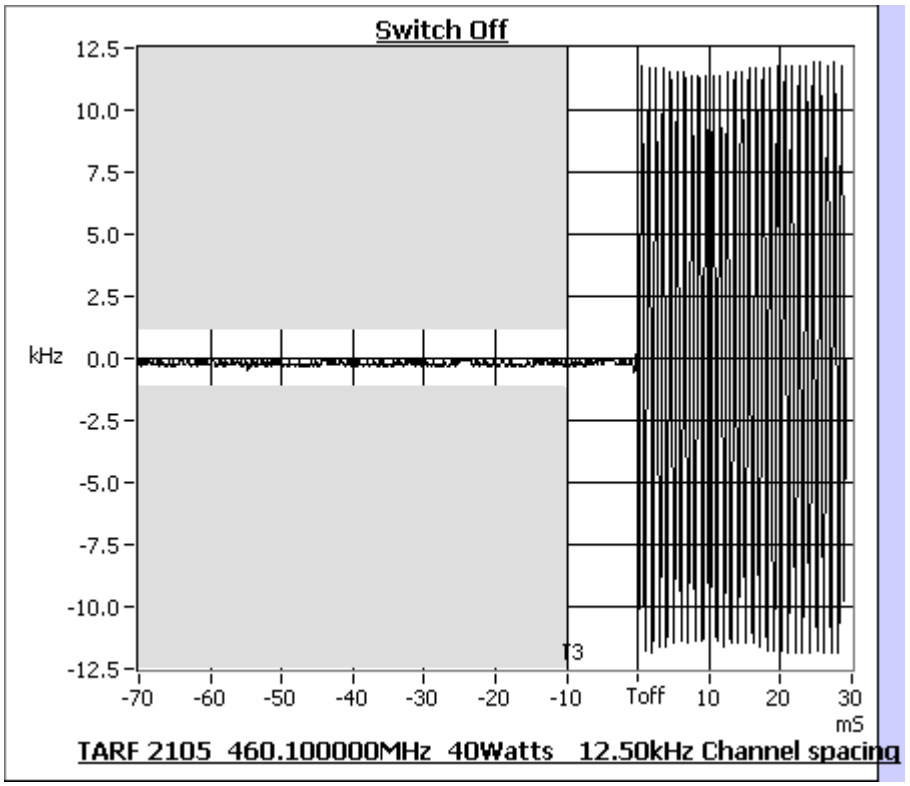
TRANSIENT PERIODS	FREQUENCY RANGE 150MHz – 174 MHz	FREQUENCY RANGE 421MHz – 512 MHz
t_1 (ms)	5 ms	10 ms
t_2 (ms)	20 ms	25 ms
t_3 (ms)	5 ms	10 ms

TRANSIENT FREQUENCY BEHAVIOUR

SPECIFICATION: FCC 47 CFR 90.214

Tx FREQUENCY: 460.1 MHz 40 W 12.5 kHz Channel Spacing





TRANSIENT FREQUENCY BEHAVIOUR

SPECIFICATION: FCC 47 CFR 90.214

Tx FREQUENCY: 460.1 MHz 40 W 25.0 kHz Channel Spacing

FREQUENCY	460.1 MHz @ 40 W Tx	
TRANSIENT RESPONSE PERIOD	CARRIER PEAK VARIATION FROM NORMAL	
	Key ON (kHz)	Key OFF (kHz)
t_1	0.8	N/A
t_2	-0.4	N/A
t_3	N/A	-0.7
$t_2 \rightarrow t_3$ ppm	0.9	
ERROR LIMIT ($t_2 \rightarrow t_3$) ppm	5	

Confirm that during periods t_1 and t_3 the frequency difference does not exceed the value of one channel separation.	YES	NO
	Y	
Confirm that during the period t_2 the frequency difference does not exceed half a channel separation.	YES	NO
	Y	
Confirm that during the period t_2 to t_3 the frequency difference does not exceed the frequency error limit.	YES	NO
	Y	

