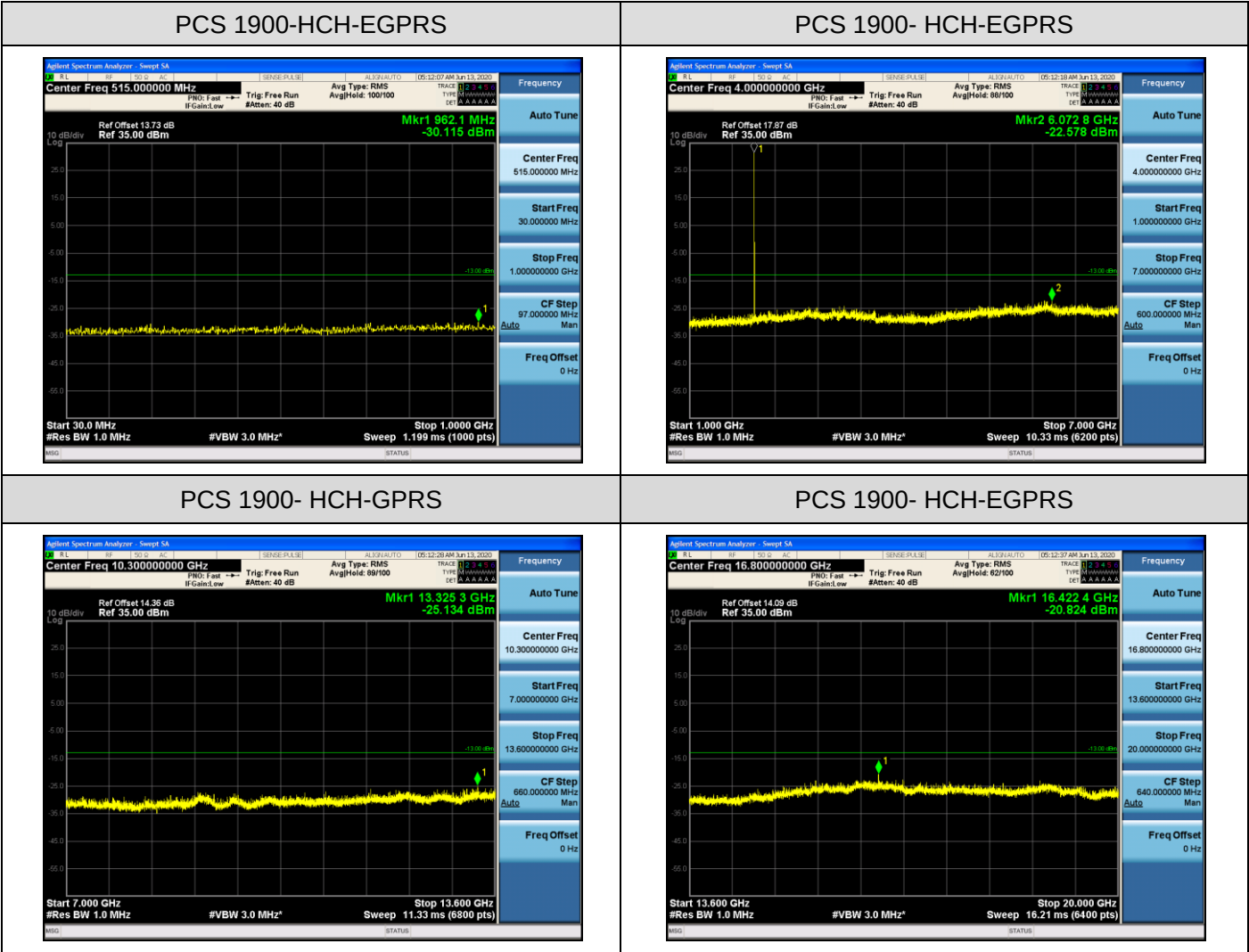
