

Test Report No.10040507 001

Appendix D: Radiated Spurious Emission Data

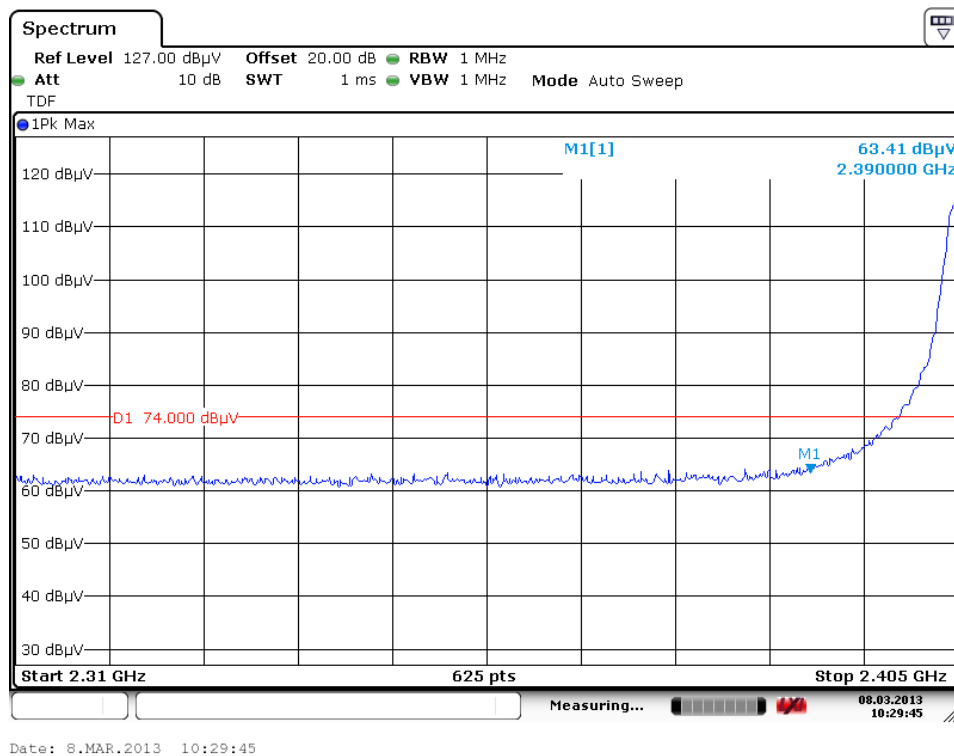
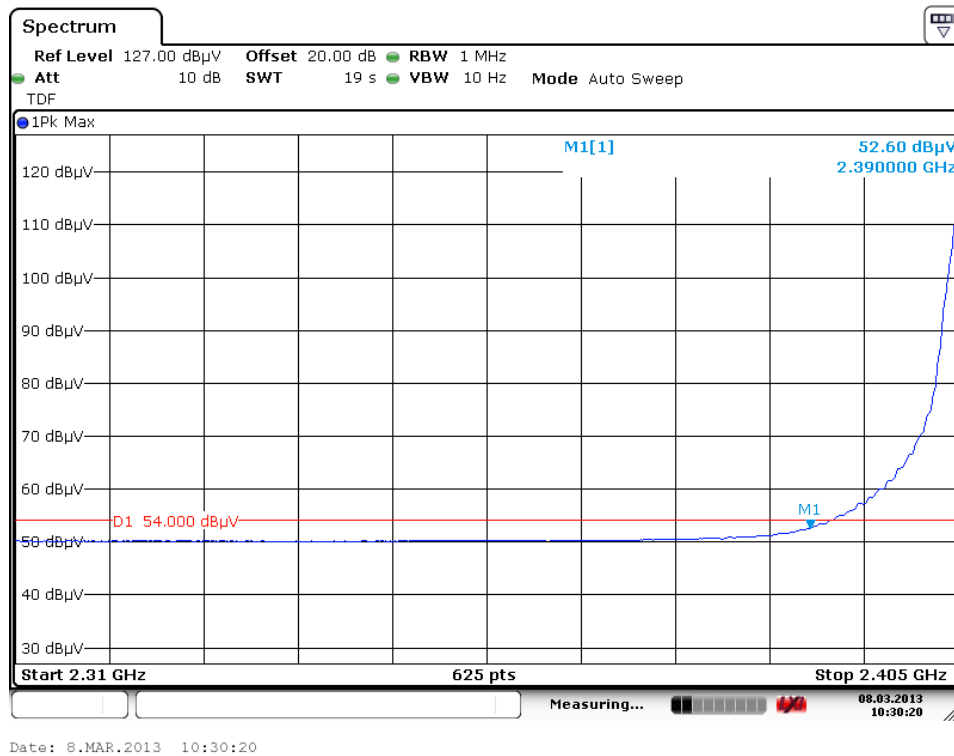
(File: 10040507AppendixD)

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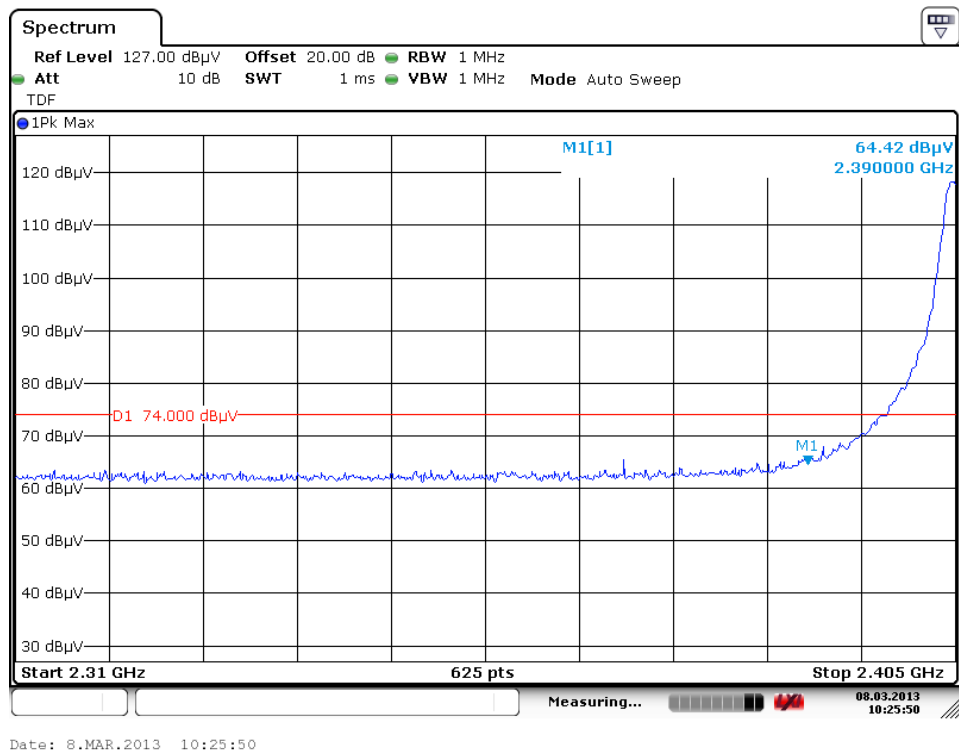
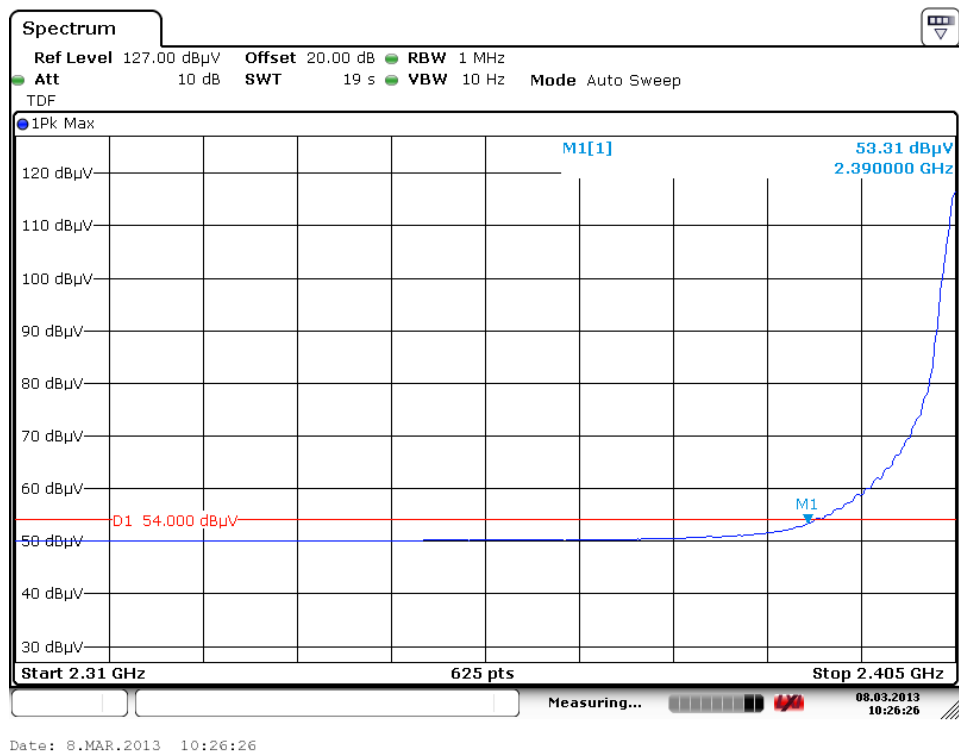
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Radiated Bandedge

Low Channel (Hor)



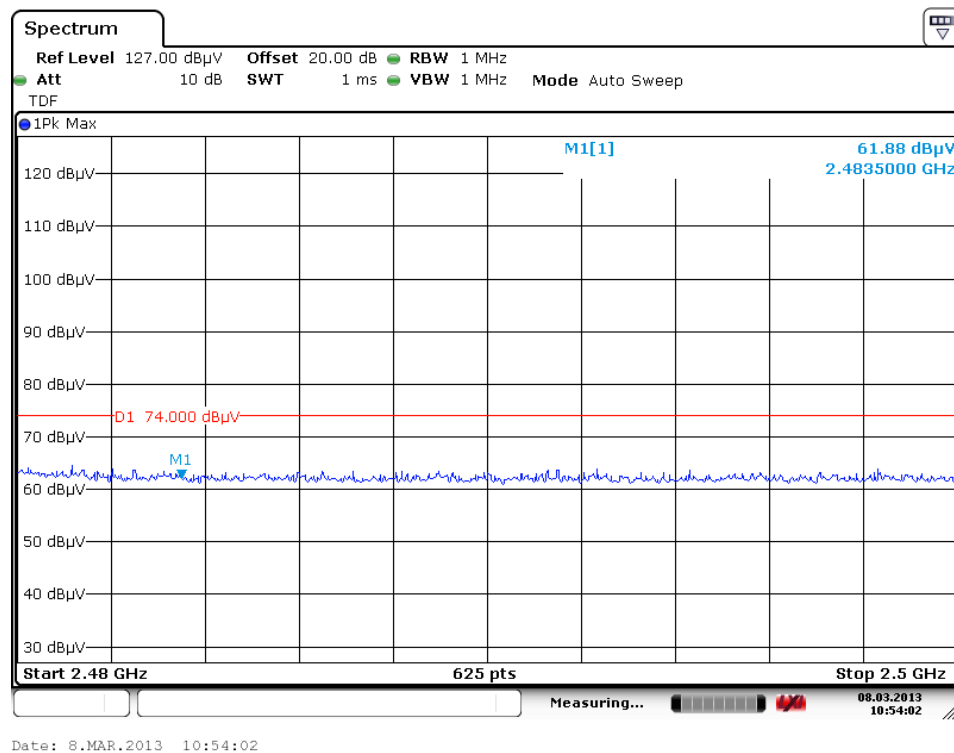
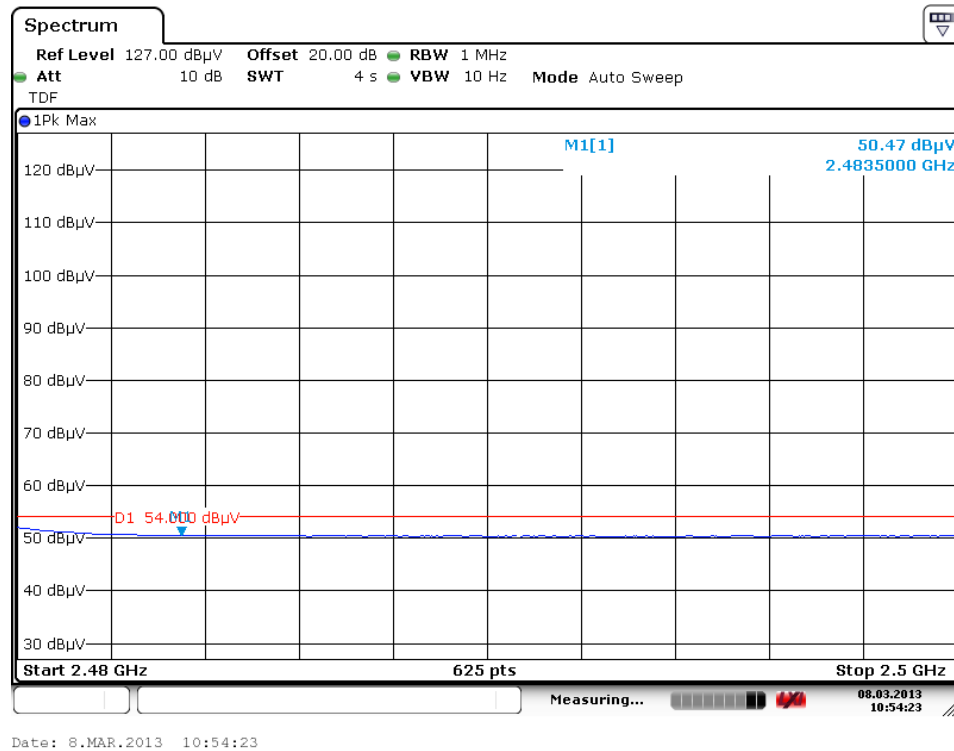
Low Channel (Ver)



