

**Test Report No. 7191147174-EEC16/02**  
dated 06 Oct 2016



PSB Singapore

**Note:** This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

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Add value.**

FORMAL REPORT ON TESTING IN ACCORDANCE WITH  
47 CFR FCC Parts 22, 74, 80, 90  
RSS-119 Issue 12: 2015  
OF A  
**HANDHELD RADIO**  
[ Model : AAH56RDR9RA1AN ]  
[ FCC ID : AZ489FT7065 ]  
[ IC : 109U-89FT7065 ]

**TEST FACILITY** TÜV SÜD PSB Pte Ltd  
Electrical & Electronics Centre (EEC), Product Services,  
No. 1 Science Park Drive, Singapore 118221

**FCC REG. NO.** 99142 (3m and 10m Semi-Anechoic Chamber, Science Park)

**IND. CANADA REG. NO.** 2932I-1 (3m and 10m Semi-Anechoic Chamber, Science Park)

**PREPARED FOR** Motorola Solutions Malaysia Sdn Bhd  
Plot 2, Technoplex Industrial Park Mukim 12 Swd,  
Medan Bayan Lepas, Bayan Lepas Industrial Park,  
11900 Bayan Lepas, Pulau Penang,  
Malaysia

Tel : +604 252 8543 Fax : +604 850 3099

**QUOTATION NUMBER** 2191048544

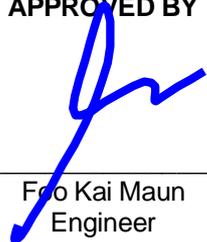
**JOB NUMBER** 7191147174

**TEST PERIOD** 26 Sep 2016 – 03 Oct 2016

**PREPARED BY**

  
Quek Keng Huat  
Higher Associate Engineer

**APPROVED BY**

  
Foo Kai Maun  
Engineer



LA-2007-0380-A LA-2007-0384-G  
LA-2007-0381-F LA-2007-0385-E  
LA-2007-0382-B LA-2007-0386-C  
LA-2007-0383-G LA-2010-0464-D

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

Laboratory:  
TÜV SÜD PSB Pte. Ltd.  
No.1 Science Park Drive  
Singapore 118221

Phone : +65-6885 1333  
Fax : +65-6776 8670  
E-mail: enquiries@tuv-sud-psb.sg  
www.tuv-sud-psb.sg  
Co. Reg : 199002667R

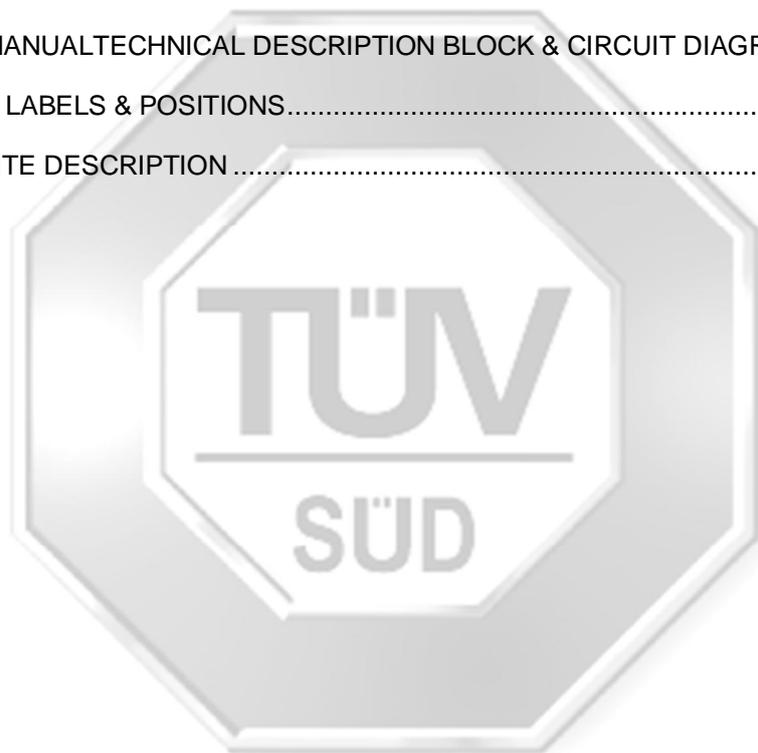
Regional Head Office:  
TÜV SÜD Asia Pacific Pte. Ltd.  
1 Science Park Drive, #02-01  
Singapore 118221  
**TUV®**



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**TEST SUMMARY**

The product was tested in accordance with the customer's specifications.

**Test Results Summary**

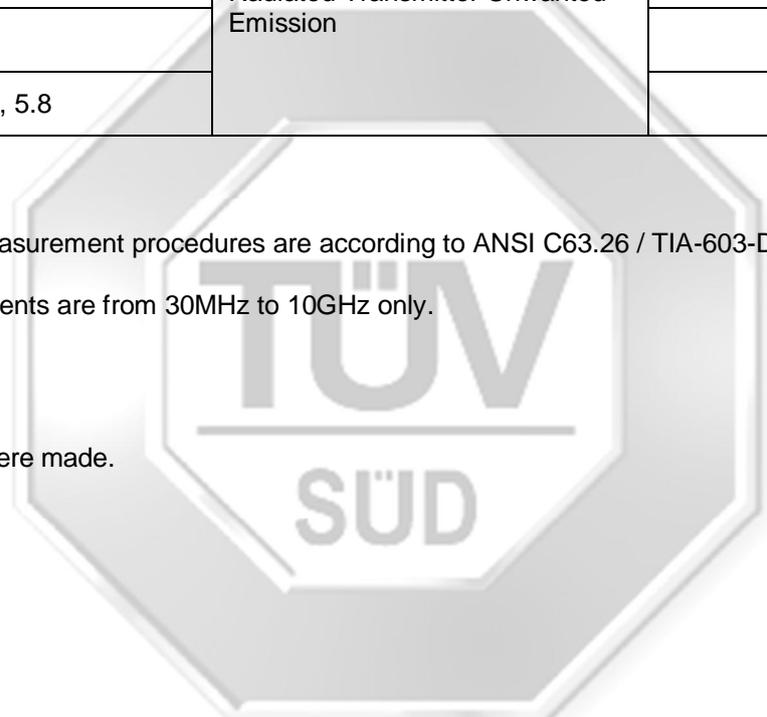
Test Standard	Description	Pass / Fail
47 CFR FCC Parts 22, 74, 80, 90 and RSS-119		
FCC Part 90.210	Radiated Transmitter Unwanted Emission	Pass
FCC Part 22.359		Pass
FCC Part 74.462		Pass
RSS-119 Sec 4.2, 5.8		Pass

**Notes**

1. All test measurement procedures are according to ANSI C63.26 / TIA-603-D: 2010.
2. Measurements are from 30MHz to 10GHz only.

**Modifications**

No modifications were made.





**PRODUCT DESCRIPTION**

Description : The Equipment Under Test (EUT) is a **HANDHELD RADIO**.

Applicant : Motorola Solutions Malaysia Sdn Bhd  
Plot 2, Technoplex Industrial Park Mukim 12 Swd,  
Medan Bayan Lepas, Bayan Lepas Industrial Park,  
11900 Bayan Lepas, Pulau Penang,  
Malaysia

Manufacturer : Motorola Solutions Malaysia Sdn Bhd  
Plot 2, Technoplex Industrial Park Mukim 12 Swd,  
Medan Bayan Lepas, Bayan Lepas Industrial Park,  
11900 Bayan Lepas, Pulau Penang,  
Malaysia

Factory (ies) : Motorola Solutions Malaysia Sdn Bhd  
Plot 2, Technoplex Industrial Park Mukim 12 Swd,  
Medan Bayan Lepas, Bayan Lepas Industrial Park,  
11900 Bayan Lepas, Pulau Penang,  
Malaysia

Model Number : AAH56RDR9RA1AN

Regulatory ID : FCC: AZ489FT7065  
IC: 109U-89FT7065

Serial Number : 871TSRK873

Microprocessor : Ti OMAPL138BZCEA3R

Operating / Transmitting Frequency : Bluetooth / Bluetooth LE  
2.402GHz (lower channel) to 2.480GHz (upper channel)  
79 channels (Bluetooth), 40 channels (Bluetooth LE)

WiFi  
2.412GHz (lower channel) to 2.462GHz (upper channel)  
11 channels

Land Mobile  
403MHz - 527MHz  
Channel Spacing 12.5kHz / 25kHz

Clock / Oscillator Frequency : Reference Clock: 38.4 MHz , LO: 806 MHz - 1054 MHz

Modulation : Bluetooth  
Gaussian Frequency Shift Keying (GFSK)  
( $\pi/4$ ) DQPSK  
8DPSK

Land Mobile  
Frequency Modulation (FM)

Antenna Gain : 2.15 dBi



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**PRODUCT DESCRIPTION**

(Continued)

Port / Connectors : Refer to manufacturer's user manual / operating manual  
Rated Input Power : 7.4Vdc 20.7Wh 2800mAh Lithium ION battery  
Accessories : Refer to manufacturer's user manual / operating manual





**SUPPORTING EQUIPMENT DESCRIPTION**

<b>Equipment Description (Including Brand Name)</b>	<b>Model, Serial &amp; FCC ID Number</b>	<b>Cable Description (List Length, Type &amp; Purpose)</b>
Motorola Solutions IMPRES Remote Speaker Microphone	M/N: PMMN4046A S/N: Nil FCC ID: DoC	0.60 m unshielded cable
Pomona Electronics BNC (Male), Resistor Termination	M/N: 3840 S/N: Nil FCC ID: DoC	Nil





**EUT OPERATING CONDITIONS**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119**

**1. Radiated Unwanted Emissions**

The EUT was exercised by operating in maximum continuous transmission in the test mode.





**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Test  
Instrumentation**

Instrument	Model	S/No	Cal Due Date	Cal Interval
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829179/005	07 Jul 2017	1 year
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	11 Mar 2017	1 year
EMCO Horn Antenna(1GHz-18GHz)	3115	0003-6088	20 Apr 2017	1 year
Schaffner Bilog Antenna –(30MHz-2GHz) BL4	CBL6112B	2593	15 Dec 2016	1 year
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441056	22 Jul 2017	1 year
Mini-Circuits High Pass Filter	NHP-500	Nil	15 Mar 2017	1 year





## RADIATED TRANSMITTER UNWANTED EMISSION TEST

### 47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Test Setup

1. The EUT and supporting equipment were set up as shown in the test setup photo. The test was conducted in an anechoic chamber under the normal test condition.
2. The EUT was connected to an appropriate power source while all other supporting equipment were powered separately from another power source.
3. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were set accordingly as per in the test requirement.
4. All other supporting equipment were powered separately from another filtered mains.

### 47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Test Method

1. The EUT was set to transmit at the maximum power at the lower operating frequency with the modulation on at normal test condition.
2. The receiving antenna (test antenna) was set at vertical polarization with the height of 1m.
3. With the spectrum analyser was set to max hold enabled (peak detector mode), the emissions outside the operating frequency range (spurious emissions) that exceeded the allowable limits or come to within 6dB below the limit were searched and recorded.
4. For each spurious emission found, the test antenna was raised or lowered through the specified range of heights (1m – 4m) until a maximum signal level was detected on the test receiver.
5. The EUT was then rotated through 360° in the horizontal plane until the maximum signal was received. The maximum received signal level was recorded as A (in dBm).
6. The EUT was replaced with the substitution antenna with the antenna input was connected to the signal generator via a 10dB attenuator (if required).
7. The signal generator was set to the found spurious frequency. The output level of the signal generator was adjusted until the test receiver was at least 20dB above the level when the signal generator was switched off.
8. The test antenna was raised and lowered through the specified range of heights (1m – 4m) until the maximum signal level was received on the test receiver.
9. The substitution antenna was rotated until the maximum level was detected on the test receiver.
10. The output level of the signal generator was adjusted until the received signal level at the test receiver was equal to the level recorded in step 6 (A dBm). The signal generator output level was recorded as B (in dBm).
11. The spurious emission level, P (e.r.p / e.i.r.p) was computed as followed:  
$$P(e.i.r.p) = B - C - D + E$$
$$P(e.r.p) = P(e.i.r.p) - 2.15$$

where	C	=	cable loss between the signal generator and the substitution
	D	=	attenuation level if attenuator is used
	E	=	substitution antenna gain
12. The steps 2 to 11 were repeated with the receiving antenna was set to horizontal polarization.
13. Comparison was made on both measured results with vertical and horizontal polarizations. The highest value out of vertical and horizontal polarizations was recorded.
14. The steps 2 to 13 were repeated until all the spurious emissions were measured.
15. The steps 1 to 14 were repeated with the EUT was set to operate at the upper operating frequency.



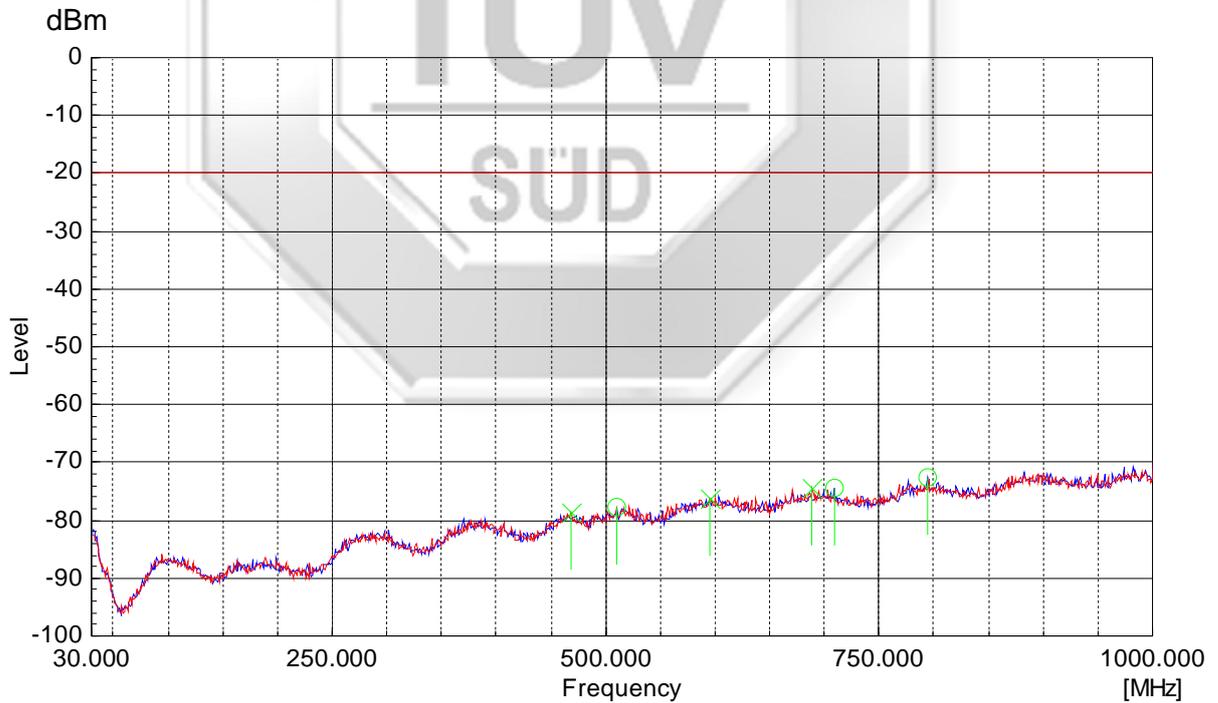
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**406.2MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
468.1380	-78.6	-20.0
510.8100	-77.8	-20.0
595.0610	-76.2	-20.0
689.1590	-74.5	-20.0
708.8540	-74.4	-20.0
794.1990	-72.6	-20.0



**406.2MHz (Digital) 30MHz – 1GHz**



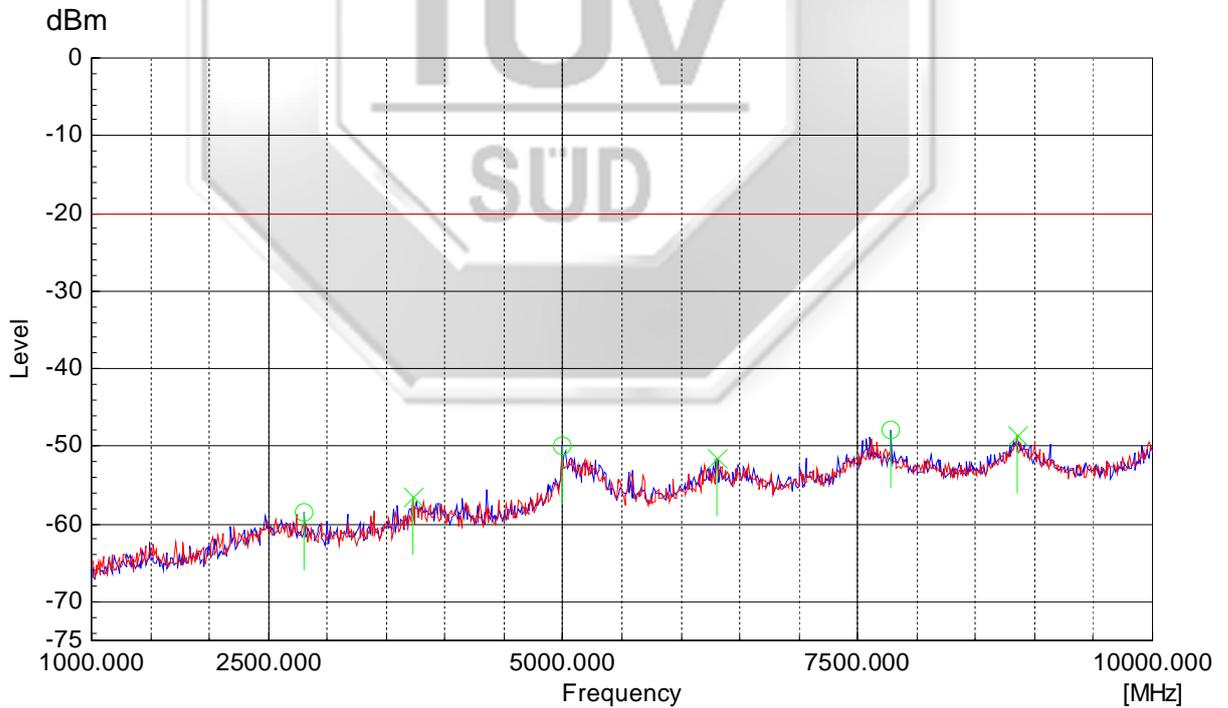
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Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**406.2MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
2807.9000	-58.5	-20.0
3727.0000	-56.4	-20.0
4989.5000	-49.8	-20.0
6302.5000	-51.6	-20.0
7787.2000	-47.9	-20.0
8847.7000	-48.5	-20.0