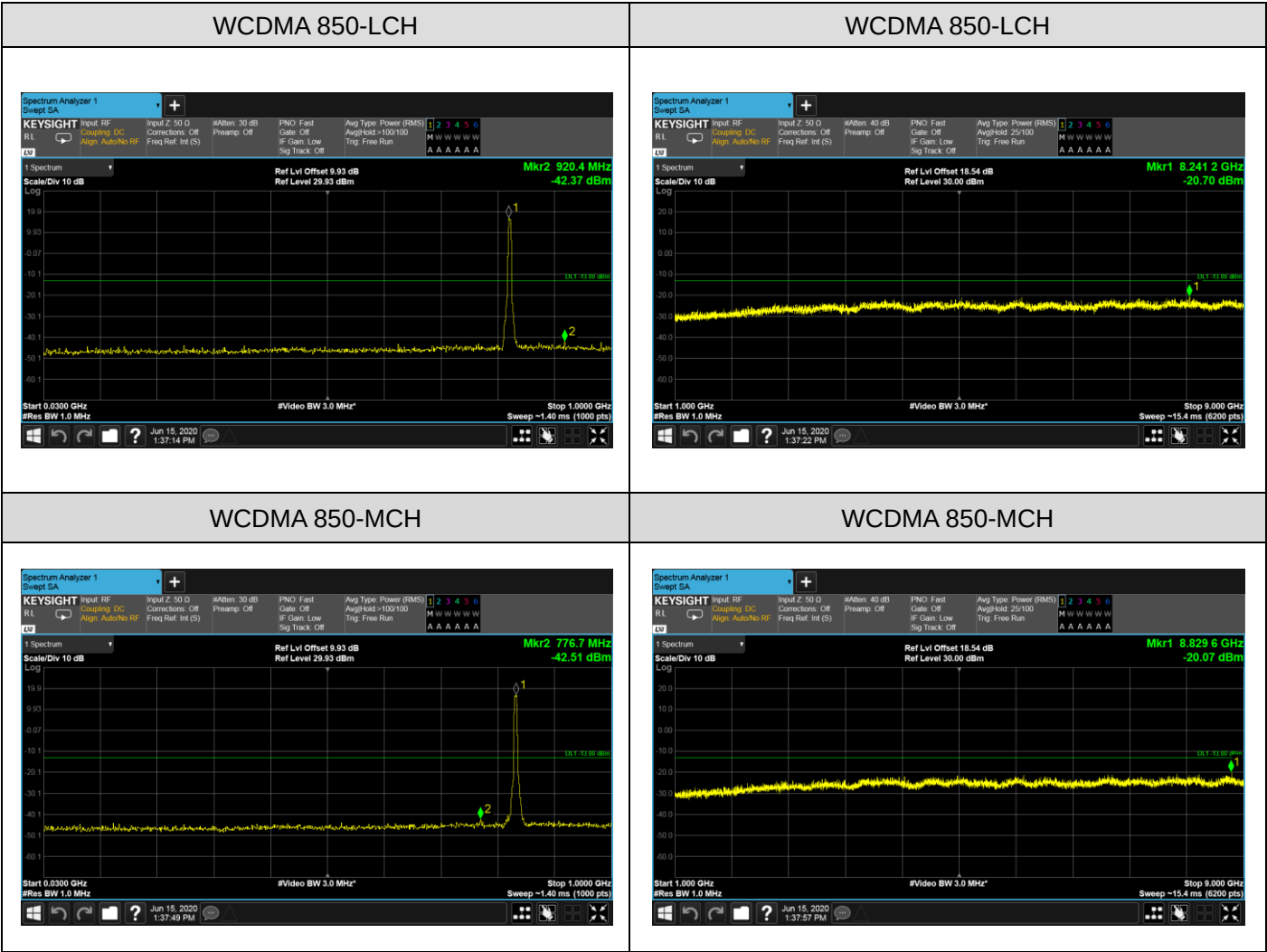