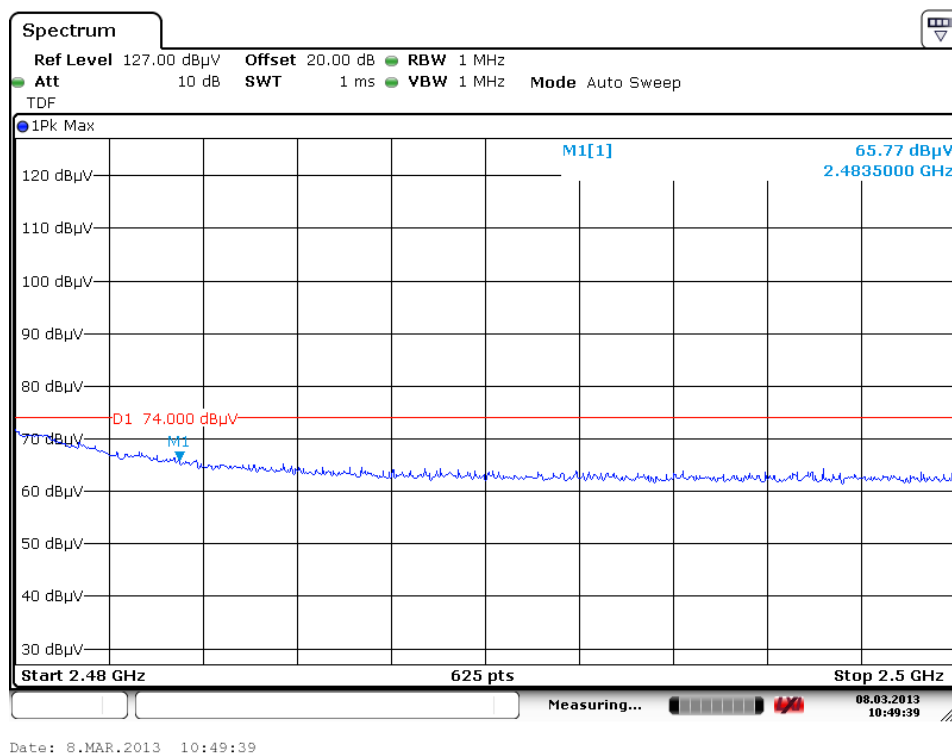
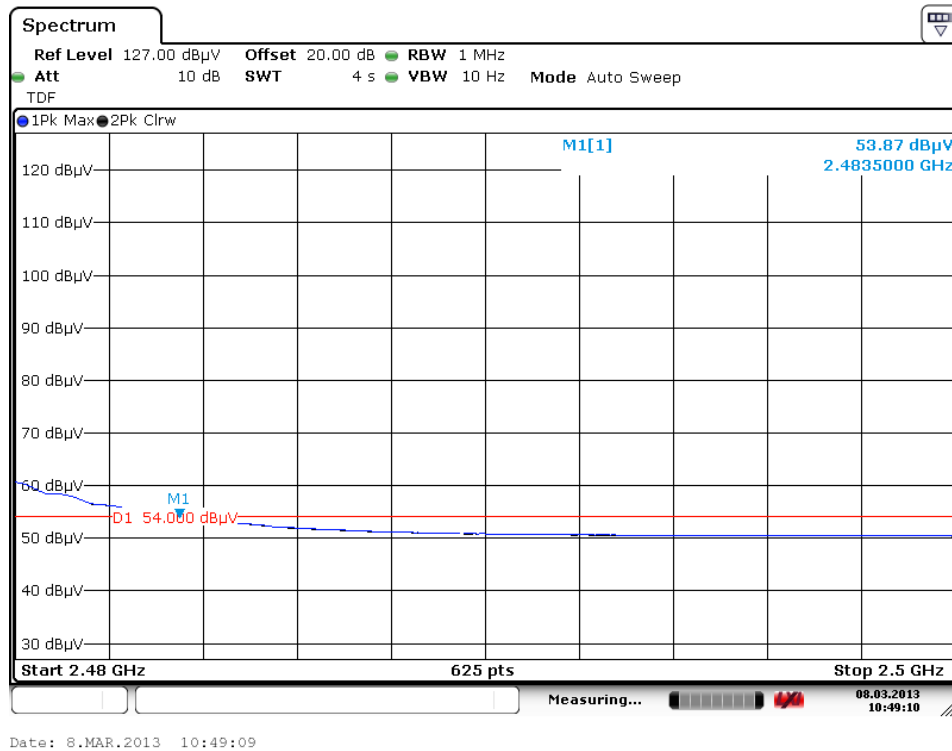
Spurious Emissions, Band Edge, 2.35-2.5G

Radiated Bandedge

High Channel (Hor) 2475

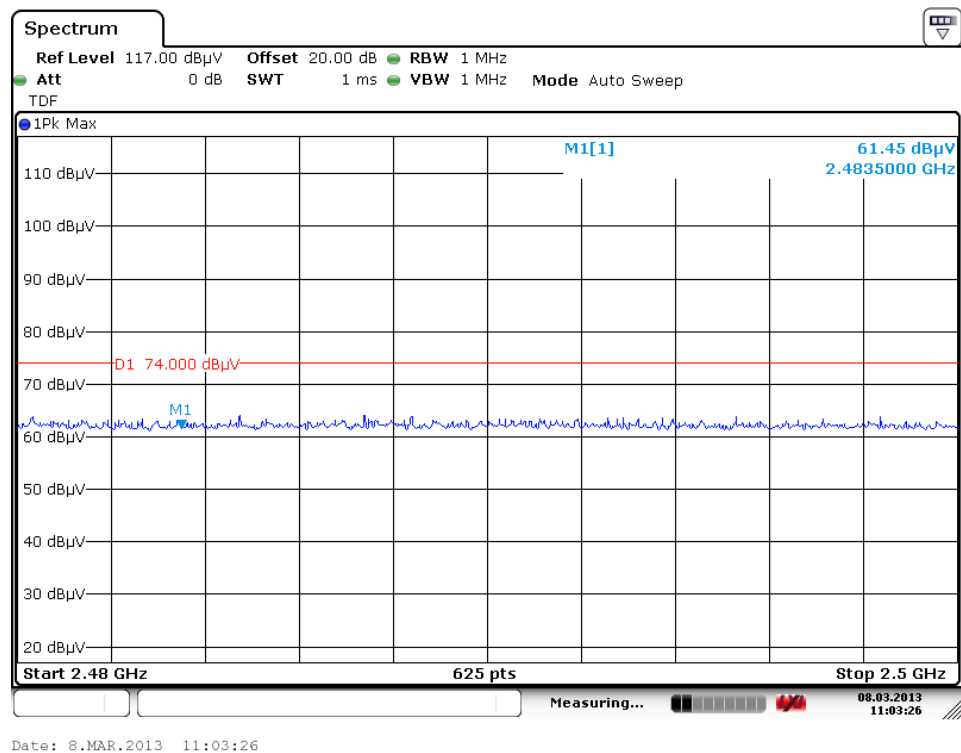
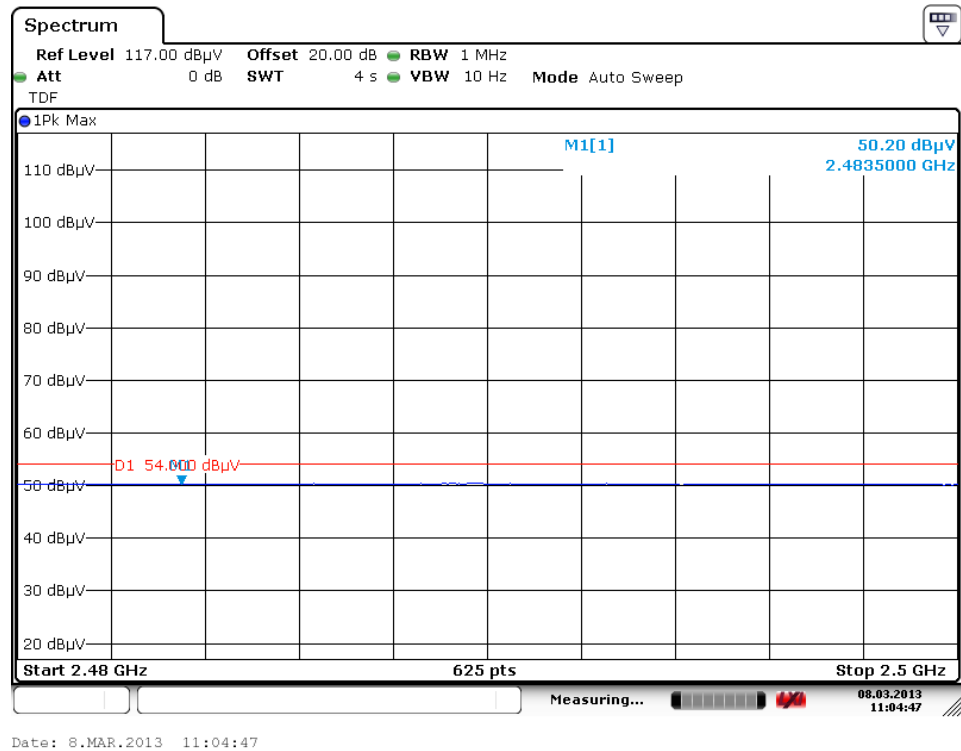


