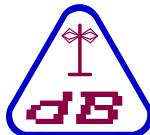


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**dB Technology**  
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## REPORT ON ELECTROMAGNETIC COMPATIBILITY TESTS

**Performed at:  
TWENTY PENCE TEST SITE**

**Twenty Pence Road,  
Cottenham,  
Cambridge  
U.K.  
CB24 8PS**

**on**

**3T Communications AG**

**SOLO-45X**

**dated**

**24th October 2012**

### Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	05/11/12		Initial release		

Based on report template:  
v090319

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X	
Test No: T4510		Test Report	Page: 2 of 79

Equipment Under Test (EUT): SOLO-45X

Test Commissioned by: 3T Communications AG  
Geyschlägergasse 14  
1150 Wien  
Austria

Representative: Ian Doggett

Test Started: 2nd October 2012

Test Completed: 11th October 2012

Test Engineer: Dave Smith

Date of Report: 24th October 2012

Written by: Dave Smith Checked by: Derek Barlow

Signature: 

Signature: 

Date: 24th October 2012 Date: 5th November 2012

**dB Technology can only report on the specific unit(s) tested at its site. The responsibility for extrapolating this data to a product line lies solely with the manufacturer.**

## Test Standards Applied

**Part 90  
of  
CFR47** *Private Land Mobile Radio Services*

**CFR 47 Part 15** *Code of Federal Regulations: Pt 15 Subpart B- Radio Frequency Devices - Unintentional Radiators*

**This Report shows that the EUT met all of the requirements for the tests performed - as shown on next page.**

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	Issue No: 1	Test Report			

## Emissions Test Results Summary

### Part 90

Test	Port	Method	Limit	PASS/FAIL	PASS Notes
Output Power Radiated		90.205	90.205(h)	N/T	#1
Output Power Conducted	antenna	90.205 2.1046	90.205(h)	Details Recorded	
Types of Emissions	antenna	90.207 2.1047	Specified by manufacturer		
Bandwidth	antenna	90.209 2.1049	90.209(b)(5)	PASS	#2
Emissions Masks Radiated		90.210 2.1051	90.221(d)	PASS	#3,#4
Emissions Masks Conducted	antenna	90.210 2.1051	90.221(d)	PASS	#3
Frequency Stability	antenna	90.213 2.1055	90.213	PASS	
Frequency Transient Behaviour	antenna	90.214	90.214	PASS	
Adjacent Channel Power		90.221	90.221(b)	PASS	

### CFR 47 Part 15

Test	Port	Method	Limit	PASS/FAIL	PASS Notes
Conducted Emissions	ac power	ANSI C63.4:2003	FCC_A	PASS	#5
Conducted Emissions Antenna	antenna	ANSI C63.4:2003	2nW	PASS	#6
Radiated Emissions		ANSI C63.4:2003	FCC_A	PASS	#5

- #1 Not tested - a conducted antenna measurement was performed instead.
- #2 The additional note 6 of FCC Waiver 11-63 was applied which allows a bandwidth of up to 22kHz providing the additional Adjacent Channel Power requirements are met.
- #3 The additional note 5 of FCC Waiver 11-63 was applied which only stipulates limits 75kHz from the carrier providing the additional Adjacent Channel Power requirements are met.
- #4 Tested with 50R load on antenna port. (Conducted antenna measurements were also performed.)
- #5 In normal operation the device does not have a receive only mode - it is always transmitting and so the limits of Part 90 would always apply. For the purposes of information, radiated tests were additionally performed with "special software" which disabled the transmitter and the limits for a class A digital device applied (because the device is never used in a domestic environment.)
- #6 As stated in the previous note, these measurements were provided for information only. In normal use the device is always in transmit mode where the transmit limits of FCC Part 90 would apply.

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## 1 EUT Details

### 1.1 General

The EUT was a TETRA Voice + Data Base Station.

The device operates over the following frequency band: 450MHz to 470MHz.

To allow duplex operation with a single antenna the device is used with various duplexers and receive filters. For the purposes of the tests described in this report the following were used.

Transmit mode tests:

Transmit @450, Rx @455  
 Transmit @460, Rx @465  
 Transmit @470, Rx @465

Receiver/standby mode tests:

Transmit @455, Rx @460 (*for this combination, "special software" was used to turn off the transmitter - in normal use the transmitter is always on*)

The nominal output power is 44dBm (25W). The unit is normally powered from ac mains.

The product is intended to comply with the FCC part 90 requirements using the "Tetra Waiver" as described in FCC 11-63.

Radiated field strength tests were performed at the dB Technology Test Site Registered with the FCC: Registration number: 90528.

Unless otherwise stated, tests were performed with nominal power supply voltage.

### List of Equipment:

Item	Manufacturer	Model	Description	Serial No:	Notes
1	3T	SOLO-45X	EUT		#1
2	Sanav	SA-700	GPS antenna		
3	Hewlett Packard	EliteBook 8560p	Laptop	608428-003	#2
4	Hewlett Packard	608428-003	Laptop PSU	CT:WBGTNOBAR169CU	

#1 Incorporating the following combinations of duplexers filters:

- a: Duplexer: Tx 450.000MHz to 452.025MHz, Rx 455.000-457.025MHz - s/n 201200460001 with Rx Filter 455.000MHz to 457.025MHz - s/n 201200460002
- b: Duplexer: Tx 458.025MHz to 460.025MHz, Rx 463.000-465.025MHz - s/n 201200460003 with Rx Filter 463.000MHz to 465.025MHz - s/n 201200460005
- c: Duplexer: Tx 468.00MHz to 470.025MHz, Rx 463.000-465.025MHz - s/n 201200460009 with Rx Filter 463.000MHz to 465.025MHz - s/n 201200460005
- d: Duplexer: Tx 454.00MHz to 456.025MHz, Rx 459.000-461.025MHz - s/n 201200460007 with Rx Filter 459.000MHz to 461.025MHz - s/n 201200460008

#2: Laptop connected to ethernet port to control operating modes.

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## 1.2 Modifications to EUT and Peripherals

Details of any modifications that were required to achieve compliance are listed below. The modification numbers are referred to in the results sections as appropriate.

Mod No:	Details	Implemented for
0	Original sample as supplied.	
1	Faulty TRX module replaced. Original serial number 30-0902402-00003 replaced by 30-0902402-00012	

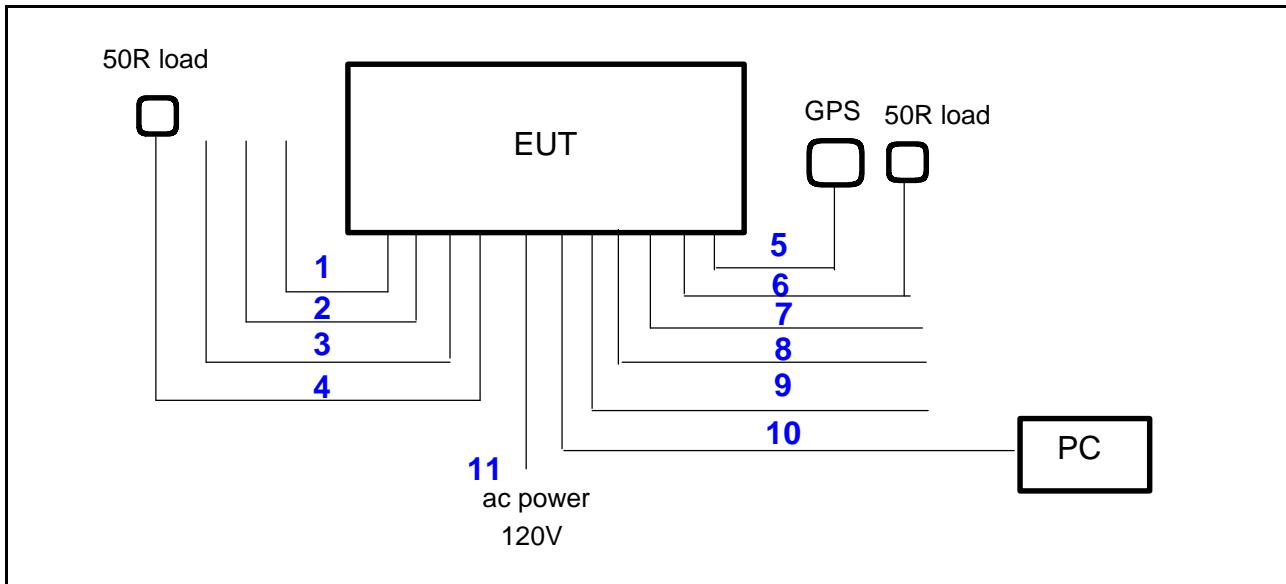
## 1.3 EUT Operating Modes

The EUT was tested in the following operating mode or modes. Generally, operating modes are chosen that will exercise the functions of the EUT as fully as possible and in a manner likely to produce maximum emission levels or susceptibility. Individual test result sheets reference the operating mode of the EUT.

Operating Mode	Details
1	Transmitting on selected channel.
2	Receiving on selected channel.

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**Figure 1 EUT and Peripherals**

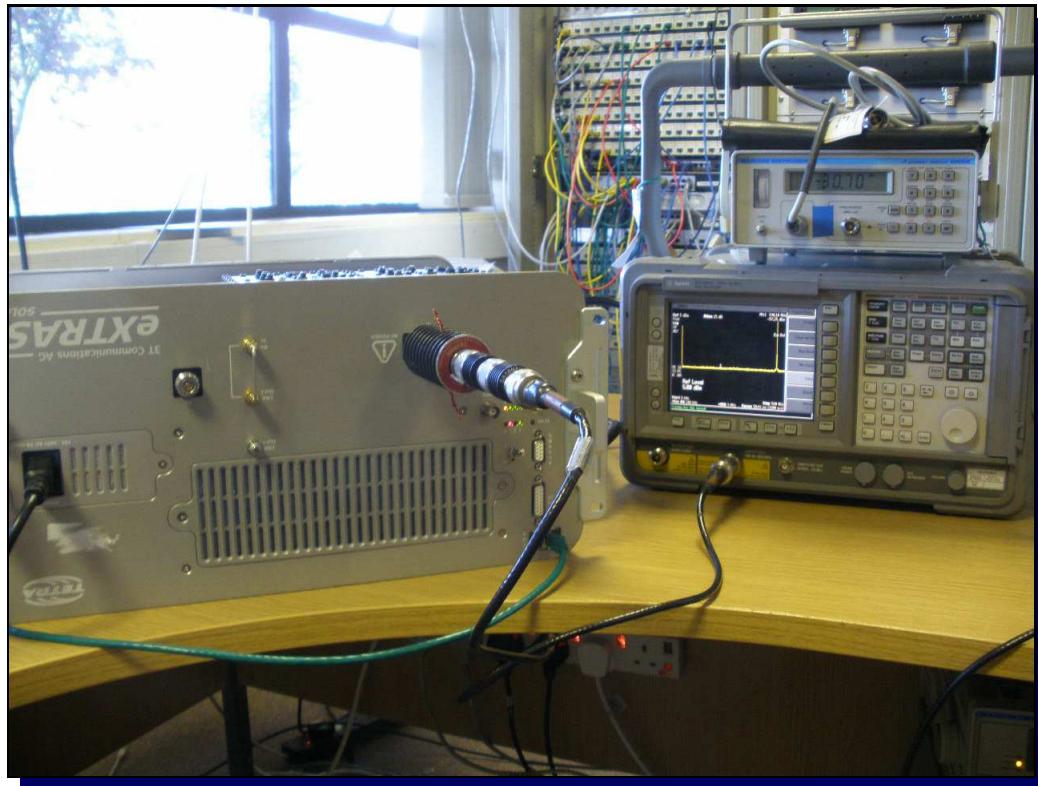


	Description	Type	Length	Notes
1	LNA Out	Co-ax	1.5m	#1
2	LNA Out 2	Co-ax	2m	#1
3	RX IN	Co-ax	2m	#1
4	Diversity Rx antenna	Co-ax	1m	#1
5	GPS antenna	Co-ax	0.8m	
6	Main Antenna	Co-ax	1m	#1
7	9 way alarm	Screened	1.5m	
8	15 way alarm	Screened	1.8m	
9	CLK	Co-ax	1m	#1
10	Ethernet	Screened	1.5m	#2
11	Mains	Unscreened	1.5m	

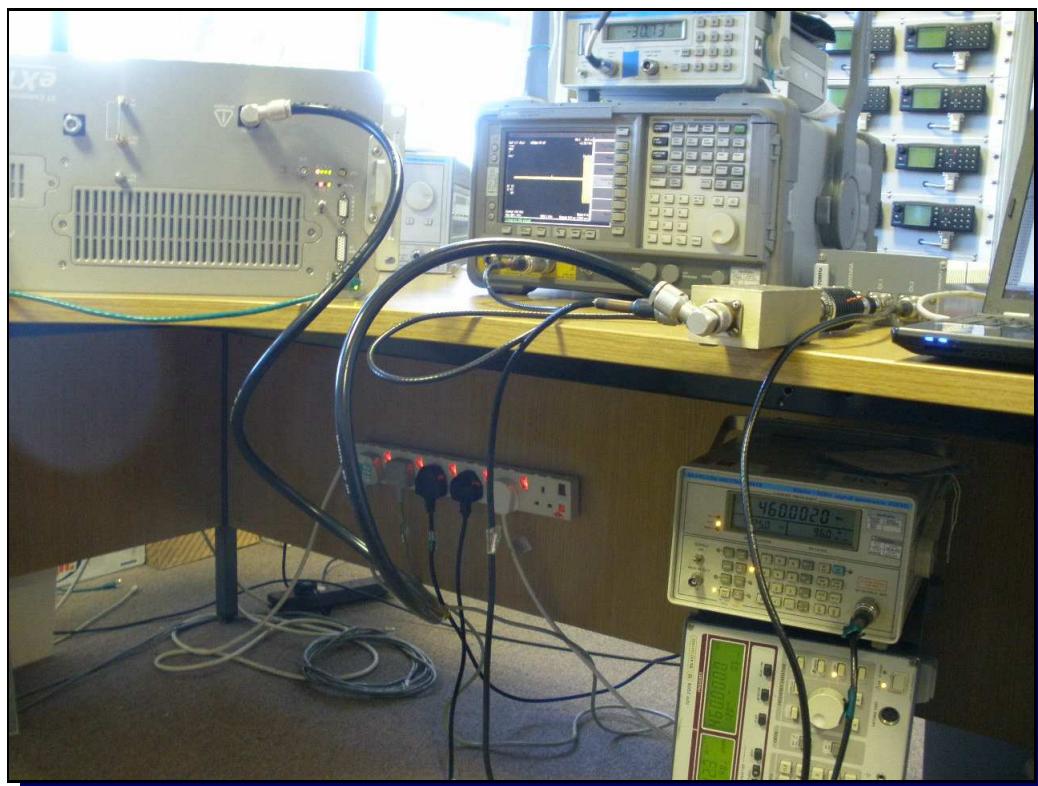
#1 50R load on end of cable.

#2 PC located outside of test area for radiated tests.

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**Photograph 1 Conducted Antenna Measurements**

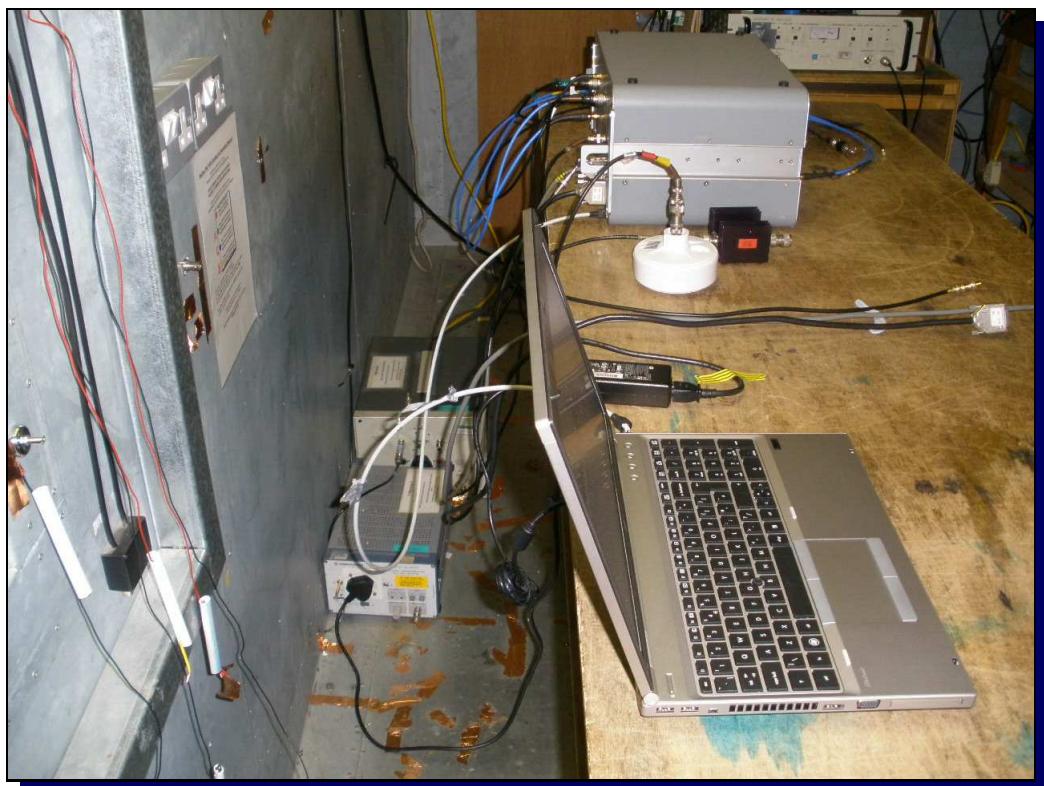


**Photograph 2 Transient Frequency Measurements**

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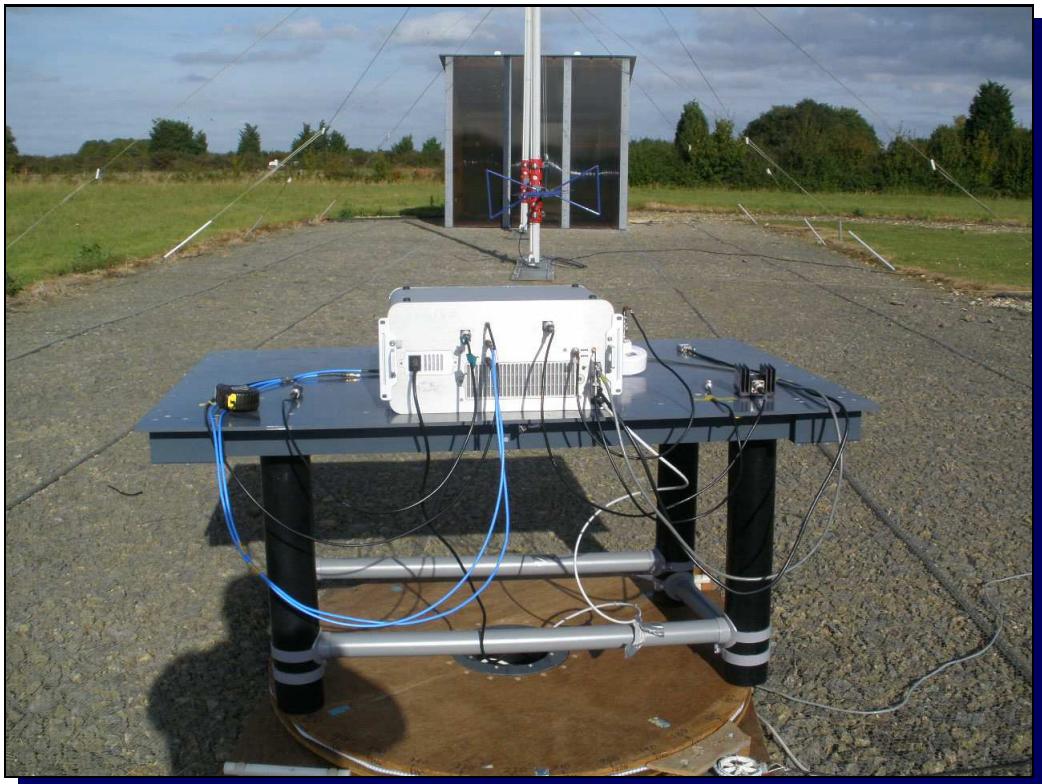


**Photograph 3 Conducted Emissions - Front**



**Photograph 4 Conducted Emissions - Back**

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**Photograph 5 Radiated Emissions**

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## 2 Test Equipment

The test equipment used during the tests was one or more of the items listed below. Individual test result sheets indicate which items were used.

Ref No:	Details	Serial Number	Cal Date	Cal Interval
A19	EMCO 3115 DR Guide (1-18GHz)	2431	23/01/2012	1 year
A24	Chase X-wing Bilog CBL6144 26MHz-3GHz	27590	18/11/2011	1 year
A5	Chase Bilog CBL6111A	1760	31/01/2012	1 year
L1	EMCO 3825/2 LISN	1358	16/02/2012	1 year
L2	R&S ESH3-Z5 LISN	843862/009	22/02/2012	1 year
PM6	Marconi 6960B RF Power Meter	236923/003	20/12/2011	1 year
PRE13	LUCIX 10M-6G pre-amp	13	08/01/2012	1 year
PS10	Marconi 6910 RF Power Sensor (-30dBm / + 20dBm) 10MHz to 20GHz	5009	20/12/2011	1 year
R10	Narda PMM 9010 Receiver (10Hz-30MHz)	595WX11003	01/02/2012	1 year
R4	R&S ESVS10	843744/002	16/12/2011	1 year
R8	Agilent E7405A Spectrum Analyser	MY44212494	19/09/2011	1 year
R9	Agilent E7405A Spectrum Analyser	MY45110758	21/11/2011	1 year
RFF09	Band Pass Filter 500MHz to 2GHz	F653-9	08/02/2012	1 year
RFF22	High Pass Filter - 1.35GHz (10GHz) MicroTronics HPM13017	033	08/02/2012	1 year
SG9	HP 8648C 9kHz-3.2GHz Signal Generator	3847A05254	10/07/2012	1 year
TTS	IFR 2310 Tetra Test Set	169949/002	10/08/2012	2 years

The Tetra Test Set is owned by 3T.

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### 3 Test Methods

#### 3.1 Antenna Conducted Carrier Power

The antenna output is connected to a spectrum analyser via a suitable PAD. The bandwidth on the spectrum analyser is set to greater than the EUT occupied bandwidth. A peak measurement is recorded. Additional measurements are made with antenna output connected to a power meter providing average measurements.

#### 3.2 Antenna Conducted Transmitter Unwanted Emissions

Measurements are made with the antenna output connected to a spectrum analyser via a suitable PAD. Sweeps are made over the specified frequency ranges . The limit is set relative to the measured carrier power. A peak detector is used.

#### 3.3 Antenna Conducted Occupied Bandwidth

Measurements are made with the antenna output connected to a spectrum analyser via a suitable PAD. Sweeps are made with a 300Hz Resolution Bandwidth and a 1kHz Video Bandwidth. A peak detector is used. Markers are used to determine the 99% power bandwidth.

#### 3.4 Antenna Conducted Adjacent Channel Power

Measurements are made with the antenna output connected to an Tetra Test Set via a suitable PAD. The Test Set is set to make adjacent channel power measurements using the pre-configured settings for Tetra with 25kHz channel spacing.

#### 3.5 Frequency Stability

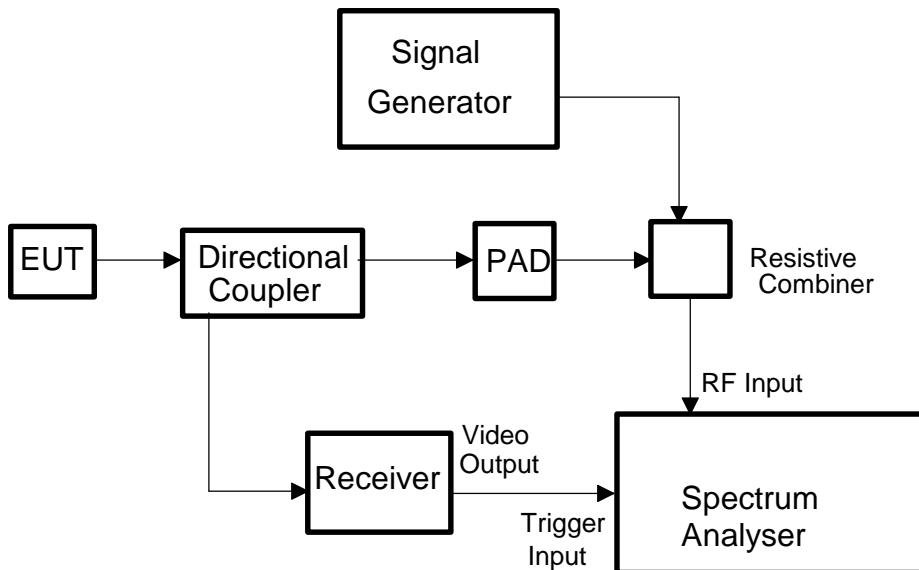
The EUT is placed in an environmental chamber. The temperature inside the chamber is set to the required level and allowed to stabilise.

The antenna output is connected to a Tetra Test Set. The EUT is set to transmit using normal modulation. The frequency error, as indicated by the Tetra Test Set, is recorded.

Measurements are made at the specified temperatures and over the required voltage supply range of the EUT.

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### 3.6 Transient Frequency Behaviour



The test equipment was set up as shown above.

The spectrum analyser was set to 0Hz span with its inbuilt FM demodulation function activated.

Initially only the EUT was set to transmit an unmodulated signal and the centre frequency of the analyser adjusted to give 0Hz FM deviation.

The EUT transmitter was then switched off and the signal generator set to provide a carrier only output. The frequency of the signal generator was adjusted to again give 0Hz FM deviation on the spectrum analyser.

The signal generator FM modulation was then switched on and adjusted to give 25kHz FM deviation on the spectrum analyser.

The spectrum analyser was then set to trigger only on video output from the receiver. The directional coupler was used to feed an attenuated portion of the EUT transmitter into the receiver. The receiver was tuned to the transmit frequency and so produced a change on its video output when the transmitter was switched on and off. This signal was used to trigger the spectrum analyser.

FM deviation data was recorded from the spectrum analyser for both carrier switch on and switch off and at all three test frequencies.

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### 3.7 Radiated Transmitter Emissions (Substitution Method)

Initial scans are performed in a semi-anechoic screened room at a distance of 3m. Scans are performed over the frequency range specified in the test standard with the antenna both horizontally and vertically polarised. During these scans the EUT and peripherals are rotated through 360°. Bench top EUTs are placed on a non-conducting bench at a height of 0.8m above the ground plane. Floor standing EUTs are placed 0.1m above the ground plane. The EUT cables were manipulated in an attempt to produce maximum emissions. The results of the scans are shown in the plots included at the end of the report.

Significant emissions identified by the scans are measured using a substitution method. Maximised emission readings are obtained by rotating the EUT through 360° and adjusting the height of the antenna from 1m to 4m. Measurements are made with the antenna both horizontally and vertically polarised and the results tabulated.

The EUT is then replaced with a calibrated reference antenna fed from a signal generator. The level fed into the reference antenna is measured with a power meter. Measurements are made to determine the power output of the signal generator required to give the same emission levels as were observed from the EUT.

The radiated power from the EUT is calculated as:

$$\begin{array}{l} \text{Signal Level} \\ \text{fed into Reference} \\ \text{Antenna} \end{array} + \begin{array}{l} \text{Gain of} \\ \text{Reference} \\ \text{Antenna} \end{array} + \begin{array}{l} \text{Radiated Level} \\ \text{From EUT} \end{array} - \begin{array}{l} \text{Radiated Level} \\ \text{From Reference} \\ \text{Antenna} \end{array}$$

For example, assuming following measurements:

$$\begin{array}{lcl} \text{Signal Level fed into Reference Antenna} & = & -14.3 \text{dBm} \\ \text{Gain of Reference Antenna} & = & 7.1 \text{ dBi} \\ \text{Radiated Level from EUT (i.e. Level at Measuring Receiver)} & = & 37 \text{ dBuV} \\ \text{Radiated Level from Reference Antenna (i.e. Level at Measuring Receiver)} & = & 61.5 \text{ dBuV} \end{array}$$

$$\begin{aligned} \text{Then the Radiated Power from the EUT} &= -14.3 + 7.1 + 37 - 61.5 \text{ dBm (isotropic)} \\ &= -31.7 \text{ dBm (isotropic)} \end{aligned}$$

### 3.8 Receiver Radiated Emissions

Initial scans are performed in a semi-anechoic screened room at a distance of 3m. Scans are performed over the frequency range specified in the test standard with the antenna both horizontally and vertically polarised. During these scans the EUT and peripherals are rotated through 360°. Bench top EUTs are placed on a non-conducting bench at a height of 0.8m above the ground plane. Floor standing EUTs are placed 0.1m above the ground plane. The EUT cables were manipulated in an attempt to produce maximum emissions. The results of the scans are shown in the plots included at the end of the report.

Significant emissions identified by the scans are measured on an open area test site at the appropriate test distance. Maximised readings are obtained by rotating the EUT through 360° and adjusting the height of the antenna from 1m to 4m. Measurements are made with the antenna both horizontally and vertically polarised and the results tabulated.

Tabulated results show levels based on the following calculation:

$$\text{Field Strength (dBuV)} = \text{receiver reading (dBuV)} + \text{CF (dB/m)}$$

CF is the correction factor for the antenna and cable.

For example:

if, at 114MHz, receiver reading was 17.9 dBuV, combined correction factor = 13.1 (dB/m).

$$\text{Total field strength} = 17.9 + 13.1 = 31.0 \text{ dBuV/m.}$$

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### 3.9 Conducted Emissions - ac power

This section describes the general method of performing this test. The specific method used and any deviations from this general method are listed in the appropriate results section.

Bench top EUTs and peripheral equipment are normally placed on a 0.8m high non-conducting bench, positioned 0.4m from one of the metallic walls of a screened room. Floor standing EUTs are normally placed 0.1m above the metallic floor of the screened room. Mains leads are bundled so as not to exceed 1m.

The EUT is powered using a 50ohm/50uH Line Impedance Stabilisation Network (LISN). Peripherals are powered using a second a 50ohm/50uH LISN. These LISNs are bonded to the screened room floor.

With the correct supply voltage applied to the EUT scans are performed on both the live and neutral line outputs of the LISN using quasi-peak detection over the specified frequency range. The results of these scans are shown in the plots section at the end of the report.

Significant emissions identified by the scans are measured and the results tabulated. The table of results is shown in the conducted emissions results section.

$$\text{Final Level (dBuV)} = \text{Receiver Reading (dBuV)} + \text{Combined Cable & Attenuator Correction Factor (dB)}$$

### Example:

if, @ 191kHz, receiver reading was 35.8dBuV and the combined correction factor was 10dB

Final Level = 35.8 + 10.0 = 45.8 dBuV

## 4 Test Results

The following sections contain tabulated test results. Plots of various scans are included at the back of this section.

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>17 of 79</b>

## 4.1 Conducted Antenna Output Power

Factor Set 1:  
Factor Set 2: - - -  
Factor Set 3: - - -  
Test Equipment: R9 PS10 PM6

### *Conducted Emissions (Signal)*

<i>Company:</i>	<b>3T Communications AG</b>	<i>Product:</i>	<b>SOLO-45X</b>								
<i>Date:</i>	<b>4/10/2012</b>	<i>Test Eng:</i>									
<i>Ports:</i>	antenna										
<i>Test:</i>	<b>90.209</b>	using limits of	<b>90.209(b)(5)</b>								
<i>Ports:</i>											
<i>Test:</i>	using limits of										
Notes	Comments and Observations										
	<p>Measurements were made using a power meter with an average detector.</p> <p>Measurements were made with continuous modulation.</p> <p>Taking into account the loss of the cable and attenuators, the following measurements were made:</p> <table> <thead> <tr> <th>Channel</th><th>Average dBm</th></tr> </thead> <tbody> <tr> <td>450MHz</td><td>42.93</td></tr> <tr> <td>460MHz</td><td>42.47</td></tr> <tr> <td>470MHz</td><td>42.98</td></tr> </tbody> </table>			Channel	Average dBm	450MHz	42.93	460MHz	42.47	470MHz	42.98
Channel	Average dBm										
450MHz	42.93										
460MHz	42.47										
470MHz	42.98										

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>18 of 79</b>

## 4.2 Conducted Antenna Occupied Bandwidth

Factor Set 1:  
Factor Set 2: - - - -  
Factor Set 3: - - - -  
Test Equipment: R9

### *Conducted Emissions (Signal)*

<i>Company:</i>	<b>3T Communications AG</b>	<i>Product:</i>	<b>SOLO-45X</b>									
<i>Date:</i>	<b>04/10/2012</b>	<i>Test Eng:</i>	<b>Dave Smith</b>									
<i>Ports:</i>	antenna											
<i>Test:</i>	<b>90.210</b>	using limits of	<b>90.221(d)</b>									
<i>Ports:</i>												
<i>Test:</i>	using limits of											
Notes	Comments and Observations											
	<p>Measurements were made with continuous modulation applied. Spectrum analyser results are shown in plots 1 to 3.</p> <p>Using the "Bandwidth Power" function of the spectrum analyser, the following measurements were recorded:</p> <table> <tr> <td>450MHz</td> <td>20.77</td> <td>kHz</td> </tr> <tr> <td>460MHz</td> <td>20.93</td> <td>kHz</td> </tr> <tr> <td>470MHz</td> <td>20.73</td> <td>kHz</td> </tr> </table> <p>Limit:</p> <p>Using note 6 in the "Tetra Waiver" (FCC11-63) the limit is 22kHz (providing Adjacent Channel Power requirements are met).</p> <p><b>PASS</b></p>			450MHz	20.77	kHz	460MHz	20.93	kHz	470MHz	20.73	kHz
450MHz	20.77	kHz										
460MHz	20.93	kHz										
470MHz	20.73	kHz										

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>19 of 79</b>

### 4.3 Frequency Stability - Frequency Error Hz

Factor Set 1:  
Factor Set 2:  
Factor Set 3:  
Test Equipment: TTS

#### Frequency Stability

<i>Company:</i>	<b>3T Communications AG</b>	<i>Product:</i>	<b>SOLO-45X</b>
<i>Date:</i>	<b>02/10/2012 &amp; 03/10/2012</b>	<i>Test Eng:</i>	<b>Dave Smith</b>
<i>Ports:</i>	antenna		
<i>Test:</i>	<b>90.205</b>	using limits of	<b>90.205(h)</b>

*Ports:*

*Test:*

using limits of

Notes	Comments and Observations				
<b>Frequency Error (as recorded from Tetra Test Set) (Hz)</b>					
		450MHz Channel	460MHz Channel	470MHz Channel	
	-30.0°C	93.5V 120V 138V	1.7 16.0 1.8	1.3 4.7 1.6	1.0 27.7 1.0
	-20.0°C	93.5V 120V 138V	-0.6 -1.1 -0.6	-1.1 0.5 -0.7	0.5 0.4 0.5
	-10.0°C	93.5V 120V 138V	0.6 0.6 0.6	0.4 0.6 0.5	-0.4 -1.2 -0.2
	0.0°C	93.5V 120V 138V	-0.5 -0.9 -0.4	-1.1 -1.0 -0.6	0.7 0.6 0.6
	10.0°C	93.5V 120V 138V	0.1 0.4 -0.2	-0.6 -0.4 -0.3	-1.2 -2.0 -1.2
	20.0°C	93.5V 120V 138V	1.5 1.4 1.6	1.7 2.0 1.8	2.1 2.4 2.3
	30.0°C	93.5V 120V 138V	2.0 2.0 2.1	1.8 1.8 1.9	1.5 1.6 1.5
	40.0°C	93.5V 120V 138V	1.0 1.0 1.0	1.3 1.3 1.3	1.6 1.6 1.6
	50.0°C	93.5V 120V 138V	1.0 1.0 1.0	1.0 1.1 0.9	0.6 0.2 0.4
	55.0°C	93.5V 120V 138V	0.5 0.6 0.5	0.6 0.4 0.6	0.6 0.6 0.5

Measured after powering EUT up with normal customer software.  
See next page for deviation in ppm.