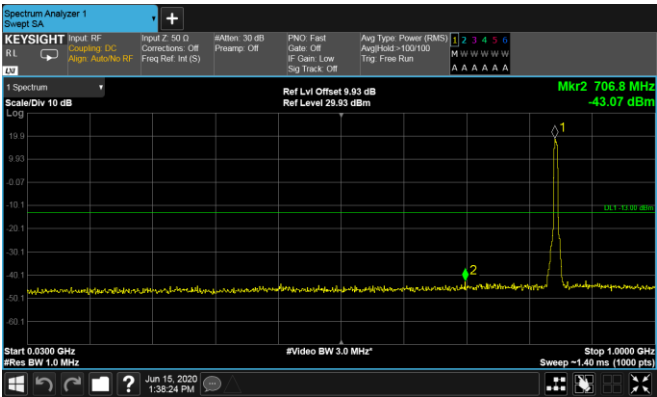


Test Band=WCDMA850/WCDMA1900

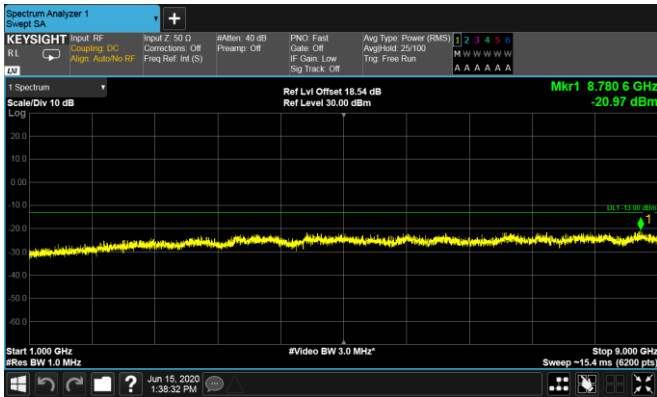
Test Mode=UMTS



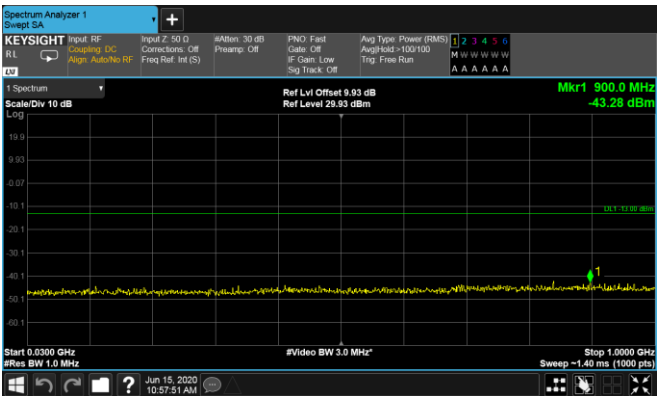
WCDMA 850-HCH



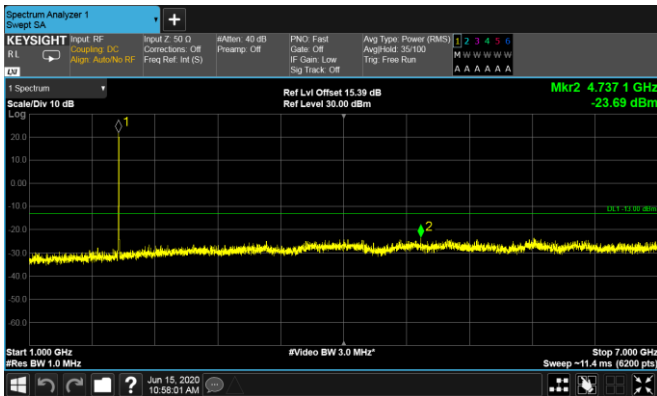
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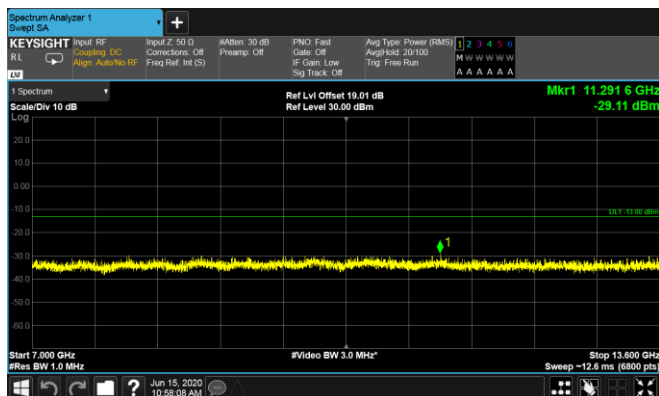
WCDMA 1900-LCH