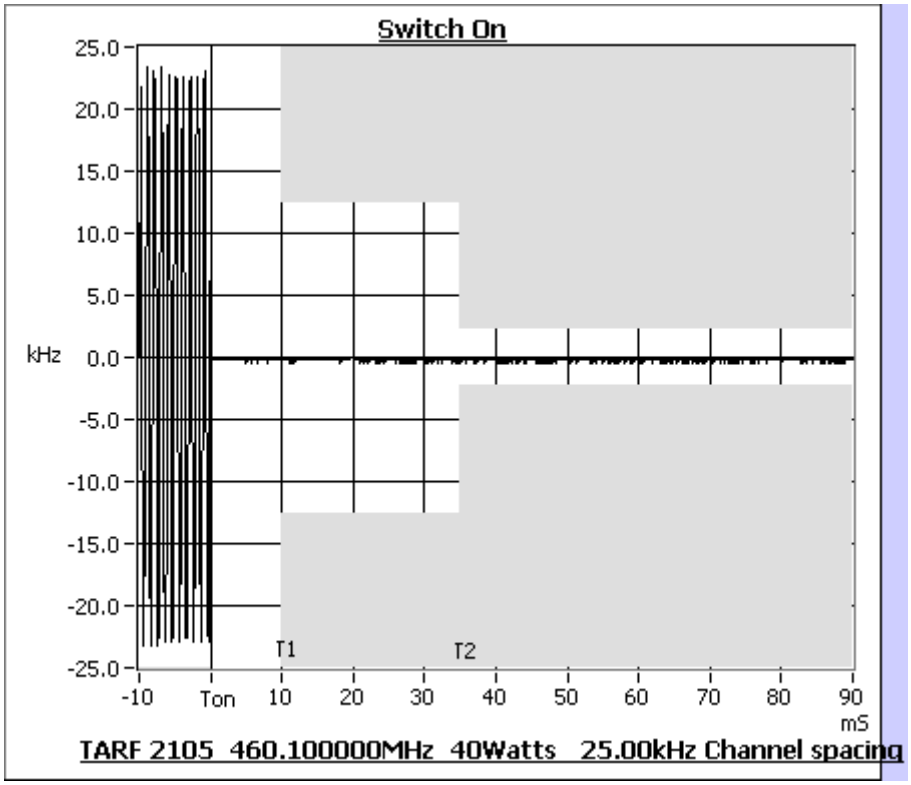
LIMIT:

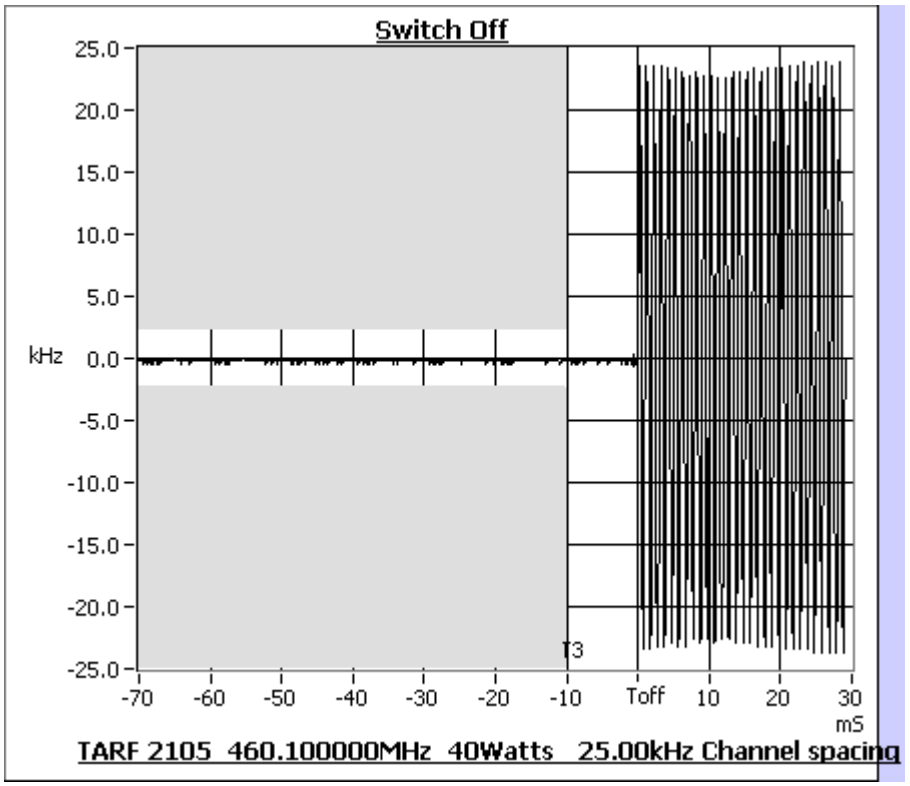
TRANSIENT PERIODS	FREQUENCY RANGE 150MHz – 174 MHz	FREQUENCY RANGE 421MHz – 512 MHz
t_1 (ms)	5 ms	10 ms
t_2 (ms)	20 ms	25 ms
t_3 (ms)	5 ms	10 ms