**406.2MHz (Digital) 1GHz - 10GHz**



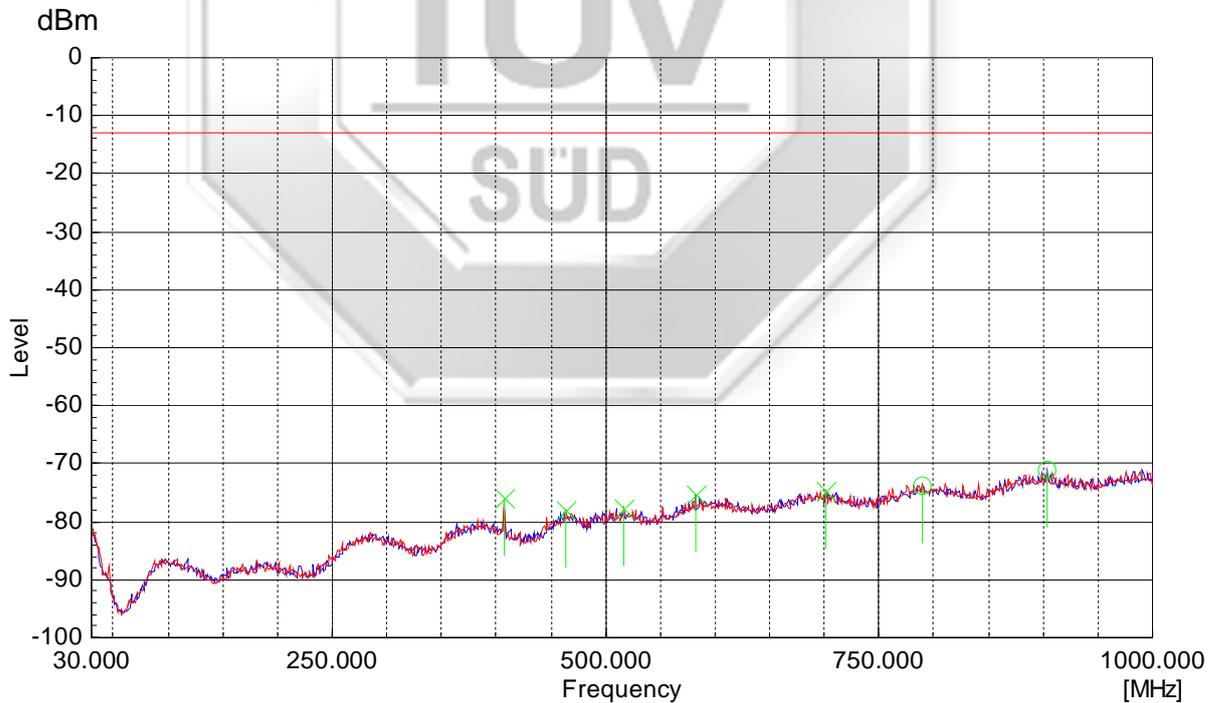
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**406.2MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
463.7610	-78.0	-13.0
517.3750	-77.8	-13.0
581.9310	-75.5	-13.0
701.1950	-74.7	-13.0
789.8230	-73.8	-13.0
903.6160	-71.1	-13.0



**406.2MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.



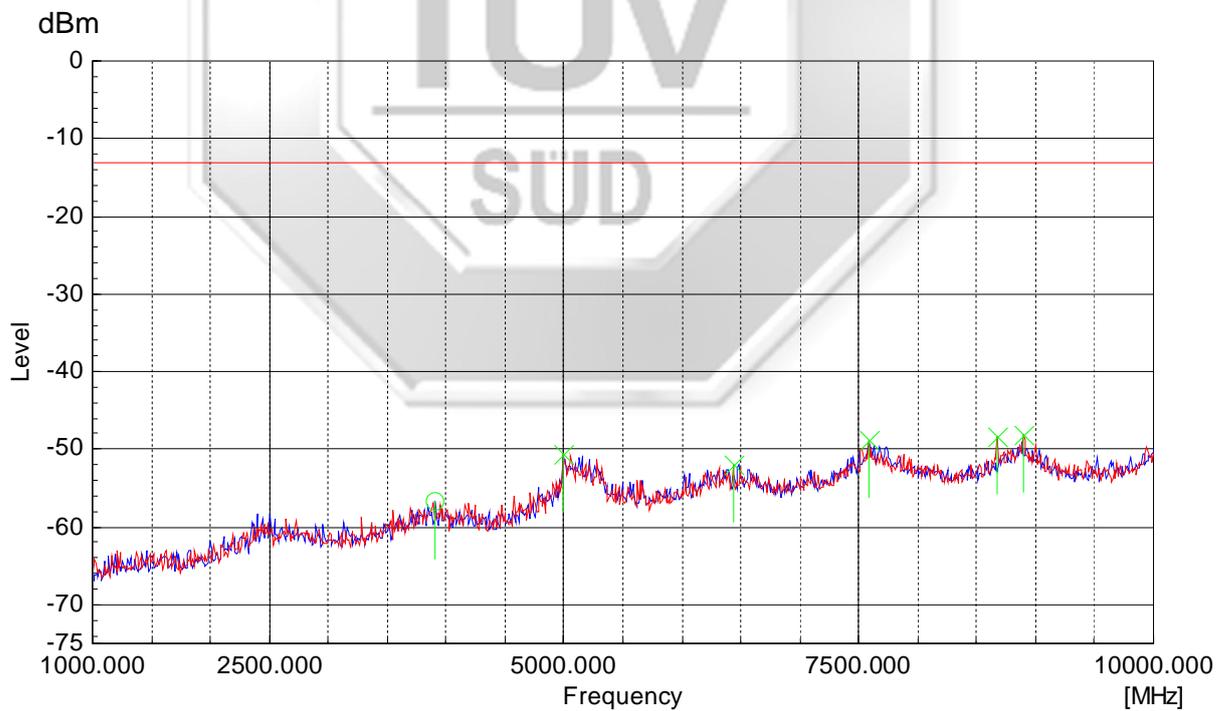
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**406.2MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
3908.8000	-56.6	-13.0
4999.6000	-50.5	-13.0
6433.8000	-52.0	-13.0
7585.2000	-48.7	-13.0
8676.0000	-48.3	-13.0
8898.2000	-48.2	-13.0



**406.2MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



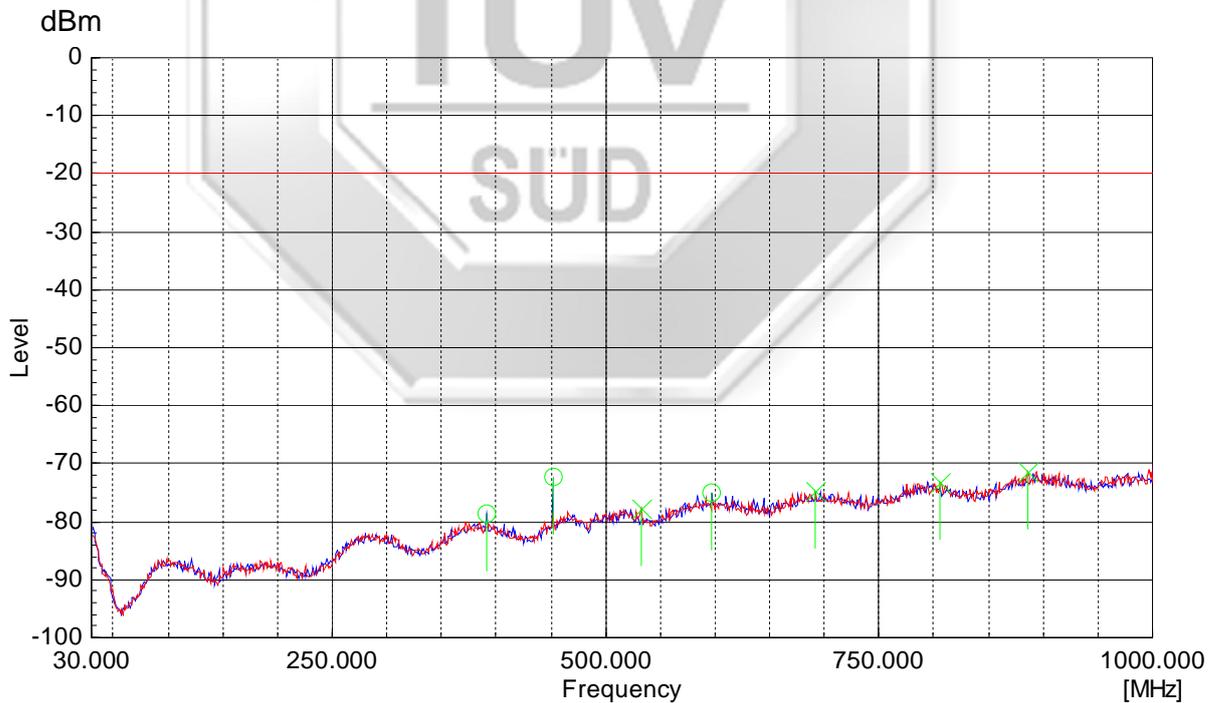
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
391.5460	-78.6	-20.0
532.6930	-77.7	-20.0
597.2490	-75.1	-20.0
692.4420	-74.6	-20.0
806.2350	-73.1	-20.0
886.1090	-71.5	-20.0



**450.65MHz (Digital) 30MHz – 1GHz**



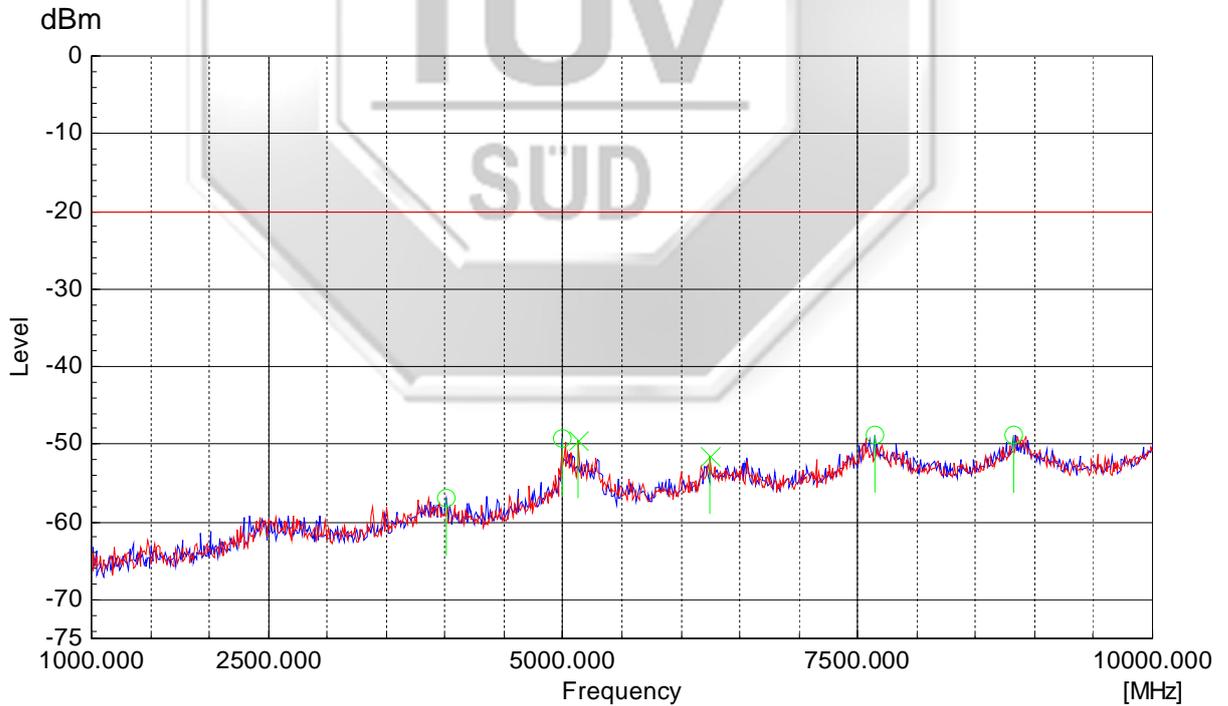
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4009.8000	-56.9	-20.0
4989.5000	-49.2	-20.0
5130.9000	-49.5	-20.0
6252.0000	-51.6	-20.0
7645.8000	-48.9	-20.0
8817.4000	-48.7	-20.0



**450.65MHz (Digital) 1GHz – 10GHz**



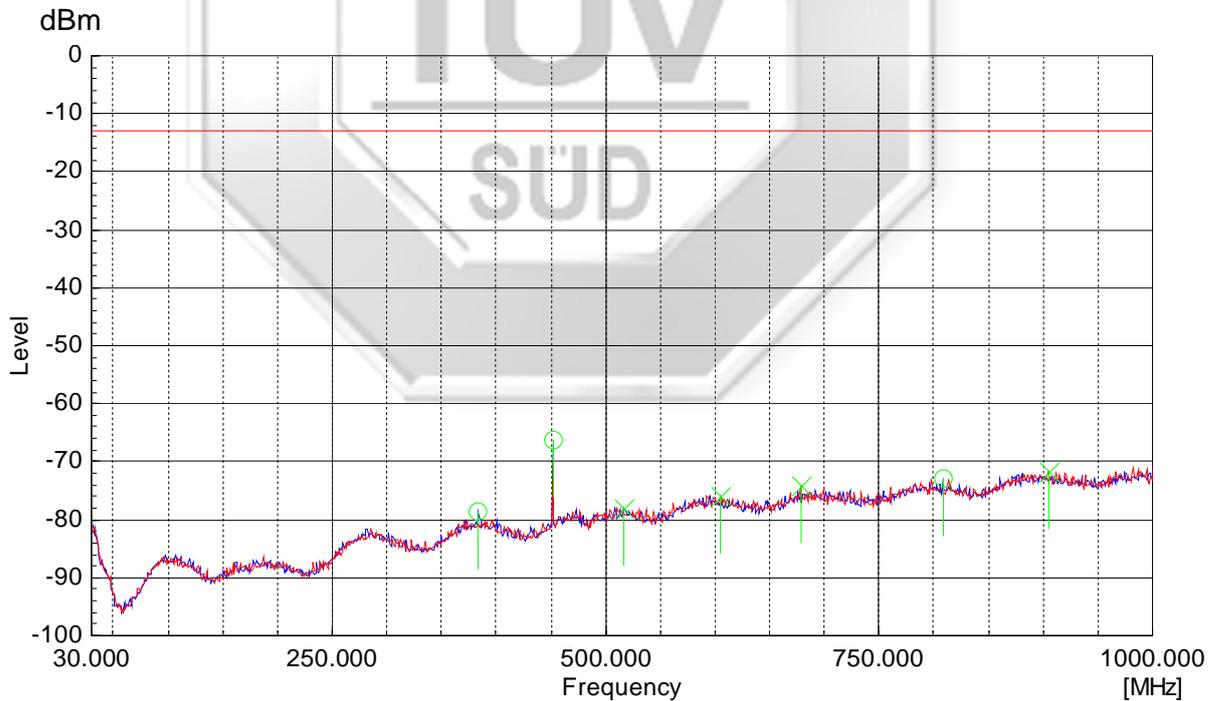
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
383.8870	-78.5	-13.0
516.2810	-78.0	-13.0
604.9080	-75.8	-13.0
678.2180	-74.1	-13.0
808.4230	-72.9	-13.0
904.7100	-71.8	-13.0



**450.65MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.



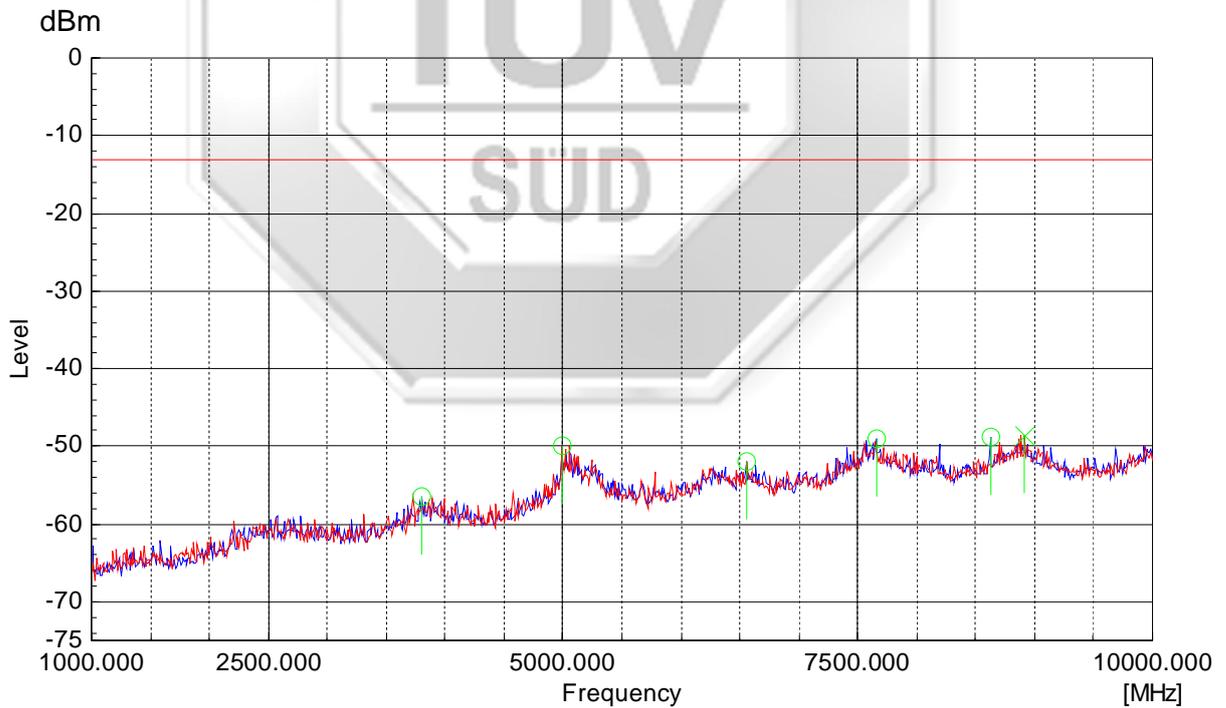
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Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
3807.8000	-56.5	-13.0
4989.5000	-49.8	-13.0
6555.0000	-51.9	-13.0
7655.9000	-49.1	-13.0
8625.5000	-48.7	-13.0
8918.4000	-48.5	-13.0



**450.65MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



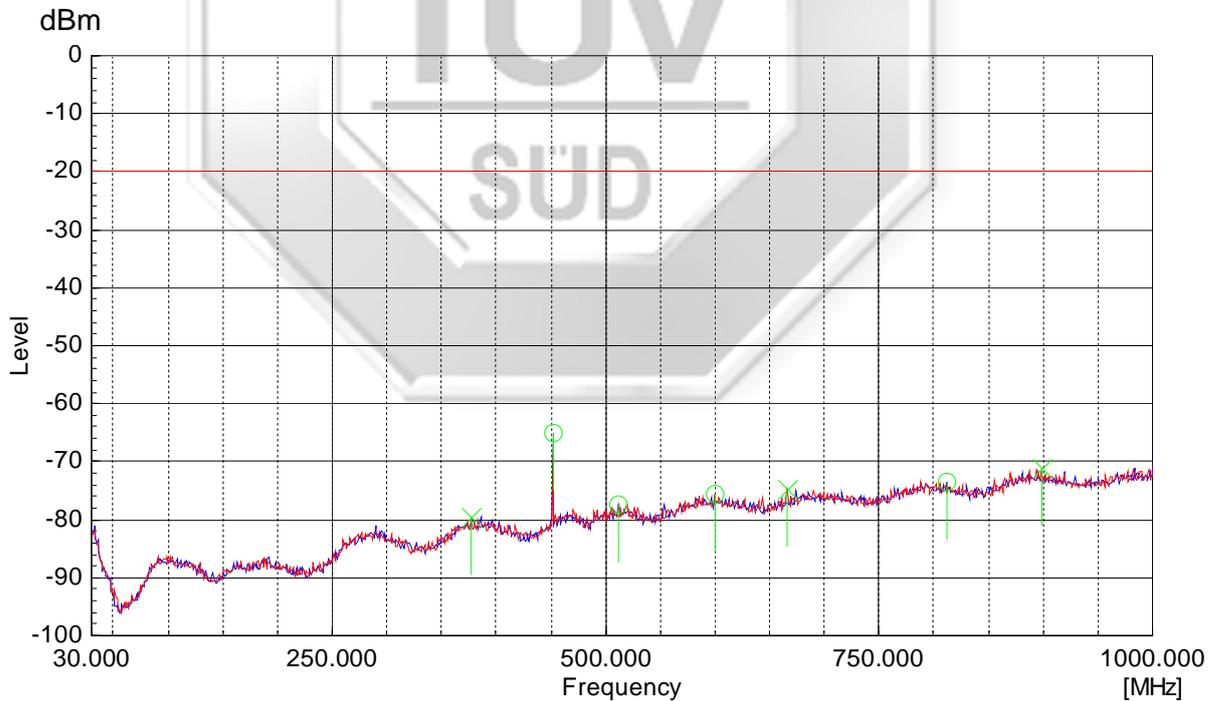
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
377.3220	-79.5	-20.0
511.9040	-77.4	-20.0
599.4380	-75.6	-20.0
666.1820	-74.8	-20.0
811.7060	-73.5	-20.0
898.1450	-71.0	-20.0