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>20 of 79</b>

## 4.4 Frequency Stability - ppm

Factor Set 1:  
Factor Set 2:  
Factor Set 3:  
Test Equipment: TTS

### Frequency Stability

<i>Company:</i>	<b>3T Communications AG</b>	<i>Product:</i>	<b>SOLO-45X</b>
<i>Date:</i>	<b>02/10/2012 &amp; 03/10/2012</b>	<i>Test Eng:</i>	<b>Dave Smith</b>
<i>Ports:</i>	antenna		
<i>Test:</i>	<b>90.205</b>	using limits of	<b>90.205(h)</b>

Notes	Comments and Observations																																																																																																																																																																												
	<b>Frequency deviation from nominal - ppm</b> <table border="1" data-bbox="372 887 1261 1931"> <thead> <tr> <th></th> <th></th> <th>450MHz Channel</th> <th>460MHz Channel</th> <th>470MHz Channel</th> <th></th> </tr> </thead> <tbody> <tr> <td rowspan="3">-30.0°C</td><td>10.8V</td><td>0.004</td><td>0.003</td><td>0.002</td><td></td></tr> <tr> <td>13.2V</td><td>0.036</td><td>0.010</td><td>0.059</td><td></td></tr> <tr> <td>15.6V</td><td>0.004</td><td>0.003</td><td>0.002</td><td></td></tr> <tr> <td rowspan="3">-20.0°C</td><td>10.8V</td><td>-0.001</td><td>-0.002</td><td>0.001</td><td></td></tr> <tr> <td>13.2V</td><td>-0.002</td><td>0.001</td><td>0.001</td><td></td></tr> <tr> <td>15.6V</td><td>-0.001</td><td>-0.002</td><td>0.001</td><td></td></tr> <tr> <td rowspan="3">-10.0°C</td><td>10.8V</td><td>0.001</td><td>0.001</td><td>-0.001</td><td></td></tr> <tr> <td>13.2V</td><td>0.001</td><td>0.001</td><td>-0.003</td><td></td></tr> <tr> <td>15.6V</td><td>0.001</td><td>0.001</td><td>-0.000</td><td></td></tr> <tr> <td rowspan="3">0.0°C</td><td>10.8V</td><td>-0.001</td><td>-0.002</td><td>0.001</td><td></td></tr> <tr> <td>13.2V</td><td>-0.002</td><td>-0.002</td><td>0.001</td><td></td></tr> <tr> <td>15.6V</td><td>-0.001</td><td>-0.001</td><td>0.001</td><td></td></tr> <tr> <td rowspan="3">10.0°C</td><td>10.8V</td><td>0.000</td><td>-0.001</td><td>-0.003</td><td></td></tr> <tr> <td>13.2V</td><td>0.001</td><td>-0.001</td><td>-0.004</td><td></td></tr> <tr> <td>15.6V</td><td>-0.000</td><td>-0.001</td><td>-0.003</td><td></td></tr> <tr> <td rowspan="3">20.0°C</td><td>10.8V</td><td>0.003</td><td>0.004</td><td>0.004</td><td></td></tr> <tr> <td>13.2V</td><td>0.003</td><td>0.004</td><td>0.005</td><td></td></tr> <tr> <td>15.6V</td><td>0.004</td><td>0.004</td><td>0.005</td><td></td></tr> <tr> <td rowspan="3">30.0°C</td><td>10.8V</td><td>0.004</td><td>0.004</td><td>0.003</td><td></td></tr> <tr> <td>13.2V</td><td>0.004</td><td>0.004</td><td>0.003</td><td></td></tr> <tr> <td>15.6V</td><td>0.005</td><td>0.004</td><td>0.003</td><td></td></tr> <tr> <td rowspan="3">40.0°C</td><td>10.8V</td><td>0.002</td><td>0.003</td><td>0.003</td><td></td></tr> <tr> <td>13.2V</td><td>0.002</td><td>0.003</td><td>0.003</td><td></td></tr> <tr> <td>15.6V</td><td>0.002</td><td>0.003</td><td>0.003</td><td></td></tr> <tr> <td rowspan="3">50.0°C</td><td>10.8V</td><td>0.002</td><td>0.002</td><td>0.001</td><td></td></tr> <tr> <td>13.2V</td><td>0.002</td><td>0.002</td><td>0.000</td><td></td></tr> <tr> <td>15.6V</td><td>0.002</td><td>0.002</td><td>0.001</td><td></td></tr> <tr> <td rowspan="3">55.0°C</td><td>10.8V</td><td>0.001</td><td>0.001</td><td>0.001</td><td></td></tr> <tr> <td>13.2V</td><td>0.001</td><td>0.001</td><td>0.001</td><td></td></tr> <tr> <td>15.6V</td><td>0.001</td><td>0.001</td><td>0.001</td><td></td></tr> </tbody> </table>			450MHz Channel	460MHz Channel	470MHz Channel		-30.0°C	10.8V	0.004	0.003	0.002		13.2V	0.036	0.010	0.059		15.6V	0.004	0.003	0.002		-20.0°C	10.8V	-0.001	-0.002	0.001		13.2V	-0.002	0.001	0.001		15.6V	-0.001	-0.002	0.001		-10.0°C	10.8V	0.001	0.001	-0.001		13.2V	0.001	0.001	-0.003		15.6V	0.001	0.001	-0.000		0.0°C	10.8V	-0.001	-0.002	0.001		13.2V	-0.002	-0.002	0.001		15.6V	-0.001	-0.001	0.001		10.0°C	10.8V	0.000	-0.001	-0.003		13.2V	0.001	-0.001	-0.004		15.6V	-0.000	-0.001	-0.003		20.0°C	10.8V	0.003	0.004	0.004		13.2V	0.003	0.004	0.005		15.6V	0.004	0.004	0.005		30.0°C	10.8V	0.004	0.004	0.003		13.2V	0.004	0.004	0.003		15.6V	0.005	0.004	0.003		40.0°C	10.8V	0.002	0.003	0.003		13.2V	0.002	0.003	0.003		15.6V	0.002	0.003	0.003		50.0°C	10.8V	0.002	0.002	0.001		13.2V	0.002	0.002	0.000		15.6V	0.002	0.002	0.001		55.0°C	10.8V	0.001	0.001	0.001		13.2V	0.001	0.001	0.001		15.6V	0.001	0.001	0.001							
		450MHz Channel	460MHz Channel	470MHz Channel																																																																																																																																																																									
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	13.2V	-0.002	0.001	0.001																																																																																																																																																																									
	15.6V	-0.001	-0.002	0.001																																																																																																																																																																									
-10.0°C	10.8V	0.001	0.001	-0.001																																																																																																																																																																									
	13.2V	0.001	0.001	-0.003																																																																																																																																																																									
	15.6V	0.001	0.001	-0.000																																																																																																																																																																									
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	13.2V	-0.002	-0.002	0.001																																																																																																																																																																									
	15.6V	-0.001	-0.001	0.001																																																																																																																																																																									
10.0°C	10.8V	0.000	-0.001	-0.003																																																																																																																																																																									
	13.2V	0.001	-0.001	-0.004																																																																																																																																																																									
	15.6V	-0.000	-0.001	-0.003																																																																																																																																																																									
20.0°C	10.8V	0.003	0.004	0.004																																																																																																																																																																									
	13.2V	0.003	0.004	0.005																																																																																																																																																																									
	15.6V	0.004	0.004	0.005																																																																																																																																																																									
30.0°C	10.8V	0.004	0.004	0.003																																																																																																																																																																									
	13.2V	0.004	0.004	0.003																																																																																																																																																																									
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	13.2V	0.001	0.001	0.001																																																																																																																																																																									
	15.6V	0.001	0.001	0.001																																																																																																																																																																									
	Part 90 Limit for a fixed Base Station (450MHz to 470MHz) is 2.5ppm <b>PASS</b>																																																																																																																																																																												

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Test No: T4510		Test Report	Page: 21 of 79

## 4.5 Conducted Emission Antenna Adjacent Channel Power

Factor Set 1:  
Factor Set 2: - - -  
Factor Set 3: - - -  
Test Equipment: TTS

### Conducted Emissions (Signal)

Company:	3T Communications AG	Product:	SOLO-45X																																																																		
Date:	04/10/2012	Test Eng:	Dave Smith																																																																		
Ports:	antenna																																																																				
Test:	90.213	using limits of	90.213																																																																		
Ports:																																																																					
Test:		using limits of																																																																			
Notes	Comments and Observations																																																																				
	<p>Using the Tetra Test Set with the appropriate Tetra adjacent channel power settings.</p> <table> <thead> <tr> <th colspan="2"></th> <th colspan="6">Readings in dBc</th> </tr> <tr> <th colspan="2"></th> <th colspan="6">Channel</th> </tr> <tr> <th colspan="2"></th> <th>-75kHz</th> <th>-50kHz</th> <th>-25kHz</th> <th>+ 25kHz</th> <th>+ 50kHz</th> <th>+ 75kHz</th> </tr> </thead> <tbody> <tr> <td>450MHz</td> <td>-79.8</td> <td>-78.0</td> <td>-63.5</td> <td>-63.7</td> <td>-78.1</td> <td>-80.0</td> </tr> <tr> <td>460MHz</td> <td>-79.3</td> <td>-77.7</td> <td>-64.1</td> <td>-64.4</td> <td>-77.8</td> <td>-79.6</td> </tr> <tr> <td>470MHz</td> <td>-79.7</td> <td>-77.7</td> <td>-63.6</td> <td>-64.1</td> <td>-77.9</td> <td>-79.9</td> </tr> <tr> <td>Limit (dBc)</td> <td>-70.0</td> <td>-70.0</td> <td>-60.0</td> <td>-60.0</td> <td>-70.0</td> <td>-70.0</td> </tr> <tr> <td colspan="7">Limit shown is the maximum allowed level (dBc) for a product with output power above 1 W and operating at a frequency below 700MHz (Part 90.221(6))</td></tr> <tr> <td colspan="7">PASS</td></tr> </tbody> </table>					Readings in dBc								Channel								-75kHz	-50kHz	-25kHz	+ 25kHz	+ 50kHz	+ 75kHz	450MHz	-79.8	-78.0	-63.5	-63.7	-78.1	-80.0	460MHz	-79.3	-77.7	-64.1	-64.4	-77.8	-79.6	470MHz	-79.7	-77.7	-63.6	-64.1	-77.9	-79.9	Limit (dBc)	-70.0	-70.0	-60.0	-60.0	-70.0	-70.0	Limit shown is the maximum allowed level (dBc) for a product with output power above 1 W and operating at a frequency below 700MHz (Part 90.221(6))							PASS						
		Readings in dBc																																																																			
		Channel																																																																			
		-75kHz	-50kHz	-25kHz	+ 25kHz	+ 50kHz	+ 75kHz																																																														
450MHz	-79.8	-78.0	-63.5	-63.7	-78.1	-80.0																																																															
460MHz	-79.3	-77.7	-64.1	-64.4	-77.8	-79.6																																																															
470MHz	-79.7	-77.7	-63.6	-64.1	-77.9	-79.9																																																															
Limit (dBc)	-70.0	-70.0	-60.0	-60.0	-70.0	-70.0																																																															
Limit shown is the maximum allowed level (dBc) for a product with output power above 1 W and operating at a frequency below 700MHz (Part 90.221(6))																																																																					
PASS																																																																					

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
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## 4.6 Transmitter Transient Frequency Behaviour - Results

Factor Set 1:  
Factor Set 2:  
Factor Set 3:  
Test Equipment: R9 R4 SG9

### Conducted Emissions (Signal)

<b>Company:</b> 3T Communications AG	<b>Product:</b> SOLO-45X												
<b>Date:</b> 04/10/2012	<b>Test Eng:</b> Dave Smith												
<b>Ports:</b> antenna													
<b>Test:</b> 90.214	using limits of 90.214												
<b>Ports:</b>													
<b>Test:</b>	using limits of												
Notes	Comments and Observations												
	<p>The output of the antenna port of the EUT was fed through a Directional Coupler and then combined with the output of a signal generator.</p> <p>The spectrum analyser has an FM demodulation function.</p> <p>The EUT was initially set to produce a constant carrier output and the tuning of the spectrum analyser adjusted to give 0Hz FM deviation.</p> <p>The output of the EUT was turned off and a carrier only signal output from the signal generator set at approximately the same frequency as the EUT. This frequency was adjusted to again give 0Hz FM deviation on the spectrum analyser.</p> <p>The signal generator was then set to give 25kHz FM deviation (with 1kHz signal).</p> <p>The forward power output of the directional coupler was fed into a receiver tuned to the carrier frequency. The video output of this receiver was used to trigger the spectrum analyser when the EUT RF is turned on or off.</p> <p>The results of sweeps captured from the spectrum analyser are shown in plots 4 to 9.</p> <p>All of the plots show the EUT comfortably meets the Transient Frequency Behaviour limits for a 25kHz channel spacing transmitter as shown below:</p> <table> <thead> <tr> <th></th> <th>Frequency</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>t1</td> <td>± 25 kHz</td> <td>10 msec</td> </tr> <tr> <td>t2</td> <td>± 12.5 kHz</td> <td>25 msec</td> </tr> <tr> <td>t3</td> <td>± 25 kHz</td> <td>10 msec</td> </tr> </tbody> </table> <p>PASS</p>		Frequency	Duration	t1	± 25 kHz	10 msec	t2	± 12.5 kHz	25 msec	t3	± 25 kHz	10 msec
	Frequency	Duration											
t1	± 25 kHz	10 msec											
t2	± 12.5 kHz	25 msec											
t3	± 25 kHz	10 msec											

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>23 of 79</b>

## 4.7 Conducted Emission Antenna Spurious Emissions

Factor Set 1:  
Factor Set 2: - - -  
Factor Set 3: - - -  
Test Equipment: R9 RFF09 RFF22

### Conducted Emissions (Signal)

<i>Company:</i>	<b>3T Communications AG</b>	<i>Product:</i>	<b>SOLO-45X</b>
<i>Date:</i>	<b>04/10/2012</b>	<i>Test Eng:</i>	<b>Dave Smith</b>
<i>Ports:</i>	antenna		
<i>Test:</i>	<b>90.213</b>	using limits of	<b>90.213</b>

<i>Ports:</i>	antenna		
<i>Test:</i>	<b>ANSI C63.4:2003</b>	using limits of	<b>2nW</b>

Notes	Comments and Observations																																							
	<p>Results of scans in transmit mode are shown in plots 10 to 27.  Scans were made on both the main antenna port and the diversity antenna port (which is a receive only port).</p> <p>The limit line on the plots is set to -13dBm.</p> <p>The highest readings observed were:</p> <table> <thead> <tr> <th colspan="4"><b>Tx @ 450MHz</b></th> </tr> <tr> <th><i>Frequency</i></th> <th><i>Level (dBm)</i></th> <th><i>Limit (dBm)</i></th> <th><i>Margin (dB)</i></th> </tr> </thead> <tbody> <tr> <td>1.35GHz</td> <td>-29.27</td> <td>-13.00</td> <td>16.27</td> </tr> </tbody> </table> <table> <thead> <tr> <th colspan="4"><b>Tx @ 460MHz</b></th> </tr> <tr> <th><i>Frequency</i></th> <th><i>Level (dBm)</i></th> <th><i>Limit (dBm)</i></th> <th><i>Margin (dB)</i></th> </tr> </thead> <tbody> <tr> <td>1.38GHz</td> <td>-30.37</td> <td>-13.00</td> <td>17.37</td> </tr> </tbody> </table> <table> <thead> <tr> <th colspan="4"><b>Tx @ 470MHz</b></th> </tr> <tr> <th><i>Frequency</i></th> <th><i>Level (dBm)</i></th> <th><i>Limit (dBm)</i></th> <th><i>Margin (dB)</i></th> </tr> </thead> <tbody> <tr> <td>0.94GHz</td> <td>-25.13</td> <td>-13.00</td> <td>12.13</td> </tr> </tbody> </table> <p>Results of scans in receive mode are shown in plots 28 to 33.  (Note - in normal use the product never operates in receive only mode).  The limit line applied was -57dBm (2nW).</p> <p>All emissions were significantly below the limit.</p> <p><b>PASS</b></p>				<b>Tx @ 450MHz</b>				<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>	1.35GHz	-29.27	-13.00	16.27	<b>Tx @ 460MHz</b>				<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>	1.38GHz	-30.37	-13.00	17.37	<b>Tx @ 470MHz</b>				<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>	0.94GHz	-25.13	-13.00	12.13
<b>Tx @ 450MHz</b>																																								
<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>																																					
1.35GHz	-29.27	-13.00	16.27																																					
<b>Tx @ 460MHz</b>																																								
<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>																																					
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<b>Tx @ 470MHz</b>																																								
<i>Frequency</i>	<i>Level (dBm)</i>	<i>Limit (dBm)</i>	<i>Margin (dB)</i>																																					
0.94GHz	-25.13	-13.00	12.13																																					

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>24 of 79</b>

## 4.8 Radiated Emissions Results - Transmit Spurious

Factor Set 1:  
Factor Set 2: - - -  
Factor Set 3: - - -  
Test Equipment: R9 A24 A19 PRE13

### *Substitution Emissions*

<i>Company:</i> 3T Communications AG	<i>Product:</i> SOLO-45X
<i>Date:</i> 05/10/2012	<i>Test Eng:</i> Dave Smith
<i>Ports:</i>	
<i>Test:</i> 90.205	using limits of
<i>Ports:</i>	
<i>Test:</i>	using limits of
<i>Notes</i>	

Results of scans shown in plots 34 to 45.

All of the emissions were 20dB below the limit line (which was set as the field strength calculated to be produced by an isotropic antenna fed with a -13dBm signal).

There were no emissions identified in transmit mode that were significantly higher than the emissions in receive mode (except the carrier itself). Emissions in receive mode were found to meet the limits for Class A digital device. These limits are significantly below the transmit mode limits.

Measurement were made with the transmitter operating at 450MHz, 460MHz and 470MHz.

PASS

	Report No: <b>R3161</b>	<b>FCC ID: QOESOLO45X</b>						
	Issue No: <b>1</b>	<b>Test Report</b>						

## 4.9 Radiated Emissions Results - Receive Mode - Below 1GHz (1 of 3)

Factor Set 1: A5\_FS\_10C CBL015\_11A - -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R4 A5 A24 R9

### Radiated Emissions

<b>Company:</b> 3T Communications AG							<b>Product:</b> SOLO-45X											
<b>Date:</b> 05/10/2012							<b>Test Eng:</b> Dave Smith											
<b>Ports:</b>																		
<b>Test:</b> ANSI C63.4:2003 using limits of FCC A																		
<b>Ports:</b>																		
<b>Test:</b> using limits of																		
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_A dBuV/m	Margin FCC_A dB	Notes					
46	Rx	0	10	1	37.500	V	7.0	15.0		22.0	39.0	17.0						
46	Rx	0	10	1	37.500	H	5.0	15.0		20.0	39.0	19.0						
46	Rx	0	10	1	156.806	V	14.0	12.4		26.4	43.5	17.1						
46	Rx	0	10	1	156.806	H	15.0	12.4		27.4	43.5	16.1						
46	Rx	0	10	1	200.149	V	21.2	10.3		31.5	43.5	12.0						
46	Rx	0	10	1	200.149	H	22.6	10.3		32.9	43.5	10.6						
47	Rx	0	10	1	375.019	V	17.7	18.6		36.3	46.5	10.2						
47	Rx	0	10	1	375.019	H	16.2	18.6		34.8	46.5	11.7						
47	Rx	0	10	1	446.427	V	12.8	20.8		33.6	46.5	12.9						
47	Rx	0	10	1	446.427	H	13.9	20.8		34.7	46.5	11.8						
47	Rx	0	10	1	532.790	V	12.6	23.1		35.7	46.5	10.8						
47	Rx	0	10	1	532.790	H	17.7	23.1		40.8	46.5	5.7						
47	Rx	0	10	1	570.000	V	10.2	24.6		34.8	46.5	11.7						
47	Rx	0	10	1	570.000	H	15.6	24.6		40.2	46.5	6.3						
47	Rx	0	10	1	575.001	V	8.6	24.5		33.1	46.5	13.4						
47	Rx	0	10	1	575.001	H	11.0	24.5		35.5	46.5	11.0						
47	Rx	0	10	1	580.026	V	10.0	24.4		34.4	46.5	12.1						
47	Rx	0	10	1	580.026	H	16.4	24.4		40.8	46.5	5.7						
47	Rx	0	10	1	590.412	V	9.9	24.4		34.3	46.5	12.2						
47	Rx	0	10	1	590.412	H	15.3	24.4		39.7	46.5	6.8						
<b>Results</b>							<b>Minimum Margin</b> <b>PASS/FAIL</b>			<b>5.7 dB</b>								
<b>Notes</b>		<b>Comments and Observations</b>																
		Results of scans shown in plots 46 and 47. EUT set to receive on 460MHz with the transmitter turned off. (Note, in normal operation the transmitter will always be turned on).  Measurements made with 120kHz bw QP detector.																

	Report No: <b>R3161</b>	<b>FCC ID: QOESOLO45X</b>						
	Issue No: <b>1</b>	<b>Test Report</b>						

## 4.10 Radiated Emissions Results - Receive Mode - Below 1GHz (2 of 3)

Factor Set 1: A5\_FS\_10C CBL015\_11A - -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R4 A5 A24 R9

### Radiated Emissions

<b>Company:</b> 3T Communications AG							<b>Product:</b> SOLO-45X											
<b>Date:</b> 05/10/2012							<b>Test Eng:</b> Dave Smith											
<b>Ports:</b>																		
<b>Test:</b> ANSI C63.4:2003 using limits of FCC A																		
<b>Ports:</b>																		
<b>Test:</b> using limits of																		
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_A dBuV/m	Margin FCC_A dB	Notes					
47	Rx	0	10	1	619.210	V	11.8	25.0		36.8	46.5	9.7						
47	Rx	0	10	1	619.210	H	16.7	25.0		41.7	46.5	4.8						
47	Rx	0	10	1	633.609	V	11.2	25.2		36.4	46.5	10.1						
47	Rx	0	10	1	633.609	H	14.1	25.2		39.3	46.5	7.2						
47	Rx	0	10	1	648.000	V	13.2	25.3		38.5	46.5	8.0						
47	Rx	0	10	1	648.000	H	14.6	25.3		39.9	46.5	6.6						
47	Rx	0	10	1	650.000	V	16.2	25.3		41.5	46.5	5.0						
47	Rx	0	10	1	650.000	H	20.8	25.3		46.1	46.5	0.4						
47	Rx	0	10	1	660.012	V	14.1	25.4		39.5	46.5	7.0						
47	Rx	0	10	1	660.012	H	18.7	25.4		44.1	46.5	2.4						
47	Rx	0	10	1	670.000	V	5.6	25.5		31.1	46.5	15.4						
47	Rx	0	10	1	670.000	H	12.7	25.5		38.2	46.5	8.3						
47	Rx	0	10	1	676.803	V	8.1	25.7		33.8	46.5	12.7						
47	Rx	0	10	1	676.803	H	11.5	25.7		37.2	46.5	9.3						
47	Rx	0	10	1	680.000	V	4.5	25.8		30.3	46.5	16.2						
47	Rx	0	10	1	680.015	H	11.0	25.8		36.8	46.5	9.7						
47	Rx	0	10	1	710.018	V	8.3	26.6		34.9	46.5	11.6						
47	Rx	0	10	1	710.018	H	17.1	26.6		43.7	46.5	2.8						
47	Rx	0	10	1	750.003	V	6.1	28.0		34.1	46.5	12.4						
47	Rx	0	10	1	750.003	H	5.2	28.0		33.2	46.5	13.3						
<b>Results</b>							<b>Minimum Margin</b> <b>PASS/FAIL</b>			<b>0.4</b>	<b>dB</b>							
<b>Notes</b>		<b>Comments and Observations</b>																
		Results of scans shown in plots 46 and 47. EUT set to receive on 460MHz with the transmitter turned off. (Note, in normal operation the transmitter will always be turned on).  Measurements made with 120kHz bw QP detector.  qp - quasi-peak, av - average, pk - peak																

	Report No: <b>R3161</b>	<b>FCC ID: QOESOLO45X</b>						
	Issue No: <b>1</b>	<b>Test Report</b>						

## 4.11 Radiated Emissions Results - Receive Mode - Below 1GHz (3 of 3)

Factor Set 1: A5\_FS\_10C CBL015\_11A - -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R4 A5 A24 R9

### Radiated Emissions

<b>Company:</b> 3T Communications AG							<b>Product:</b> SOLO-45X											
<b>Date:</b> 05/10/2012							<b>Test Eng:</b> Dave Smith											
<b>Ports:</b>																		
<b>Test:</b> ANSI C63.4:2003 using limits of FCC A																		
<b>Ports:</b>																		
<b>Test:</b> using limits of																		
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_A dBuV/m	Margin FCC_A dB	Notes					
47	Rx	0	10	1	770.012	V	6.2	27.8		34.0	46.5	12.5						
47	Rx	0	10	1	770.012	H	7.7	27.8		35.5	46.5	11.0						
47	Rx	0	10	1	800.008	V	7.7	28.0		35.7	46.5	10.8						
47	Rx	0	10	1	800.008	H	10.2	28.0		38.2	46.5	8.3						
47	Rx	0	10	1	830.025	V	6.3	28.6		34.9	46.5	11.6						
47	Rx	0	10	1	830.025	H	4.6	28.6		33.2	46.5	13.3						
47	Rx	0	10	1	870.000	V	6.1	29.3		35.4	46.5	11.1						
47	Rx	0	10	1	870.000	H	7.5	29.3		36.8	46.5	9.7						
47	Rx	0	10	1	900.000	V	5.0	29.4		34.4	46.5	12.1						
47	Rx	0	10	1	900.000	H	4.0	29.4		33.4	46.5	13.1						
47	Rx	0	10	1	924.997	V	9.1	30.4		39.5	46.5	7.0						
47	Rx	0	10	1	924.997	H	8.8	30.4		39.2	46.5	7.3						
47	Rx	0	10	1	999.999	V	7.3	31.3		38.6	49.5	10.9						
47	Rx	0	10	1	999.999	H	8.1	31.3		39.4	49.5	10.1						
<b>Results</b>																		
<b>Minimum Margin</b> <b>PASS/FAIL</b>																		
<b>Notes</b>		<b>Comments and Observations</b>																
		Results of scans shown in plots 46 and 47. EUT set to receive on 460MHz with the transmitter turned off. (Note, in normal operation the transmitter will always be turned on).  Measurements made with 120kHz bw QP detector.																

	Report No: <b>R3161</b>	<b>FCC ID: QOESOLO45X</b>						
	Issue No: <b>1</b>	<b>Test Report</b>						

## 4.12 Radiated Emissions Results - Receive Mode - Above 1GHz

Factor Set 1: A19\_3m\_12B PRE9\_12A CBL071\_12A -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R9 A19 PRE13

### Radiated Emissions

<b>Company:</b> 3T Communications AG							<b>Product:</b> SOLO-45X											
<b>Date:</b> 05/10/2012							<b>Test Eng:</b> Dave Smith											
<b>Ports:</b>																		
<b>Test:</b> ANSI C63.4:2003 using limits of FCC A																		
<b>Ports:</b>																		
<b>Test:</b> using limits of																		
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_A dBuV/m	Margin FCC_A dB	Notes					
48	Rx	0	3	1	1066.660	V	57.6	-12.8		44.8	60.0	15.2	pk					
48	Rx	0	3	1	1066.660	H	57.7	-12.8		44.9	60.0	15.1	pk					
48	Rx	0	3	1	1066.660	V	54.5	-12.8		41.6	60.0	18.3	av					
48	Rx	0	3	1	1066.660	H	55.1	-12.8		42.2	60.0	17.7	av					
48	Rx	0	3	1	1275.000	V	54.7	-11.6		43.1	60.0	16.8	pk					
48	Rx	0	3	1	1275.000	H	53.2	-11.6		41.6	60.0	18.4	pk					
48	Rx	0	3	1	1275.000	V	52.1	-11.6		40.5	60.0	19.4	av					
48	Rx	0	3	1	1275.000	H	50.2	-11.6		38.6	60.0	21.3	av					
49	Rx	0	3	1	2133.500	V	58.2	-10.2		48.0	60.0	11.9	pk					
49	Rx	0	3	1	2133.500	H	61.5	-10.2		51.3	60.0	8.6	pk					
49	Rx	0	3	1	2133.500	V	54.1	-10.2		43.9	60.0	16.0	av					
49	Rx	0	3	1	2133.500	H	58.2	-10.2		48.0	60.0	11.9	av					
49	Rx	0	3	1	3733.750	V	52.3	-4.8		47.4	60.0	12.5	pk					
49	Rx	0	3	1	3733.750	H	57.4	-4.8		52.6	60.0	7.4	pk					
49	Rx	0	3	1	3733.750	V	49.0	-4.8		44.2	60.0	15.8	av					
49	Rx	0	3	1	3733.750	H	53.6	-4.8		48.8	60.0	11.2	av					
49	Rx	0	3	1	4800.450	V	38.3	-3.1		35.2	60.0	24.8	pk					
49	Rx	0	3	1	4800.450	H	54.8	-3.1		51.7	60.0	8.2	pk					
49	Rx	0	3	1	4800.450	V	35.6	-3.1		32.5	60.0	27.4	av					
49	Rx	0	3	1	4800.450	H	52.1	-3.1		49.0	60.0	10.9	av					
<b>Results</b>										<b>Minimum Margin</b> <b>PASS/FAIL</b>	<b>7.4</b> <b>dB</b> <b>PASS</b>							
Notes	Comments and Observations																	
	Results of scans shown in plots 48 and 49. EUT set to receive on 460MHz with the transmitter turned off. (Note, in normal operation the transmitter will always be turned on).																	
	Measurements made at a 3m test distance and the FCC class A limit extrapolated for this distance.																	
Key:	qp - quasi-peak, av - average, pk - peak																	

	Report No: <b>R3161</b>	<b>FCC ID: QOESOLO45X</b>						
	Issue No: <b>1</b>	<b>Test Report</b>						
Test No: <b>T4510</b>							Page: <b>29 of 79</b>	

## 4.13 Conducted Emissions (Power) - Results

Factor Set 1: L1\_12A AB002\_CBL005\_CBL039\_12A - -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R10 L1 L2

### Conducted Emissions (Power)

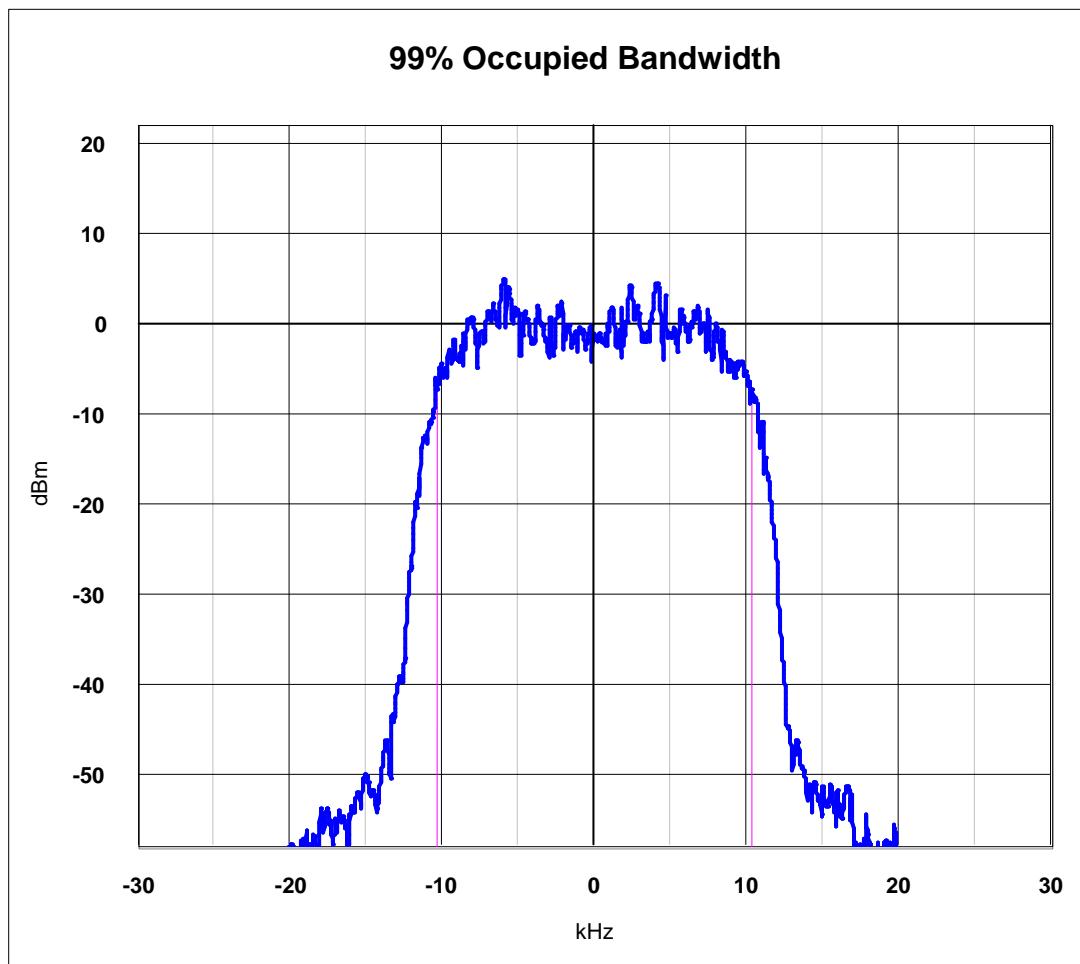
<b>Company:</b> 3T Communications AG <b>Date:</b> 10/10/2012 <b>Ports:</b> ac power <b>Test:</b> ANSI C63.4:2003 using limits of FCC A						<b>Product:</b> SOLO-45X <b>Test Eng:</b> Dave Smith <b>Ports:</b> <b>Test:</b> using limits of								
Plot	Op Mode	Mod State	Line (L/N)	Fact Set	Freq. MHz	Det qp/ av	Rec. Level dBuV	Corr'n Factor dB	Total Level dBuV	Limit CISPR22(A) dBuV	Margin CISPR22(A) dB			
50	Rx	0	L	1	0.195	qp	34.4	10.0	44.4	79.0	34.6			
50	Rx	0	L	1	0.195	av	30.2	10.0	40.2	66.0	25.8			
50	Rx	0	L	1	25.380	qp	35.0	10.5	45.4	73.0	27.6			
50	Rx	0	L	1	25.380	av	18.7	10.5	29.2	60.0	30.8			
51	Rx	0	N	1	0.195	qp	34.4	10.0	44.4	79.0	34.6			
51	Rx	0	N	1	0.195	av	31.3	10.0	41.3	66.0	24.7			
51	Rx	0	N	1	25.585	qp	34.0	10.5	44.5	73.0	28.5			
51	Rx	0	N	1	25.585	av	19.1	10.5	29.6	60.0	30.4			
52	Tx	0	L	1	0.195	qp	34.6	10.0	44.6	79.0	34.4			
52	Tx	0	L	1	0.195	av	30.3	10.0	40.3	66.0	25.7			
52	Tx	0	L	1	25.530	qp	32.2	10.5	42.7	73.0	30.3			
52	Tx	0	L	1	25.530	av	24.5	10.5	35.0	60.0	25.0			
53	Tx	0	N	1	0.195	qp	38.1	10.0	48.1	79.0	30.9			
53	Tx	0	N	1	0.195	av	31.4	10.0	41.4	66.0	24.6			
53	Tx	0	N	1	25.235	qp	32.0	10.5	42.5	73.0	30.5			
53	Tx	0	N	1	25.235	av	25.1	10.5	35.5	60.0	24.5			
<b>Results</b>						<b>Minimum Margin</b> <b>PASS/FAIL</b>			<b>24.5</b> dB					
<b>Notes</b>		Comments and Observations												
		Results of scans shown in plots 50 to 53.												