TRANSIENT FREQUENCY BEHAVIOUR

SPECIFICATION: FCC 47 CFR 90.214

Tx FREQUENCY: 460.1 MHz 40 W 25.0 kHz Channel Spacing





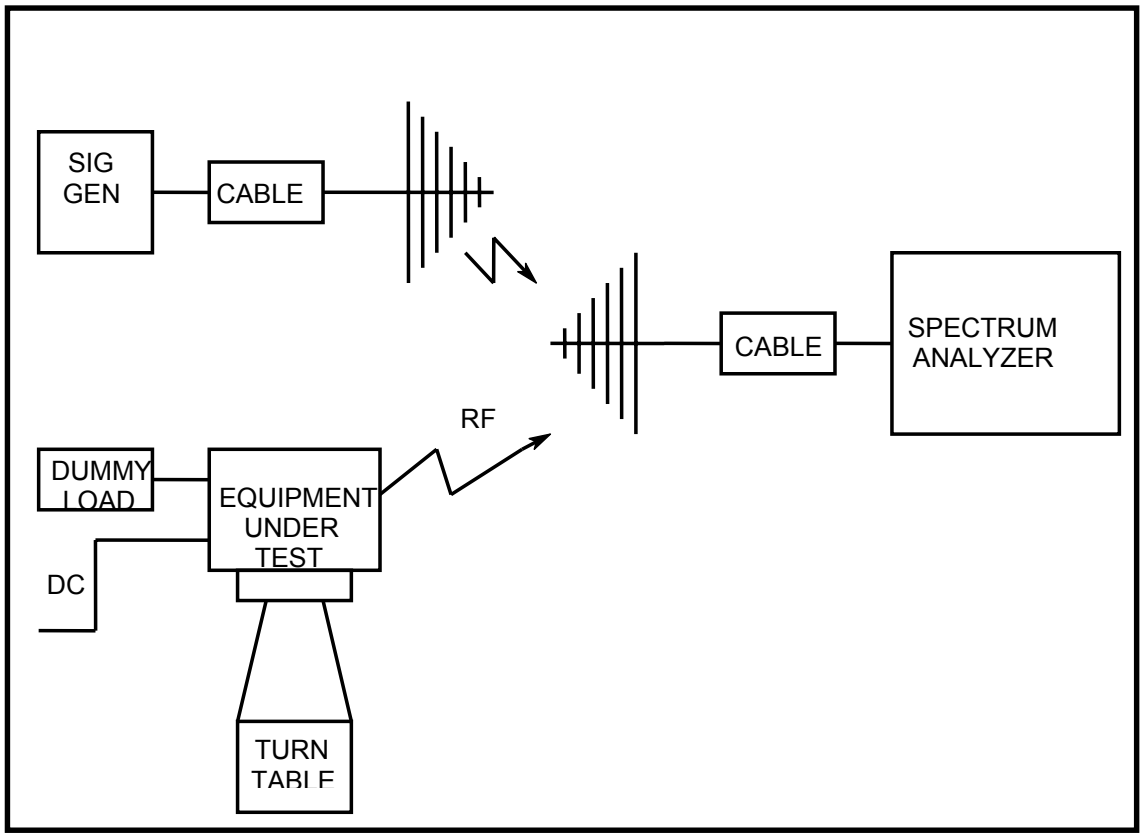
TEST EQUIPMENT USED

No#	Equipment	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
1	Signal Generator	Hewlett Packard	HP8642B (Opt 001)	2512A00176	E3064	18-Feb-05
3	Signal Generator	Agilent	E4422B	GB40050320	E3788	22-Oct-04
4	Signal Generator	Hewlett Packard	HP8648C	3443U00543	E3558	11-Sep-05
11	Modulation Analyser	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	11-Sep-05
13	Audio Analyser	Hewlett Packard	HP8903A	2308A02597	E3074	15-Oct-04
20	Power Supply	Hewlett Packard	HP6032A	2441A-0041Z	E3075	15-Oct-04
23	Universal Counter	Goldstar	FC2015U -		E3550	28-Feb-03
43	Horn Antenna	Emco	DRG3115		E3076	27-Sep-06
62	RF Attenuator 150W	Weinschel	57-10-34	LB590	E3674	20-Jul-05
83	1m Coax Cable (BLUE)	Suhner	Sucoflex 104A	25006/4A	E3693	30-Oct-04
82	3m Coax Cable BLUE)	Suhner	Sucoflex 104A	25033/4A	E3694	30-Oct-04
86	1m Coax Cable (BLUE)	Suhner	Sucoflex 104A	25003/4A	E3690	13-Aug-05
88	Spectrum Analyser	Hewlett Packard	HP8562E	3821A00779	E3715	06-Jan-05
100	Oscilloscope	Tektronics	TDS380	B017095	E3782	16-Oct-04
118	RF Attenuator	Weinschel	Model 1	BL9958	E4081	24-May-05
123	Spectrum Analyser	Agilent	E4445A	MY42510072	E4139	23-Apr-05
135	Attenuator	Weinschel	67-30-33	BR0531	E4280	13-Aug-05

APPENDIX A

TEST SETUP DETAILS

Test set up for Spurious Emissions (Radiated)



All other testing was performed using the **T**eltest **R**adio **EVA**luation 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.