A TEST REPORT

FOR

TEAM SIMOCO Ltd

ON

SB2025NT100W

Private Land Mobile Radio

DOCUMENT NO. TRA-009970-W-US-1

TEST REPORT NO: TRA-009970-W-US-1

COPY NO: 1

ISSUE NO: 1

FCC ID: U89SB2K5354N2N2V

REPORT ON THE CERTIFICATION TESTING OF A
TEAM SIMOCO
SB2025NT100W
WITH RESPECT TO
THE FCC RULES CFR 47,
PART 90

PRIVATE LAND MOBILE RADIO.

TEST DATE: 25th May – 8th Ocotber 2012

APPROVED BY: _____ J CHARTERS
RADIO
PRODUCT
MANAGER

DATE: 8th August 2012

Distribution:

Copy Nos: 1. Team Simoco

2. TRaC Global

CONTENTS

Notes:

1. Component failure during test

YES	[ ]
NO	[X]

2. If Yes, details of failure:

3. The facilities used for the testing of the product contain in this report are FCC Listed.

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	U89SB2K5354N2N2V
PURPOSE OF TEST:	Certification
TEST SPECIFICATION:	FCC RULES CFR 47, Part 90
TEST RESULT:	Compliant to Specification
EQUIPMENT UNDER TEST:	SB2025NT100W
EQUIPMENT TYPE:	Private Land Mobile Radio
FREQUENCY OF OPERATION:	400MHz – 435MHz
MAXIMUM OUTPUT CONDUCTED:	49.96dBm 99.08W
MODULATION TYPE:	F3E, F1E
POWER SOURCE(s):	+13.8Vdc
TEST DATE(s):	25th May – 8th October 2012
APPLICANT:	Team Simoco
ADDRESS:	Team Simoco Ltd Field House Uttoxeter Old Road Derby DE1 1NH

APPROVED BY: _____

RADIO
PRODUCT
MANAGER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	SB2025NT100W 400MHz
EQUIPMENT TYPE:	Private Land Mobile Radio
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 90
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S CONTACT PERSON(s):	Mr Richard Stimson
EMAIL ADDRESS	Richard.stimson@teamsimoco.com
APPLICANT:	Team Simoco Ltd
ADDRESS:	Team Simoco Ltd Field House Uttoxeter Old Road Derby DE1 1NH
TEL:	01332 375414
MANUFACTURER:	Team Simoco Ltd
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRaC Global
TEST DATE(s):	25th May – 8thOctober 2012
TEST REPORT No:	TRA-009970-W-US-1

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	APPLICABILITY	RESULT
RF Power Output	90.205	Yes	Complies
Audio Frequency Response (a)	2.1047	Yes	Complies
Modulation Limiting	2.1047	No	N/a
Occupied Bandwidth	90.210	Yes	Complies
Spurious Emissions at Antenna Terminals	90.210	Yes	Complies
Field Strength of Spurious Emissions	90.210	Yes	Complies
Field Strength of Un- Intentional Spurious Emissions	15.109	Yes	Complies
Frequency Stability	90.213	Yes	Complies
Transient behaviour	90.214	Yes	Complies
Emission Mask	90.210(d)	Yes	Complies

2. Product class: Class A [X] Class B [ ]

3. Product Use: Private Land Mobile Radio

4. Emission Designator: F3E, F1E

5. Temperatures: Ambient (Tnom) 22^{o}C

6. Supply Voltages: Vnom +13.8Vdc

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

7. Equipment Category: Single channel [ ]
Two channel [ ]
Multi-channel [X]

8. Channel spacing: Narrowband [X]
Wideband [X]

9. Test Location TRaC Global
Skelmersdale [X]

10. Modifications made during test program No modifications were performed.

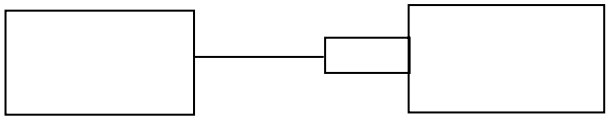
System description:

The SB2025NT100W is a radio base station capable of operating in analogue FM and digital P25 modes as a stand-alone repeater or as part of a simulcast/voted system. Inputs are provided for connection to external frequency and 1PPS timing signals to ensure the accurate frequency and modulation synchronisation necessary for simulcast operation. Dispatcher connection is via Ethernet using the TIA DFSI protocol."

COMPLIANCE TESTS

RF OUTPUT POWER – CONDUCTED – PART 2.1046

Ambient temperature = 22°C Radio Laboratory
Relative humidity = 56%
Supply voltage = +13.8Vdc
Channel number = See test results



Cable & Attenuator

EUT TRL05 CMTA

Frequency MHz	Level at Analyser (dBm)	Output Cable & Attenuator loss (dB)	Conducted Output Power (dBm)	Conducted Output Power (W)	Rated output Power (dBm)	Rated output Power (W)
400.0000*	9.1	40.86	49.96	99.08	50	100
416.9875*	9.0	40.89	49.89	97.49	50	100
434.9875*	9.1	40.80	49.90	97.72	50	100
411.0000	9.0	40.88	49.88	97.27	50	100
425.5000	9.0	40.87	49.87	97.05	50	100

Notes:

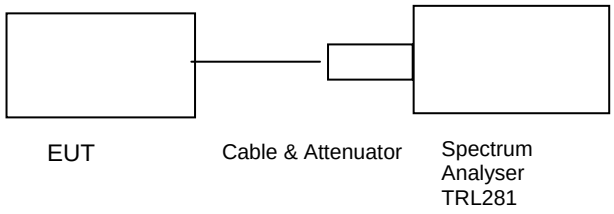
1. Power and antenna height clause 90.205(g) refers to limitations specified in clause 90.279 in the band 421MHz – 430MHz. the maximum allowable station effective radiated power (ERP) and effective Antenna Height EAH.
2. * indicates this frequency is NOT applicable to FCC filing.

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	No	ACTUAL EQUIPMENT USED
Radio Communications Analyser	RHODE & SCHWARZ	CMTA 52	894715/003	TRL05	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	

TRANSMITTER TESTS

99% Bandwidth – CONDUCTED

Ambient temperature	=	22^{o}C	Radio Laboratory
Relative humidity	=	56%	
Supply voltage	=	+13.8Vdc	
Channel number	=	See test results	



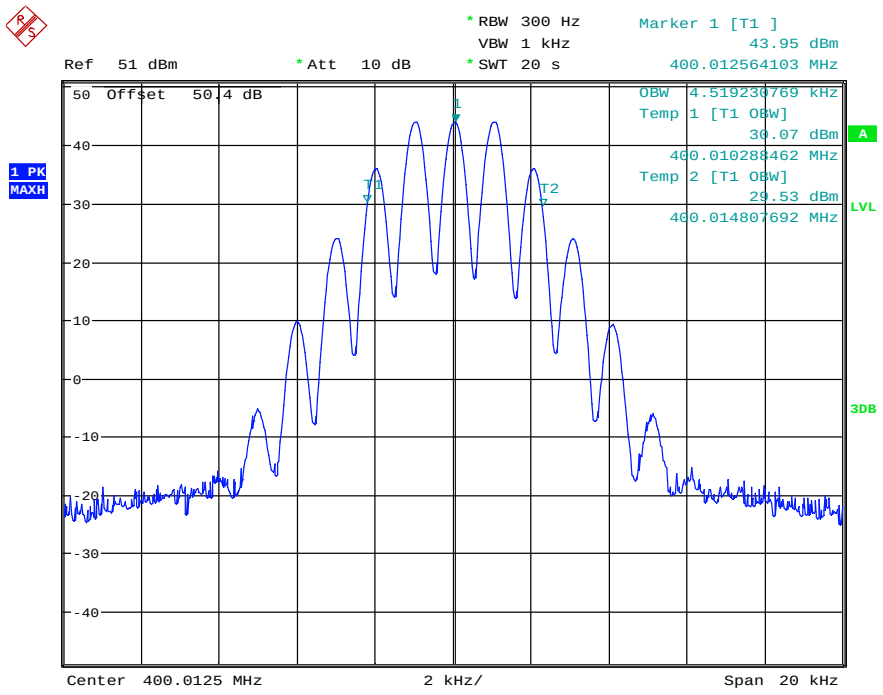
Note:

1. Cable and attenuator between EUT and spectrum analyser 50dB
2. See Table below for 99% Power Occupied Bandwidth
3. Internally generated test tone analogue speech
4. P25 Internally generated test tone C4FM
5. * indicates this frequency is NOT applicable to FCC filing.

Frequency Of Operation Channel	Modulation Type
	FM 2.5kHz Deviation
400.0125MHz*	99% Bandwidth =4.51kHz
416.9875MHz*	99% Bandwidth =4.51kHz
434.9875MHz*	99% Bandwidth =4.51kHz
411.0000MHz	99% Bandwidth =4.42kHz
425.5000MHz	99% Bandwidth =4.55kHz
	P25 Modulation
400.0125MHz*	99% Bandwidth =8.01kHz
416.9875MHz*	99% Bandwidth =8.09kHz
434.9875MHz*	99% Bandwidth =8.09kHz
411.0000MHz	99% Bandwidth =7.85kHz
425.5000MHz	99% Bandwidth =8.25kHz
	FM 25kHz Deviation
400.0125MHz*	99% Bandwidth =8.25kHz
416.9875MHz*	99% Bandwidth =8.25kHz
434.9875MHz*	99% Bandwidth =8.25kHz
411.0000MHz	99% Bandwidth =8.09kHz
425.5000MHz	99% Bandwidth =8.33kHz

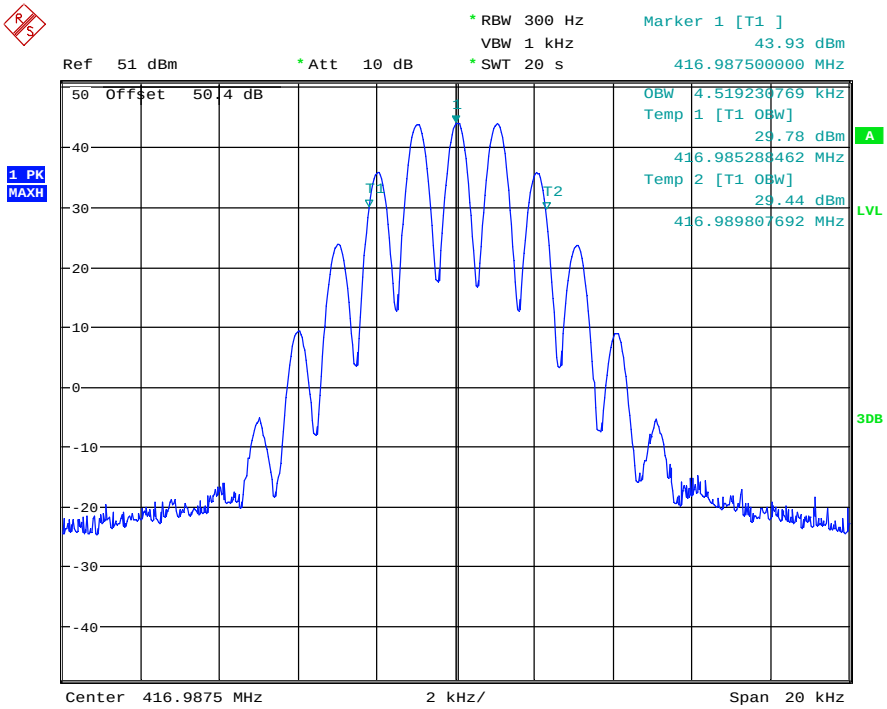
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**

400.0125MHz 12.5kHz analogue speech - This frequency is NOT applicable to FCC filing.



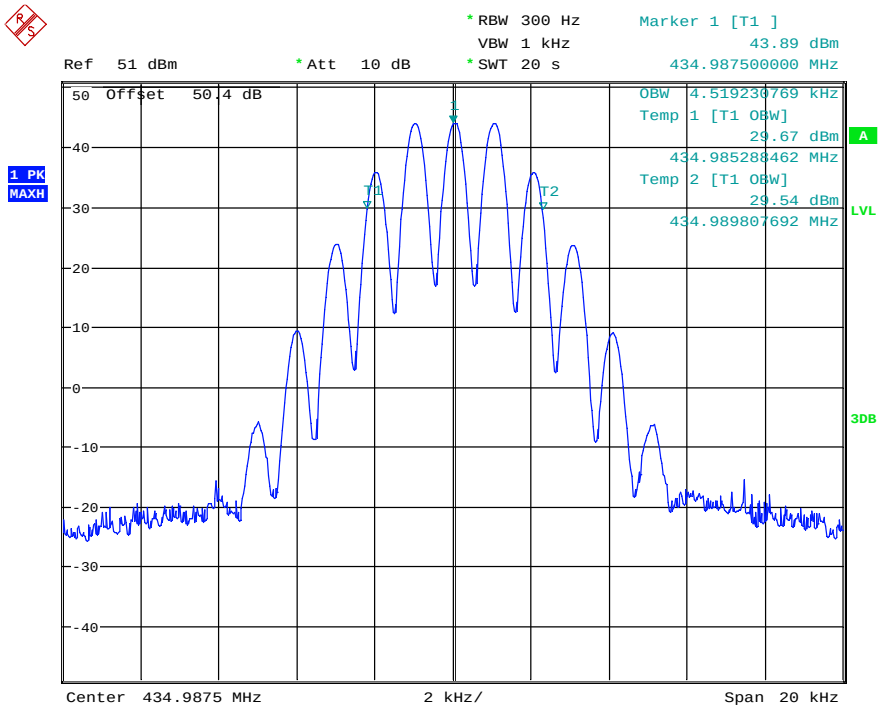
Date: 25.MAY.2012 13:30:25

416.9875MHz 12.5kHz analogue speech - This frequency is NOT applicable to FCC filing.



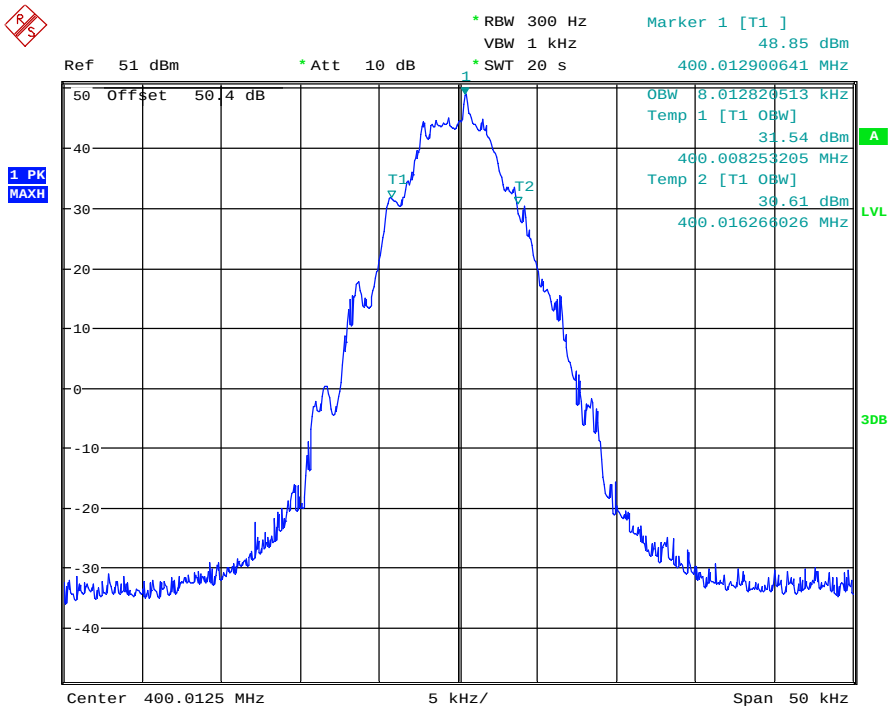
Date: 25.MAY.2012 13:34:02

434.9875MHz 12.5kHz analogue speech - This frequency is NOT applicable to FCC filing.



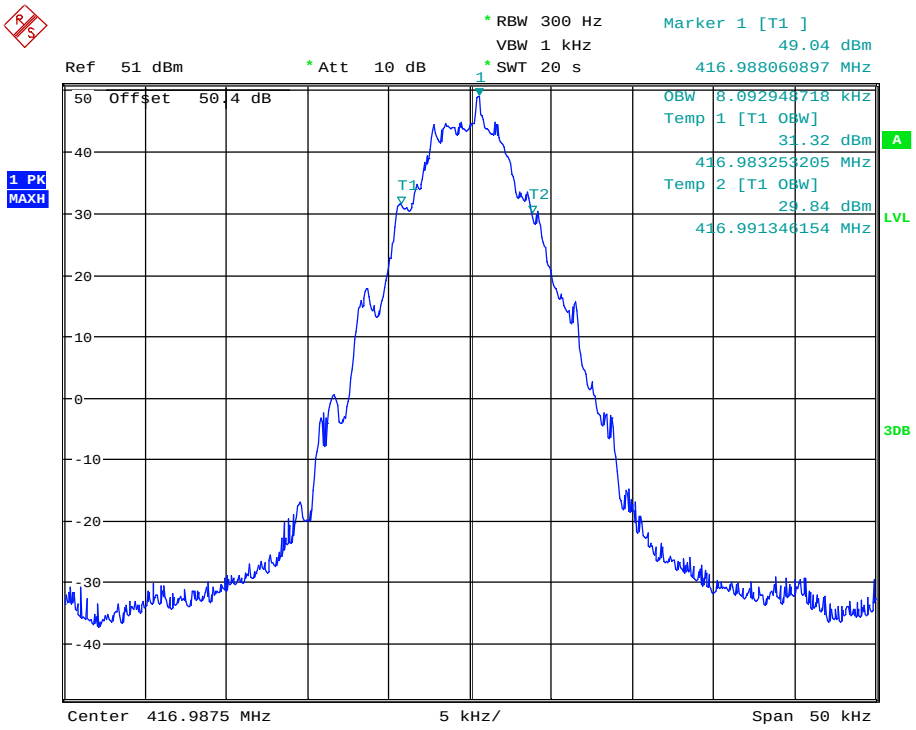
Date: 25.MAY.2012 13:36:14

400.0125MHz P25 Modulation - This frequency is NOT applicable to FCC filing.



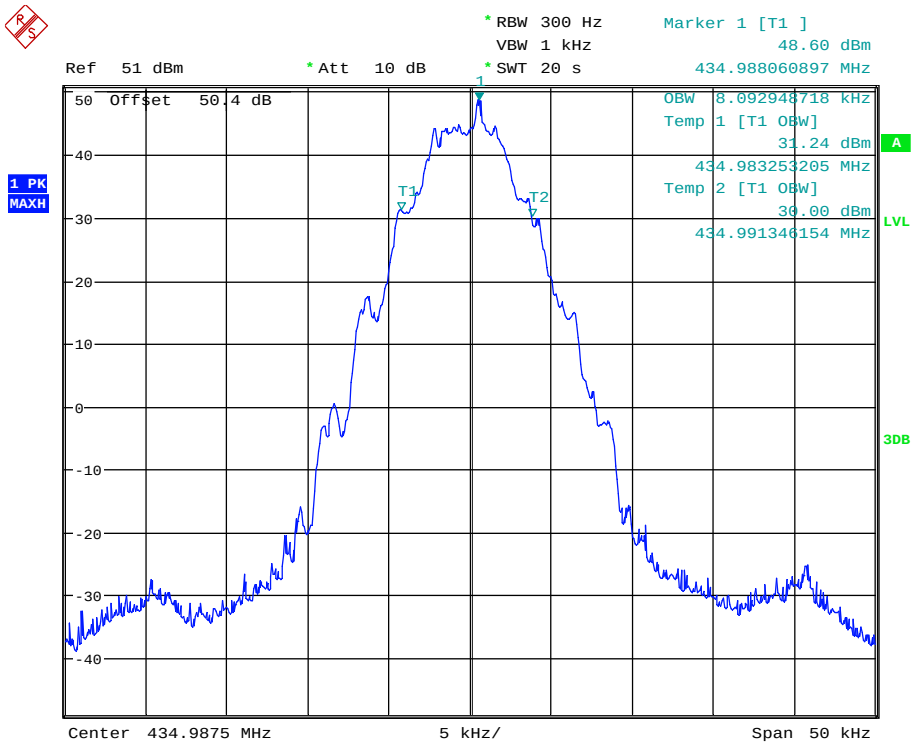
Date: 25.MAY.2012 14:49:40

416.9875MHz P25 Modulation - This frequency is NOT applicable to FCC filing.



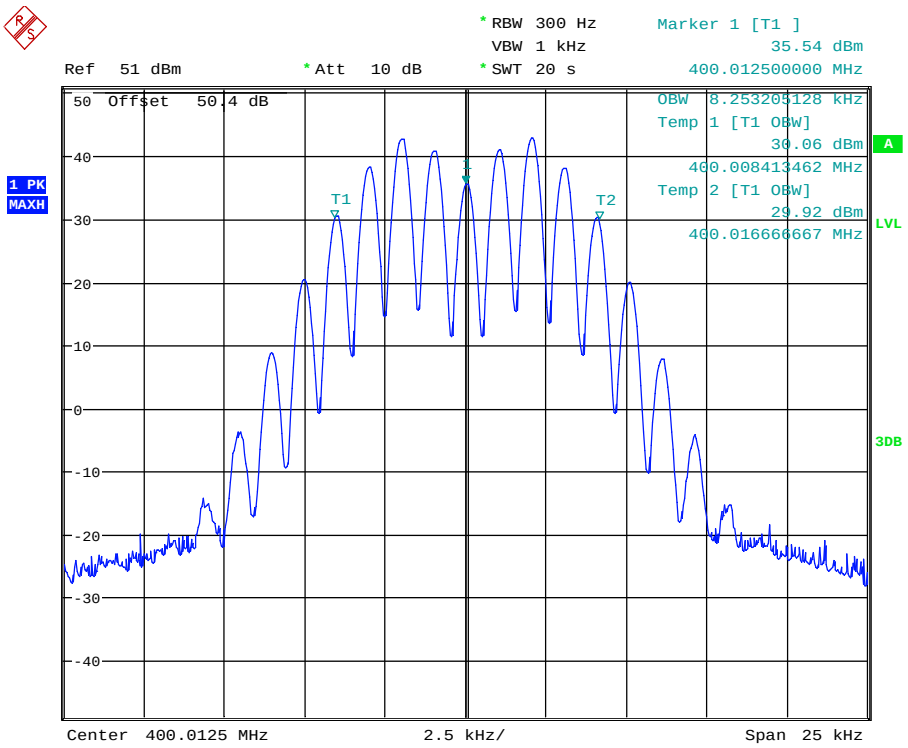
Date: 25.MAY.2012 15:05:38

434.9875MHz P25 Modulation - This frequency is NOT applicable to FCC filing.



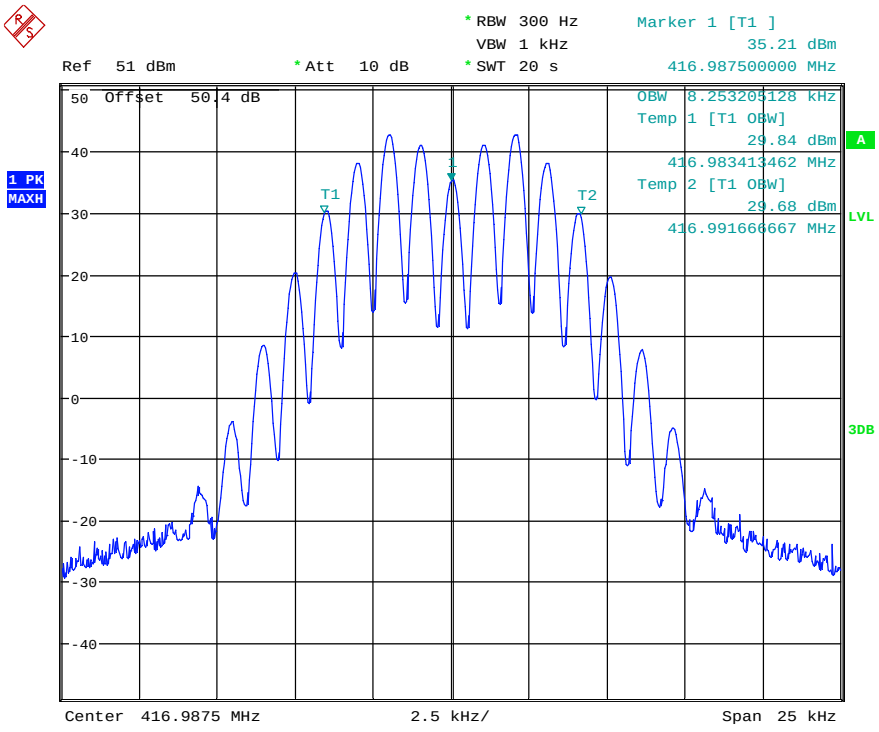
Date: 25.MAY.2012 15:14:23

400.0125MHz 25kHz analogue speech - This frequency is NOT applicable to FCC filing.



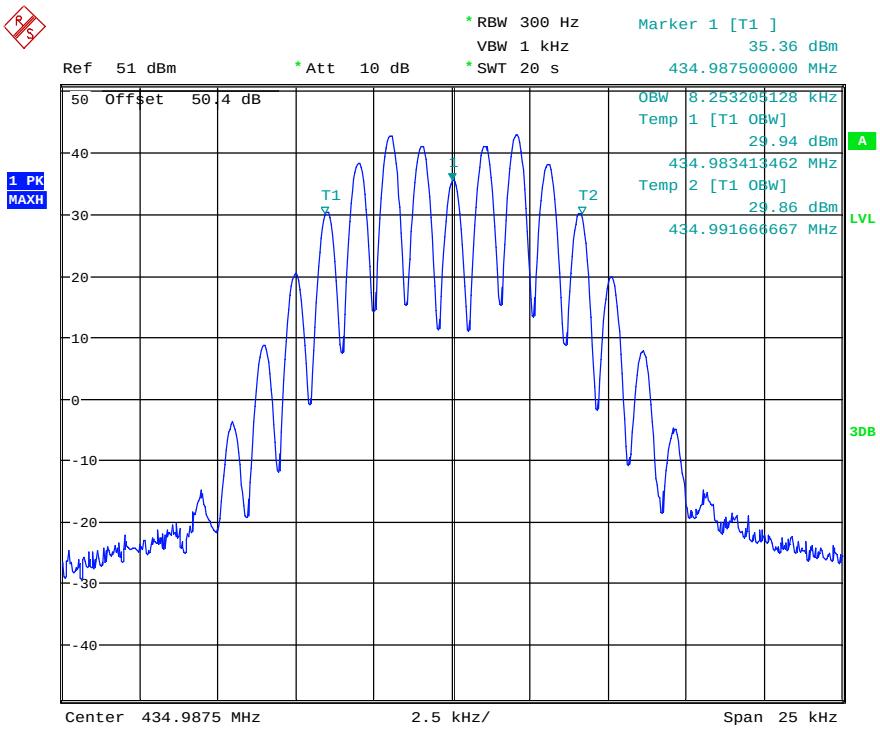
Date: 25.MAY.2012 14:05:10

416.9875MHz 25kHz analogue speech - This frequency is NOT applicable to FCC filing.



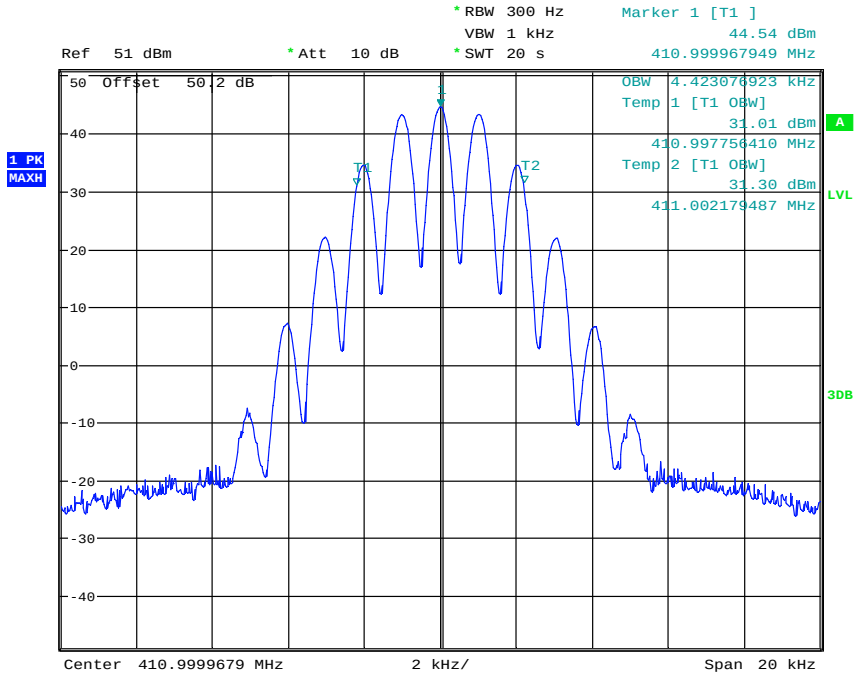
Date: 25.MAY.2012 14:02:28

434.9875MHz 25kHz analogue speech - This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 13:59:53

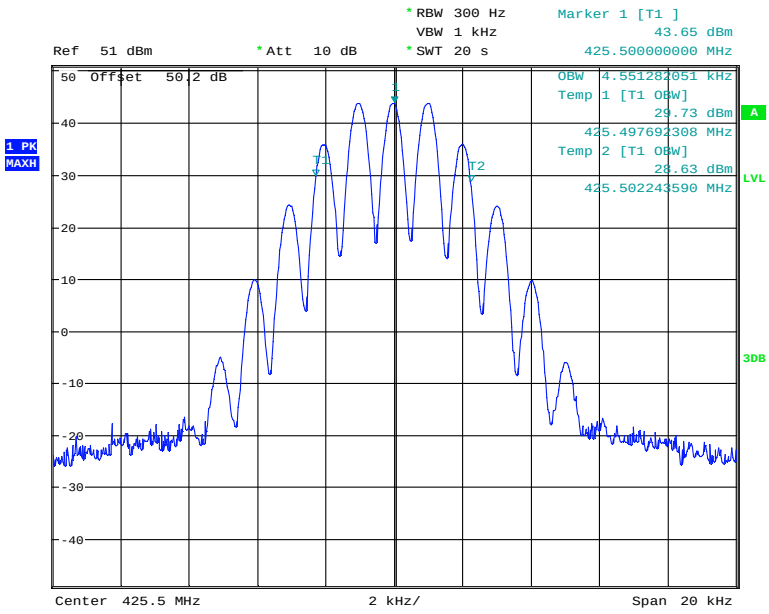
411.0MHz 12.5kHz analogue speech



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 10:59:01

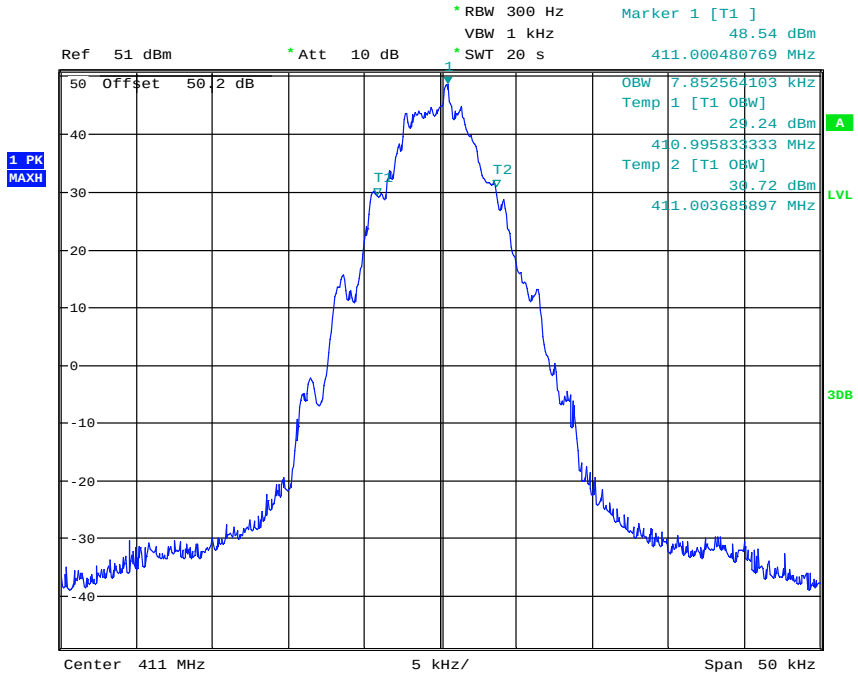
425.5MHz 12.5kHz analogue speech



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:00:44

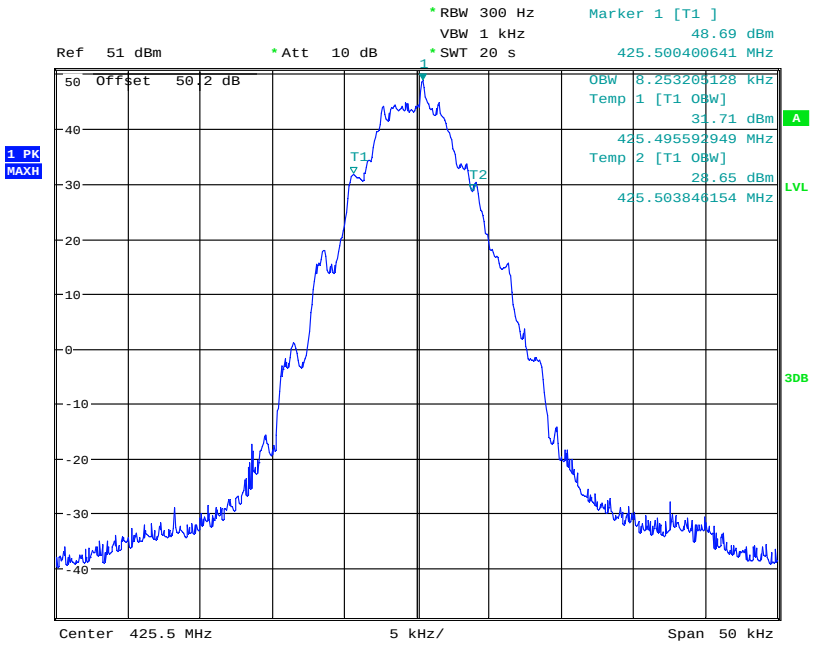
411.0MHz P25 Modulation



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:16:35

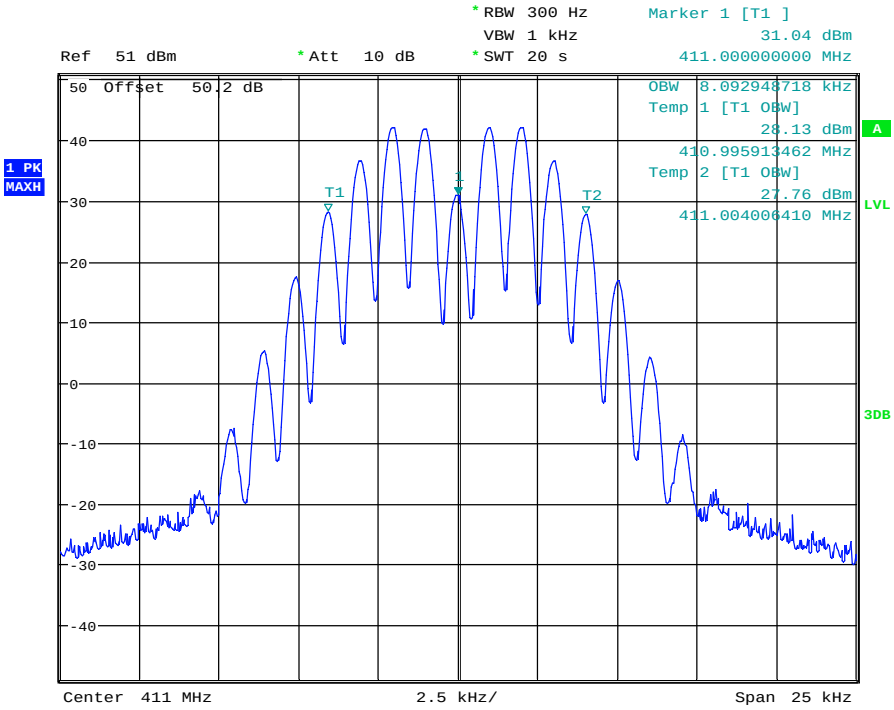
425.5MHz P25 Modulation



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:22:26

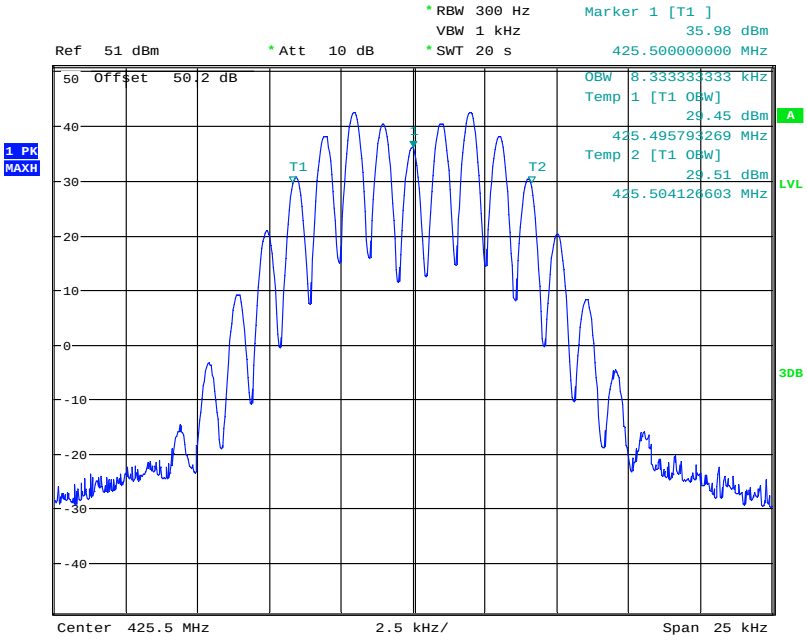
411.0MHz 25kHz analogue speech



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:07:57

425.5MHz 25kHz analogue



0 dBm inptut, 1-no filter, 2-575filter

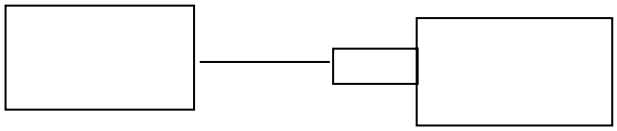
Date: 4.OCT.2012 11:09:38

spe ech

TRANSMITTER TESTS

Occupied Bandwidth
Emission Masks. Part 90.210(d)