**450.65MHz (Digital) 30MHz – 1GHz**



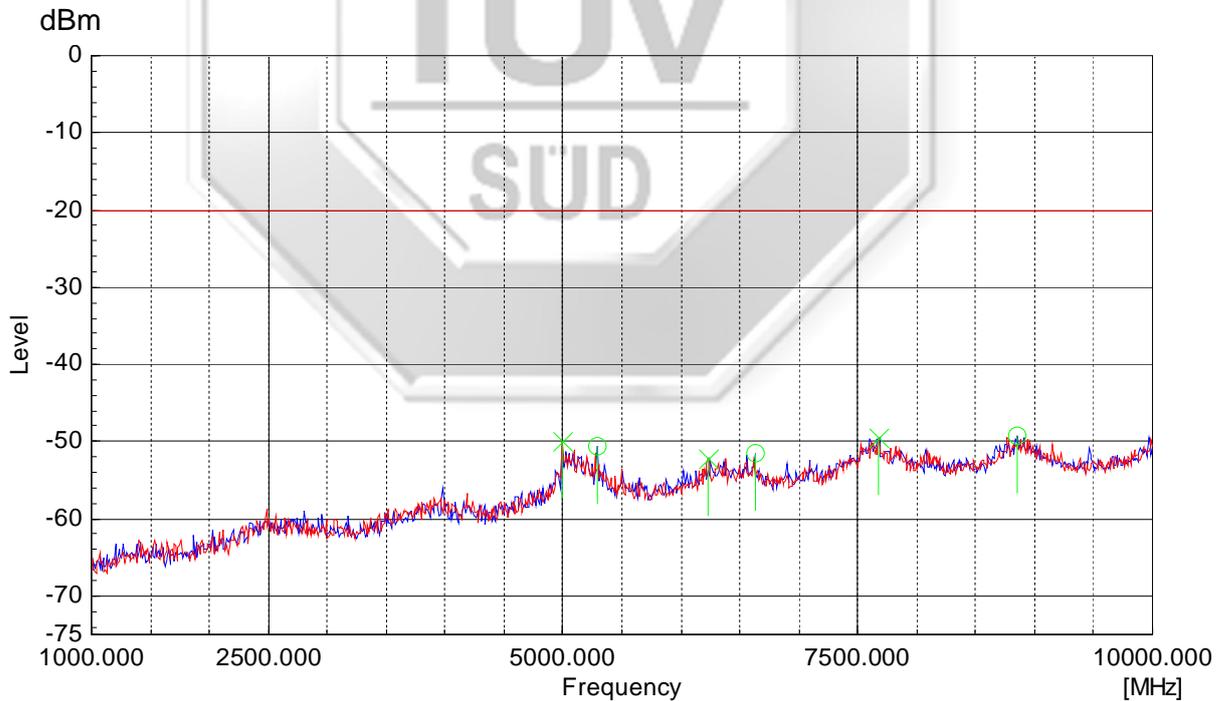
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Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-50.0	-20.0
5292.5000	-50.5	-20.0
6231.8000	-52.1	-20.0
6625.7000	-51.6	-20.0
7676.1000	-49.5	-20.0
8857.8000	-49.3	-20.0



**450.65MHz (Digital) 1GHz – 10GHz**



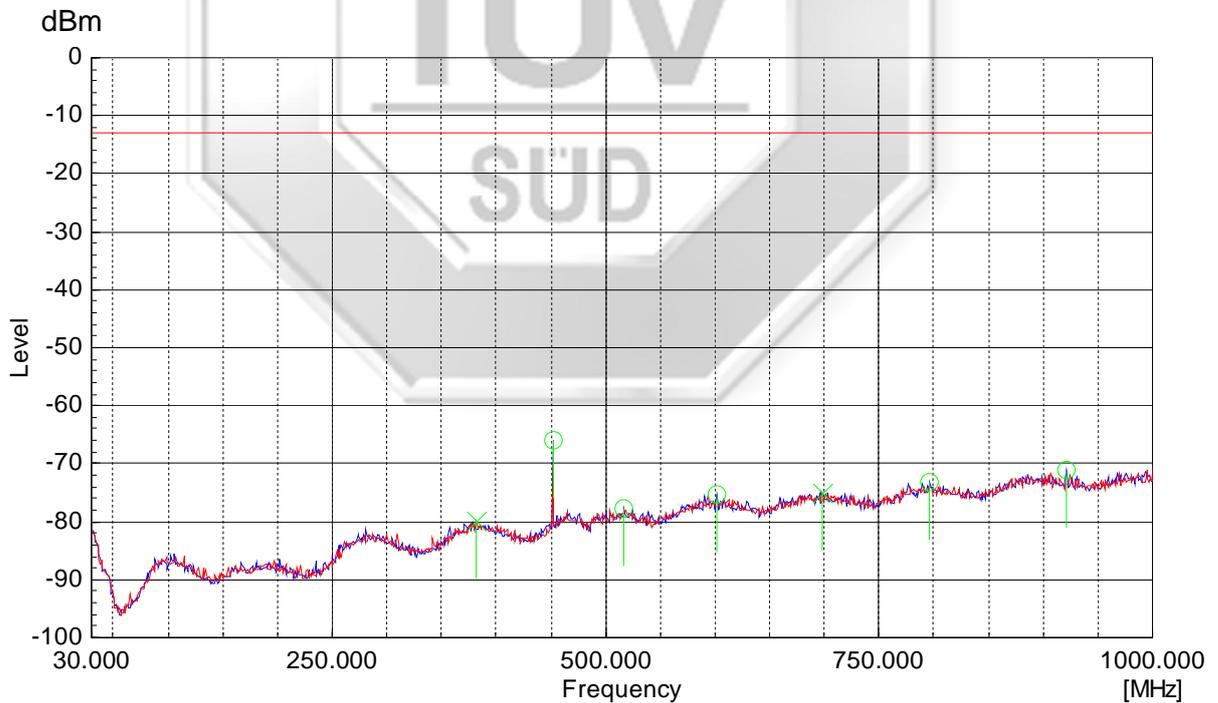
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
381.6980	-79.9	-13.0
517.3750	-77.8	-13.0
601.6260	-75.3	-13.0
697.9130	-74.9	-13.0
796.3880	-73.3	-13.0
921.1230	-71.1	-13.0



**450.65MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.



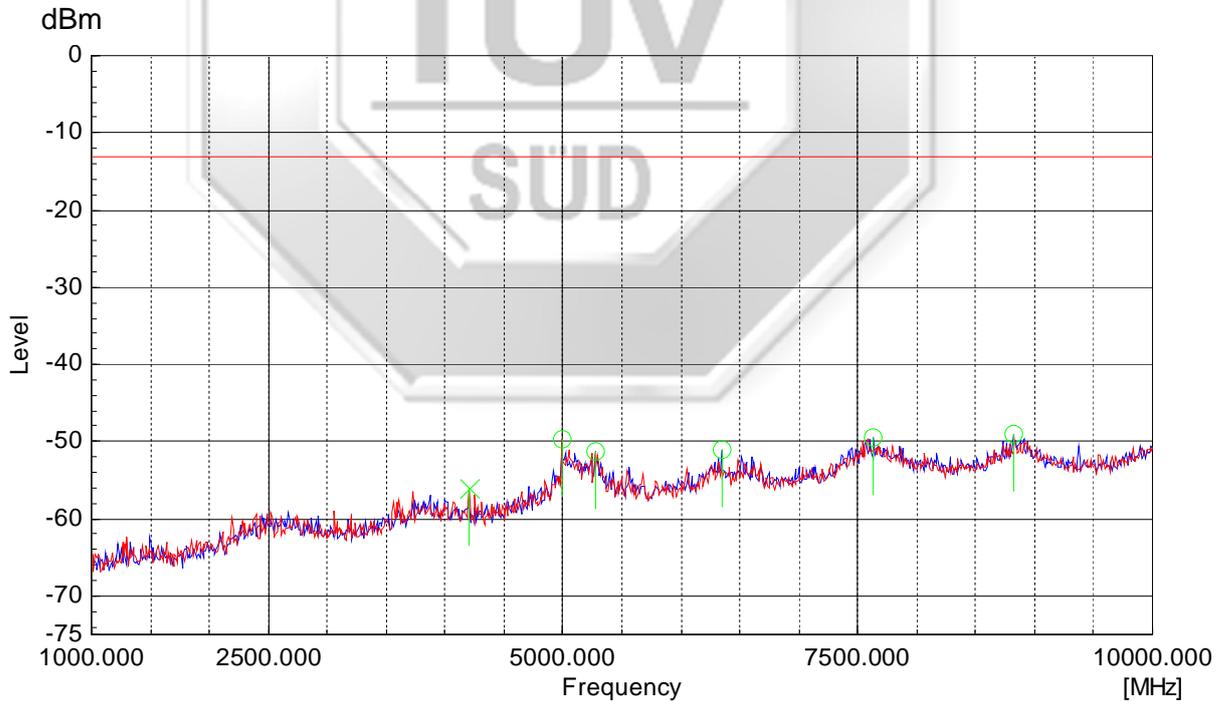
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Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**450.65MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4201.7000	-56.0	-13.0
4989.5000	-49.6	-13.0
5272.3000	-51.4	-13.0
6342.9000	-51.0	-13.0
7635.7000	-49.5	-13.0
8817.4000	-49.0	-13.0



**450.65MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



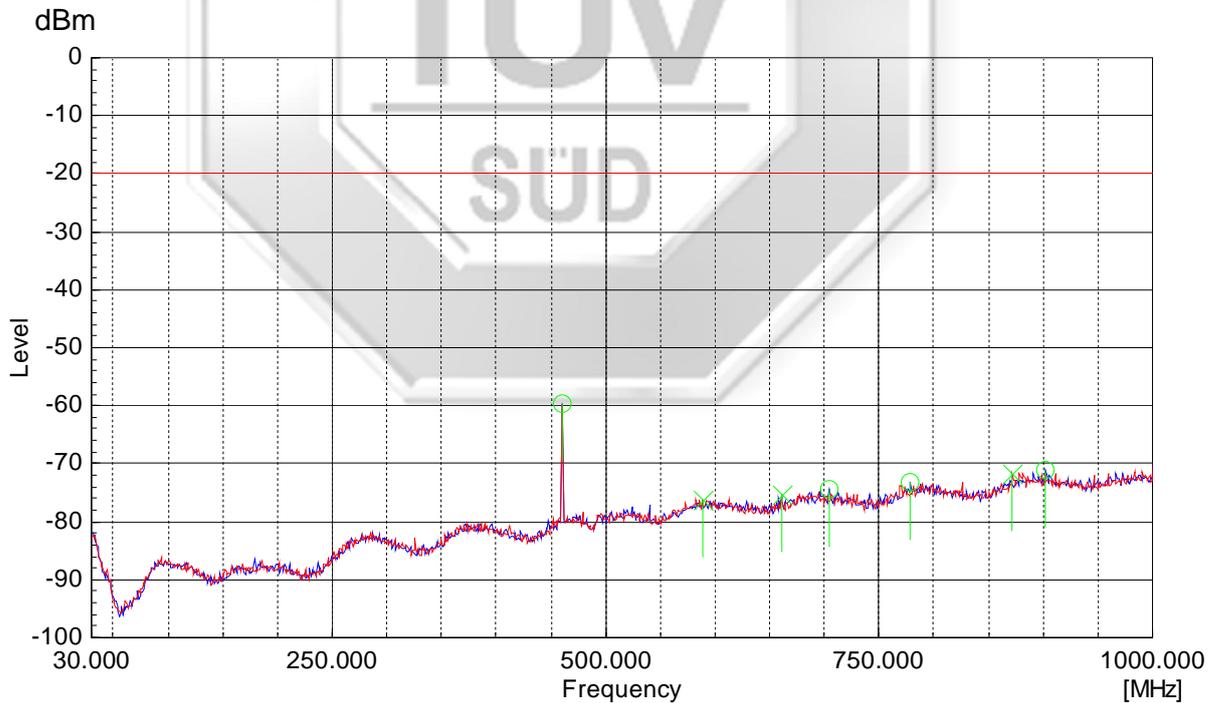
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Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
588.4960	-76.1	-20.0
660.7110	-75.4	-20.0
704.4780	-74.4	-20.0
778.8810	-73.1	-20.0
871.8850	-71.5	-20.0
902.5220	-71.0	-20.0



**459.125MHz (Digital) 30MHz – 1GHz**



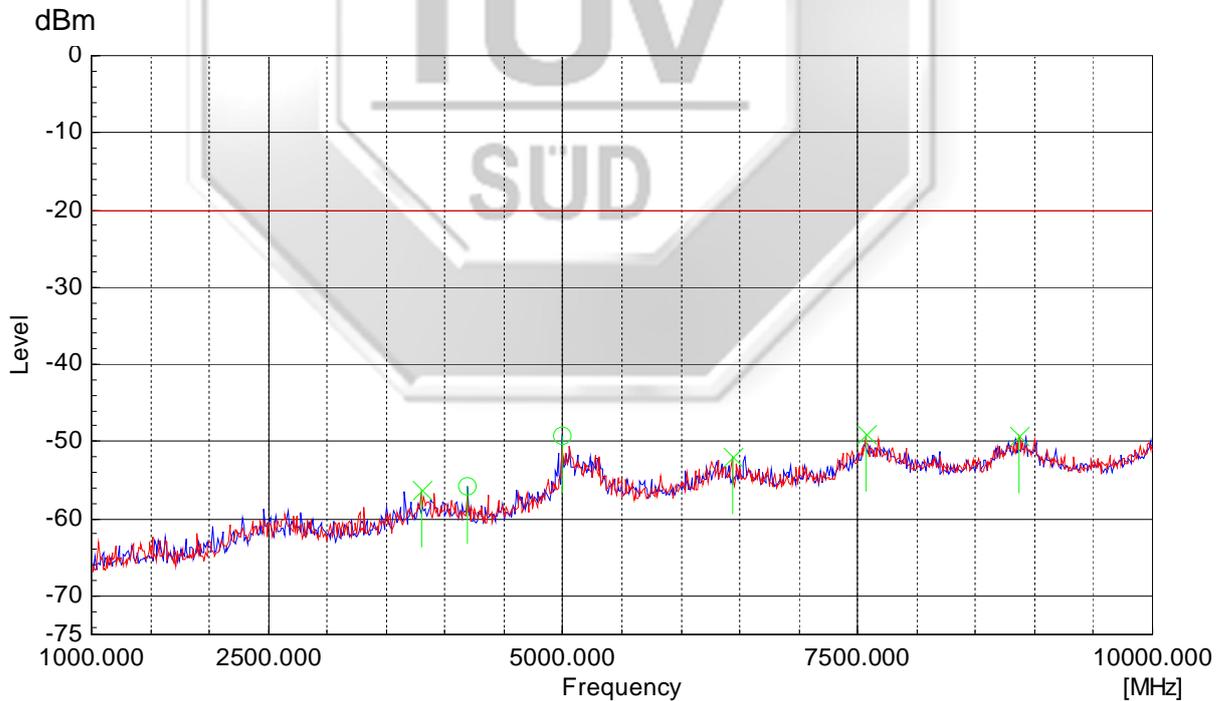
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Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
3797.7000	-56.2	-20.0
4191.6000	-55.7	-20.0
4989.5000	-49.3	-20.0
6433.8000	-52.0	-20.0
7565.0000	-49.0	-20.0
8867.9000	-49.2	-20.0



**459.125MHz (Digital) 1GHz – 10GHz**



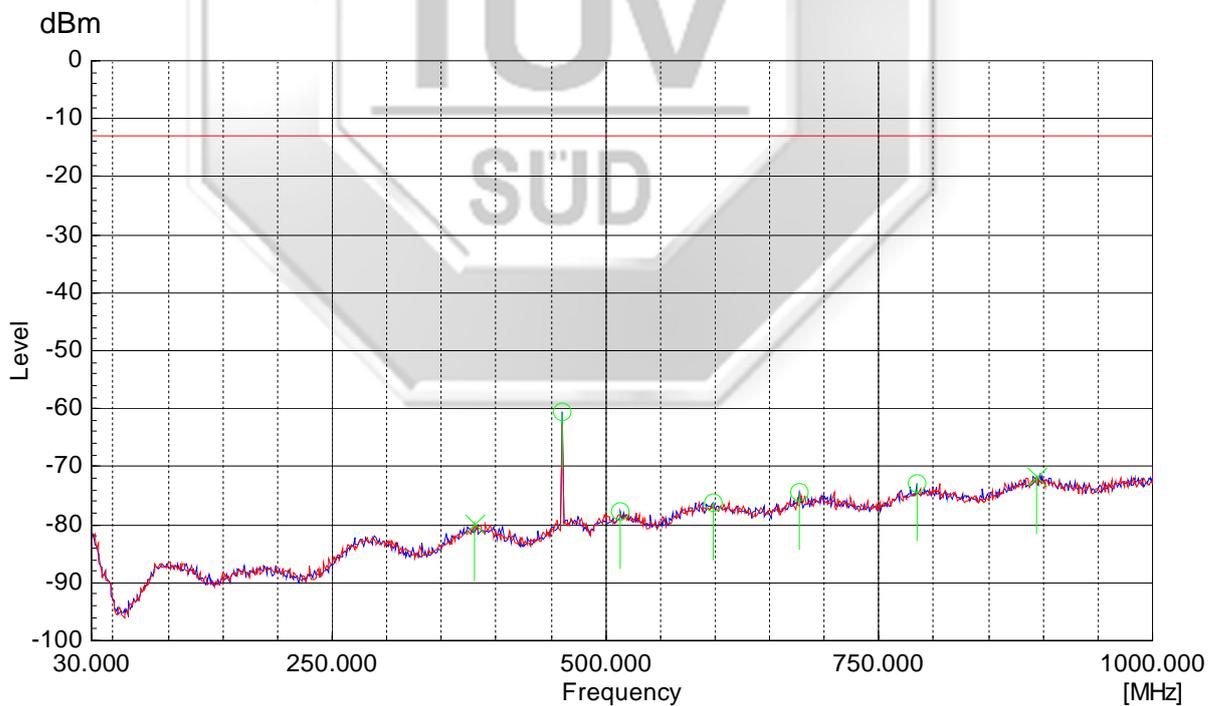
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
379.5100	-79.7	-13.0
514.0930	-77.8	-13.0
598.3430	-76.1	-13.0
677.1230	-74.4	-13.0
784.3520	-72.9	-13.0
893.7680	-71.5	-13.0