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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Company: 3T  
Product: SOLO  
Date: 04/10/2012  
Mode: 450MHz

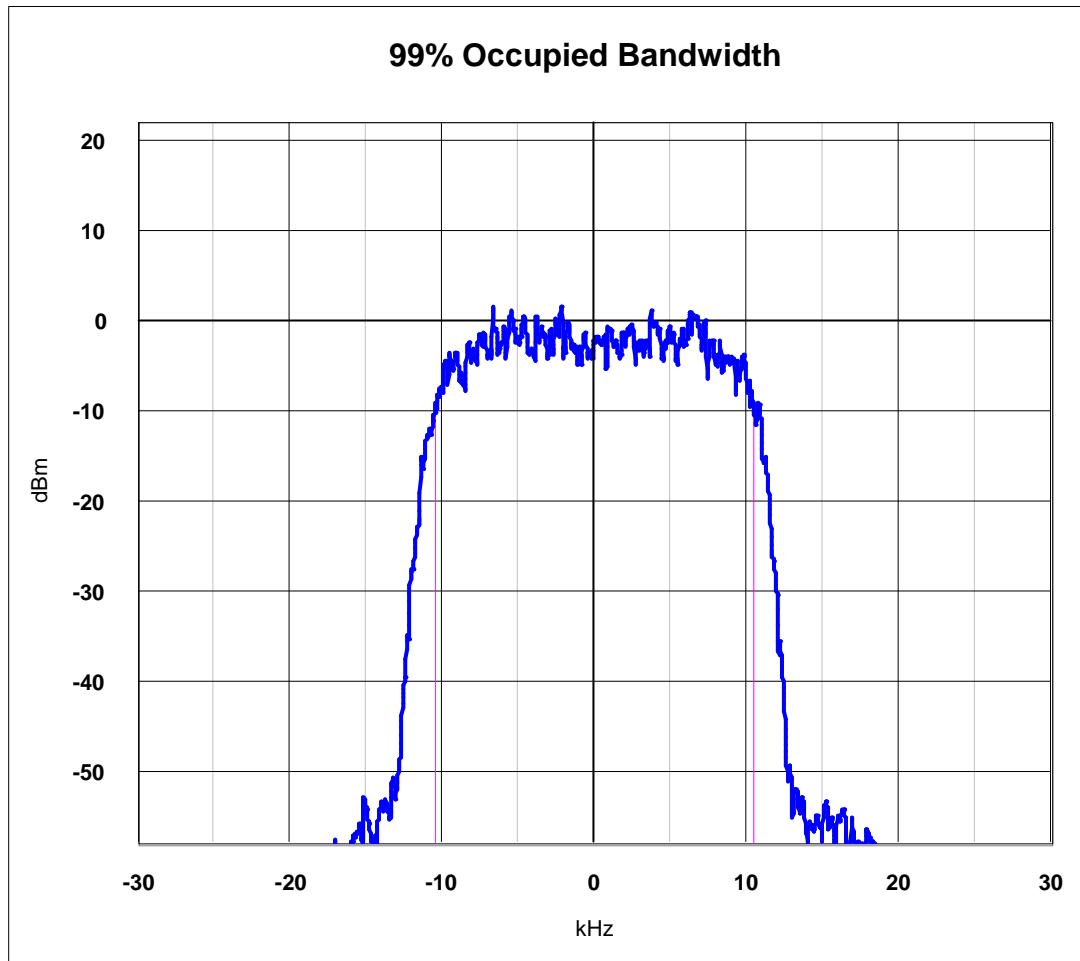
Test Eng: DS  
Mod State: 1  
Analyser: R9

Centre Frequency: 450 MHz RBW: 40 kHz VBW: Mode: Sample  
Span

99% Occupied bandwidth: 20.77 kHz

**PLOT 1 Occupied BW (450MHz)**

	Report No: R3161	FCC ID: QOESOLO45X	
	Issue No: 1		
Test No: T4510	Test Report		Page: 31 of 79

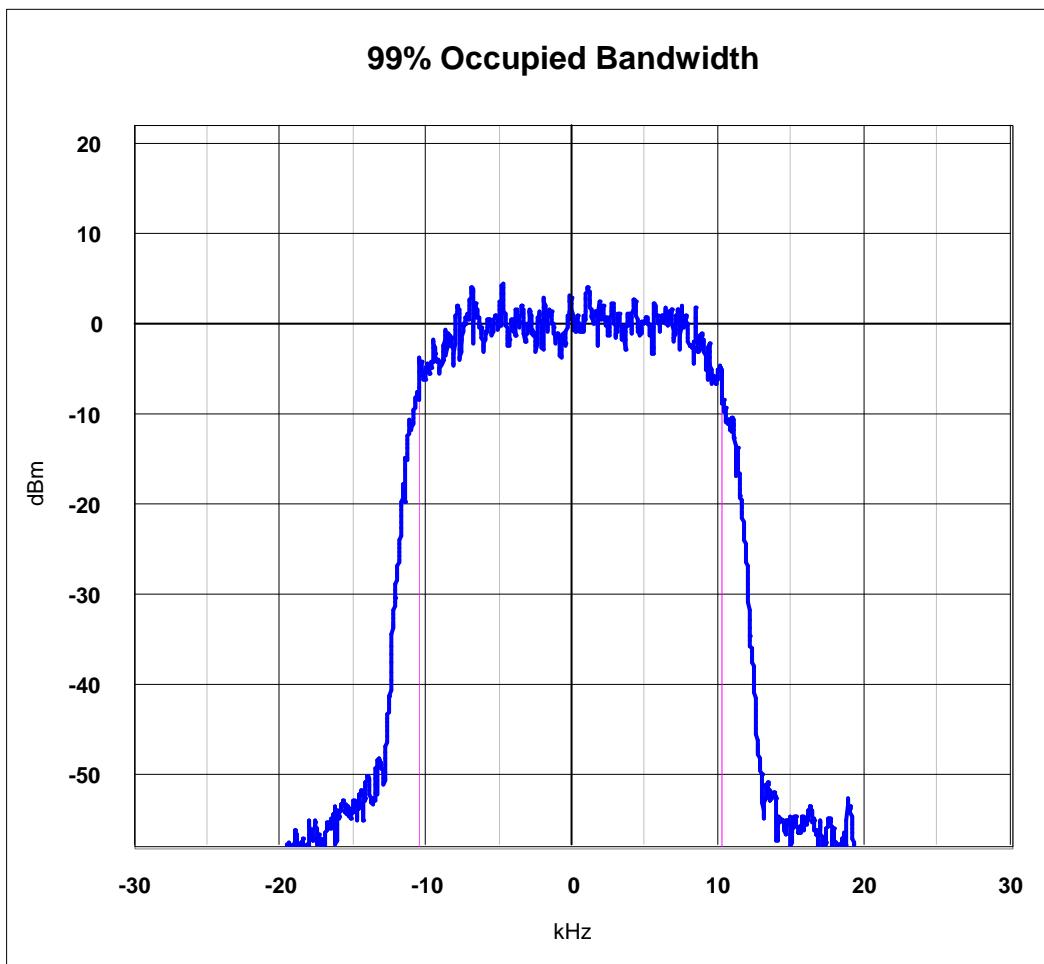


Company: 3T	Test Eng: DS	
Product: SOLO	Mod State: 1	
Date: 04/10/2012	Analyser: R9	
Mode: 460MHz		
Centre Frequency: 460 MHz	RBW: 40 kHz	Mode: Sample
Span	VBW	

99% Occupied bandwidth 20.93 kHz

## PLOT 2 Occupied BW (460MHz)

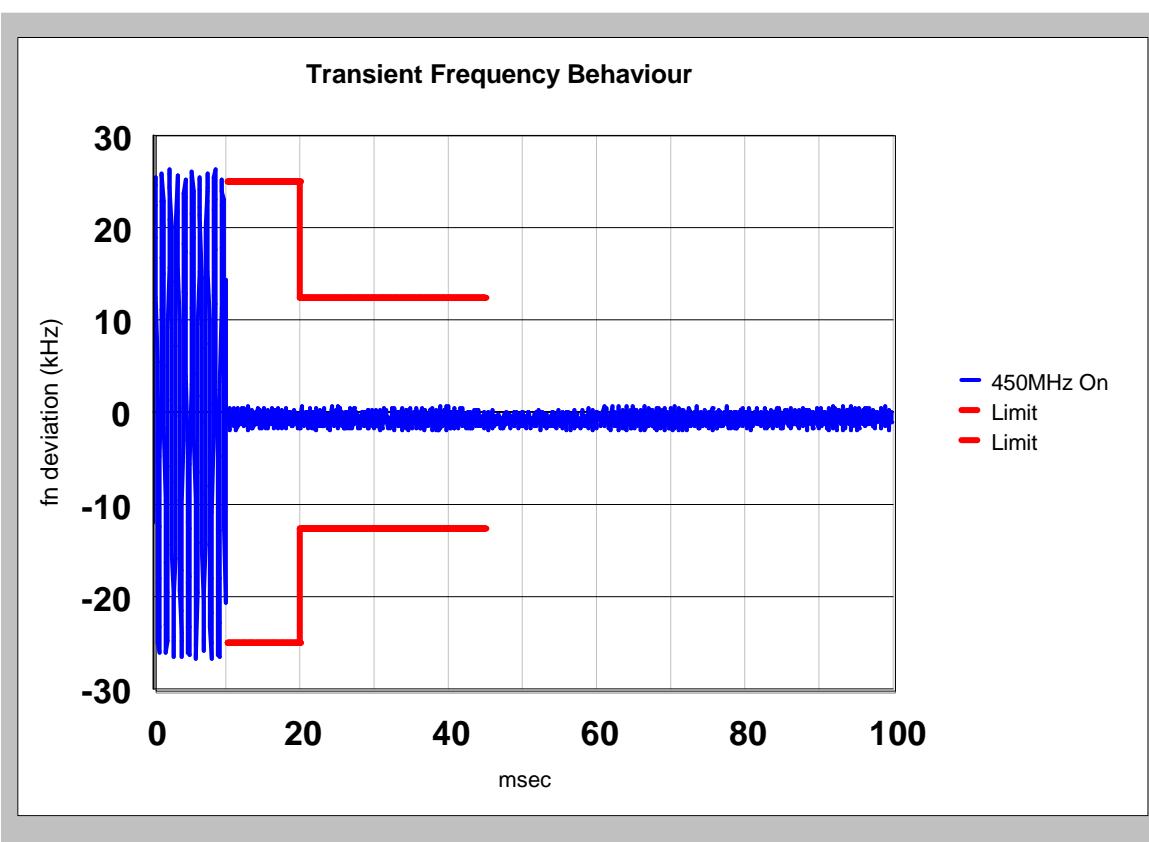
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X	
Test No: T4510		Test Report	Page: 32 of 79



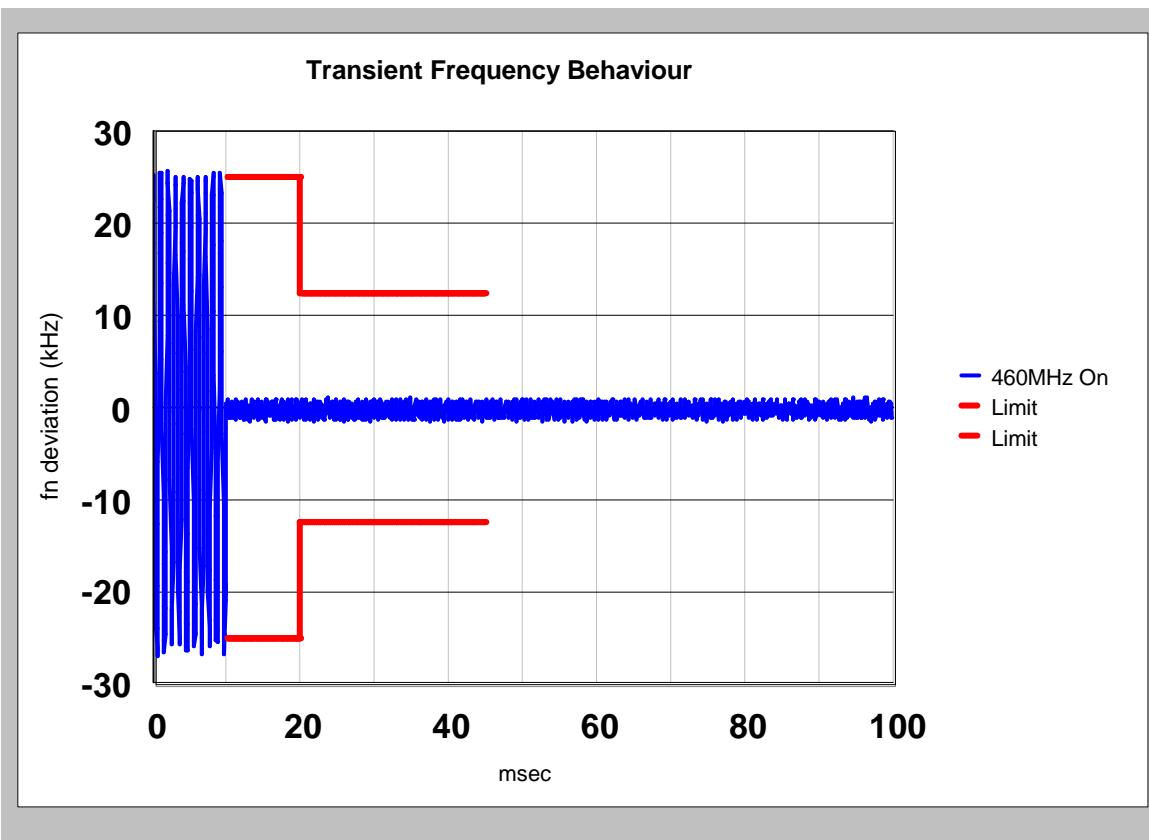
Company: 3T	Test Eng: DS	
Product: SOLO	Mod State: 0	
Date: 04/10/2012	Analyser: R9	
Mode: 470MHz		
Centre Frequency: 470 MHz	RBW: 40 kHz	Mode: Sample
Span	VBW	

99% Occupied bandwidth 20.73 kHz

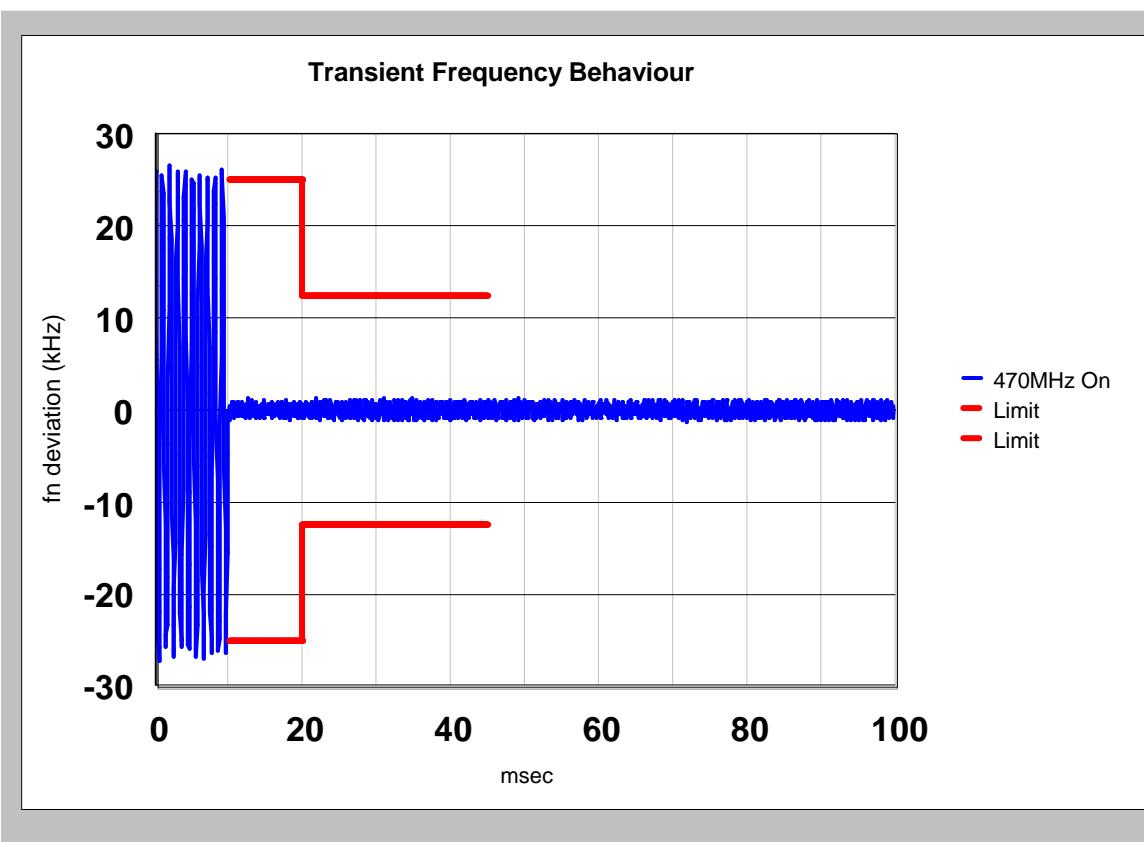
### PLOT 3 Occupied BW (470MHz)



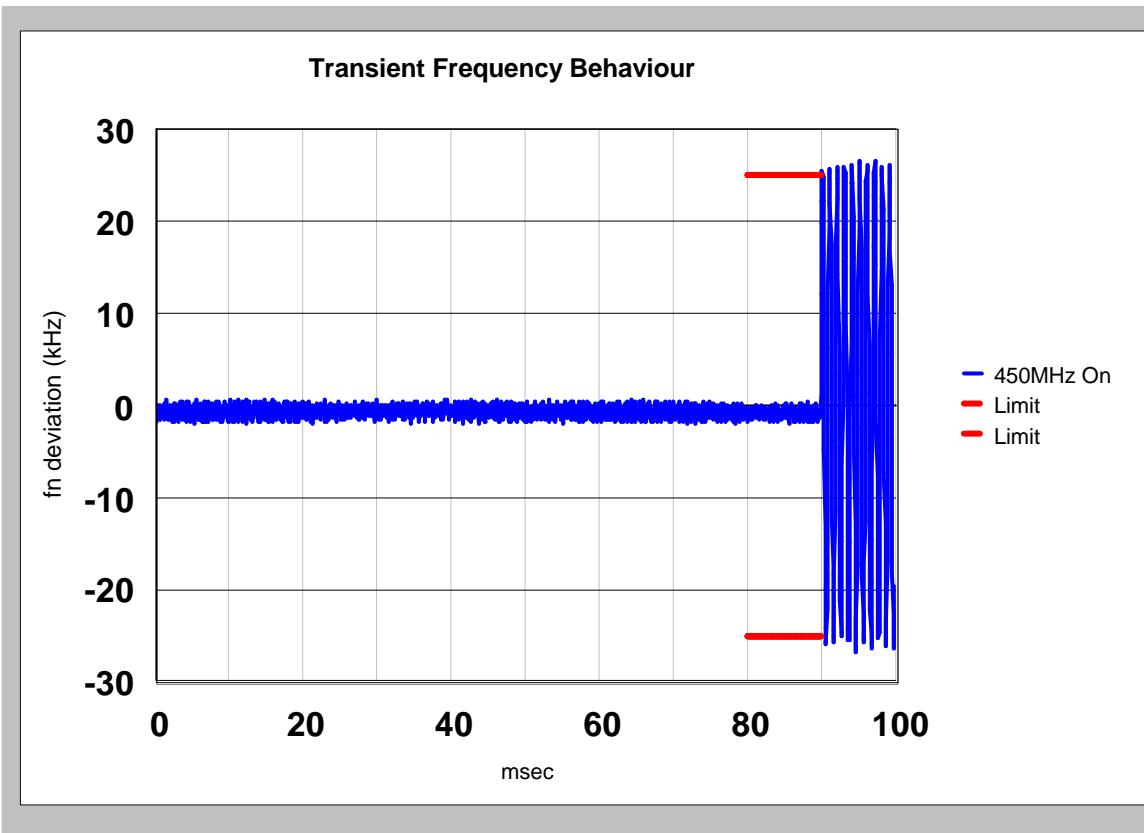
**PLOT 4 Transient Frequency - 450MHz - On**



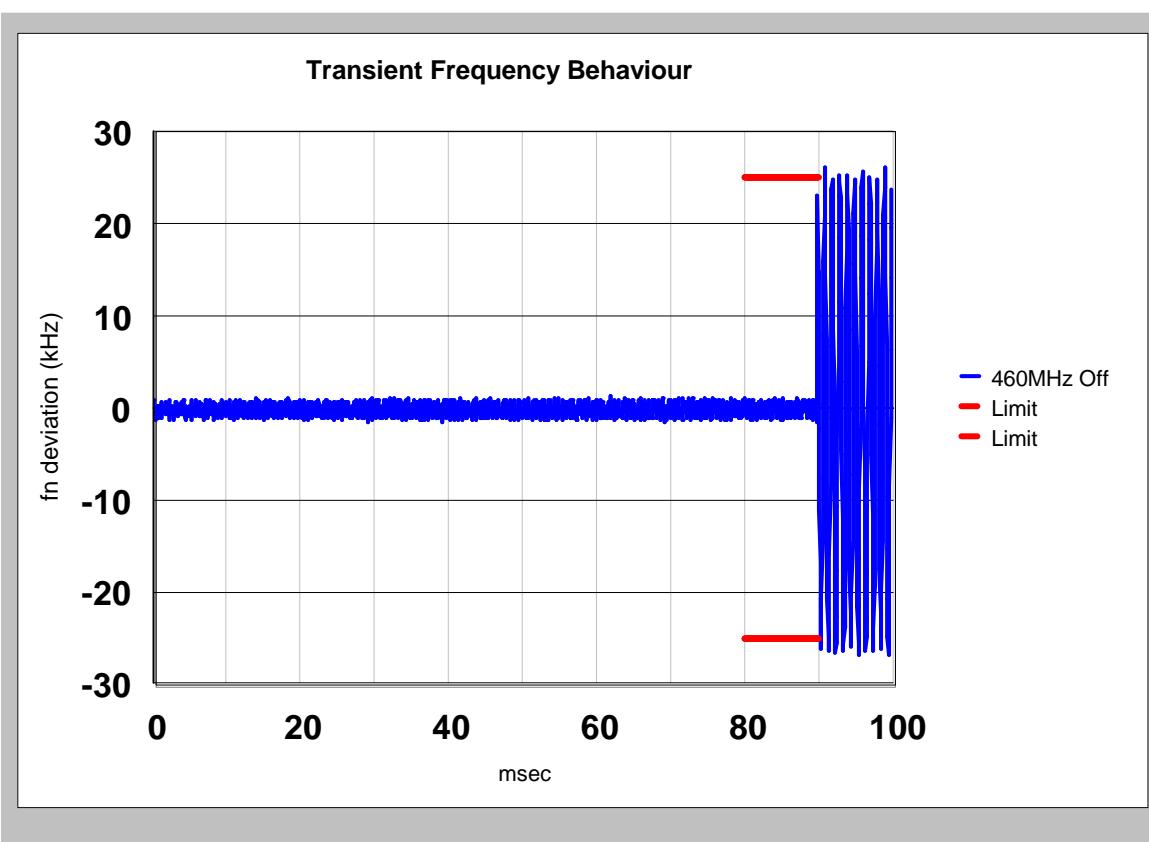
**PLOT 5 Transient Frequency - 460MHz - On**



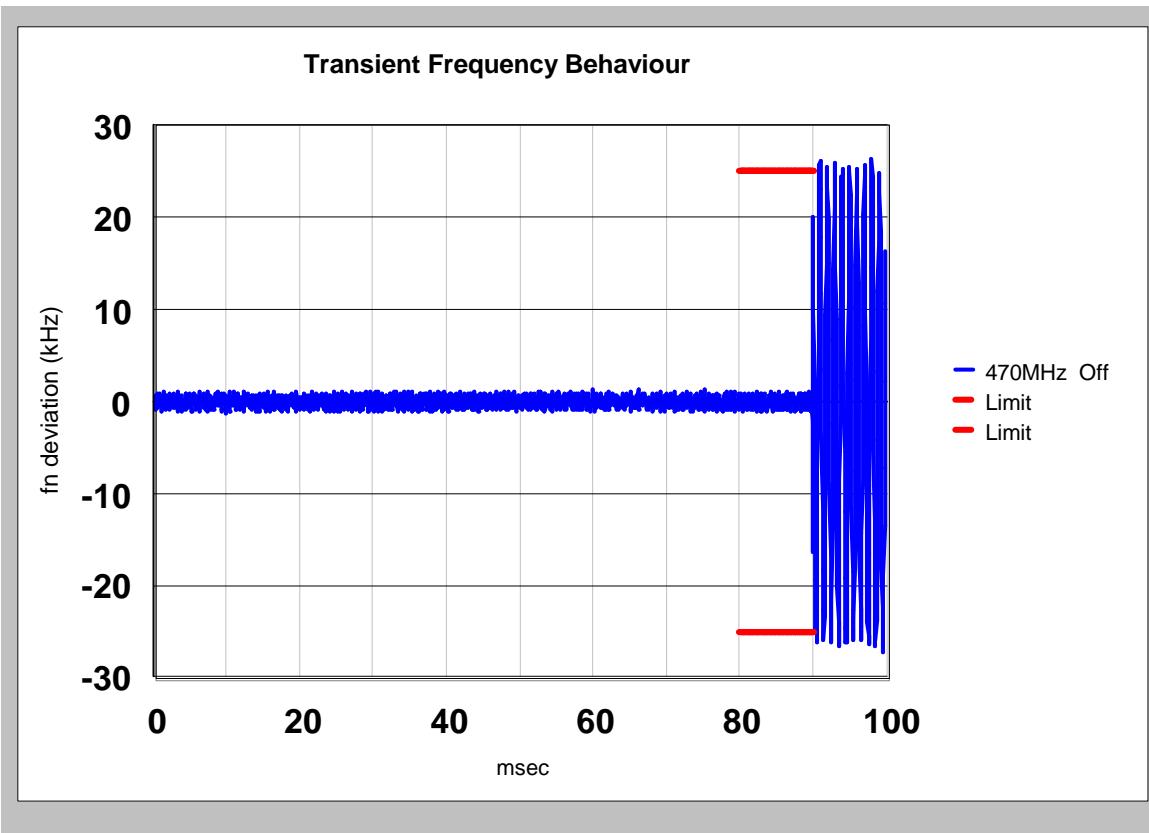
**PLOT 6 Transient Frequency - 470MHz - On**



**PLOT 7 Transient Frequency - 450MHz - Off**



**PLOT 8 Transient Frequency - 460MHz - Off**



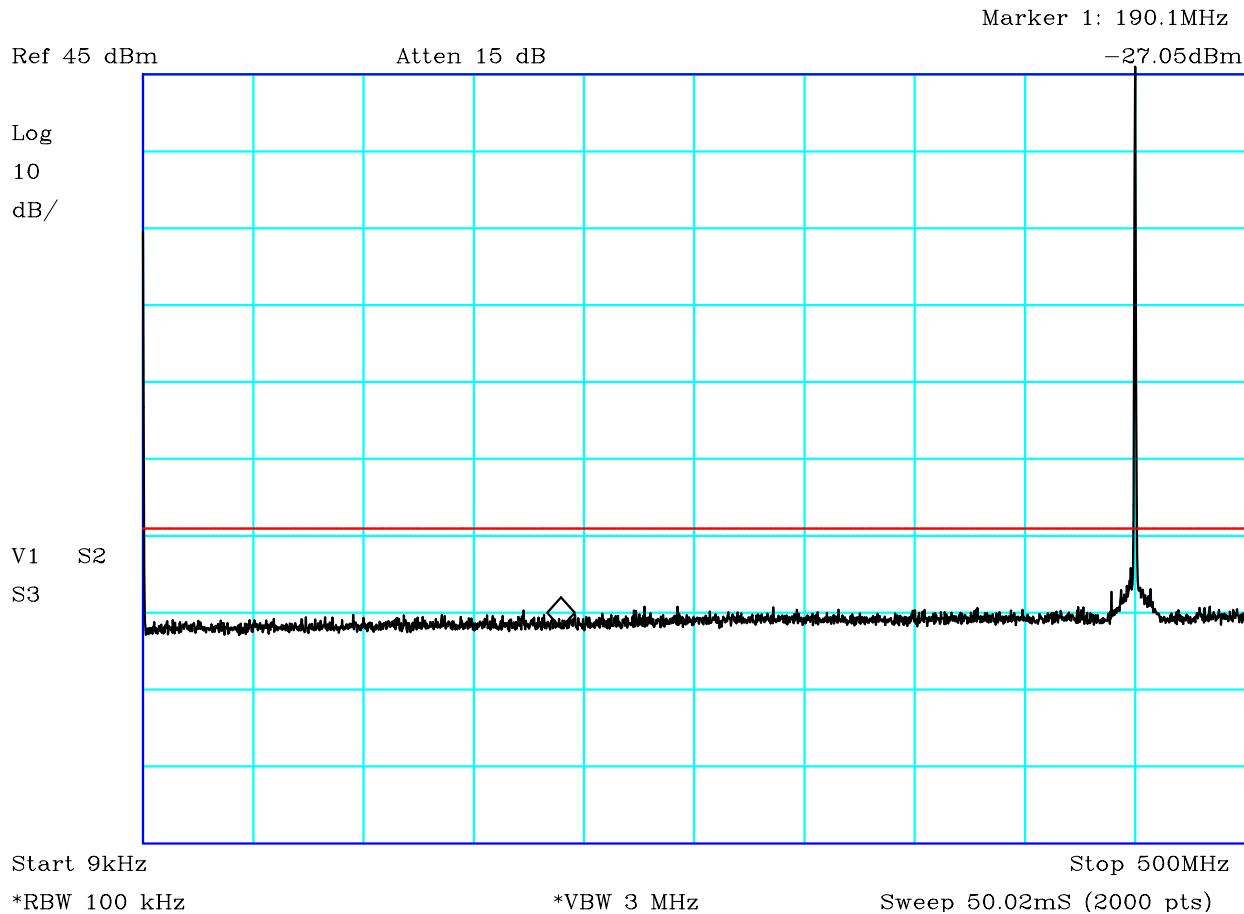
**PLOT 9 Transient Frequency - 470MHz - Off**