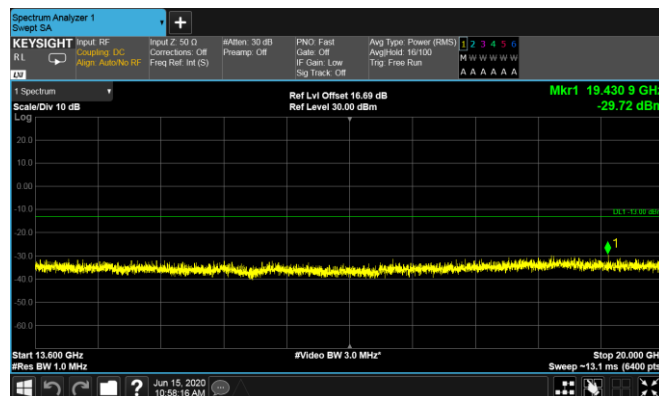
WCDMA 1900-LCH



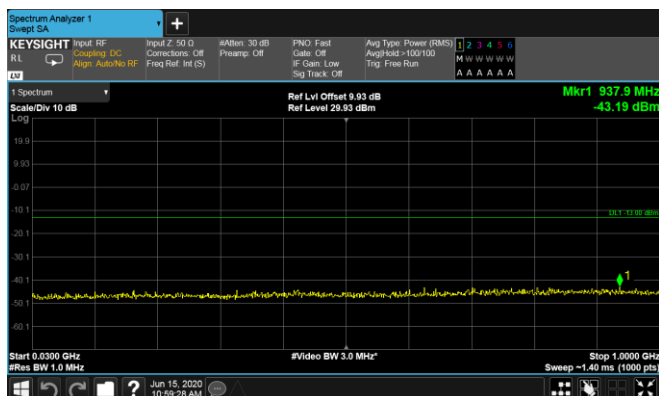
WCDMA 1900-LCH



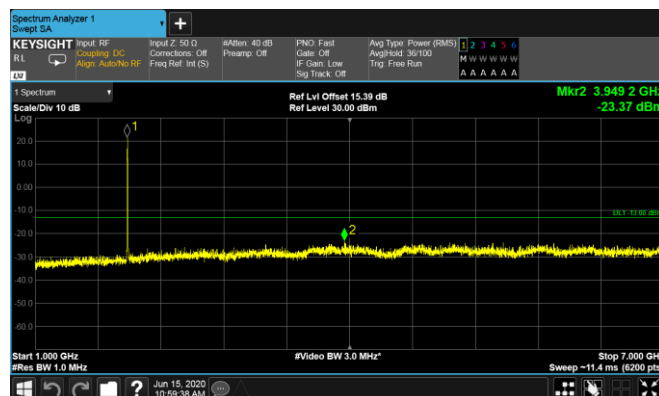
WCDMA 1900-LCH



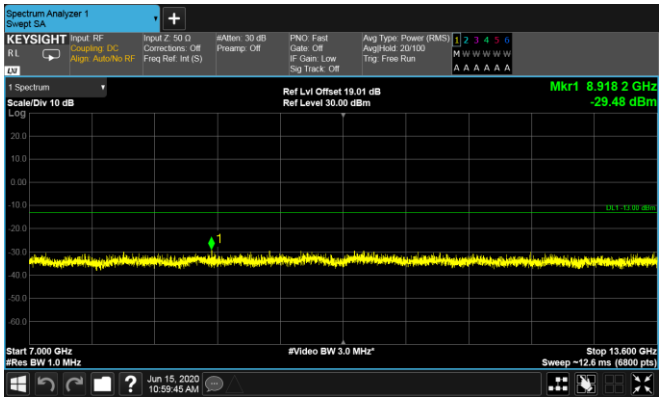
WCDMA 1900-MCH



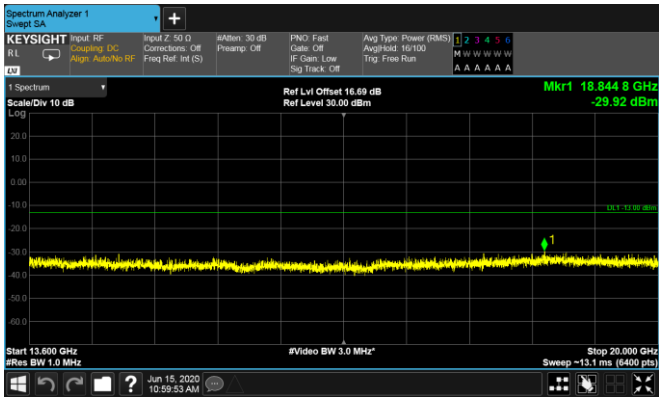
WCDMA 1900-MCH



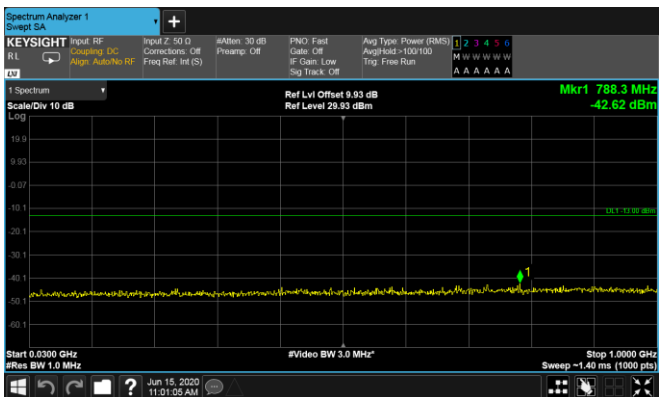
WCDMA 1900-MCH



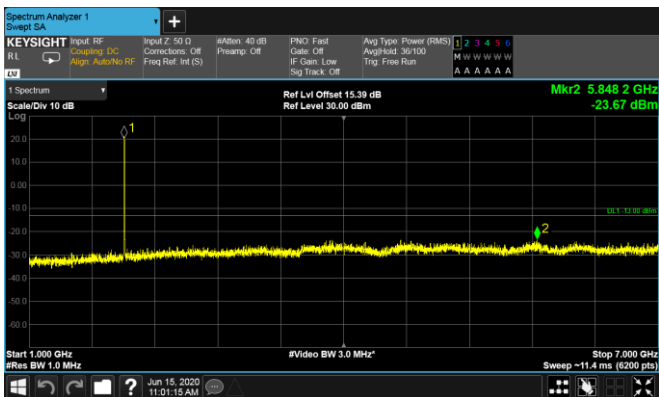
WCDMA 1900-MCH