**459.125MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.



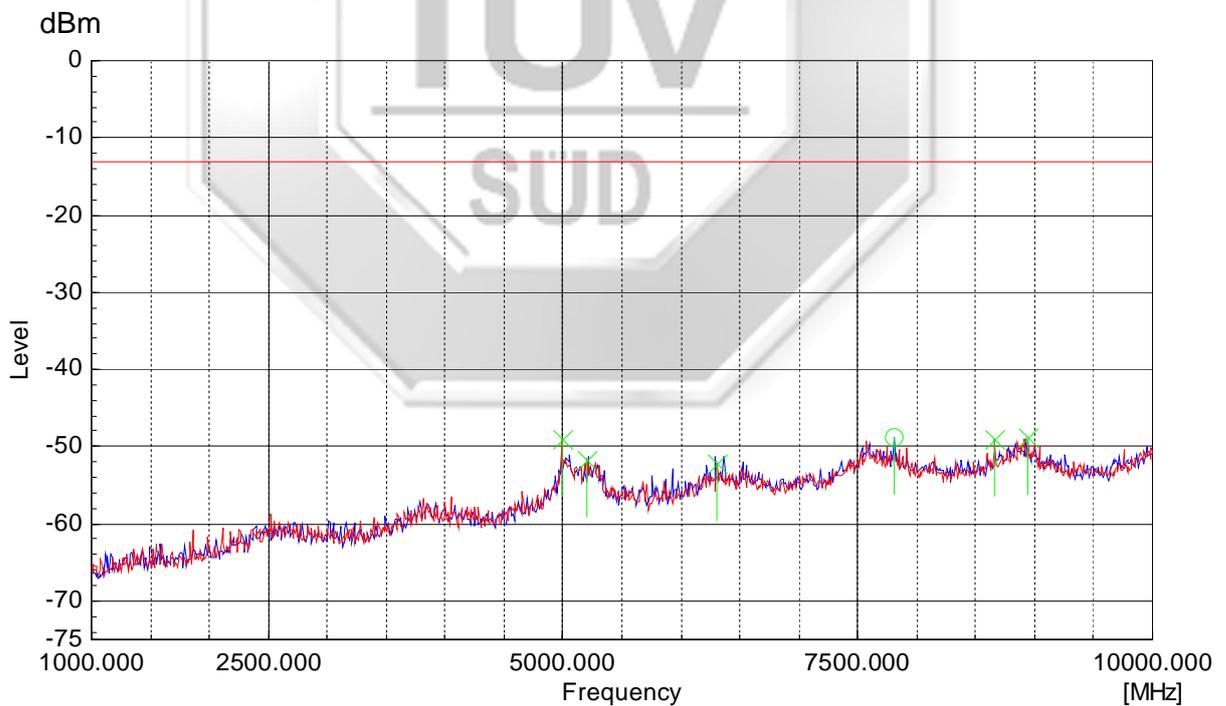
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-49.1	-13.0
5201.6000	-51.7	-13.0
6302.5000	-52.2	-13.0
7807.4000	-48.8	-13.0
8665.9000	-49.0	-13.0
8948.7000	-48.7	-13.0



**459.125MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



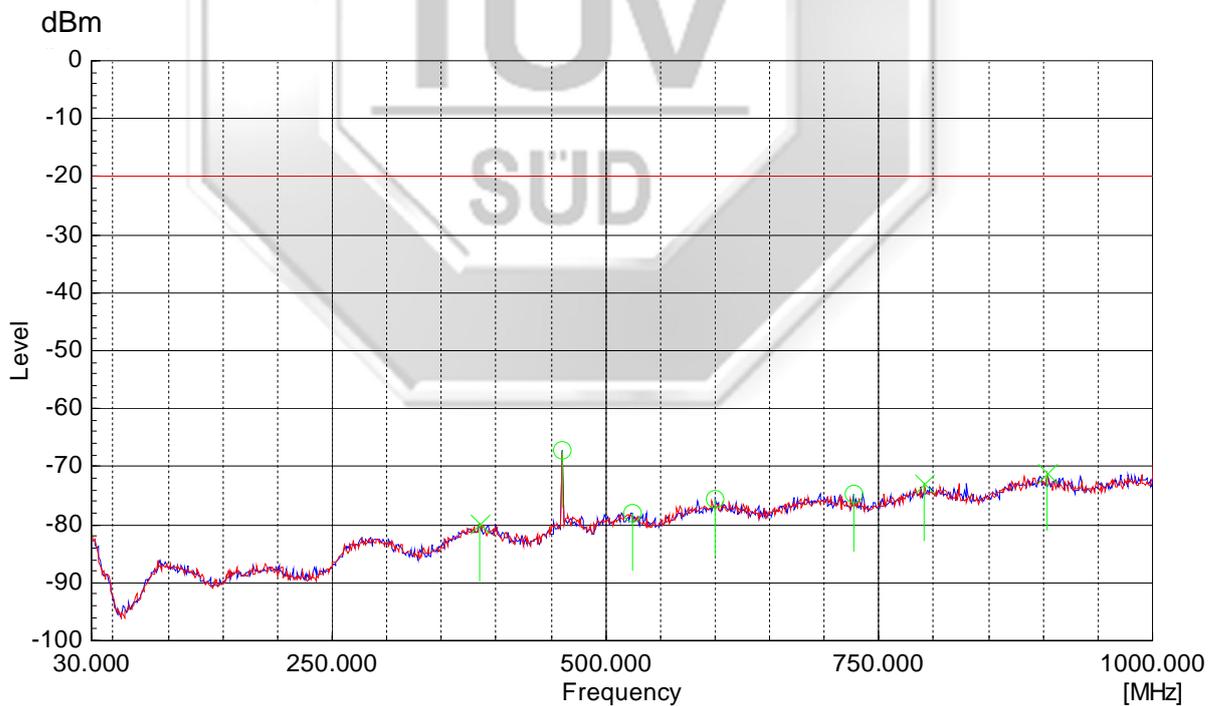
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
384.9810	-79.9	-20.0
523.9400	-78.0	-20.0
600.5320	-75.7	-20.0
726.3610	-74.6	-20.0
792.0110	-72.8	-20.0
903.6160	-71.2	-20.0



**459.125MHz (Digital) 30MHz – 1GHz**



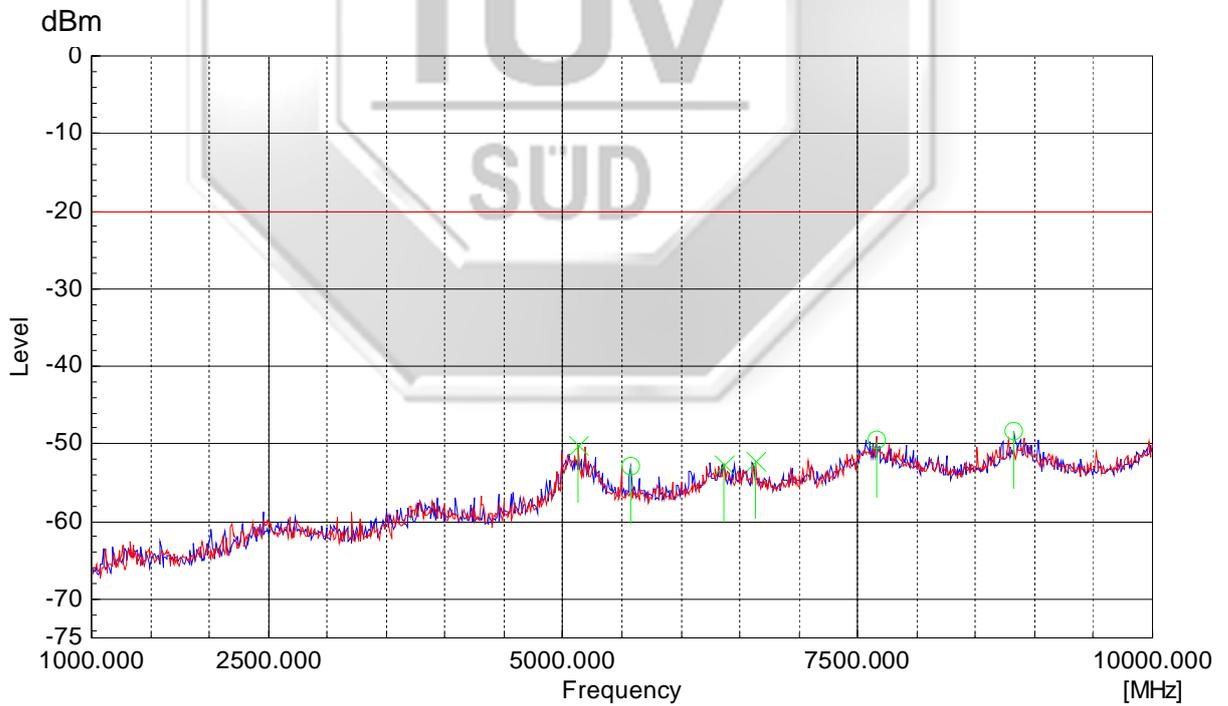
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
5130.9000	-50.2	-20.0
5575.3000	-52.8	-20.0
6363.1000	-52.6	-20.0
6635.8000	-52.1	-20.0
7655.9000	-49.5	-20.0
8827.5000	-48.4	-20.0



**459.125MHz (Digital) 1GHz – 10GHz**



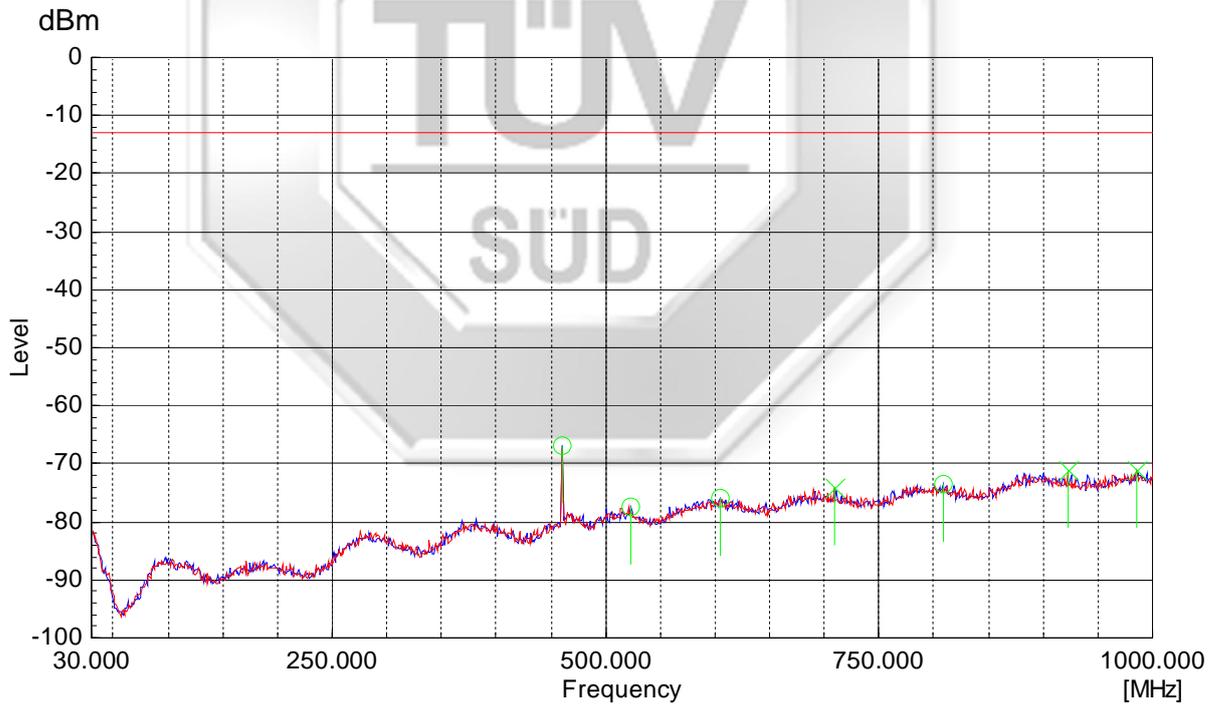
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
522.8460	-77.3	-13.0
604.9080	-75.8	-13.0
708.8540	-74.0	-13.0
808.4230	-73.5	-13.0
922.2170	-71.0	-13.0
985.6780	-71.1	-13.0



**459.125MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



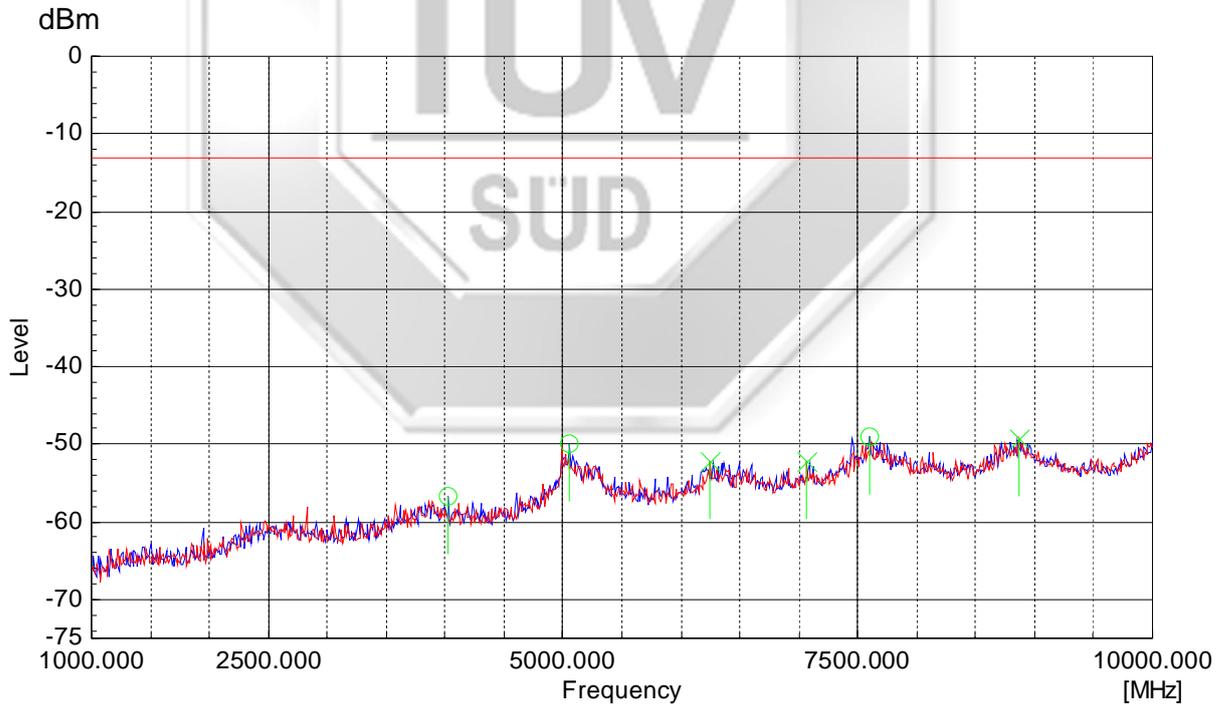
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**459.125MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4030.0000	-56.8	-13.0
5060.2000	-50.0	-13.0
6252.0000	-52.3	-13.0
7070.1000	-52.1	-13.0
7595.3000	-49.0	-13.0
8867.9000	-49.3	-13.0



**459.125MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



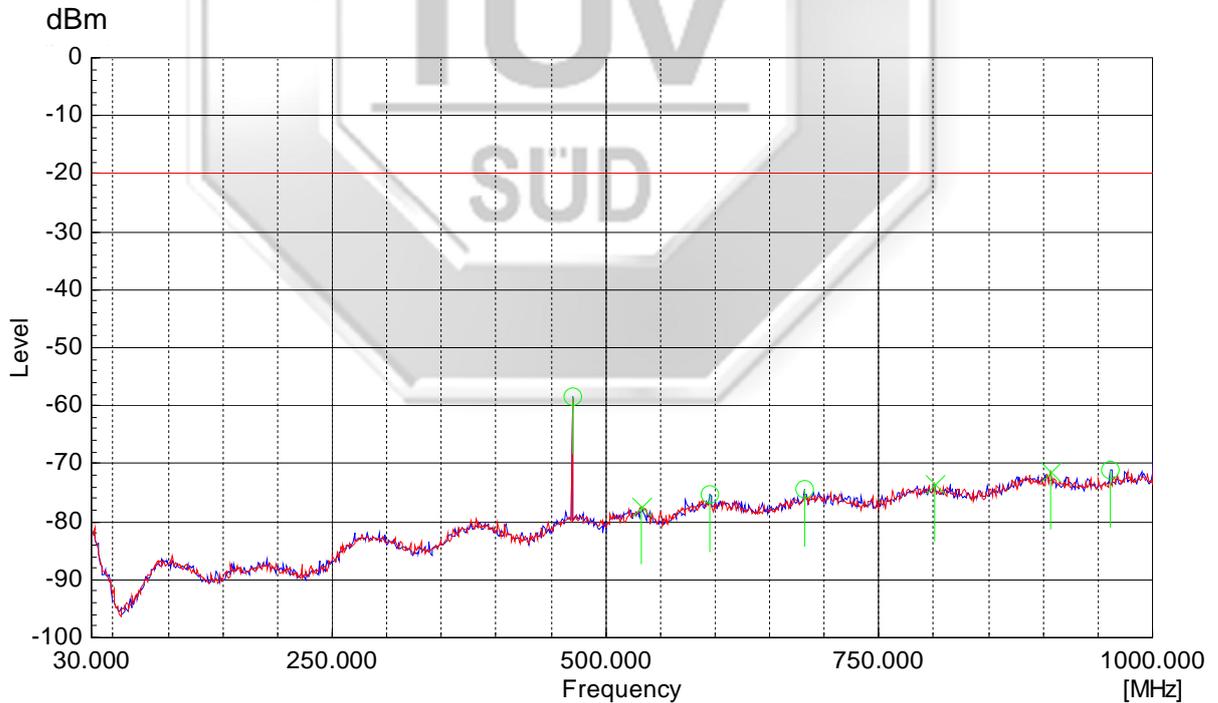
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
532.6930	-77.3	-20.0
595.0610	-75.4	-20.0
681.5000	-74.3	-20.0
800.7640	-73.4	-20.0
906.8980	-71.4	-20.0
961.6070	-71.1	-20.0



**467.775MHz (Digital) 30MHz – 1GHz**



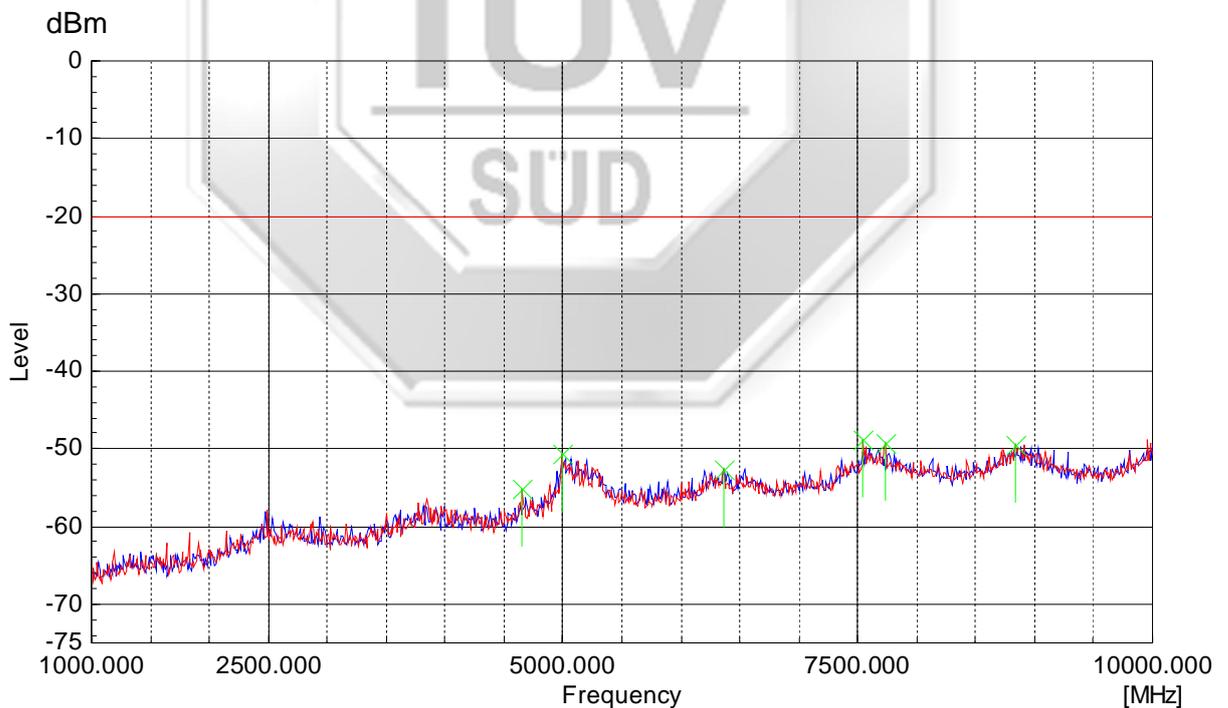
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4656.2000	-55.1	-20.0
4989.5000	-50.7	-20.0
6363.1000	-52.6	-20.0
7544.8000	-48.9	-20.0
7736.7000	-49.3	-20.0
8837.6000	-49.5	-20.0