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 10 Antenna conducted spurious - Tx @ 450MHz - main antenna port - 9kHz to 500MHz**

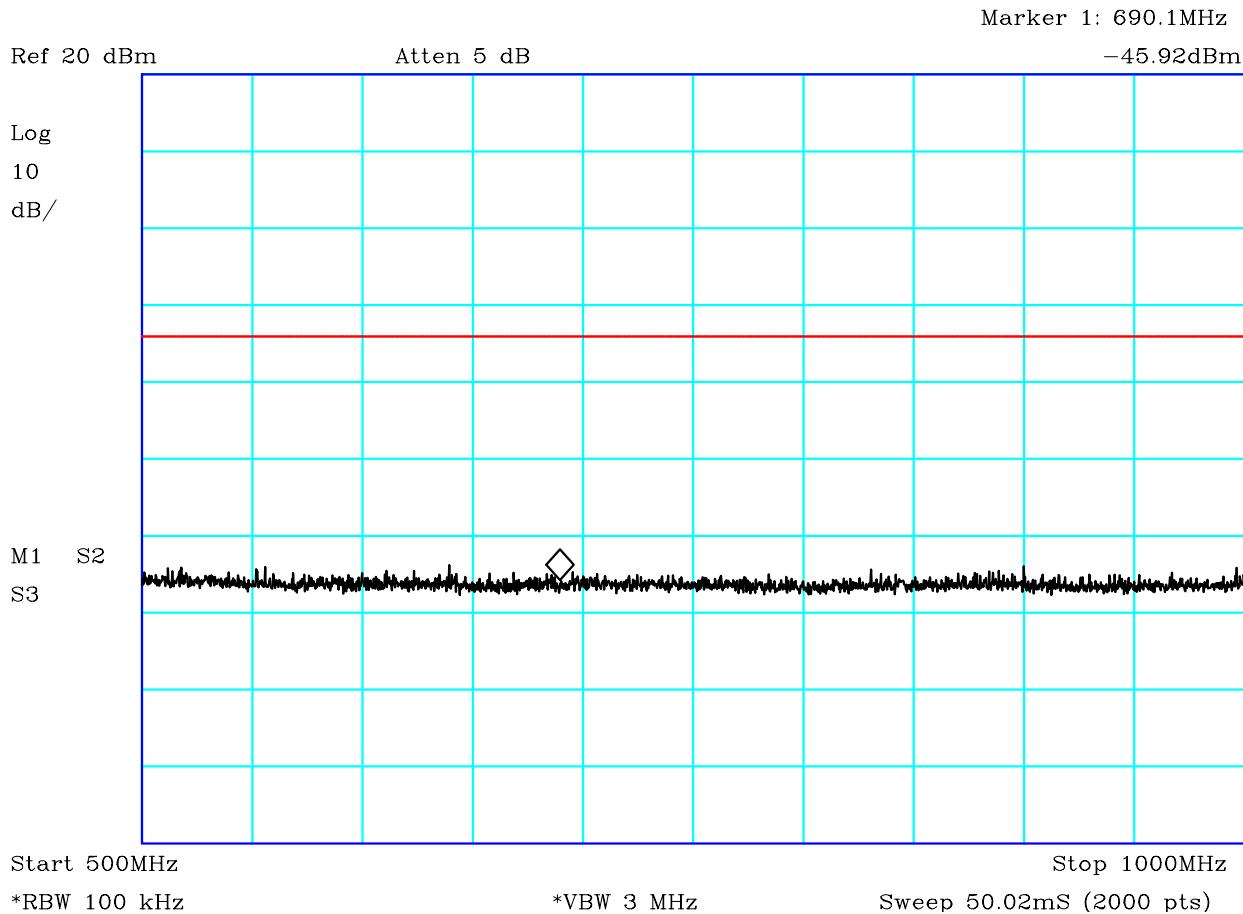
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
450MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
File: H2904570	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 11 Antenna conducted spurious - Tx @ 450MHz - main antenna port - 500MHz to 1GHz**

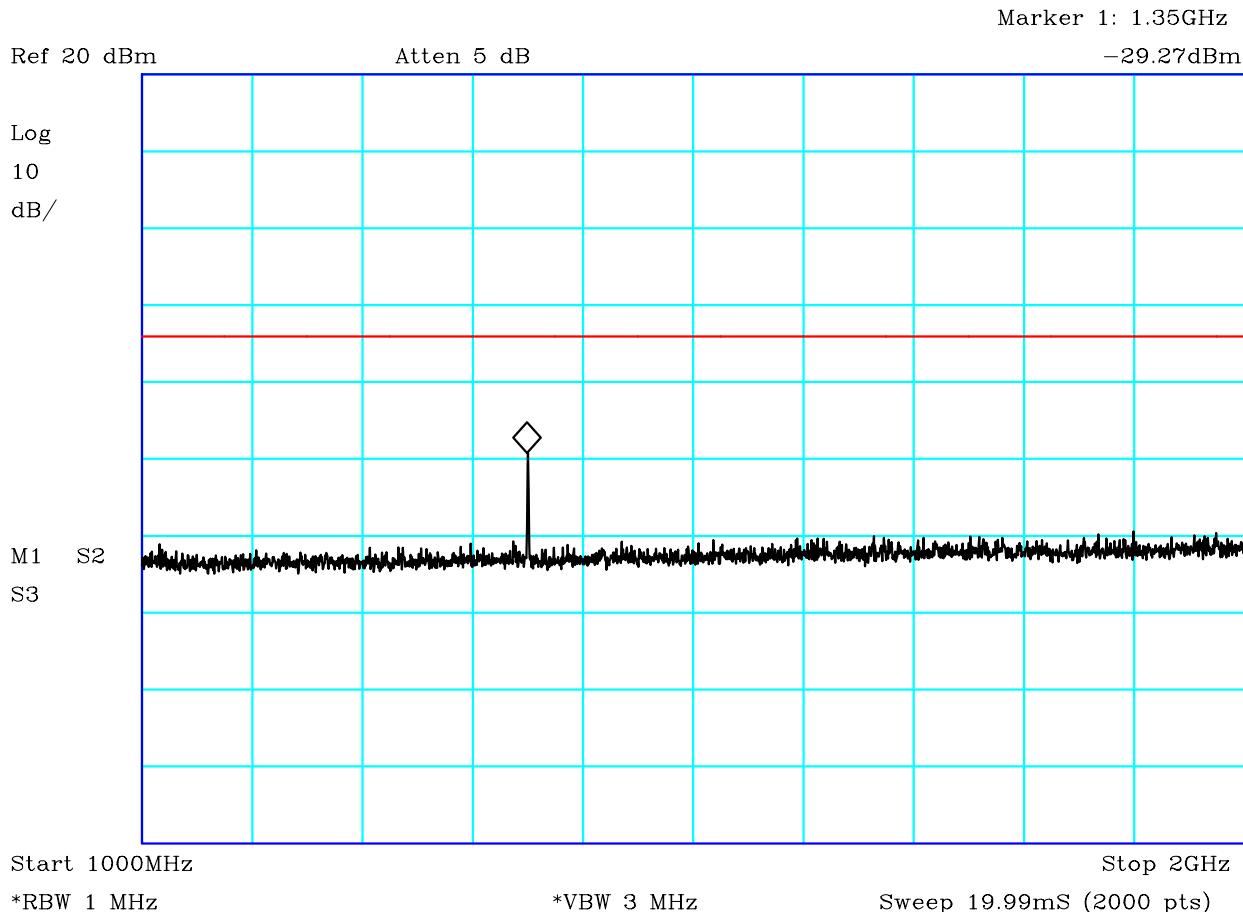
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
450MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H2904577

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 12 Antenna conducted spurious - Tx @ 450MHz - main antenna port - 1GHz to 2GHz**

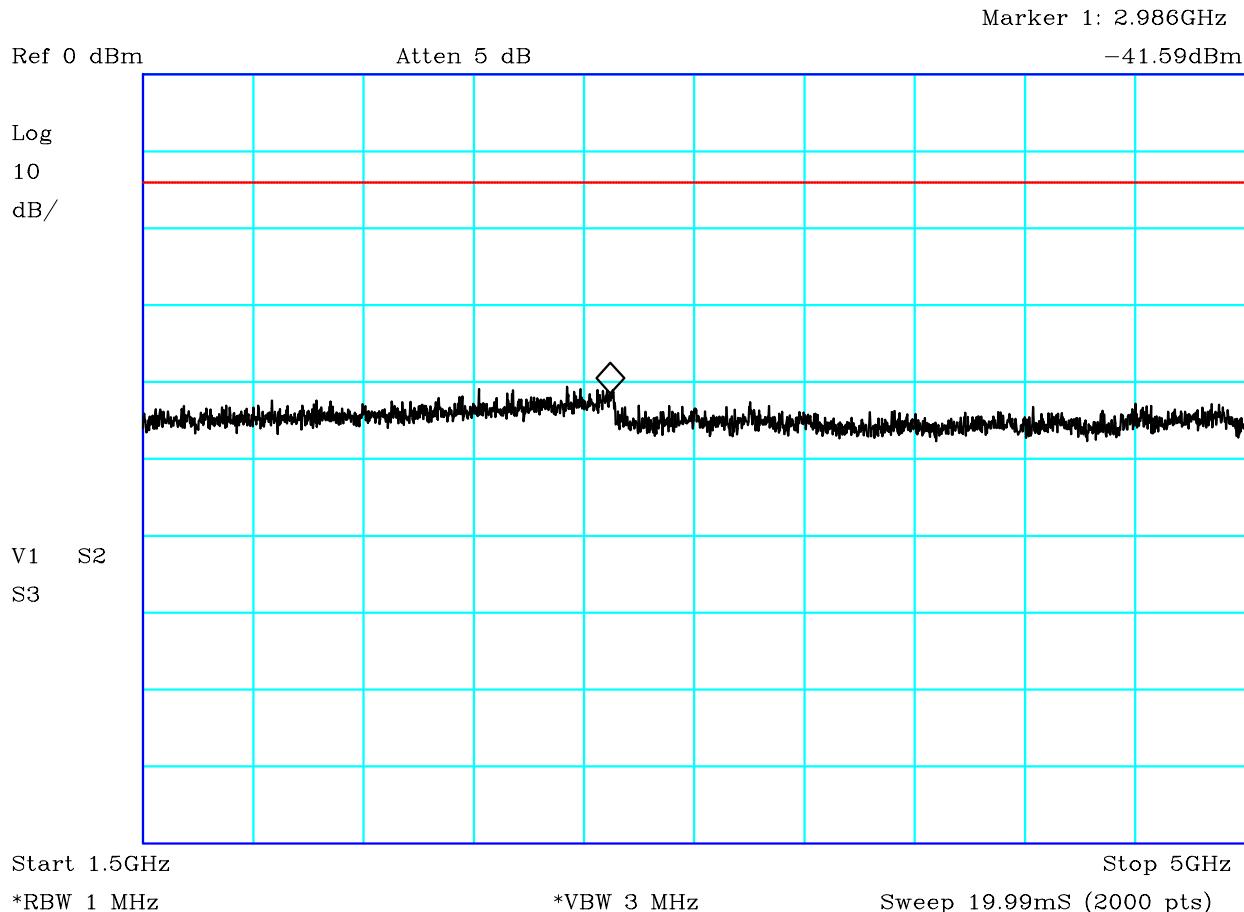
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
450MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H290457B

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 13 Antenna conducted spurious - Tx @ 450MHz - main antenna port - 1.5GHz to 5GHz**

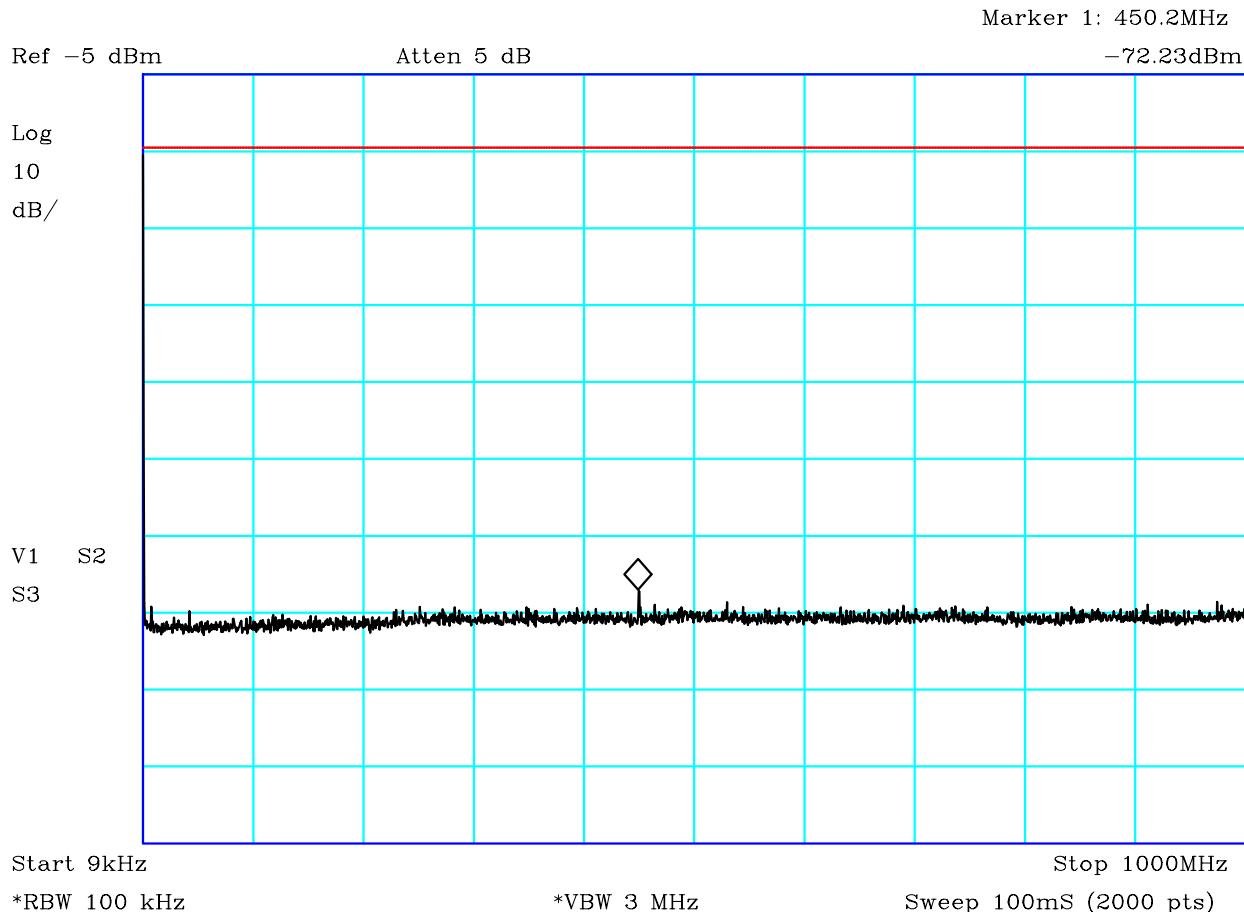
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
450MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
File: H2904582	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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CF2:Cable 72

**PLOT 14 Antenna conducted spurious - Tx @ 450MHz - diversity antenna port - 9kHz to 1GHz**

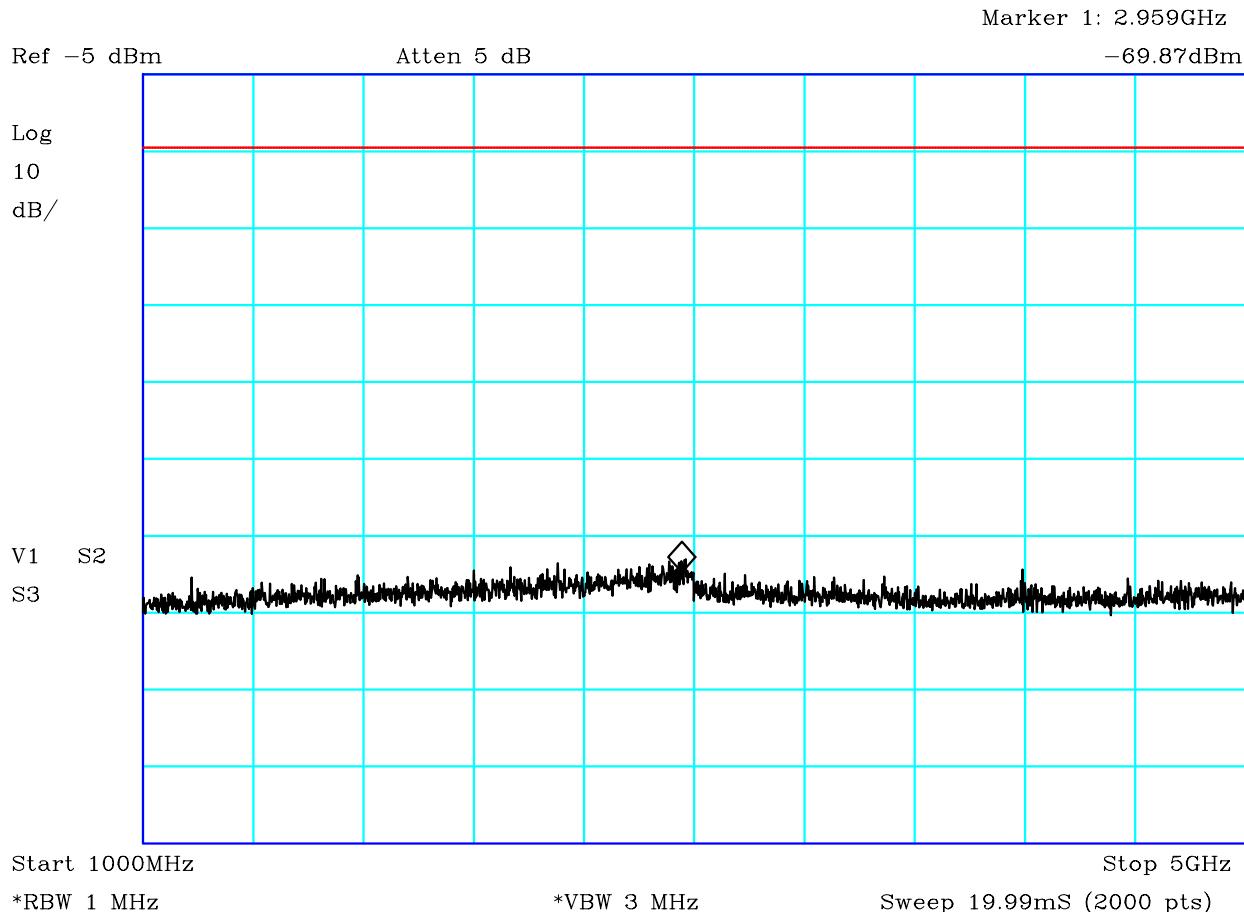
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:

450MHz  
Tx spurious on diversity antenna port.

Facility: 3T	Mode: 1
	Modification State: 1

File: H290452B

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>41 of 79</b>



CF2:Cable 72

**PLOT 15 Antenna conducted spurious - Tx @ 450MHz - diversity antenna port - 1GHz to 5GHz**

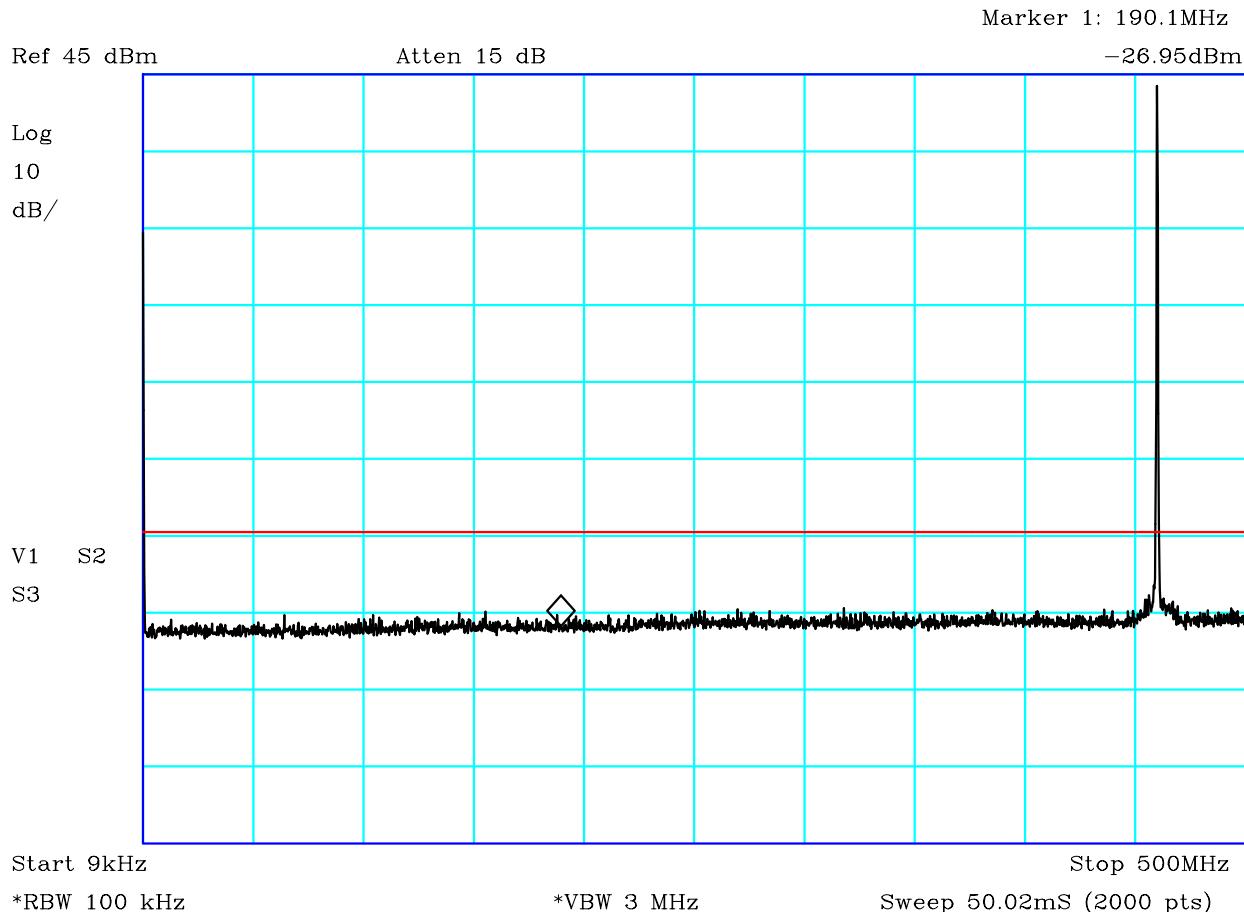
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
450MHz	
Tx spurious on diversity antenna port.	
Facility: 3T	Mode: 1
	Modification State: 1
File: H2904529	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 16 Antenna conducted spurious - Tx @ 460MHz - main antenna port - 9kHz to 500MHz**

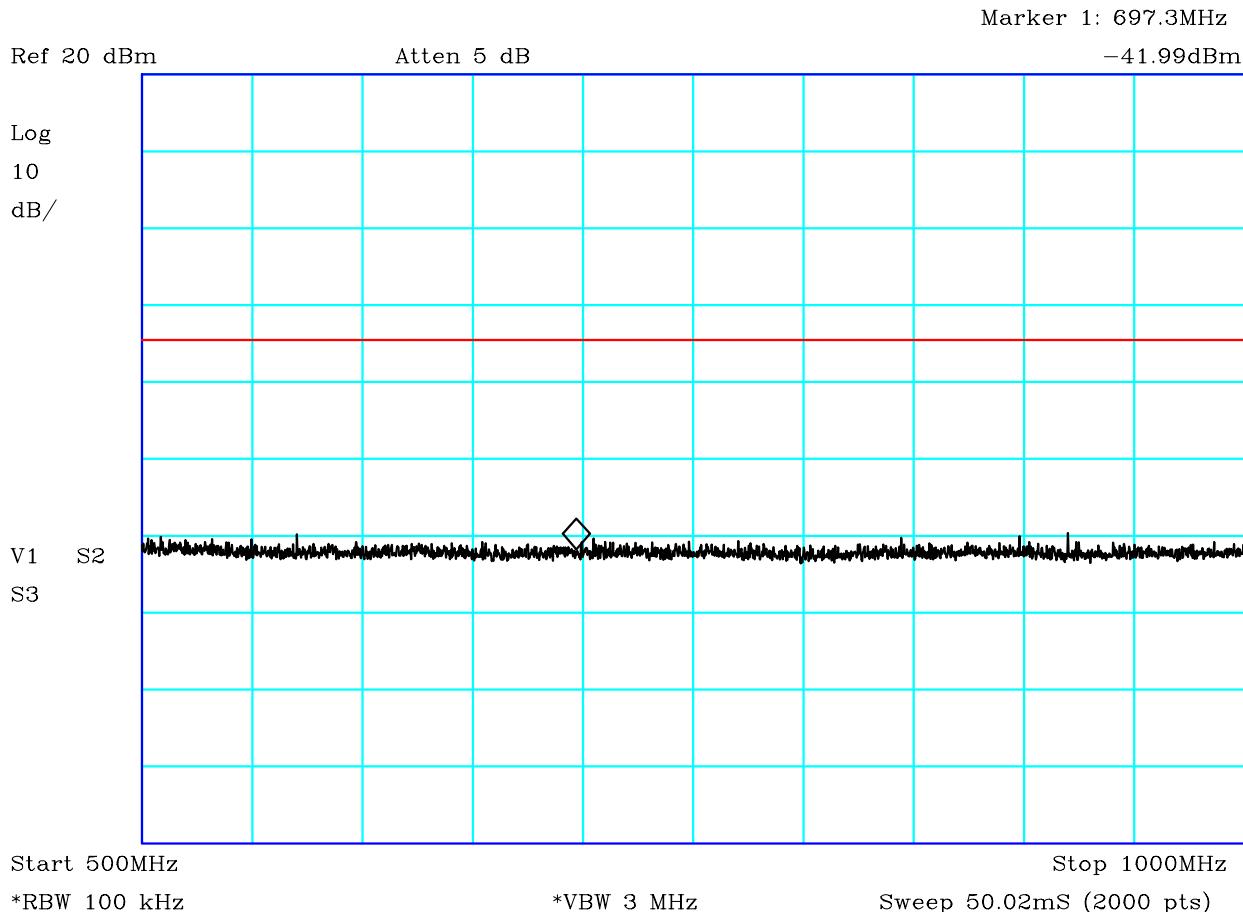
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
460MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H29044AA

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 17 Antenna conducted spurious - Tx @ 460MHz - main antenna port - 500MHz to 1GHz**

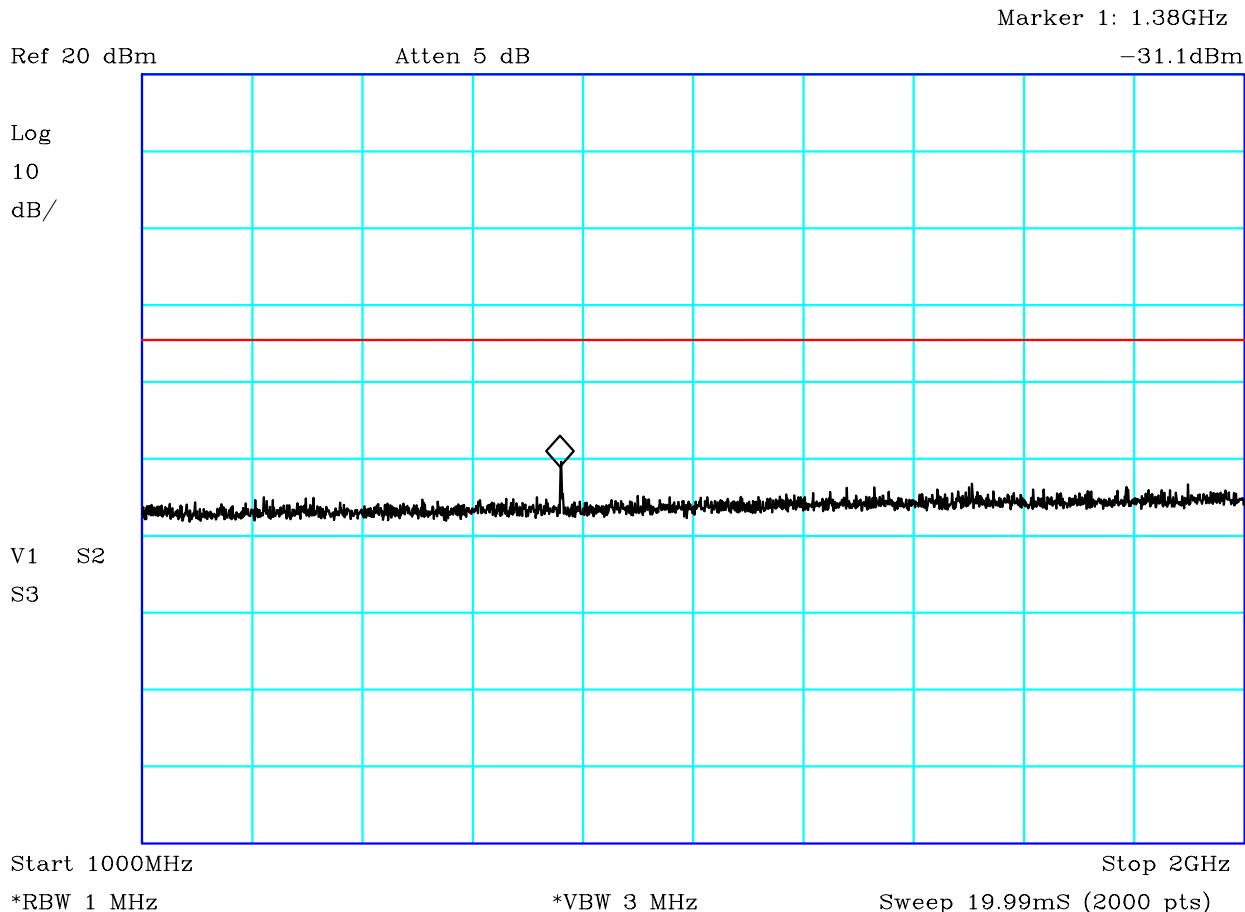
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
460MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H2904499

	Report No: <b>R3161</b> Issue No: <b>1</b>
Test No: <b>T4510</b>	

**FCC ID: QOESOLO45X**

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**PLOT 18 Antenna conducted spurious - Tx @ 460MHz - main antenna port - 1GHz to 2GHz**

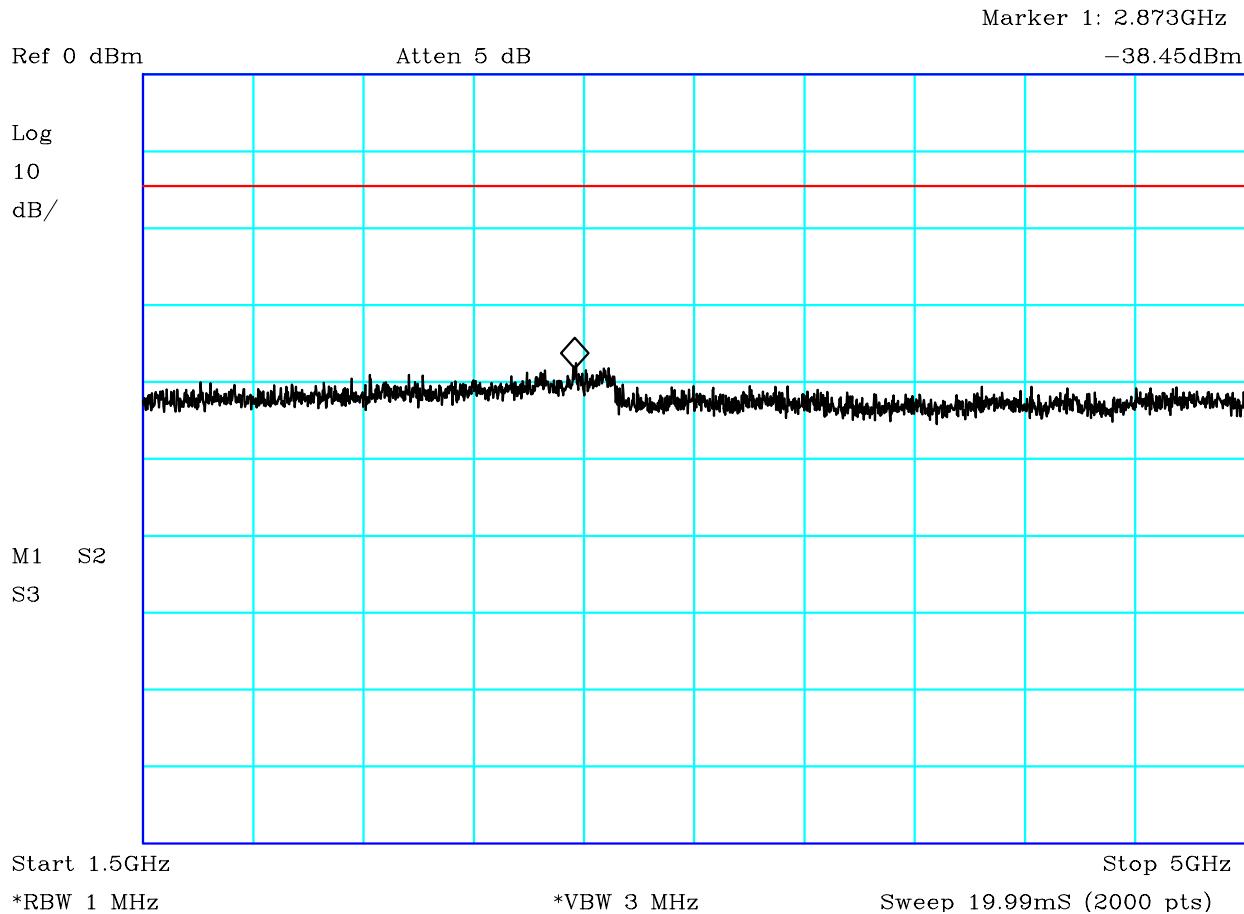
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
460MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H290449C