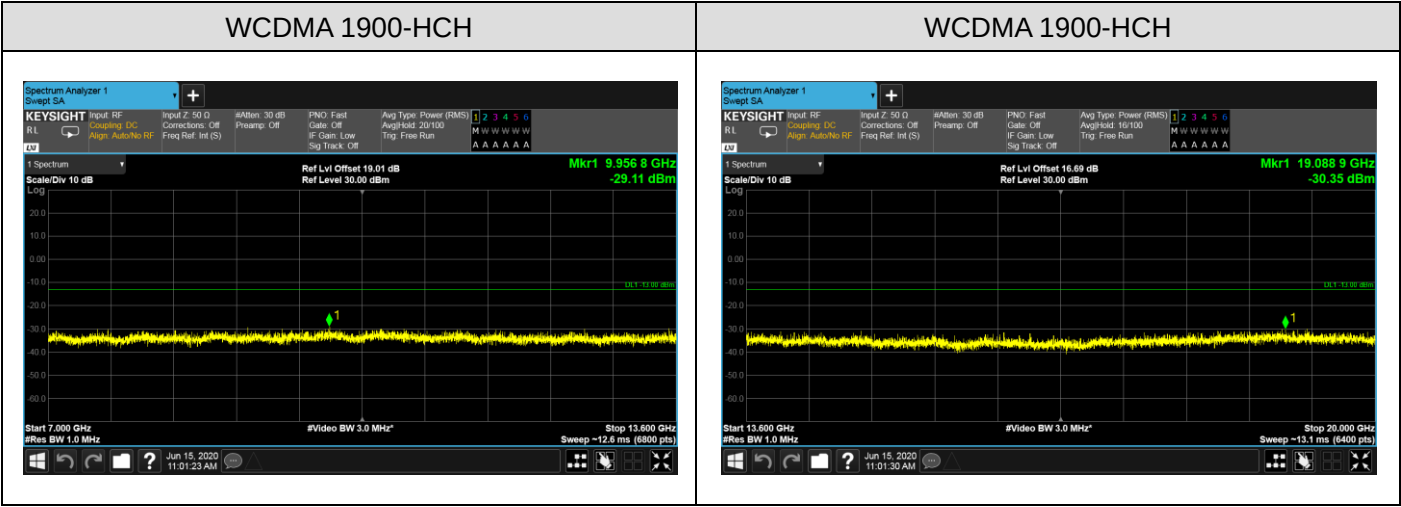


WCDMA 1900-HCH



WCDMA 1900-HCH





Note:1. Below 30MHZ no Spurious found and Above is the worst mode data.
2. As no emission found in standby or receive mode, no recording in this report.

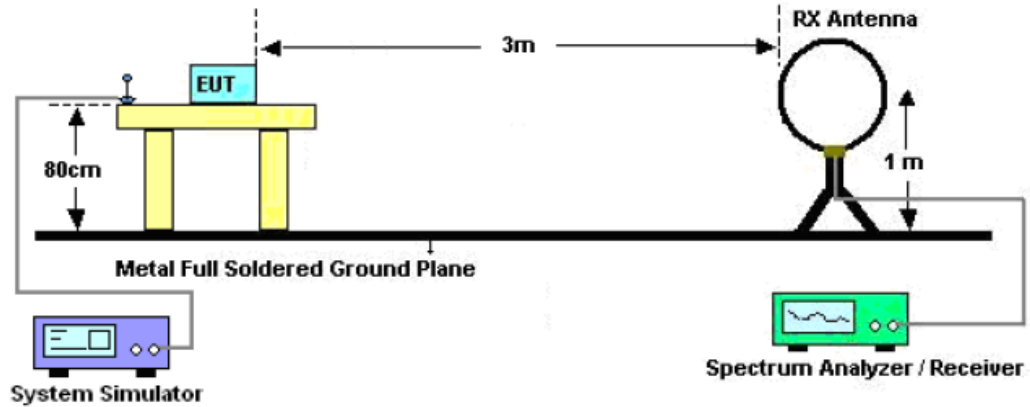
9.2 RADIATED SPURIOUS EMISSION

9.2.1 MEASUREMENT METHOD

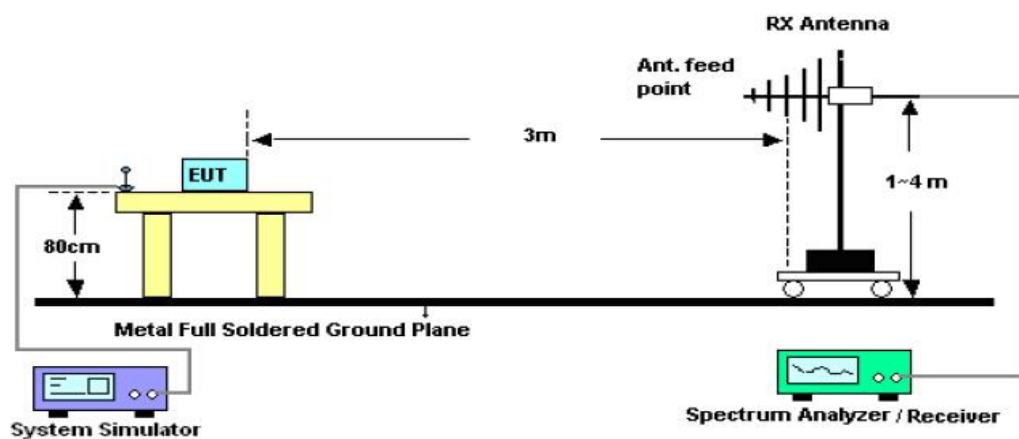
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