**467.775MHz (Digital) 1GHz - 10GHz**



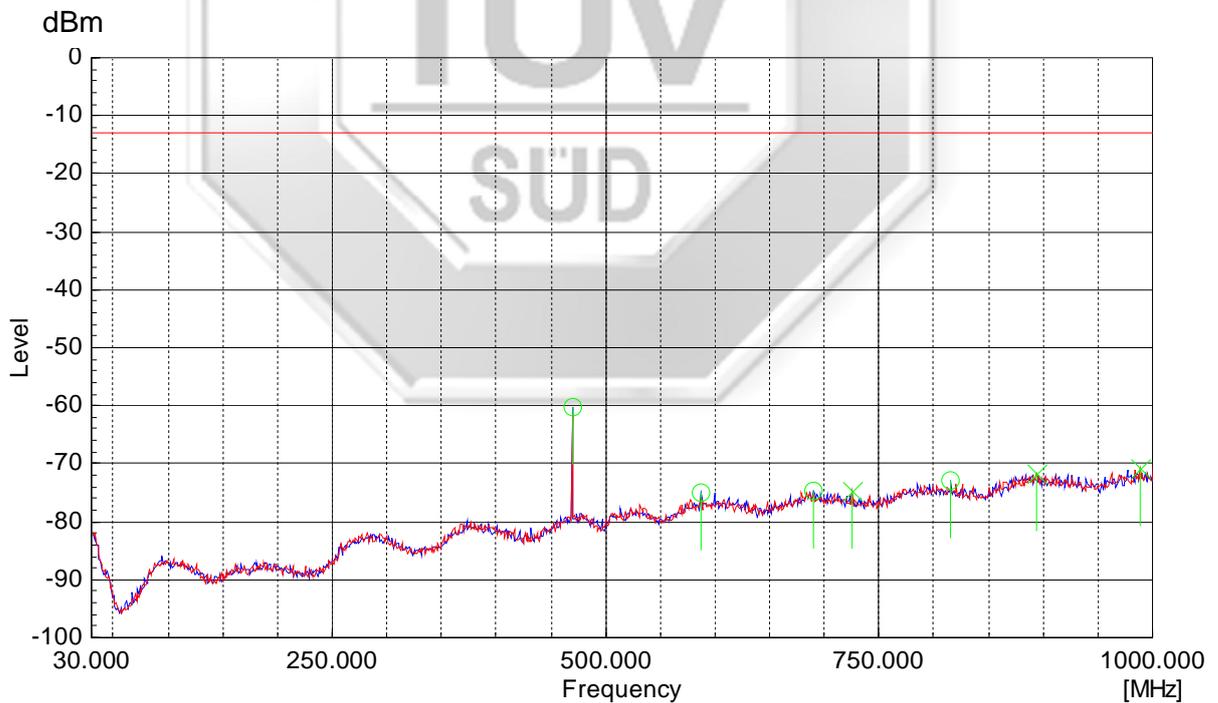
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
587.4020	-74.9	-13.0
690.2530	-74.8	-13.0
725.2670	-74.7	-13.0
816.0830	-73.0	-13.0
893.7680	-71.8	-13.0
988.9610	-70.8	-13.0



**467.775MHz (Analog 30MHz – 1GHz)**

\*Not Applicable for FCC Part 90.



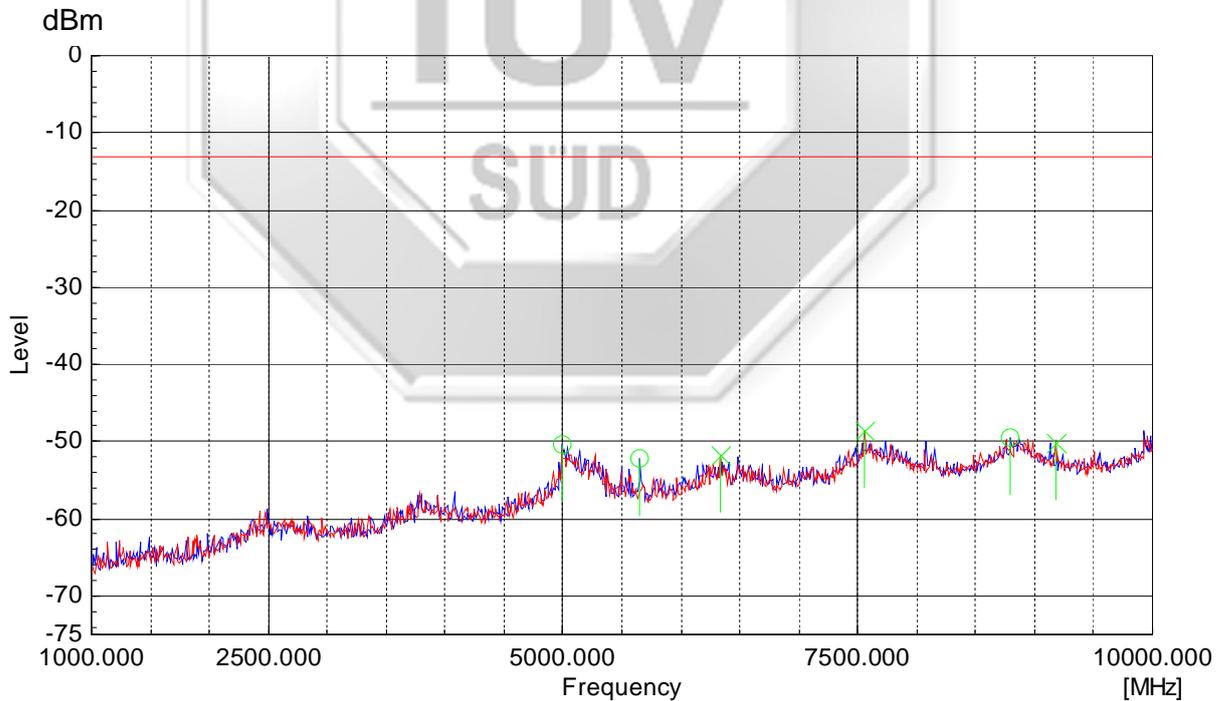
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-50.5	-13.0
5656.1000	-52.2	-13.0
6332.8000	-51.7	-13.0
7554.9000	-48.7	-13.0
8797.2000	-49.4	-13.0
9181.0000	-50.2	-13.0



**467.775MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



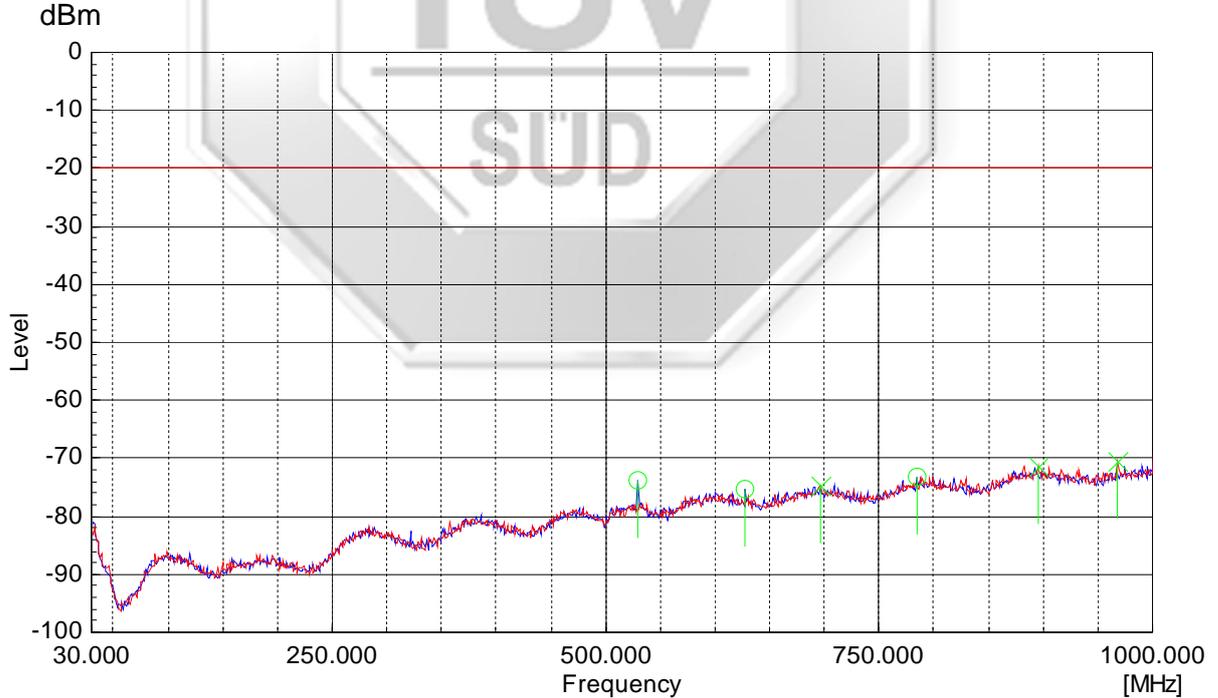
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
529.4110	-73.9	-20.0
627.8860	-75.3	-20.0
695.7240	-74.8	-20.0
784.3520	-73.1	-20.0
894.8630	-71.3	-20.0
968.1720	-70.5	-20.0



**467.775MHz (Digital) 30MHz – 1GHz**



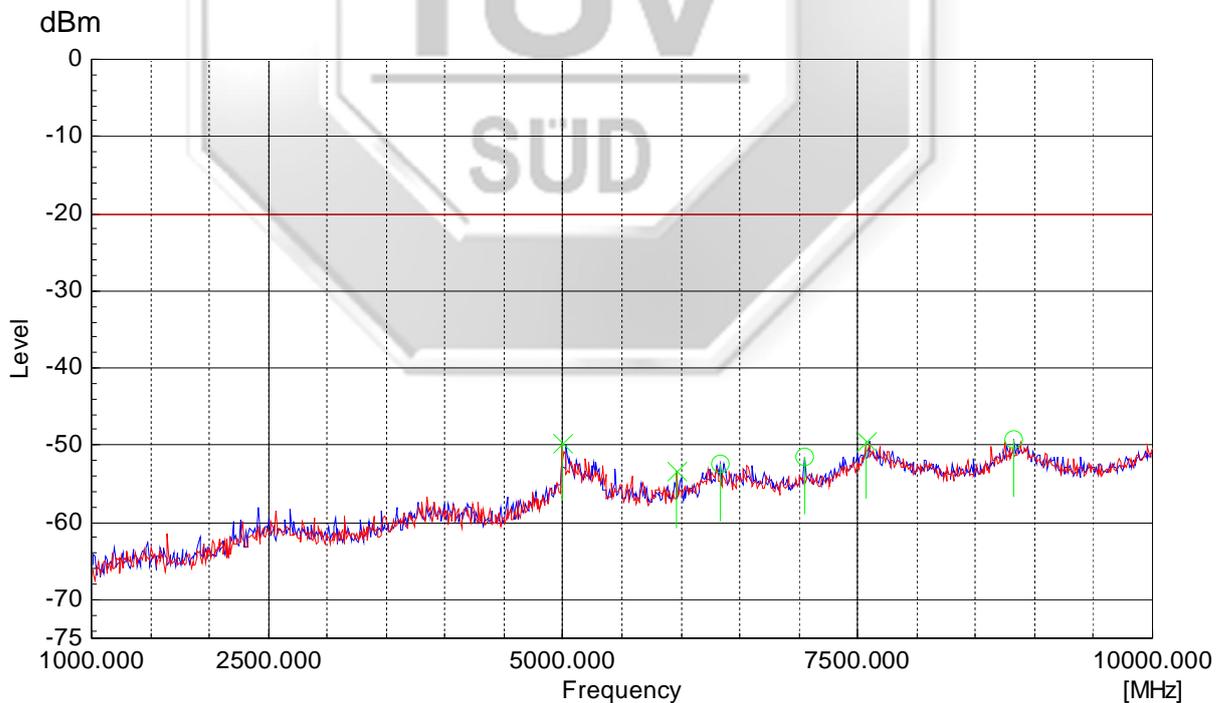
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-49.7	-20.0
5969.2000	-53.4	-20.0
6332.8000	-52.3	-20.0
7049.9000	-51.4	-20.0
7565.0000	-49.5	-20.0
8827.5000	-49.3	-20.0



**467.775MHz (Digital) 1GHz – 10GHz**



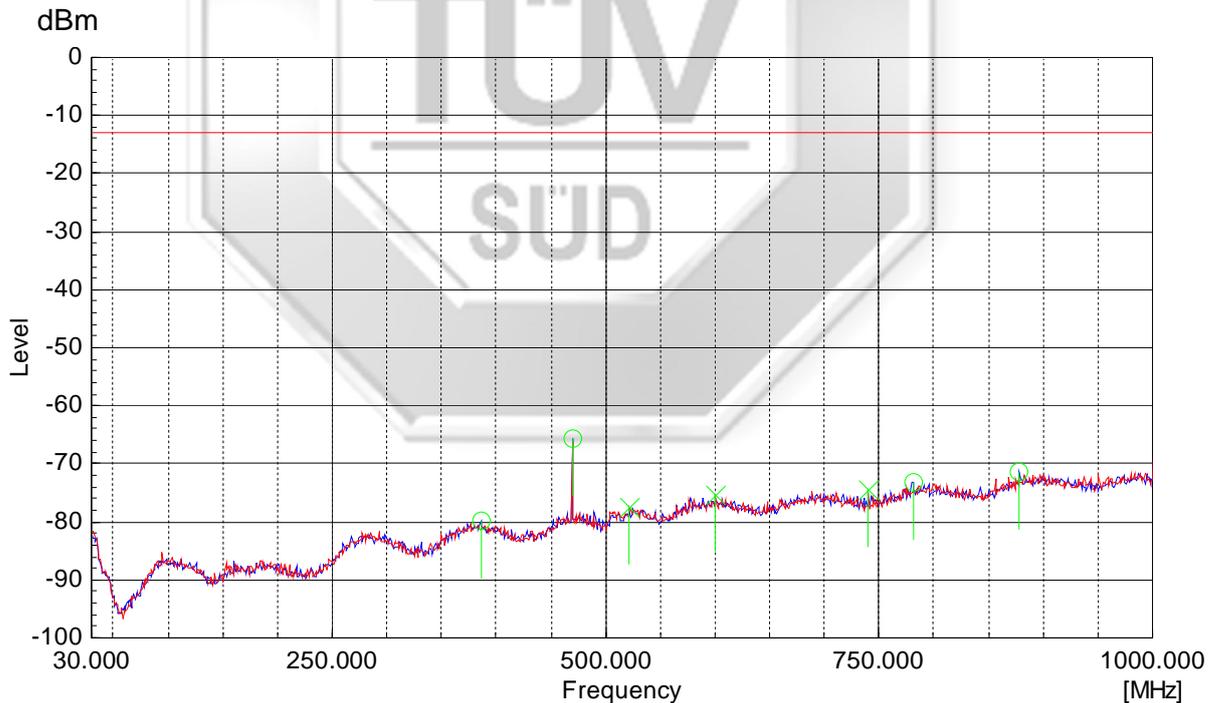
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
386.0750	-79.8	-13.0
521.7520	-77.4	-13.0
600.5320	-75.4	-13.0
740.5850	-74.4	-13.0
781.0690	-73.1	-13.0
878.4500	-71.3	-13.0



**467.775MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.



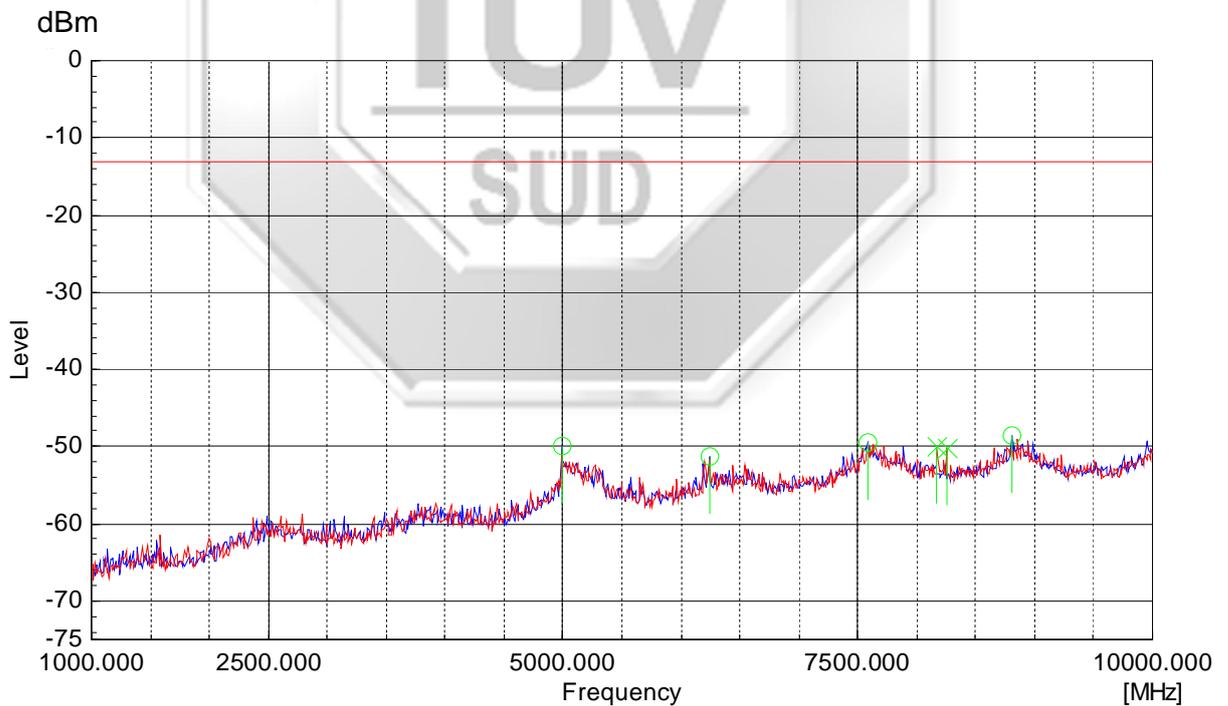
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**467.775MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-49.9	-13.0
6241.9000	-51.3	-13.0
7585.2000	-49.5	-13.0
8171.0000	-49.8	-13.0
8251.8000	-50.2	-13.0
8807.3000	-48.6	-13.0



**467.775MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.



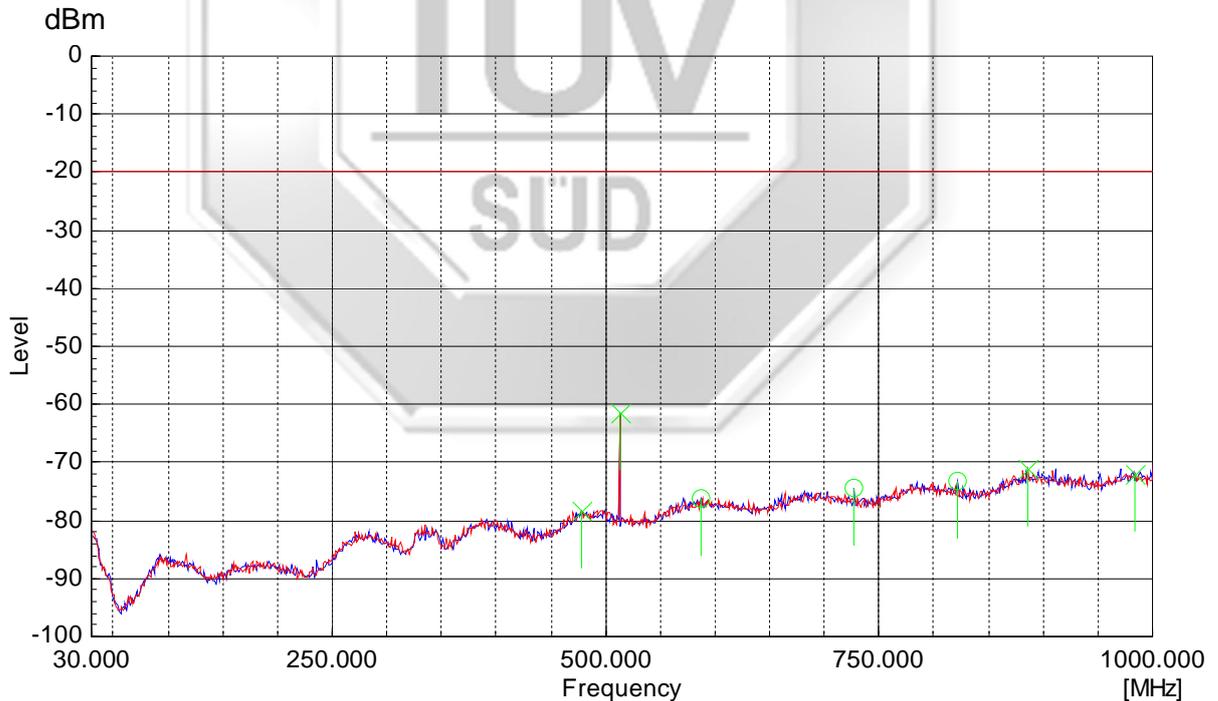
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
477.9850	-78.2	-20.0
587.4020	-76.2	-20.0
727.4550	-74.5	-20.0
821.5530	-73.3	-20.0
886.1090	-71.0	-20.0
984.5840	-71.9	-20.0



**511.9875MHz (Digital) 30MHz - 1GHz**

\*Not Applicable to IC Canada.