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 19 Antenna conducted spurious - Tx @ 460MHz - main antenna port - 1.5GHz to 5GHz**

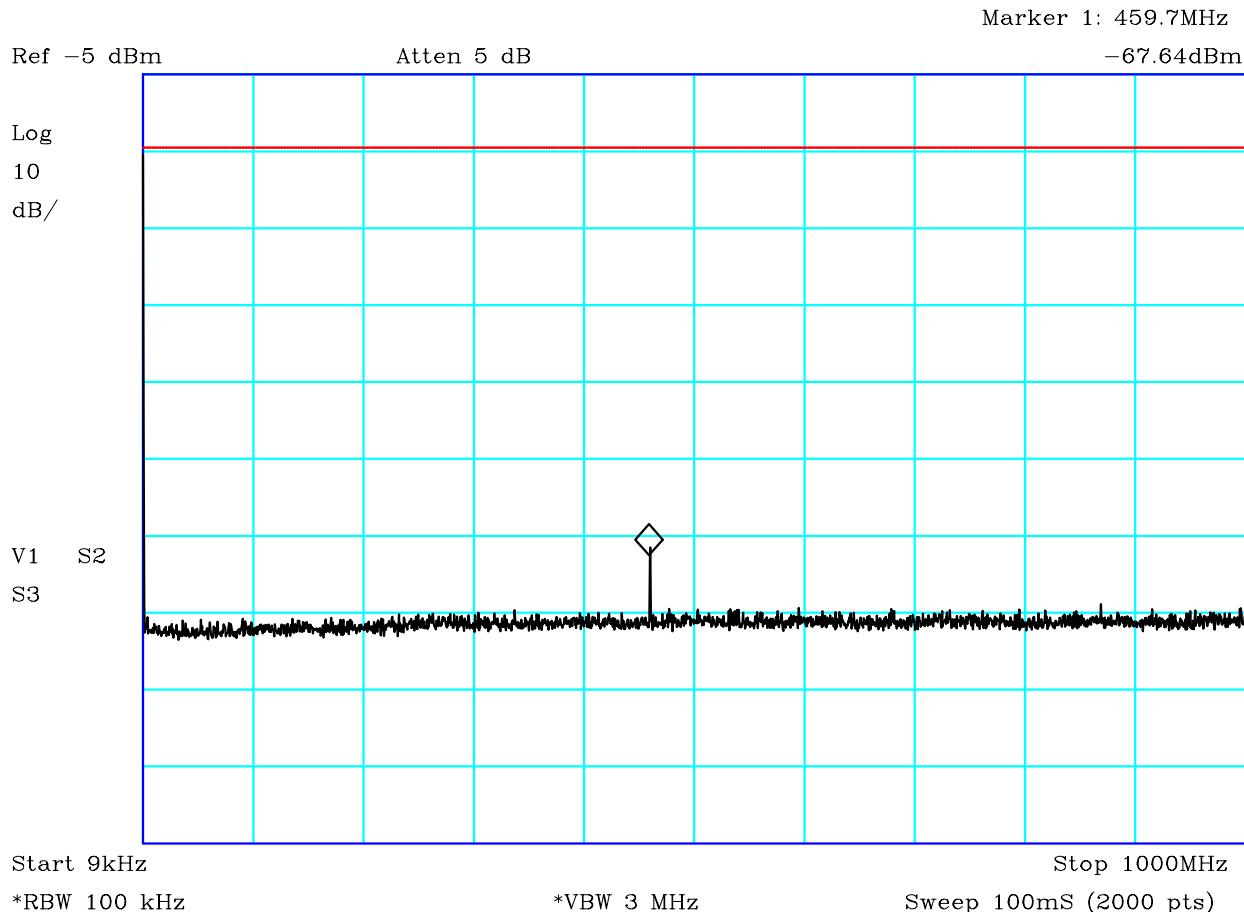
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
460MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H2904494

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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CF2:Cable 72

**PLOT 20 Antenna conducted spurious - Tx @ 460MHz - diversity antenna port - 9kHz to 1GHz**

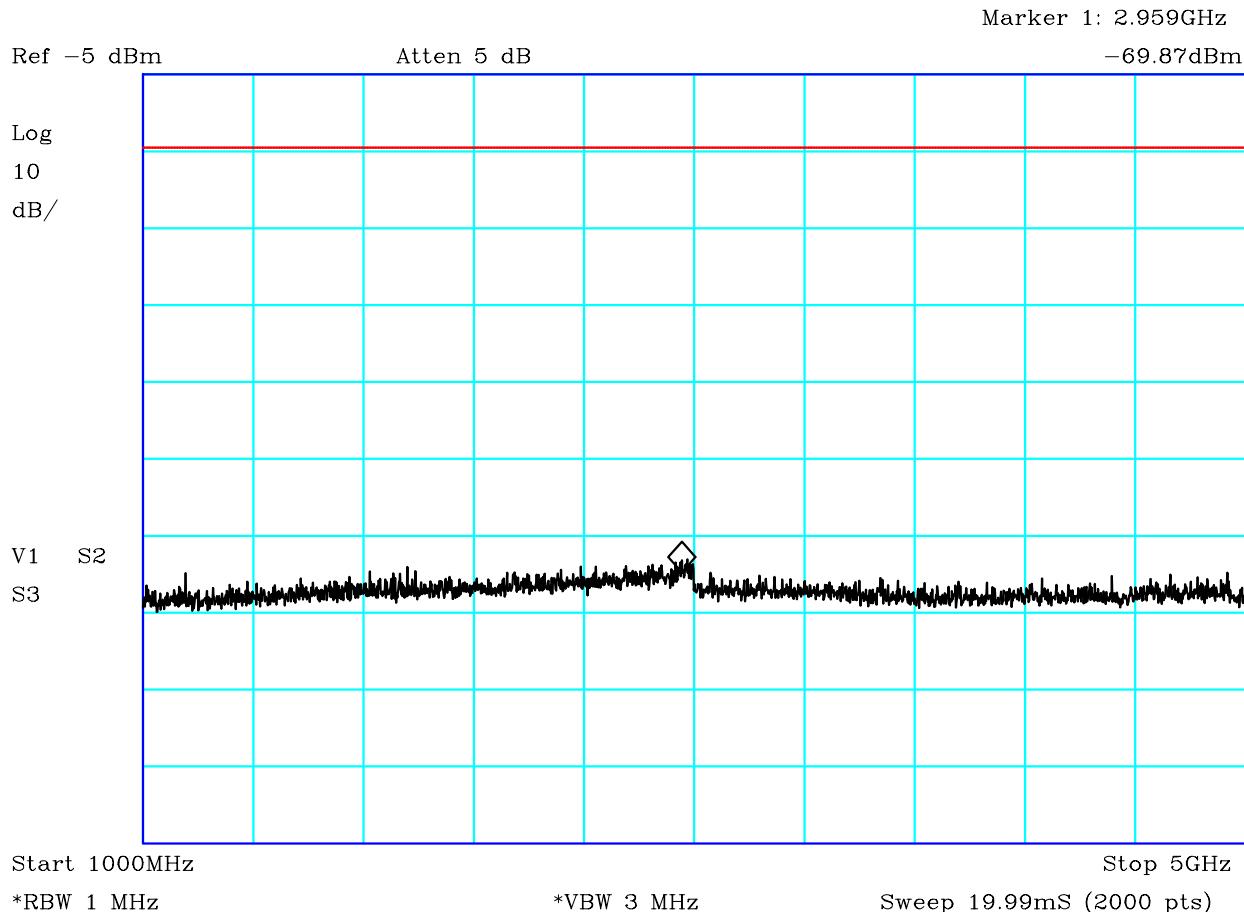
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
460MHz	
Tx spurious on diversity antenna port.	
Facility: 3T	Mode: 1
	Modification State: 1
File: H2904513	

	Report No: <b>R3161</b> Issue No: <b>1</b>
Test No: <b>T4510</b>	

**FCC ID: QOESOLO45X**

**Test Report**

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CF2:Cable 72

**PLOT 21 Antenna conducted spurious - Tx @ 460MHz - diversity antenna port - 1GHz to 5GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:

460MHz  
Tx spurious on diversity antenna port.

Facility: 3T	Mode: 1
	Modification State: 1

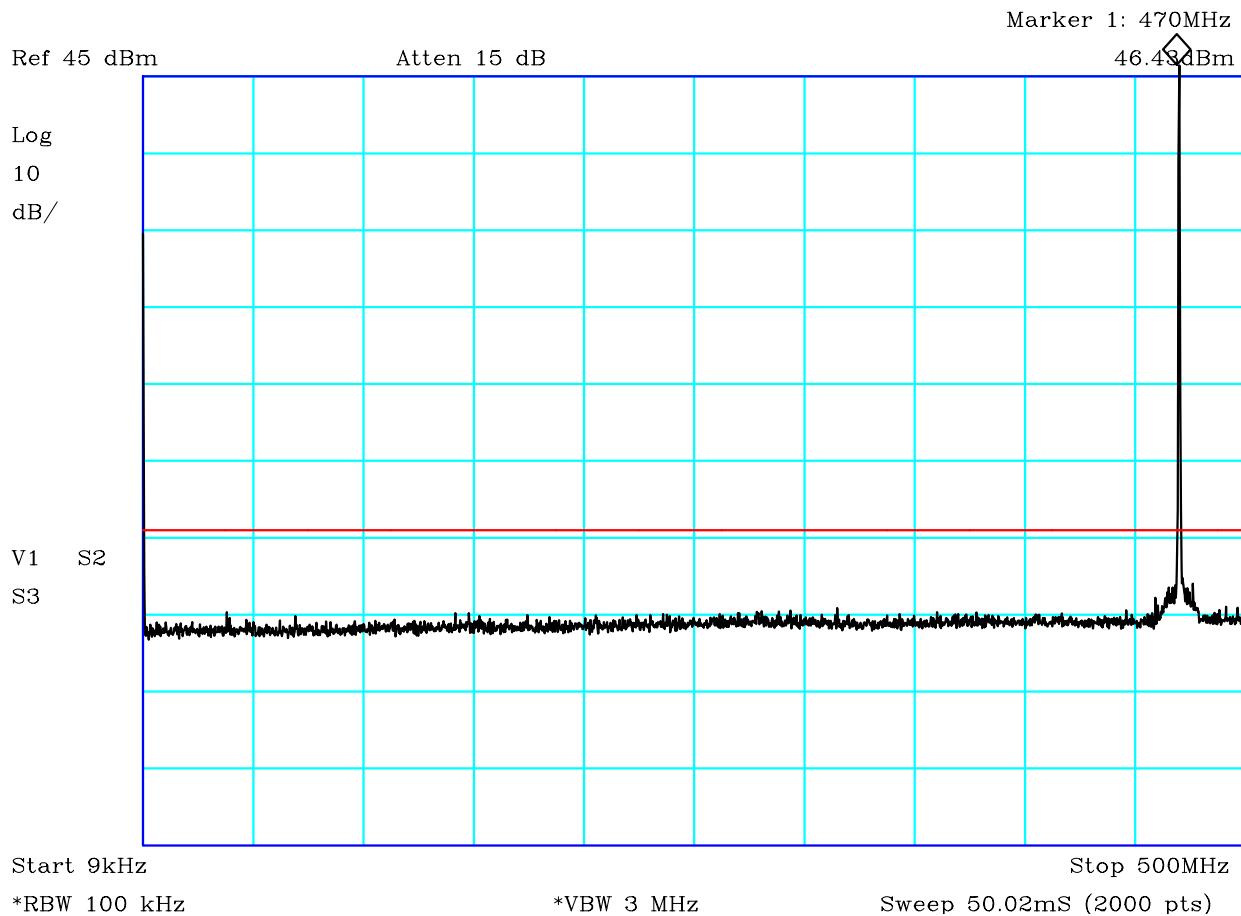
File: H2904515

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 22 Antenna conducted spurious - Tx @ 470MHz - main antenna port - 9kHz to 500MHz**

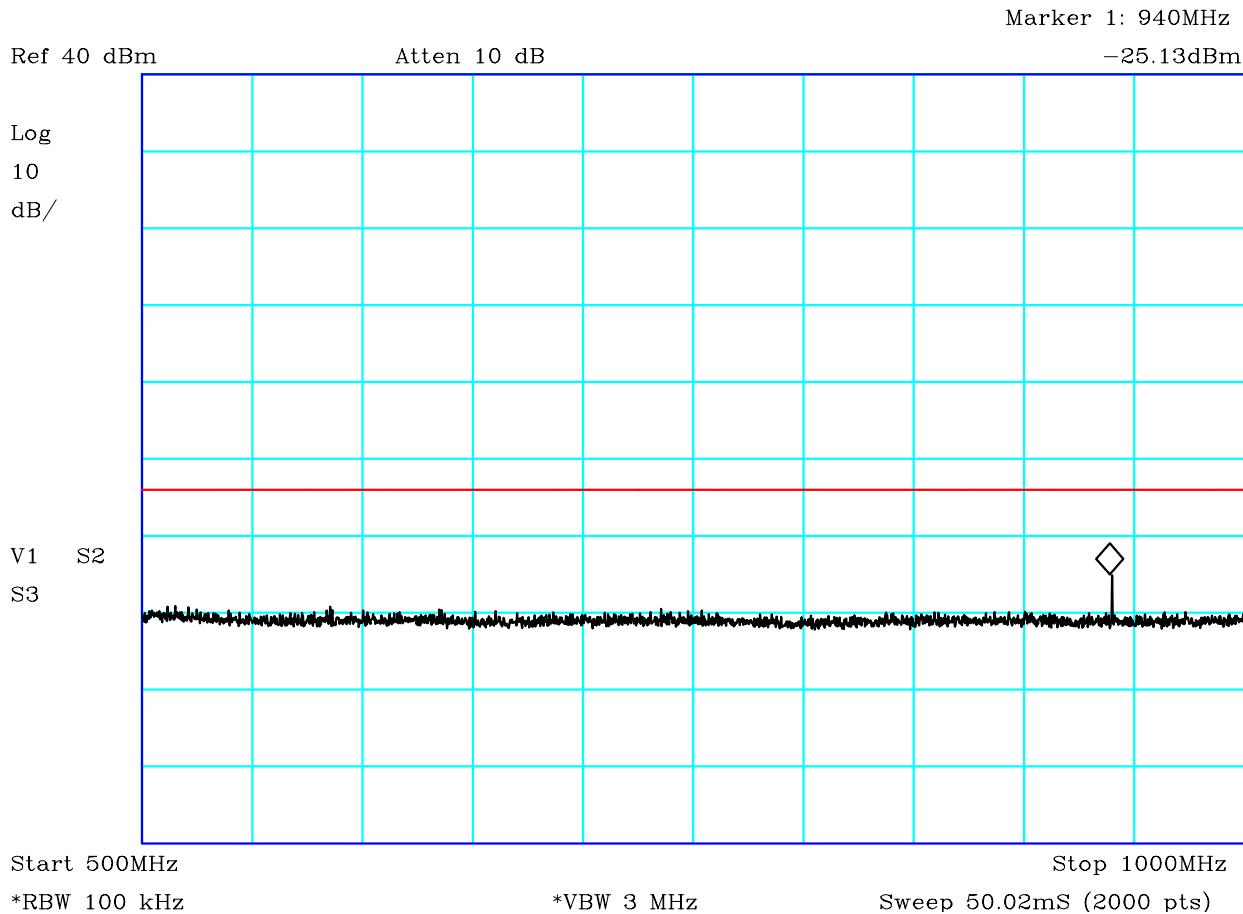
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
470MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
	File: H29045A1

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 23 Antenna conducted spurious - Tx @ 470MHz - main antenna port - 500MHz to 1GHz**

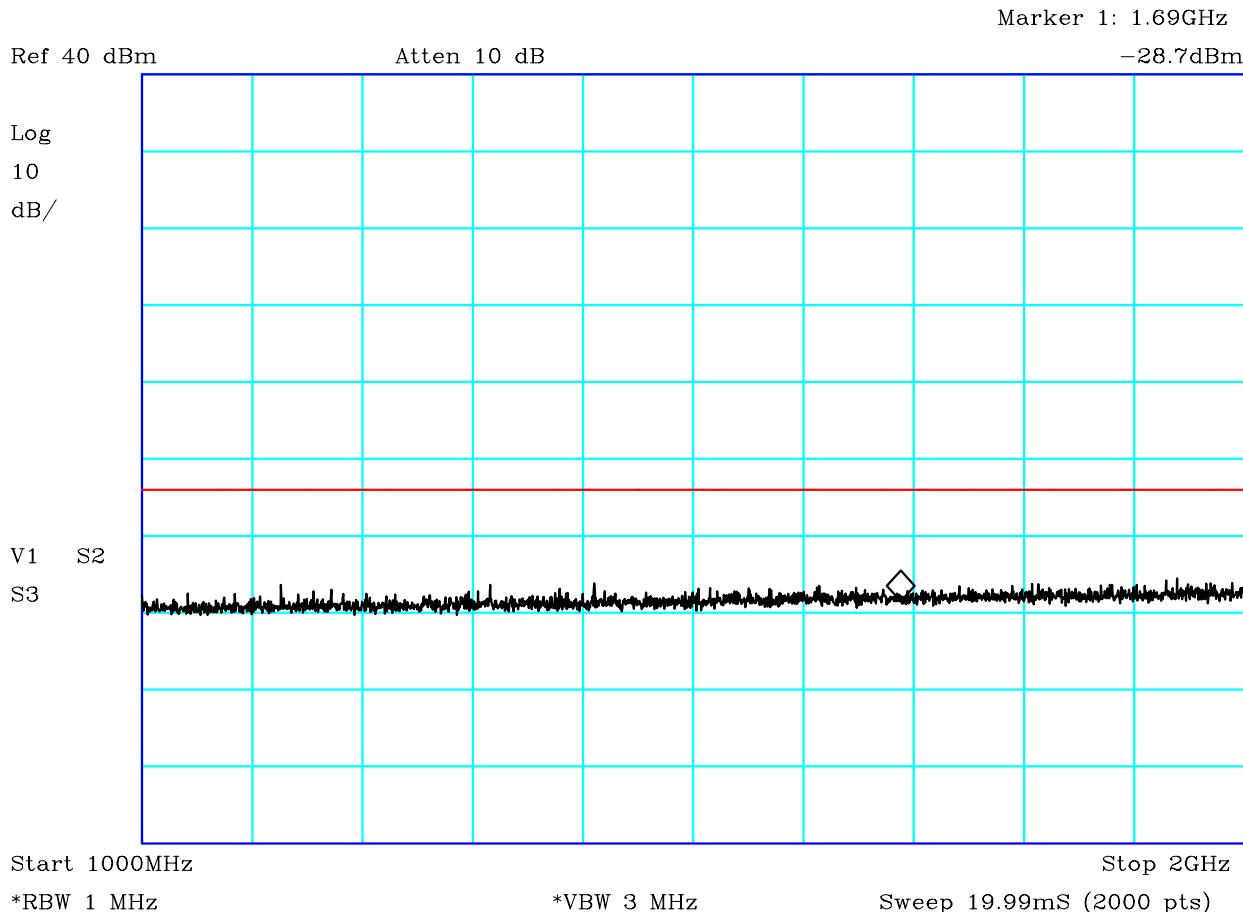
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
470MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
File: H29045B4	

	Report No: <b>R3161</b> Issue No: <b>1</b>
Test No: <b>T4510</b>	

**FCC ID: QOESOLO45X**

**Test Report**

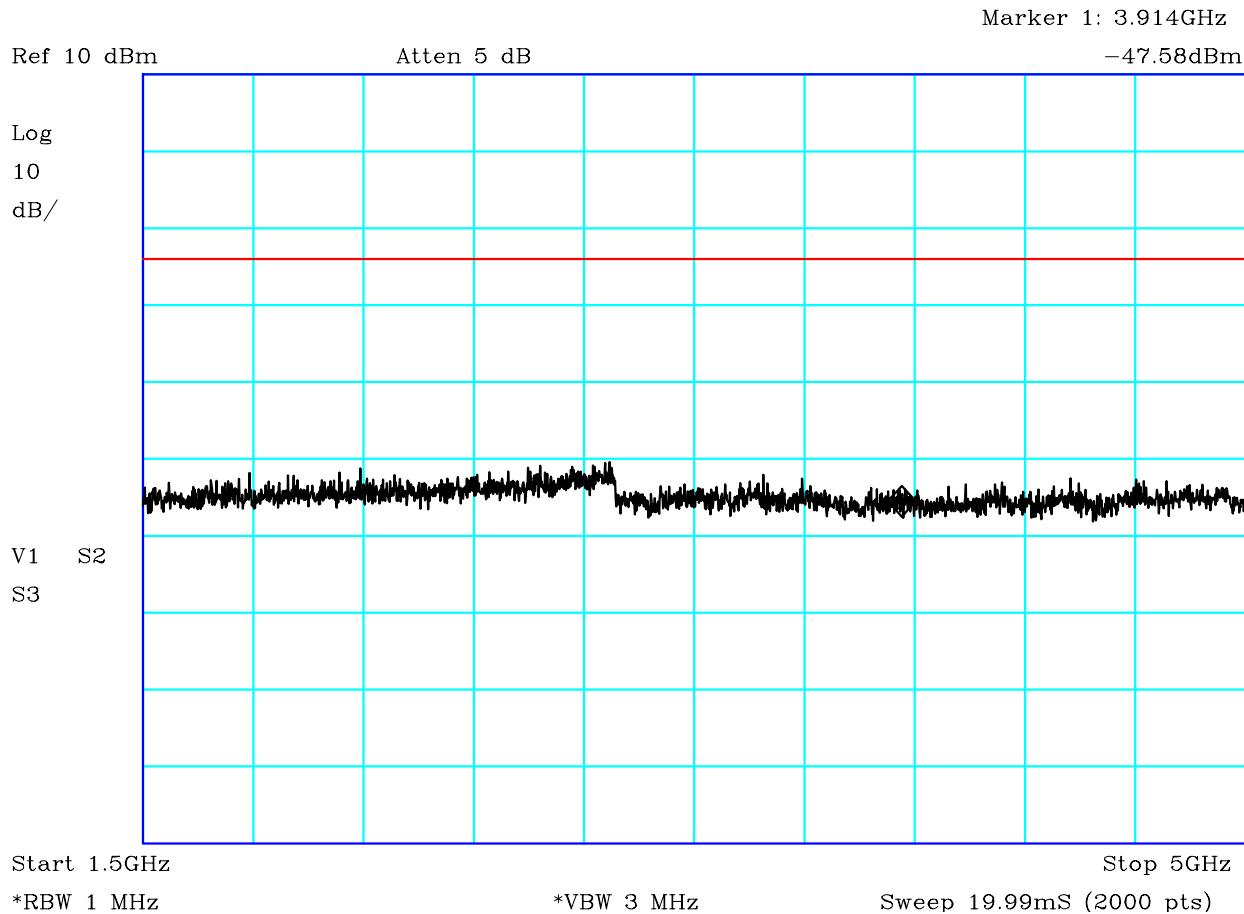
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**PLOT 24 Antenna conducted spurious - Tx @ 470MHz - main antenna port - 1GHz to 2GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
470MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
File: H29045B6	

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>51 of 79</b>



**PLOT 25 Antenna conducted spurious - Tx @ 470MHz - main antenna port - 1.5GHz to 5GHz**

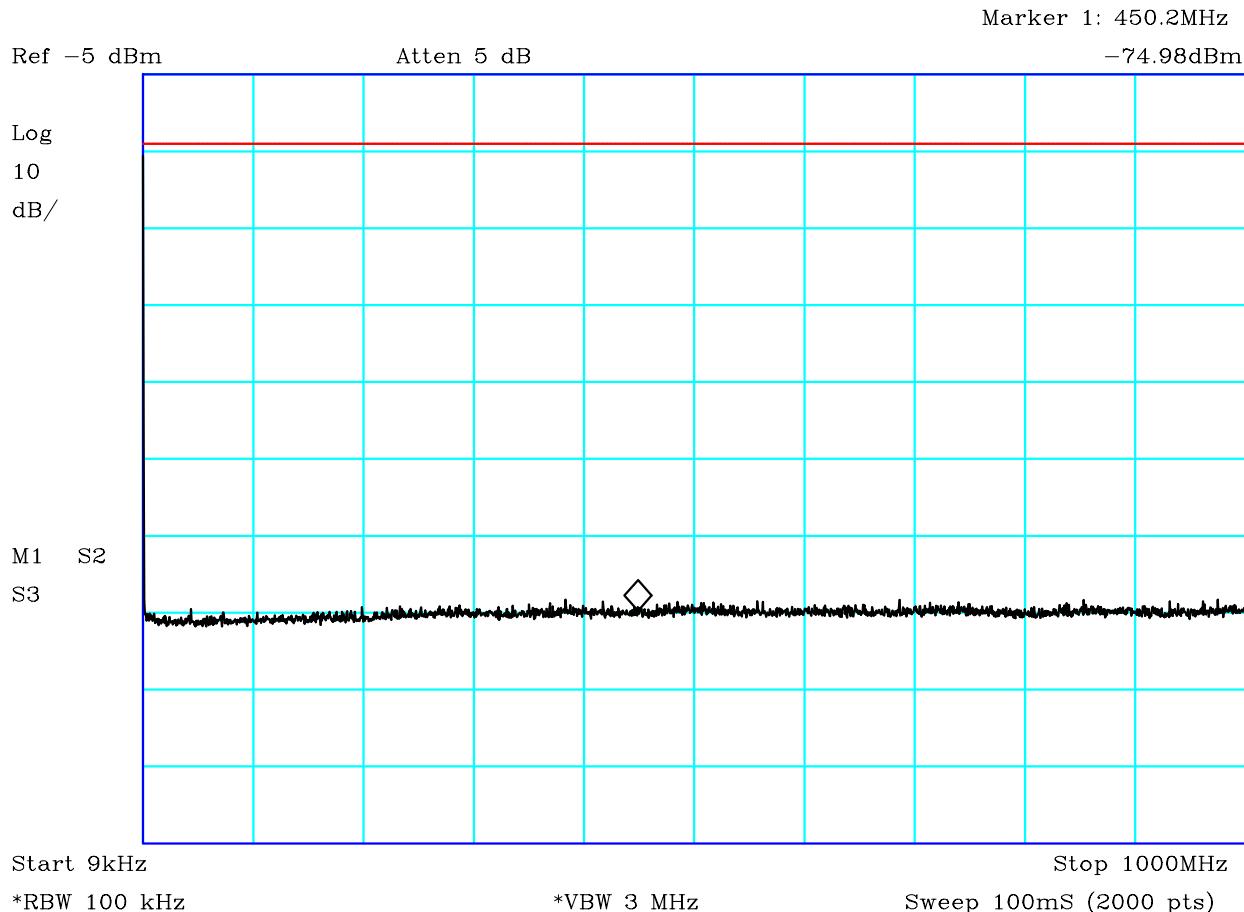
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
470MHz Tx spurious	
Facility: 3T	Mode: 1
	Modification State: 1
File: H29045BC	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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CF2:Cable 72

**PLOT 26 Antenna conducted spurious - Tx @ 470MHz - diversity antenna port - 9kHz to 1GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:

470MHz  
Tx spurious on diversity antenna port.

Facility: 3T	Mode: 1
	Modification State: 1

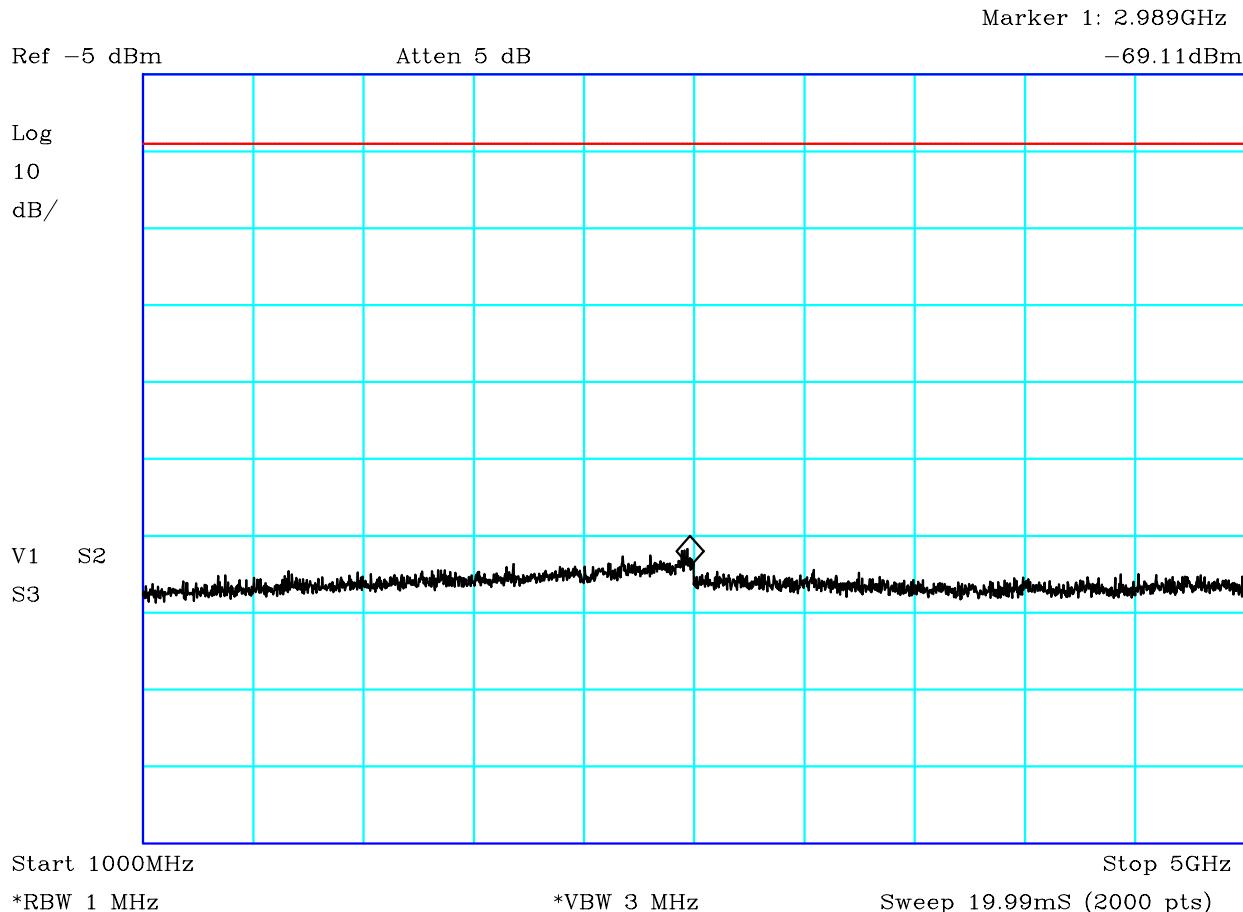
File: H29045A9

	Report No: <b>R3161</b> Issue No: <b>1</b>
Test No: <b>T4510</b>	

**FCC ID: QOESOLO45X**

**Test Report**

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CF2:Cable 72

**PLOT 27 Antenna conducted spurious - Tx @ 470MHz - diversity antenna port - 1GHz to 5GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: FCC Part 90	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:

470MHz  
Tx spurious on diversity antenna port.