9.2.2 TEST SETUP

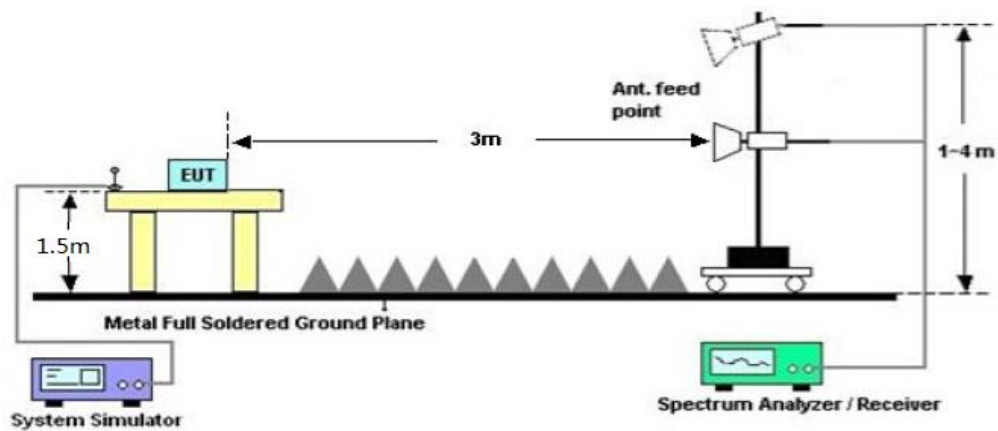
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



9.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least $43+10\log(P)$ dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

9.2.4 MEASUREMENT RESULT

GSM 850:

The Worst Test Results for Channel 251/848.8 MHz				
Frequency	Emission Level	Limits	Margin	Comment
(MHz)	(dBm)	(dBm)	(dB)	
1697.60	-55.00	-13	-42.00	Horizontal
3546.40	-52.48	-13	-39.48	Horizontal
5395.20	-49.80	-13	-36.80	Horizontal
1697.60	-52.97	-13	-39.97	Vertical
2694.36	-53.26	-13	-40.26	Vertical
5214.58	-49.52	-13	-36.52	Vertical

PCS 1900:

The Worst Test Results for Channel 810/1909.8MHz				
Frequency	Emission Level	Limits	Margin	Comment
(MHz)	(dBm)	(dBm)	(dB)	
1758.61	-53.52	-13	-40.52	Horizontal
3819.60	-54.60	-13	-41.60	Horizontal
6147.52	-52.53	-13	-39.53	Horizontal
1869.74	-53.30	-13	-40.30	Vertical
3819.60	-54.69	-13	-41.69	Vertical
5001.52	-52.79	-13	-39.79	Vertical

HSPA band II:

The Worst Test Results for Channel 9538/1907.6MHz				
Frequency	Emission Level	Limits	Margin	Comment
(MHz)	(dBm)	(dBm)	(dB)	
1368.42	-51.09	-13	-38.09	Horizontal
3815.20	-49.17	-13	-36.17	Horizontal
6748.41	-47.56	-13	-34.56	Horizontal
1678.92	-49.04	-13	-36.04	Vertical
3815.20	-49.00	-13	-36.00	Vertical
7116.28	-46.95	-13	-33.95	Vertical

HSPA band V:

The Worst Test Results for Channel 4233/846.6MHz				
Frequency	Emission Level	Limits	Margin	Comment
(MHz)	(dBm)	(dBm)	(dB)	
1693.20	-51.72	-13	-38.72	Horizontal
3695.54	-50.89	-13	-37.89	Horizontal
6771.42	-51.06	-13	-38.06	Horizontal
1693.20	-52.37	-13	-39.37	Vertical
3691.54	-49.48	-13	-36.48	Vertical
5846.34	-49.10	-13	-36.10	Vertical

RESULT: PASS

Note:

1. Margin = Emission Level -Limit
2. Below 30MHZ no Spurious found and Above is the worst mode data

10. FREQUENCY STABILITY

10.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

- 1 Measure the carrier frequency at room temperature.
- 2 Subject the EUT to overnight soak at -10°C.
- 3 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
- 4 Repeat the above measurements at 10°C increments from -10°C to +40°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
- 5 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
- 6 Subject the EUT to overnight soak at +40°C.
- 7 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
- 8 Repeat the above measurements at 10°C increments from +40°C to -10°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
- 9 At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

10.2 PROVISIONS APPLICABLE

10.2.1 FOR HAND CARRIED BATTERY POWERED EQUIPMENT

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.27 VDC and 4.40VDC, with a nominal voltage of 3.85 VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

10.2.2 FOR EQUIPMENT POWERED BY PRIMARY SUPPLY VOLTAGE

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.