High Channel (Ver) 2475

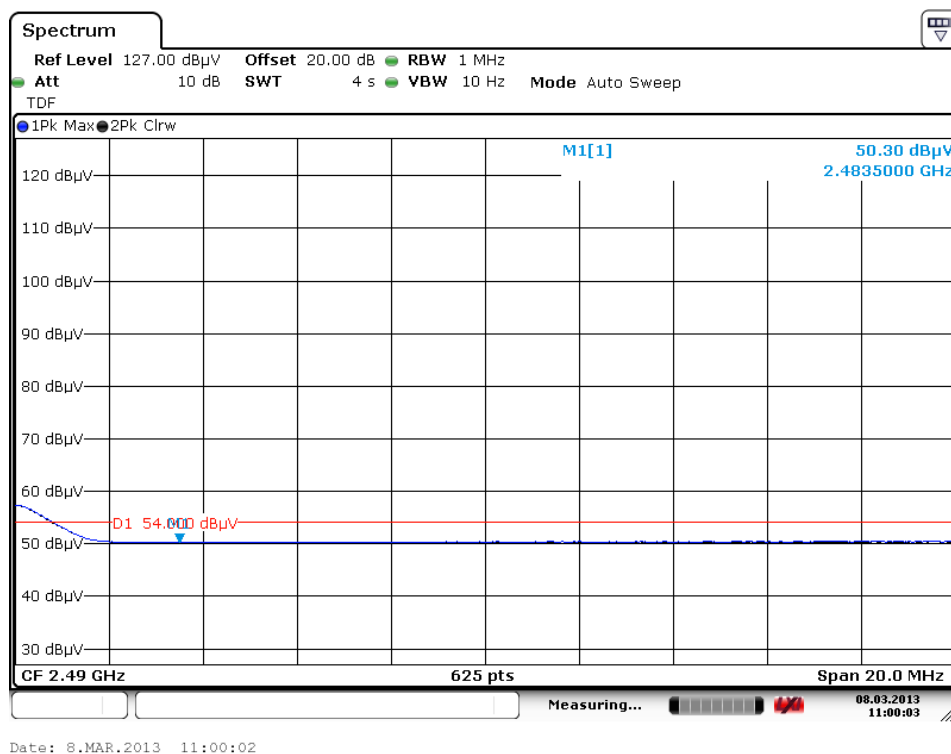
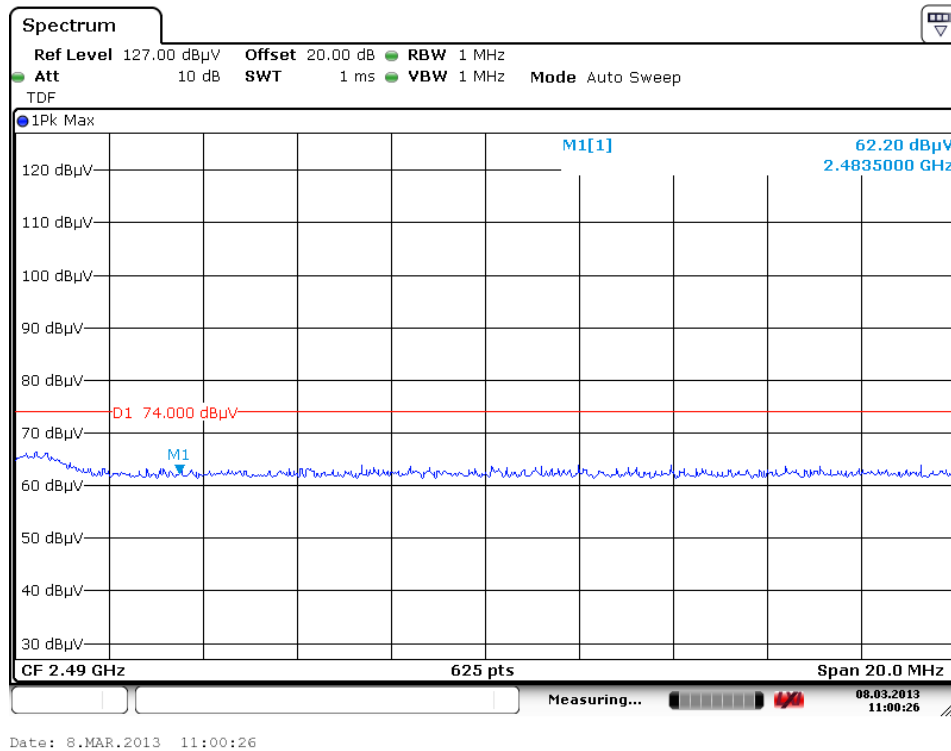


Radiated Bandedge

High Channel (Hor) 2480



High Channel (Ver) 2480



Spurious Emissions, Band Edge, 2.35-2.5G

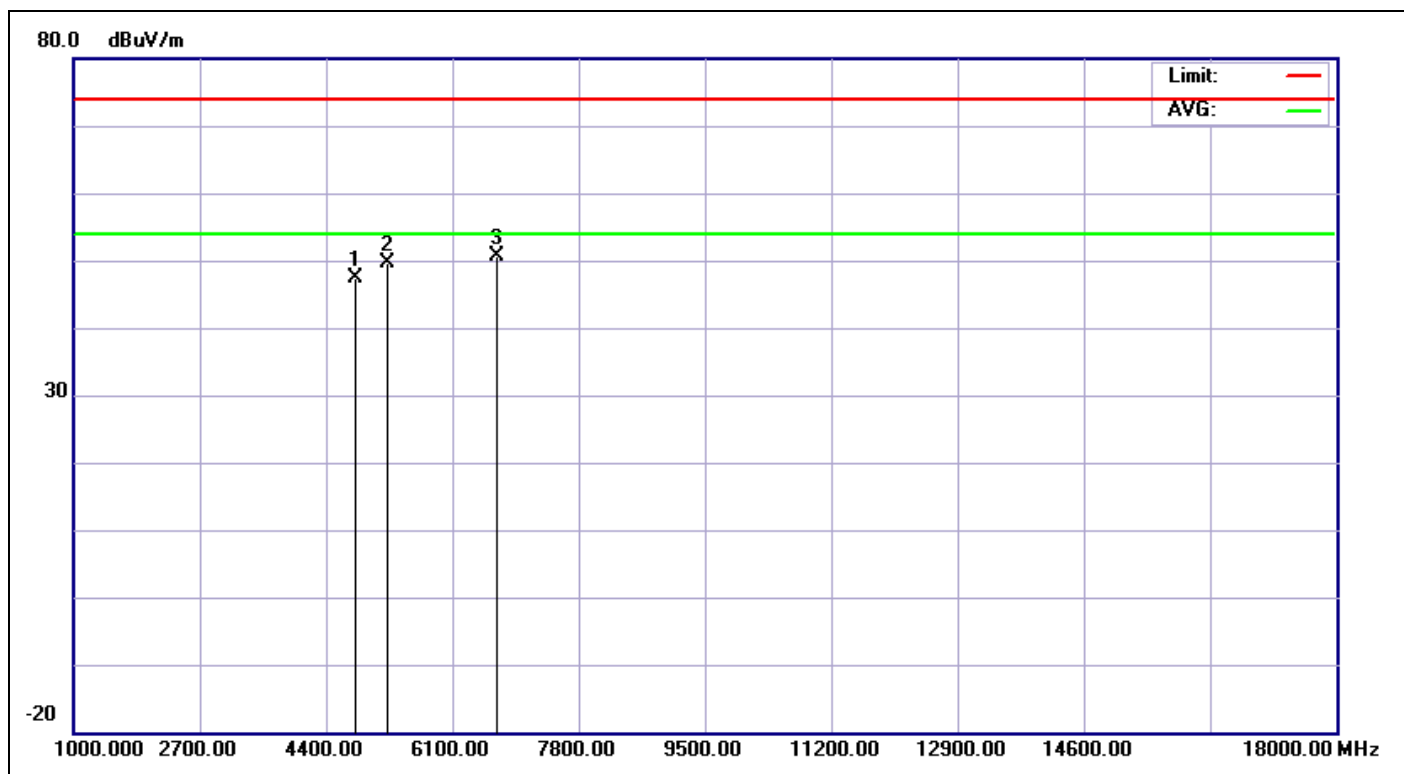
Spurious Emissions, TX Mode, 1-18G



TUV Taiwan

11F., No.758, Sec.4 Bade Road. Songshan Dist, Taipei City 105

Tel:+886-2172-7000 fax:+886-2528-0018



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:15:55

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

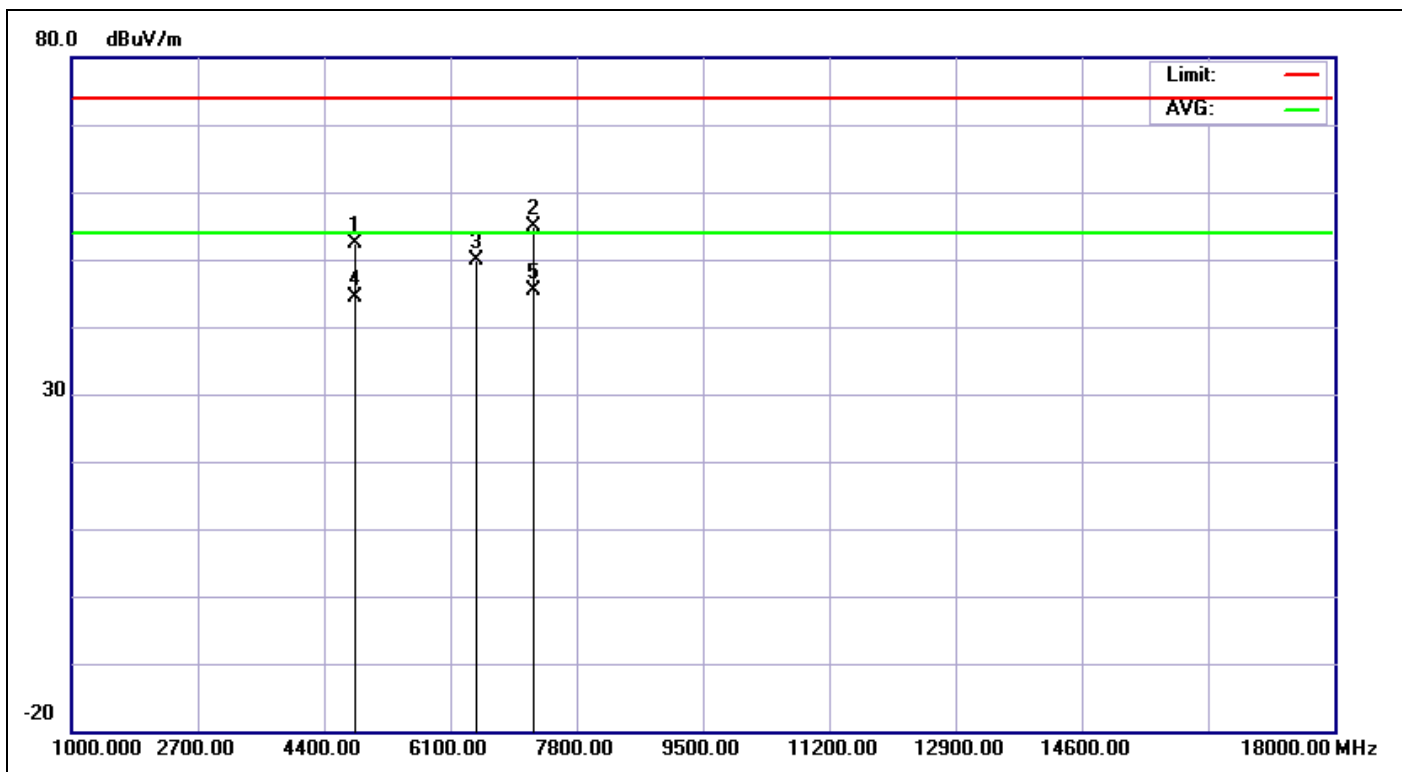
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2405