Facility: 3T	Mode: 1
	Modification State: 1

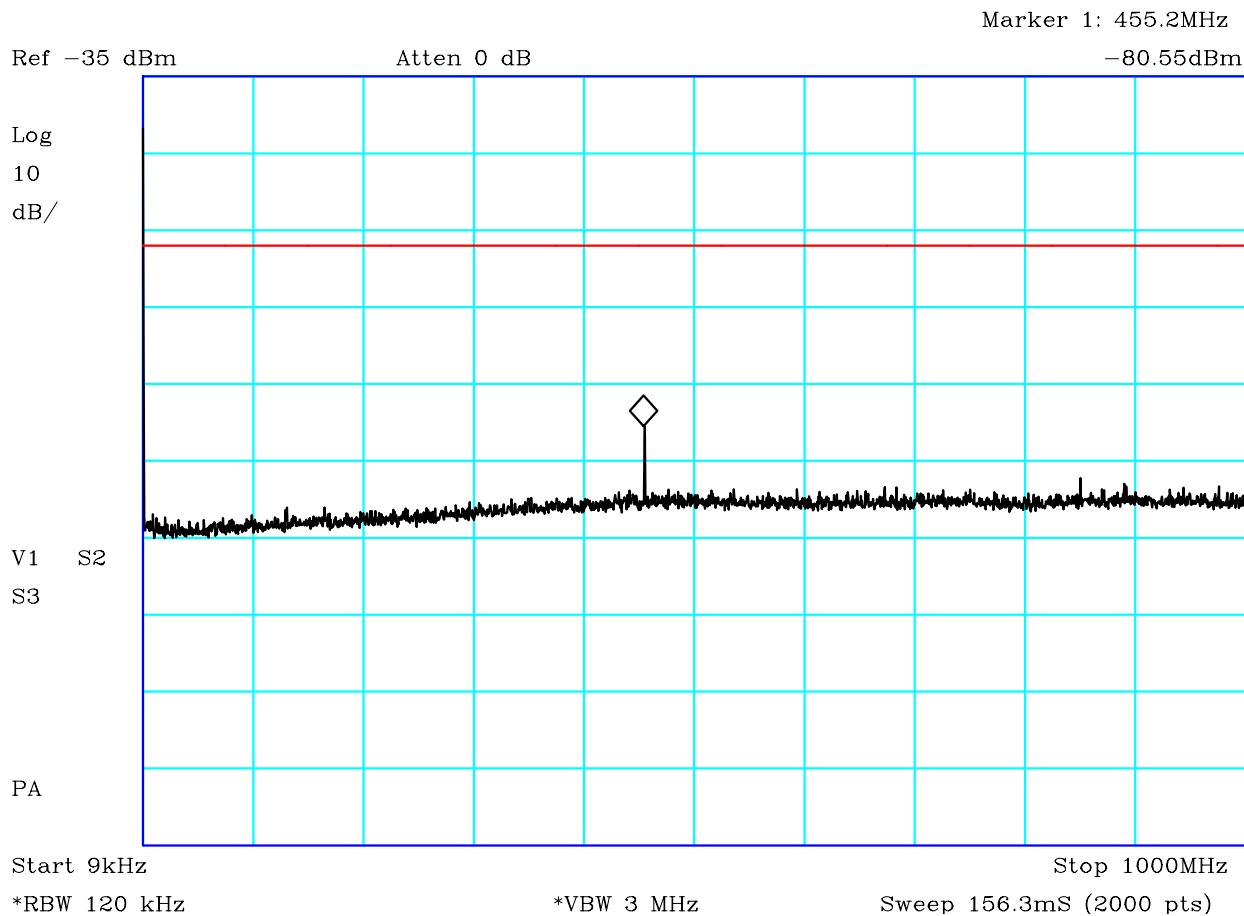
File: H29045AB

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 28 Antenna conducted spurious - Rx @ 460MHz - main antenna port - 9kHz to 1GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:

460MHz  
Rx spurious on main antenna port.

Facility: 3T	Mode: 2
	Modification State: 1

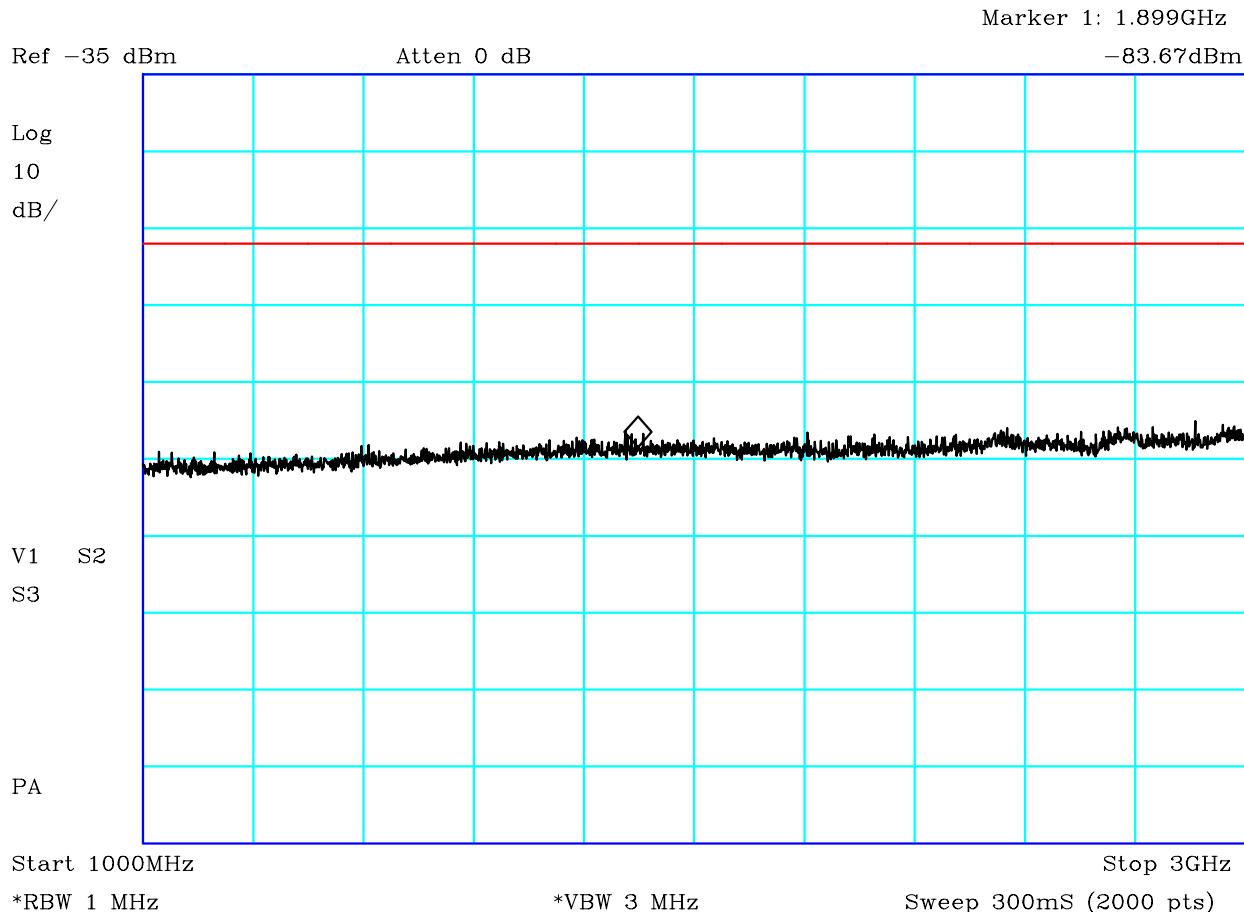
File: H29045FE

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 29 Antenna conducted spurious - Rx @ 460MHz - main antenna port - 1GHz to 3GHz**

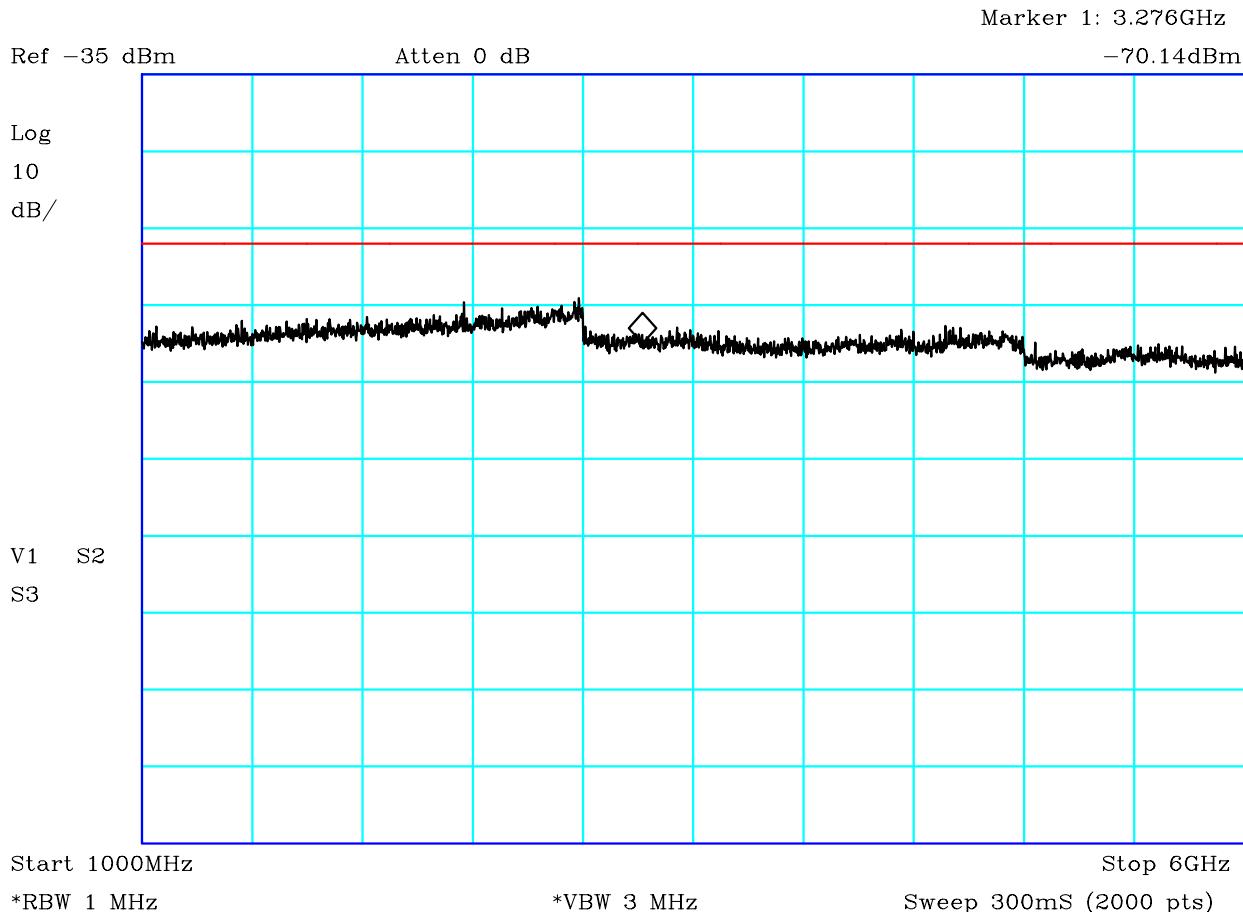
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:
460MHz Rx spurious on main antenna port.	
Facility: 3T	Mode: 2
	Modification State: 1
File: H2904606	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 30 Antenna conducted spurious - Rx @ 460MHz - main antenna port - 1GHz to 6GHz**

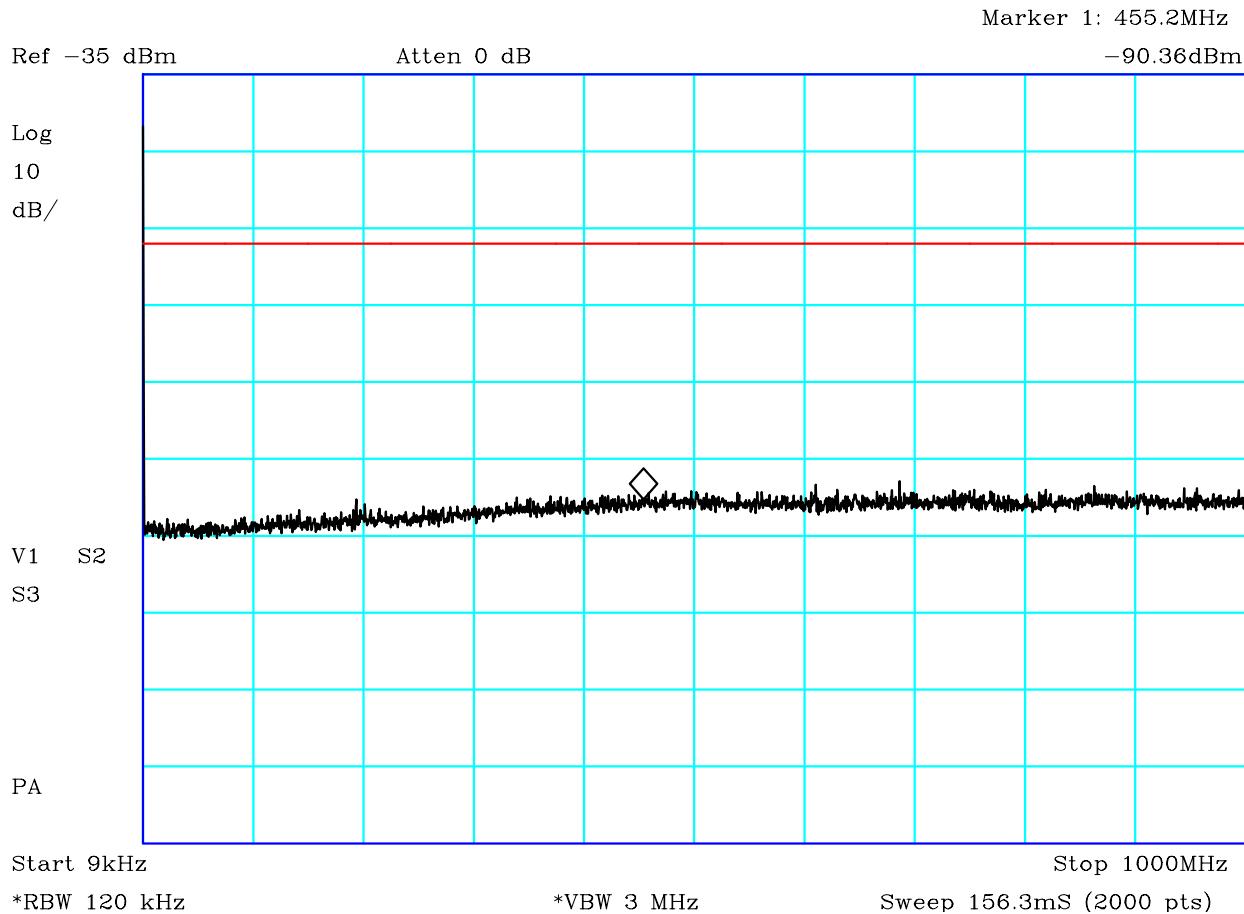
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:
460MHz Rx spurious on main antenna port.	
Facility: 3T	Mode: 2
	Modification State: 1
File: H2918362	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 31 Antenna conducted spurious - Rx @ 460MHz - diversity antenna port - 9kHz to 1GHz**

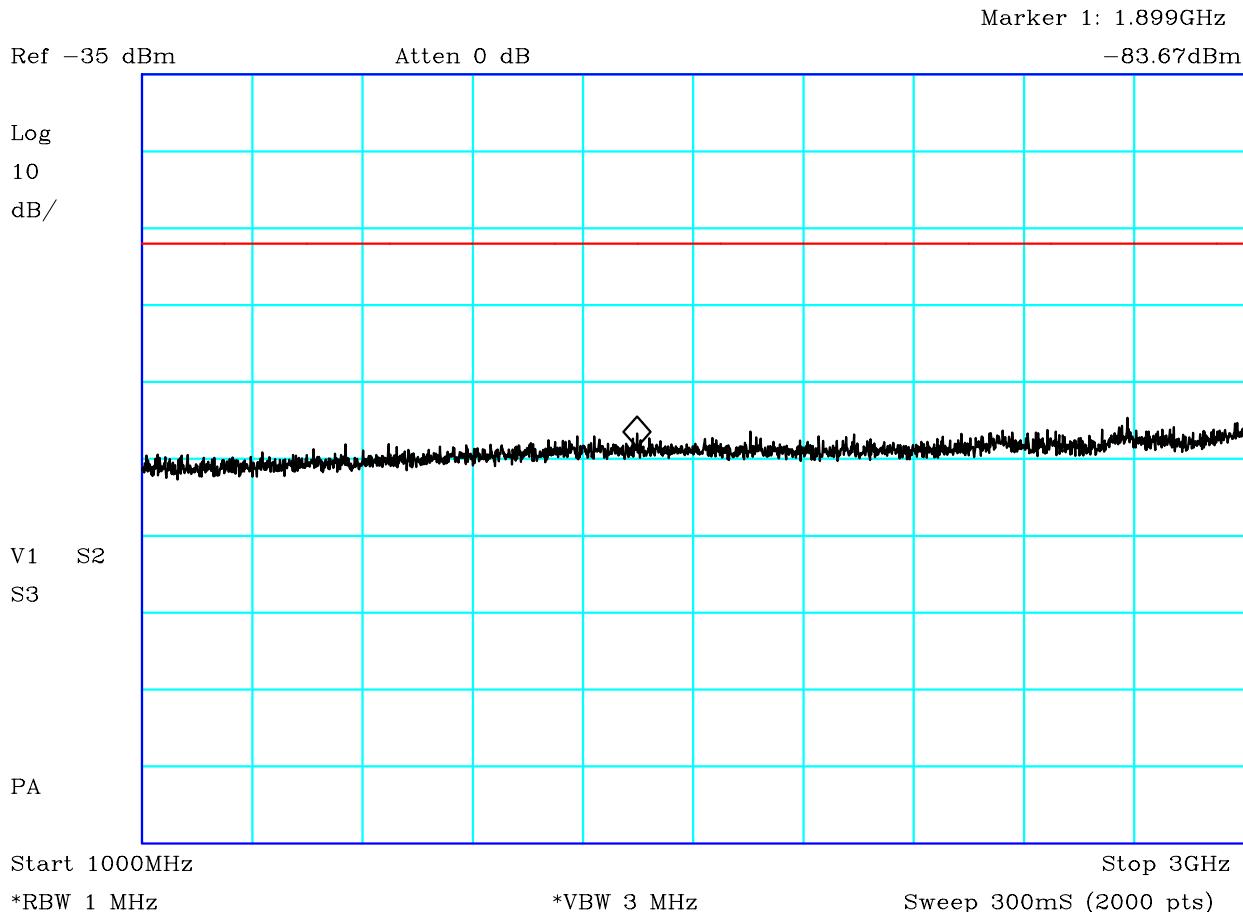
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:
460MHz Rx spurious on diversity antenna port.	
Facility: 3T	Mode: 2
	Modification State: 1
File: H2904600	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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**PLOT 32 Antenna conducted spurious - Rx @ 460MHz - diversity antenna port - 1GHz to 3GHz**

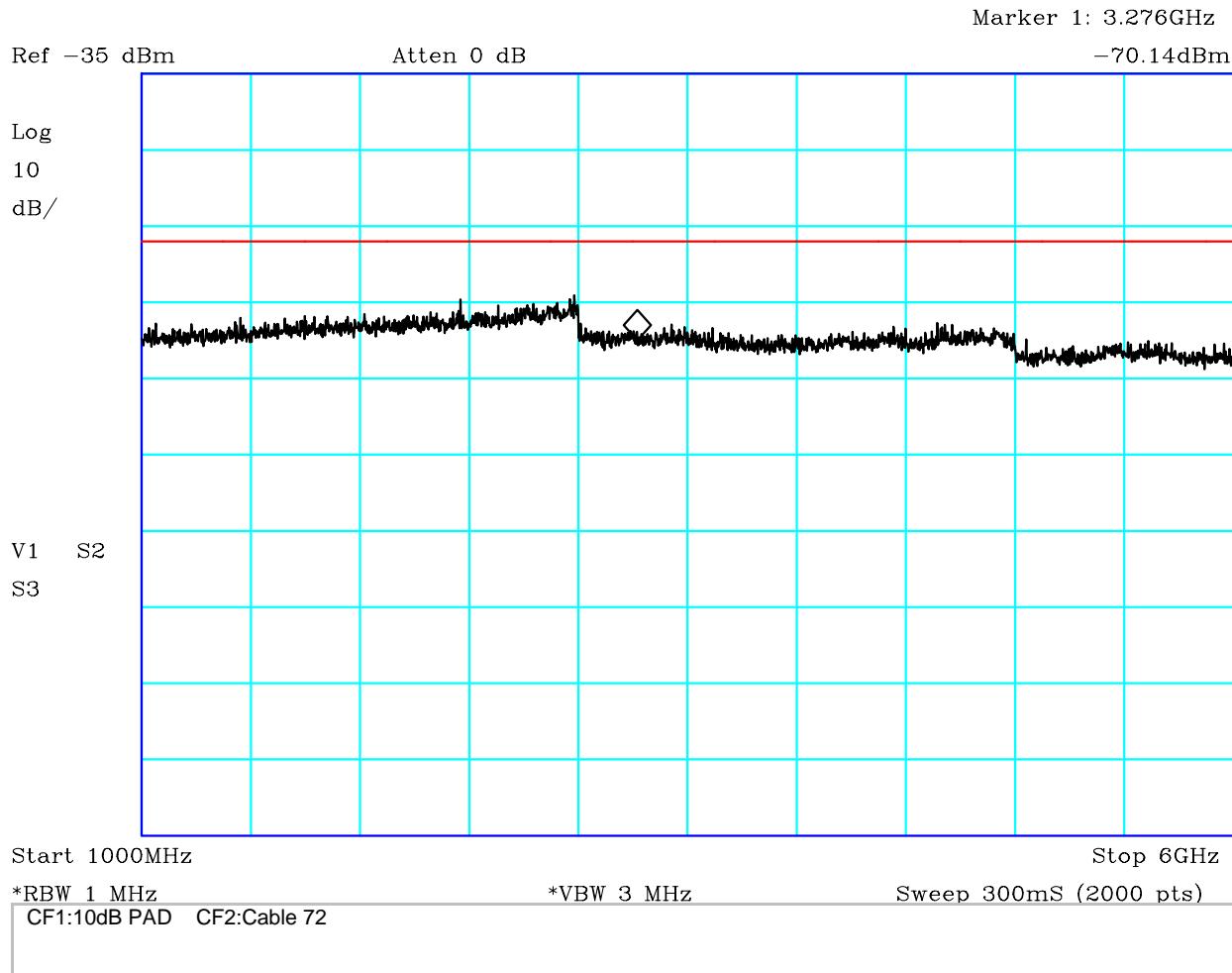
Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:
460MHz Rx spurious on diversity antenna port.	
Facility: 3T	Mode: 2
	Modification State: 1
File: H2904607	

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

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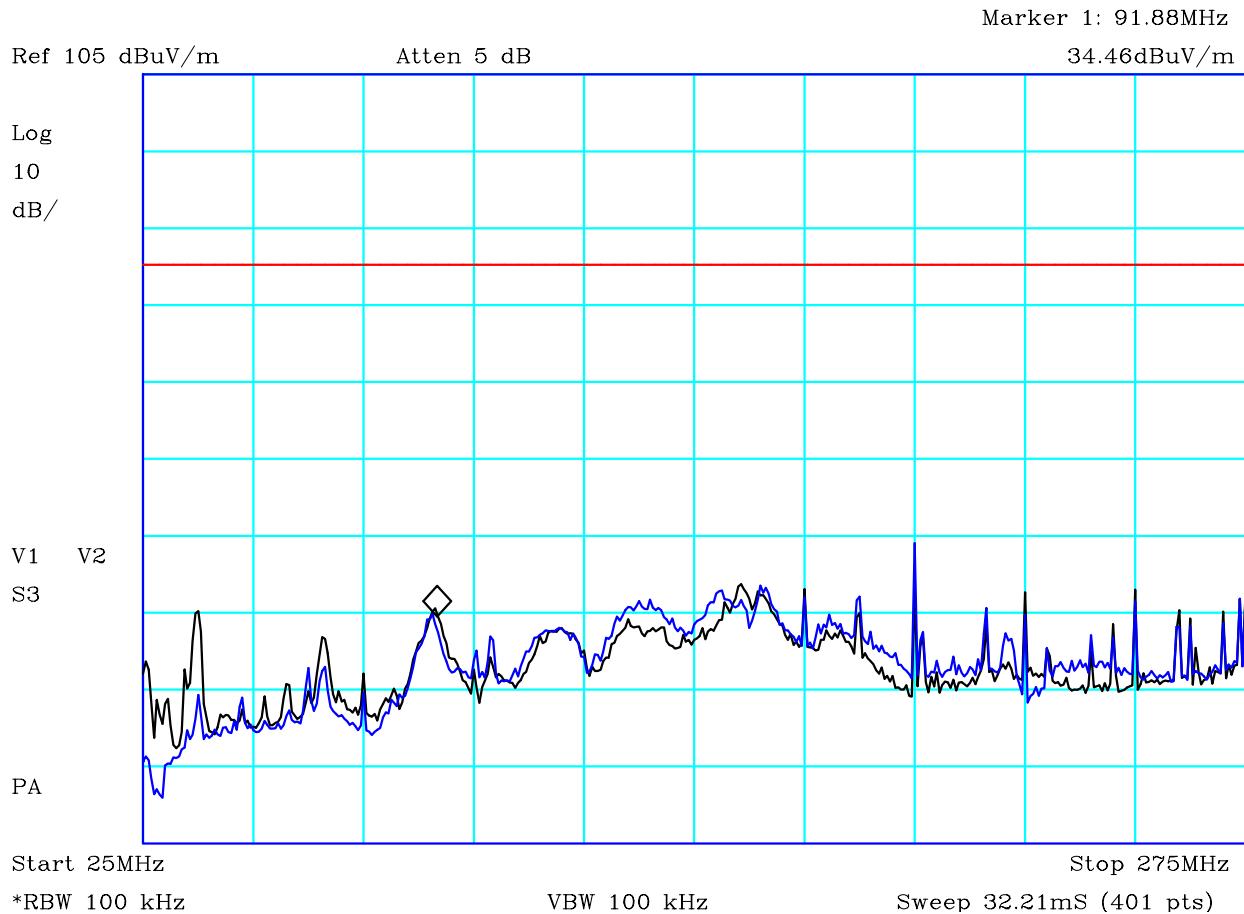
**PLOT 33 Antenna conducted spurious - Rx @ 460MHz - diversity antenna port - 1GHz to 6GHz**

Company: 3T	Product: SOLO-45X
Date: 04/10/2012	Test Eng: Dave Smith
Method: ANSI C63.4	Method:
Limit1:(RED) 2nW	Limit2:
Limit3:	Limit4:

460MHz  
Rx spurious on diversity antenna port.

Facility: 3T	Mode: 2
	Modification State: 1
File: H2918364	

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 60 of 79	



CF1:A24\_3m CF2:CBL059\_CBL018\_CBL065\_CBL060

### PLOT 34 Radiated Emissions - Tx @450MHz - 25MHz to 275MHz

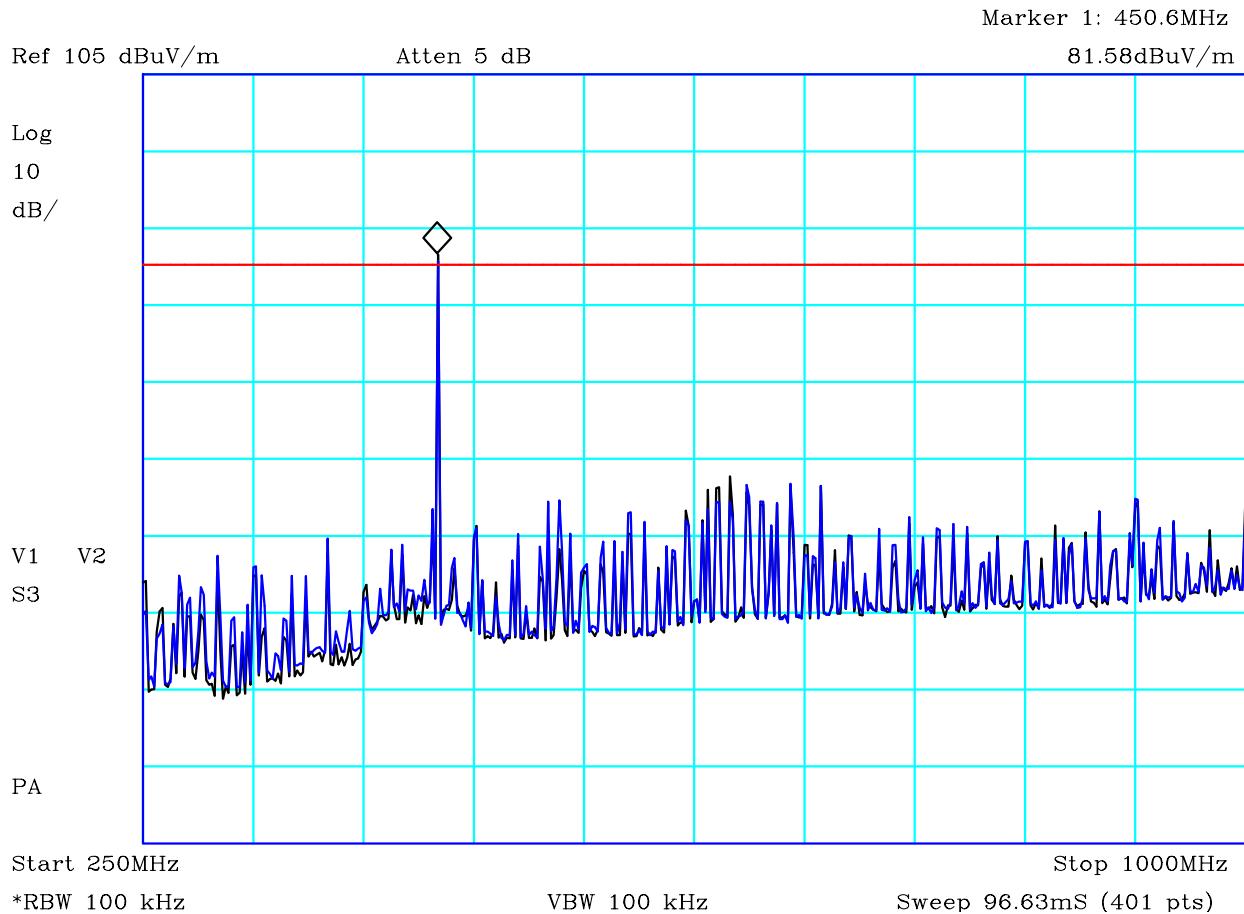
Company: 3T	Product: SOLO-45X
Date: 05/10/2012	Test Eng: Dave Smith
Method: Ansi C63.4	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:

Black: vertical, Blue: horizontal

450MHz/455MHz Duplexer/filter combination.  
All cables connected. Good screened cable on alarms.  
Transmitter at 450MHz.