10.3 MEASUREMENT RESULT

Test Results

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.(V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	GSM	LCH	TN	VL	11.43	0.013868	±2.5	PASS
			TN	VN	9.94	0.012060	±2.5	PASS
			TN	VH	12.40	0.015045	±2.5	PASS
		MCH	TN	VL	9.56	0.011427	±2.5	PASS
			TN	VN	13.11	0.015671	±2.5	PASS
			TN	VH	12.01	0.014356	±2.5	PASS
		HCH	TN	VL	14.08	0.016588	±2.5	PASS
			TN	VN	12.53	0.014762	±2.5	PASS
			TN	VH	13.24	0.015598	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.(V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	EGPRS	LCH	TN	VL	16.01	0.019425	±2.5	PASS
			TN	VN	17.24	0.020917	±2.5	PASS
			TN	VH	16.69	0.020250	±2.5	PASS
		MCH	TN	VL	17.60	0.021038	±2.5	PASS
			TN	VN	16.69	0.019950	±2.5	PASS
			TN	VH	17.47	0.020882	±2.5	PASS
		HCH	TN	VL	17.24	0.020311	±2.5	PASS
			TN	VN	19.21	0.022632	±2.5	PASS
			TN	VH	17.14	0.020193	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt. (V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
PCS1900	GSM	LCH	TN	VL	19.11	0.010329	PASS
			TN	VN	16.66	0.009004	PASS
			TN	VH	16.79	0.009075	PASS
		MCH	TN	VL	18.60	0.009894	PASS
			TN	VN	19.31	0.010271	PASS
			TN	VH	20.28	0.010787	PASS
		HCH	TN	VL	15.30	0.008011	PASS
			TN	VN	17.89	0.009367	PASS
			TN	VH	15.95	0.008352	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt. (V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
GSM1900	EGPRS	LCH	TN	VL	24.15	0.013053	PASS
			TN	VN	28.83	0.015582	PASS
			TN	VH	27.48	0.014852	PASS
		MCH	TN	VL	21.57	0.011473	PASS
			TN	VN	24.83	0.013207	PASS
			TN	VH	26.96	0.014340	PASS
		HCH	TN	VL	21.57	0.011294	PASS
			TN	VN	22.44	0.011750	PASS
			TN	VH	23.44	0.012274	PASS

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	GSM	LCH	VN	-10	13.82	0.016768	±2.5	PASS
			VN	0	11.69	0.014183	±2.5	PASS
			VN	10	11.17	0.013553	±2.5	PASS
			VN	20	9.69	0.011757	±2.5	PASS
			VN	30	10.59	0.012849	±2.5	PASS
			VN	40	14.53	0.017629	±2.5	PASS
GSM850	GSM	MCH	VN	-10	14.66	0.017523	±2.5	PASS
			VN	0	10.40	0.012431	±2.5	PASS
			VN	10	13.17	0.015742	±2.5	PASS
			VN	20	12.72	0.015204	±2.5	PASS
			VN	30	12.40	0.014822	±2.5	PASS
			VN	40	11.69	0.013973	±2.5	PASS
GSM850	GSM	HCH	VN	-10	14.33	0.016883	±2.5	PASS
			VN	0	12.53	0.014762	±2.5	PASS
			VN	10	14.14	0.016659	±2.5	PASS
			VN	20	12.53	0.014762	±2.5	PASS
			VN	30	12.91	0.015210	±2.5	PASS
			VN	40	13.30	0.015669	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GSM850	EGPRS	LCH	VN	-10	26.25	0.031849	±2.5	PASS
			VN	0	25.83	0.031339	±2.5	PASS
			VN	10	21.50	0.026086	±2.5	PASS
			VN	20	21.21	0.025734	±2.5	PASS
			VN	30	19.79	0.024011	±2.5	PASS
			VN	40	23.05	0.027967	±2.5	PASS
GSM850	EGPRS	MCH	VN	-10	20.66	0.024695	±2.5	PASS
			VN	0	15.21	0.018181	±2.5	PASS
			VN	10	20.50	0.024504	±2.5	PASS
			VN	20	17.18	0.020536	±2.5	PASS
			VN	30	20.11	0.024038	±2.5	PASS
			VN	40	17.69	0.021145	±2.5	PASS
GSM850	EGPRS	HCH	VN	-10	19.50	0.022974	±2.5	PASS
			VN	0	17.05	0.020087	±2.5	PASS
			VN	10	17.72	0.020877	±2.5	PASS
			VN	20	20.28	0.023893	±2.5	PASS
			VN	30	16.95	0.019969	±2.5	PASS
			VN	40	17.63	0.020770	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
PCS1900	GSM	LCH	VN	-10	15.11	0.008167	PASS
			VN	0	18.60	0.010053	PASS
			VN	10	16.47	0.008902	PASS
			VN	20	18.08	0.009772	PASS
			VN	30	16.79	0.009075	PASS
			VN	40	17.18	0.009285	PASS
PCS1900	GSM	MCH	VN	-10	20.28	0.010787	PASS
			VN	0	14.85	0.007899	PASS
			VN	10	18.08	0.009617	PASS
			VN	20	15.17	0.008069	PASS
			VN	30	19.18	0.010202	PASS
			VN	40	20.92	0.011128	PASS
PCS1900	GSM	HCH	VN	-10	16.08	0.008420	PASS
			VN	0	14.92	0.007812	PASS
			VN	10	15.63	0.008184	PASS
			VN	20	14.98	0.007844	PASS
			VN	30	12.40	0.006493	PASS
			VN	40	15.69	0.008216	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
GSM1900	EGPRS	LCH	VN	-10	48.49	0.026208	PASS
			VN	0	46.81	0.025300	PASS
			VN	10	45.43	0.024554	PASS
			VN	20	41.36	0.022354	PASS
			VN	30	38.23	0.020663	PASS
			VN	40	34.80	0.018809	PASS
GSM1900	EGPRS	MCH	VN	-10	31.87	0.016952	PASS
			VN	0	14.40	0.007660	PASS
			VN	10	32.16	0.017106	PASS
			VN	20	29.15	0.015505	PASS
			VN	30	28.35	0.015080	PASS
			VN	40	28.80	0.015319	PASS
GSM1900	EGPRS	HCH	VN	-10	28.51	0.014928	PASS
			VN	0	19.66	0.010294	PASS
			VN	10	18.40	0.009635	PASS
			VN	20	25.05	0.013117	PASS
			VN	30	28.06	0.014693	PASS
			VN	40	22.66	0.011865	PASS