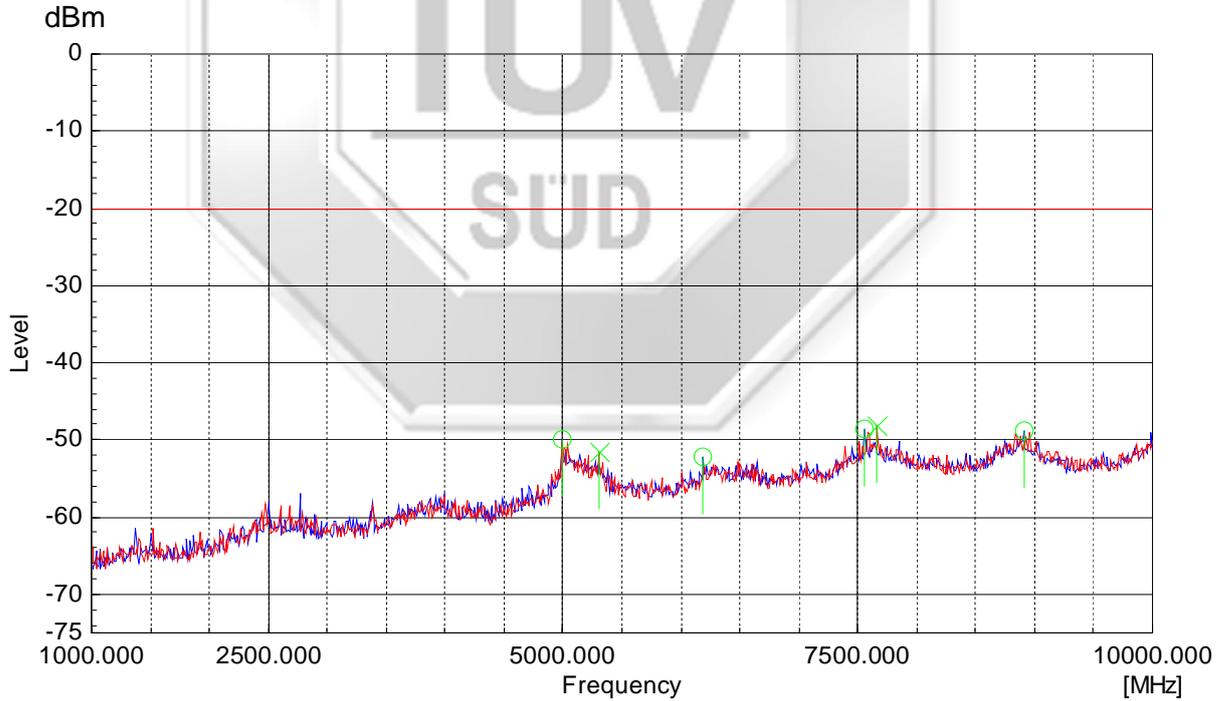
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-49.9	-20.0
5302.6000	-51.6	-20.0
6191.4000	-52.3	-20.0
7554.9000	-48.6	-20.0
7666.0000	-48.0	-20.0
8908.3000	-48.7	-20.0



**511.9875MHz (Digital) 1GHz – 10GHz**

\*Not Applicable to IC Canada.



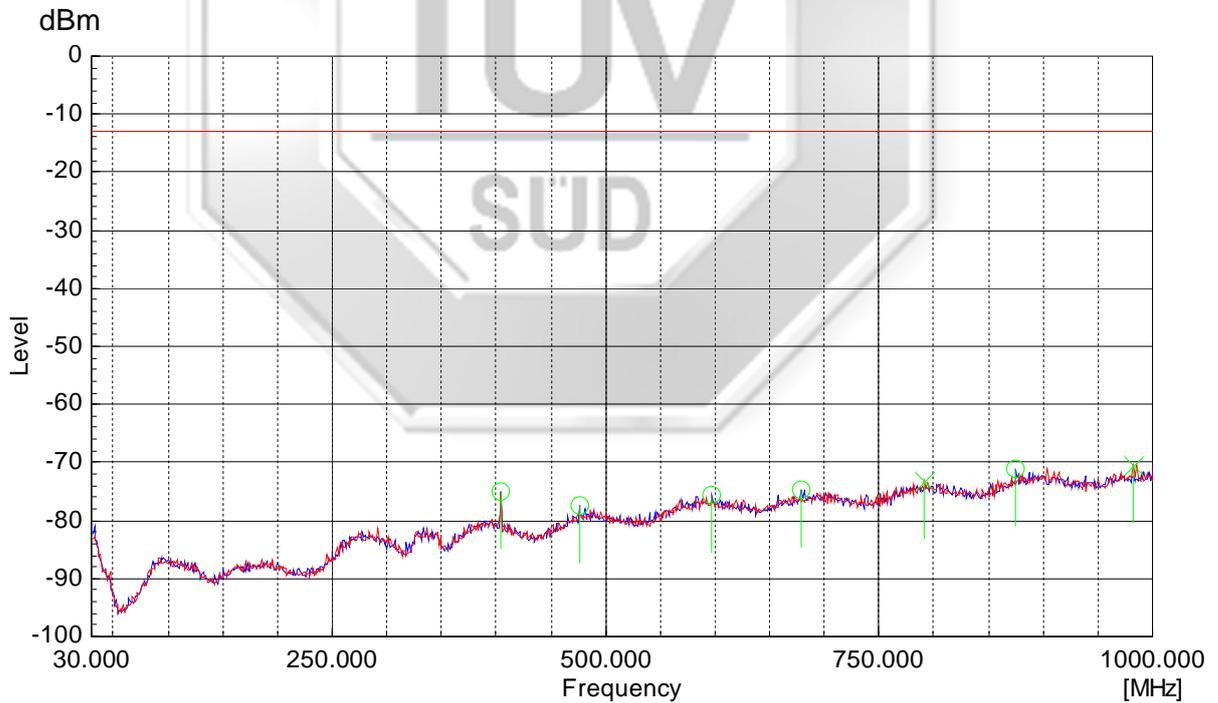
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
404.6760	-75.1	-13.0
597.2490	-75.6	-13.0
679.3120	-74.6	-13.0
792.0110	-73.2	-13.0
875.1680	-71.2	-13.0
982.3960	-70.5	-13.0



**511.9875MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



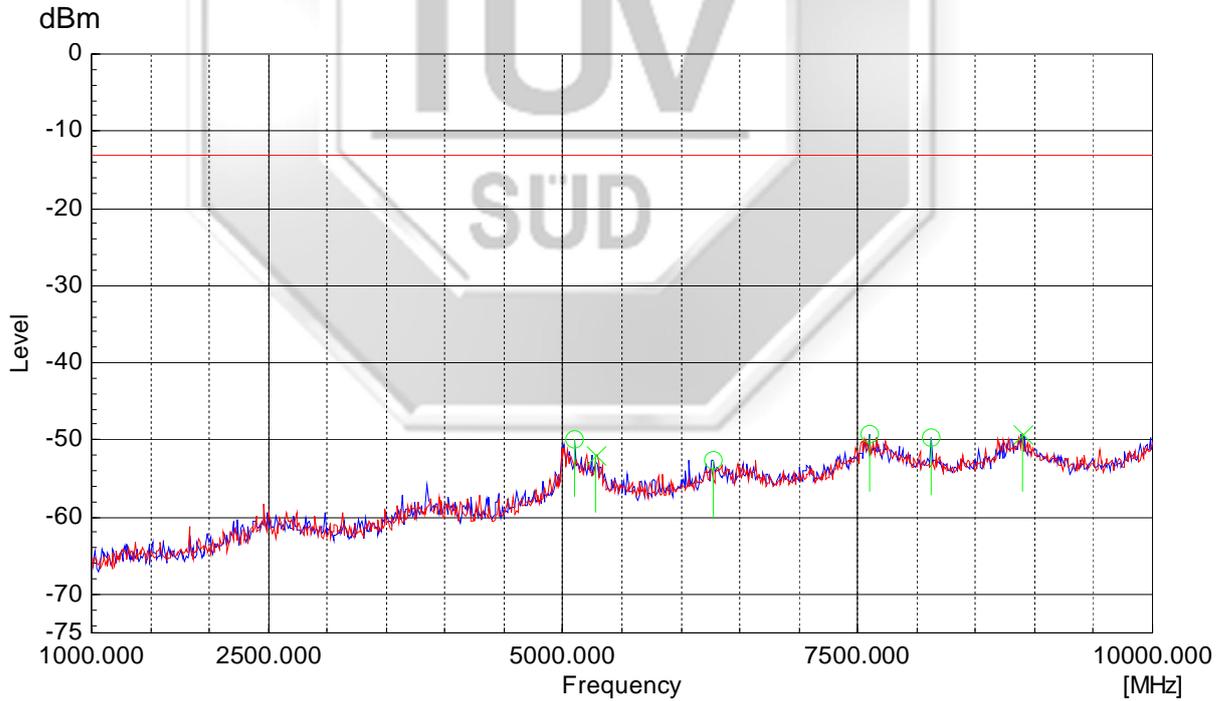
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
5100.6000	-50.0	-13.0
5282.4000	-52.1	-13.0
6272.2000	-52.6	-13.0
7595.3000	-49.2	-13.0
8120.5000	-49.8	-13.0
8898.2000	-49.3	-13.0



**511.9875MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



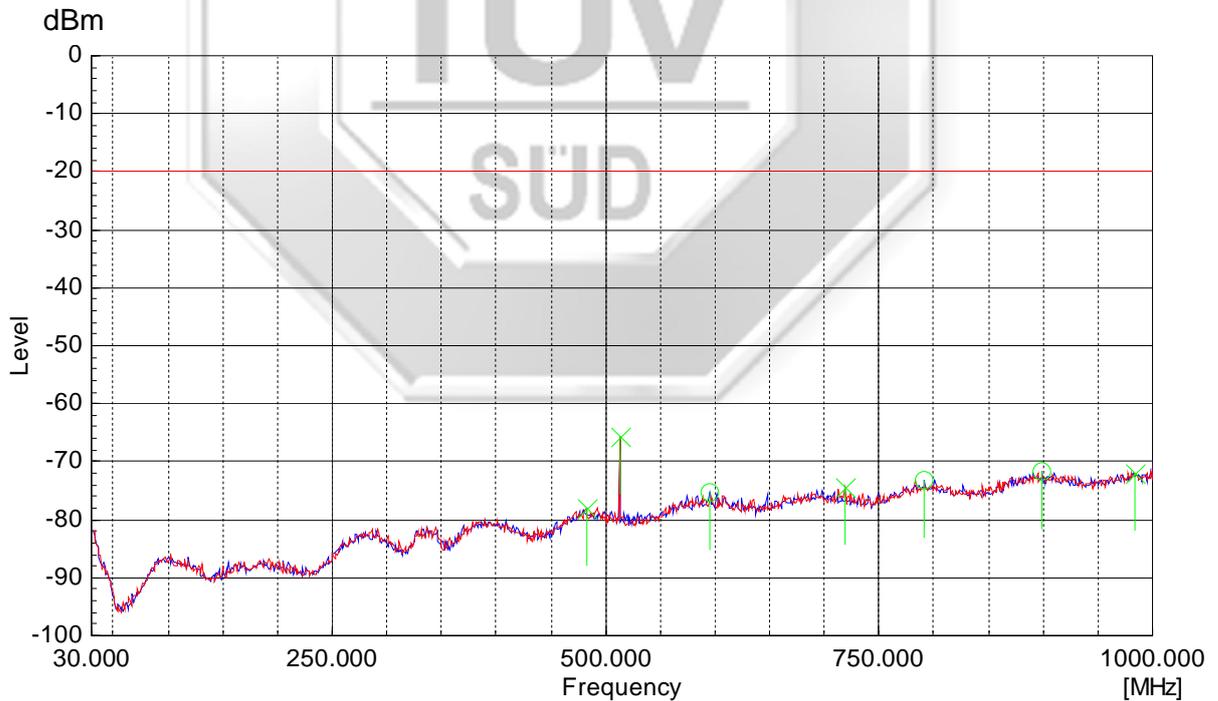
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
482.3620	-78.0	-20.0
595.0610	-75.4	-20.0
718.7020	-74.4	-20.0
792.0110	-73.2	-20.0
899.2390	-71.7	-20.0
984.5840	-71.9	-20.0



**511.9875MHz (Digital) 30MHz – 1GHz**

\*Not Applicable to IC Canada.



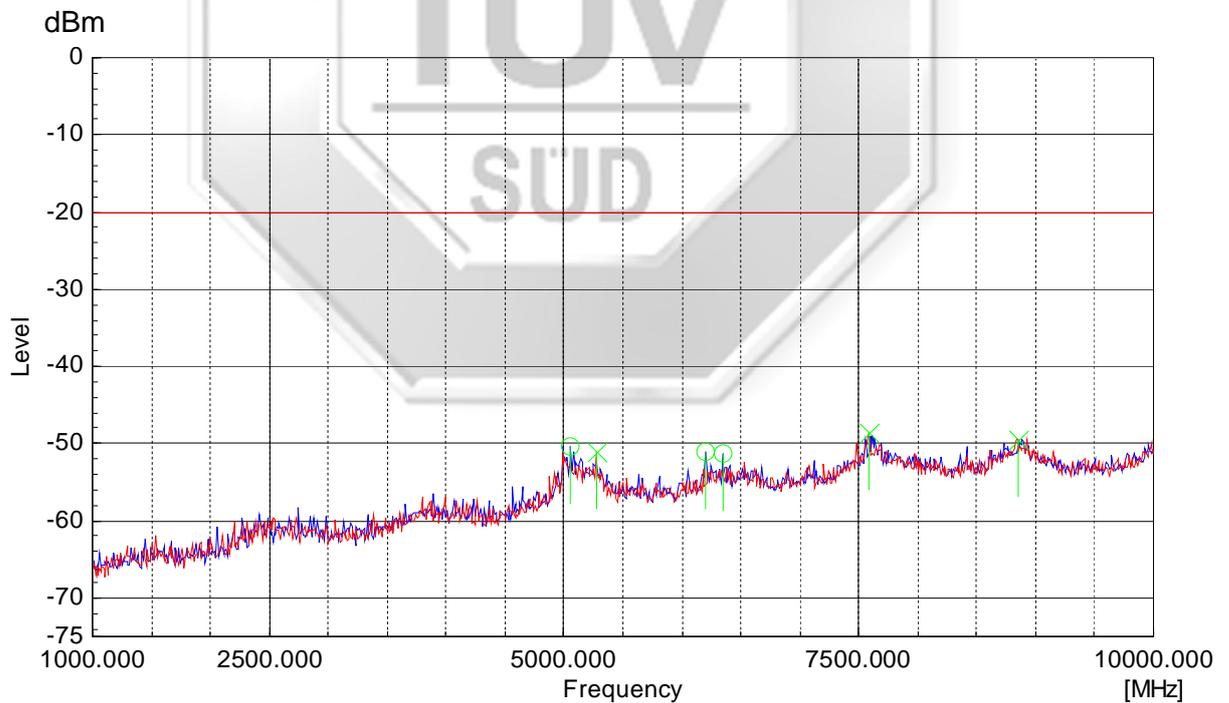
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Low Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
5060.2000	-50.3	-20.0
5272.3000	-51.0	-20.0
6201.5000	-51.1	-20.0
6342.9000	-51.3	-20.0
7585.2000	-48.7	-20.0
8847.7000	-49.4	-20.0



**511.9875MHz (Digital) 1GHz – 10GHz**

\*Not Applicable to IC Canada.