Facility: Anech_2	Height: 1m,1.5m,2m	Mode: 1
Distance: 3m	Polarisation: V+H	Modification State: 1
Angle: 0-360	File: H29056C8	

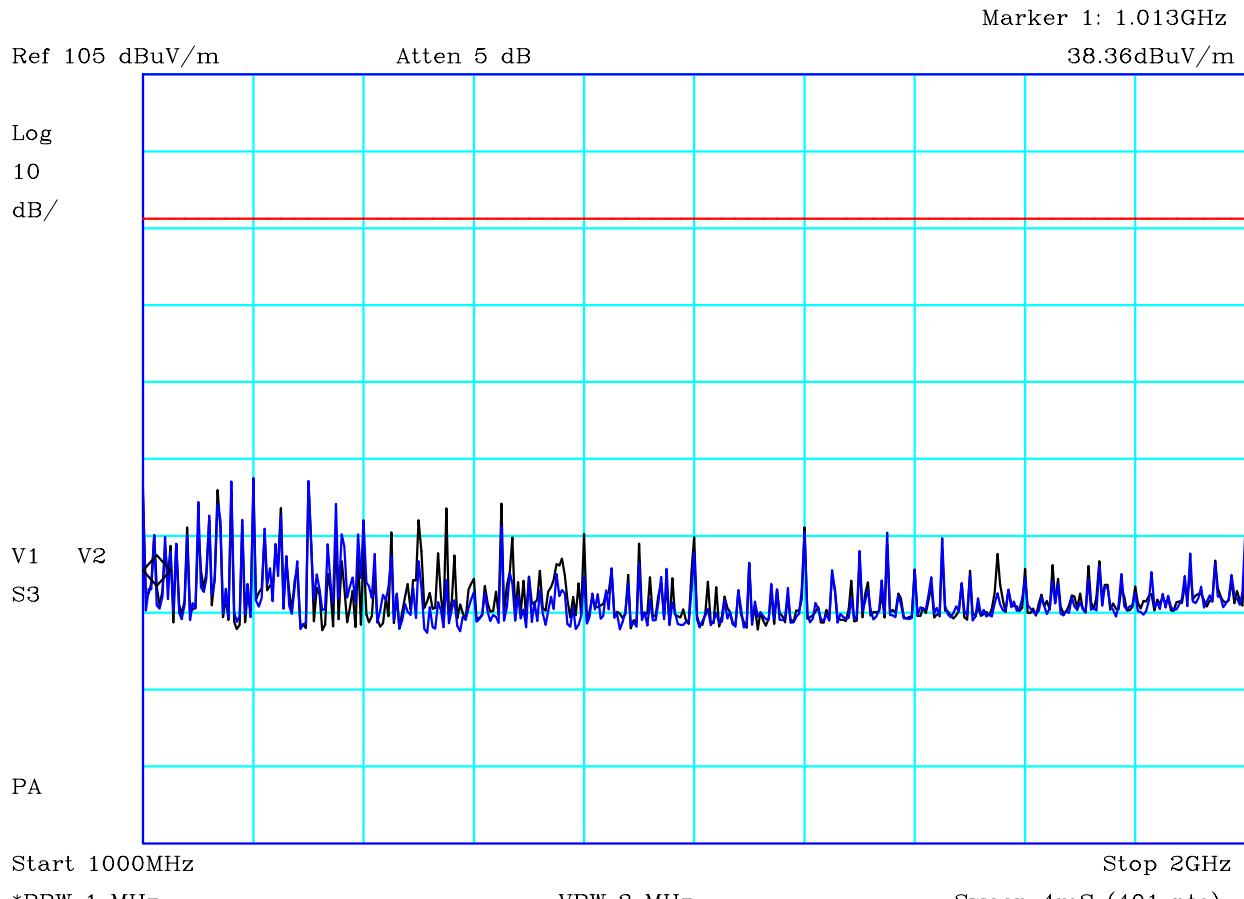
	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>61 of 79</b>



### PLOT 35 Radiated Emissions - Tx @450MHz - 250MHz to 1GHz

Company: 3T	Product: SOLO-45X
Date: 05/10/2012	Test Eng: Dave Smith
Method: Ansi C63.4	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
Black: vertical, Blue: horizontal	
450MHz/455MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 450MHz.	
Facility: Anech_2	Height 1m,1.5m,2m
Distance 3m	Polarisation V+H
Angle 0-360	File: H29056DB
Mode: 1	Modification State: 1

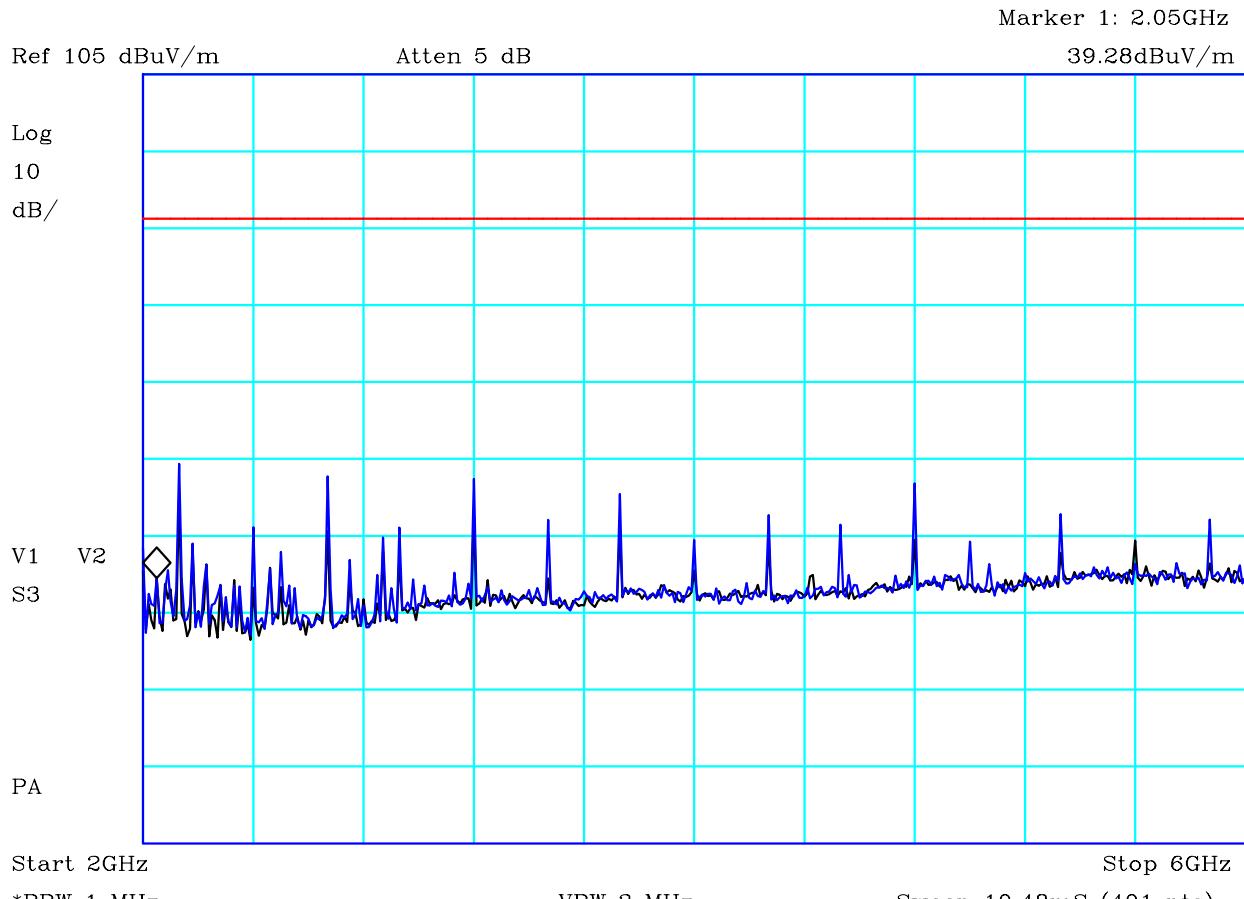
	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>62 of 79</b>



### PLOT 36 Radiated Emissions - Tx @450MHz - 1GHz to 2GHz

Company: 3T	Product: SOLO-45X
Date: 05/10/2012	Test Eng: Dave Smith
Method: Ansi C63.4	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
Black: vertical, Blue: horizontal	
450MHz/455MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 450MHz.	
Facility: Anech_2	Height 1m
Distance 1.5m	Polarisation V+H
Angle 0-360	File: H29057F2
Mode: 1	Modification State: 1

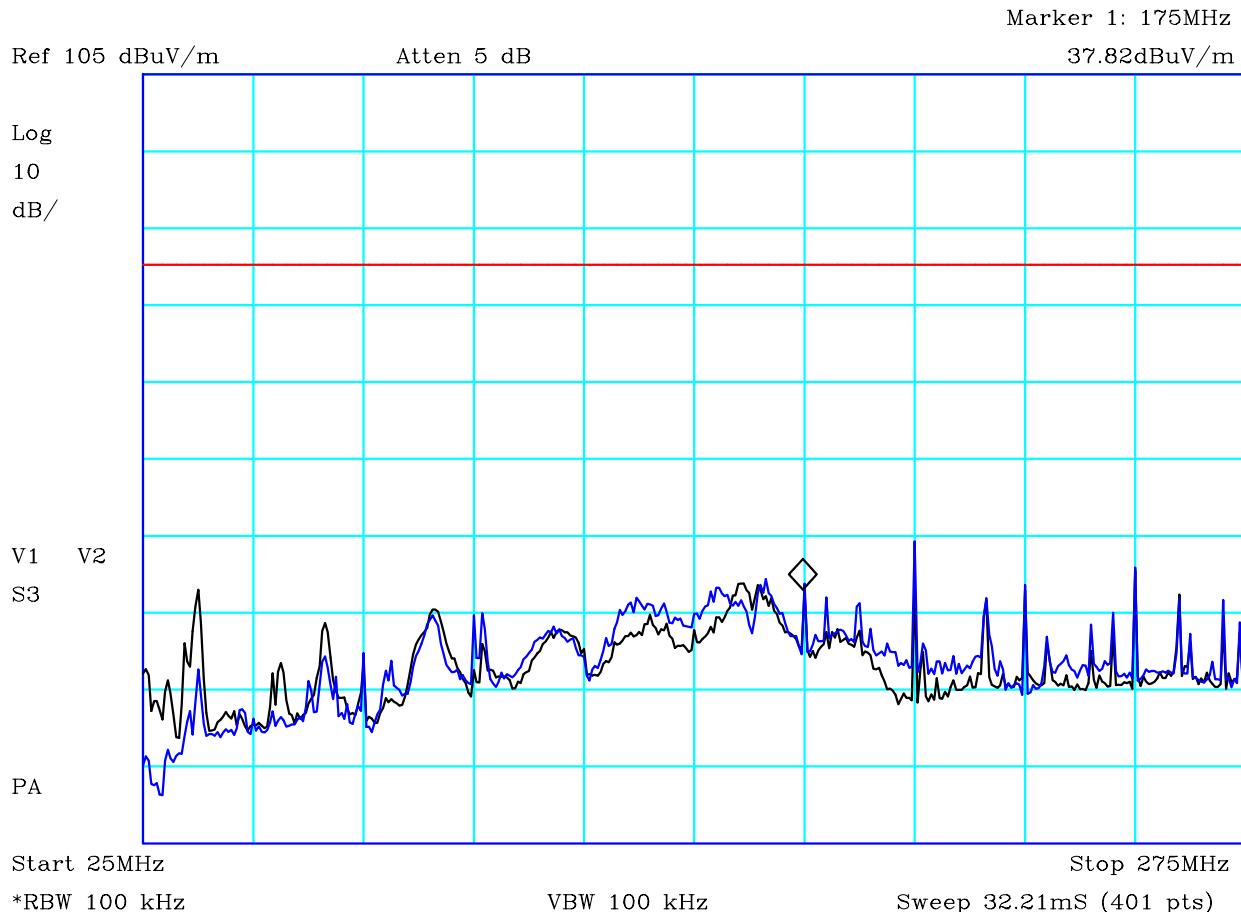
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 63 of 79	



### PLOT 37 Radiated Emissions - Tx @450MHz - 2GHz to 6GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
450MHz/455MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 450MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2905771

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 64 of 79	



### PLOT 38 Radiated Emissions - Tx @460MHz - 25MHz to 275MHz

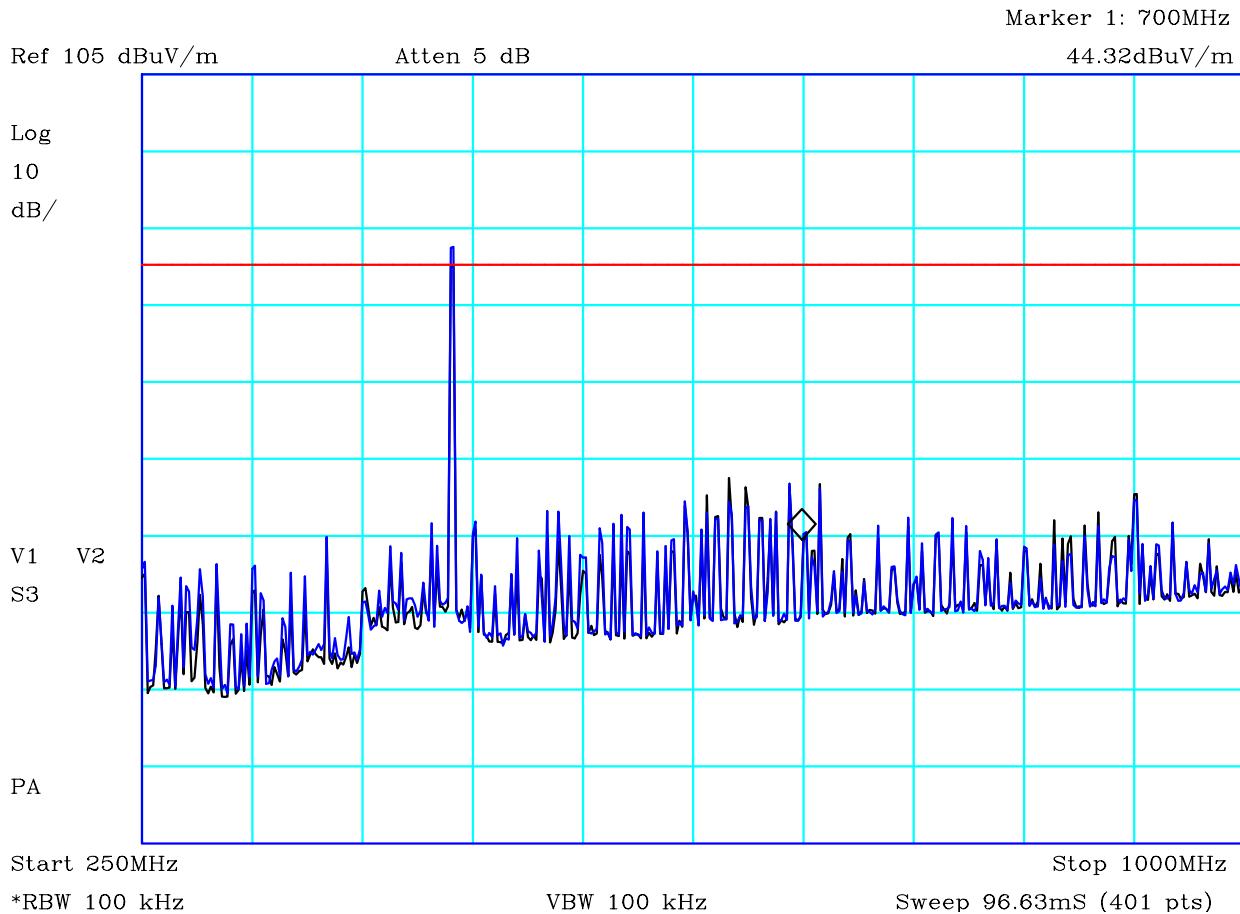
Company: 3T	Product: SOLO-45X
Date: 05/10/2012	Test Eng: Dave Smith
Method: Ansi C63.4	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
Black: vertical, Blue: horizontal	
460MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 460MHz.	
Facility: Anech_2	Height 1m,1.5m,2m
Distance 3m	Polarisation V+H
Angle 0-360	File: H2905616
Mode: 1	Modification State: 1

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

**Test Report**

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### PLOT 39 Radiated Emissions - Tx @460MHz - 250MHz to 1GHz

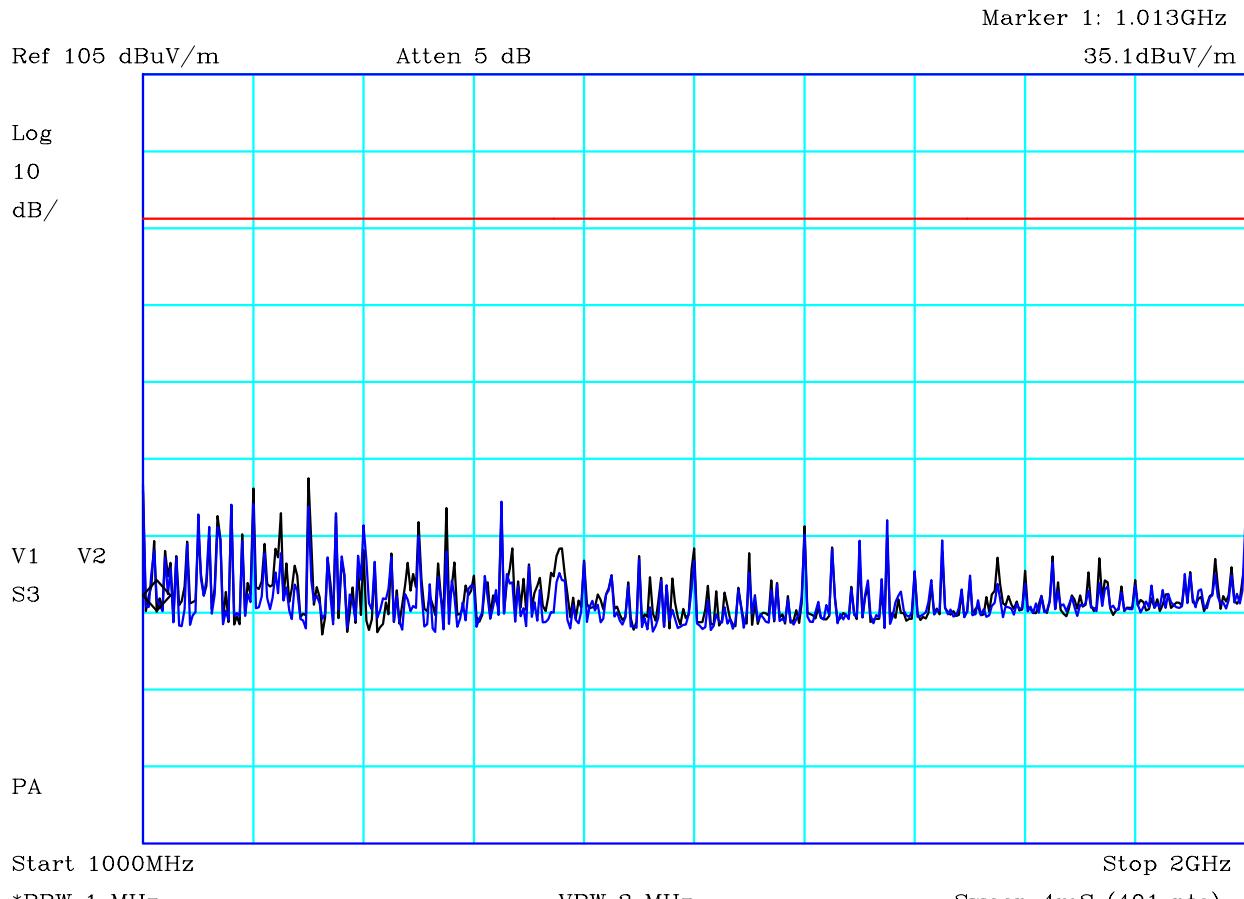
Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	

Black: vertical, Blue: horizontal

460MHz/465MHz Duplexer/filter combination.  
All cables connected. Good screened cable on alarms.  
Transmitter at 460MHz.

Facility:	Anech_2	Height	1m,1.5m,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H2905627		

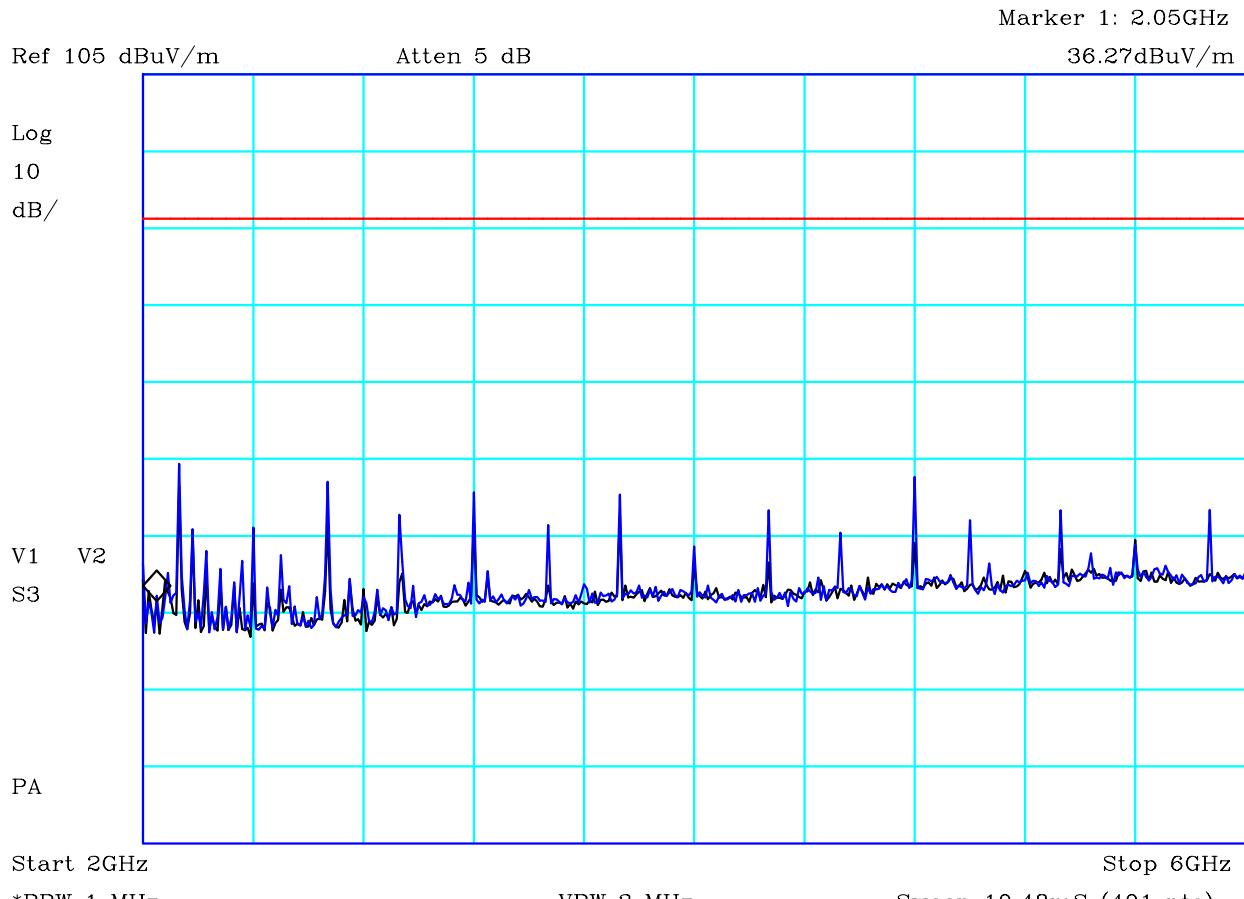
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X	
Test No: T4510		Test Report	Page: 66 of 79



## PLOT 40 Radiated Emissions - Tx @460MHz - 1GHz to 2GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
460MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 460MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H290582A

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 67 of 79	

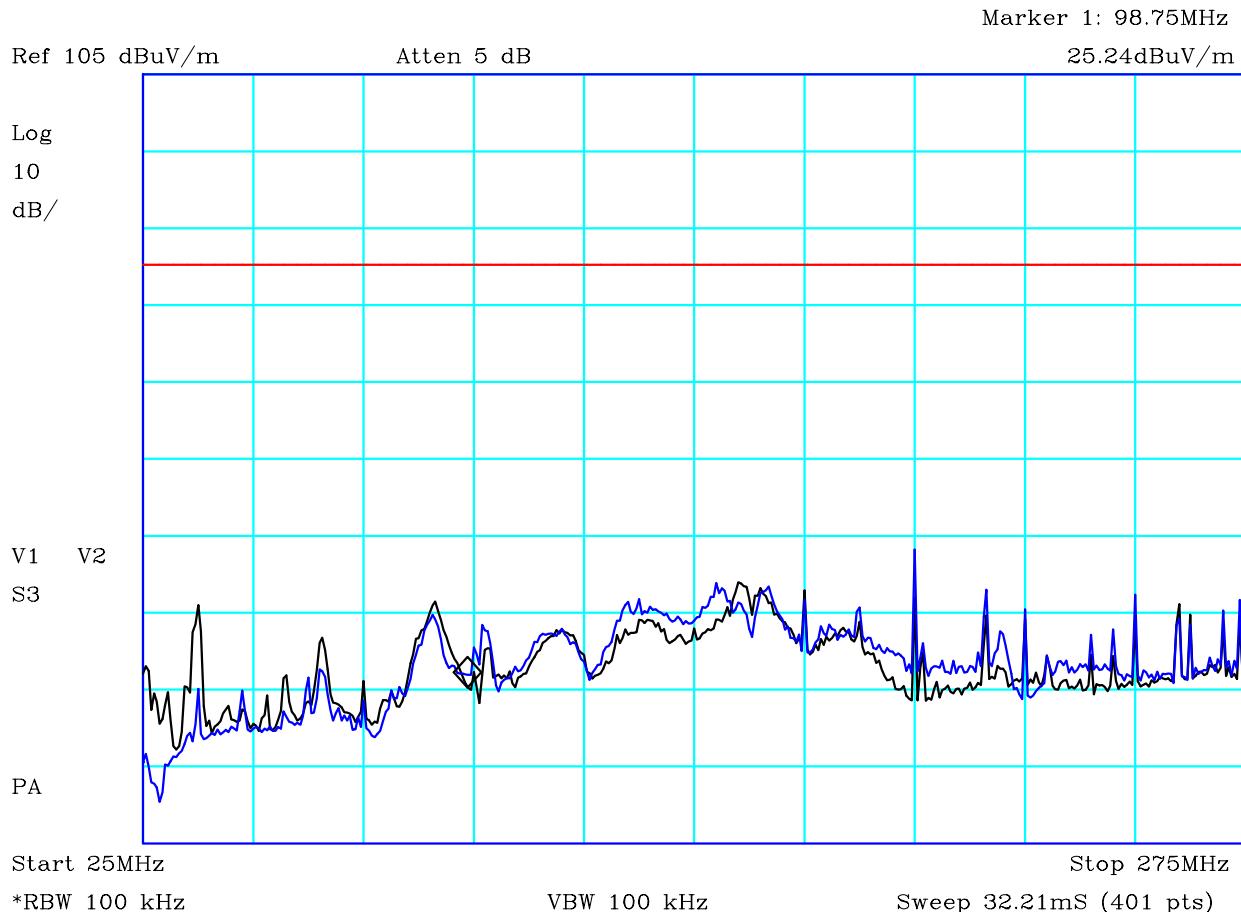


CF1:A19\_3m CF2:CBL071 CF3:PRE13

### PLOT 41 Radiated Emissions - Tx @460MHz - 2GHz to 6GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
460MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 460MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2905757
Mode:	1	Modification State:	1

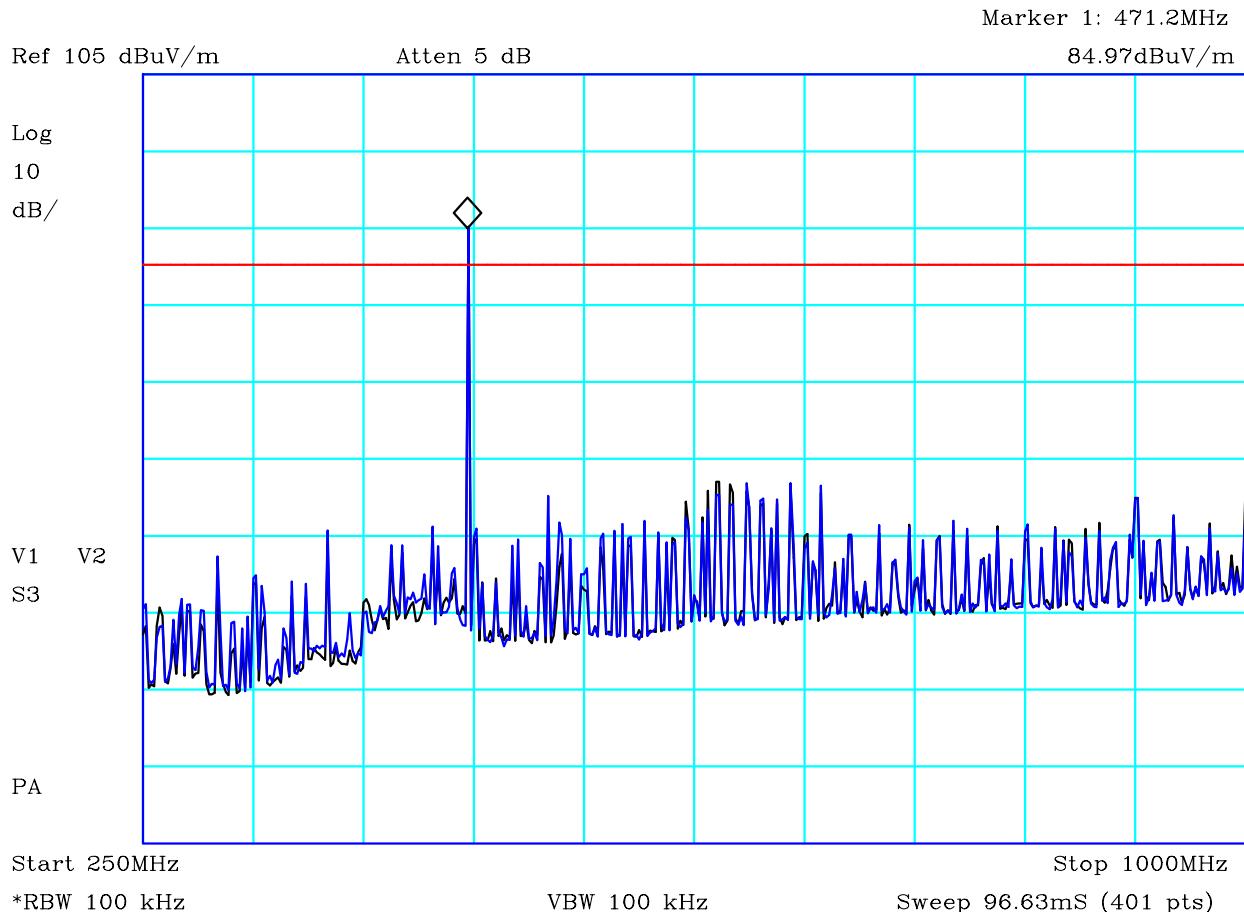
	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>	
Test No: <b>T4510</b>		<b>Test Report</b>	Page: <b>68 of 79</b>



## PLOT 42 Radiated Emissions - Tx @470MHz - 25MHz to 275MHz

Company: 3T	Product: SOLO-45X
Date: 05/10/2012	Test Eng: Dave Smith
Method: Ansi C63.4	Method:
Limit1:(RED) -13dBm	Limit2:
Limit3:	Limit4:
Black: vertical, Blue: horizontal	
470MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 470MHz.	
Facility: Anech_2	Height 1m,1.5m,2m
Distance 3m	Polarisation V+H
Angle 0-360	File: H2905694
Mode: 1	Modification State: 1

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 69 of 79	



### PLOT 43 Radiated Emissions - Tx @470MHz - 250MHz to 1GHz

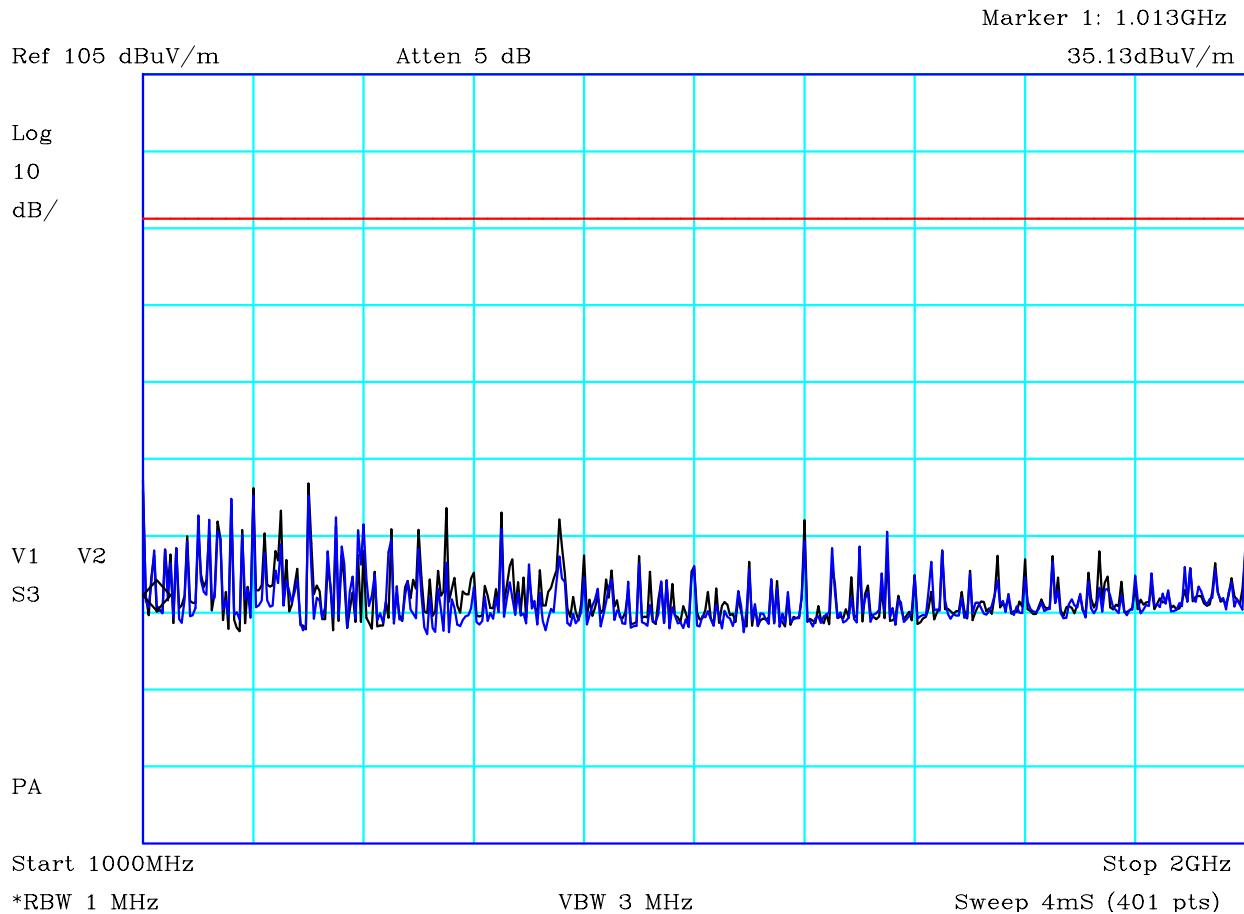
Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
470MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 470MHz.			
Facility:	Anech_2	Height	1m,1.5m,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H29056A2
Modification State:	1	Mode:	1

	Report No: <b>R3161</b> Issue No: <b>1</b>
Test No: <b>T4510</b>	

**FCC ID: QOESOLO45X**

**Test Report**

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**PLOT 44 Radiated Emissions - Tx @470MHz - 1GHz to 2GHz**

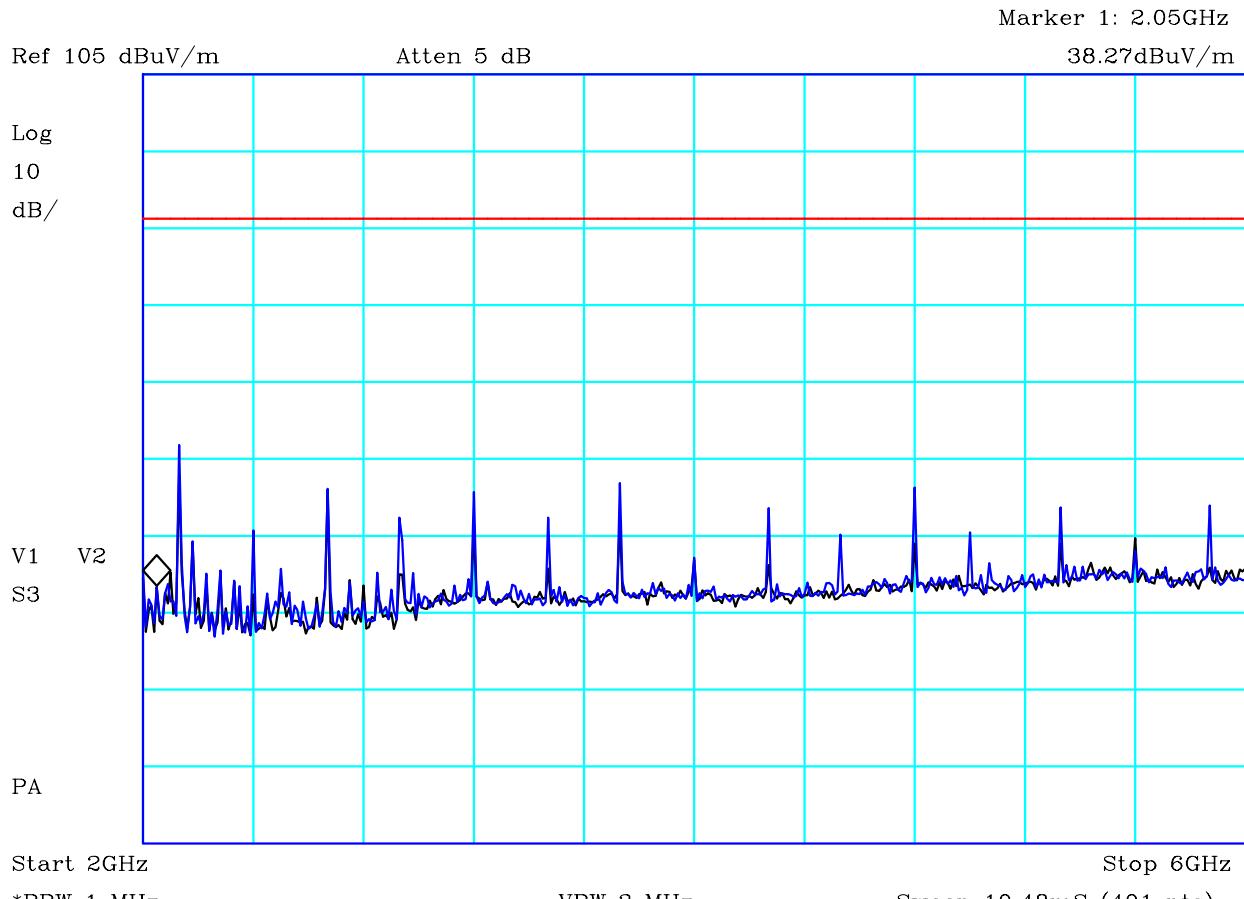
Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	

Black: vertical, Blue: horizontal

470MHz/465MHz Duplexer/filter combination.  
All cables connected. Good screened cable on alarms.  
Transmitter at 470MHz.

Facility:	Anech_2	Height	1m	Mode:	1
Distance	1.5m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H290580F		

	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 71 of 79	



### PLOT 45 Radiated Emissions - Tx @470MHz - 2GHz to 6GHz

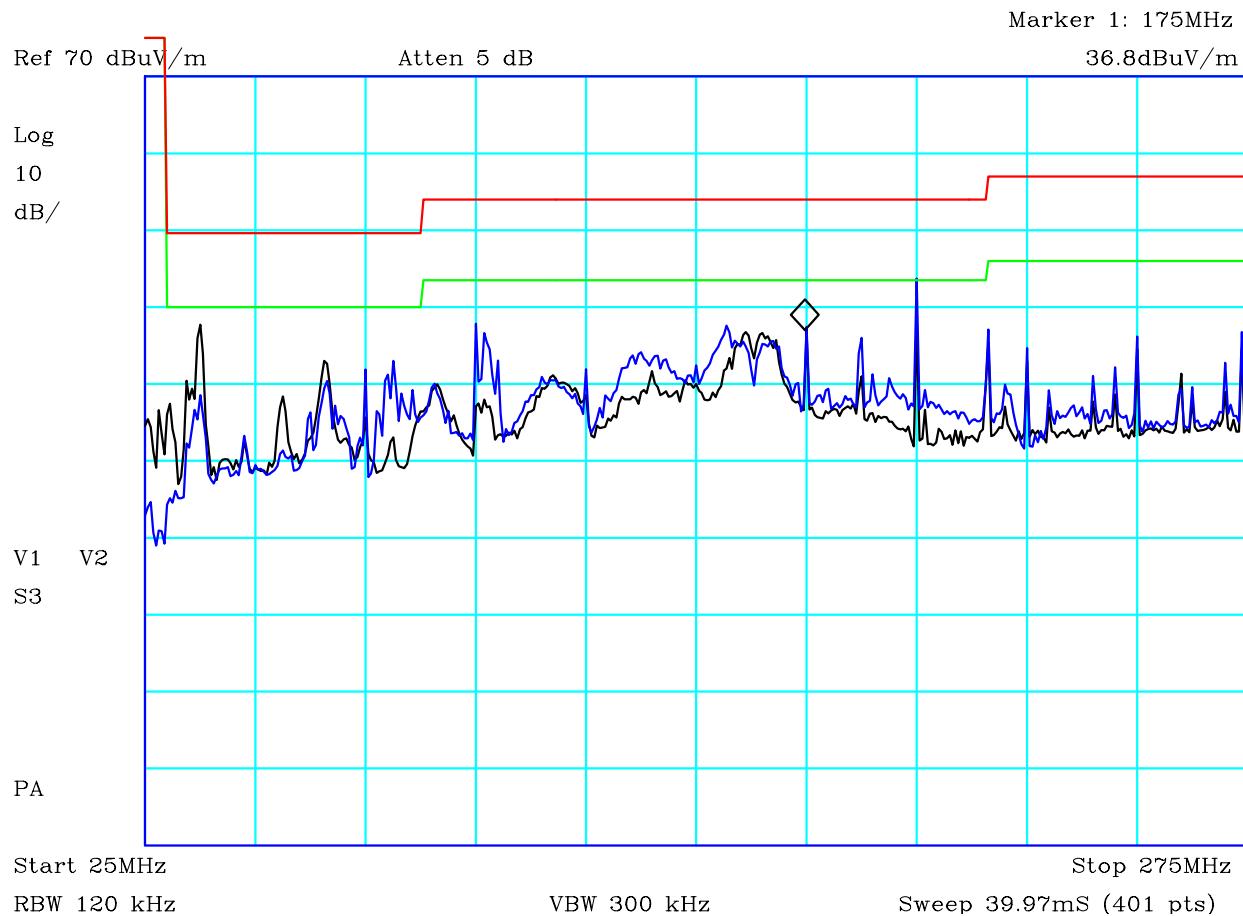
Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(RED)	-13dBm	Limit2:	
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
470MHz/465MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter at 470MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2905744
Mode:	1	Modification State:	1

	Report No: R3161 Issue No: 1
Test No: T4510	

FCC ID: QOESOLO45X

Test Report

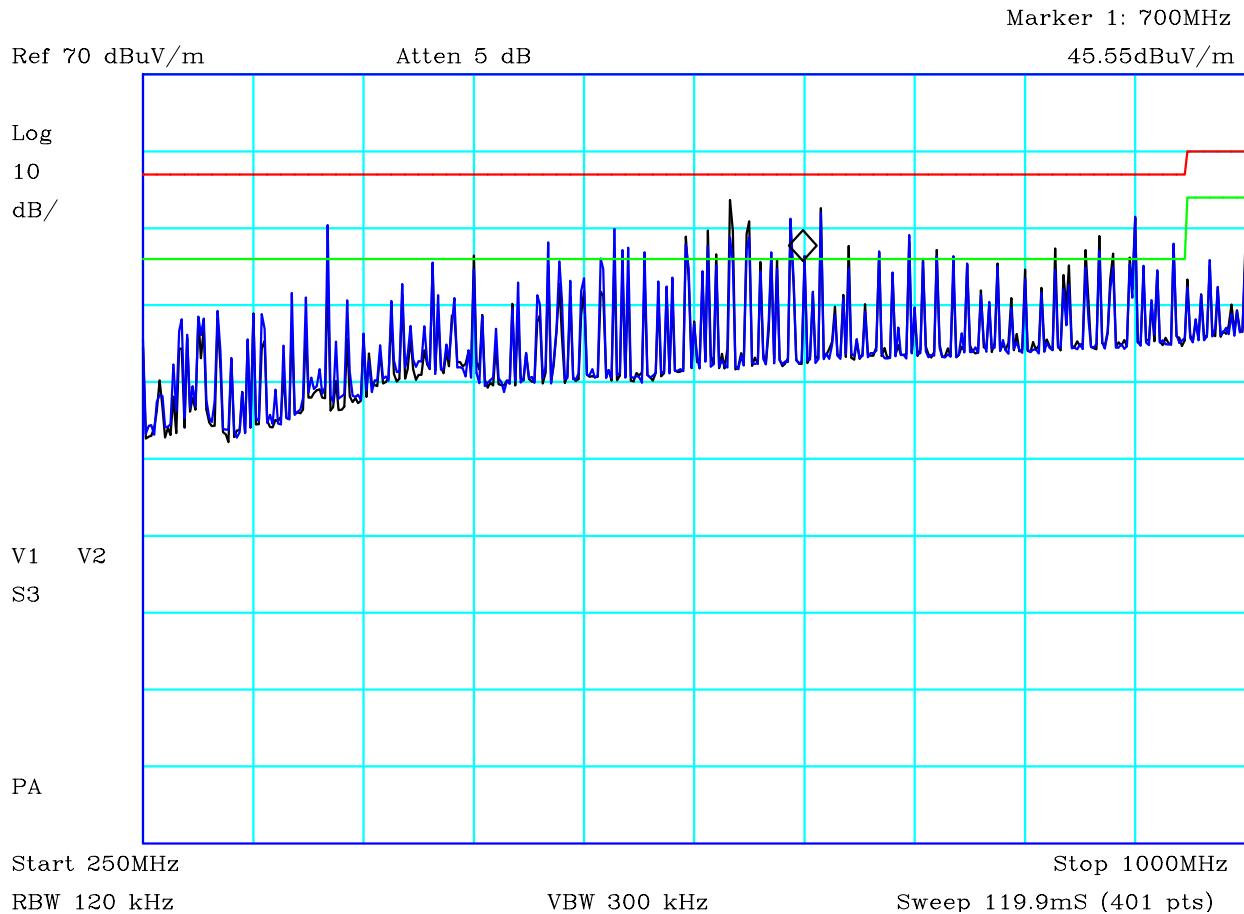
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### PLOT 46 Radiated Emissions - Rx @460MHz - 25MHz to 275MHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(GRN)	FCC(B)@3m	Limit2:(RED)	FCC(A)@3m
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
455MHz/460MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter off. Rx on 460MHz.			
Facility:	Anech_2	Height	1m,1.5m,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H29055CC
Mode:	2	Modification State:	1

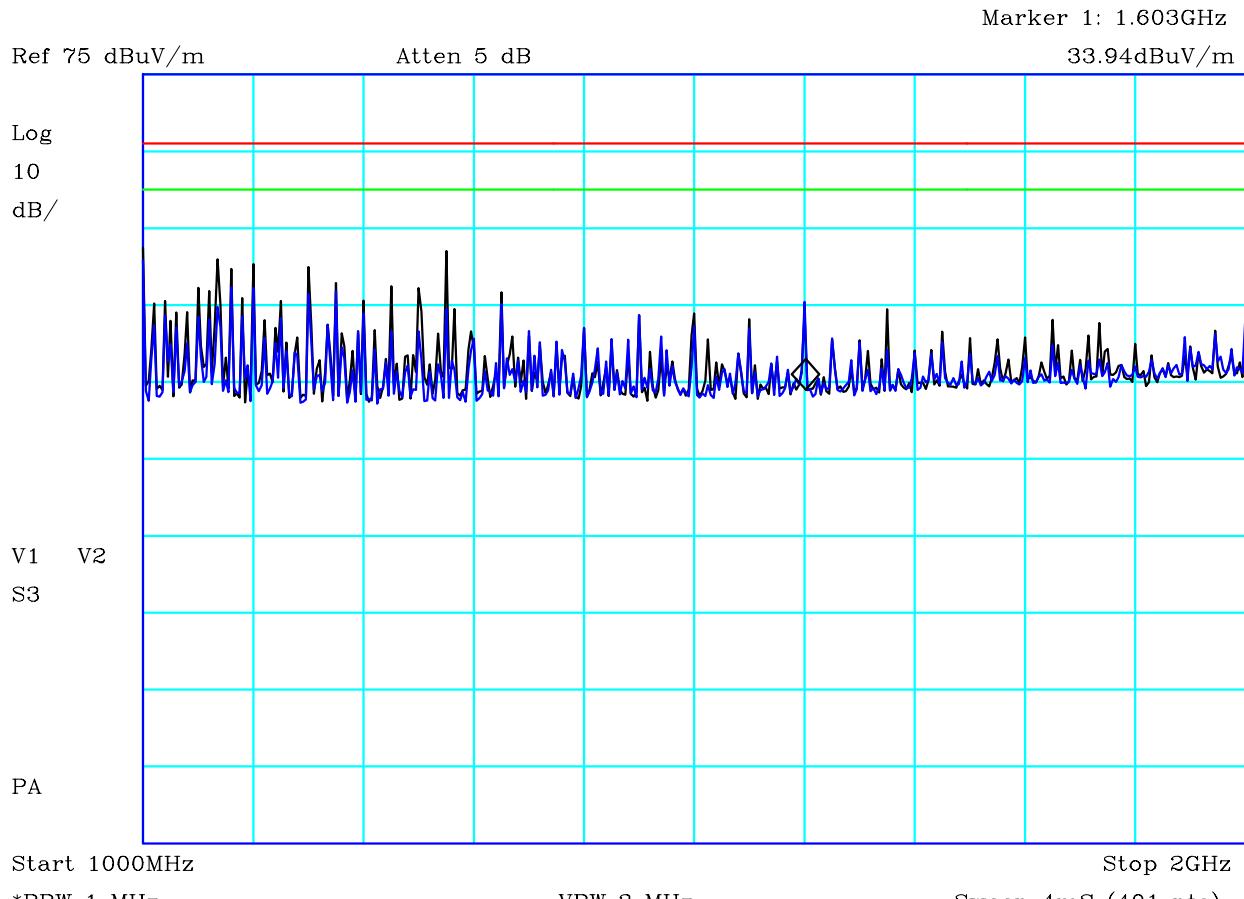
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 73 of 79	



### PLOT 47 Radiated Emissions - Rx @460MHz - 250MHz to 1GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(GRN)	FCC(B)@3m	Limit2:(RED)	FCC(A)@3m
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
455MHz/460MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter off. Rx on 460MHz.			
Facility:	Anech_2	Height	1m,1.5m,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H29055D9
Modification State:	1	Mode:	2

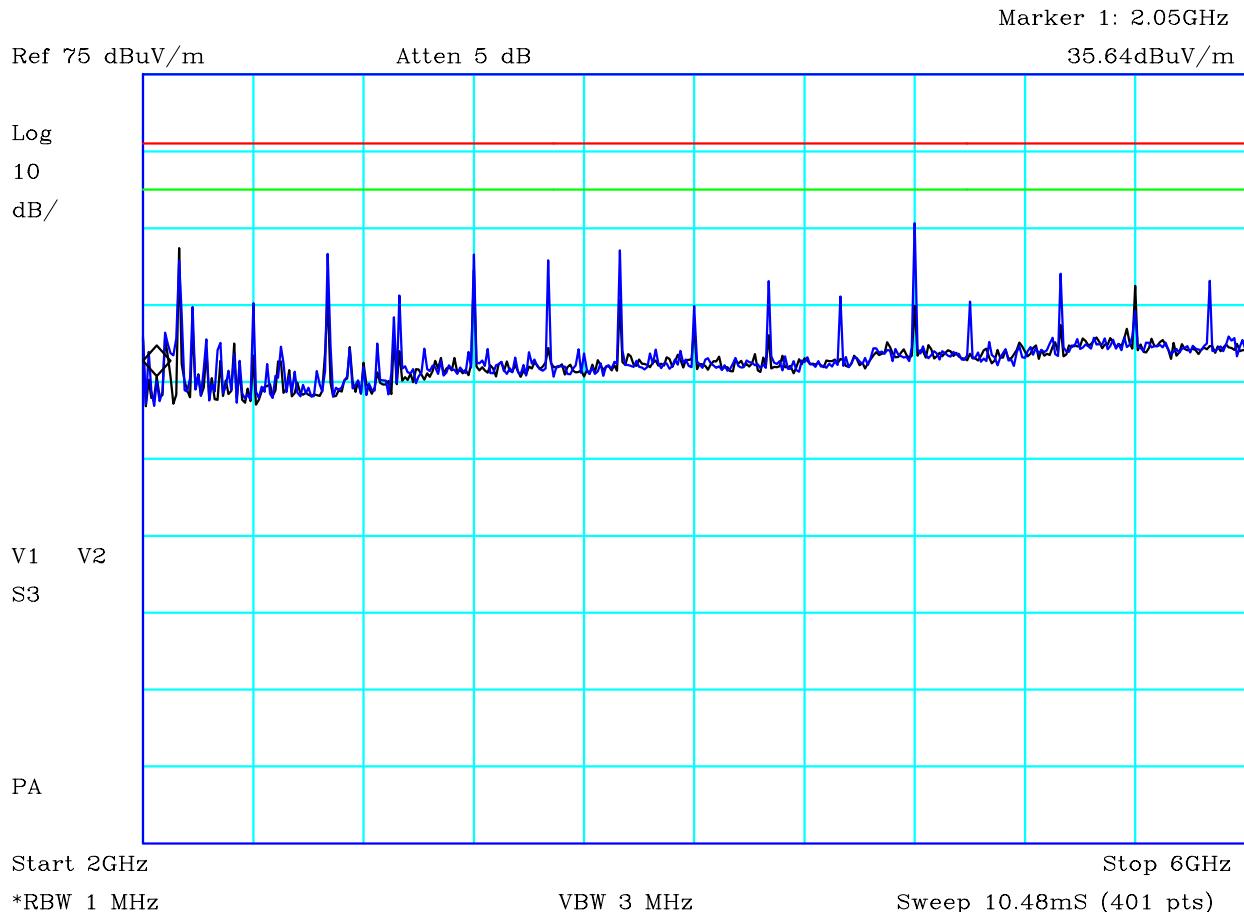
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X	
Test No: T4510		Test Report	Page: 74 of 79



### PLOT 48 Radiated Emissions - Rx @460MHz - 1GHz to 2GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(GRN)	FCC(B)@1.5m	Limit2:(RED)	FCC(A)@1.5m
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
455MHz/460MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter off. Rx at 460MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H29057D1

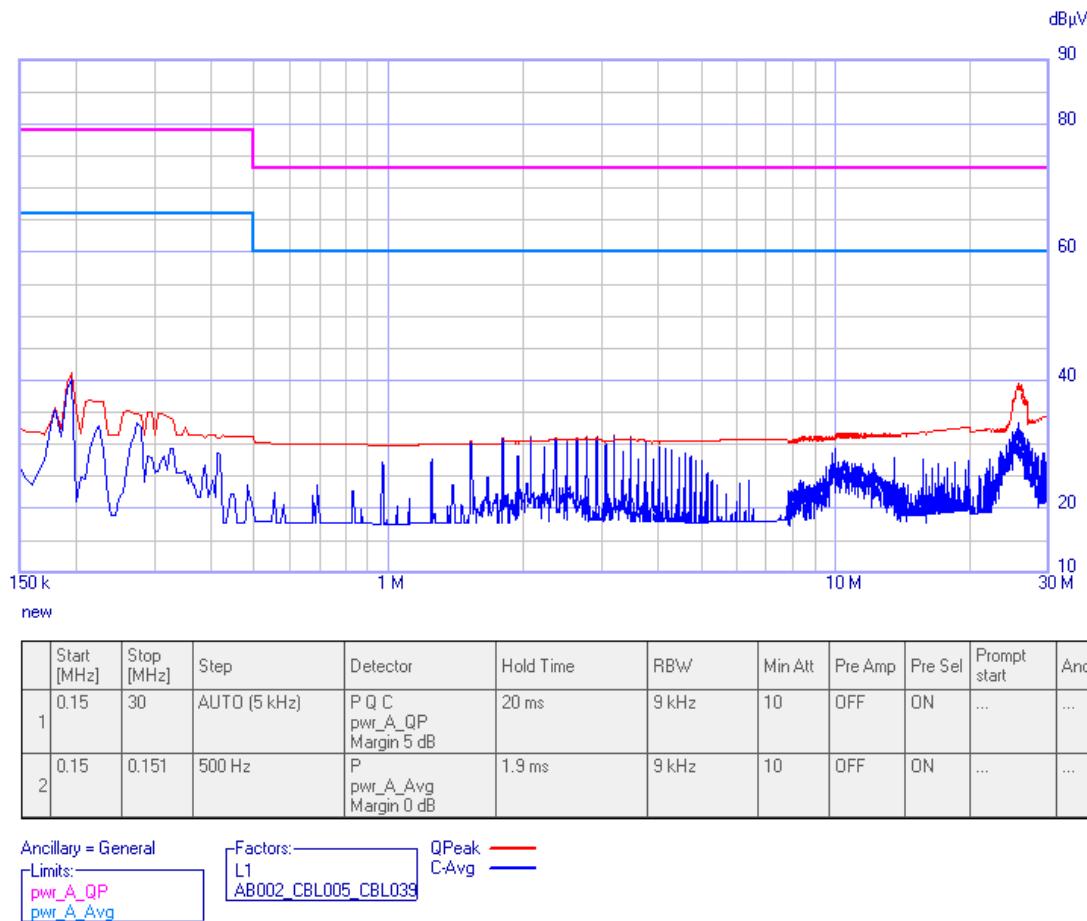
	Report No: R3161 Issue No: 1	FCC ID: QOESOLO45X		
Test No: T4510	Test Report		Page: 75 of 79	



### PLOT 49 Radiated Emissions - Rx @460MHz - 2GHz to 6GHz

Company:	3T	Product:	SOLO-45X
Date:	05/10/2012	Test Eng:	Dave Smith
Method:	Ansi C63.4	Method:	
Limit1:(GRN)	FCC(B)@1.5m	Limit2:(RED)	FCC(A)@1.5m
Limit3:		Limit4:	
Black: vertical, Blue: horizontal			
455MHz/460MHz Duplexer/filter combination. All cables connected. Good screened cable on alarms. Transmitter off. Rx at 460MHz.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H290578A
Mode:	2	Modification State:	1

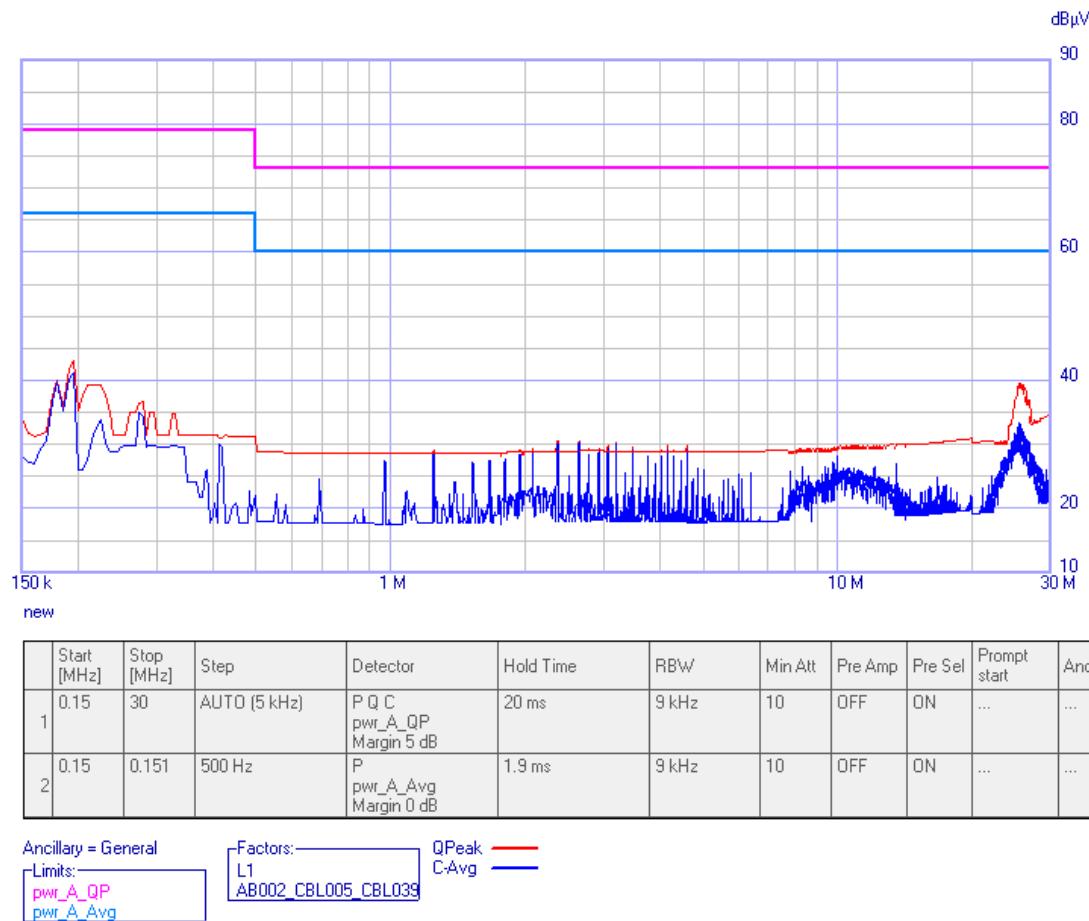
	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>			
Test No: <b>T4510</b>	<b>Test Report</b>			Page: <b>76 of 79</b>	



## PLOT 50 Conducted Emissions - Receiving at 460MHz - Live Line

Company: 3T	Product: SOLO-45X
Date: 10 Oct 12	Test Engineer: Dave Smith
Test: ANSI C63.4	Limit: Class A QP + AV
Notes: 455MHz/460MHz Duplexer/filter Transmitter off. Receiving on 460MHz.	
Line: Live Detector: QP/AVG LISN: EMCO	
Attenuator: 10dB PAD Mod. State: 1 Filename: C2A10425.png	

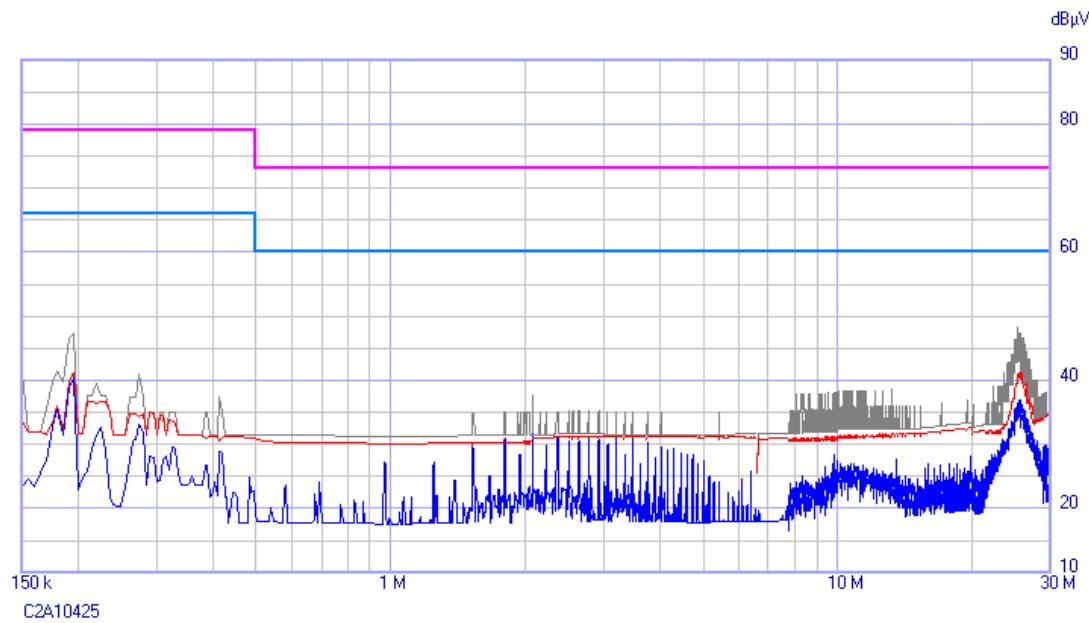
	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>			
Test No: <b>T4510</b>	<b>Test Report</b>			Page: <b>77 of 79</b>	



## PLOT 51 Conducted Emissions - Receiving at 460MHz - Neutral Line

Company: 3T	Product: SOLO-45X
Date: 10 Oct 12	Test Engineer: Dave Smith
Test: ANSI C63.4	Limit: Class A QP + AV
Notes: 455MHz/460MHz Duplexer/filter Transmitter off. Receiving on 460MHz.	
Line: Neutral Detector: QP/AVG LISN: EMCO	
Attenuator: 10dB PAD Operating Mode: Rx Mod. State: 1 Filename: C2A10444.png	

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>			
Test No: <b>T4510</b>	<b>Test Report</b>			Page: <b>78 of 79</b>	



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Alt	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (5 kHz)	P Q C pwr_A_QP Margin 5 dB	20 ms	9 kHz	10	OFF	ON	...	...
2	0.15	0.151	500 Hz	P pwr_A_Avg Margin 0 dB	1.9 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:

**pwr\_A\_QP**

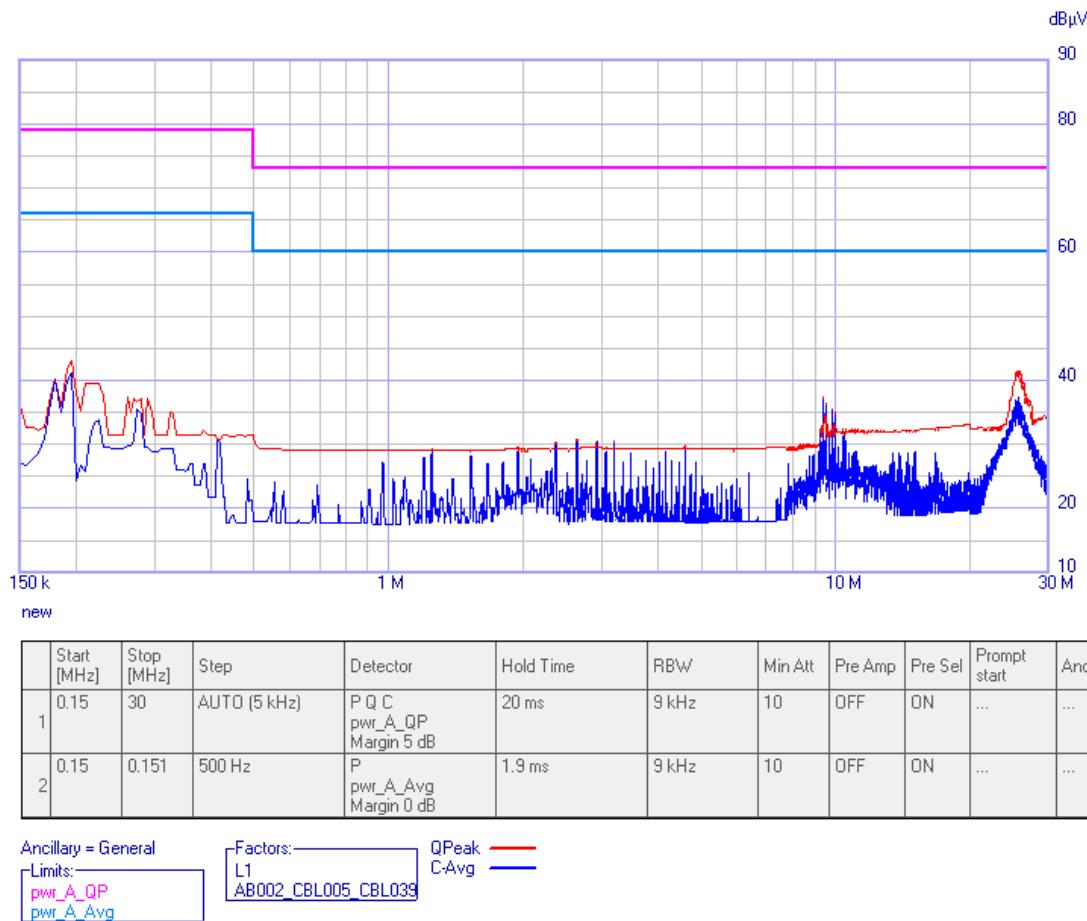
**pwr\_A\_Avg**

Factors:  Peak  QPeak  C-Avg  
L1 AB002\_CBL005\_CBL039

## PLOT 52 Conducted Emissions - Transmitting at 455MHz - Live Line

Company: 3T	Product: SOLO-45X	
Date: 10 Oct 12	Test Engineer: Dave Smith	
Test: ANSI C63.4	Limit: Class A QP + AV	
Notes:		
455MHz/460MHz Duplexer/filter		
Transmitting at 455MHz.		
Line: Live	Attenuator: 10dB PAD	Operating Mode: Tx
Detector: QP/AVG		Mod. State: 1
LISN: EMCO	Filename: C2A10452.png	

	Report No: <b>R3161</b> Issue No: <b>1</b>	<b>FCC ID: QOESOLO45X</b>			
Test No: <b>T4510</b>	<b>Test Report</b>			Page: <b>79 of 79</b>	



### PLOT 53 Conducted Emissions - Transmitting at 455MHz - Neutral Line

Company: 3T	Product: SOLO-45X
Date: 10 Oct 12	Test Engineer: Dave Smith
Test: ANSI C63.4	Limit: Class A QP + AV
Notes: 455MHz/460MHz Duplexer/filter Transmitting at 455MHz.	
Line: Neutral Detector: QP/AVG LISN: EMCO	
Attenuator: 10dB PAD Operating Mode: Tx Mod. State: 1 Filename: C2A10465.png	