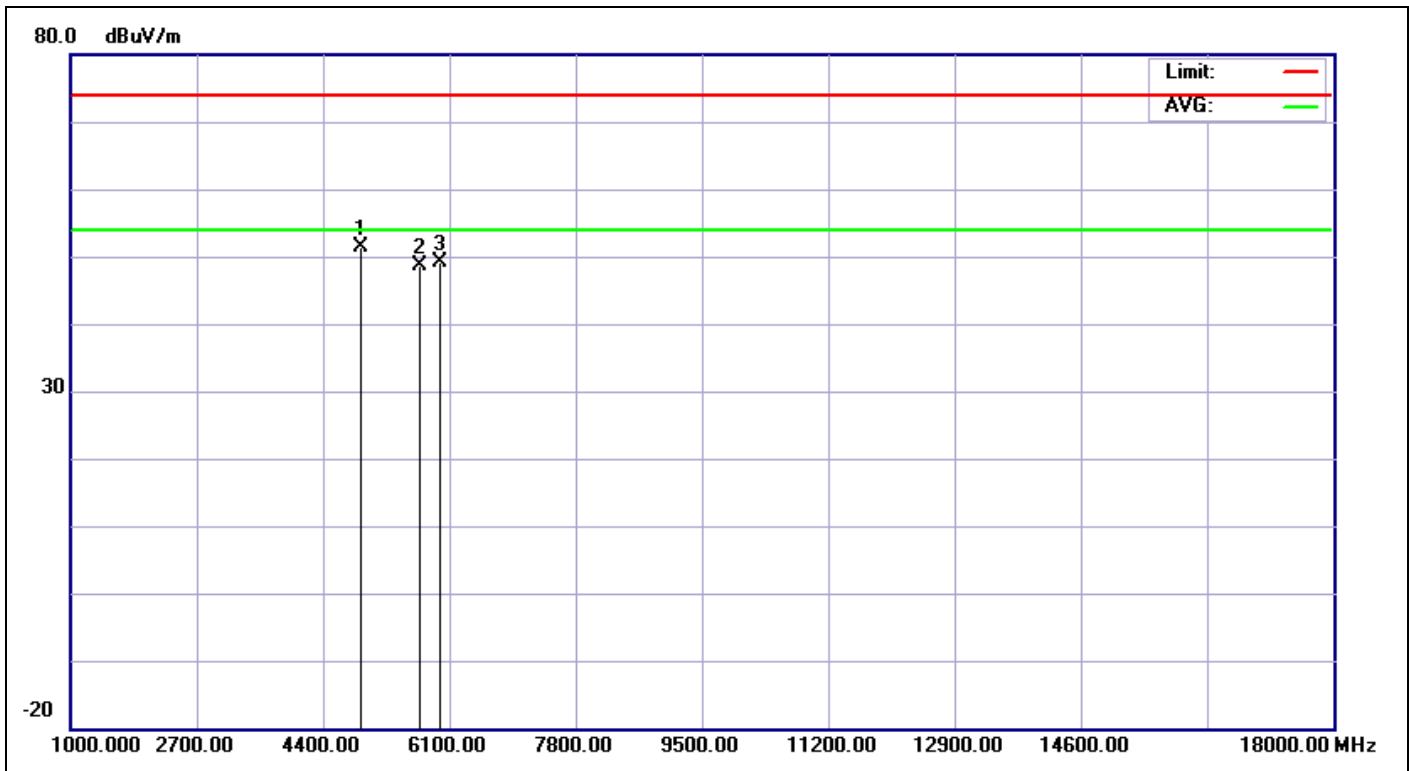
Remark: parameter=-8

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4799.000	-0.94	48.41	47.47	74.00	-26.53	peak	100	360	
2	5234.000	1.04	48.62	49.66	74.00	-24.34	peak	100	360	
3	6703.000	6.17	44.46	50.63	74.00	-23.37	peak	100	360	



Service No.:	113162303-AT357HP	Test Distance:	3M
Test Standard:	FCC above 1G PEAK	Ant. Polarization:	Vertical
Test item:	Radiation Emission	Test Time:	2013-3-8 AM 11:19:14
Applicant:	TUVR Singapore	Test Rating:	DC 3.3V
Product:	Zigbee Module	Temp.(°C)/Hum.(%)	22(°C)/21%
Model No.:	AT357HP	Test Engineer:	Hugo Chang
Test Mode:	CH2405		
Remark:	parameter=-8		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4826.000	-0.80	53.30	52.50	74.00	-21.50	peak	100	0	
2	7219.000	7.66	47.30	54.96	98.32	-43.36	peak	100	0	
3	6458.000	5.32	44.55	49.87	74.00	-24.13	peak	100	0	
4	4826.000	-0.80	45.25	44.45	54.00	-9.55	AVG			
5	7219.000	7.66	37.73	45.39	96.51	-51.12	AVG			



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:26:41

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

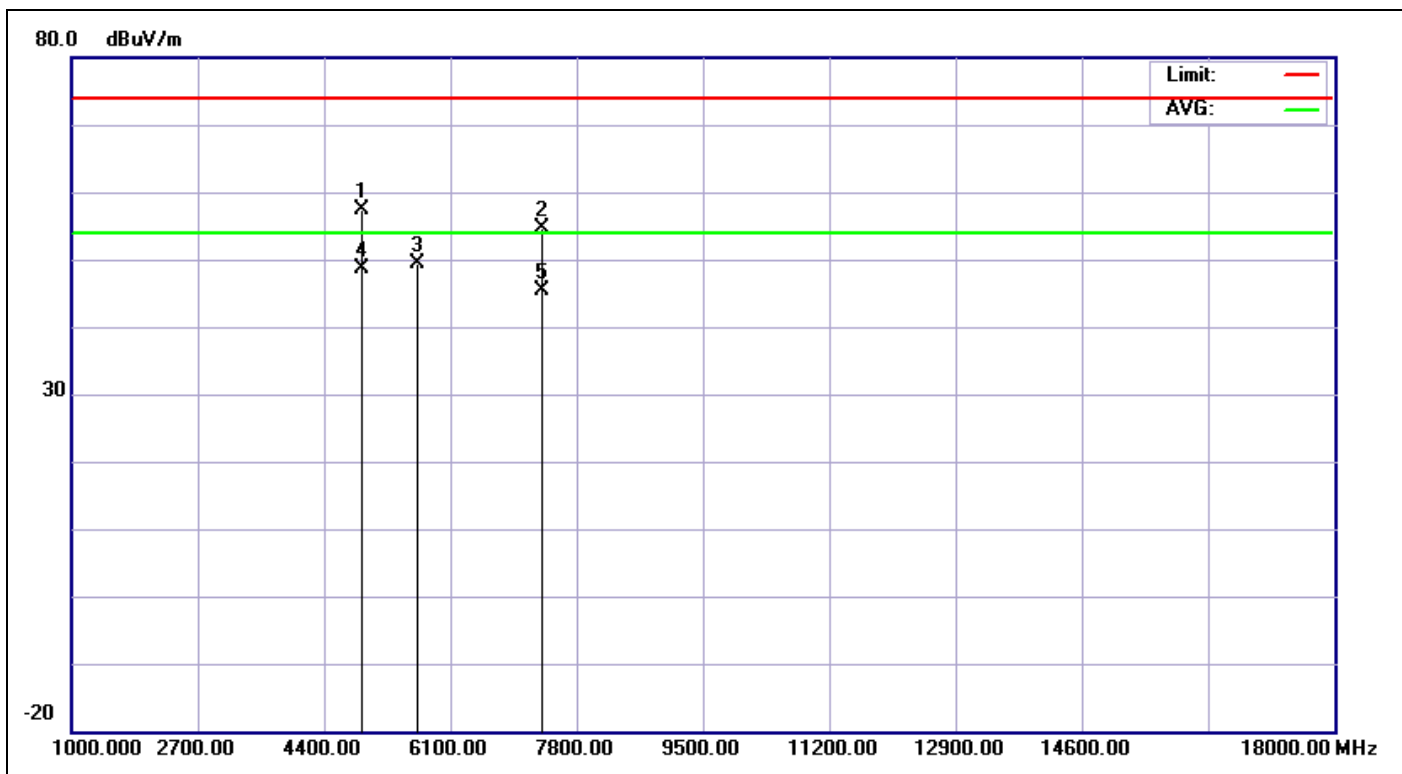
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2445

Remark: parameter=-7

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4904.000	-0.41	51.74	51.33	74.00	-22.67	peak	151	0	
2	5693.000	2.97	45.68	48.65	74.00	-25.35	peak	151	0	
3	5965.000	4.17	44.89	49.06	74.00	-24.94	peak	151	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:29:53

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

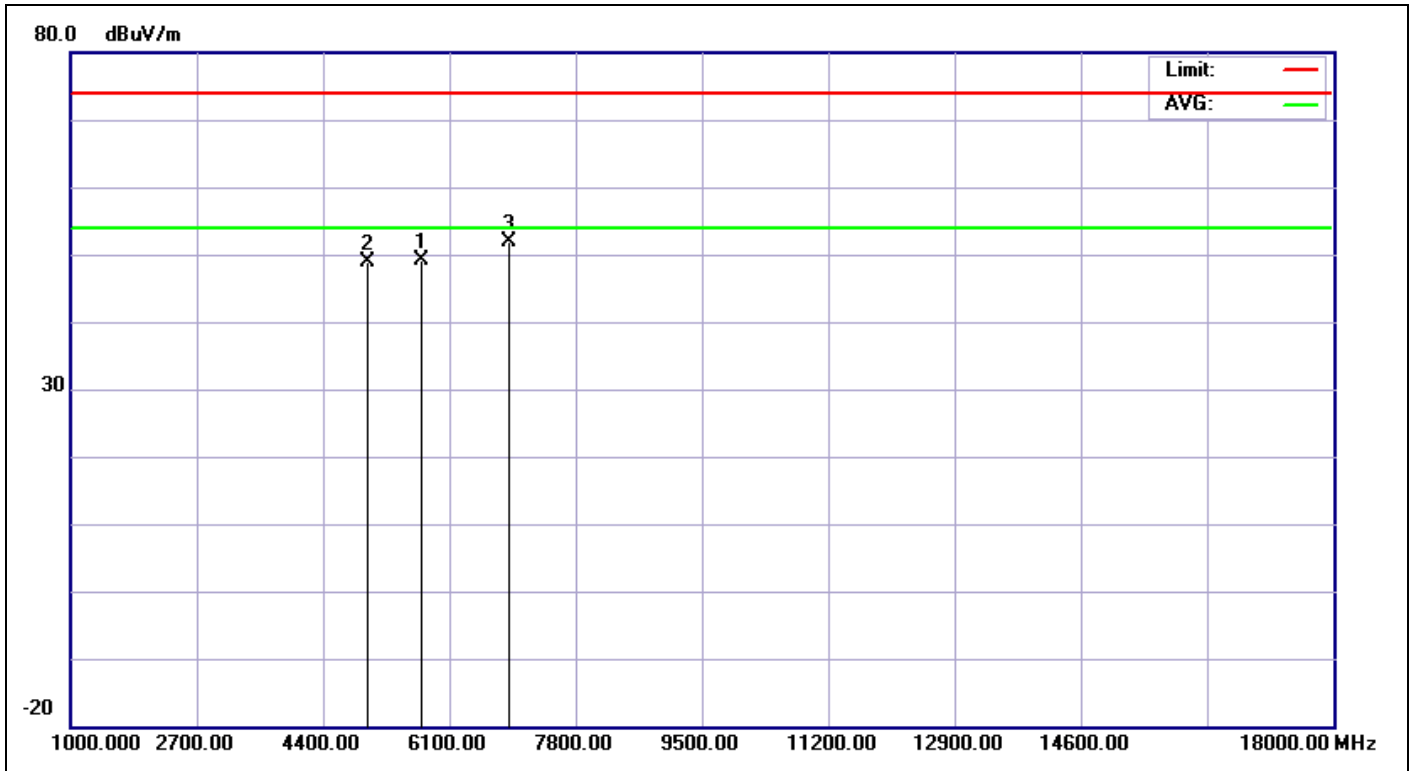
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2445

Remark: parameter=-7

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4904.000	-0.41	57.90	57.49	74.00	-16.51	peak	100	0	
2	7325.000	7.83	46.89	54.72	74.00	-19.28	peak	100	0	
3	5666.000	2.86	46.60	49.46	74.00	-24.54	peak	100	0	
4	4904.000	-0.41	49.09	48.68	54.00	-5.32	AVG			
5	7325.000	7.83	37.66	45.49	54.00	-8.51	AVG			



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:35:27

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

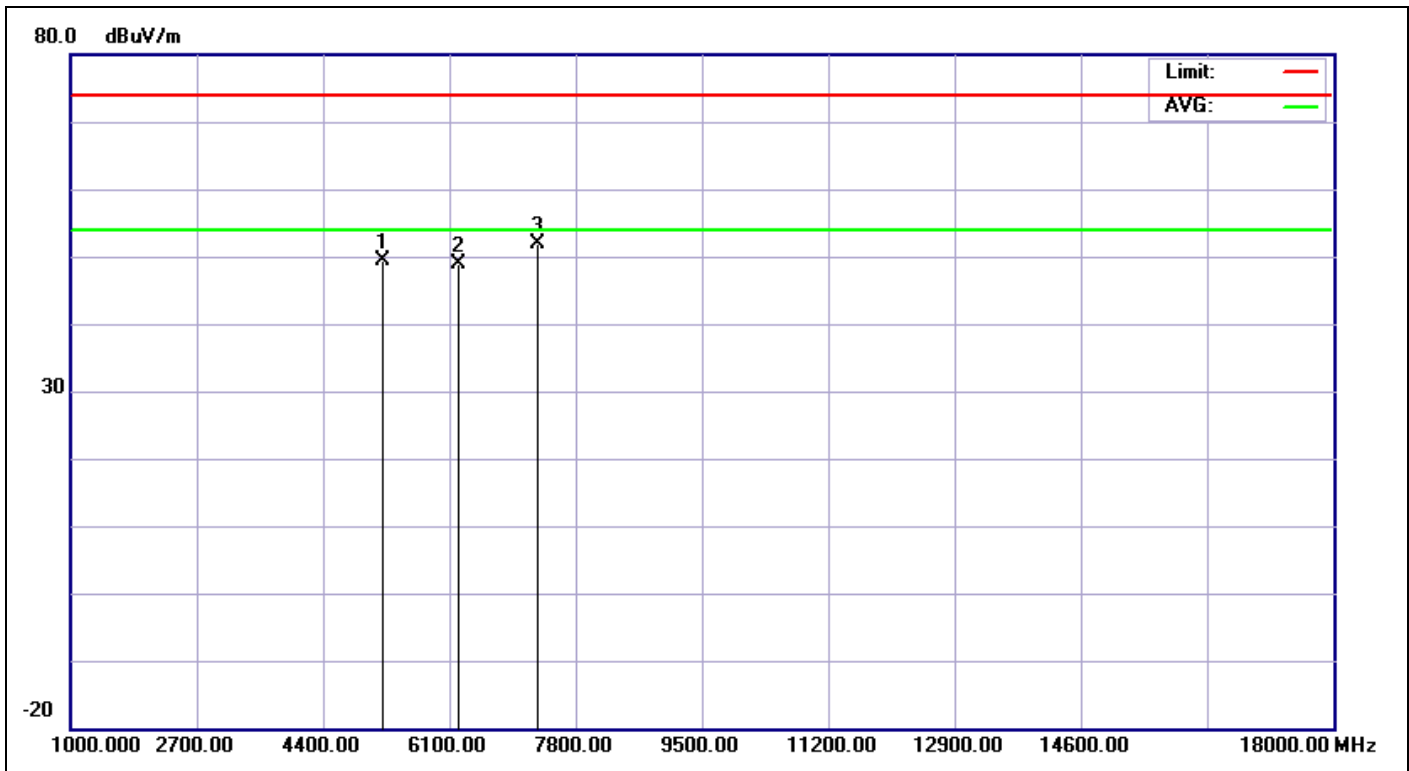
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2475

Remark: parameter=-11

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	5729.000	3.13	46.06	49.19	74.00	-24.81	peak	100	0	
2	4994.000	0.04	48.78	48.82	74.00	-25.18	peak	100	0	
3	6898.000	6.90	44.94	51.84	74.00	-22.16	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:37:47

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

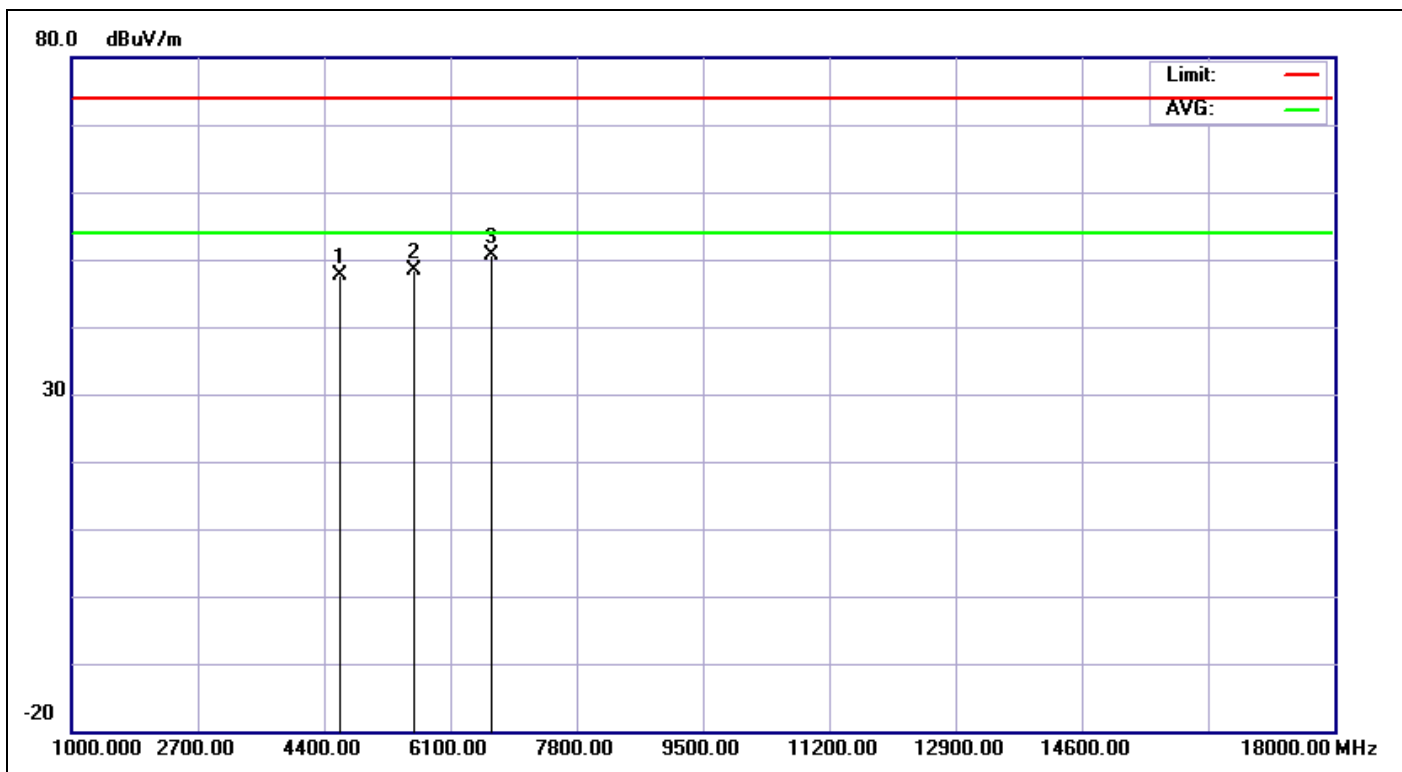
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2475

Remark: parameter=-11

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	5212.000	0.95	48.49	49.44	74.00	-24.56	peak	100	360	
2	6218.000	4.80	43.98	48.78	74.00	-25.22	peak	100	360	
3	7279.000	7.75	44.09	51.84	74.00	-22.16	peak	100	360	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:39:28

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

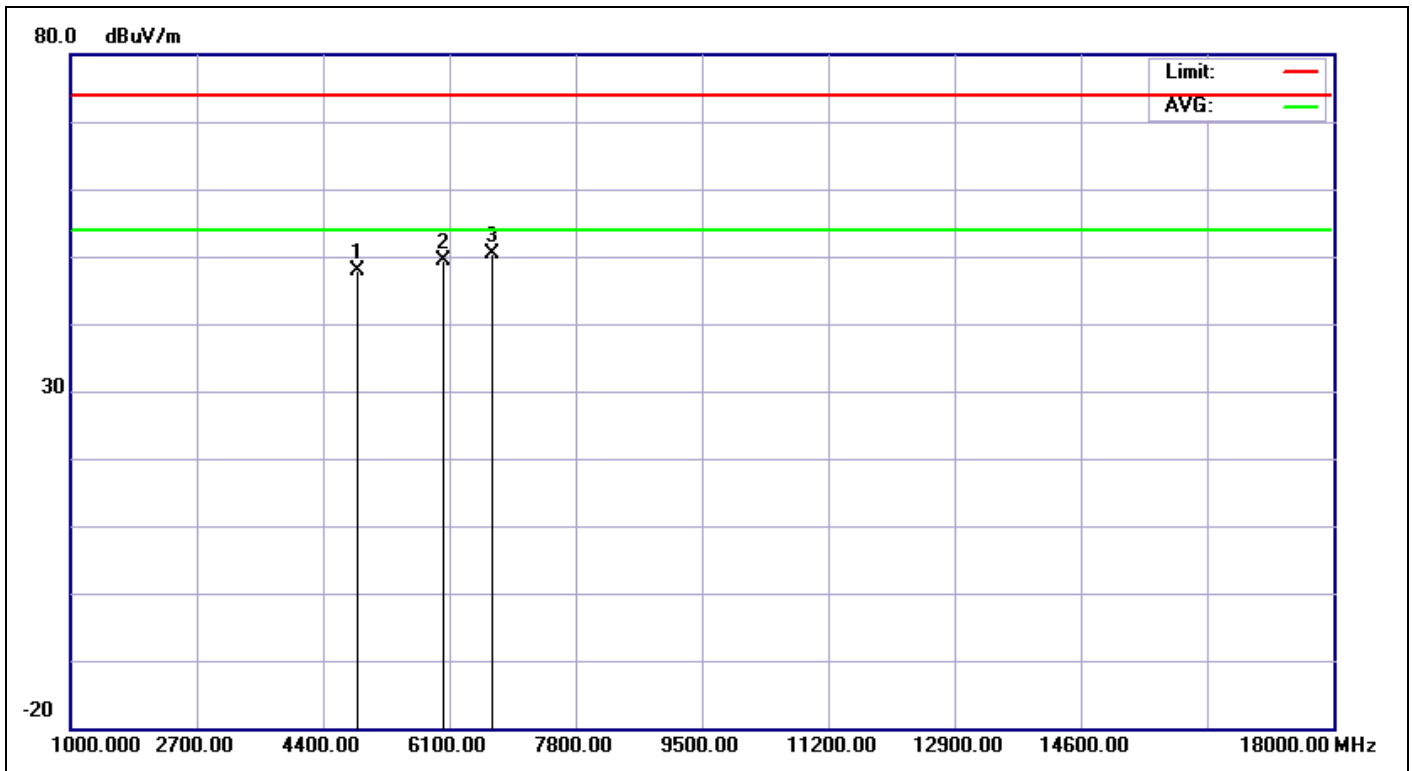
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2480

Remark: parameter=-2b

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4614.000	-1.88	49.45	47.57	74.00	-26.43	peak	100	0	
2	5620.000	2.64	45.80	48.44	74.00	-25.56	peak	100	0	
3	6654.000	5.99	44.74	50.73	74.00	-23.27	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013-3-8 AM 11:46:25

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/21%

Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2480

Remark: parameter=-2b

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	4858.000	-0.64	48.63	47.99	74.00	-26.01	peak	100	360	
2	6028.000	4.38	45.00	49.38	74.00	-24.62	peak	100	360	
3	6681.000	6.09	44.41	50.50	74.00	-23.50	peak	100	360	

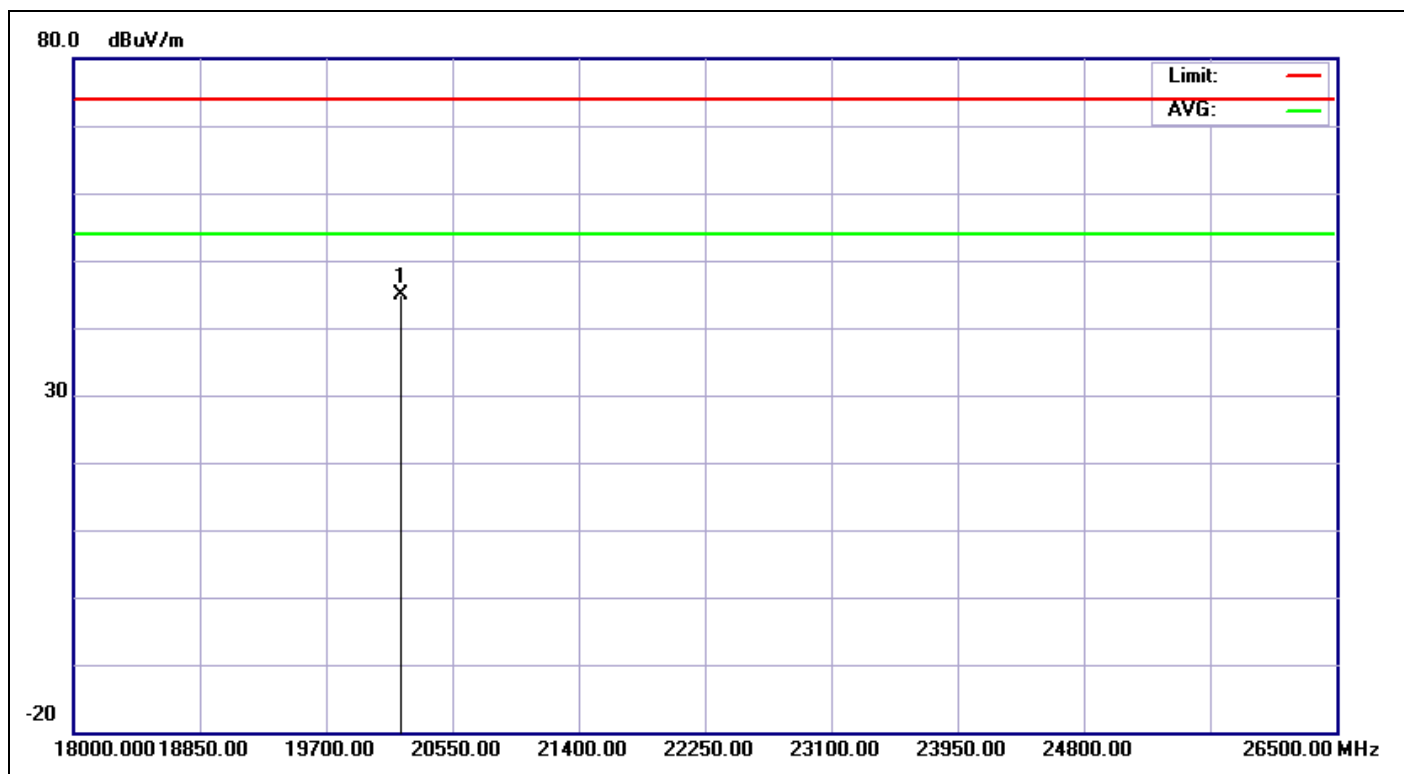
Spurious Emissions, TX Mode, 18-26G



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Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:11:26