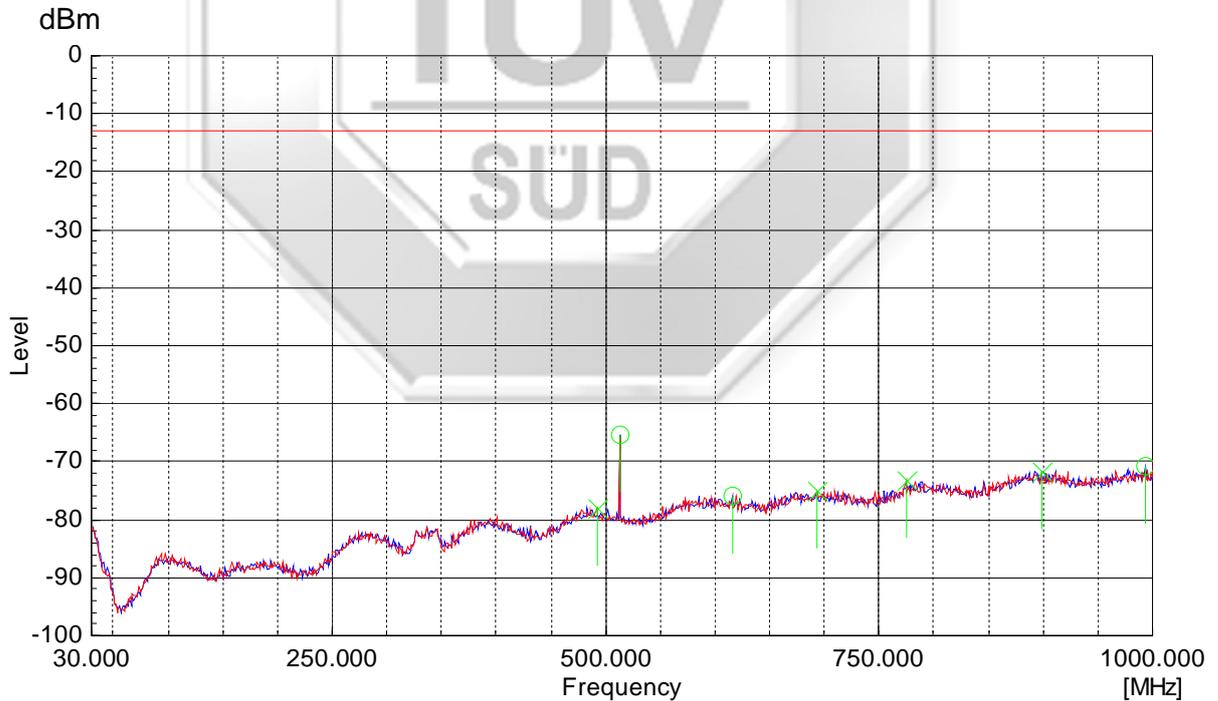
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
492.2090	-78.0	-13.0
615.8500	-75.8	-13.0
693.5360	-74.9	-13.0
774.5040	-73.3	-13.0
898.1450	-71.6	-13.0
993.3380	-70.7	-13.0



**511.9875MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



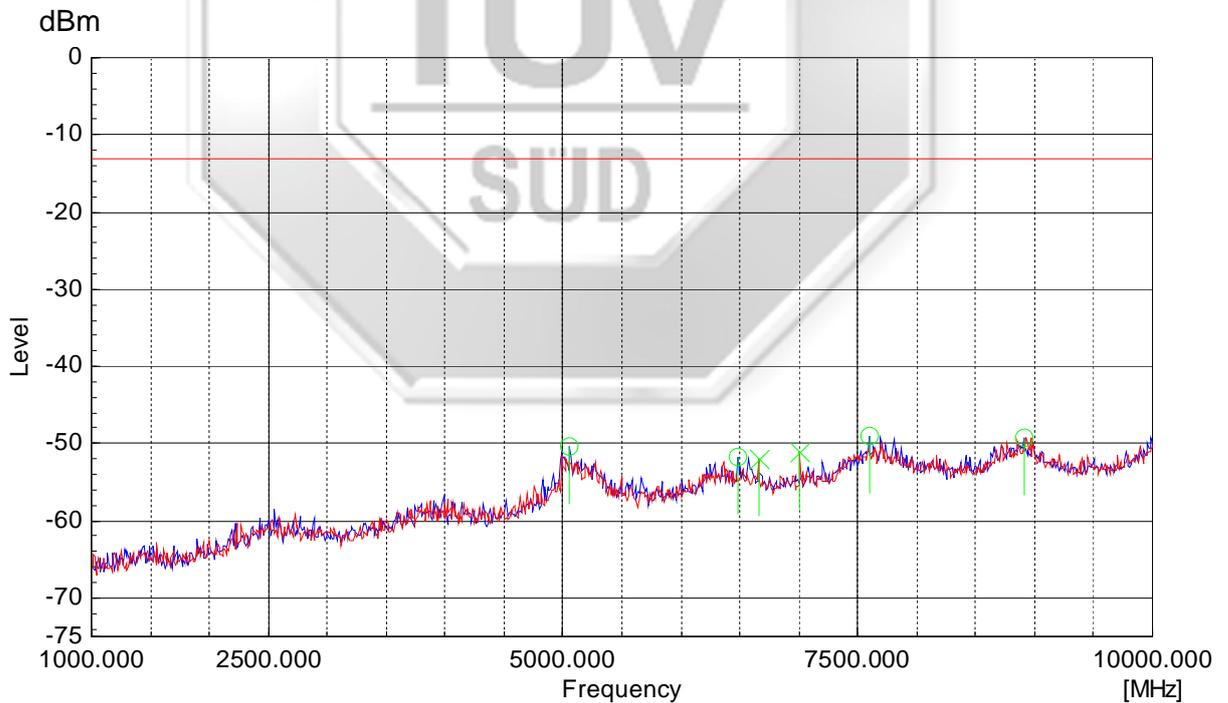
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Low Power	Tested By	Lim Kay Tak

**511.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
5060.2000	-50.3	-13.0
6484.3000	-51.7	-13.0
6656.0000	-51.9	-13.0
7009.5000	-51.1	-13.0
7595.3000	-49.0	-13.0
8908.3000	-49.2	-13.0



**511.9875MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



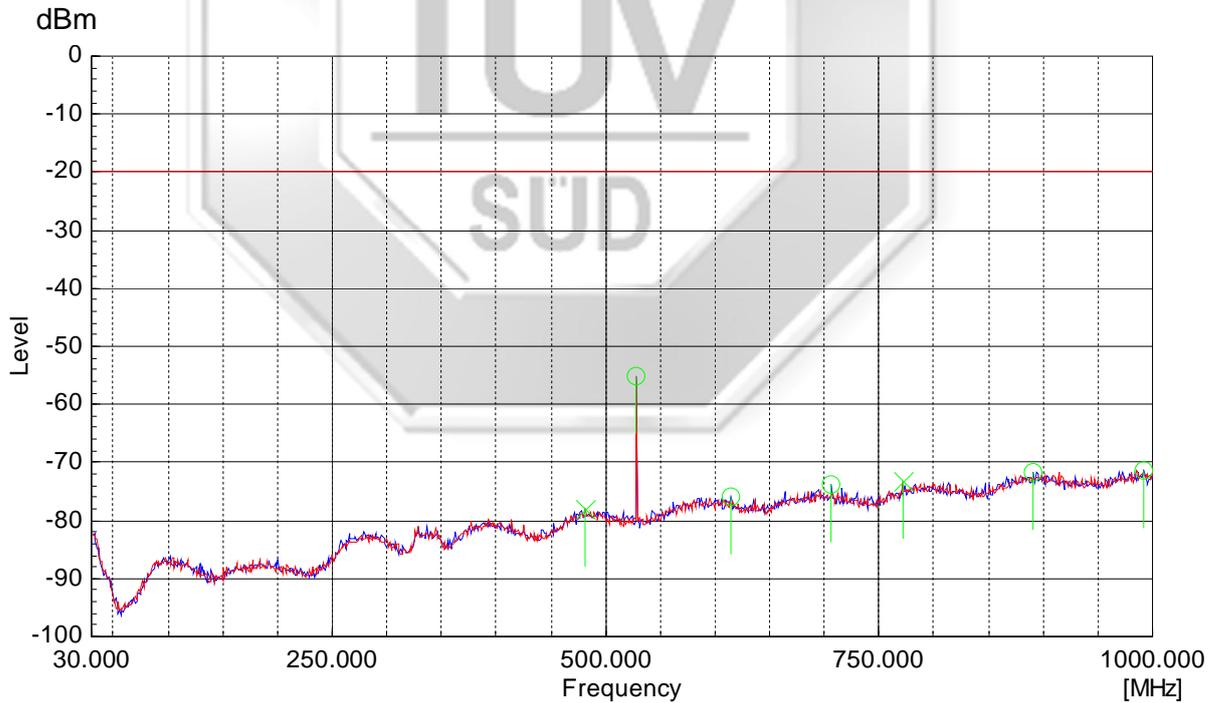
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**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**526.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
481.2680	-78.0	-20.0
614.7560	-75.9	-20.0
706.6660	-73.9	-20.0
771.2220	-73.3	-20.0
891.5800	-71.6	-20.0
992.2430	-71.4	-20.0



**526.9875MHz (Digital) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



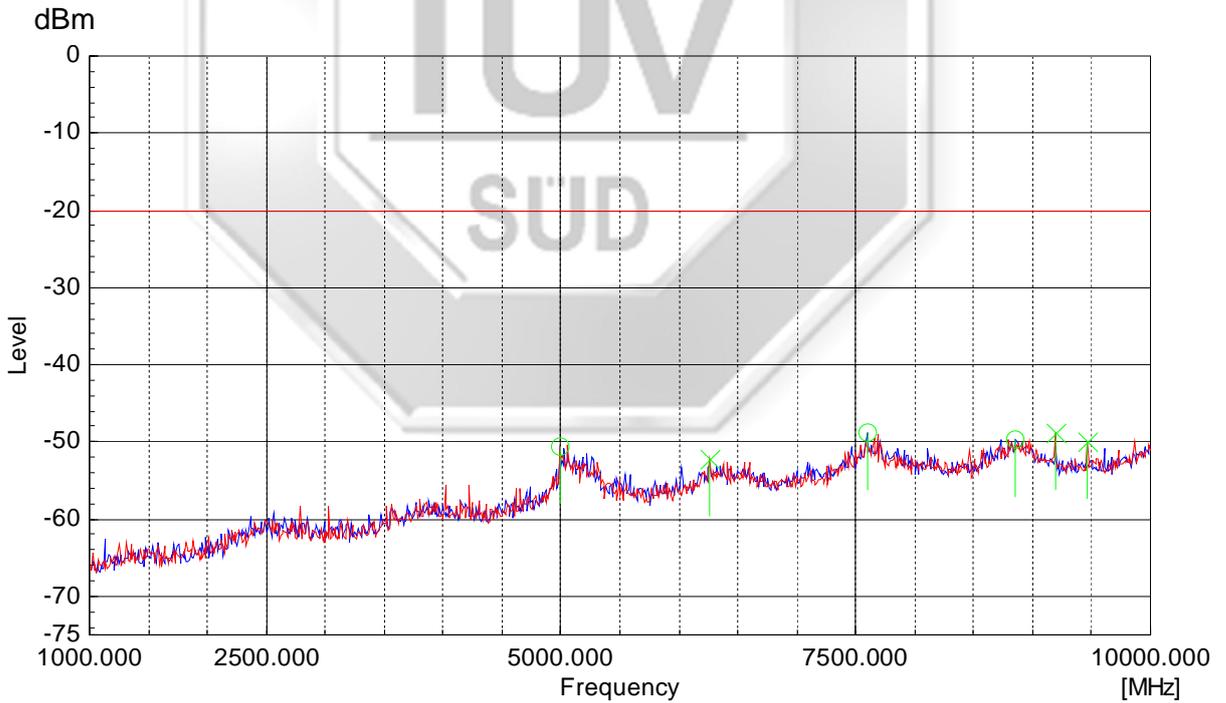
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Digital 12.5kHz Max Power	Tested By	Lim Kay Tak

**526.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
4989.5000	-50.5	-20.0
6262.1000	-52.3	-20.0
7595.3000	-48.9	-20.0
8857.8000	-49.6	-20.0
9191.1000	-48.9	-20.0
9463.8000	-50.0	-20.0



**526.9875MHz (Digital) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



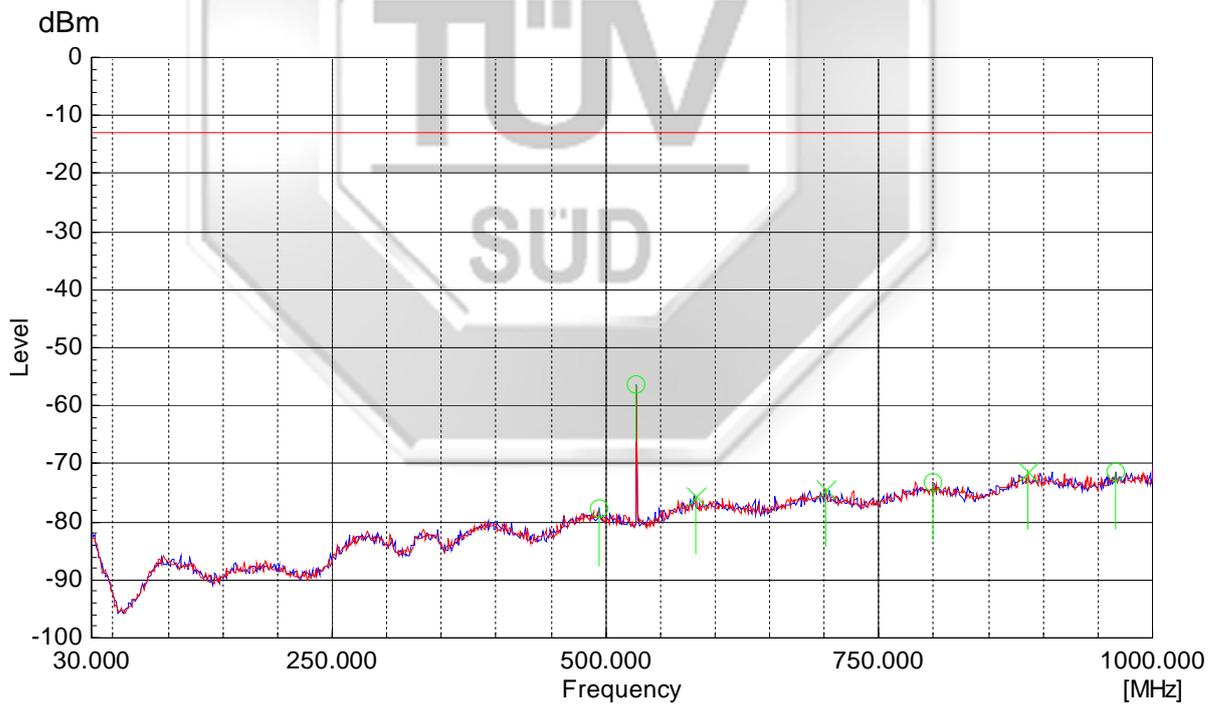
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**526.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
494.3980	-77.6	-13.0
583.0250	-75.5	-13.0
701.1950	-74.5	-13.0
799.6700	-73.2	-13.0
886.1090	-71.5	-13.0
967.0780	-71.5	-13.0



**526.9875MHz (Analog) 30MHz – 1GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



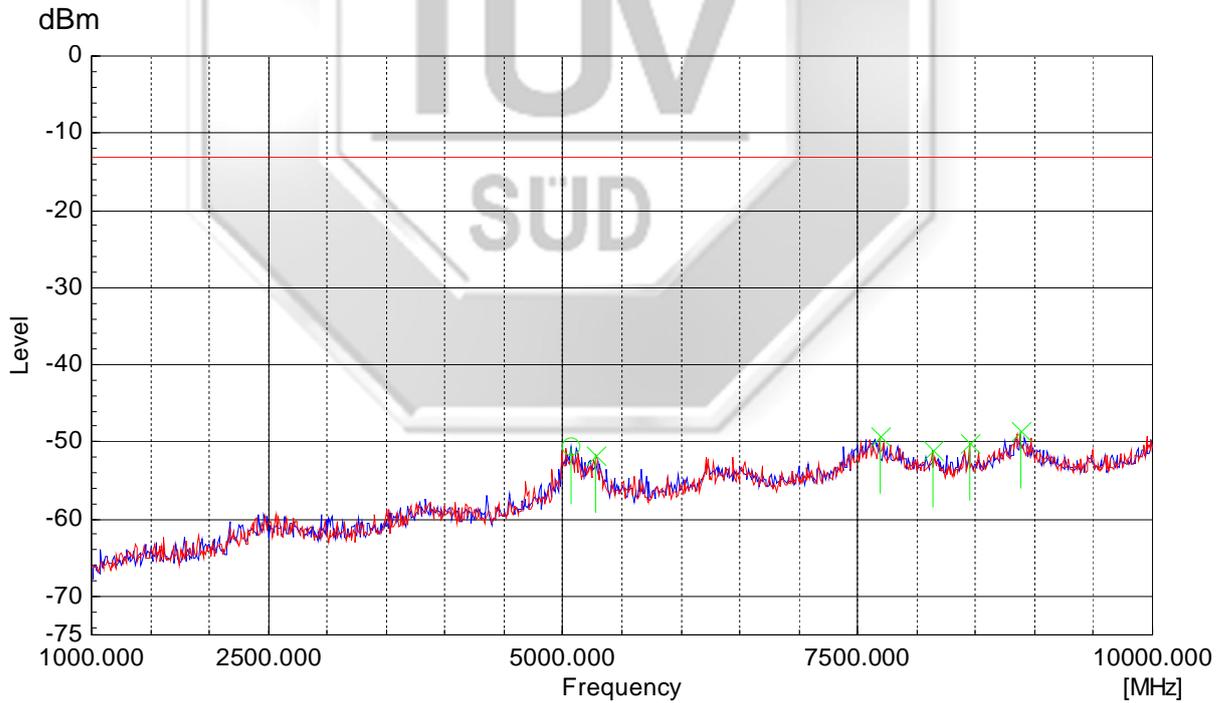
**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

**47 CFR FCC Parts 22, 74, 80, 90 and RSS-119 Radiated Transmitter Unwanted Emission Results**

Operating Mode	Transmit	Temperature	26°C
Test Input Power	7.4Vdc	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Modulation	Analog 25kHz Max Power	Tested By	Lim Kay Tak

**526.9875MHz**

Frequency (MHz)	Amplitude (dBm)	Limit (dBm)
5070.3000	-50.6	-13.0
5282.4000	-51.8	-13.0
7686.2000	-49.2	-13.0
8130.6000	-51.0	-13.0
8443.7000	-50.2	-13.0
8878.0000	-48.5	-13.0



**526.9875MHz (Analog) 1GHz – 10GHz**

\*Not Applicable for FCC Part 90.

\*Not Applicable to IC Canada.



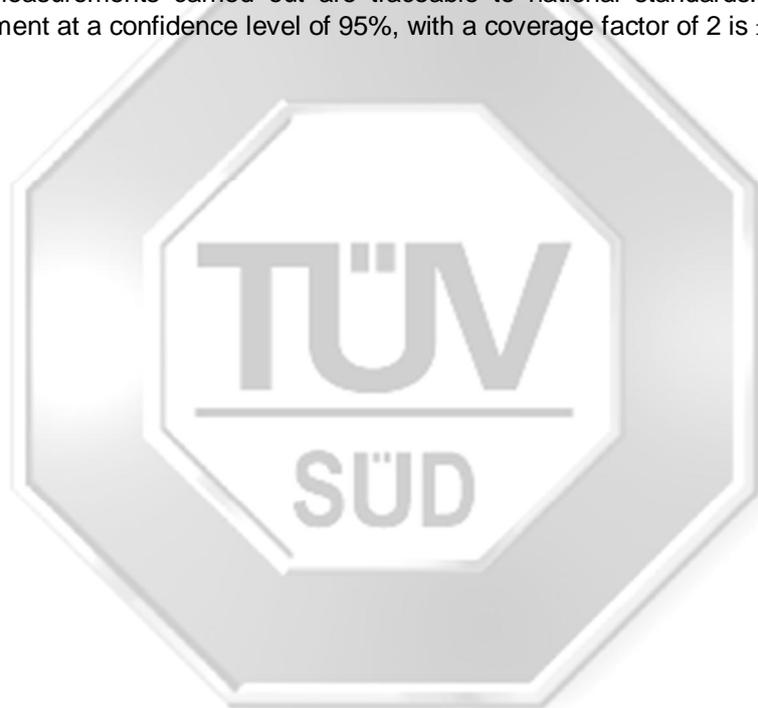
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**RADIATED TRANSMITTER UNWANTED EMISSION TEST**

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Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured were reported. All other emissions were relatively insignificant.
2. The transmitting antenna was found to be in the worst case condition when it was orientated in a vertical position.
3. A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative" margin indicates a FAIL.
4. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
>1GHz  
RBW: 1MHz                      VBW: 3MHz
5. Radiated Transmitter Unwanted Emissions Test Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of 95%, with a coverage factor of 2 is  $\pm 4.0\text{dB}$ .