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.(V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA850	UMTS	LCH	TN	VL	-10.53	-0.01	±2.5	PASS
			TN	VN	-13.28	-0.02	±2.5	PASS
			TN	VH	-8.83	-0.01	±2.5	PASS
		MCH	TN	VL	-13.46	-0.02	±2.5	PASS
			TN	VN	-12.01	-0.01	±2.5	PASS
			TN	VH	-11.69	-0.01	±2.5	PASS
		HCH	TN	VL	-16.02	-0.02	±2.5	PASS
			TN	VN	-5.91	-0.01	±2.5	PASS
			TN	VH	-9.98	-0.01	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.(V)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
WCDMA1900	UMTS	LCH	TN	VL	-19.73	-0.01	PASS
			TN	VN	-12.88	-0.01	PASS
			TN	VH	-19.97	-0.01	PASS
		MCH	TN	VL	-18.04	-0.01	PASS
			TN	VN	-19.27	-0.01	PASS
			TN	VH	-19.27	-0.01	PASS
		HCH	TN	VL	-18.17	-0.01	PASS
			TN	VN	-16.75	-0.01	PASS
			TN	VH	-22.66	-0.01	PASS

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA850	UMTS	LCH	VN	-10	-9.95	-0.01	±2.5	PASS
			VN	0	-12.25	-0.01	±2.5	PASS
			VN	10	-15.79	-0.02	±2.5	PASS
			VN	20	-9.38	-0.01	±2.5	PASS
			VN	30	-7.40	-0.01	±2.5	PASS
			VN	40	-14.47	-0.02	±2.5	PASS
WCDMA850	UMTS	MCH	VN	-10	-6.09	-0.01	±2.5	PASS
			VN	0	-15.43	-0.02	±2.5	PASS
			VN	10	-12.59	-0.02	±2.5	PASS
			VN	20	-8.33	-0.01	±2.5	PASS
			VN	30	-10.96	-0.01	±2.5	PASS
			VN	40	-15.26	-0.02	±2.5	PASS
WCDMA850	UMTS	HCH	VN	-10	-11.75	-0.01	±2.5	PASS
			VN	0	-8.77	-0.01	±2.5	PASS
			VN	10	-9.96	-0.01	±2.5	PASS
			VN	20	-8.35	-0.01	±2.5	PASS
			VN	30	-8.79	-0.01	±2.5	PASS
			VN	40	-5.69	-0.01	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Tem. (°C)	Freq.Error (Hz)	Freq.vs.rated (ppm)	Verdict
WCDMA1900	UMTS	LCH	VN	-10	-20.98	-0.01	PASS
			VN	0	-20.92	-0.01	PASS
			VN	10	-14.34	-0.01	PASS
			VN	20	-15.46	-0.01	PASS
			VN	30	-19.70	-0.01	PASS
			VN	40	-19.96	-0.01	PASS
WCDMA1900	UMTS	MCH	VN	-10	-6.12	0.00	PASS
			VN	0	-17.73	-0.01	PASS
			VN	10	-16.82	-0.01	PASS
			VN	20	-10.36	-0.01	PASS
			VN	30	-20.16	-0.01	PASS
			VN	40	-22.16	-0.01	PASS
WCDMA1900	UMTS	HCH	VN	-10	-19.74	-0.01	PASS
			VN	0	-20.19	-0.01	PASS
			VN	10	-24.44	-0.01	PASS
			VN	20	-17.44	-0.01	PASS
			VN	30	-11.93	-0.01	PASS
			VN	40	-10.60	-0.01	PASS

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION



RADIATED SPURIOUS ABOVE 1G EMISSION



----END OF REPORT----