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

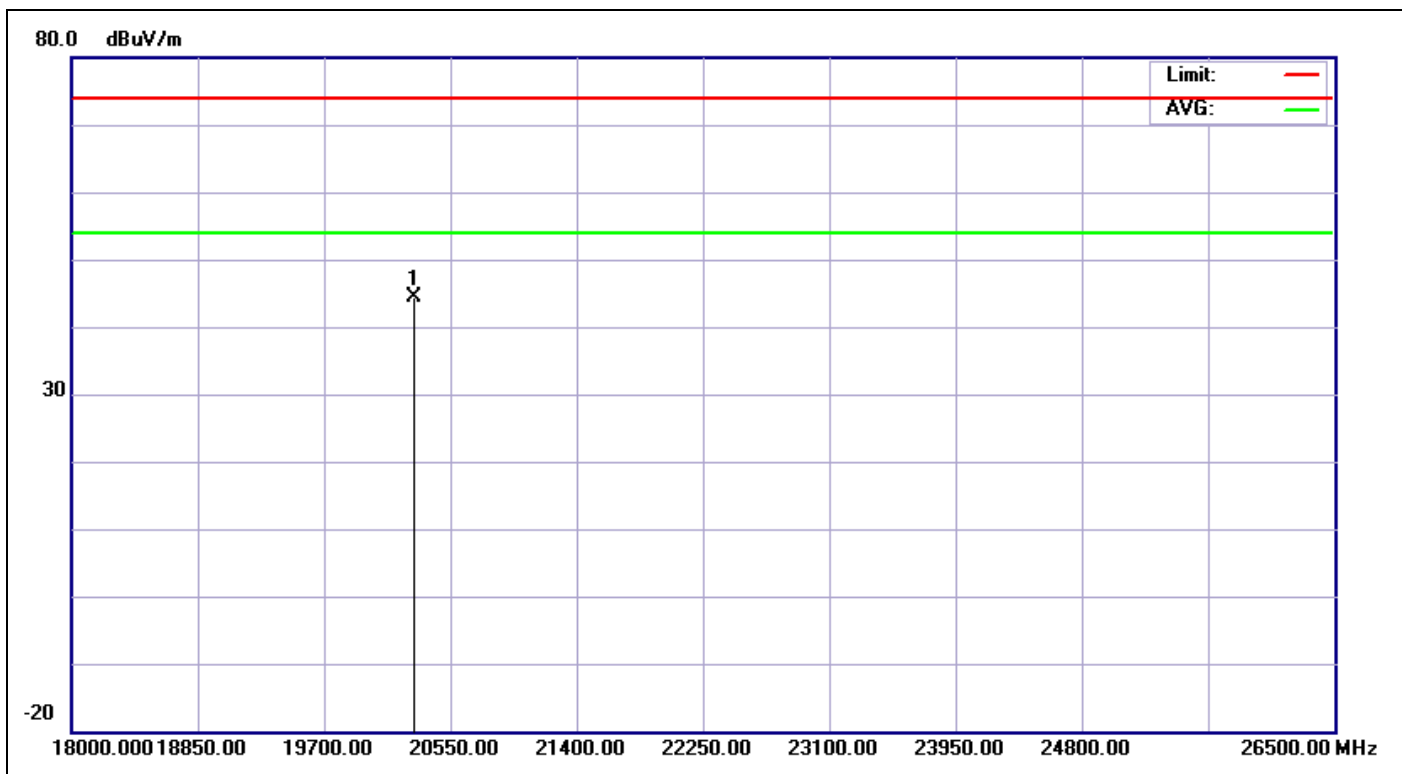
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2405

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20210.000	26.44	18.48	44.92	74.00	-29.08	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:12:25

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

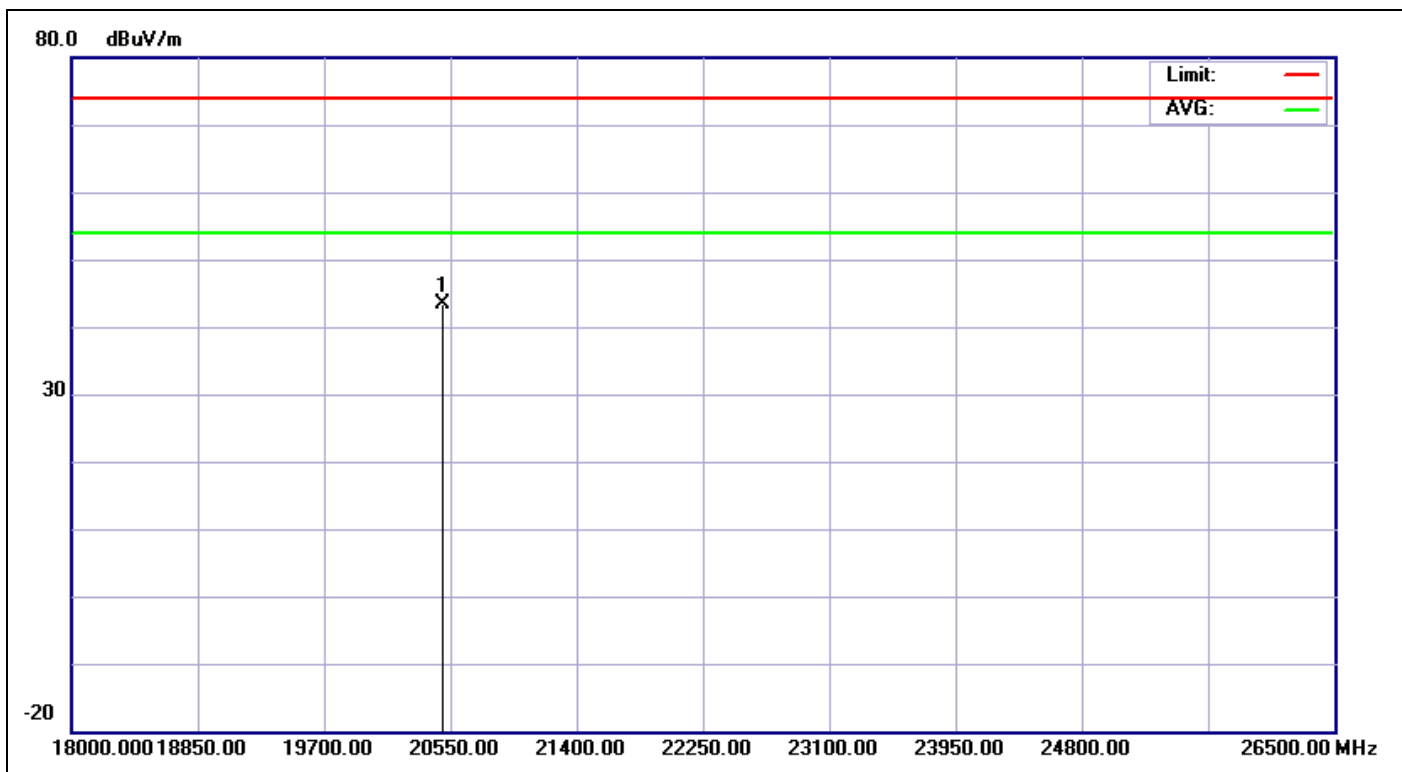
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2405

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20305.000	26.51	17.93	44.44	74.00	-29.56	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:12:51

Applicant: TUV R Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

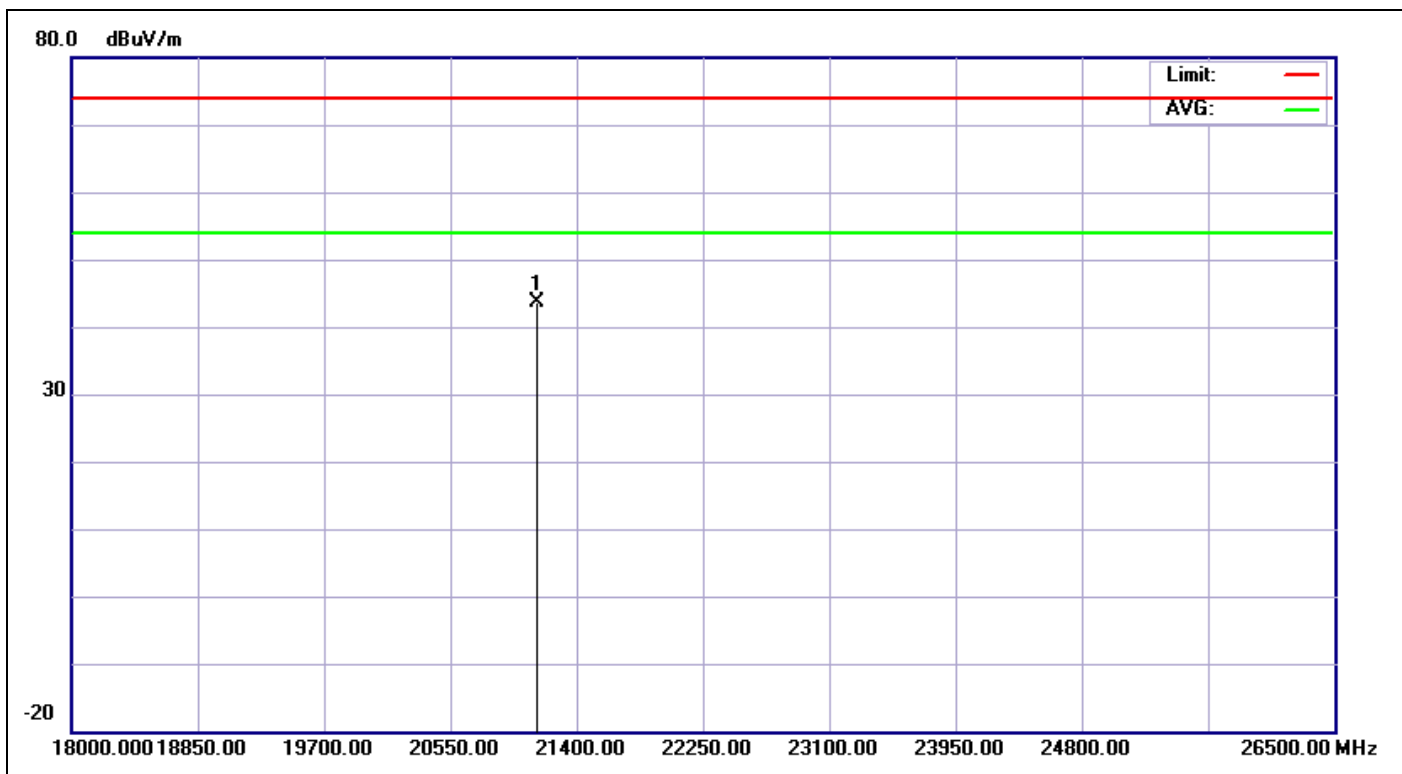
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2445

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20496.000	26.66	16.74	43.40	74.00	-30.60	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:13:16

Applicant: TUV R Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

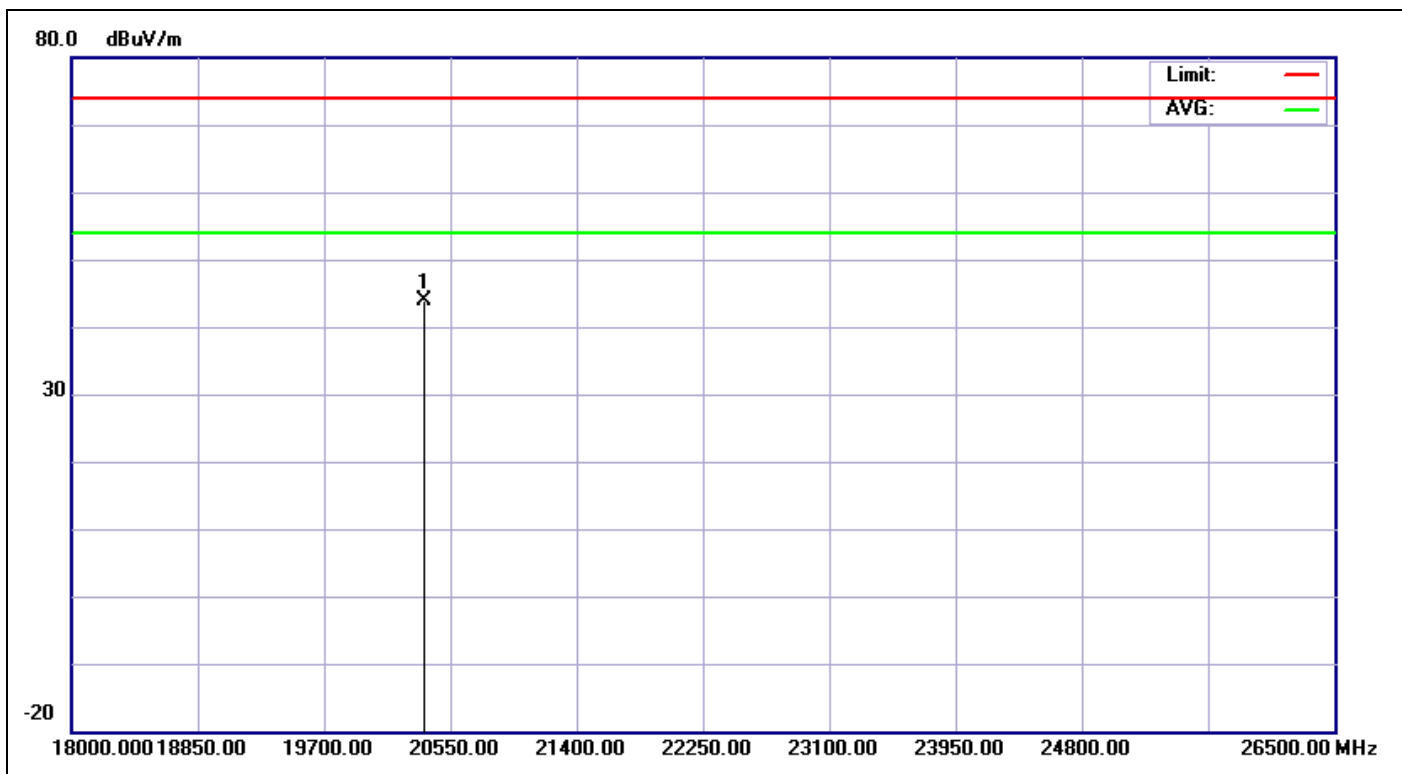
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2445

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	21135.000	25.25	18.38	43.63	74.00	-30.37	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013/2/19 PM 02:41:19

Applicant: TUV R Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 20(°C)/55%

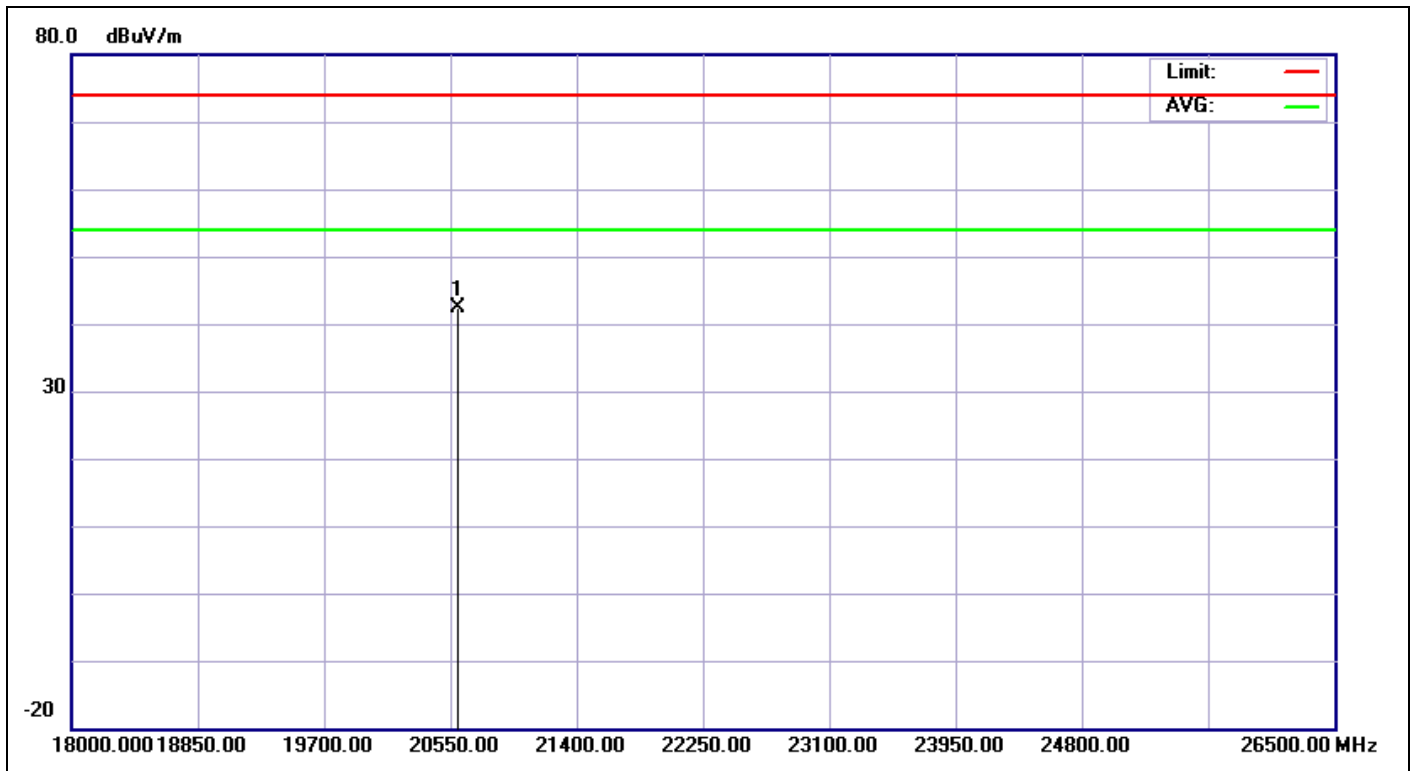
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2475

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20373.000	26.56	17.39	43.95	74.00	-30.05	peak	100	185	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013/2/19 PM 02:41:58

Applicant: TUV R Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 20(°C)/55%

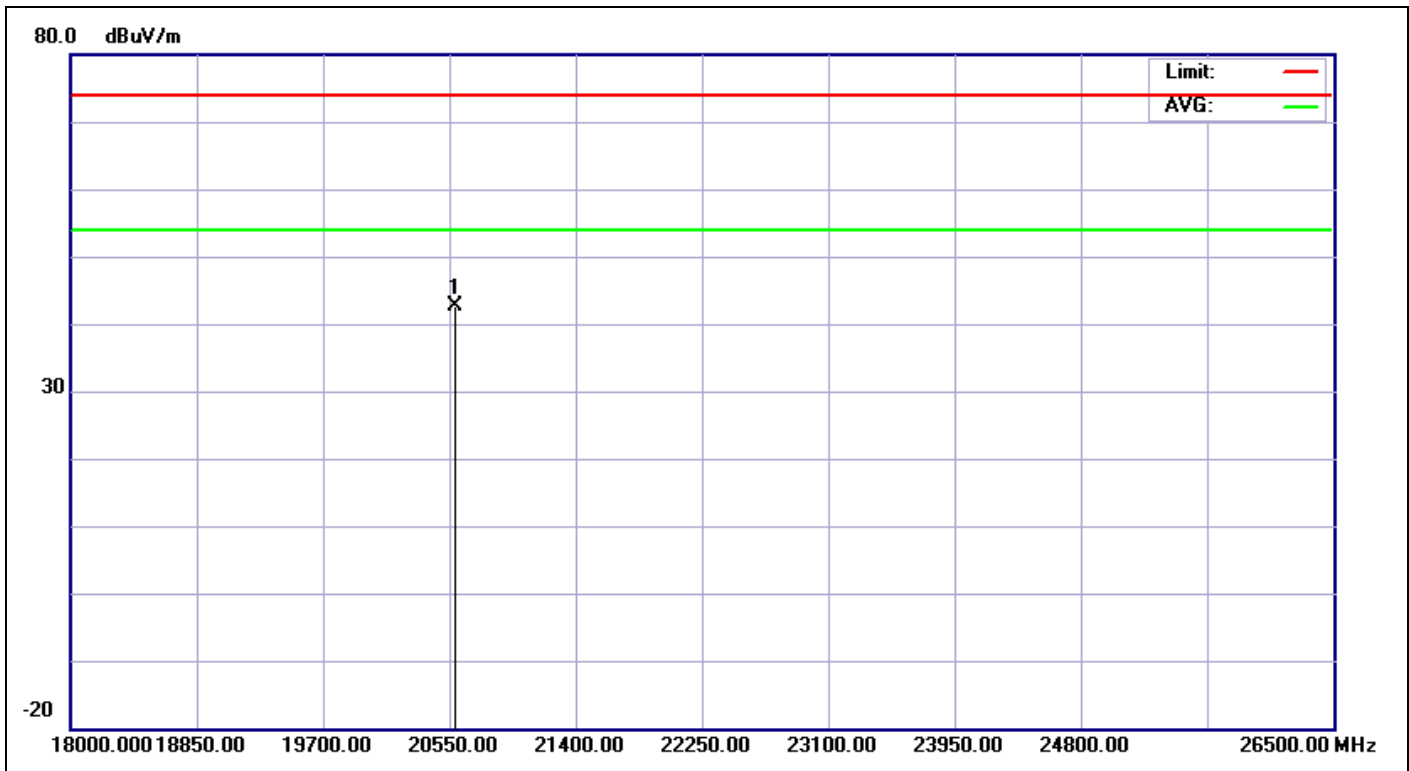
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2475

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20604.000	26.35	16.09	42.44	74.00	-31.56	peak	100	185	



Service No.: 113162303-AT357HP

Test Standard: FCC above 1G PEAK

Test item: Radiation Emission

Applicant: TUV R Singapore

Product: Zigbee Module

Model No.: AT357HP

Test Mode: CH2480

Remark:

Test Distance: 3M

Ant. Polarization: Horizontal

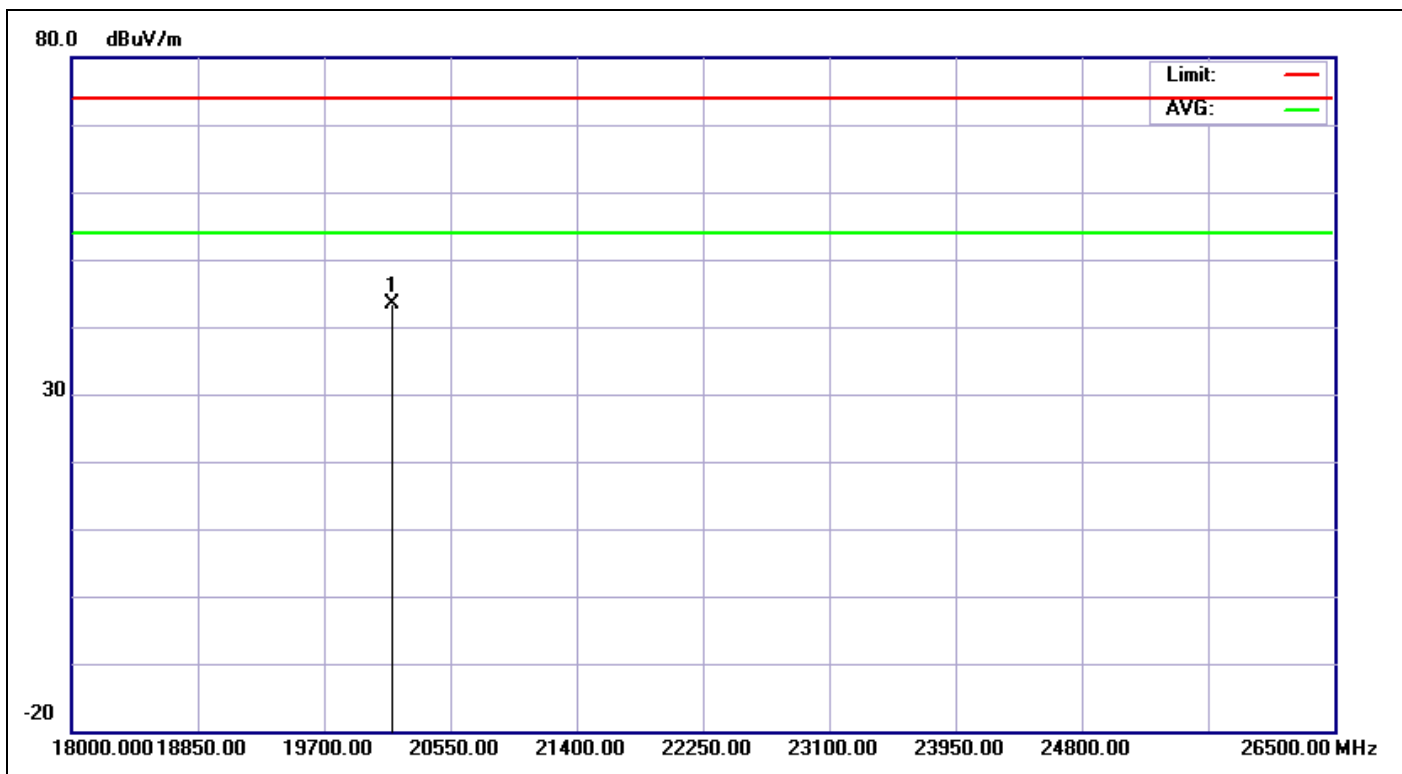
Test Time: 2013/1/30 PM 01:13:46

Test Rating: DC 3.3V

Temp.(°C)/Hum.(%): 22(°C)/59%

Test Engineer: Hugo Chang

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20591.000	26.38	16.13	42.51	74.00	-31.49	peak	100	0	



Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC above 1G PEAK

Ant. Polarization: Vertical

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:14:12

Applicant: TUV R Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode: CH2480

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	20156.000	26.40	17.01	43.41	74.00	-30.59	peak	100	0	

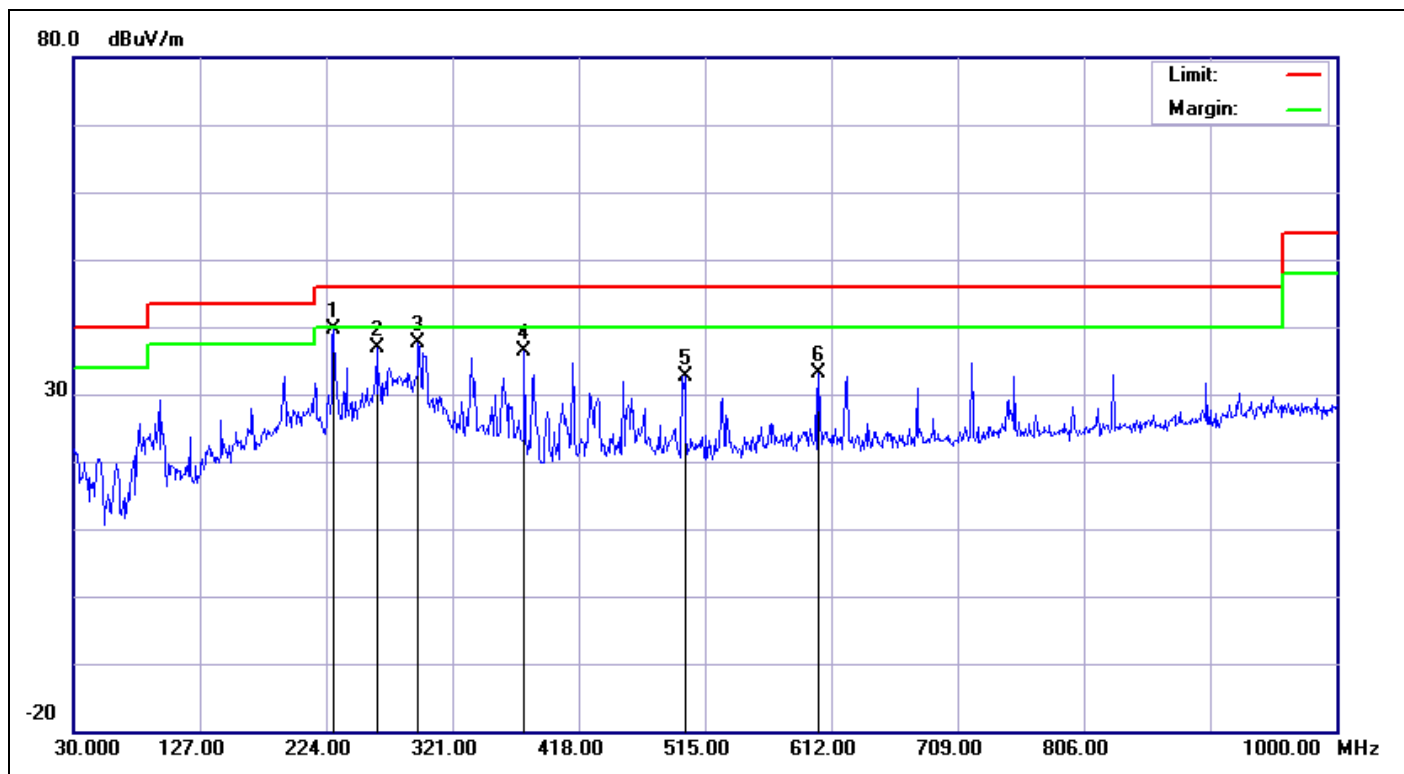
Spurious Emissions, TX Mode, 30M-1G



TUV Taiwan

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Service No.: 113162303-AT357HP

Test Distance: 3M

Test Standard: FCC Class B 3M Radiation

Ant. Polarization: Horizontal

Test item: Radiation Emission

Test Time: 2013/1/30 PM 01:24:01

Applicant: TUVR Singapore

Test Rating: DC 3.3V

Product: Zigbee Module

Temp.(°C)/Hum.(%): 22(°C)/59%

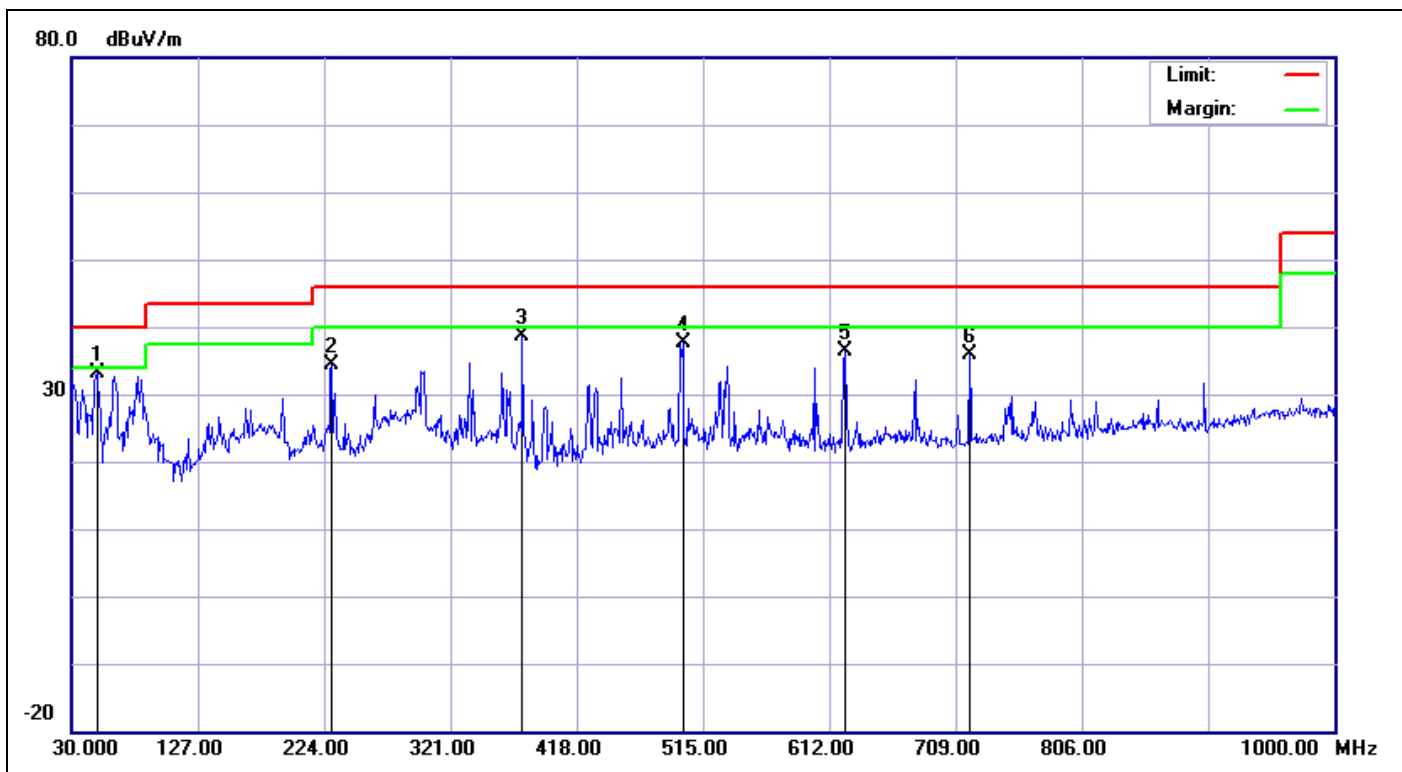
Model No.: AT357HP

Test Engineer: Hugo Chang

Test Mode:

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	229.8200	-14.87	54.56	39.69	46.00	-6.31	QP			
2	262.8000	-11.48	48.46	36.98	46.00	-9.02	QP			
3	294.8100	-11.47	49.08	37.61	46.00	-8.39	QP			
4	376.2900	-9.51	45.92	36.41	46.00	-9.59	QP			
5	499.4800	-7.61	40.29	32.68	46.00	-13.32	QP			
6	602.3000	-5.84	38.99	33.15	46.00	-12.85	QP			



Service No.: 113162303-AT357HP

Test Standard: FCC Class B 3M Radiation

Test item: Radiation Emission

Applicant: TUVR Singapore

Product: Zigbee Module

Model No.: AT357HP

Test Mode:

Remark:

Test Distance: 3M

Ant. Polarization: Vertical

Test Time: 2013/1/30 PM 01:25:25

Test Rating: DC 3.3V

Temp.(°C)/Hum.(%): 22(°C)/59%

Test Engineer: Hugo Chang

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	49.4000	-17.97	51.15	33.18	40.00	-6.82	QP			
2	229.8200	-14.87	49.23	34.36	46.00	-11.64	QP			
3	376.2900	-9.51	48.14	38.63	46.00	-7.37	QP			
4	499.4800	-7.61	45.21	37.60	46.00	-8.40	QP			
5	624.6100	-5.57	41.97	36.40	46.00	-9.60	QP			
6	719.6700	-4.30	40.29	35.99	46.00	-10.01	QP			