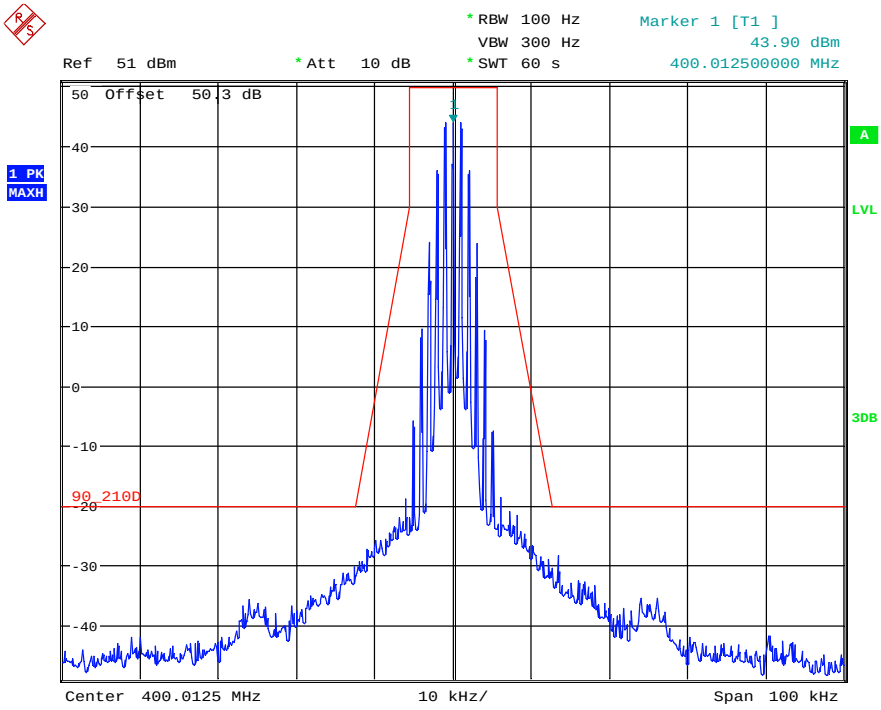
Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



EUT | Cable & Attenuator | Spectrum Analyser TRL281

Part 90 Bottom channel: Analogue 12.5kHz channel spacing

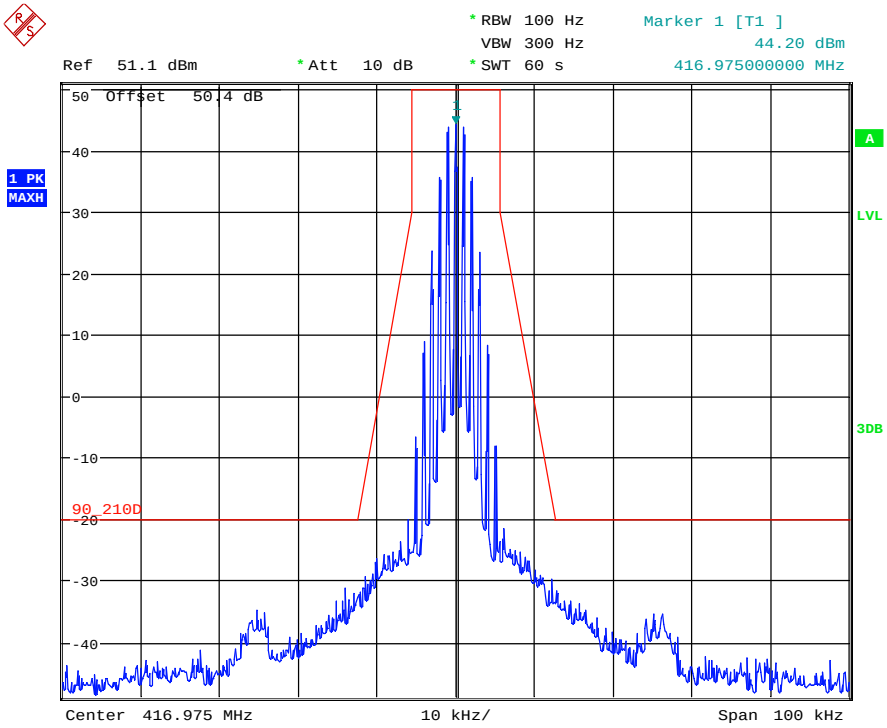
- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 15:40:24

Part 90 Middle channel: Analogue 12.5kHz channel spacing

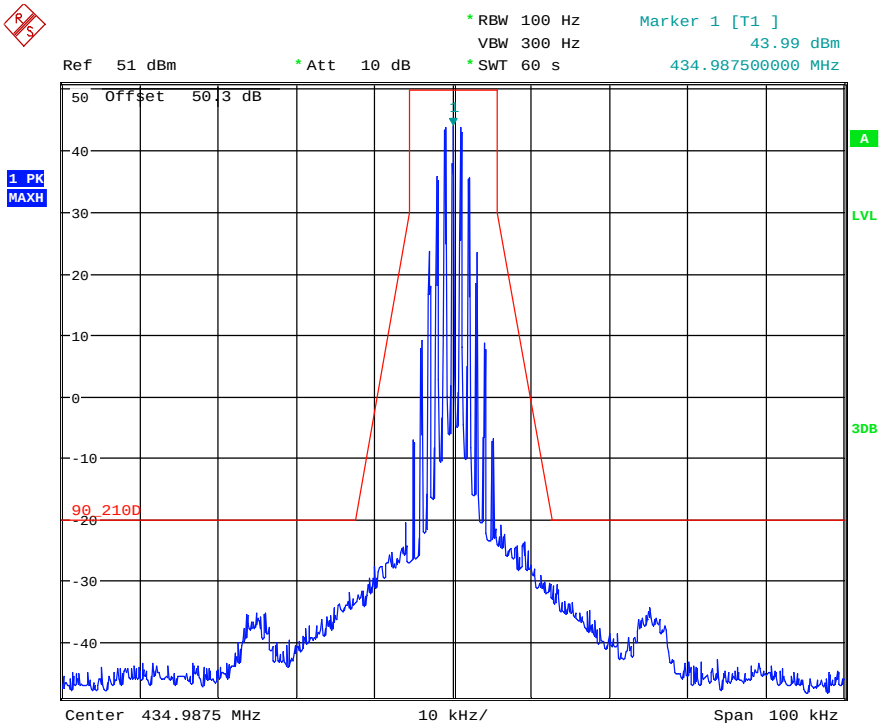
- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 15:44:45

Part 90 Top channel: Analogue 12.5kHz channel spacing

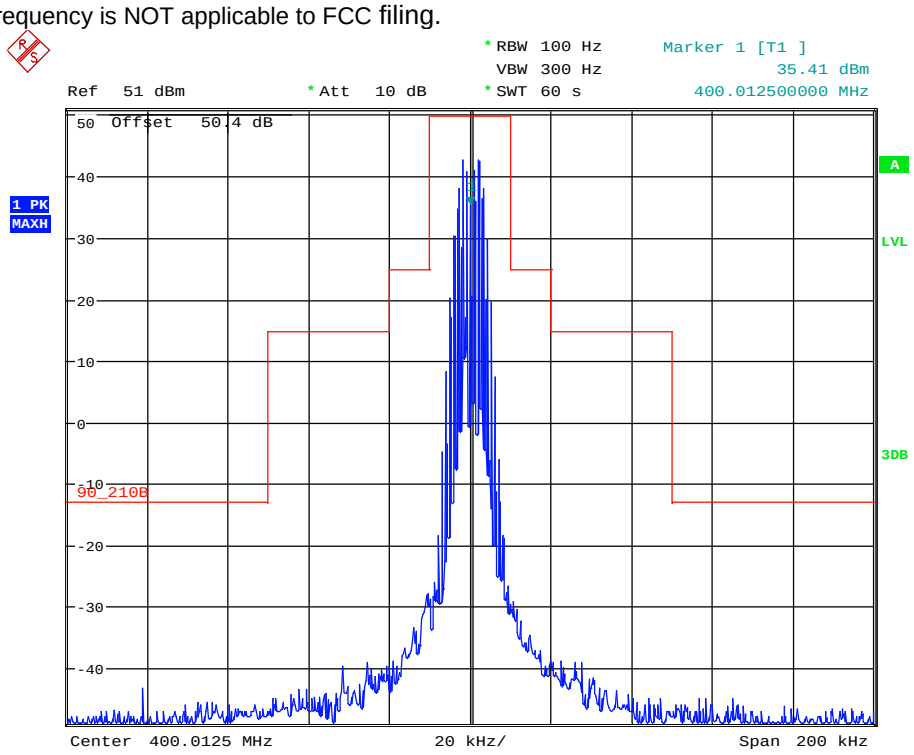
- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 15:50:25

Part 90 Bottom channel: Analogue 25kHz channel spacing

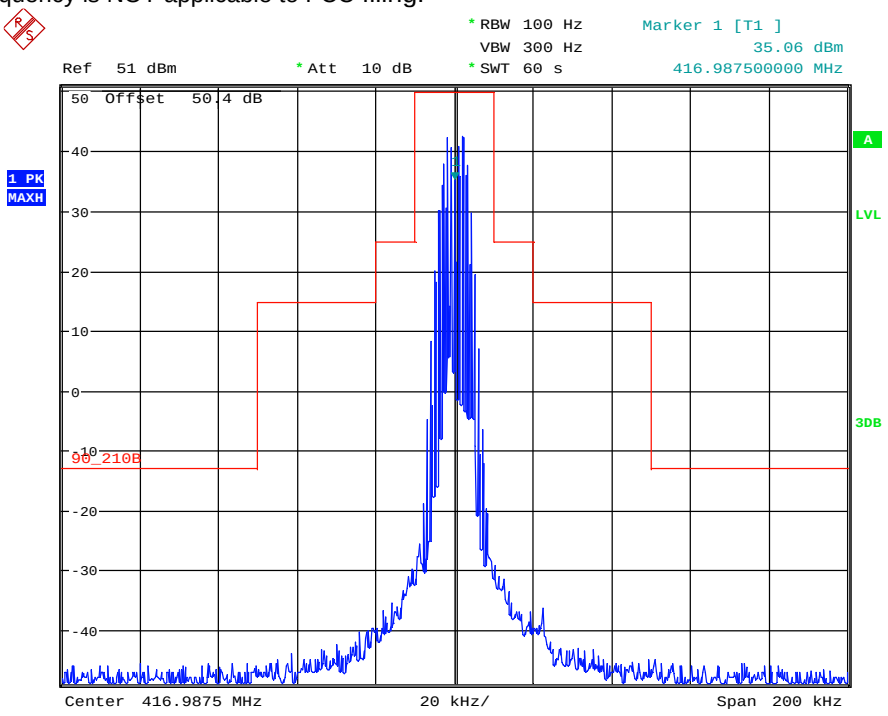
- This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 15:22:44

Part 90 Middle channel: Analogue 25kHz channel spacing

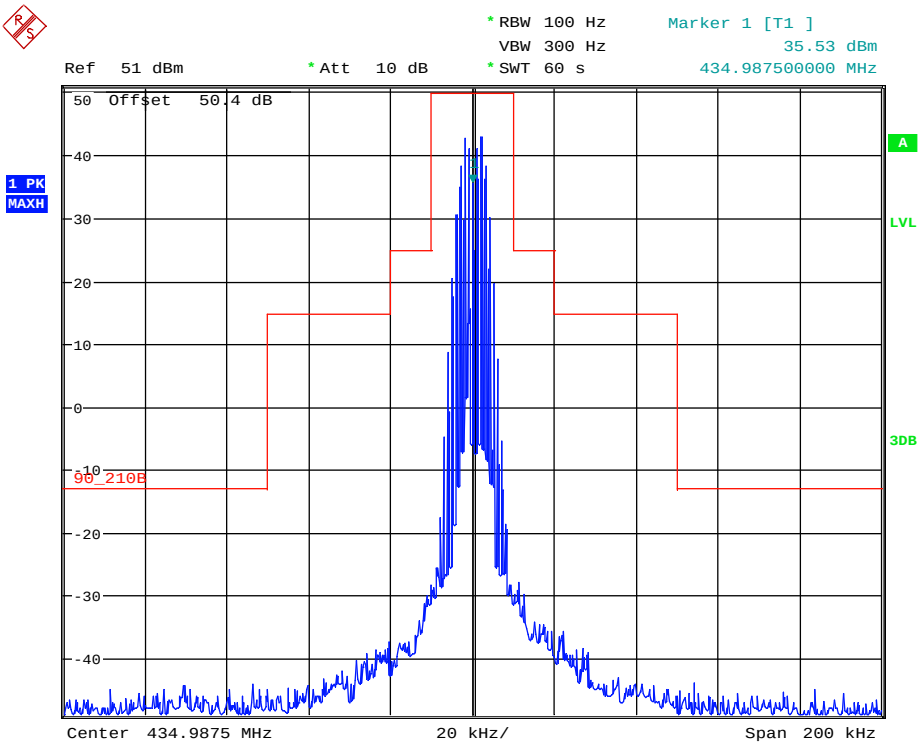
- This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 15:25:27

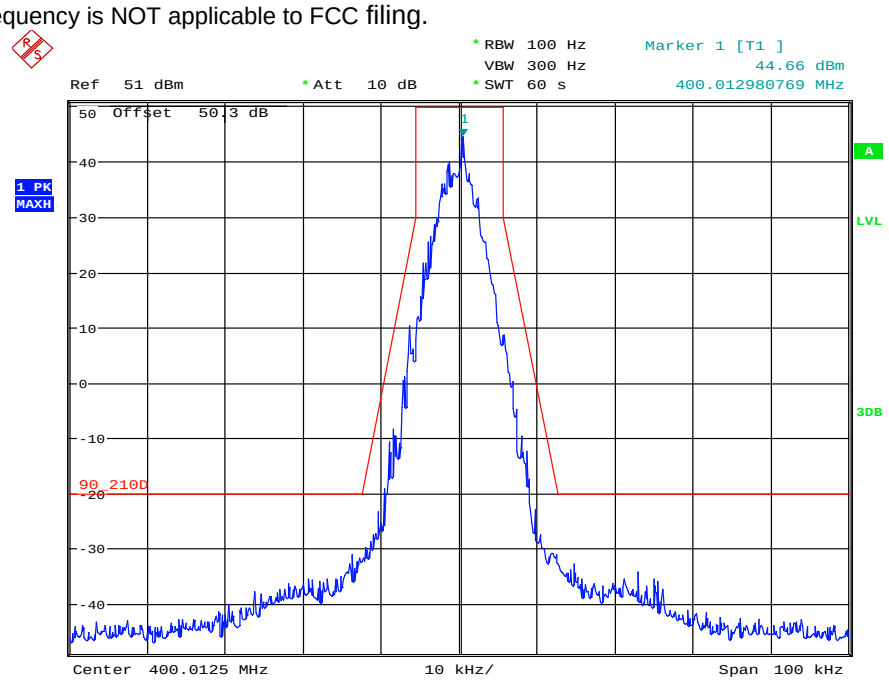
Part 90 Top channel: Analogue 25kHz channel spacing

- This frequency is NOT applicable to FCC filing.



Part 90 bottom channel: P25 12.5kHz channel spacing

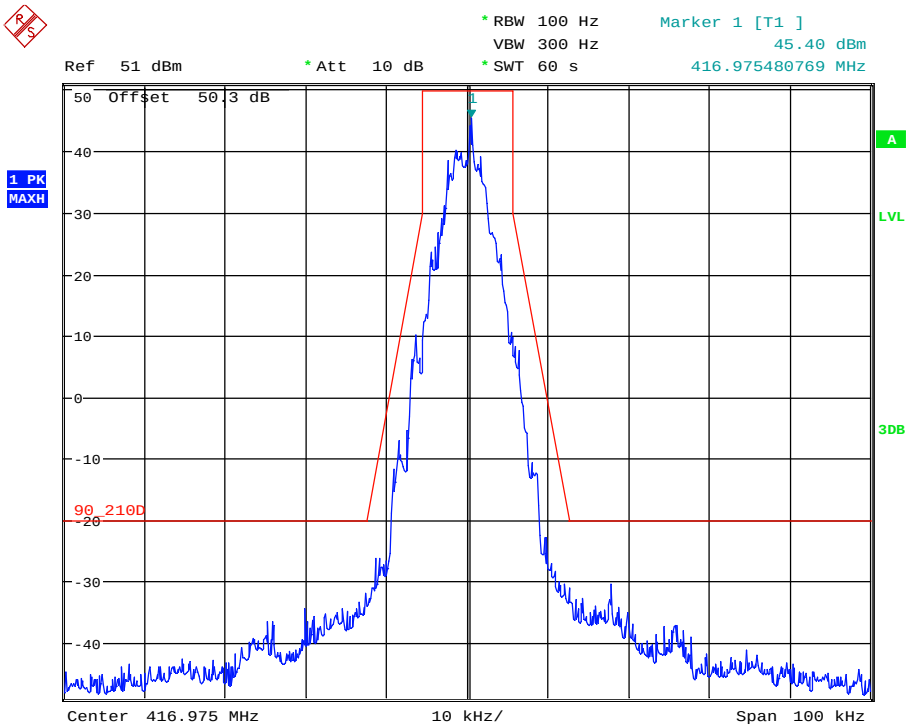
- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 16:08:38

Part 90 Middle channel: P25 12.5kHz channel spacing

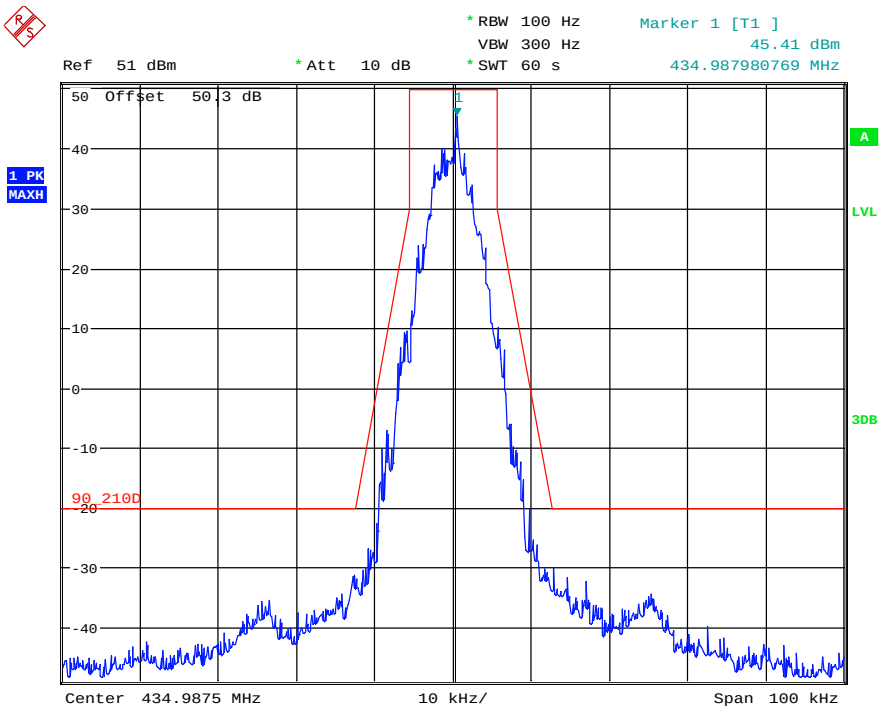
- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 16:00:57

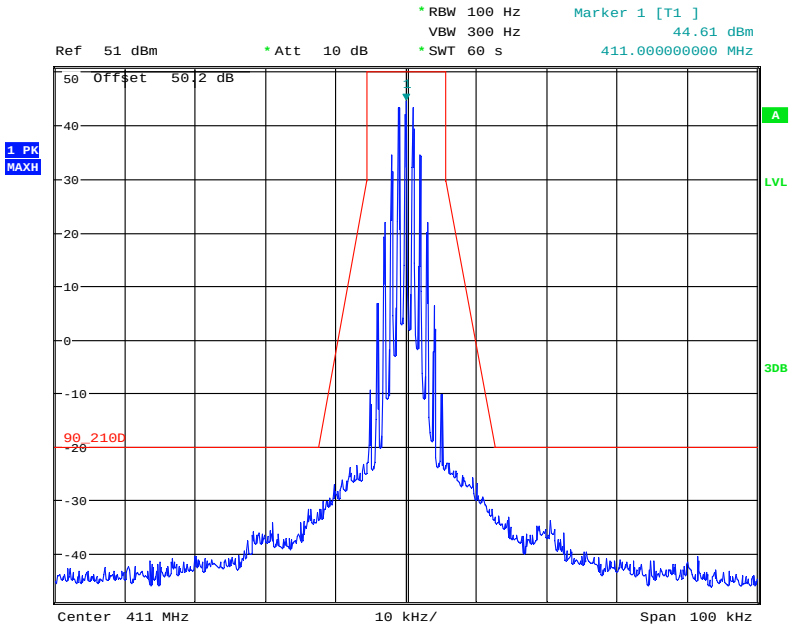
Part 90 Top channel: P25 12.5kHz channel spacing

- This frequency is NOT applicable to FCC filing.



Date: 7.JUN.2012 15:55:37

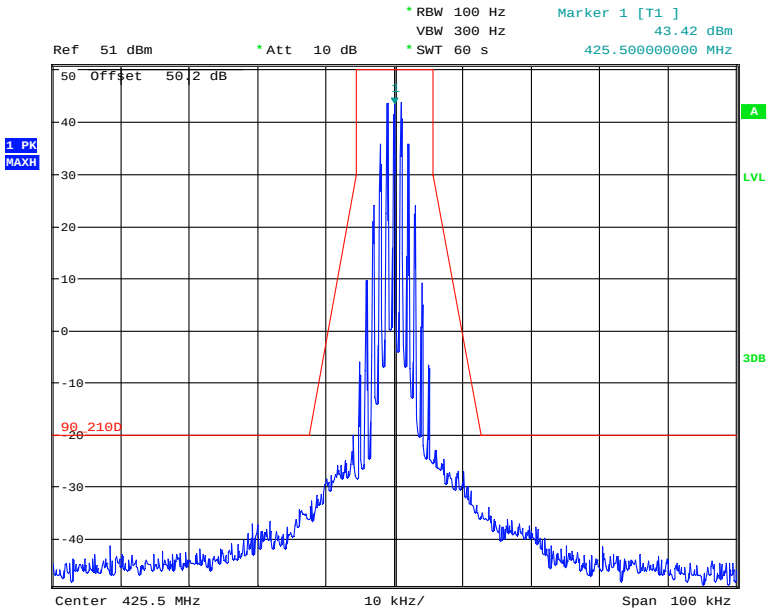
Part 90 411.0MHz: Analogue 12.5kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:45:00

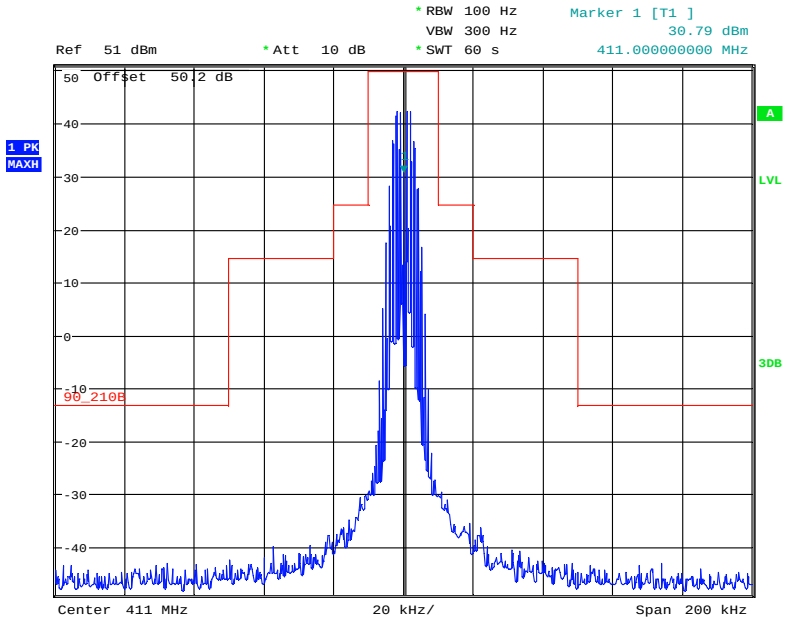
Part 90 425.5MHz: Analogue 12.5kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 11:48:54

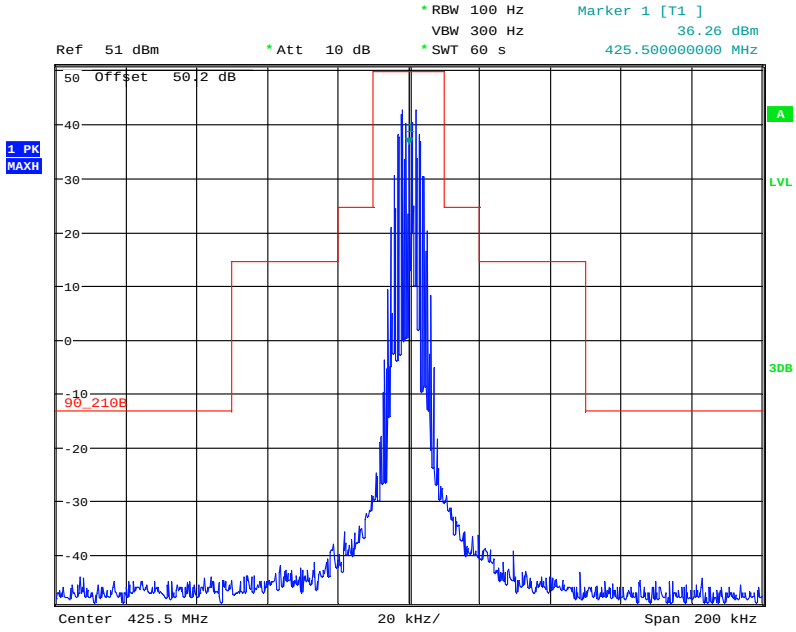
Part 90 411.0MHz: Analogue 25kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 12:21:17

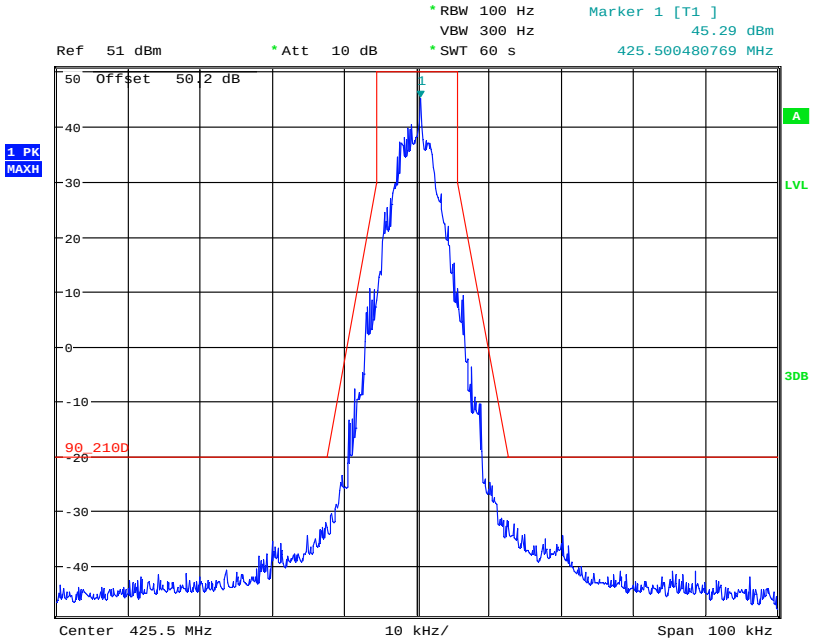
Part 90 425.5MHz: Analogue 25kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 12:24:21

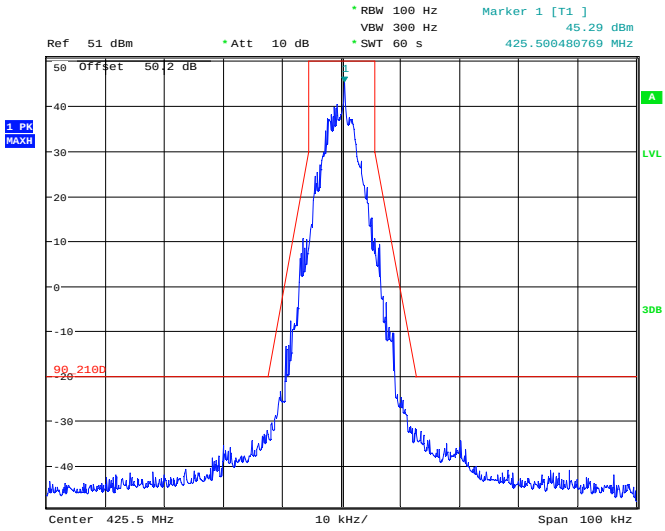
Part 90 411.0MHz P25 12.5kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 12:04:03

Part 90 425.5MHz: P25 12.5kHz channel spacing



0 dBm inptut, 1-no filter, 2-575filter

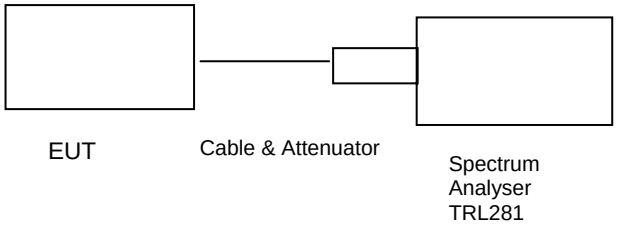
Date: 4.OCT.2012 12:04:03

Note: the spectrum masks are defined in: Part 90.210(d) as the transmitter operates in the band 400MHz- 435MHz using an authorized bandwidth of 11.25kHz as per section 90.209(5).

TRANSMITTER TESTS

SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053
Bottom Channel

Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



The test was set up as per the diagram. The unit was tested operating at maximum power.

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

Bottom Channel - This frequency is NOT applicable to FCC filing.

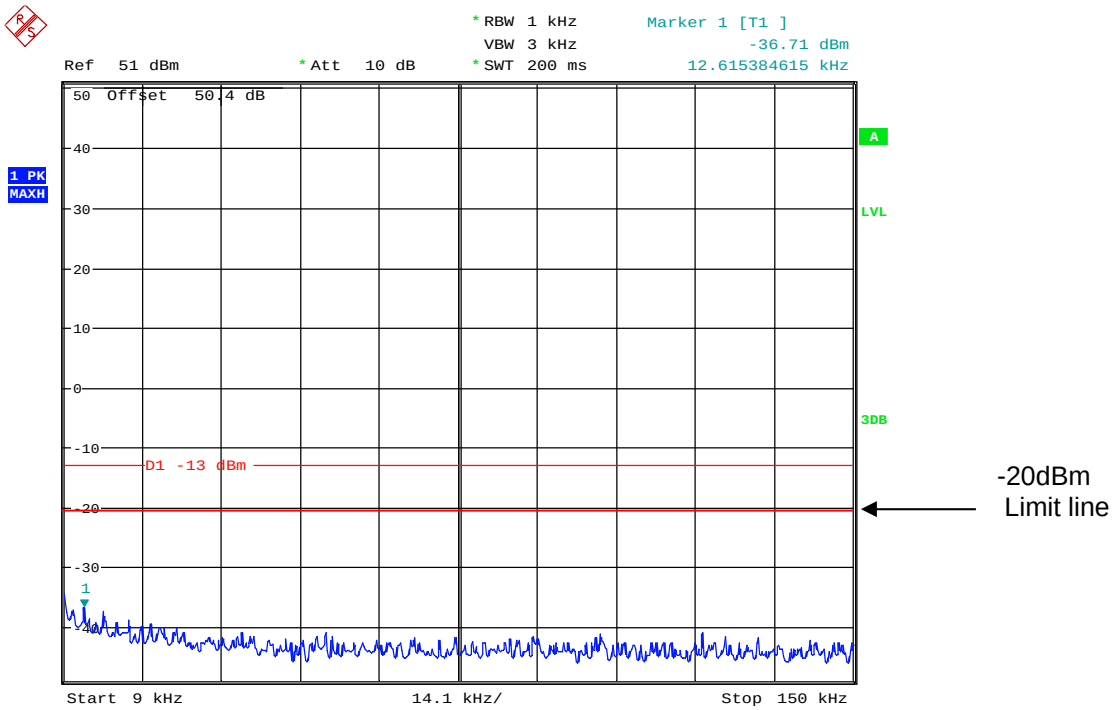
FREQUENCY RANGE	FREQ. (GHz)	MEASURED LEVEL (dBm)	LIMIT (dBm)
9kHz – 10GHz	1.20	-30.81	-20

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**
NOTCH FILTER	TELONIC BERLELEY	TTR-375-3EE	60011-3	TRLUH265	**X**

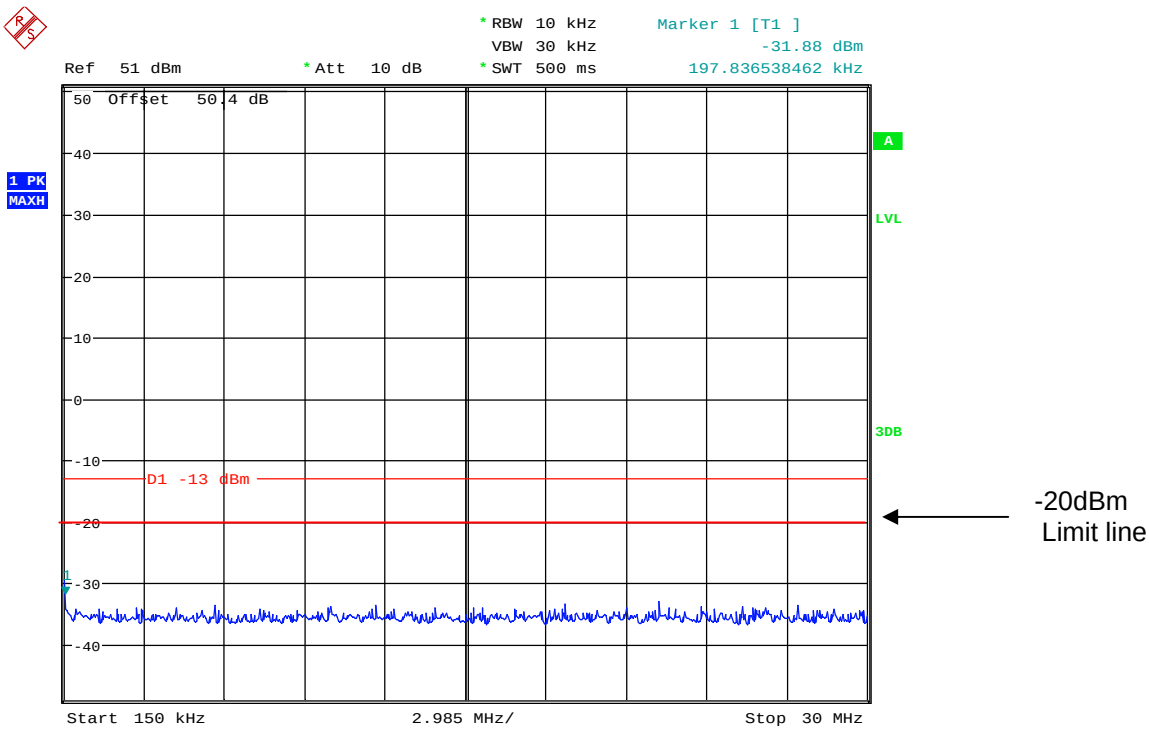
Conducted emissions Bottom Channel

400.0125MHz 9kHz – 150kHz - This frequency is NOT applicable to FCC filing.



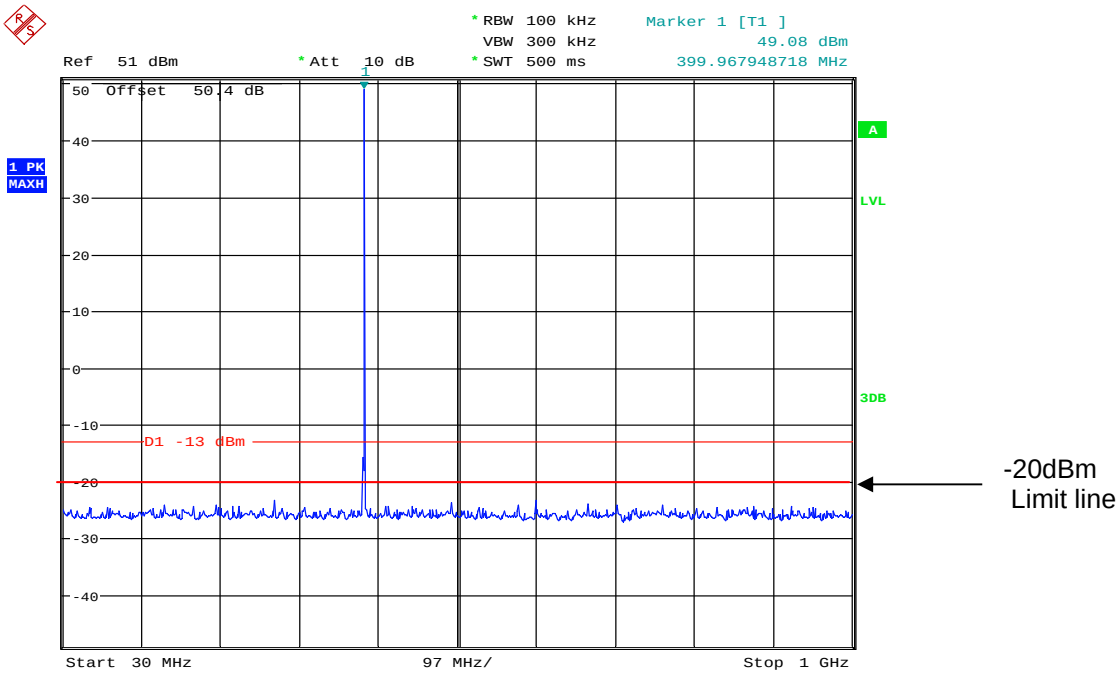
Date: 25.MAY.2012 10:28:39

400.0125MHz 150kHz-30MHz - This frequency is NOT applicable to FCC filing.



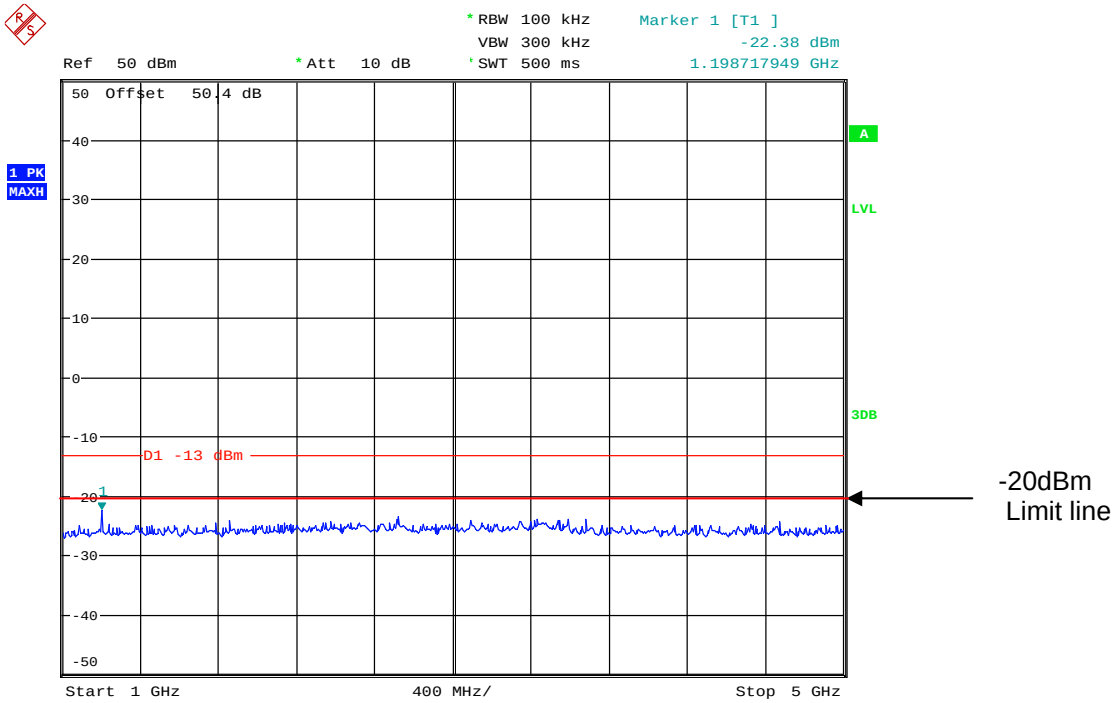
Date: 25.MAY.2012 10:30:29

400.0125MHz 30MHz-1GHz - This frequency is NOT applicable to FCC filing.



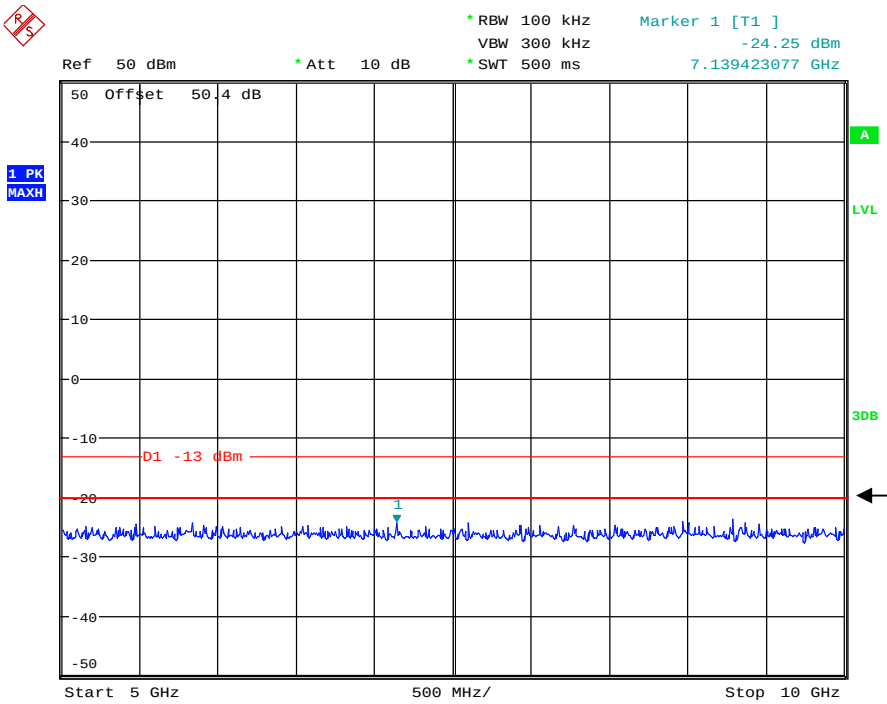
Date: 25.MAY.2012 10:56:24

400.0125MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 10:59:27

400.0125MHz 5GHz-10GHz - This frequency is NOT applicable to FCC filing.

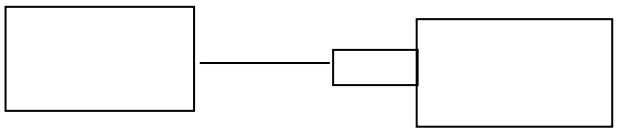


-20dBm
Limit line

Date: 25.MAY.2012 10:59:53

SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053
Middle Channel

Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc/+28.0Vdc			



The test was set up as per the diagram. The unit was tested operating at maximum power.

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation.

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

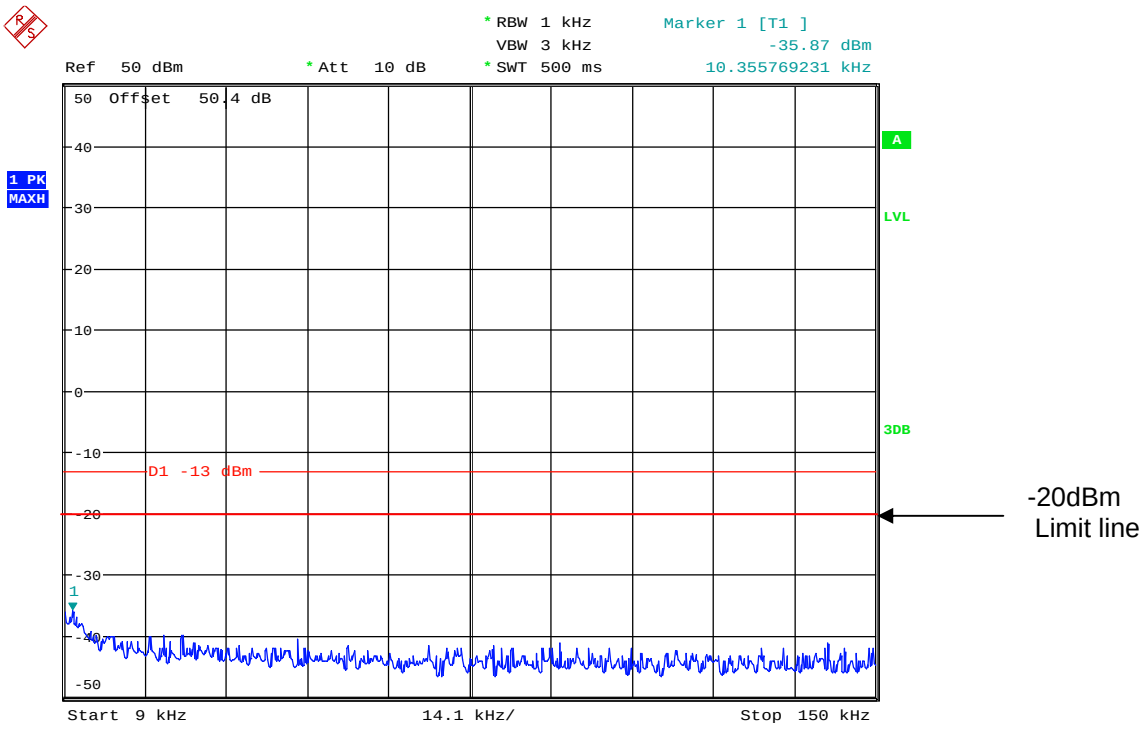
Middle Channel - This frequency is NOT applicable to FCC filing.

FREQUENCY RANGE	FREQ. (GHz)	MEASURED LEVEL (dBm)	LIMIT (dBm)
9kHz – 10GHz	1.2509	-26.9	-20

The test equipment used for the Transmitter Conducted Emissions:

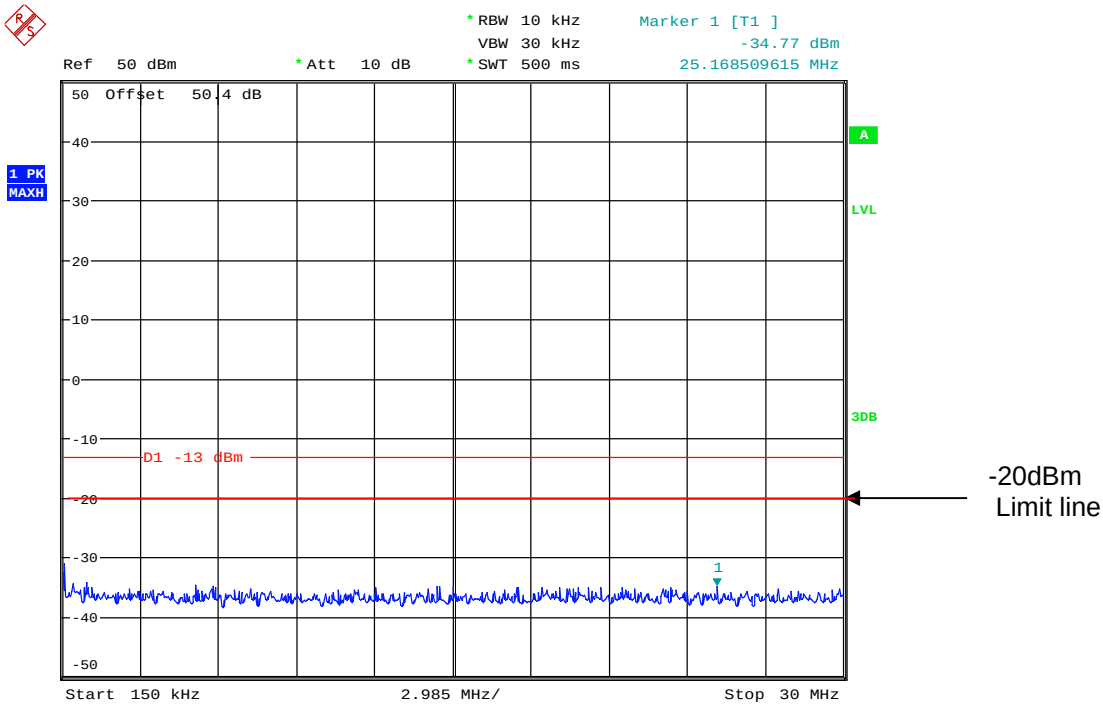
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**
NOTCH FILTER	TELONIC BERLELEY	TTR-375-3EE	60011-3	TRLUH265	**X**

416.9875MHz 9kHz – 150kHz - This frequency is NOT applicable to FCC filing.



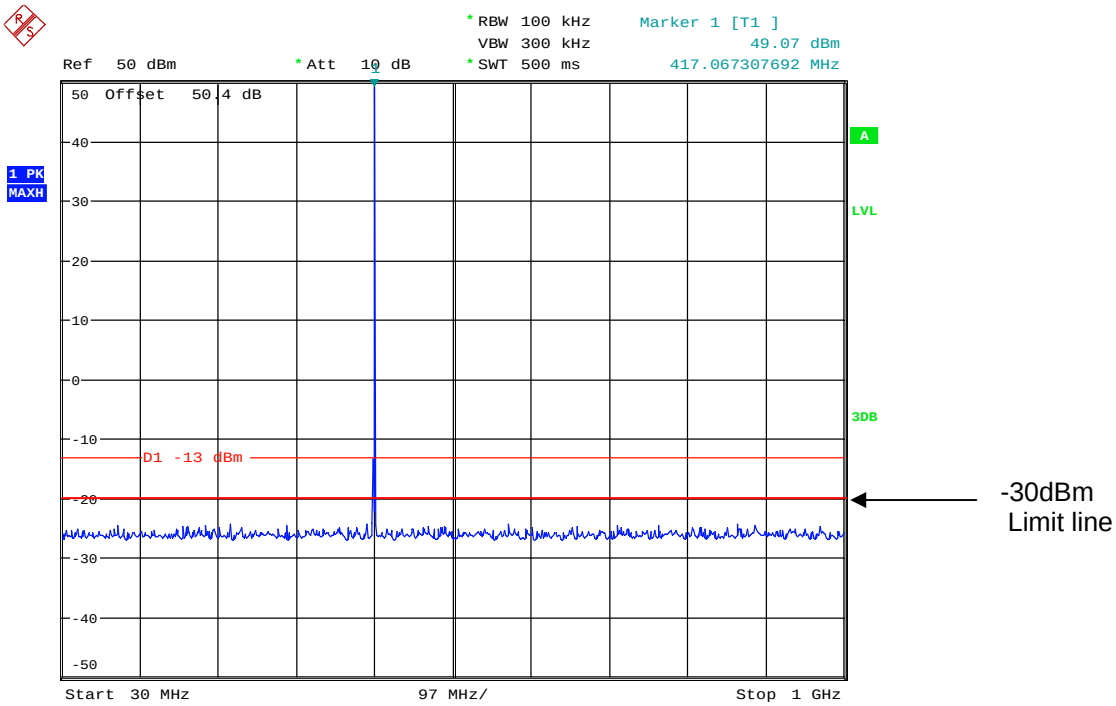
Date: 25.MAY.2012 11:09:45

416.9875MHz 150kHz – 30MHz - This frequency is NOT applicable to FCC filing.



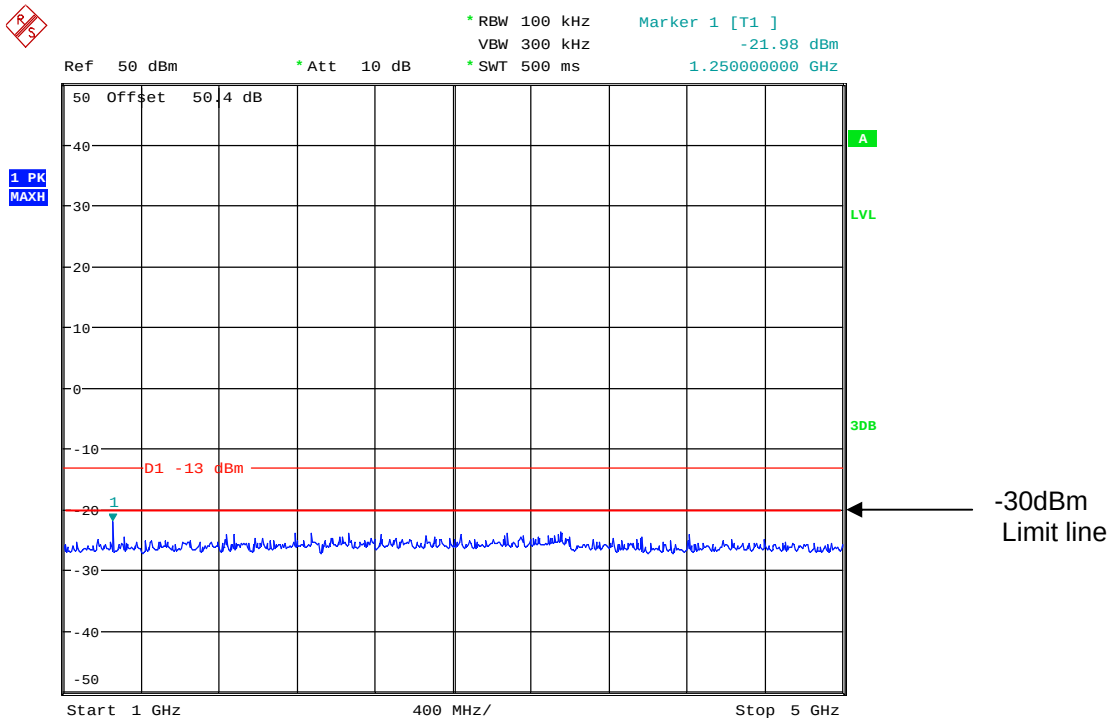
Date: 25.MAY.2012 11:10:35

416.9875MHz 30MHz- 1GHz - This frequency is NOT applicable to FCC filing.



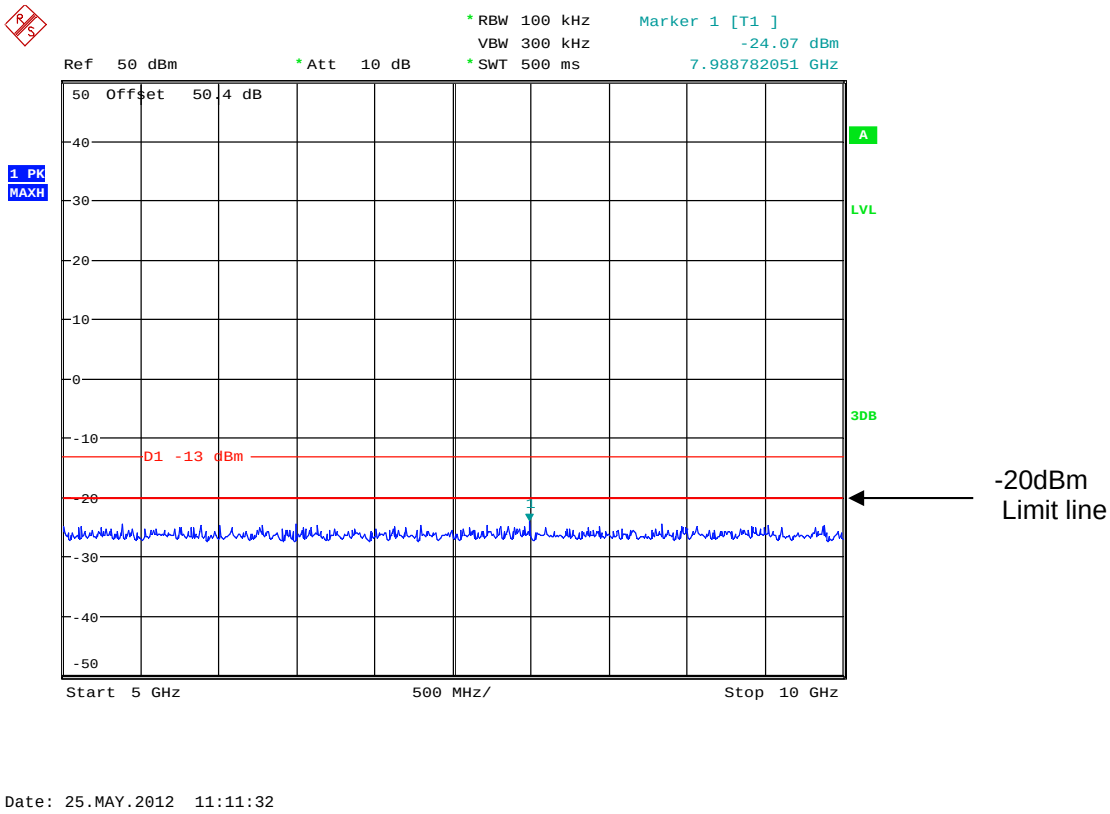
Date: 25.MAY.2012 11:09:06

416.9875MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 11:11:06

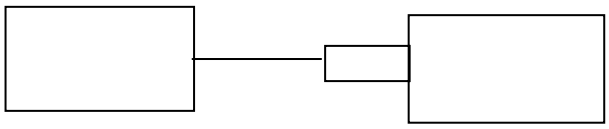
416.9875MHz 5GHz – 10GHz - This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 11:11:32

SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053
Top Channel

Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



The test was set up as per the diagram. The unit was tested operating at maximum power .

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation.

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

Top Channel - This frequency is NOT applicable to FCC filing.

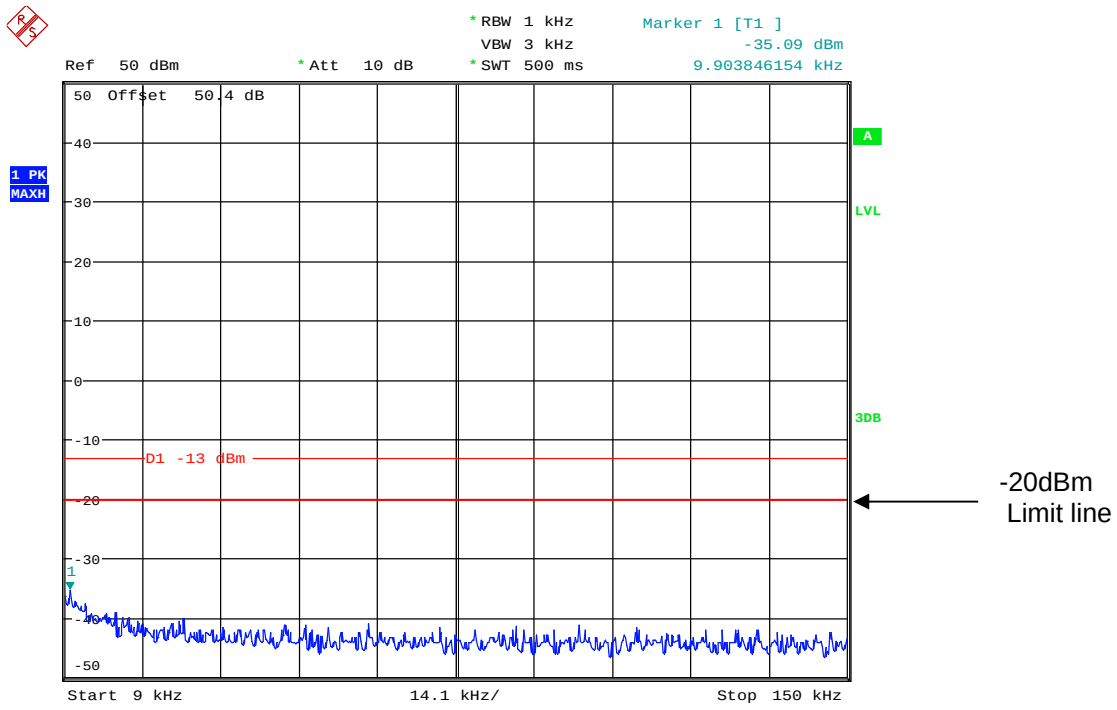
FREQUENCY RANGE	FREQ. (GHz)	MEASURED LEVEL (dBm)	LIMIT (dBm)
9kHz – 10GHz	1.3012	-28.16	-20

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**
NOTCH FILTER	TELONIC BERLELEY	TTR-375-3EE	60011-3	TRLUH265	**X**

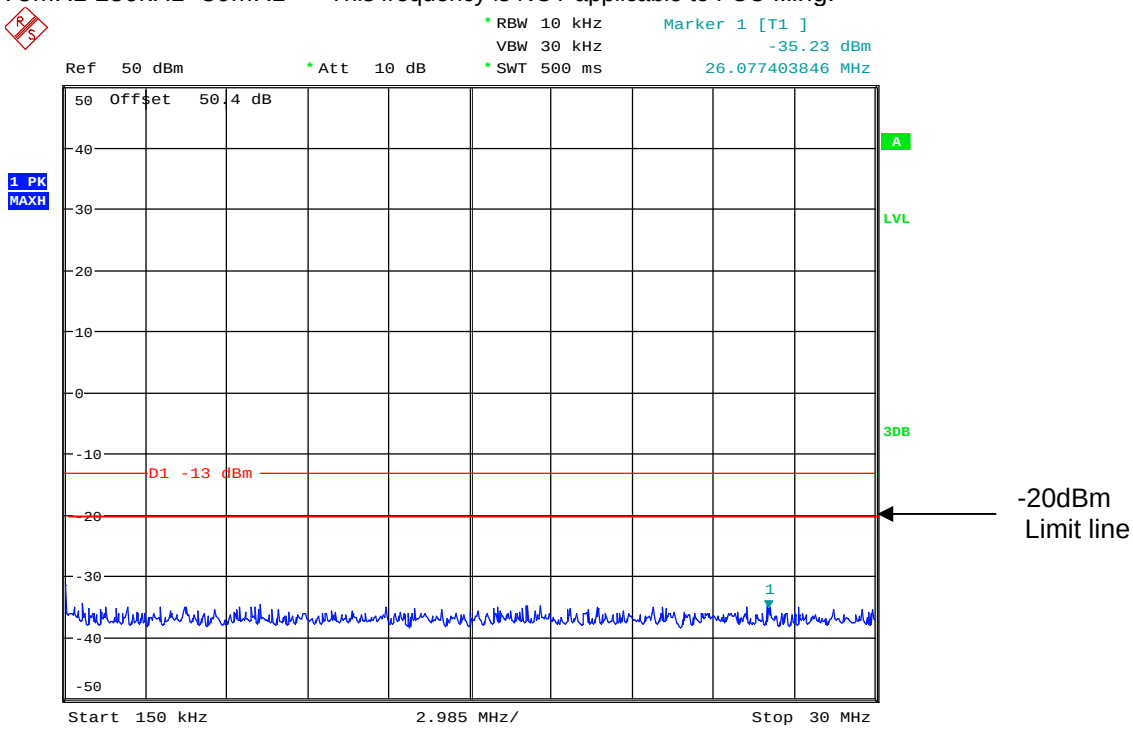
Conducted emissions Top Channel

434.9875MHz 9kHz – 150kHz - This frequency is NOT applicable to FCC filing.



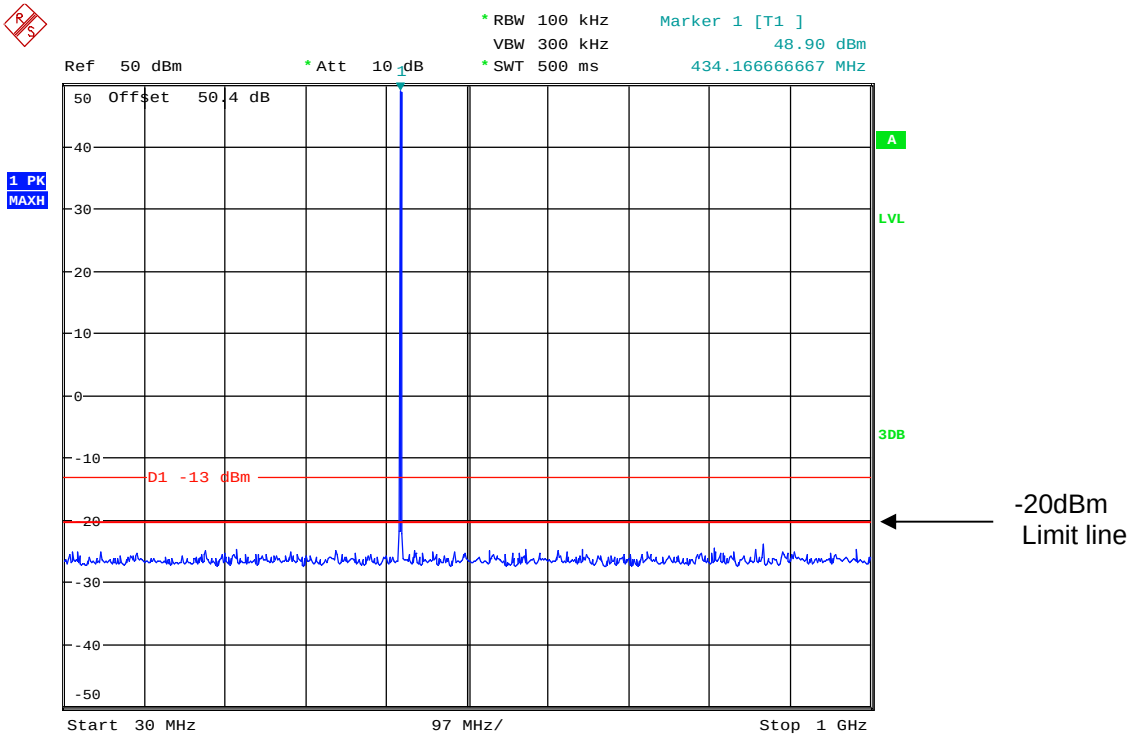
Date: 25.MAY.2012 11:14:36

434.9875MHz 150kHz -30MHz - This frequency is NOT applicable to FCC filing.



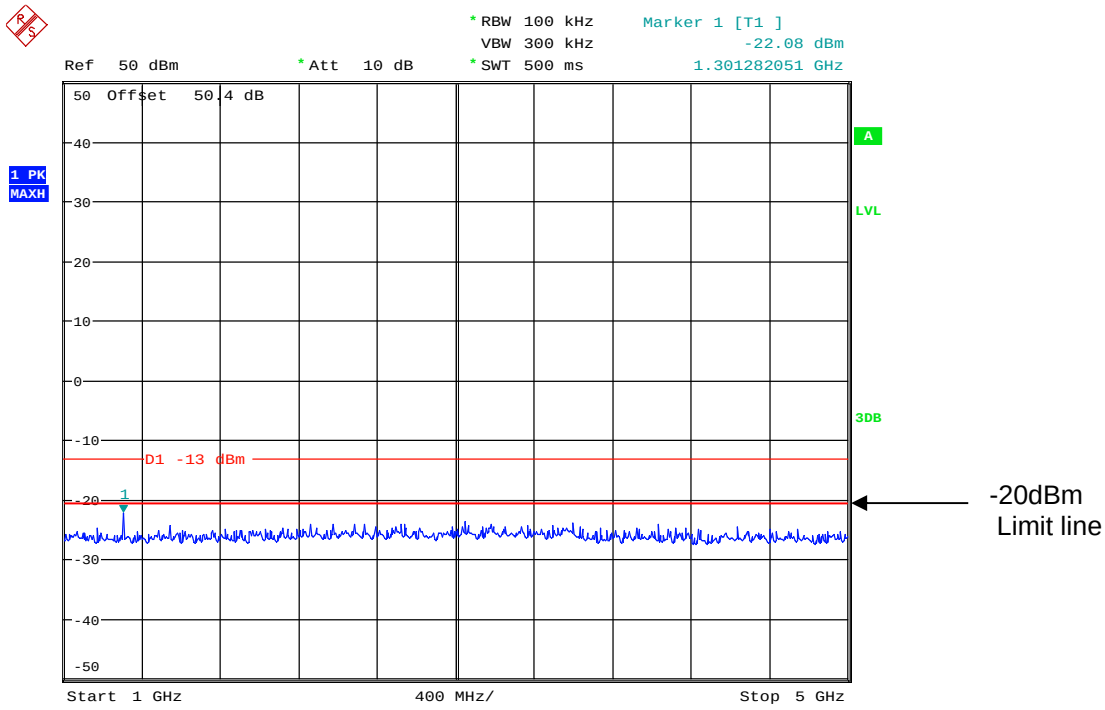
Date: 25.MAY.2012 11:15:20

434.9875MHz 30MHz-1GHz - This frequency is NOT applicable to FCC filing.



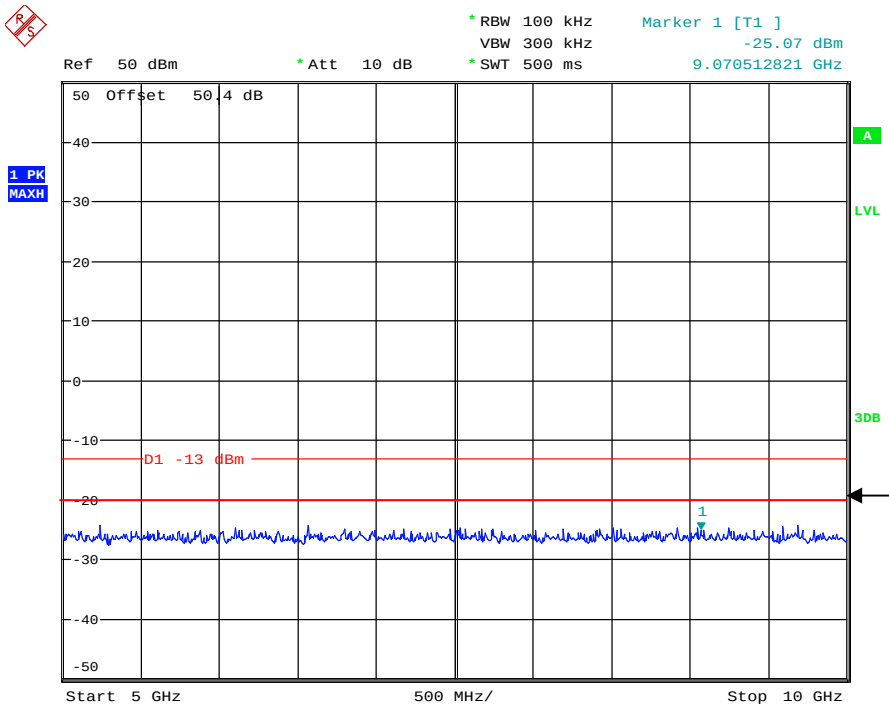
Date: 25.MAY.2012 11:15:58

434.9875MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



Date: 25.MAY.2012 11:16:22

434.9875MHz 5GHz – 10GHz - This frequency is NOT applicable to FCC filing.

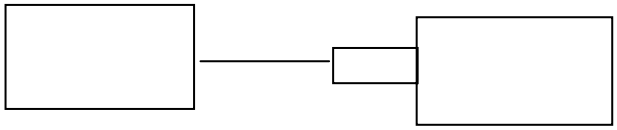


-20dBm
Limit line

Date: 25.MAY.2012 11:16:59

SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053
406MHz-416MHz band 411.0MHz

Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



The test was set up as per the diagram. The unit was tested operating at maximum power.

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

406MHz-416MHz band- 411.0MHz

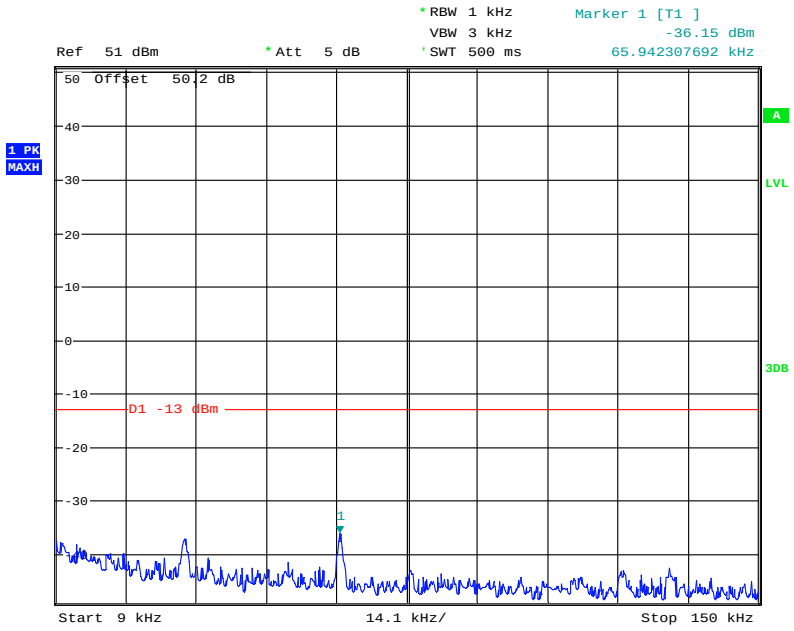
FREQUENCY RANGE	FREQ. (GHz)	MEASURED LEVEL (dBm)	LIMIT (dBm)
9kHz – 10GHz	0.822	-30.06	-20
9kHz – 10GHz	1.233	-25.05	-20

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**
NOTCH FILTER	TELONIC BERLELEY	TTR-375-3EE	60011-3	TRLUH265	**X**

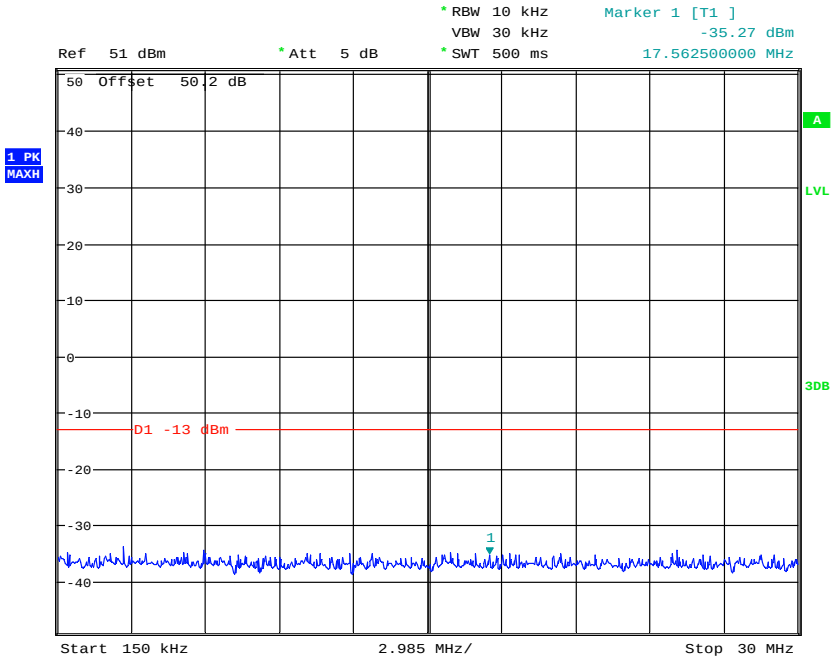
Conducted emissions 406MHz-416MHz band

411.0 9kHz – 150kHz



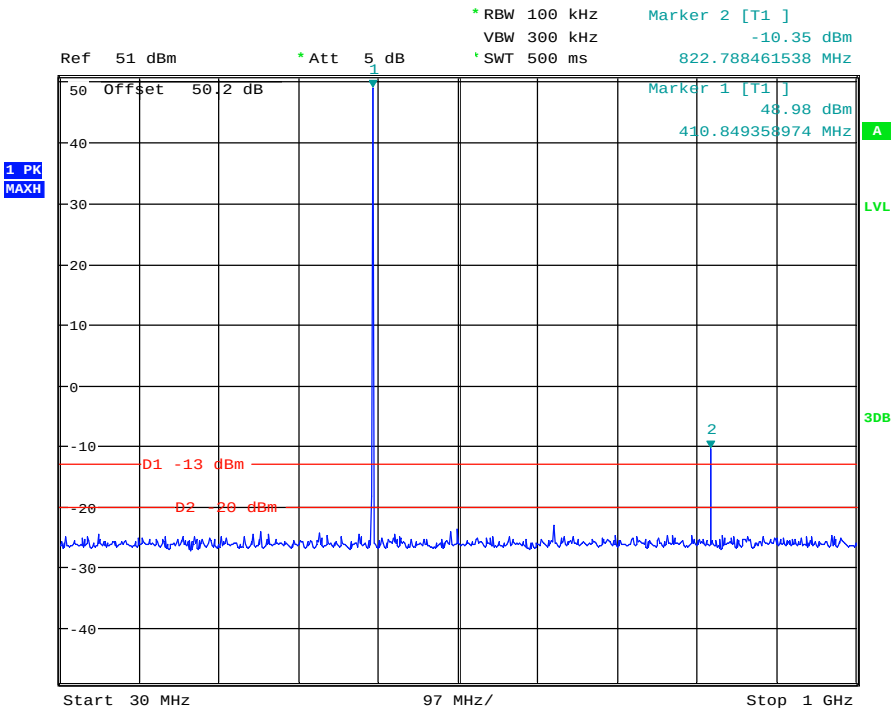
0 dBm inptut, 1-no filter, 2-575filter
Date: 4.OCT.2012 14:03:08

411.0 150kHz-30MHz



0 dBm inptut, 1-no filter, 2-575filter
Date: 4.OCT.2012 14:03:54

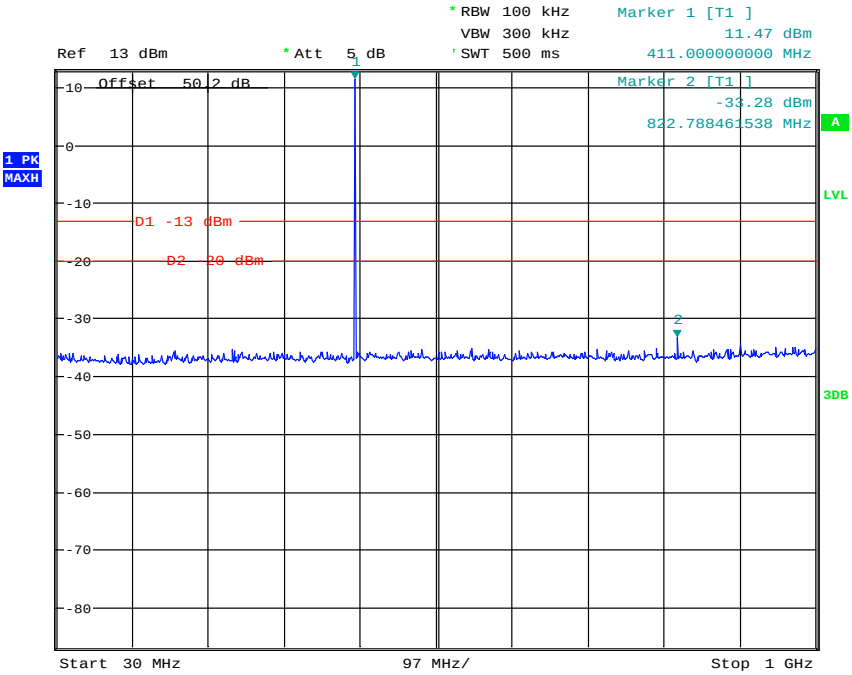
411.0MHz 30MHz-1GHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:30:03

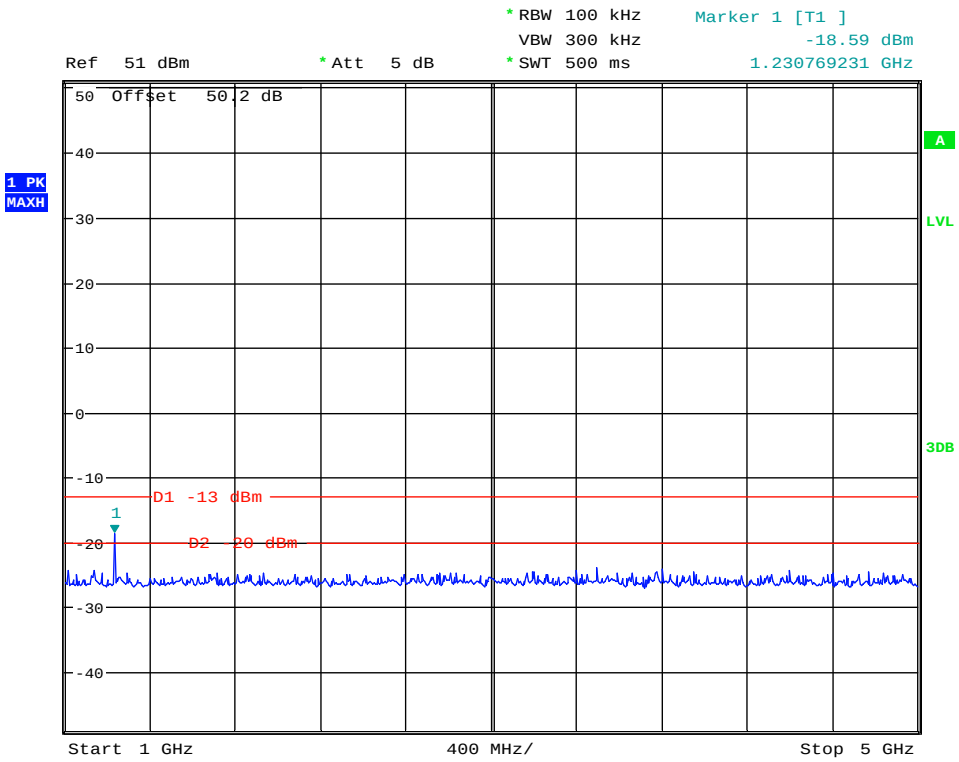
411.0MHz 30MHz-1GHz- With filter



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 15:10:36

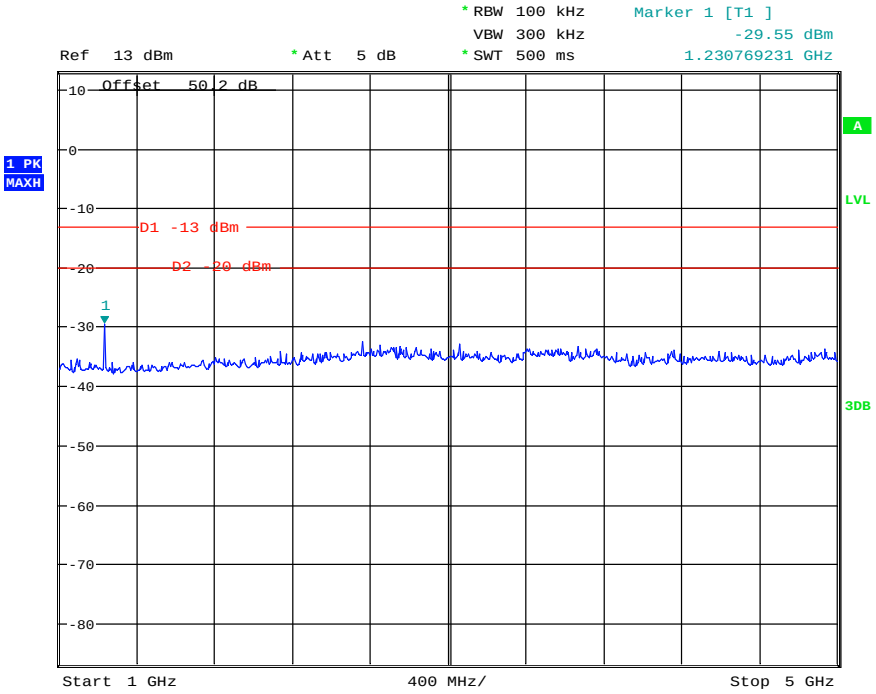
411.0MHz 1GHz – 5GHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:31:33

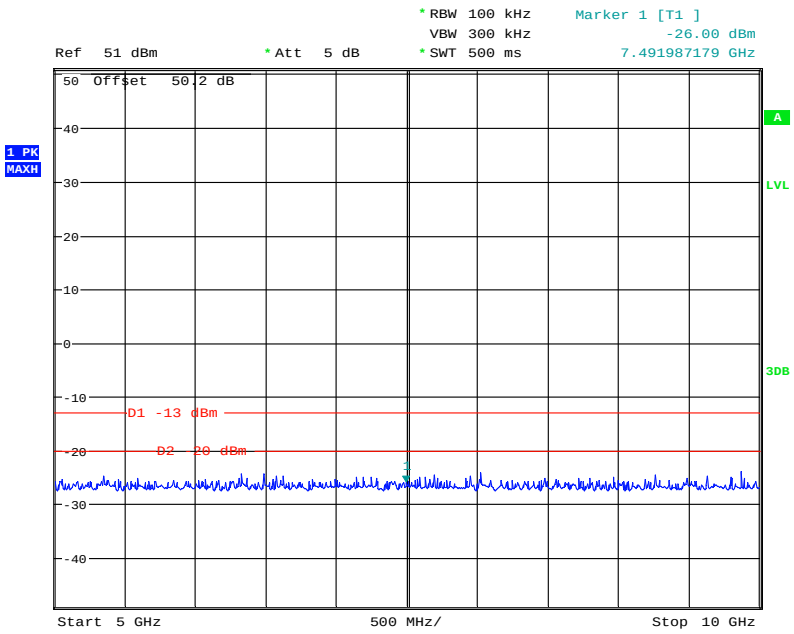
411.0MHz 1GHz – 5GHz With filter



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 15:11:25

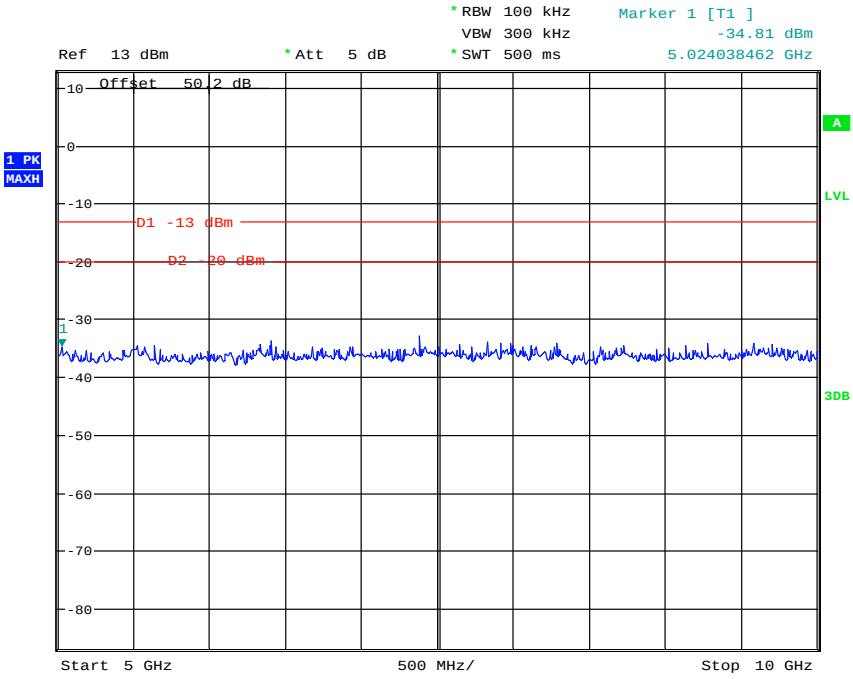
411.0MHz 5GHz-10GHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:32:10

411.0MHz 5GHz-10GHz With filter

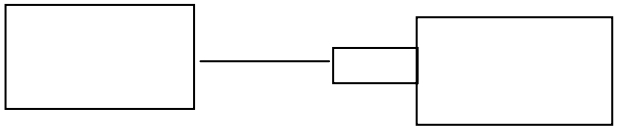


0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 15:11:59

SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053
421MHz-430MHz band 425.5MHz

Ambient temperature	=	22^{o}C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



The test was set up as per the diagram. The unit was tested operating at maximum power.

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

421MHz-430MHz band 425.5MHz

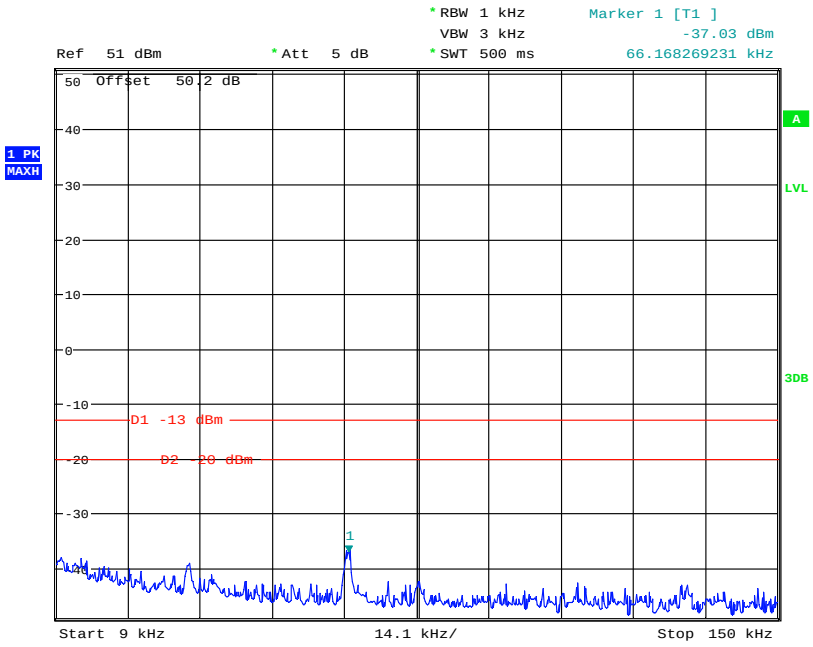
FREQUENCY RANGE	FREQ. (GHz)	MEASURED LEVEL (dBm)	LIMIT (dBm)
9kHz – 10GHz	0.8509967	-28.46	-20
9kHz – 10GHz	1.2765	-26.0	-20

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**
CABLE	TRAC	N/A	N/A	UH271	**X**
CABLE	TRAC	N/A	N/A	UH272	**X**
ATTENUATOR	SPINNER	745357	N/A	TRLUH225	**X**
ATTENUATOR	-	-	-	20dB	**X**
ATTENUATOR	BIRD	8304-100-N	N/A	222	**X**
NOTCH FILTER	TELONIC BERLELEY	TTR-375-3EE	60011-3	TRLUH265	**X**

Conducted emissions 421MHz-430MHz band

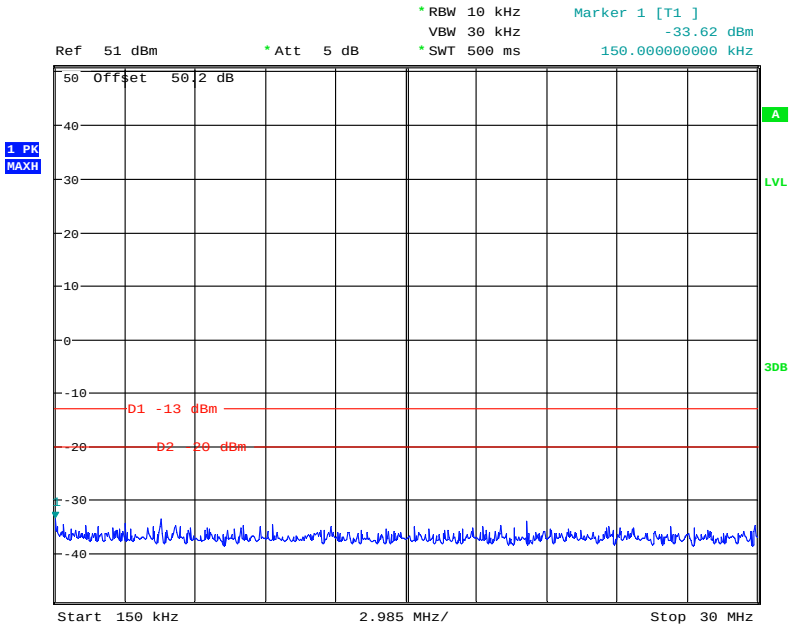
425.5MHz 9kHz – 150kHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:33:15

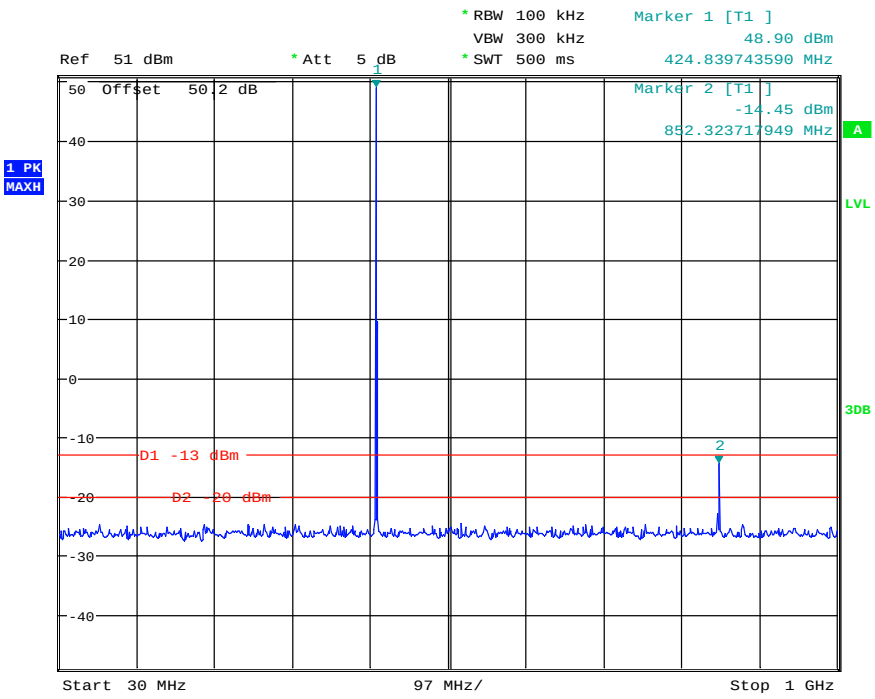
425.5MHz 150kHz-30MHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:33:48

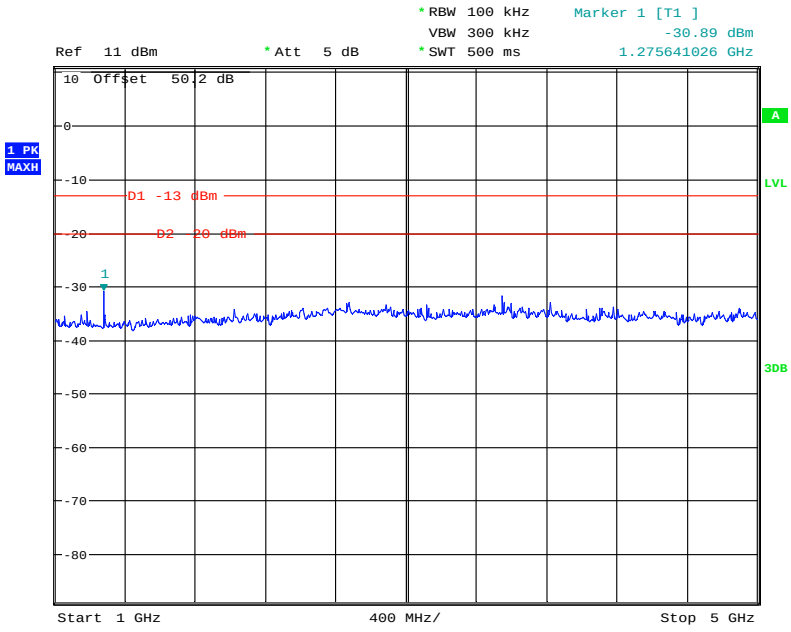
425.5MHz 30MHz-1GHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:34:34

425.5MHz 30MHz-1GHz With filter

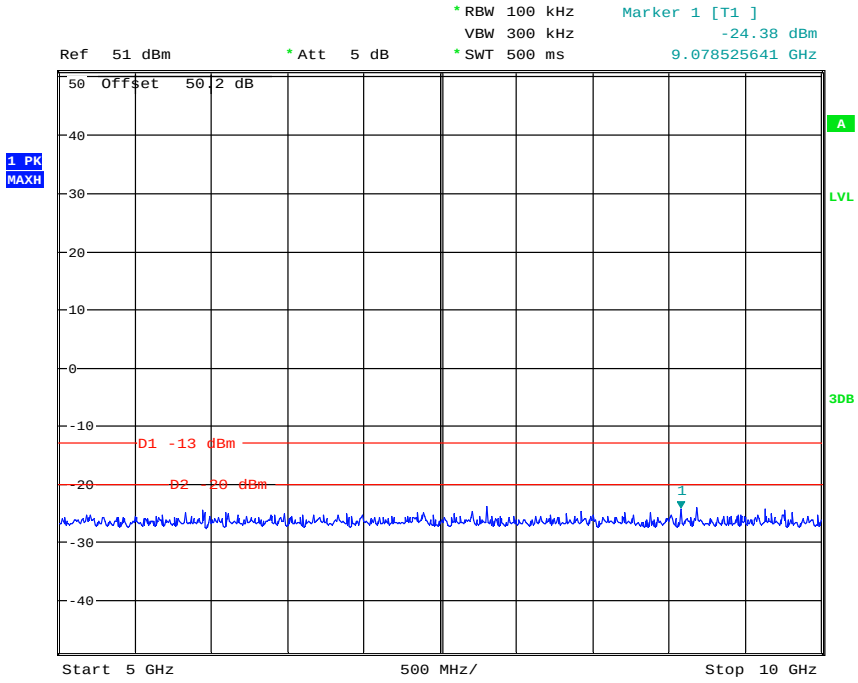


0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 15:22:42

425.5MHz 1GHz – 5GHz

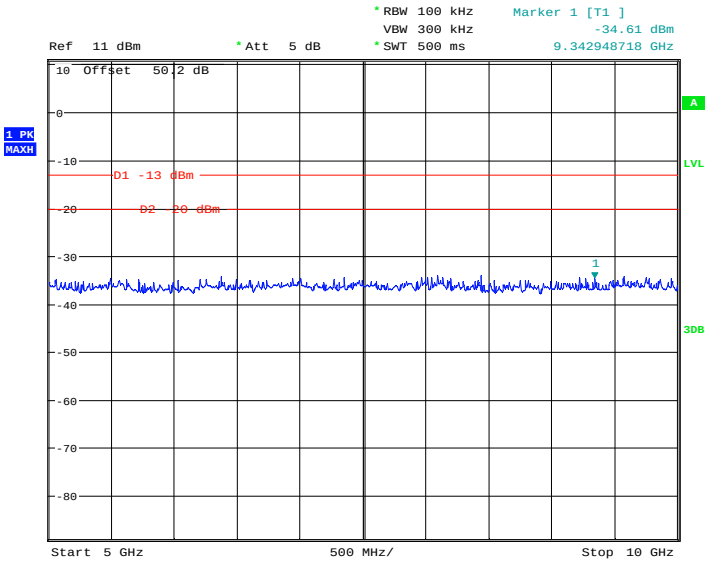
425.5MHz 5GHz-10GHz



0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 14:35:34

425.5MHz 5GHz-10GHz With filter



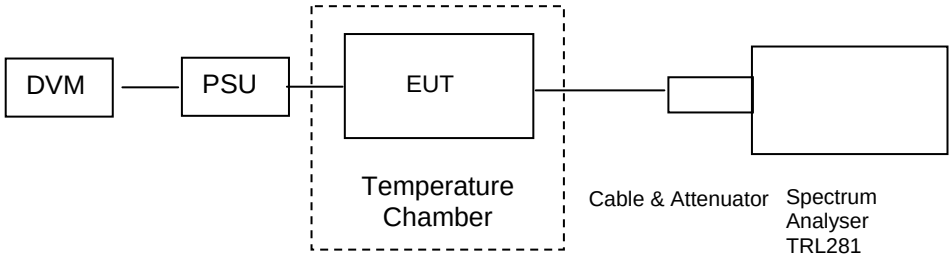
0 dBm inptut, 1-no filter, 2-575filter

Date: 4.OCT.2012 15:23:19

FREQUENCY STABILITY – CONDUCTED – Part 90.214(7)

Ambient temperature = 22°C
Relative humidity = 56%
Supply voltage = +13.8Vdc

Radio Laboratory
Test Signal = F3E



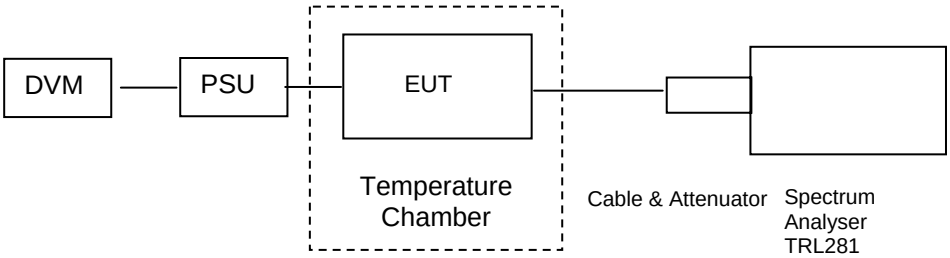
Bottom Channel - This frequency is NOT applicable to FCC filing.

Temperature °C	Vnom (Vdc)	Measured Frequency (MHz)	Frequency Difference (Hz)	ppm	Limit ± 1.5ppm Pass/Fail
+50	13.8	400.012500000	0	0	Pass
+40	13.8	400.012500000	0	0	Pass
+30	13.8	400.012500000	0	0	Pass
+20	13.8	400.012500000	0	0	Pass
+10	13.8	400.012500000	0	0	Pass
0	13.8	400.012510000	10	0.02	Pass
-10	13.8	400.012510000	10	0.02	Pass
-20	13.8	400.012510000	10	0.02	Pass
-30	13.8	400.012500000	0	0	Pass

Tnom 22 °C	85%= 11.7Vdc	115%= 15.9Vdc
Frequency (MHz)	400.01249	400.0125
Frequency Difference (Hz)	-10	0
ppm	0.02	0
Limit ± 1.5 ppm Pass/Fail	Pass	Pass

Ambient temperature = 22°C
Relative humidity = 56%
Supply voltage = +13.8Vdc

Radio Laboratory
Test Signal = F3E



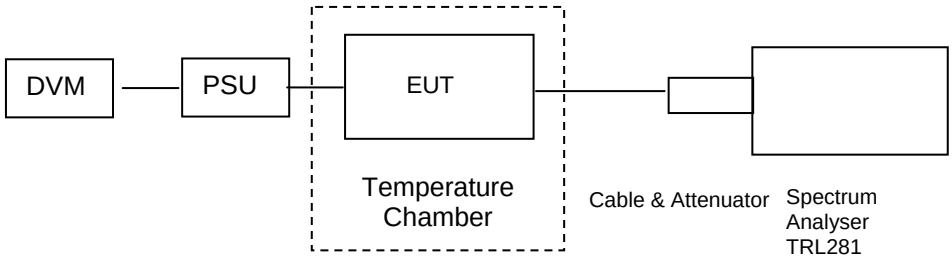
Middle Channel - This frequency is NOT applicable to FCC filing.

Temperature °C	Vnom (Vdc)	Measured Frequency (MHz)	Frequency Difference (Hz)	ppm	Limit ± 1.5 ppm Pass/Fail
+50	13.8	416.987500000	0	0	Pass
+40	13.8	416.987510000	10	0.02	Pass
+30	13.8	416.987500000	0	0	Pass
+20	13.8	416.987500000	0	0	Pass
+10	13.8	416.987500000	0	0	Pass
0	13.8	416.987510000	10	0.02	Pass
-10	13.8	416.987510000	10	0.02	Pass
-20	13.8	416.987510000	10	0.02	Pass
-30	13.8	416.987510000	10	0.02	Pass

Tnom 22°C	85%= 11.7Vdc	115%= 15.9Vdc
Frequency (MHz)	416.9875	416.98751
Frequency Difference (Hz)	0	10
ppm	0	0.02
Limit ± 1.5 ppm Pass/Fail	Pass	Pass

Ambient temperature = 22°C
Relative humidity = 56%
Supply voltage = +13.8Vdc

Radio Laboratory
Test Signal = F3E



Top Channel - This frequency is NOT applicable to FCC filing.

Temperature °C	Vnom (Vdc)	Measured Frequency (MHz)	Frequency Difference (Hz)	ppm	Limit ± 1.5 ppm Pass/Fail
+50	13.8	434.987500000	0	0	Pass
+40	13.8	434.987510000	10	0.02	Pass
+30	13.8	434.987500000	0	0	Pass
+20	13.8	434.987500000	0	0	Pass
+10	13.8	434.987500000	0	0	Pass
0	13.8	434.987510000	10	0.02	Pass
-10	13.8	434.987510000	10	0.02	Pass
-20	13.8	434.987510000	10	0.02	Pass
-30	13.8	434.987510000	10	0.02	Pass

Tnom 21.5°C	85%= 11.7Vdc	115%= 15.9Vdc
Frequency (MHz)	434.9875	434.98751
Frequency Difference (Hz)	0	10
ppm	0	0.02
Limit ± 1.5 ppm Pass/Fail	Pass	Pass

Frequency stability measurements were between -30°C and +50°C in 10°C increments.

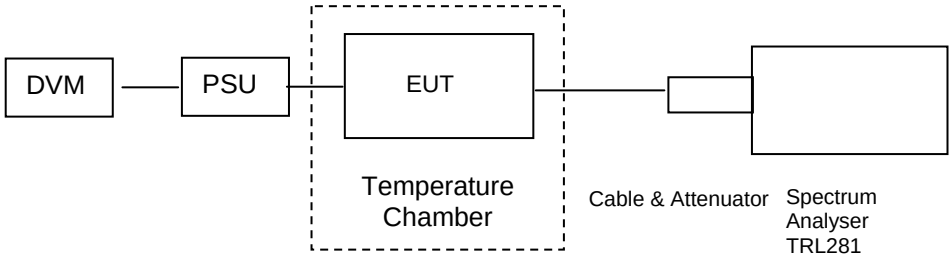
At each temperature the transmitter was given a period of 60 minutes to stabilise. The transmitter was then turned on and the frequency error measured after a period of 1 minute.

Measurements were also made with the supply voltage varied between 115% and 85% of the nominal supply voltage(13.8Vdc).

FREQUENCY STABILITY – CONDUCTED – Part 90.214(7)

Ambient temperature = 22°C
Relative humidity = 56%
Supply voltage = +13.8Vdc

Radio Laboratory
Test Signal = F3E



406MHz - 416MHz band

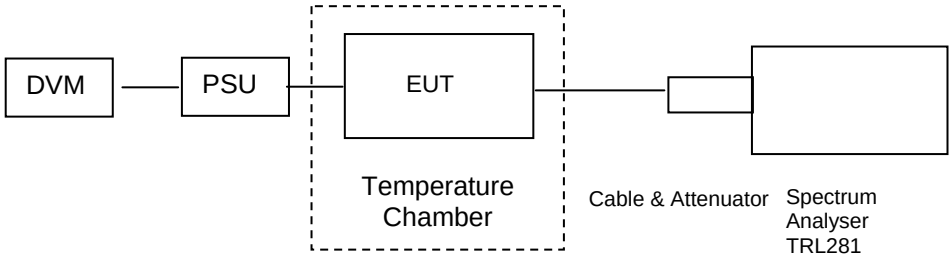
Temperature °C	Vnom (Vdc)	Measured Frequency (MHz)	Frequency Difference (Hz)	ppm	Limit ± 1.5ppm Pass/Fail
+50	13.8	411.000000000	0	0	Pass
+40	13.8	411.000000000	0	0	Pass
+30	13.8	411.000000000	0	0	Pass
+20	13.8	411.000000000	0	0	Pass
+10	13.8	411.000000000	0	0	Pass
0	13.8	411.000010000	10	0.02	Pass
-10	13.8	411.000010000	10	0.02	Pass
-20	13.8	411.000010000	10	0.02	Pass
-30	13.8	411.000000000	0	0	Pass

Tnom 22 °C	85%= 11.7Vdc	115%= 15.9Vdc
Frequency (MHz)	400.01249	400.0125
Frequency Difference (Hz)	-10	0
ppm	0.02	0
Limit ± 1.5 ppm Pass/Fail	Pass	Pass

FREQUENCY STABILITY – CONDUCTED – Part 90.214(7)

Ambient temperature = 22°C
Relative humidity = 56%
Supply voltage = +13.8Vdc

Radio Laboratory
Test Signal = F3E



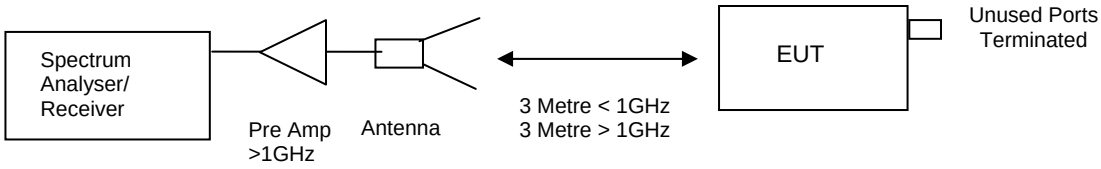
421MHz -430MHz band

Temperature °C	Vnom (Vdc)	Measured Frequency (MHz)	Frequency Difference (Hz)	ppm	Limit ± 1.5ppm Pass/Fail
+50	13.8	425.500000000	0	0	Pass
+40	13.8	425.500000000	0	0	Pass
+30	13.8	425.500000000	0	0	Pass
+20	13.8	425.500000000	0	0	Pass
+10	13.8	425.500000000	0	0	Pass
0	13.8	425.500010000	10	0.02	Pass
-10	13.8	425.500010000	10	0.02	Pass
-20	13.8	425.500010000	10	0.02	Pass
-30	13.8	425.500000000	0	0	Pass

Tnom 22 °C	85%= 11.7Vdc	115%= 15.9Vdc
Frequency (MHz)	400.01249	400.0125
Frequency Difference (Hz)	-10	0
ppm	0.02	0
Limit ± 1.5 ppm Pass/Fail	Pass	Pass

INTENTIONAL RADIATOR SPURIOUS EMISSIONS – RADIATED – Part 2.1053

Ambient temperature	=	22°C	Test Signal	=	F3E
Relative humidity	=	56%			
Conditions	=	ATS			
Supply voltage	=	+13.8Vdc			
Supply Frequency	=	N/A			



The test was set up as per the diagram. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output.

The Spurious limit was calculated as follows:

On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5kHz : At least 50 + 10 log (P) or 70dB, whichever is the lesser attenuation

50 + 10 log (100W) = 70dBc = 50dBm - 70 = -20dBm

RESULTS

Bottom Channel - This frequency is NOT applicable to FCC filing.

FREQUENCY RANGE	FREQ. (GHz)	Measured (dBm)	LIMIT (dBm)
30MHz – 10GHz	1.26298	-37.24	-20
	1.68399	-31.60	-20
	2.10500	-34.26	-20
	2.52610	-28.46	-20
	2.94703	-29.36	-20
	3.33680	-25.94	-20
	4.21076	-38.96	-20
	5.05220	-37.98	-20
	5.47321	-28.21	-20
	5.89422	-30.45	-20
	6.37625	-33.00	-20

Middle Channel - This frequency is NOT applicable to FCC filing.

FREQUENCY RANGE	FREQ. (GHz)	Measured (dBm)	LIMIT (dBm)
30MHz – 10GHz	1.27642	-36.50	-20
	1.70216	-35.97	-20
	2.12758	-36.05	-20
	2.55303	-29.92	-20
	2.97834	-31.80	-20
	3.40393	-29.91	-20
	4.25495	-30.65	-20
	4.68045	-32.41	-20
	5.10595	-38.93	-20
	5.53126	-37.19	-20
	5.95703	-27.34	-20
	6.38240	-37.92	-20
	6.80801	-26.45	-20

Top Channel - This frequency is NOT applicable to FCC filing.

FREQUENCY RANGE	FREQ. (GHz)	Measured (dBm)	LIMIT (dBm)
30MHz – 10GHz	1.28996	-34.49	-20
	1.71990	-38.92	-20
	2.57992	-32.96	-20
	3.00999	-32.36	-20
	3.42998	-36.59	-20
	4.29997	-31.67	-20
	4.72972	-35.41	-20
	5.15980	-31.94	-20
	5.58982	-22.91	-20
	6.01978	-30.87	-20
	6.44981	-34.27	-20
	6.87993	-30.54	-20

* Note: Emissions that fall below 20dB of the limit are not shown in the above table

411MHz : 406MHz- 416MHz band

FREQUENCY RANGE	FREQ. (GHz)	Measured (dBm)	LIMIT (dBm)
30MHz – 10GHz	1.64397	-38.56	-20
	2.46596	-35.56	-20
	2.87697	-28.83	-20
	3.28797	-30.30	-20
	4.10997	-39.96	-20
	5.34305	-25.96	-20
	5.75399	-28.95	-20

* Note: Emissions that fall below 20dB of the limit are not shown in the above table

425.5 MHz : 421MHz- 430 MHz band

FREQUENCY RANGE	FREQ. (GHz)	Measured (dBm)	LIMIT (dBm)
30MHz – 10GHz	1.70196	-37.89	-20
	2.55128	-37.20	-20
	2.97046	-32.64	-20
	3.40395	-37.33	-20
	4.25490	-34.22	-20
	5.53147	-25.85	-20
	5.97501	-31.91	-20

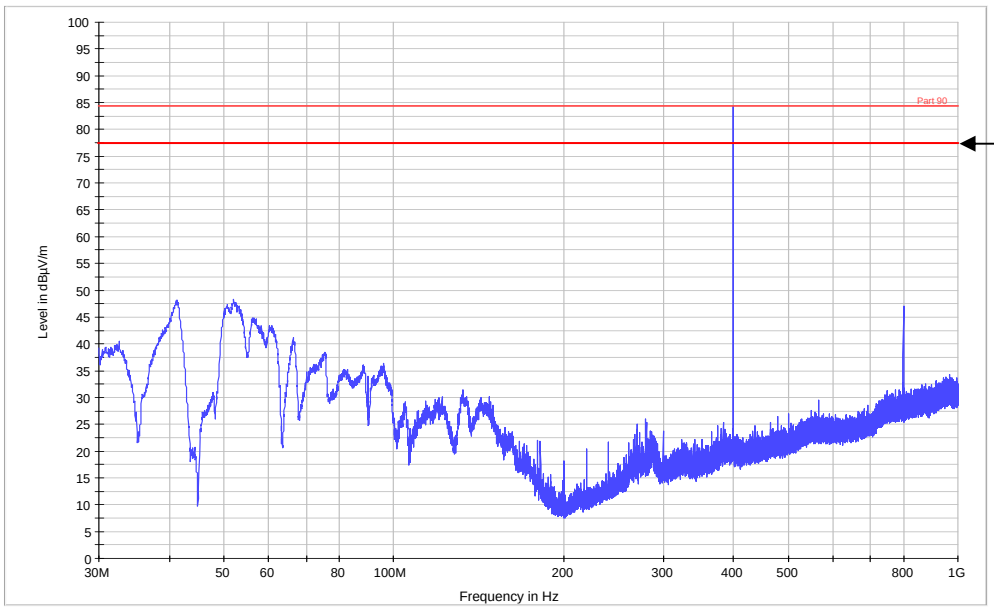
* Note: Emissions that fall below 20dB of the limit are not shown in the above table

The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRAC No	ACTUAL EQUIPMENT USED
HORN	EMCO	3115	9010-3580	138	**X**
SPECTRUM ANALYSER	R&S	FSU46	200034	TRL281	**X**
PRE AMPLIFIER	HP	8449B	3008A016	572	**X**
ANTENNA	YORK	CBL611/A	1618	UH191	**X**
RECEIVER	R&S	ESVS10	825892/006	UH04	**X**

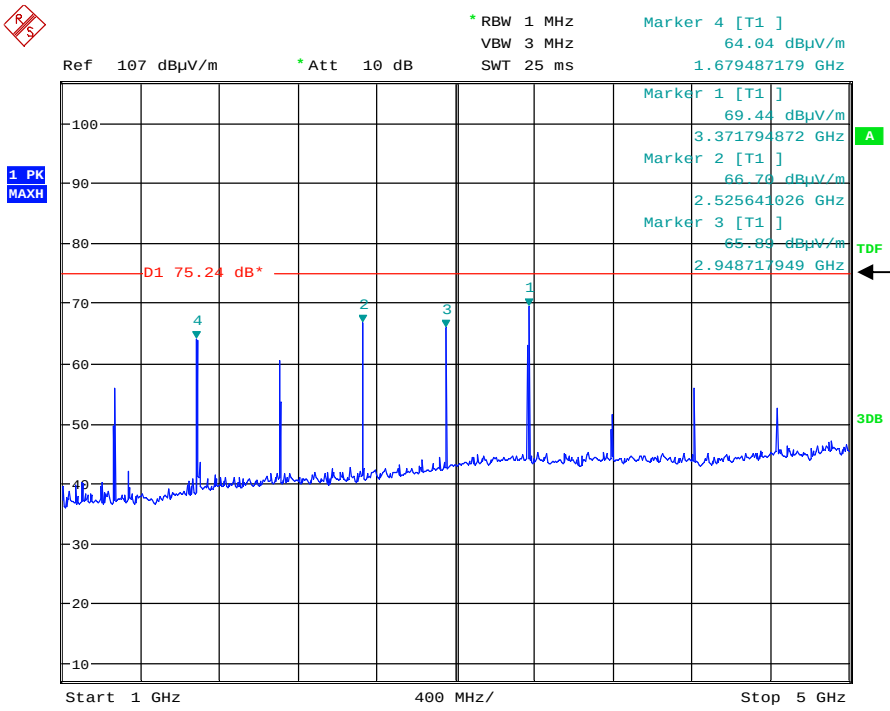
Radiated emissions Bottom Channel

400.0125MHz 30MHz – 1GHz - This frequency is NOT applicable to FCC filing.



The above test results show that there were no emissions within 20dBs of the –20dBm limit.

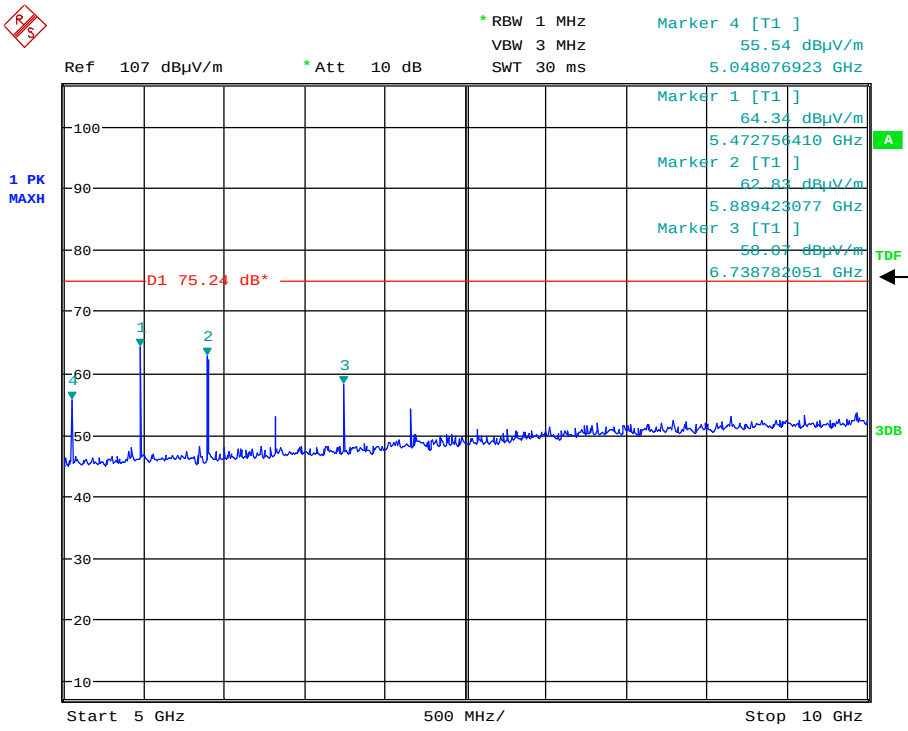
400.0125MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



-20dBm Limit line

Date: 24.AUG.2012 14:44:40

400.0125MHz 5GHz – 10GHz - This frequency is NOT applicable to FCC filing.

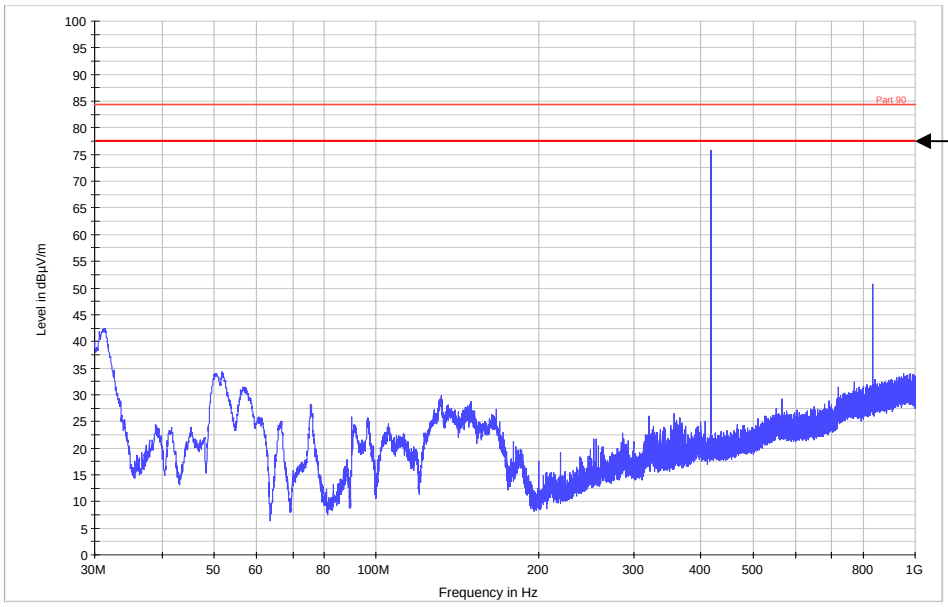


-20dBm Limit line

Date: 24.AUG.2012 14:45:42

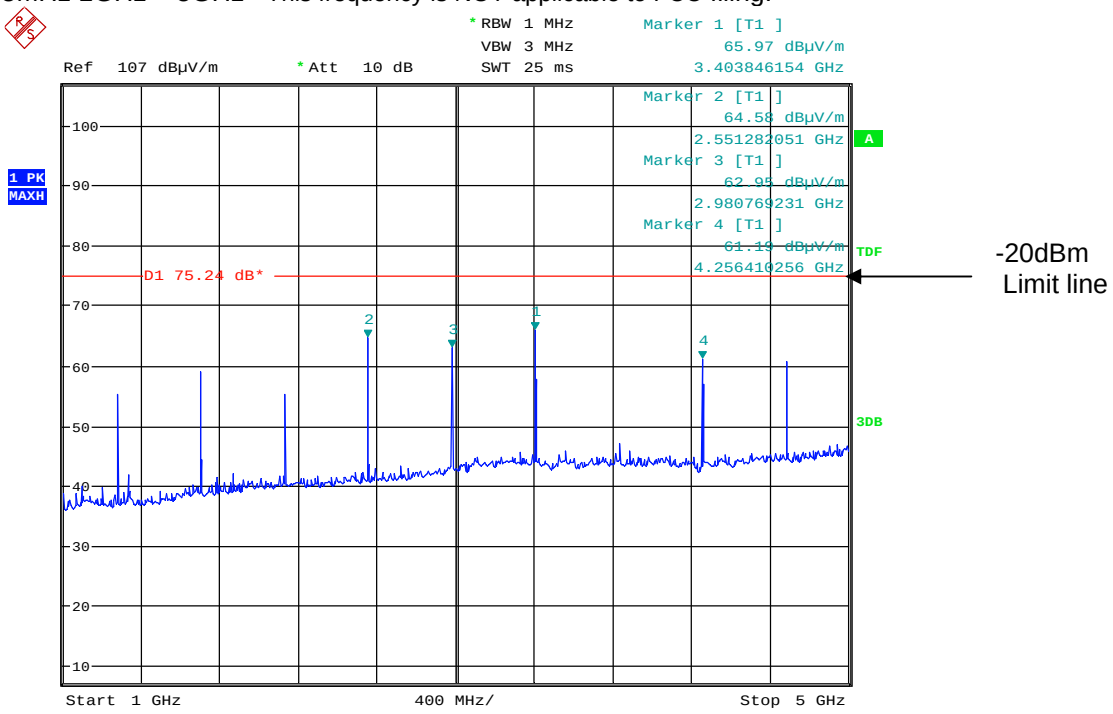
Radiated emissions Middle Channel

416.9875MHz 30MHz – 1GHz - This frequency is NOT applicable to FCC filing.



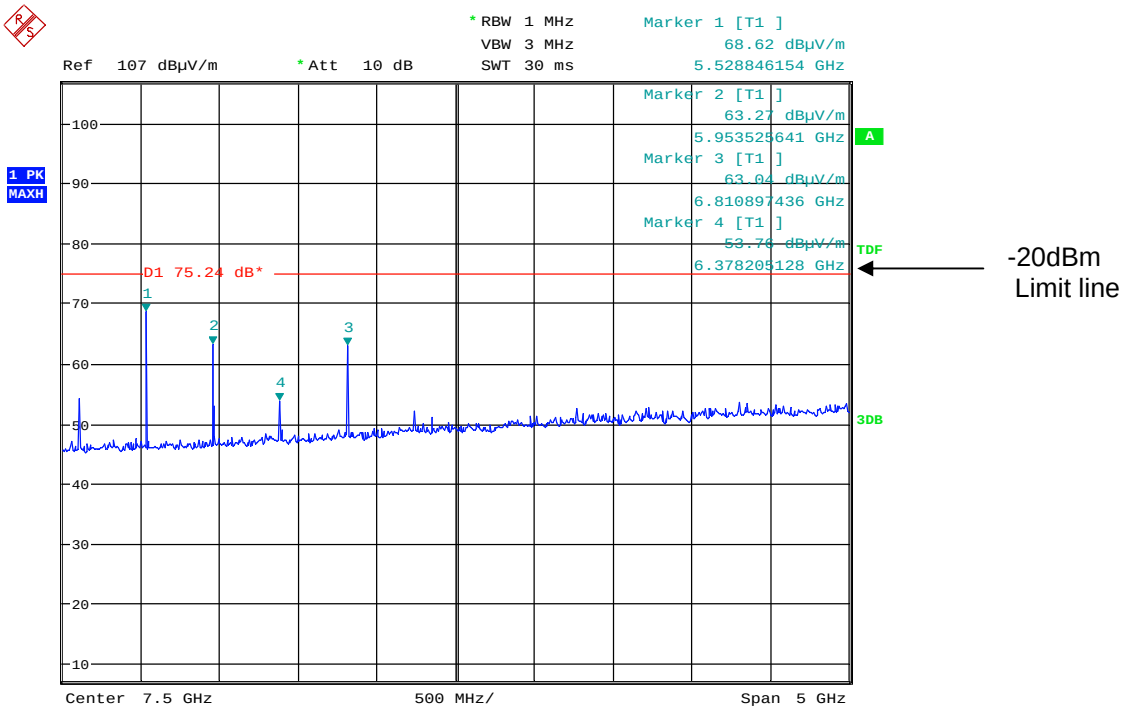
The above test results show that there were no emissions within 20dBs of the –20dBm limit.

416.9875MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



Date: 24.AUG.2012 16:27:48

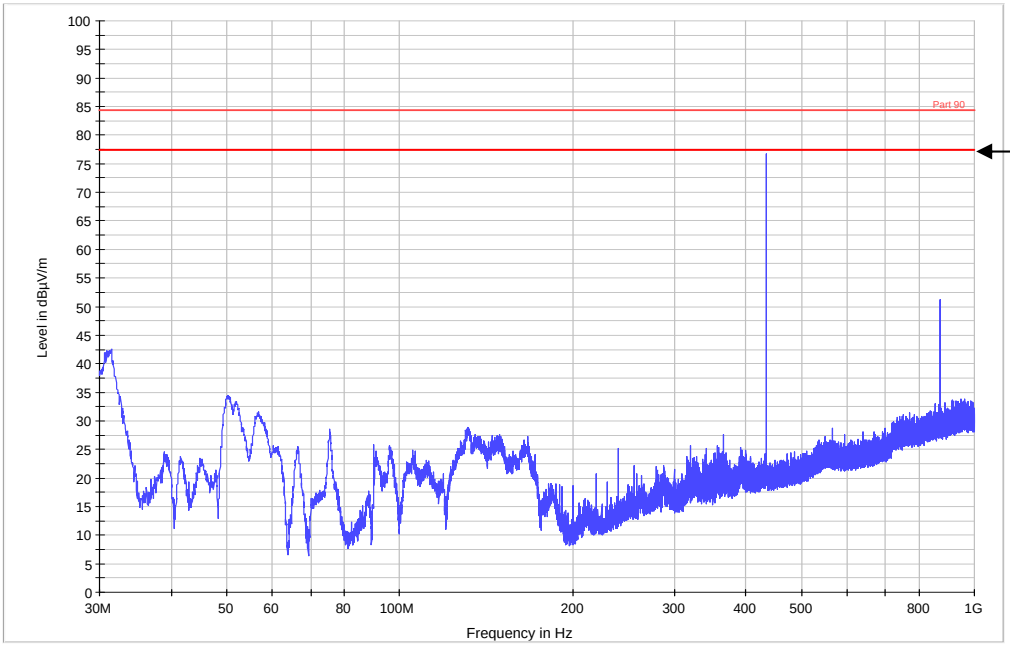
416.9875MHz 5GHz – 10GHz - This frequency is NOT applicable to FCC filing.



Date: 24.AUG.2012 16:26:33

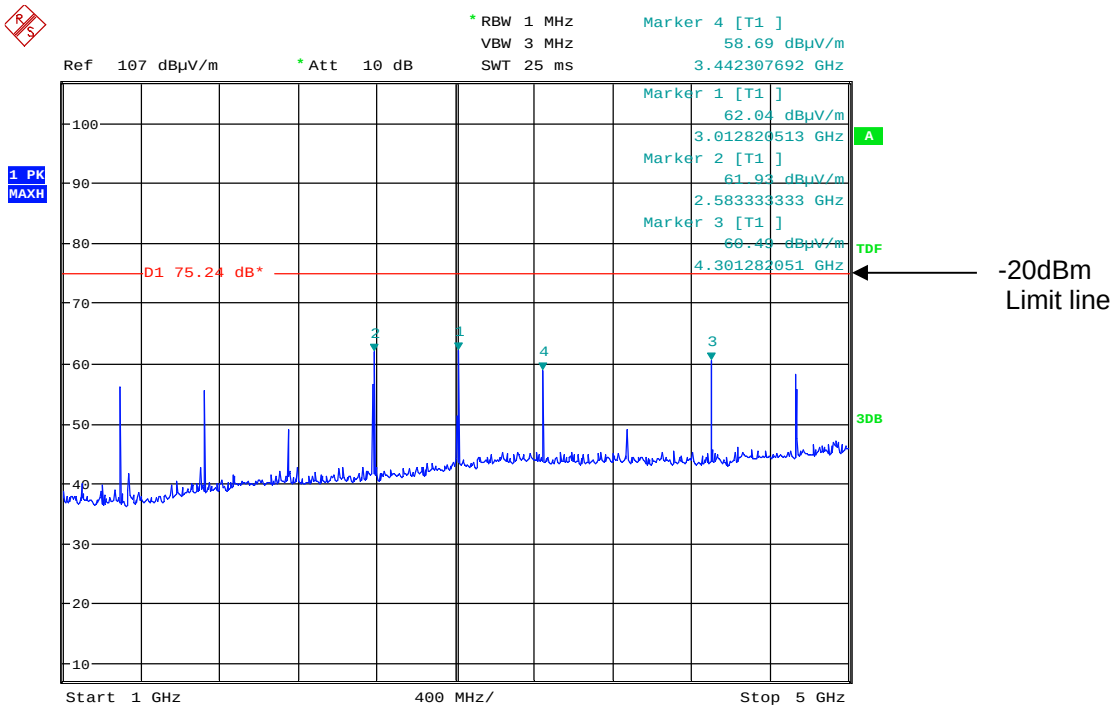
Radiated emissions Top Channel

434.9875MHz - 30MHz – 1GHz - This frequency is NOT applicable to FCC filing.



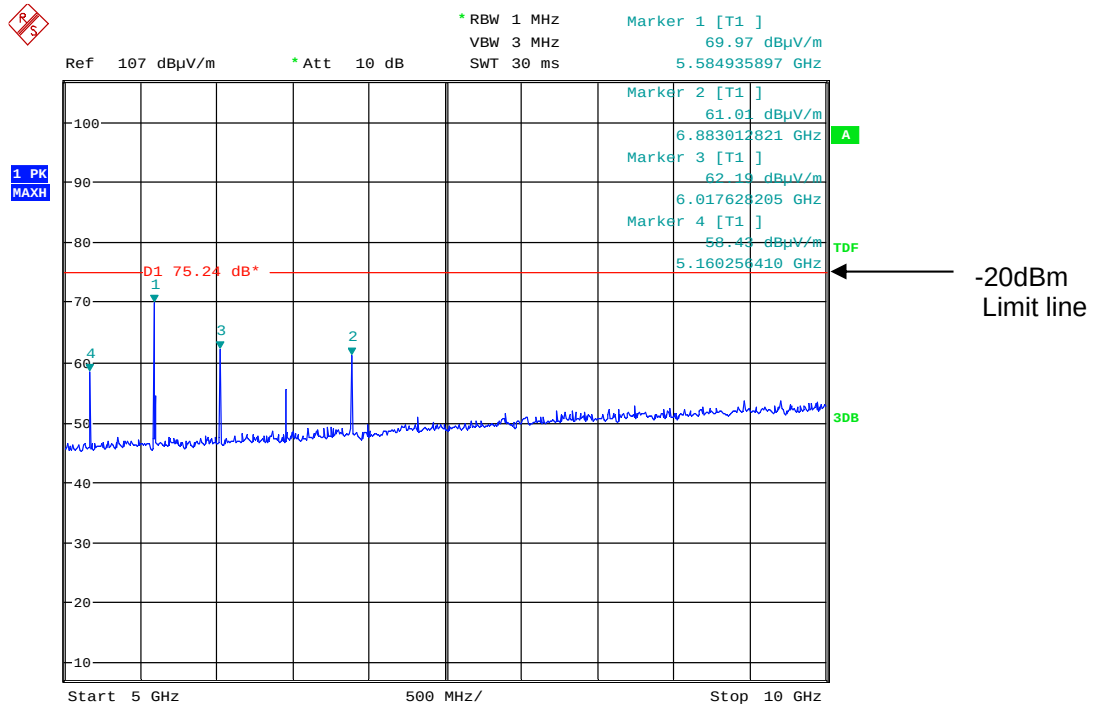
The above test results show that there were no emissions within 20dBs of the –20dBm limit.

434.9875MHz 1GHz – 5GHz - This frequency is NOT applicable to FCC filing.



Date: 24.AUG.2012 16:29:16

434.9875MHz 5GHz – 10GHz - This frequency is NOT applicable to FCC filing.



Date: 24.AUG.2012 16:30:29

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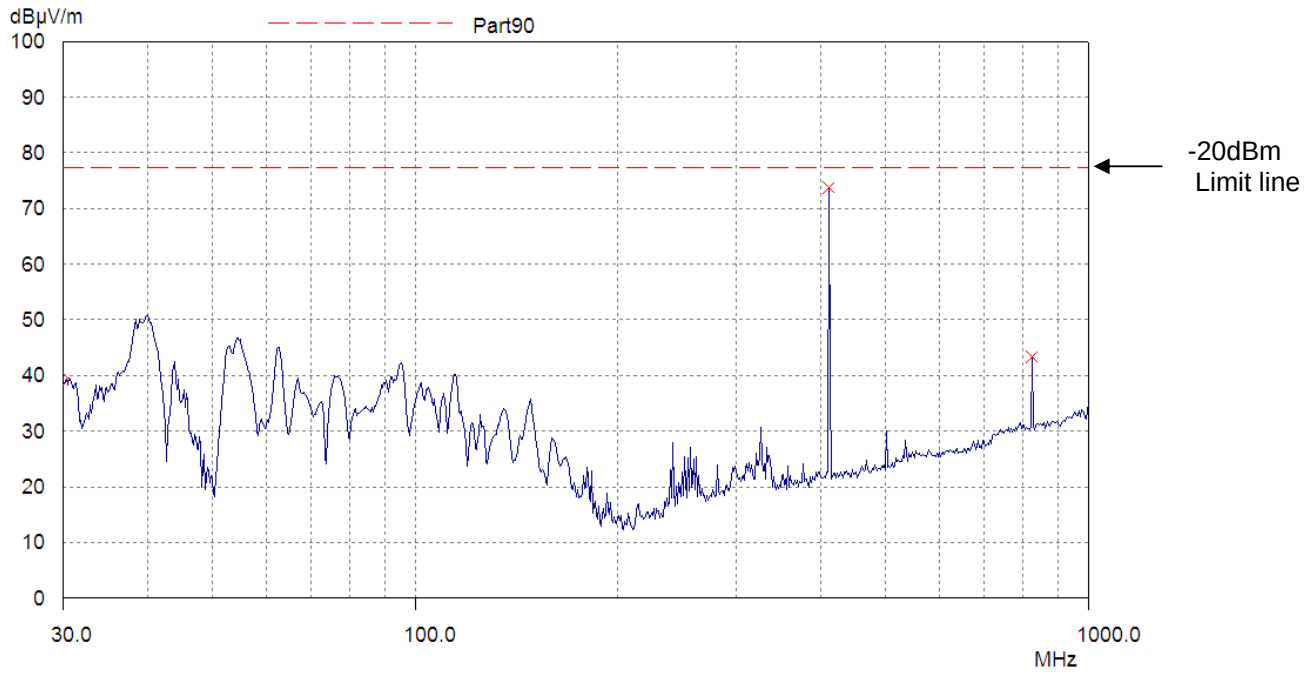
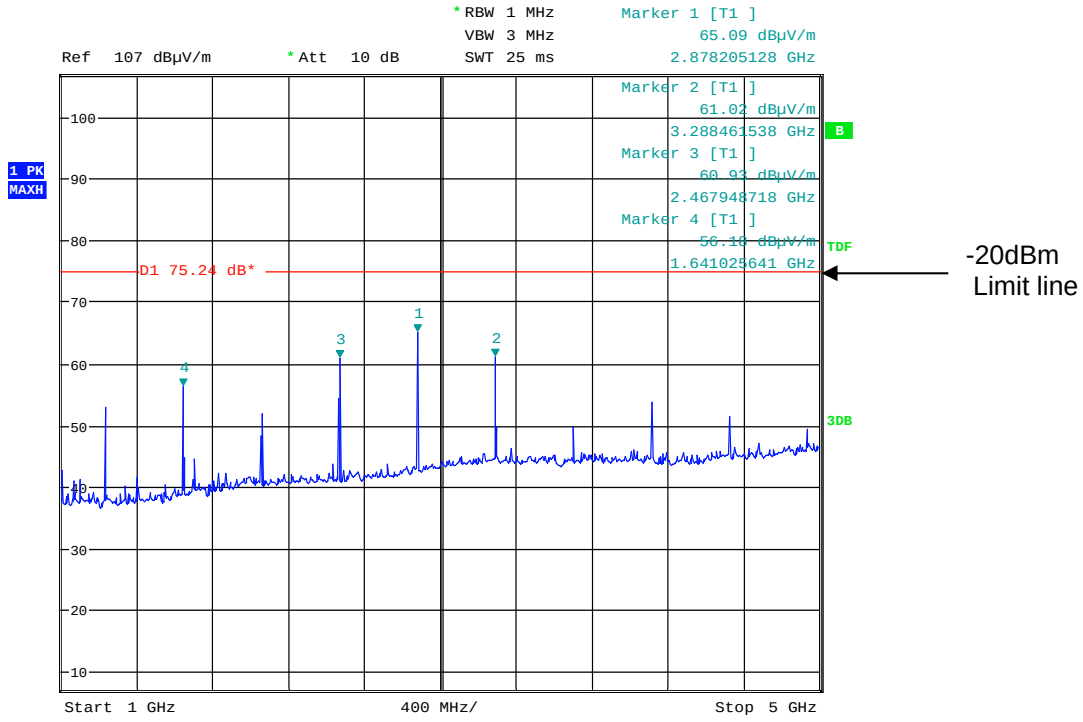
Radiated emissions 406MHz – 416MHz Channel

411.0MHz 30MHz – 1GHz



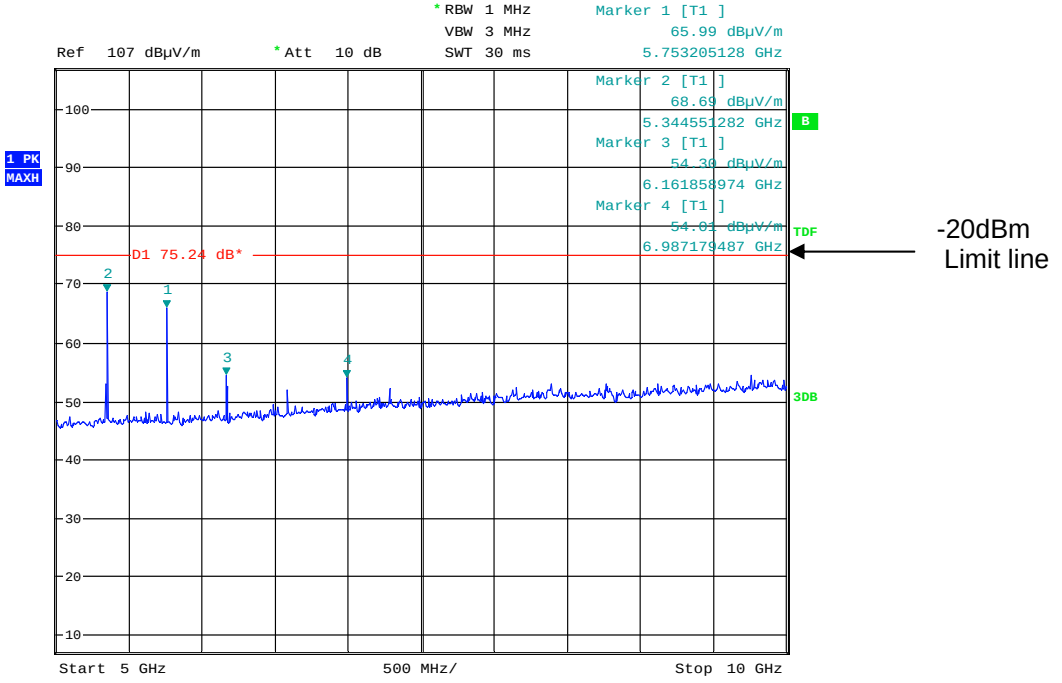
The above test results show that there were no emissions within 20dBs of the –20dBm limit.

411.0MHz 1GHz – 5GHz



Date: 5.OCT.2012 11:30:18

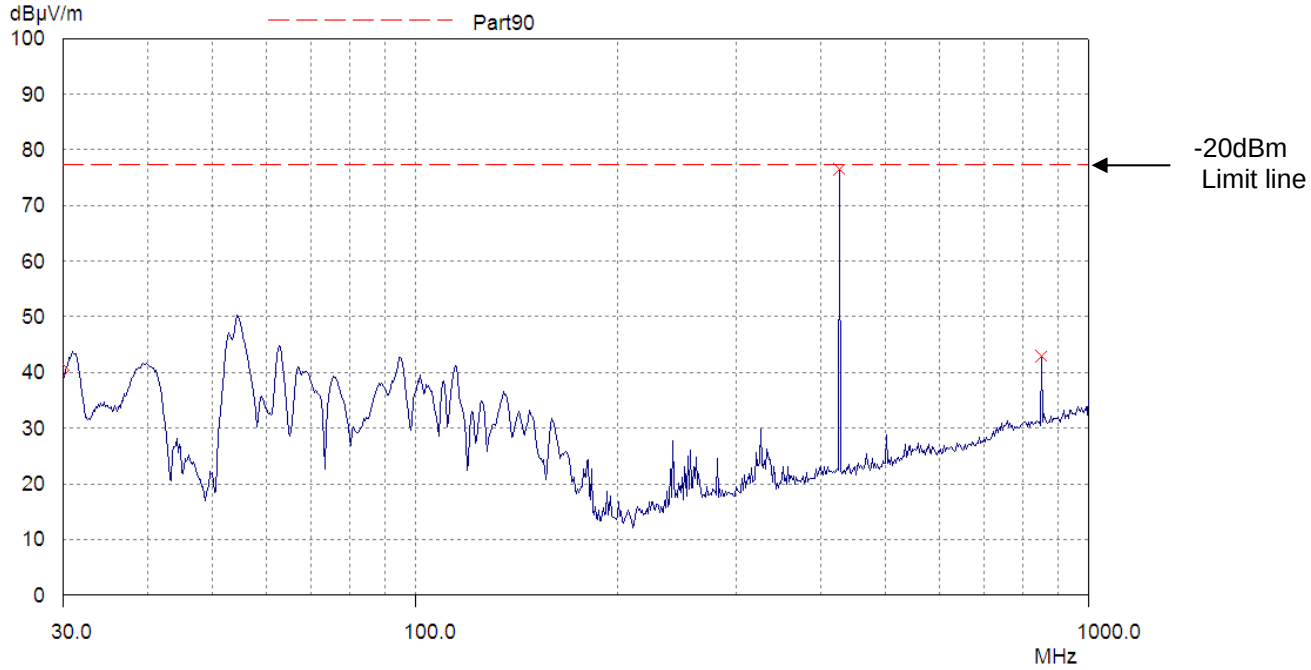
411.0MHz 5GHz – 10GHz .



Date: 5.OCT.2012 11:37:22

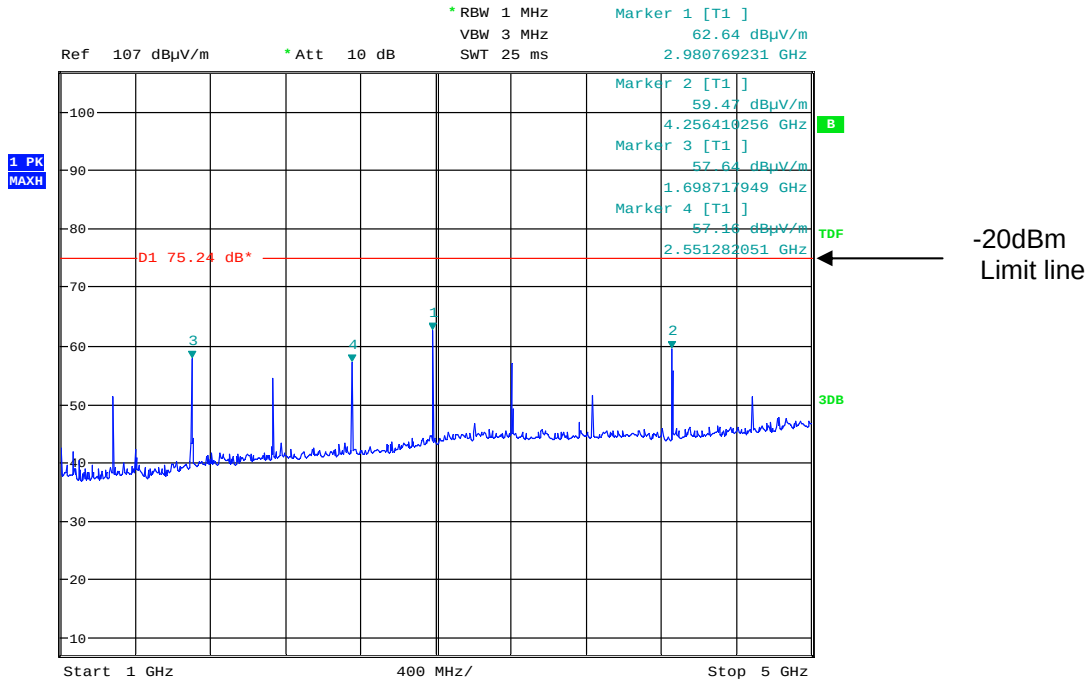
Radiated emissions – 425.5MHz Channel

425.5MHz 30MHz – 1GHz



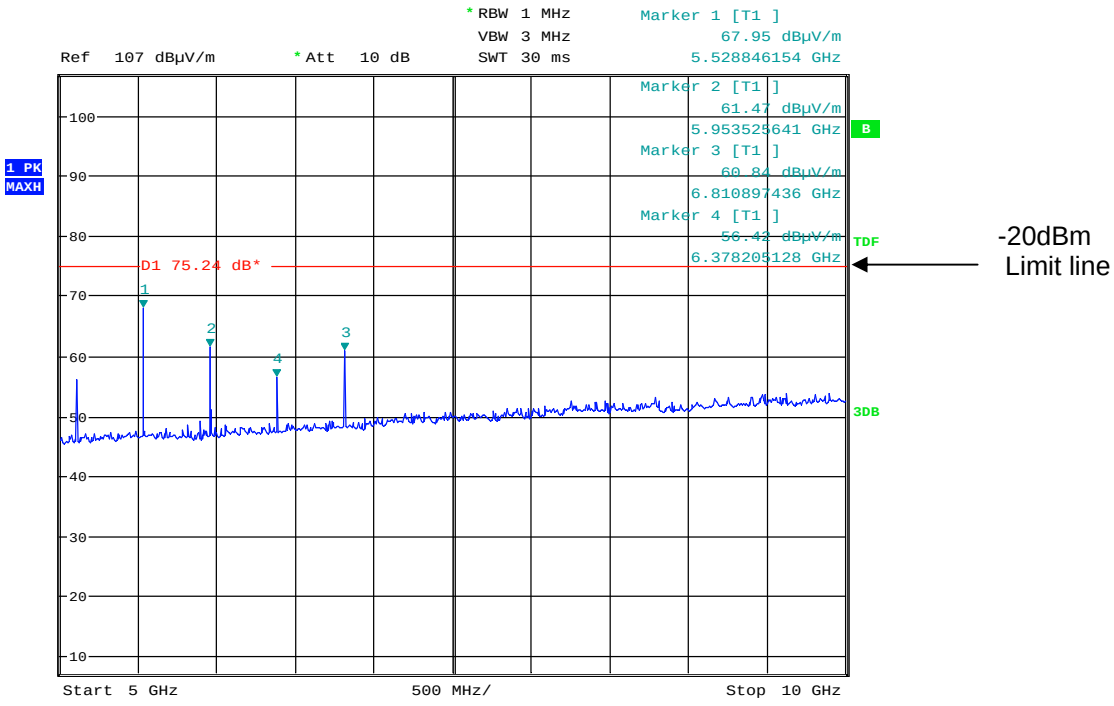
The above test results show that there were no emissions within 20dBs of the –20dBm limit.

425.5 MHz 1GHz – 5GHz



Date: 5.OCT.2012 11:17:16

425.5 MHz 5GHz – 10GHz

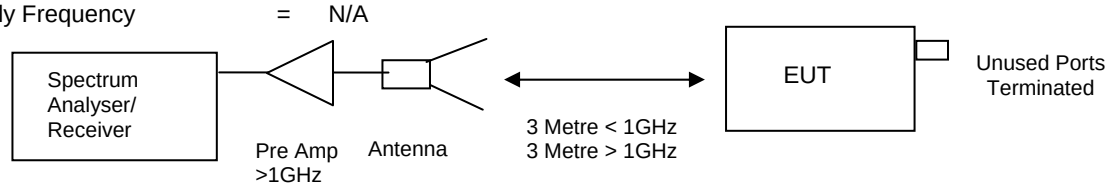


Date: 5.OCT.2012 11:19:05

UN-INTENTIONAL RADIATOR SPURIOUS EMISSIONS – RADIATED – Part 15:109

Ambient temperature = 24°C
Relative humidity = 56%
Conditions = ATS
Supply voltage = +13.8Vdc
Supply Frequency = N/A

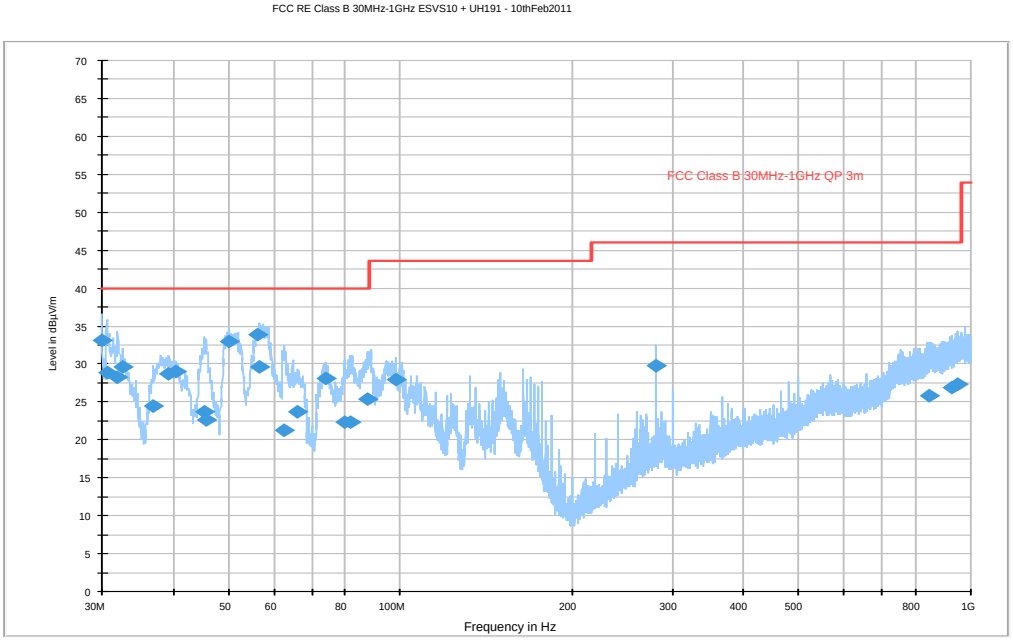
Test Signal = F3E



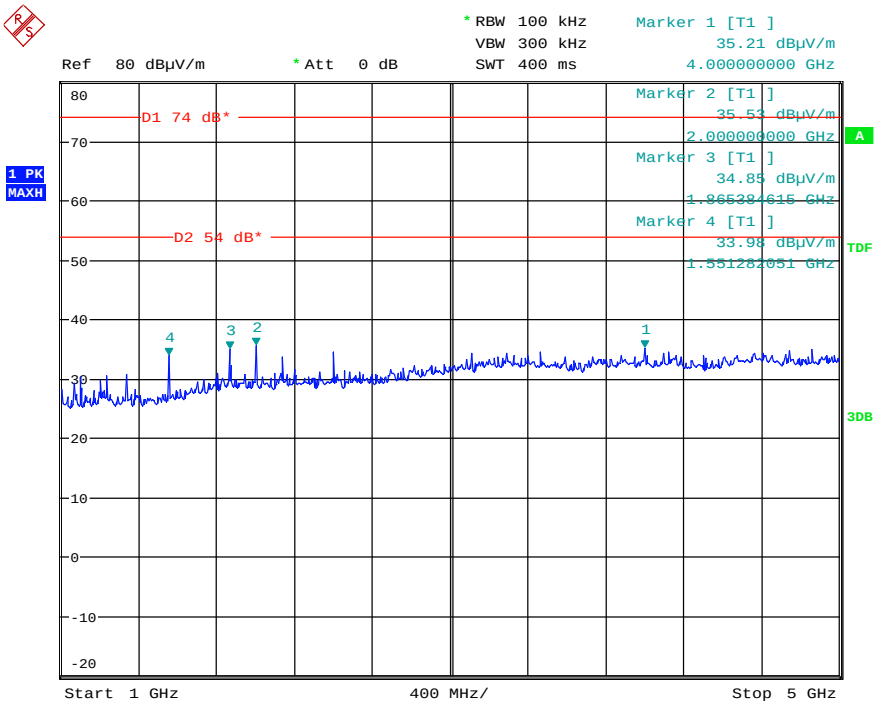
The test was set up as per the diagram, the receiver was tested while in receive mode while attached to a dummy load.
30MHz -1GHz

FREQ. (MHz)	MEAS. Rx. (dBµV)	Cable Loss (dB)	Ant Factor	Pre Amp (dB)	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (µV/m)	Limit (dBµV/m)	Limit (µV/m)
30.000000	10.5	0.4	18.6	-	33.1	45.18	40.00	100
30.650000	10.1	0.4	18.3	-	28.8	27.54	40.00	100
32.000000	10.5	0.4	17.4	-	28.3	26.00	40.00	100
32.600000	12.2	0.4	17.1	-	29.7	30.54	40.00	100
36.900000	9.3	0.4	14.7	-	24.4	16.59	40.00	100
39.300000	15.0	0.4	13.4	-	28.8	27.54	40.00	100
40.350000	15.8	0.4	12.8	-	29.0	28.18	40.00	100
45.250000	13.2	0.4	10.1	-	23.7	15.31	40.00	100
45.800000	12.4	0.4	9.9	-	22.7	13.64	40.00	100
50.000000	24.8	0.4	7.7	-	32.9	44.15	40.00	100
56.050000	27.8	0.4	5.7	-	33.9	49.54	40.00	100
56.650000	23.6	0.4	5.6	-	29.6	30.20	40.00	100
62.800000	15.8	0.5	5.0	-	21.3	11.61	40.00	100
66.250000	18.0	0.6	5.1	-	23.7	15.31	40.00	100
73.900000	21.6	0.6	6.0	-	28.2	25.70	40.00	100
80.000000	14.8	0.6	7.0	-	22.4	13.18	40.00	100
82.050000	14.5	0.6	7.3	-	22.4	13.18	40.00	100
87.600000	16.5	0.6	8.3	-	25.4	18.62	40.00	100
98.400000	17.7	0.6	9.6	-	27.9	24.83	43.52	150
280.05000	16.1	1.0	12.7	-	29.8	30.90	46.02	200
2000.00	53.39	2.1	27.5	35.6	47.49	236.86	74.0pk	5011pk
2000.00	45.98	2.1	27.5	35.6	39.98	99.77	54.0Av	500Av
2400.10	51.09	2.1	28.3	35.6	45.89	197.01	74.0pk	5011pk
2400.10	40.99	2.1	28.3	35.6	35.79	61.58	54.0Av	500Av
3109.80	49.54	2.5	30.4	35.5	46.94	222.33	74.0pk	5011pk
3109.80	38.07	2.5	30.4	35.5	35.47	59.36	54.0Av	500Av

Rx 30MHz-1GHz

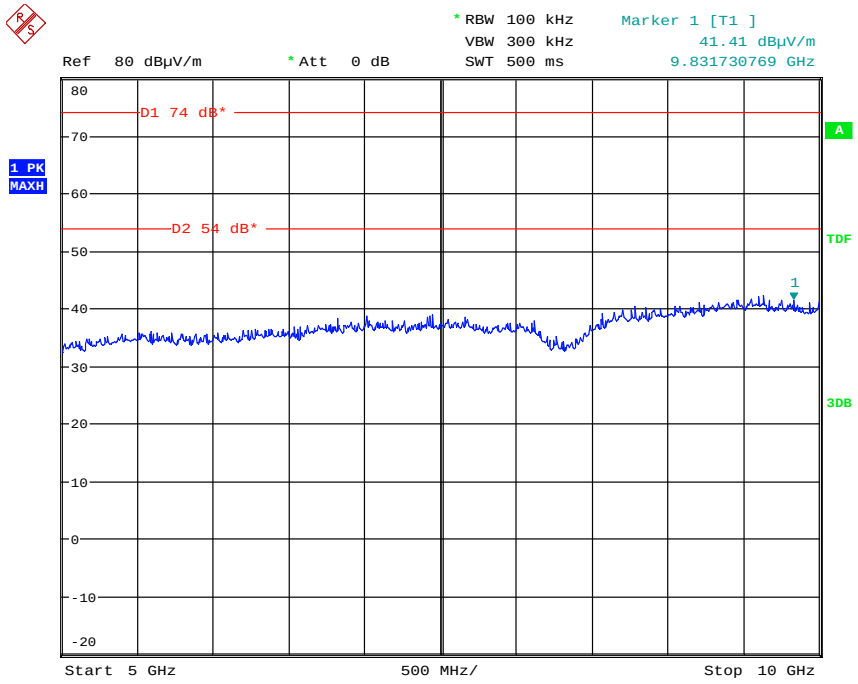


Rx 1GHz – 5GHz



Date: 1.JUN.2012 13:39:00

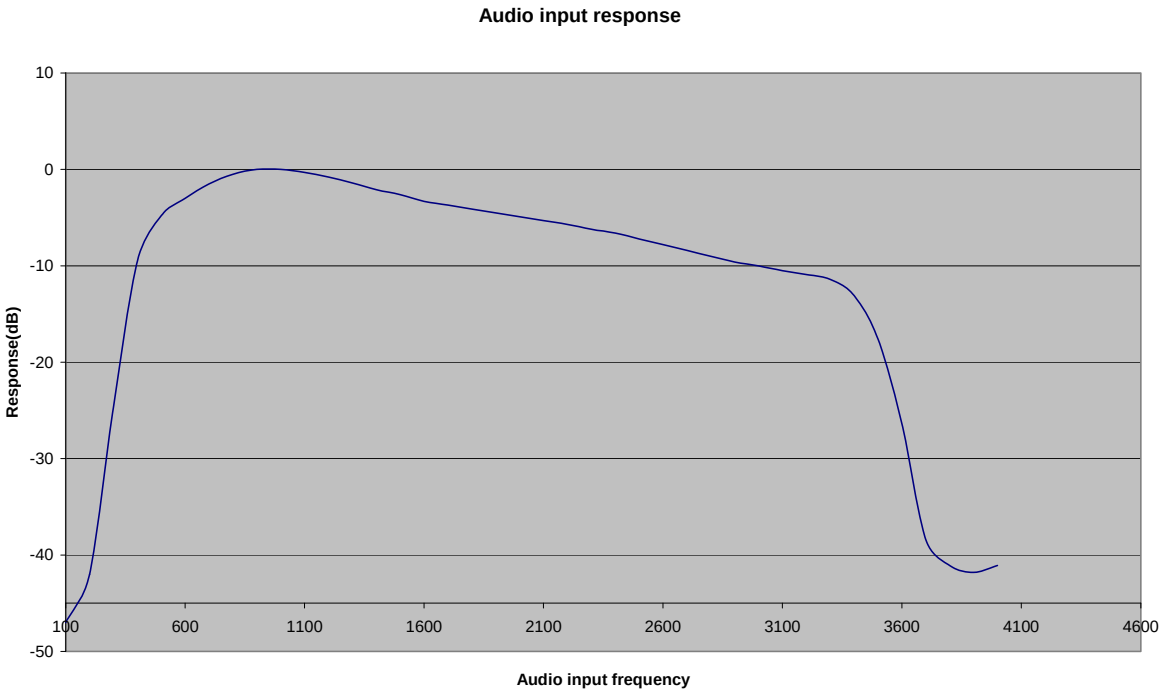
Rx 5GHz – 10GHz



Date: 1.JUN.2012 13:39:43

Modulation Characteristics: 2.1047 (a)

Ambient temperature	=	22°C	Radio Laboratory		
Relative humidity	=	56%	Test Signal	=	F3E
Supply voltage	=	+13.8Vdc			



Note: The SB2025NT100W 400MHz unit is capable of transmitting analogue speech and P25 digital audio modulation.

There are no transmitter audio frequency inputs available via a microphone socket or any other audio frequency input.

The transmitter was tested whilst operating under the following conditions:

1) A signal generator was connected into the receiver RF input, tuned to the receiver frequency, and the deviation level set to 2.5kHz, the audio frequency was then varied between 100Hz and 5kHz.

2) testing was carried out with the talk through feature enabled.
(therefore the audio response will take into account the pre emphasis and de emphasis of the receiver and transmitter).

3) A 1kHz audio signal was applied which was used as a 0dB response reference.

The above plot shows the audio response of the transmitter.

Modulation Characteristics: 2.1047 (b)

Note: The SB2025NT100W 400MHz unit is capable of transmitting analogue speech and P25 digital audio modulation.

There are no transmitter external audio inputs available via a microphone socket etc, and therefore the test was not performed. The external audio is via the receiver RF input or the digital audio input.

Transient frequency Behaviour: Part 90.214

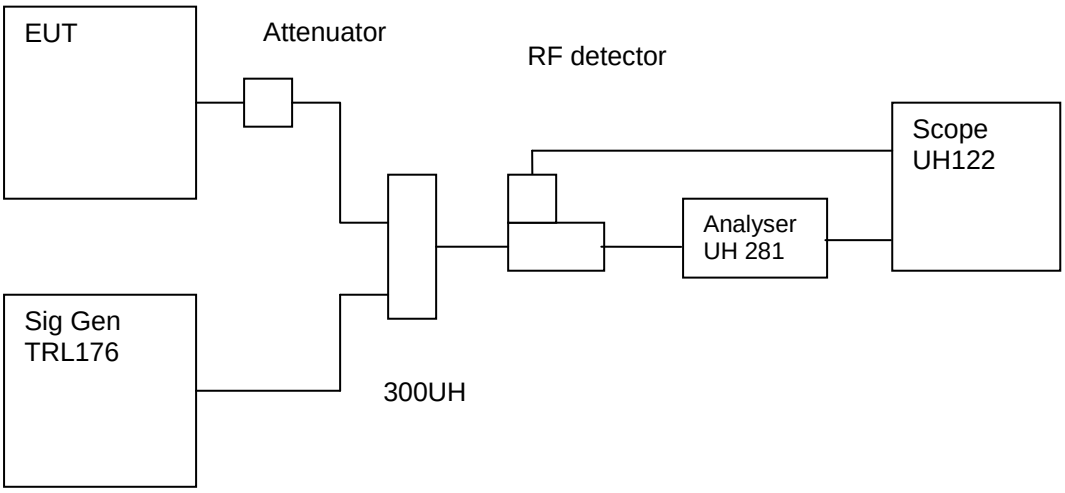
Tnom = 22°C

RHnom = 56%

Tx Pnom = 100W

Method

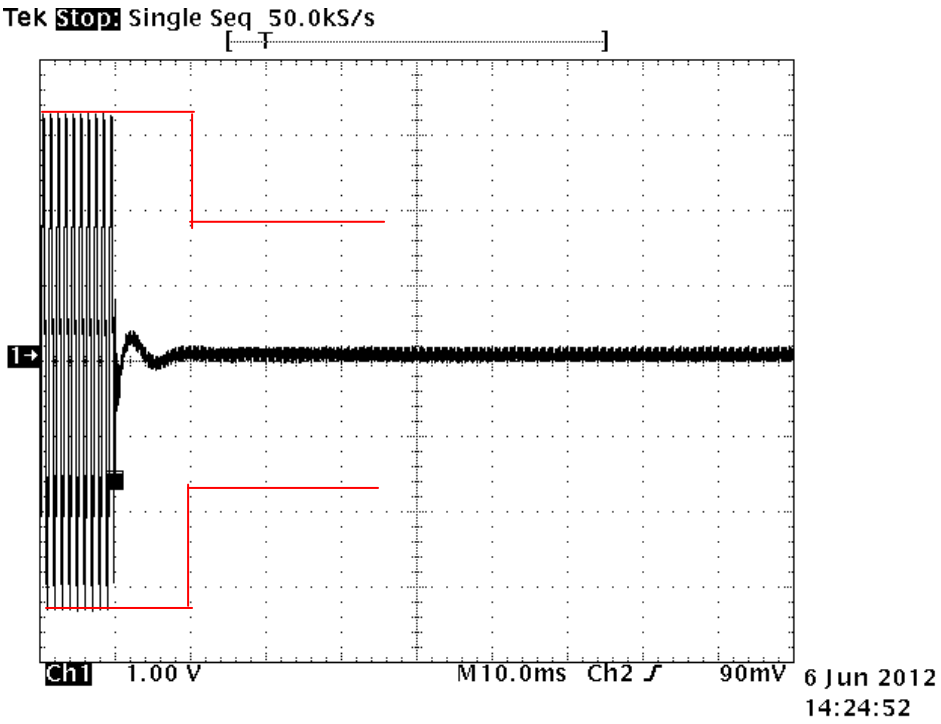
Channel Spacing = 12.5kHz



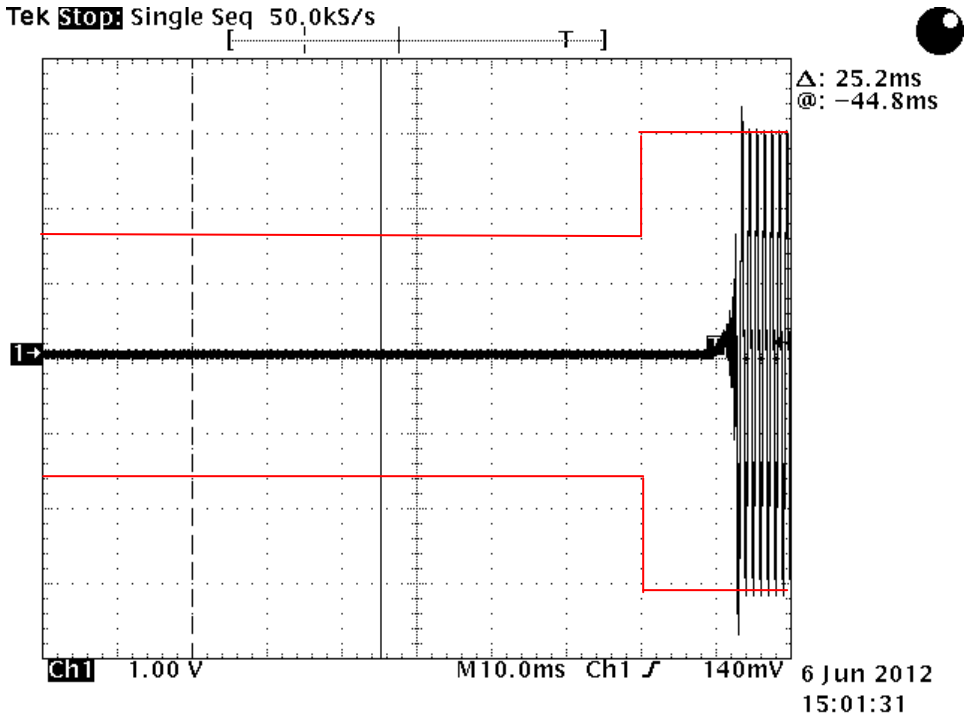
Channel		400.0125 MHz*	411.0 MHz	416.9875 MHz*	425.5 MHz	434.9875 MHz*
Time, t1 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Time, t2 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Time, t3 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Limits Clause	t1	10ms @ 12.5kHz				
	t2	25ms @ 6.25kHz				
	t3	10ms @ 12.5kHz				

Note * indicates this frequency is NOT applicable to FCC filing

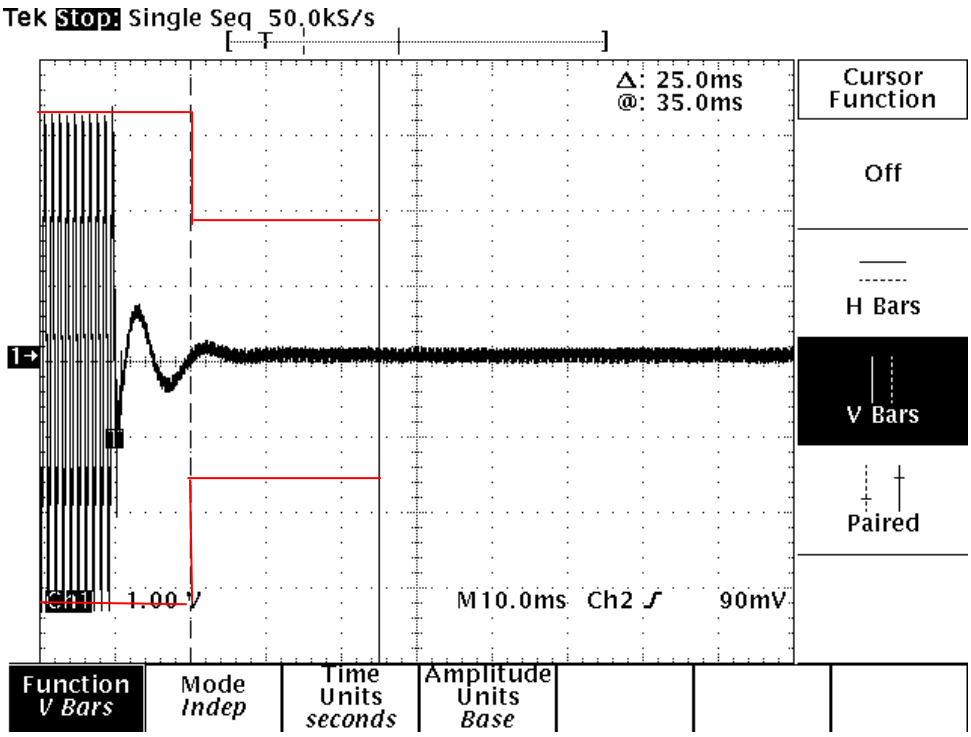
400.0125MHz Tx on 12.5kHz - This frequency is NOT applicable to FCC filing.



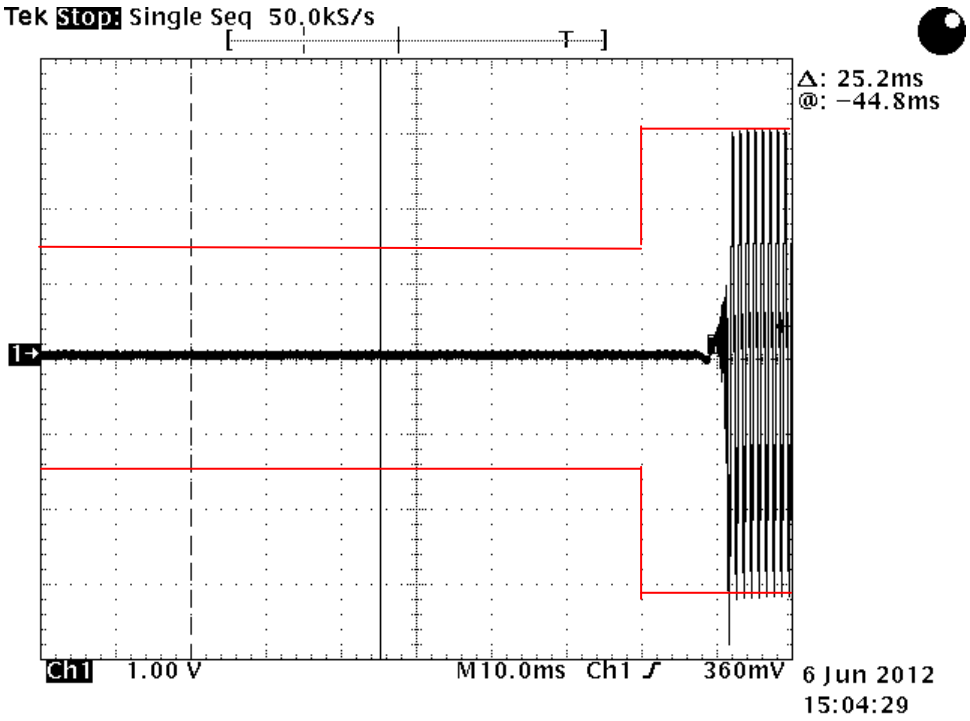
400.0125MHz Tx off 12.5kHz - This frequency is NOT applicable to FCC filing.



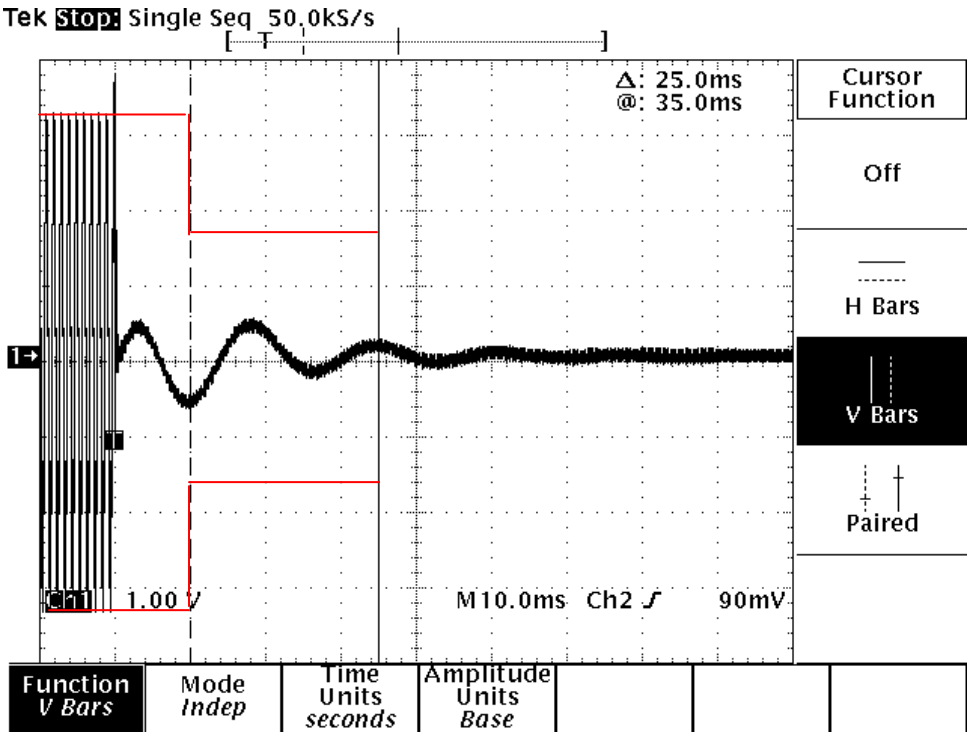
416.9875MHz Tx on 12.5kHz - This frequency is NOT applicable to FCC filing.



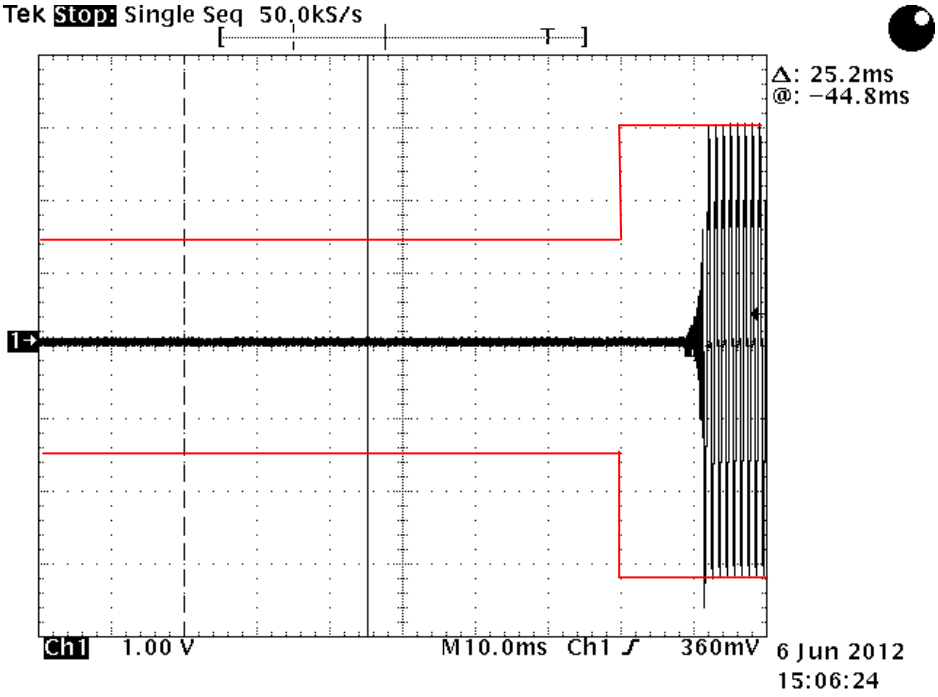
416.9875MHz Tx off 12.5kHz - This frequency is NOT applicable to FCC filing.



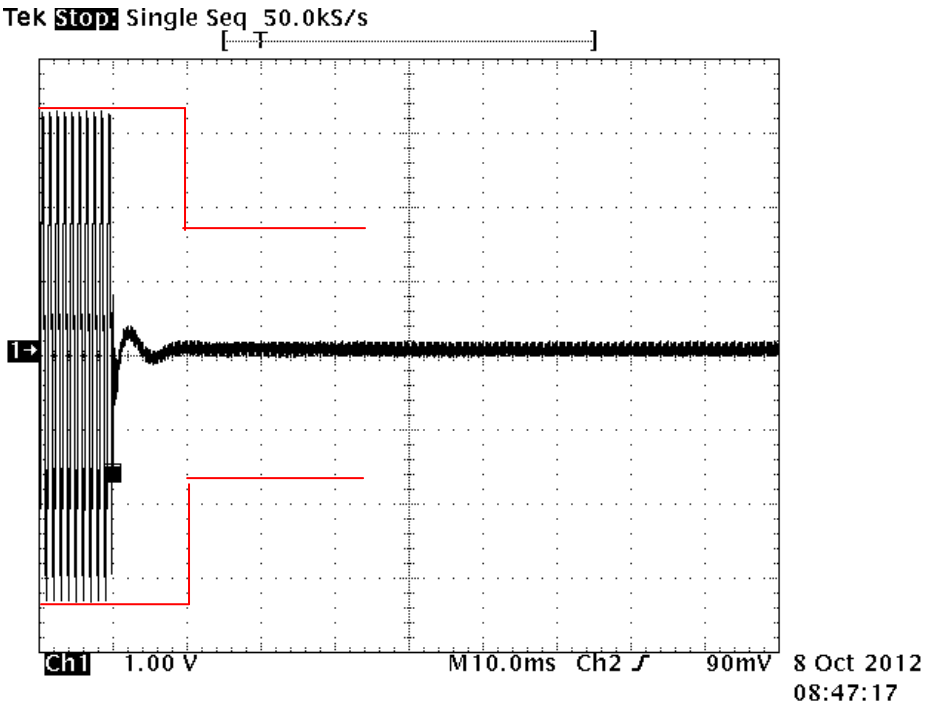
434.9875MHz Tx on 12.5kHz - This frequency is NOT applicable to FCC filing.



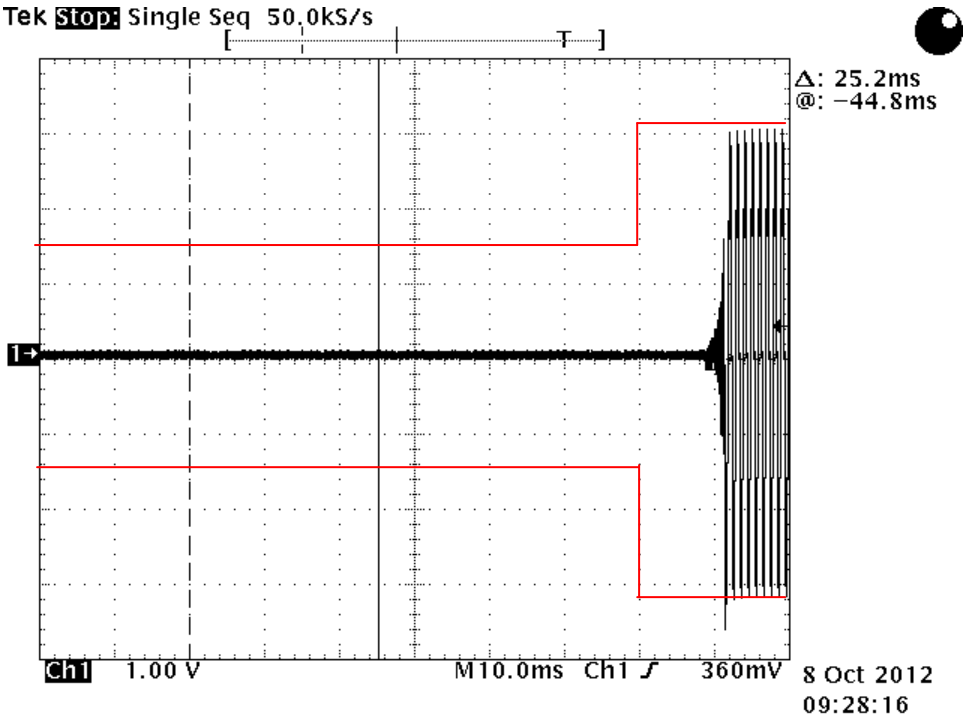
434.9875MHz Tx off 12.5kHz - This frequency is NOT applicable to FCC filing.



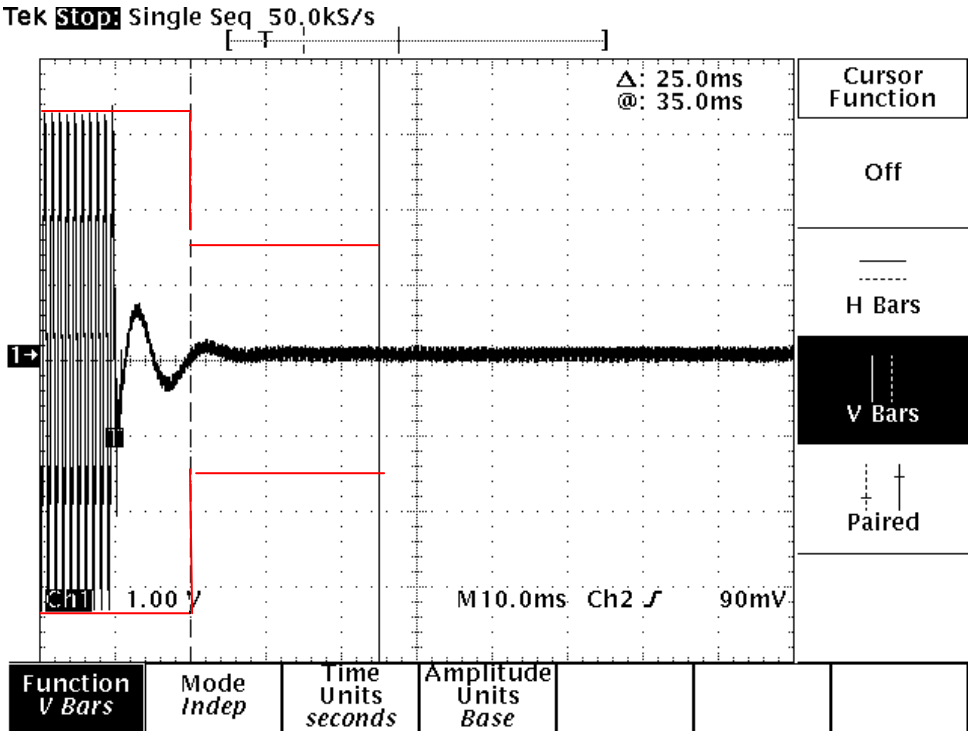
411.00MHz Tx on 12.5kHz



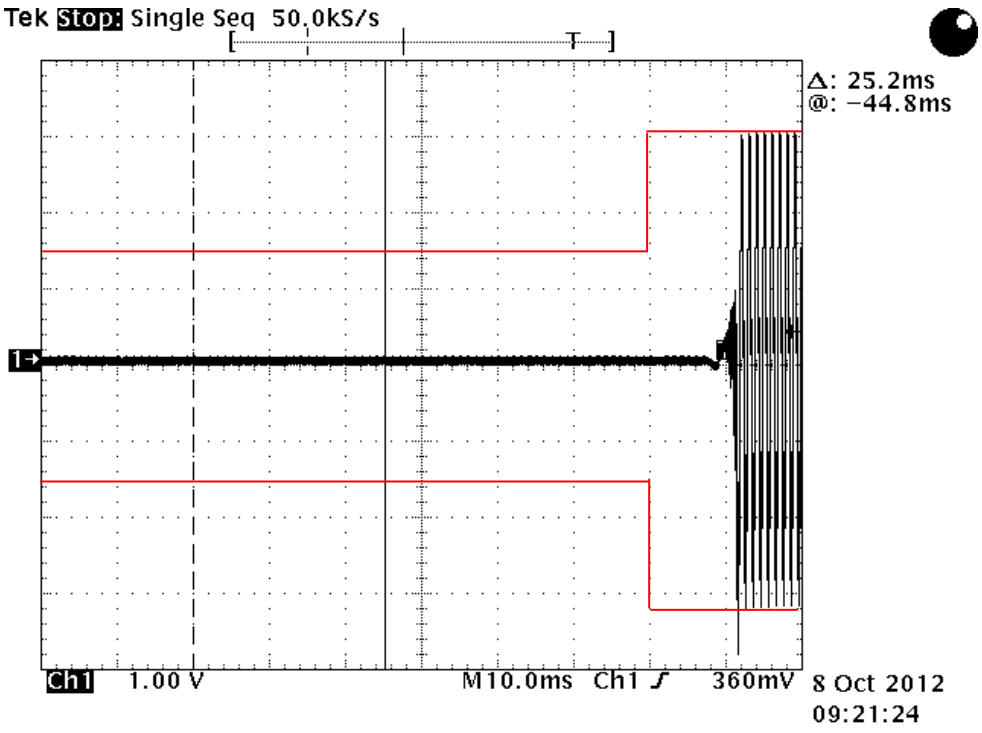
411.00MHz Tx off 12.5kHz



425.50MHz Tx on 12.5kHz



425.50MHz Tx off 12.5kHz



Transient frequency Behaviour: Part 90.214

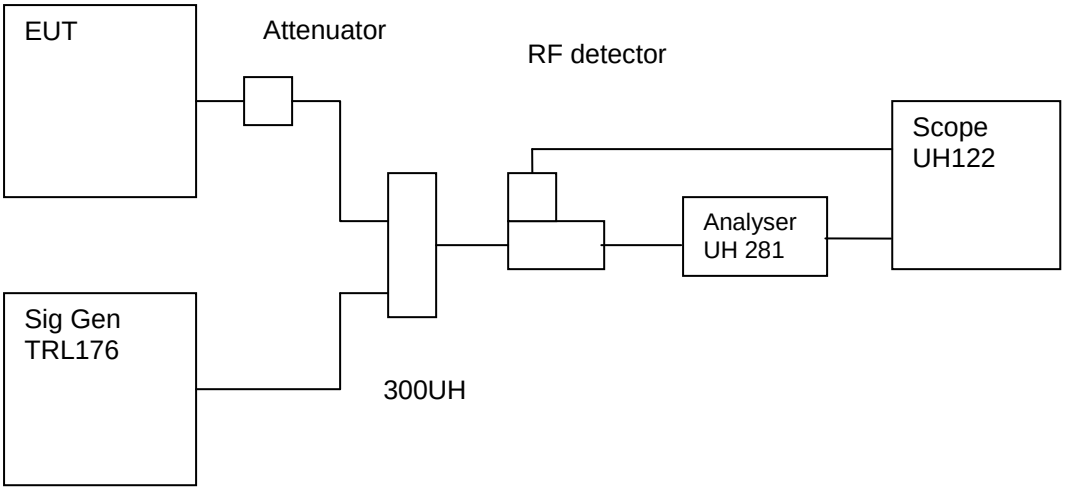
Tnom = 22°C

RHnom = 56%

Tx Pnom = 100W

Method

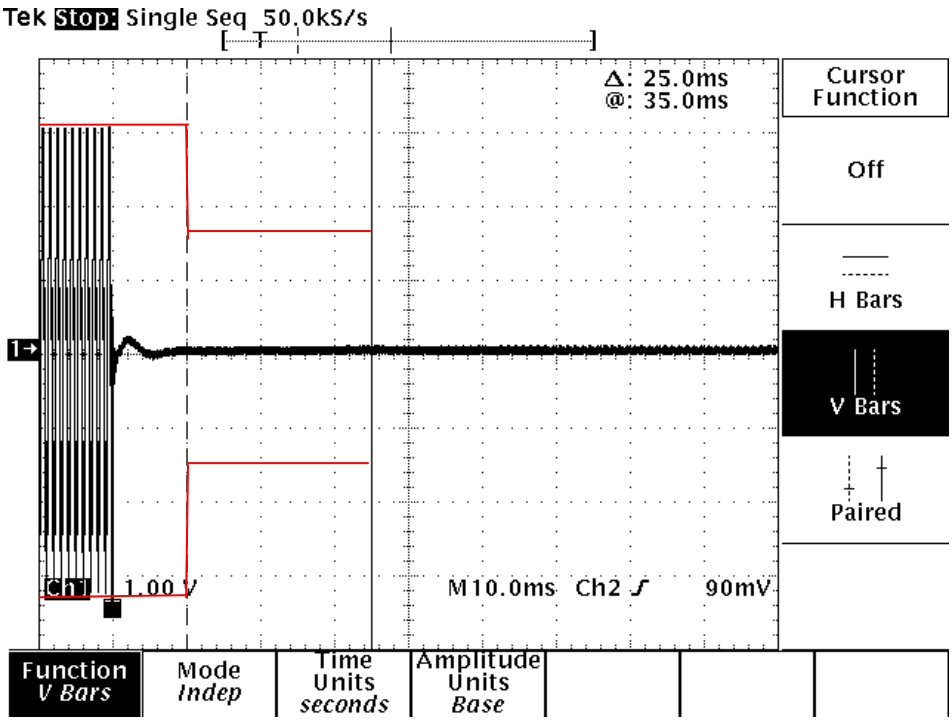
Channel Spacing = 25kHz



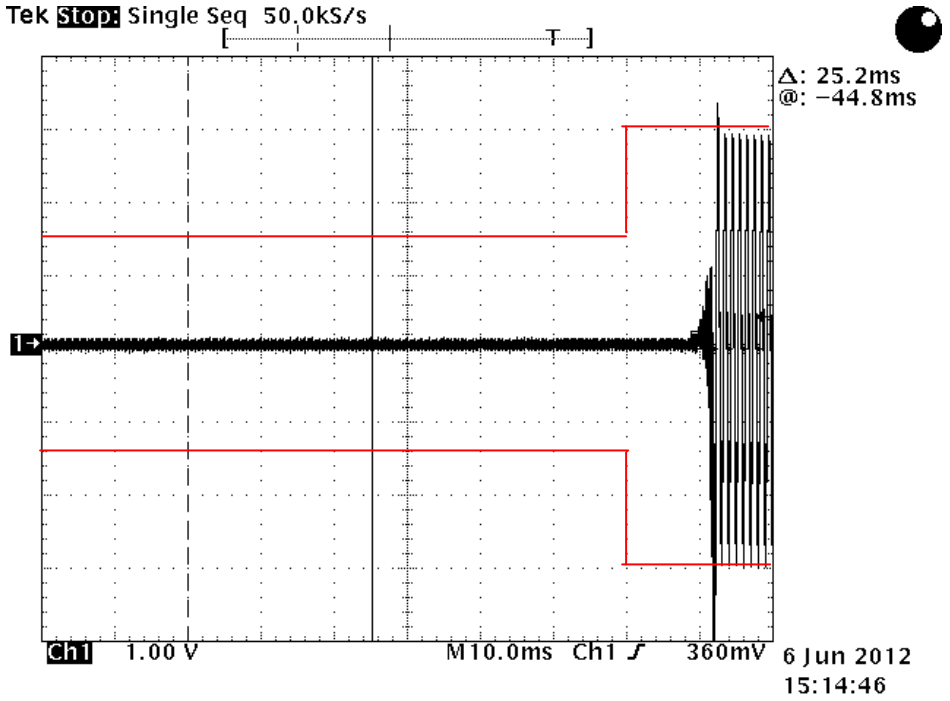
Channel		400.0125 MHz*	411.0 MHz	416.9875 MHz*	425.5 MHz	434.9875 MHz*
Time, t1 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Time, t2 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Time, t3 Transient Frequency		Compliant	Compliant	Compliant	Compliant	Compliant
Limits Clause	t1	10ms @ 25kHz				
	t2	25ms @ 12.5kHz				
	t3	10ms @ 25kHz				

Note * indicates this frequency is NOT applicable to FCC filing.

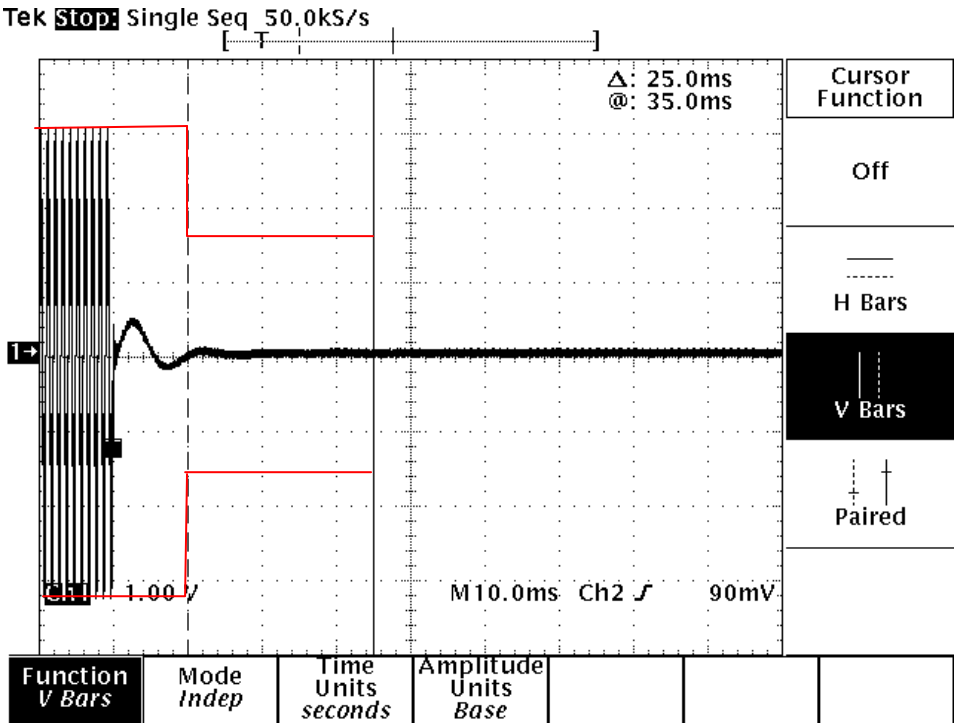
400.0125MHz Tx on 25kHz - This frequency is NOT applicable to FCC filing.



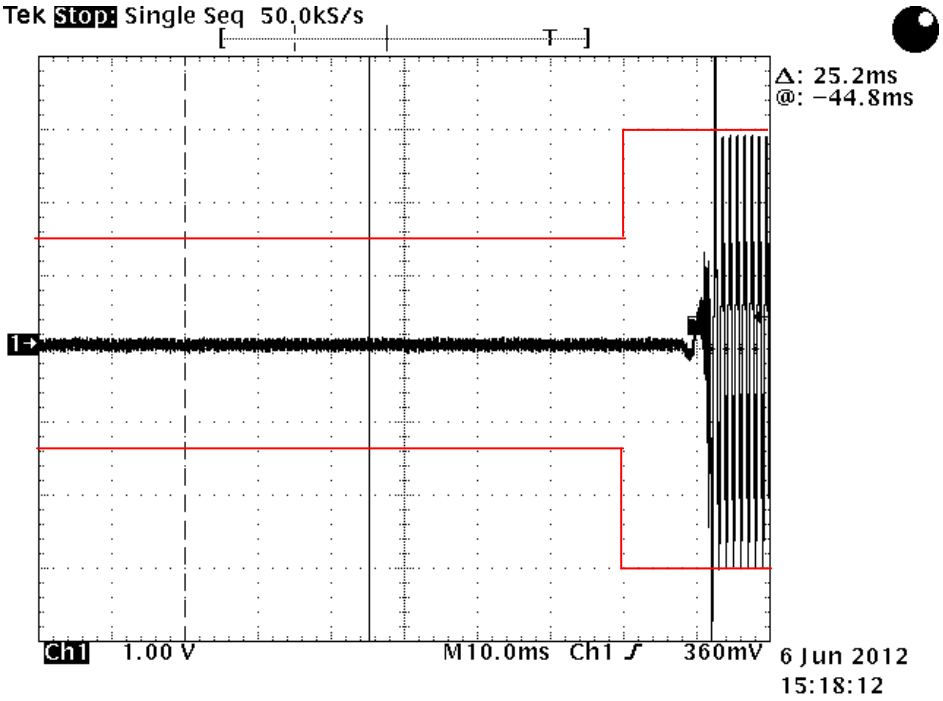
400.0125MHz Tx off 25kHz - This frequency is NOT applicable to FCC filing.



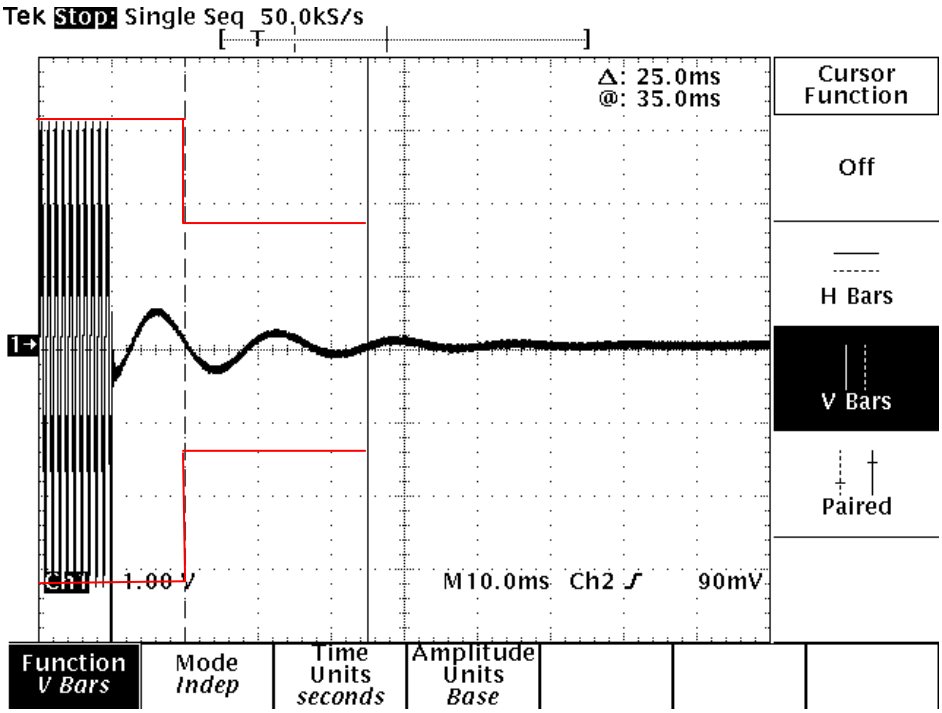
416.9875MHz Tx on 25kHz - This frequency is NOT applicable to FCC filing.



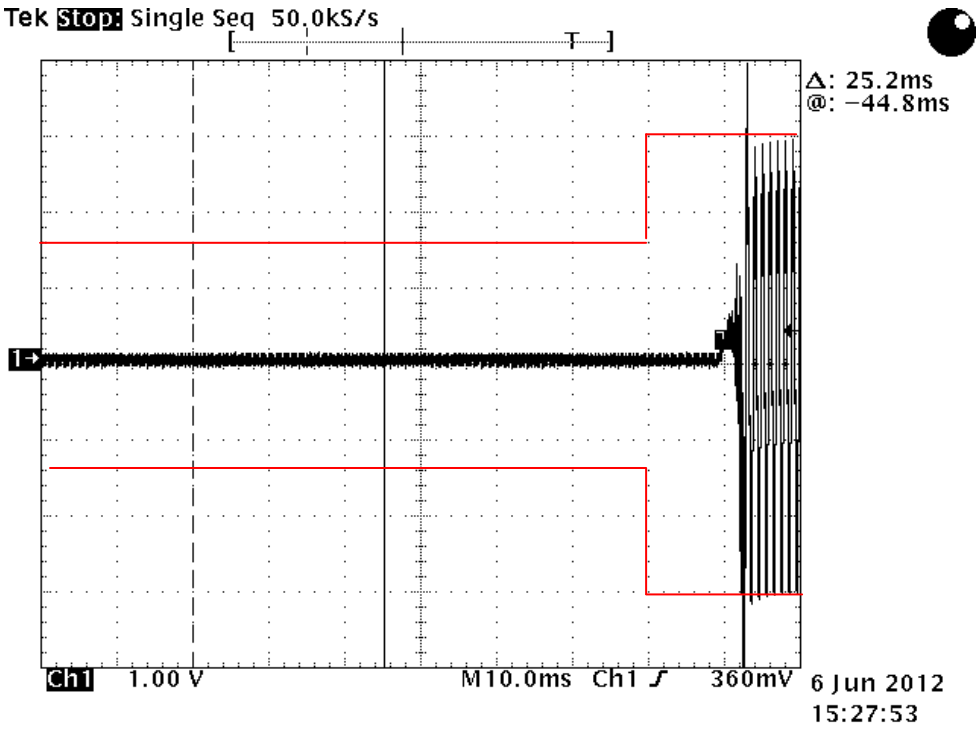
416.9875MHz Tx off 25kHz - This frequency is NOT applicable to FCC filing.



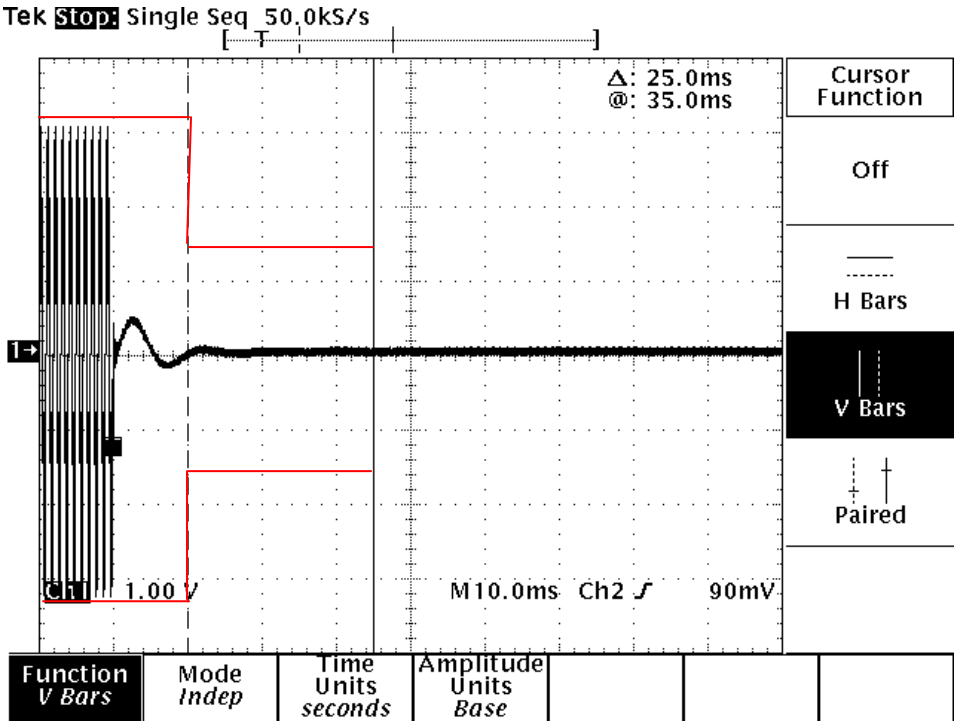
434.9875MHz Tx on 25kHz - This frequency is NOT applicable to FCC filing.



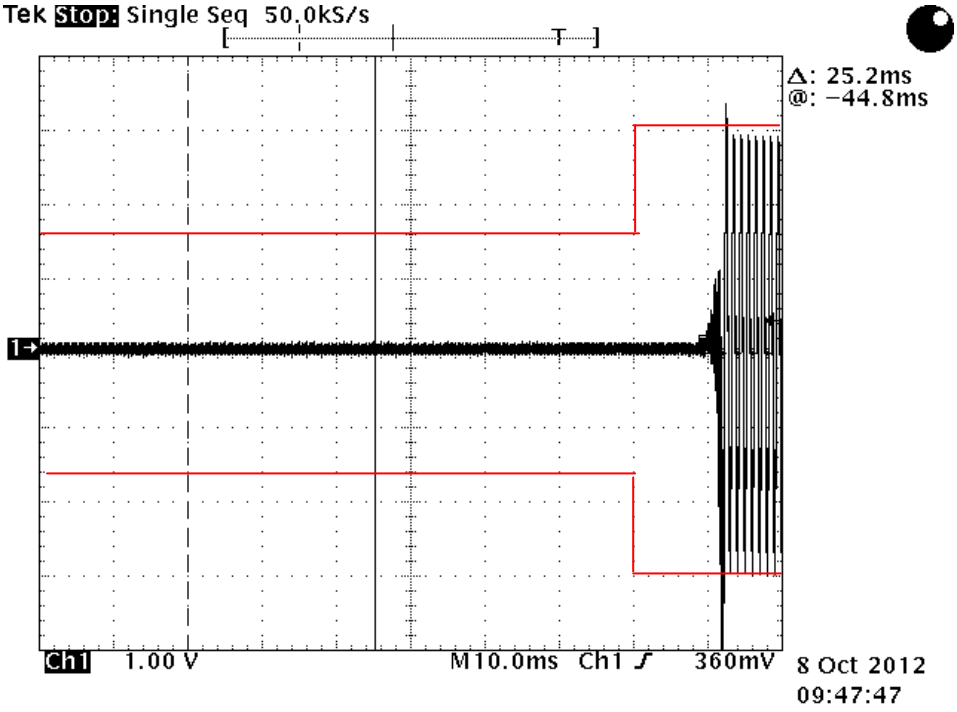
434.9875MHz Tx off 25kHz - This frequency is NOT applicable to FCC filing.



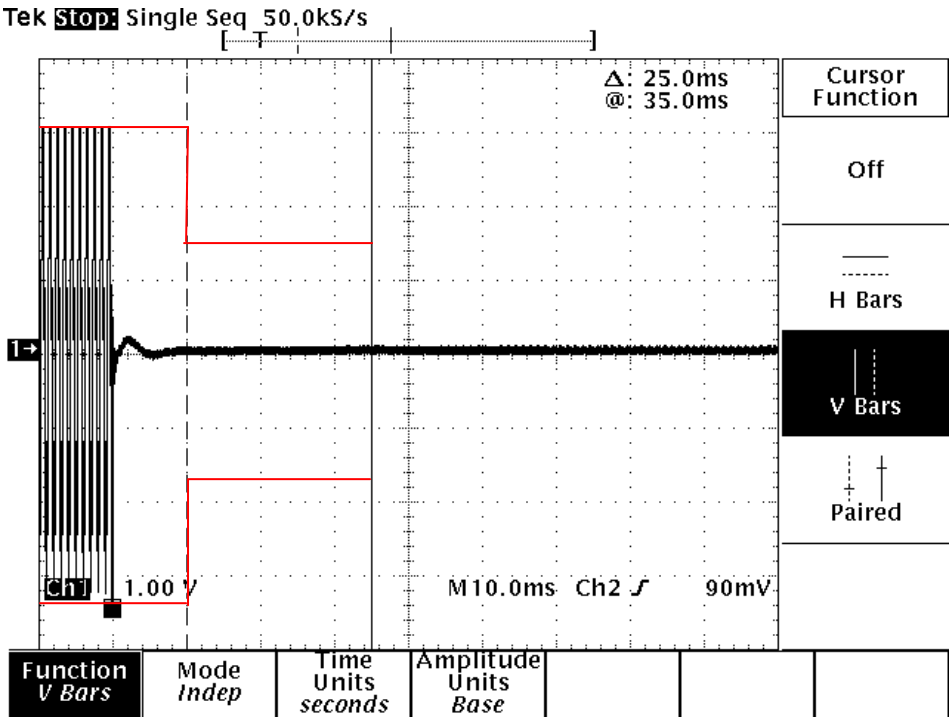
411.00MHz Tx on 25kHz



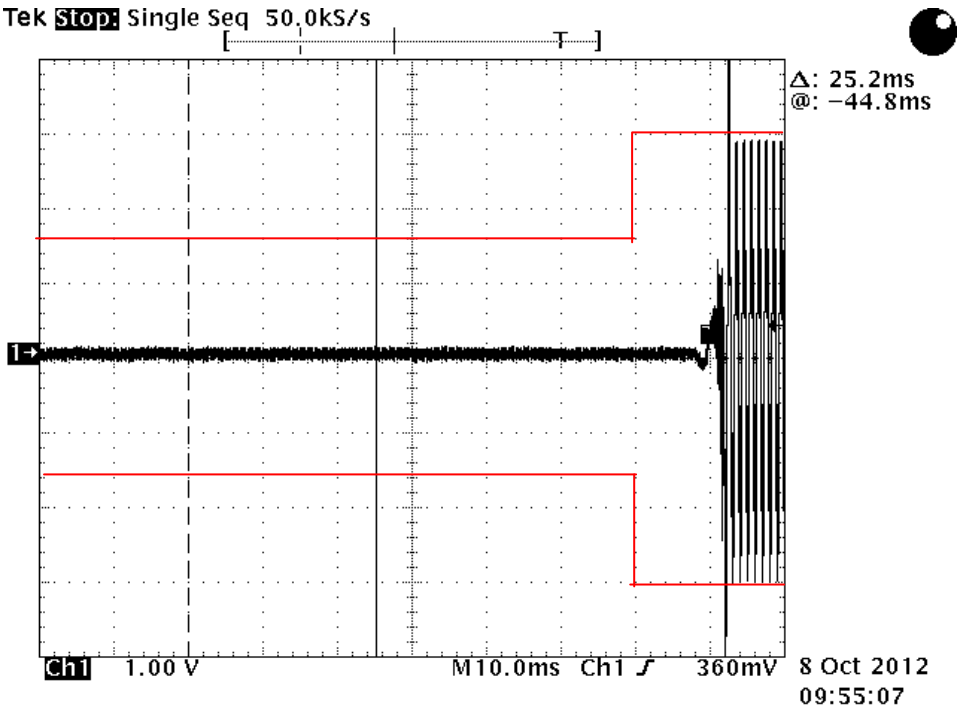
411.00MHz Tx off 25kHz



425.5MHz Tx on 25kHz



425.5MHz Tx off 25kHz

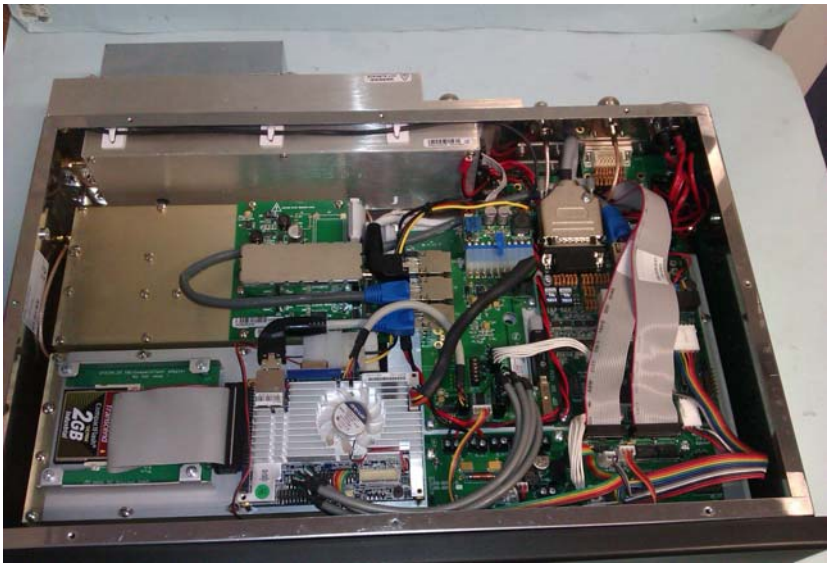


ANNEX A

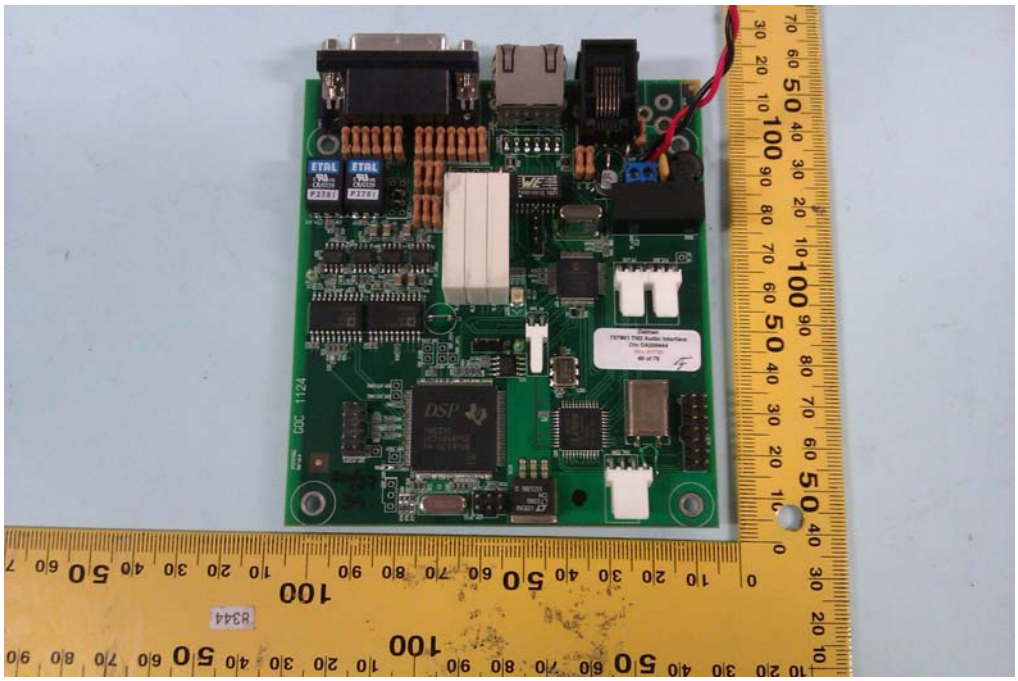
PHOTOGRAPHS

Photograph 1&2: Test Setup

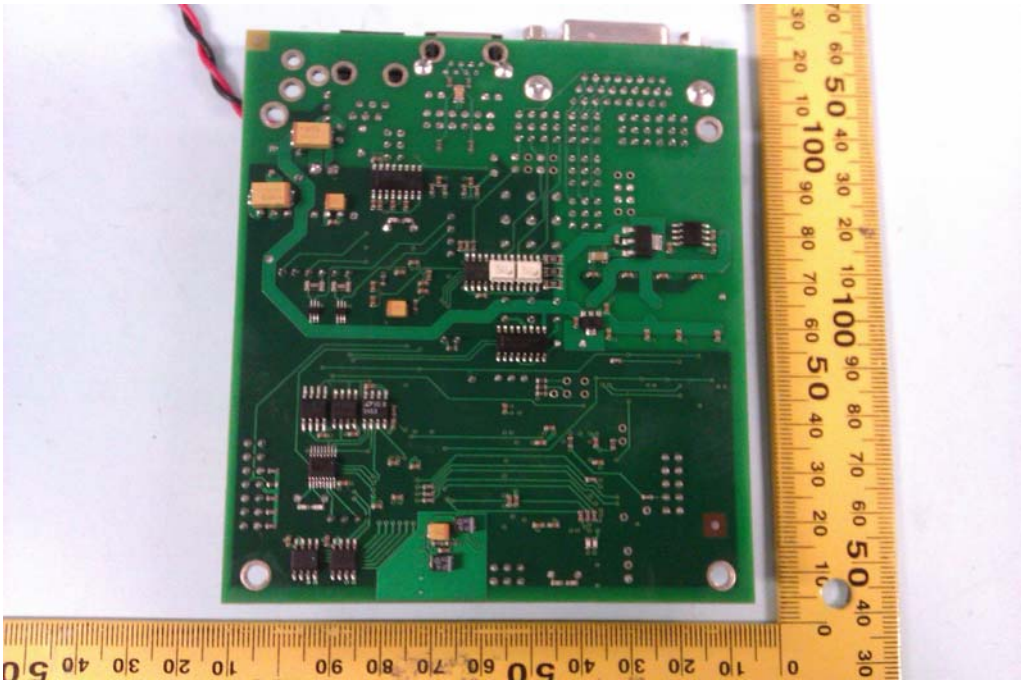
Photograph 3&4: Equipment overview



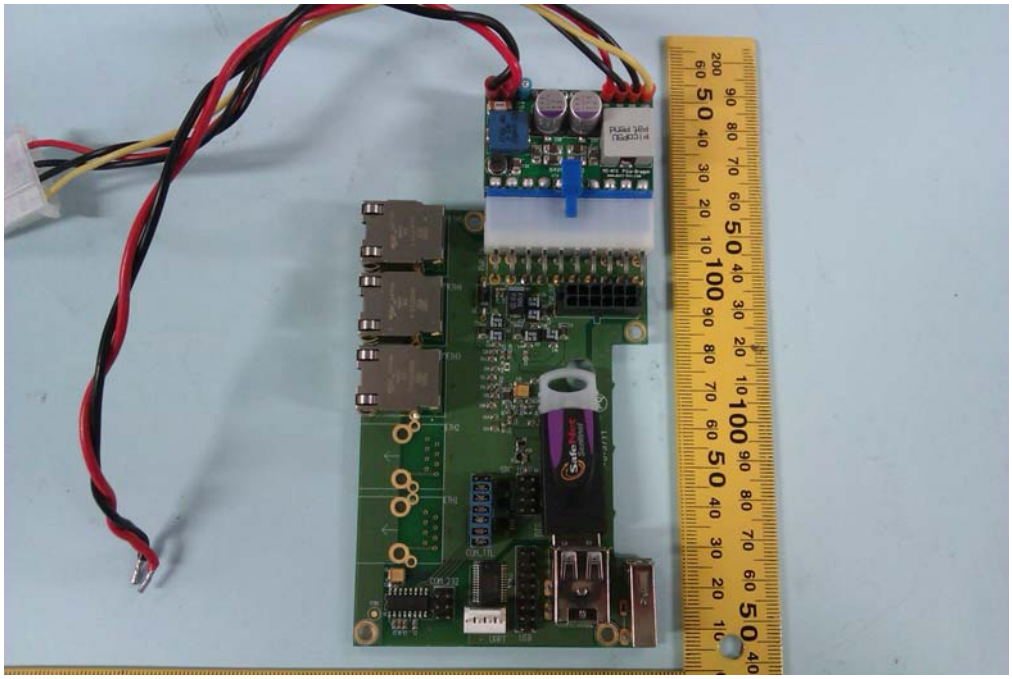
Photograph 5&6: Top View Main Audio PC



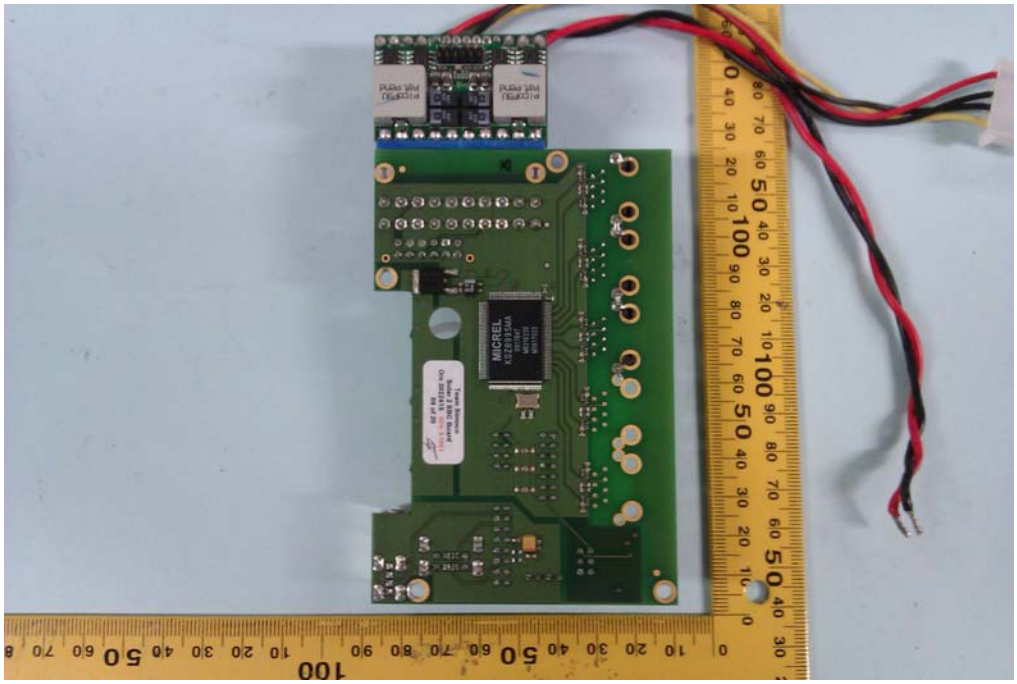
Underside view Main Audio PC



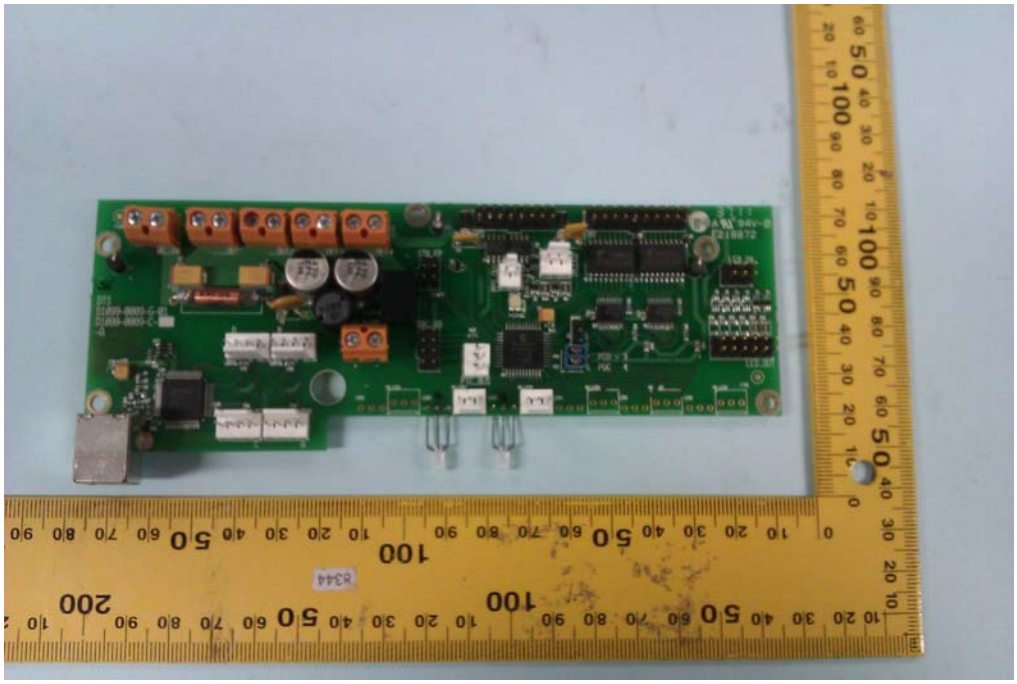
Photograph 7&8: Top View SBC Support PCB



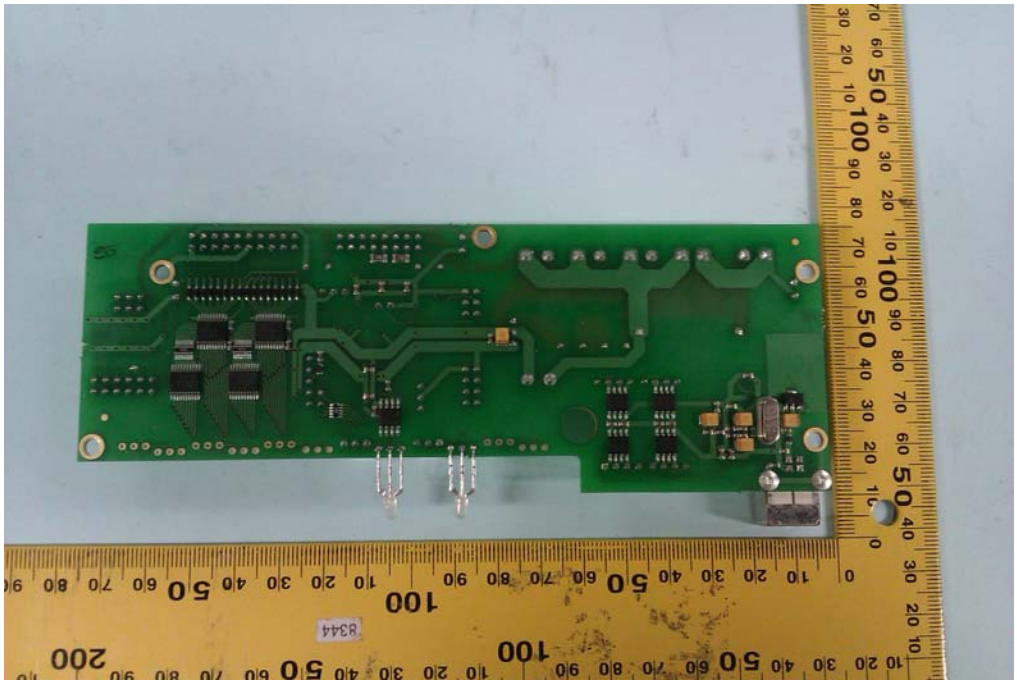
Underside view SBC Support PCB



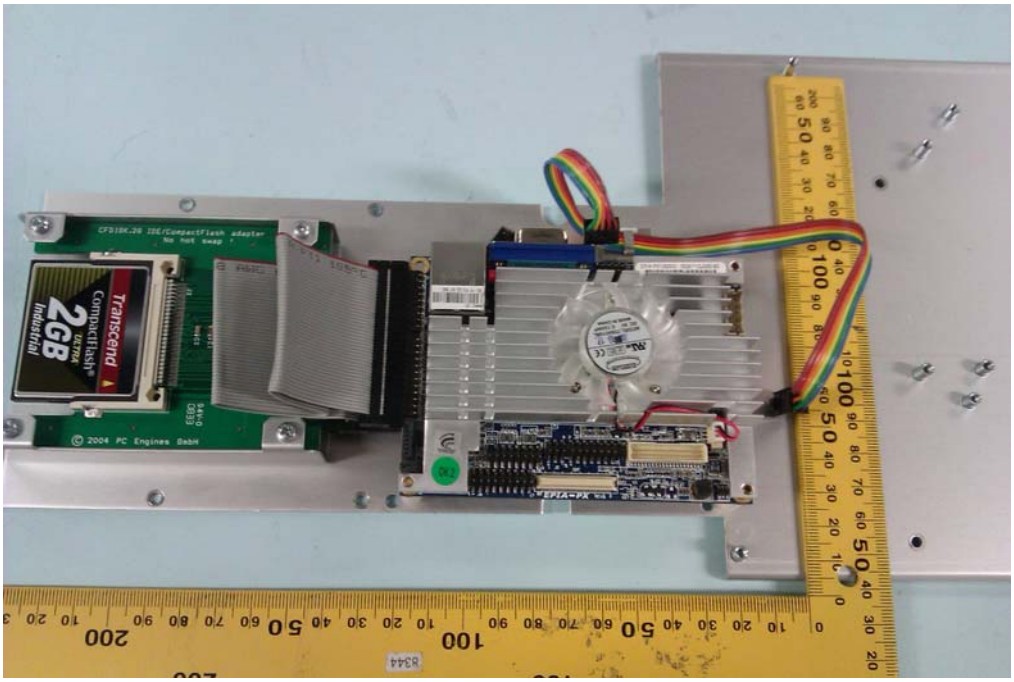
Photograph 9&10: Top View Aux PCB



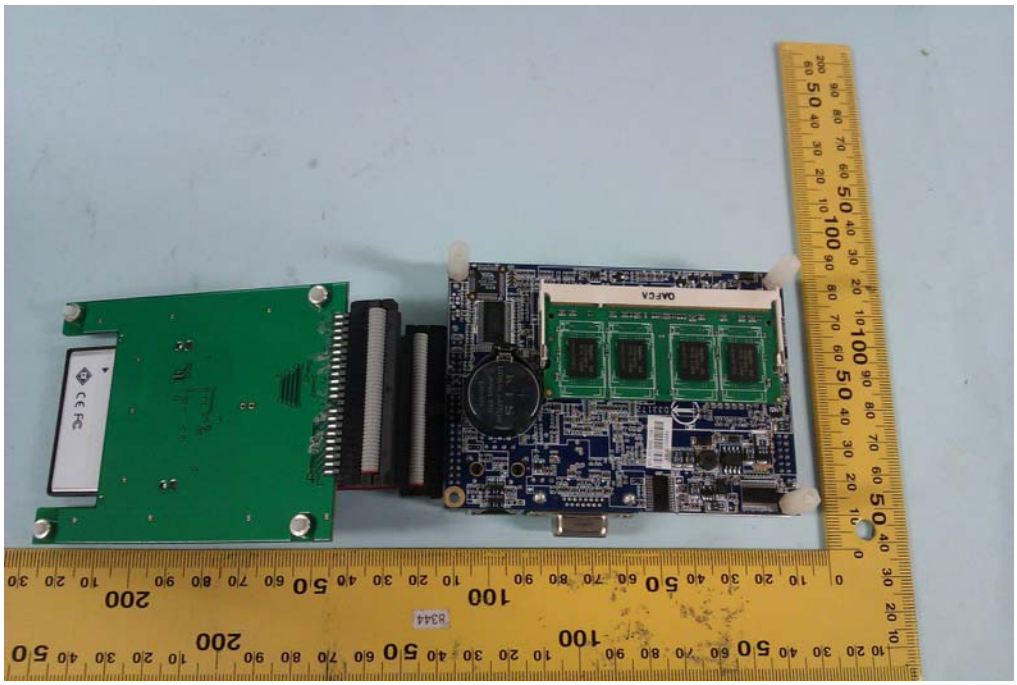
Underside view Aux PCB



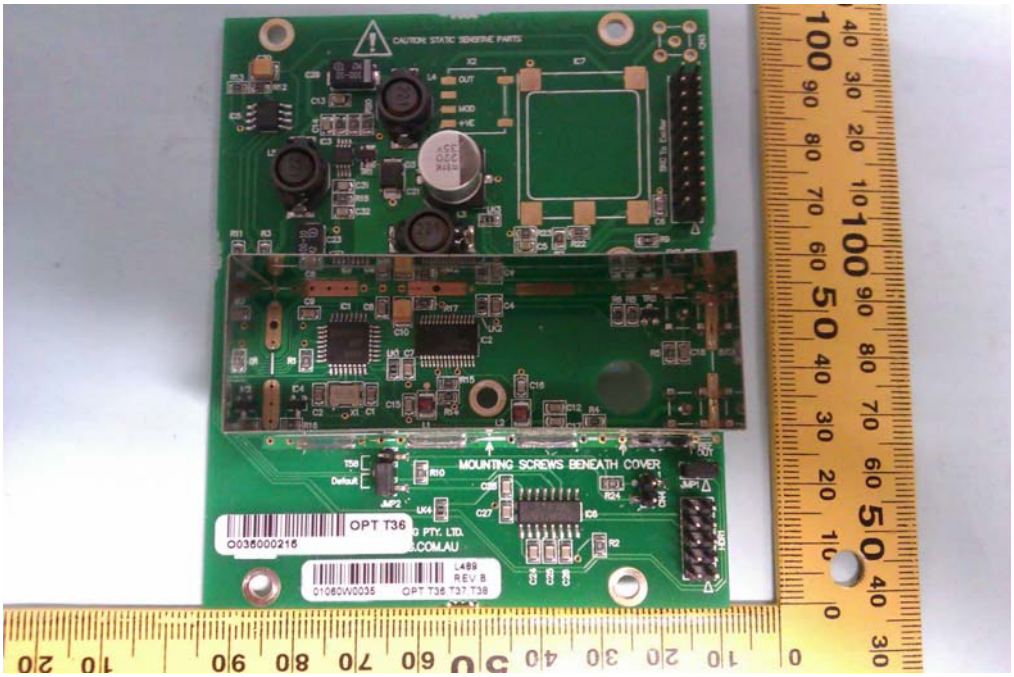
Photograph 11&12: Top View SBC



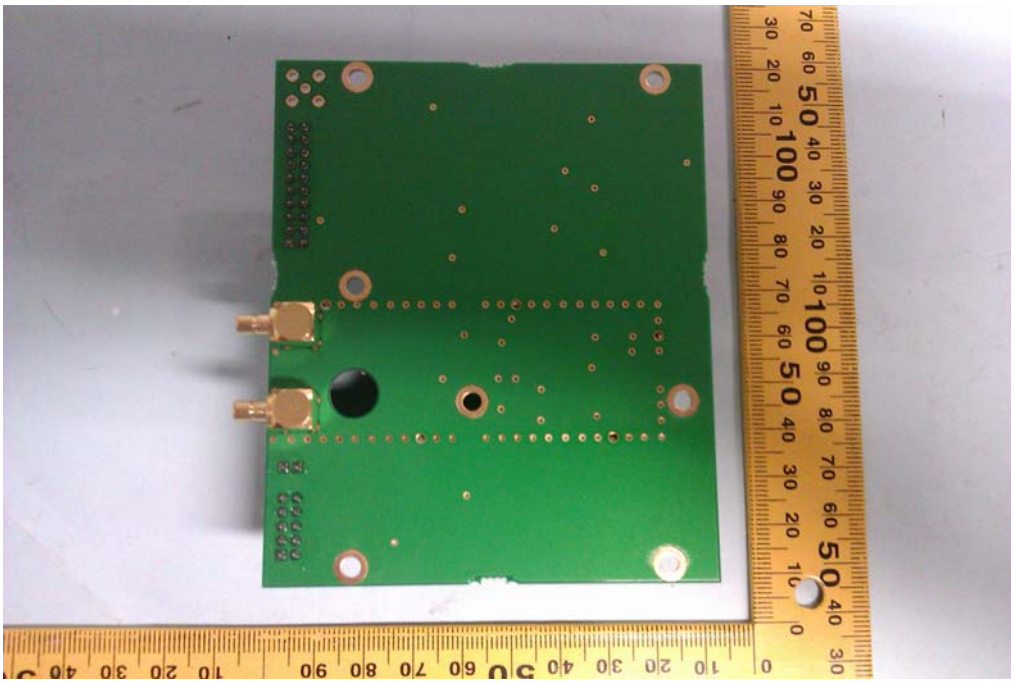
Underside view SBC



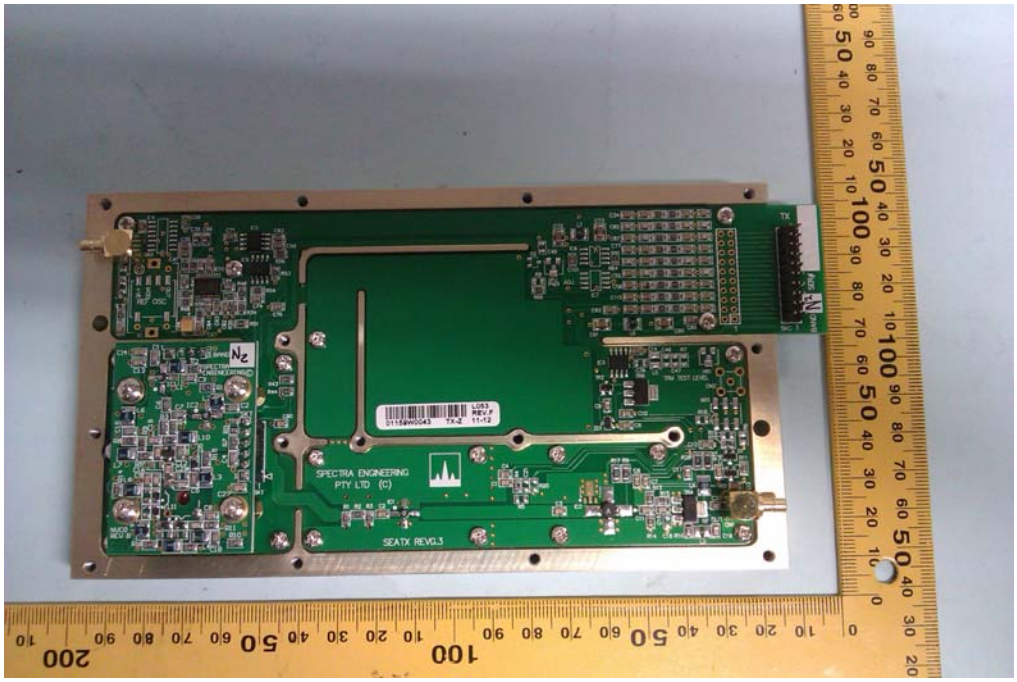
Photograph 13&14: Top View T36 Option PCB



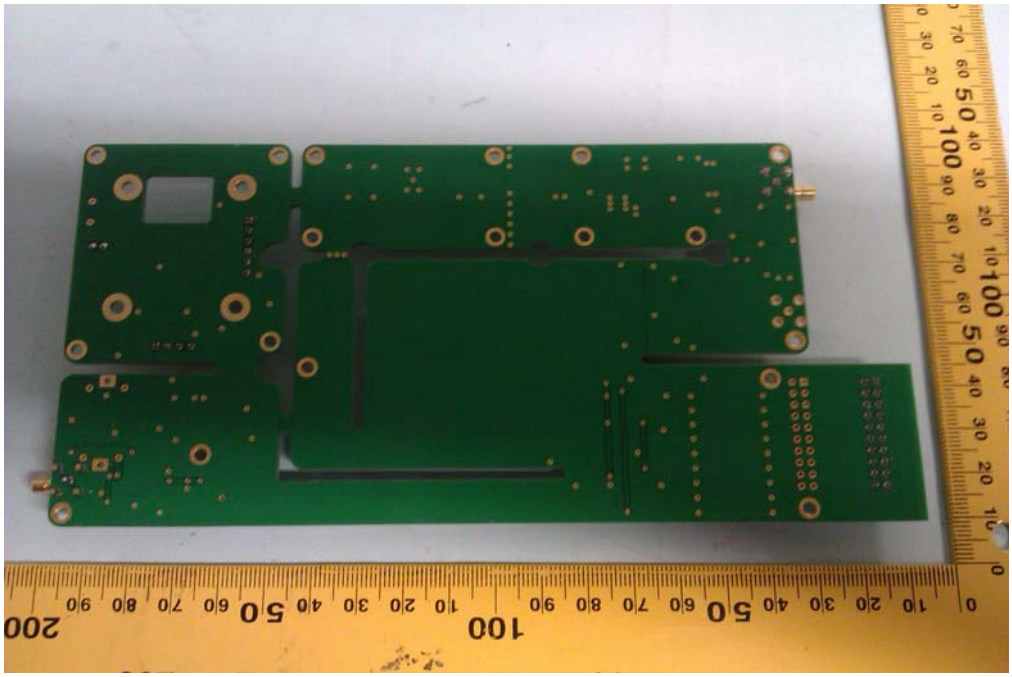
Underside view T36 Option PCB



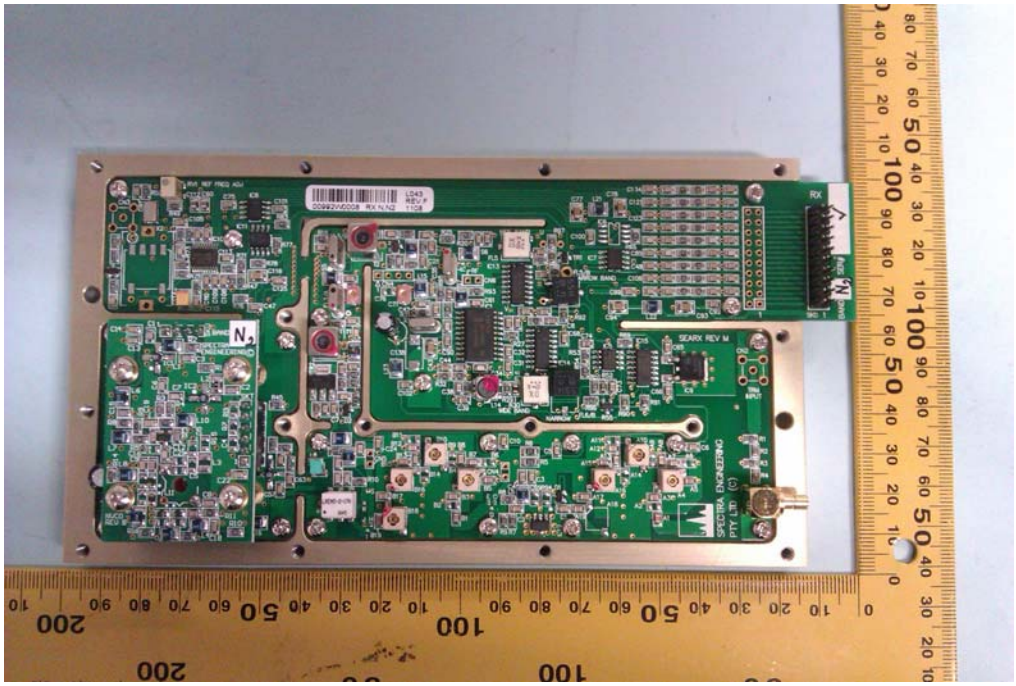
Photograph 15&16: Top View Tx'er exciter PCB



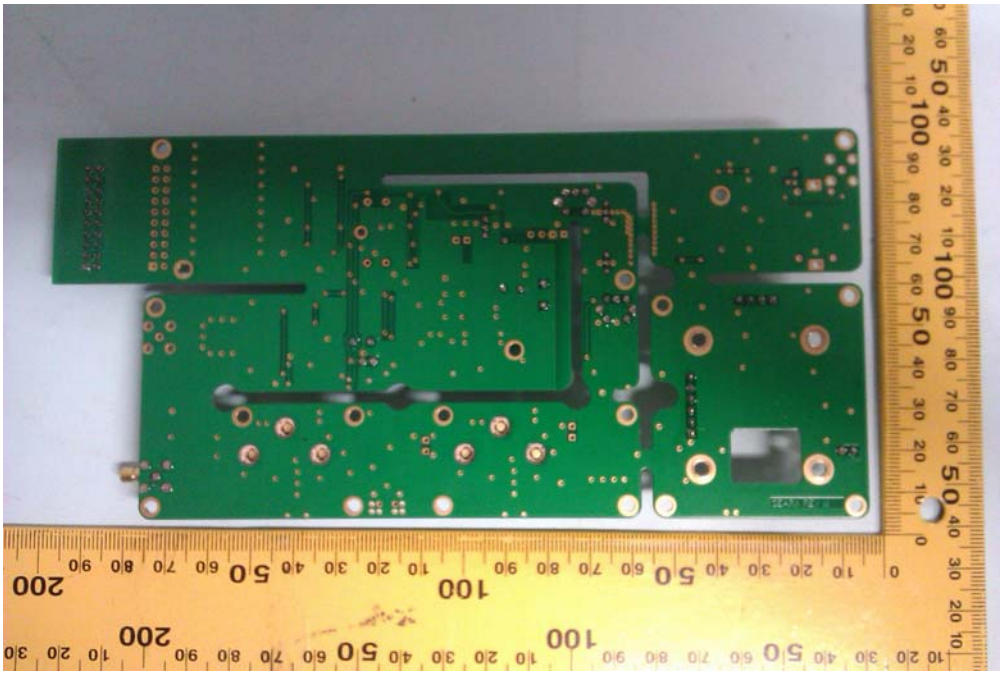
Underside view Tx'er exciter PCB



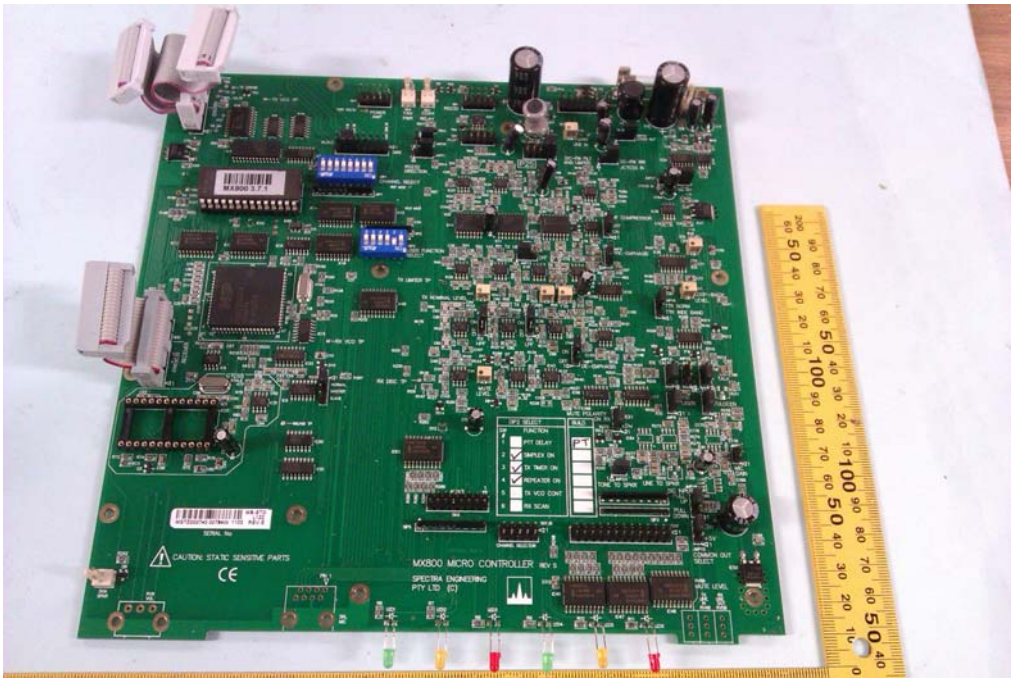
Photograph 17&18: Top View Rx'er PCB



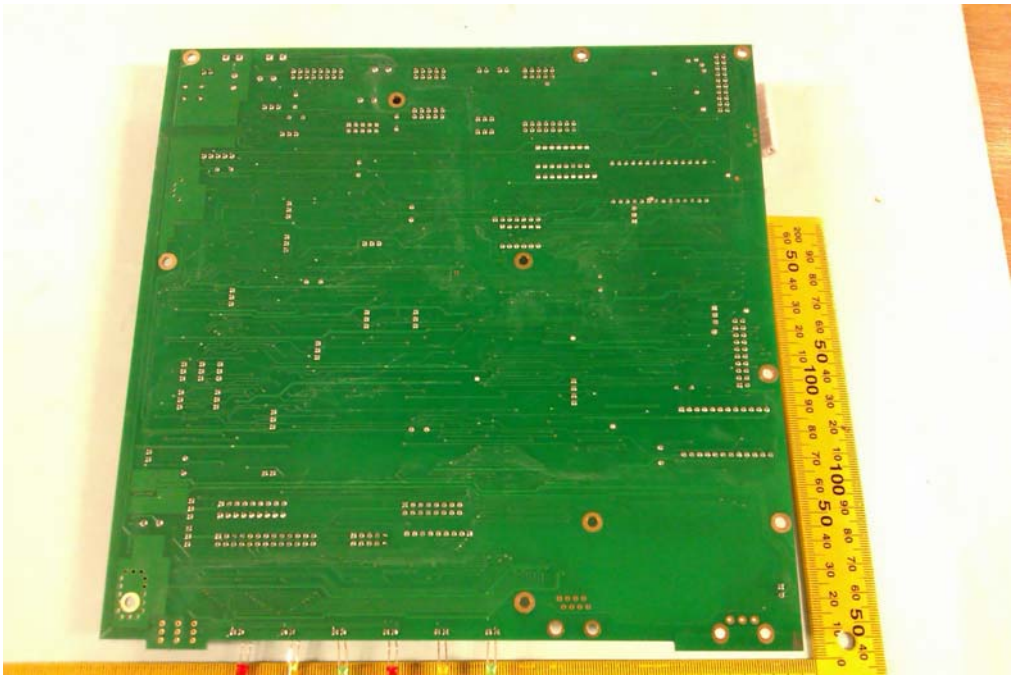
Underside view Rx'er PCB



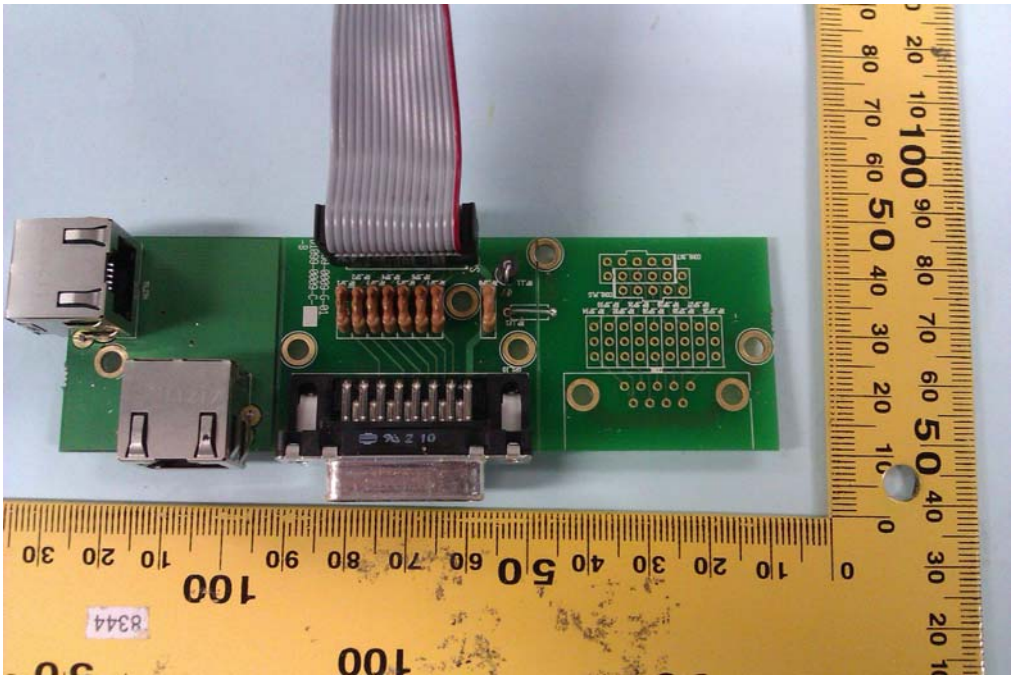
Photograph 19&20: Top View Controller PCB



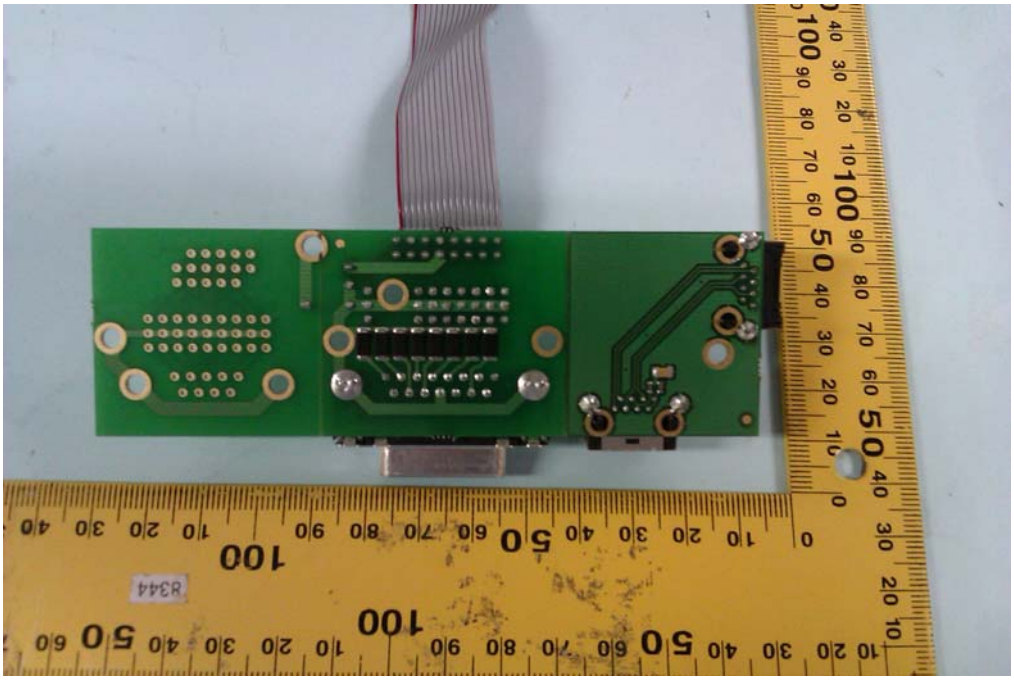
Underside view Controller PCB



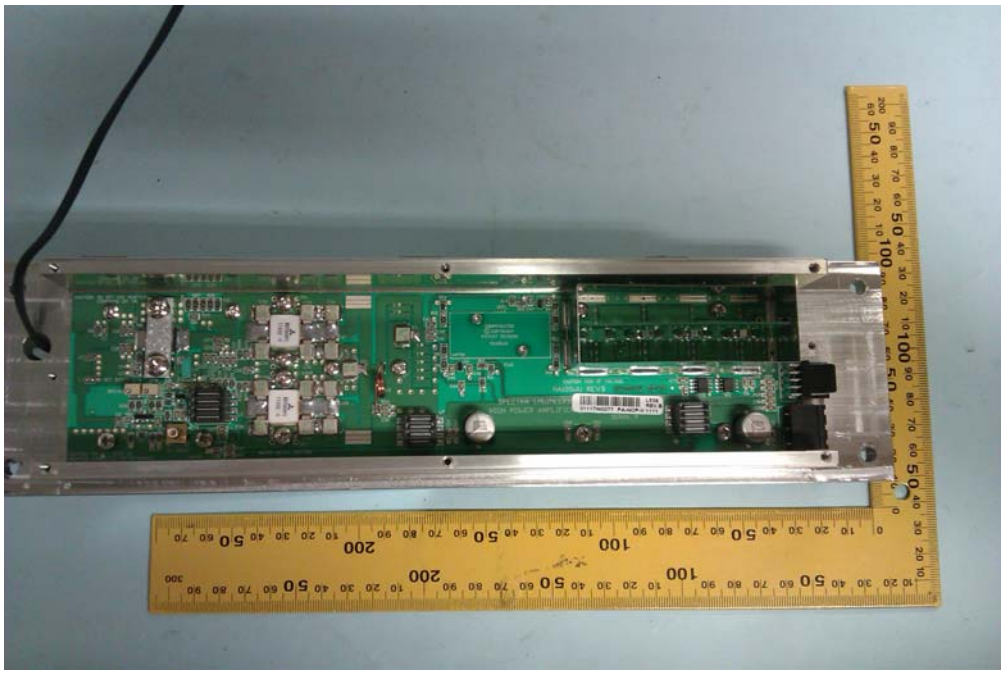
Photograph 21&22 Top View Digital I/O PCB



Underside view Digital I/O PCB



Photograph 23: Top View 100W P. A. PCB



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[ ]
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		[ ]
e.	LABELLING	-	PHOTOGRAPHS	[ ]
		-	DECLARATION	[ ]
		-	DRAWINGS	[ ]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
i.	COMPONENT LOCATION	-	Tx	[ ]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
j.	PCB TRACK LAYOUT	-	Tx	[ ]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

ANNEX C

EQUIPMENT CALIBRATION

TRAC Ref	Type	Description	Manufacturer	Date Calibrated.
TRL281	FSU46	Spectrum Analyser	Rhode & Schwarz	09/02/2011
TRL139	3115	Horn Antenna	EMCO	14/09/2011
TRL572	8449B	Pre amp	Agilent	20/04/2011
TRLUH04	ESVS10	Receiver	Rhode & Schwarz	12/01/2012
TRLUH93	CBL6112B	Antenna	Chase	20/06/2011
TRL222	8304-100-N	ATTENUATOR	BIRD	Cal In Use
TRLUH225	745357	ATTENUATOR	SPINNER	Cal In Use
REF916	SMBV100A	Signal Generator	Rhode & Schwarz	Level checked as required
TRL426	52 Series 11	Temperature Indicator	Fluke	04/03/2011
TRL11	-	Environmental Chamber	Sharetree	USE TRL426
TRLUH41	M3004	Multimeter	AVOmeter	04/03/2011
TRLUH194	AP60/50	Power Supply	Farnell	USE TRLUH41
TRLUH265	TTR-375-3EE	NOTCH FILTER	TELONIC BERLELEY	Cal In Use
TRLUH122	TDS 520B	Scope	Tektronix	11/04/2012
TRL05	CMTA 52	Radio Communications Analyser	Rhode & Schwarz	19/03/2012

ANNEX D

MEASUREMENT UNCERTAINTY

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result (Power Meter) = **1.08dB**
Uncertainty in test result (Spectrum Analyser) = **2.48dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.71dB**

[4] Spurious Emissions

Uncertainty in test result = **4.75dB**

[5] Maximum frequency error

Uncertainty in test result (Power Meter) = **0.113ppm**
Uncertainty in test result (Spectrum Analyser) = **0.265ppm**

[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**,
Uncertainty in test result (30MHz – 1GHz) = **4.6dB**,
Uncertainty in test result (1GHz – 18GHz) = **4.7dB**

[7] Frequency deviation

Uncertainty in test result = **3.2%**

[8] Magnetic Field Emissions

Uncertainty in test result = **2.3dB**

[9] Conducted Spurious

Uncertainty in test result – Up to 8.1GHz = **3.31dB**
Uncertainty in test result – 8.1GHz – 15.3GHz = **4.43dB**
Uncertainty in test result – 15.3GHz – 21GHz = **5.34dB**
Uncertainty in test result – Up to 26GHz = **3.14dB**

[10] Channel Bandwidth

Uncertainty in test result = **15.5%**

[11] Amplitude and Time Measurement – Oscilloscope

Uncertainty in overall test level = **2.1dB**,
Uncertainty in time measurement = **0.59%,**
Uncertainty in Amplitude measurement = **0.82%**

[12] Power Line Conduction

Uncertainty in test result = **3.4dB**

[13] Spectrum Mask Measurements

Uncertainty in test result = **2.59% (frequency)**
Uncertainty in test result = **1.32dB (amplitude)**

[14] Adjacent Sub Band Selectivity

Uncertainty in test result = **1.24dB**

[15] Receiver Blocking – Listen Mode, Radiated

Uncertainty in test result = **3.42dB**

[16] Receiver Blocking – Talk Mode, Radiated

Uncertainty in test result = **3.36dB**

[17] Receiver Blocking – Talk Mode, Conducted

Uncertainty in test result = **1.24dB**

[18] Receiver Threshold

Uncertainty in test result = **3.23dB**

[19] Transmission Time Measurement

Uncertainty in test result = **7.98%**

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