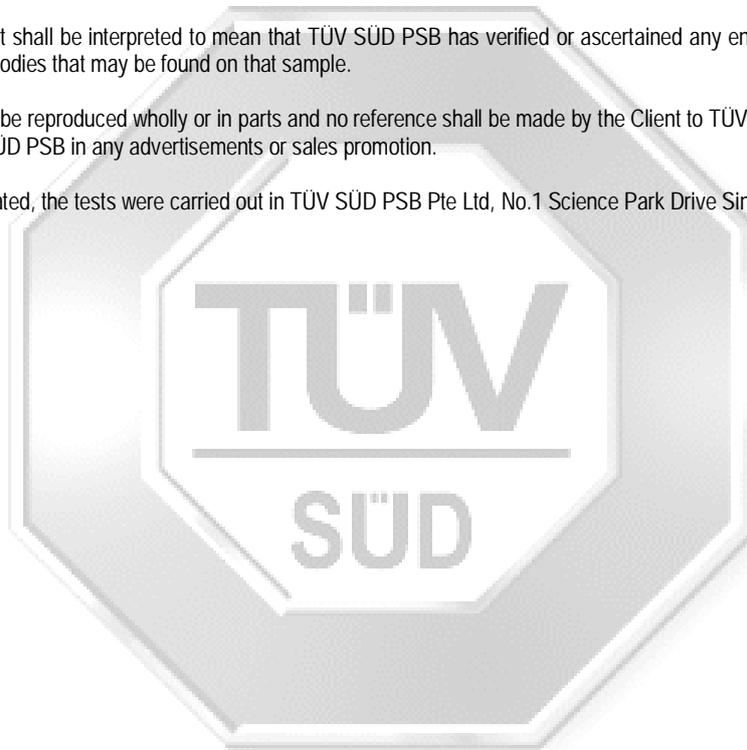




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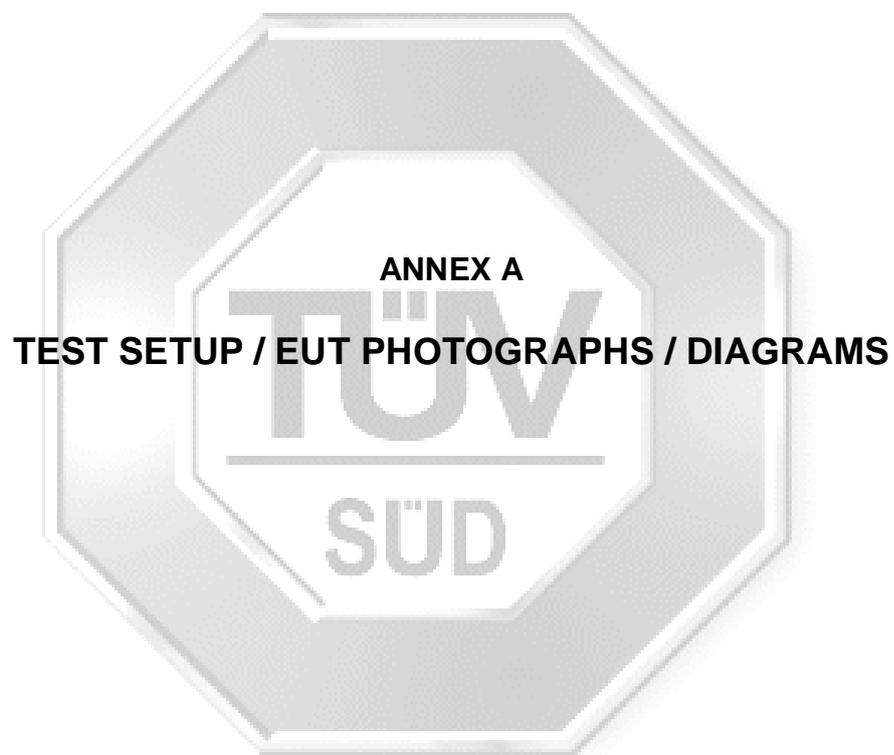
July 2011





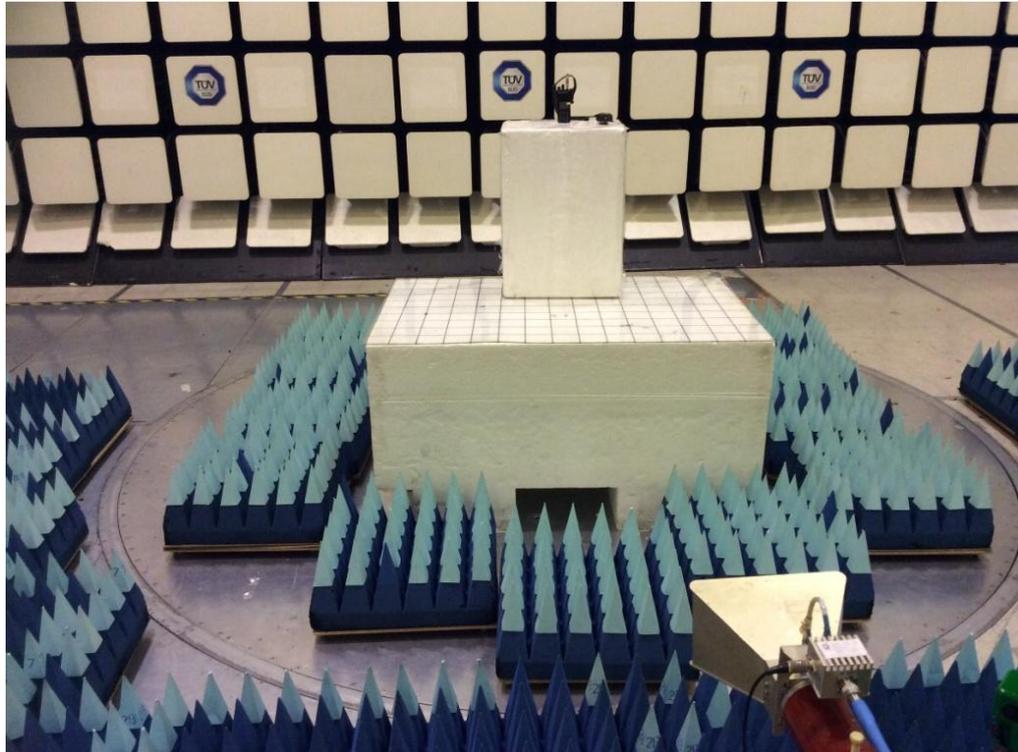
**ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS**

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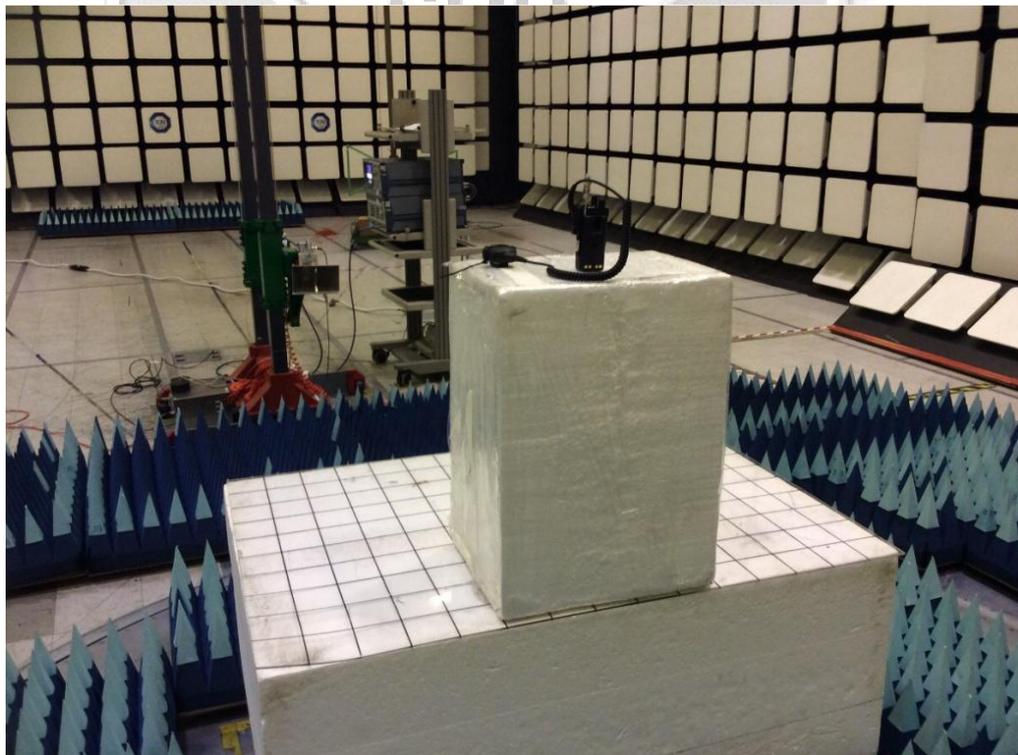


**ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS**

**TEST SETUP (ANSI C63.26)**



**Transmitter Spurious Emissions (Radiated) Test Setup (Front View)**



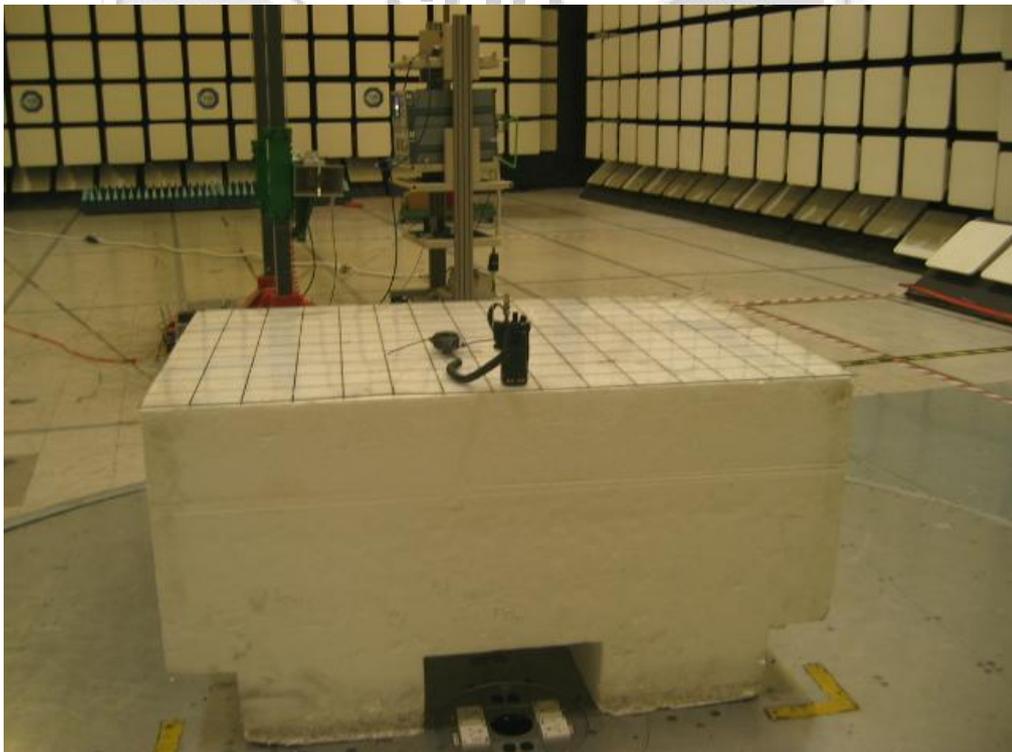
**Transmitter Spurious Emissions (Radiated) Test Setup (Rear View)**

**ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS**

**TEST SETUP (TIA-603-D: 2010)**



**Transmitter Spurious Emissions (Radiated) Test Setup (Front View)**



**Transmitter Spurious Emissions (Radiated) Test Setup (Rear View)**

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Front View

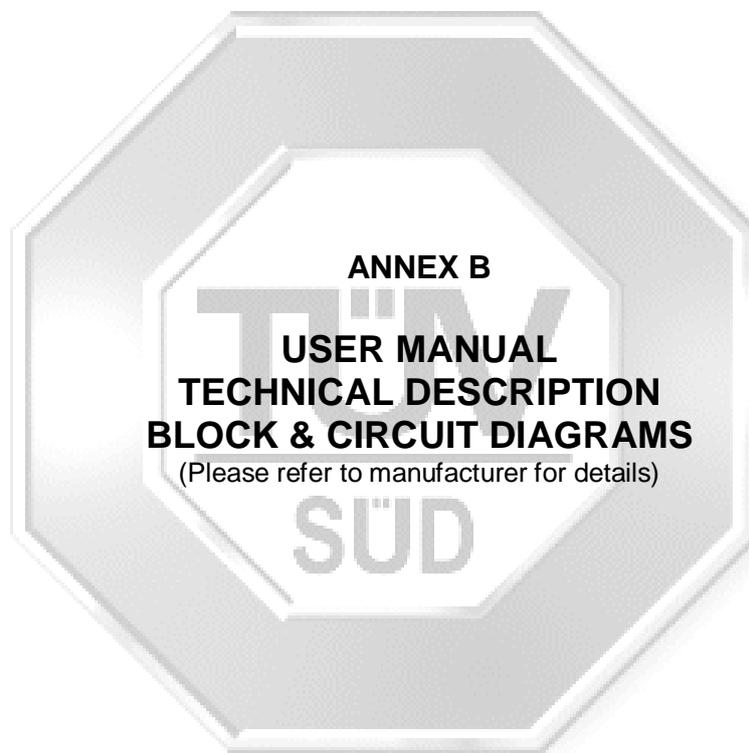


Rear View



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**ANNEX B USER MANUAL TECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS**





**ANNEX C FCC, IC LABELS & POSITIONS**

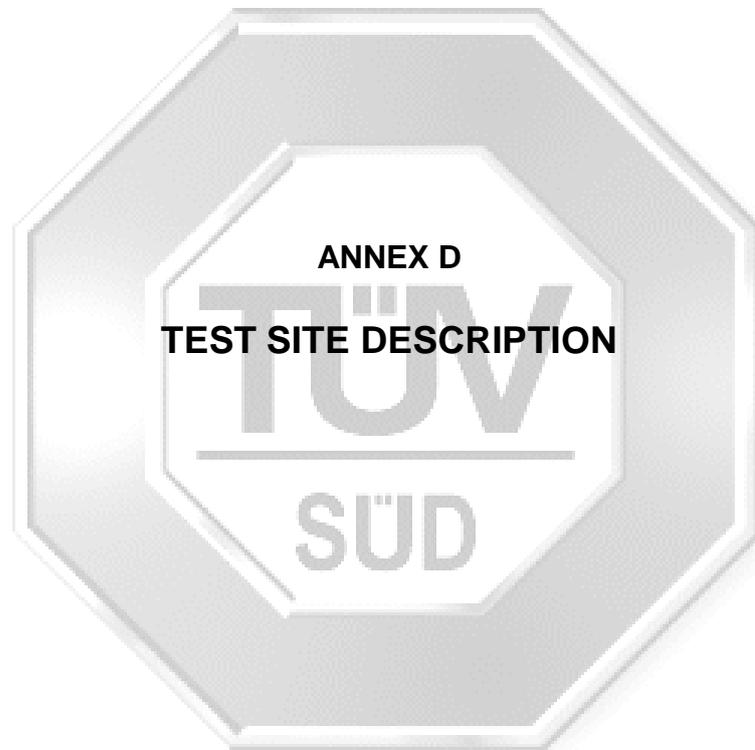
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**ANNEX D TEST SITE DESCRIPTION**



## ANNEX D TEST SITE DESCRIPTION

### Radiated Emission Test Site Description

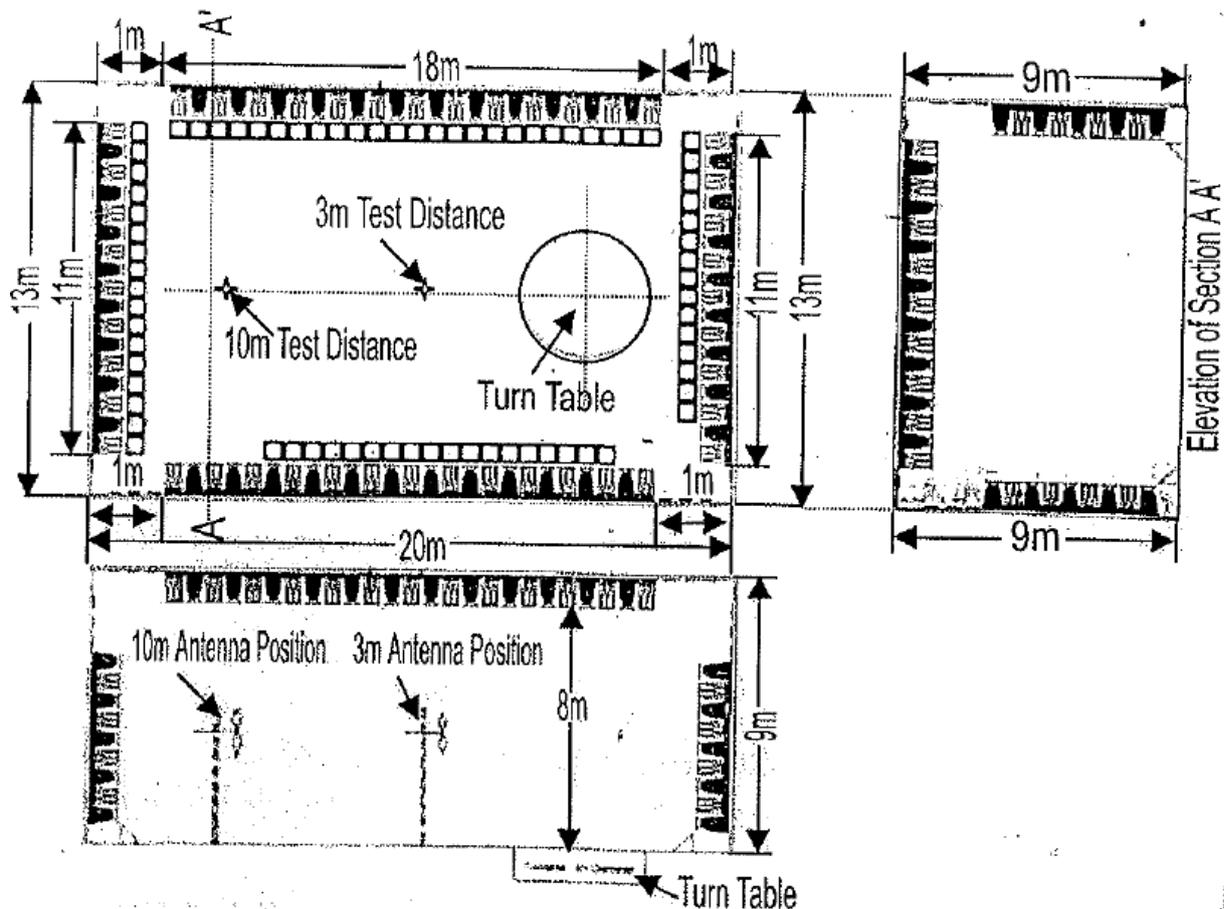
The Radiated Emission test facility consists of a RF-shielded enclosure (Model: 04" x 07") manufactured by Lindgren whose dimensions are shown below. The exterior of the chamber is made of rigid steel panels while the interior is covered with RF absorbing panels on the 4 walls and ceiling. The steel-clad ground plane is covered with vinyl flooring.

The turntable is mounted flush with the chamber floor and is driven by a pneumatic motor, which is capable of supporting 4,000 kg.

The boresight antenna mast is driven by a pneumatic motor with heights variation from 1m- 4m for both vertical and horizontal polarity and with tilt capability.

Both turntable and antenna mast in the chamber are controlled by the system controller stationed outside the chamber.

The physical layout of the chamber is show below:



**ANNEX D TEST SITE DESCRIPTION**

Conducted Emission Test Site Description

The Conducted Emission facility consists of an RF-shielded enclosure measuring 4.3m x 3.7m x 2.45m manufactured by Universal Shielding Corporation. The Conducted Emission data were taken using two LISNs.

The physical layout of the test site is show below:

