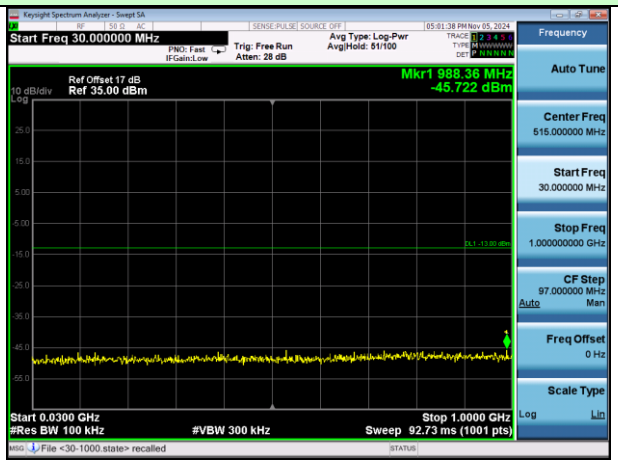
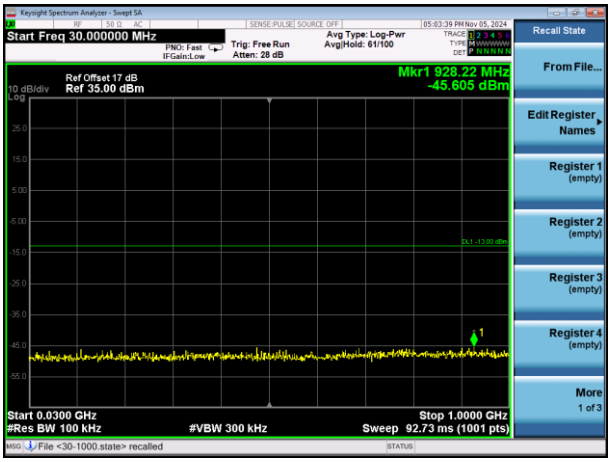
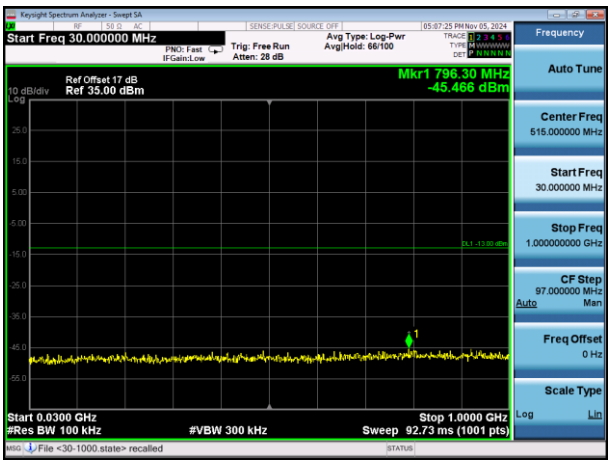
Test Mode: Traffic mode	PCS1900 (EGPRS 1 link)



Lowest channel

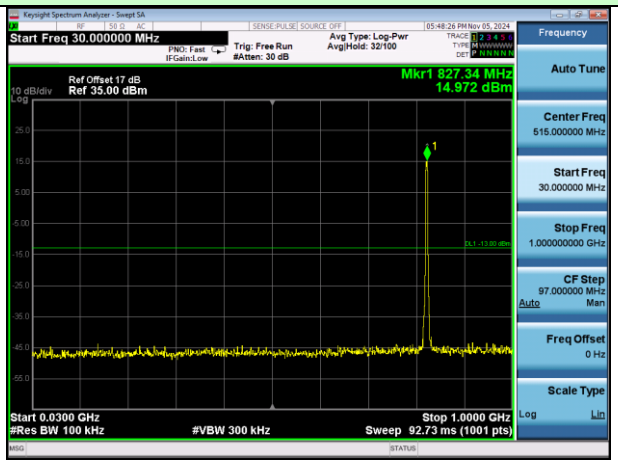


Middle channel

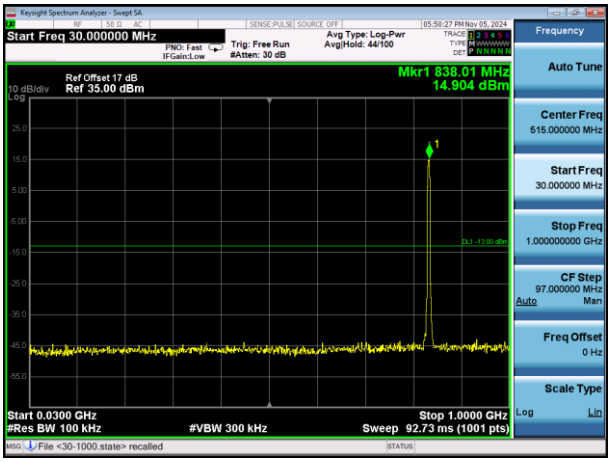


Highest channel

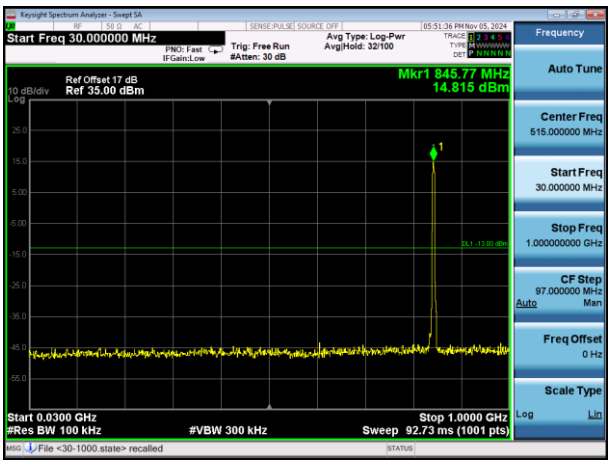
Test Mode: Traffic mode	WCDMA Band V (RMC 12.2Kbps link)



Lowest channel

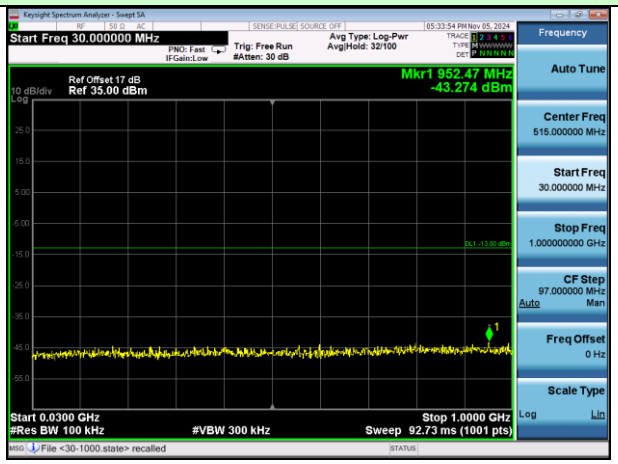


Middle channel

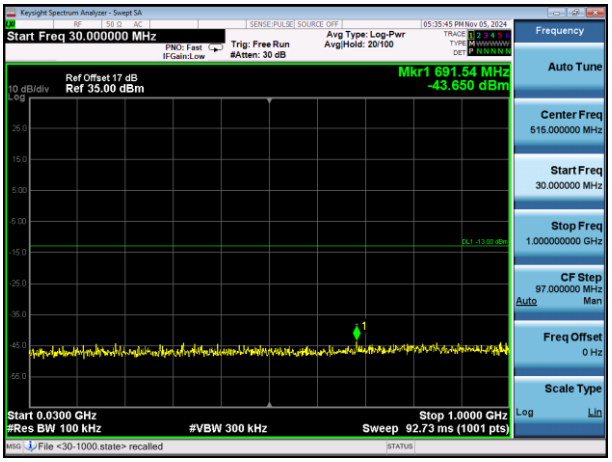


Highest channel

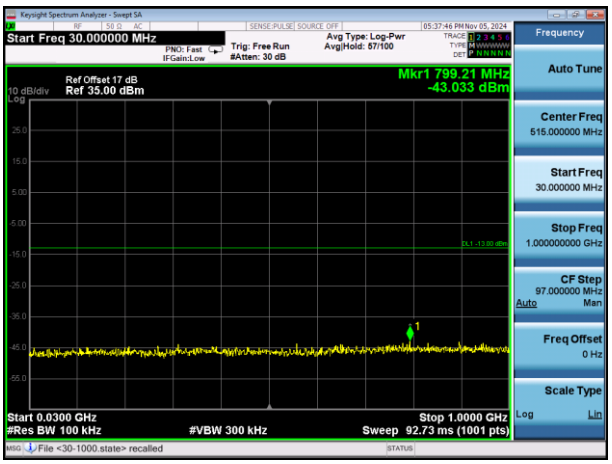
Test Mode: Traffic mode	WCDMA Band II (RMC 12.2Kbps link)



Lowest channel

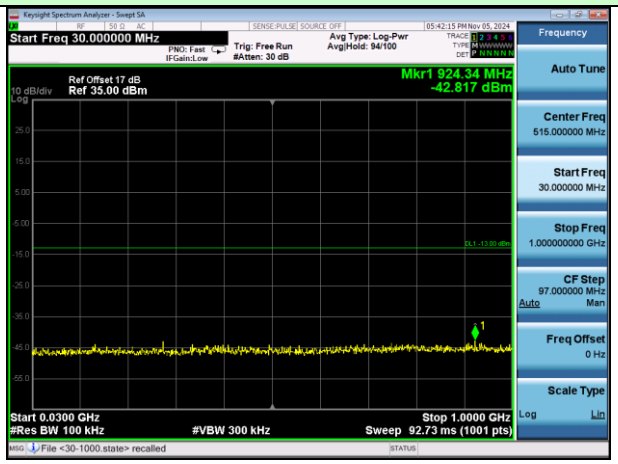


Middle channel

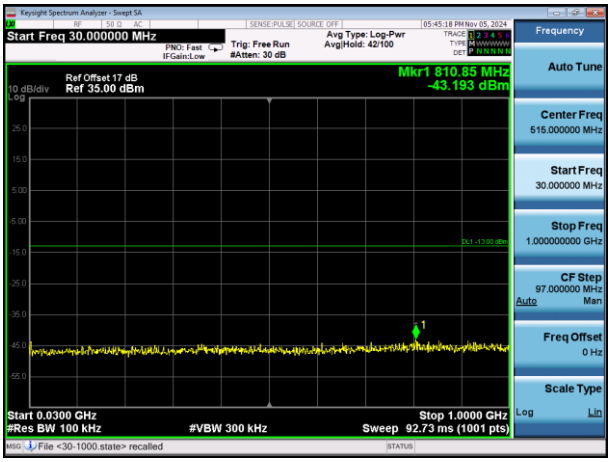


Highest channel

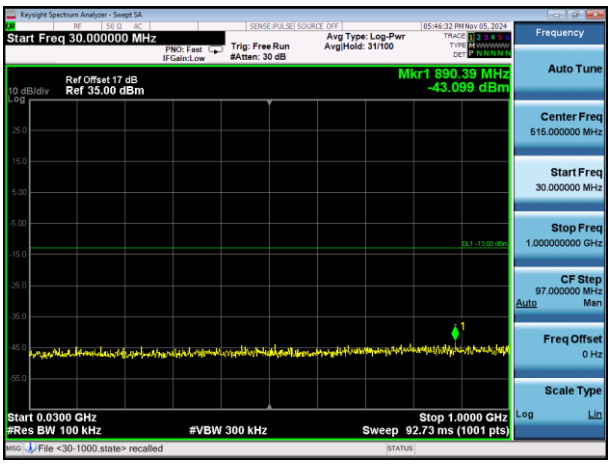
Test Mode: Traffic mode	WCDMA Band IV (RMC 12.2Kbps link)



Lowest channel



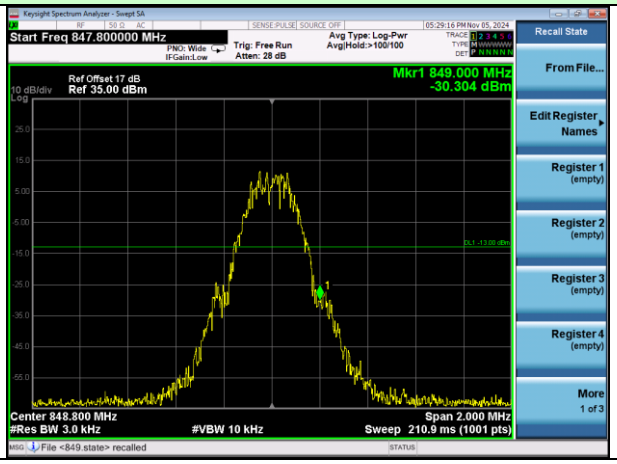
Middle channel

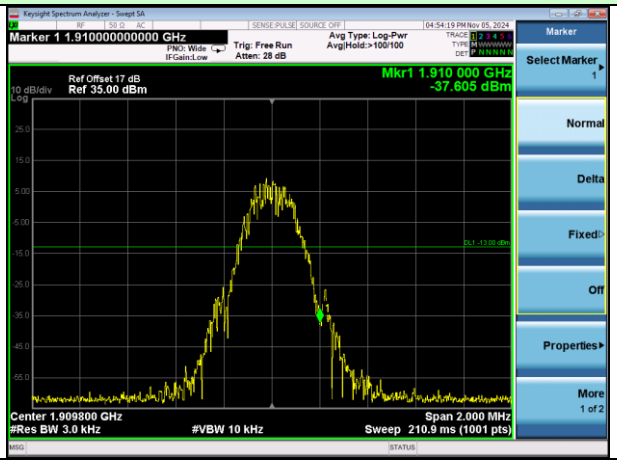


Highest channel

Band Edge:

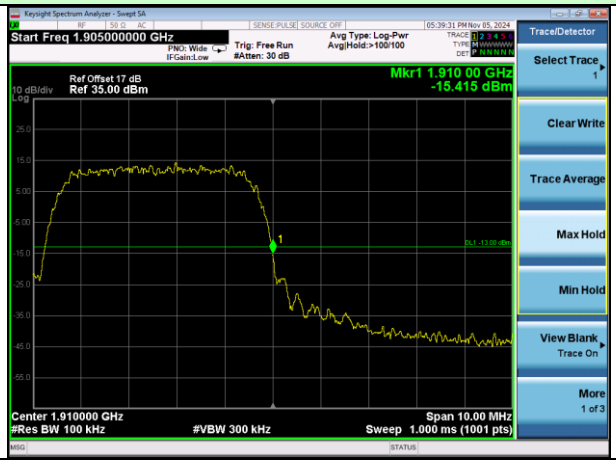
Test Mode: Traffic mode	GSM850 (GPRS 1 link)
Lowest channel	Highest channel

Test Mode: Traffic mode	GSM850 (EGPRS 1 link)
	
Lowest channel	Highest channel

Test Mode: Traffic mode	PCS1900 (GPRS 1 link)
	
Lowest channel	Highest channel

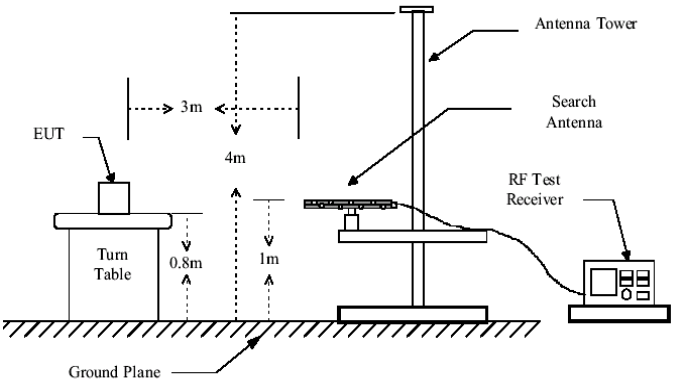
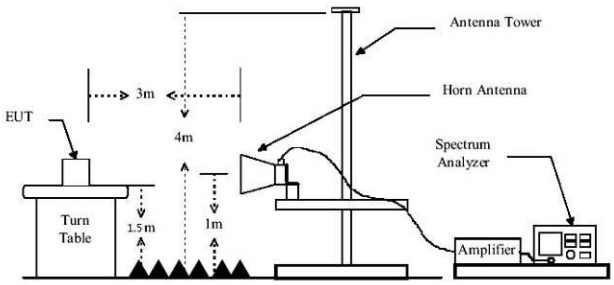
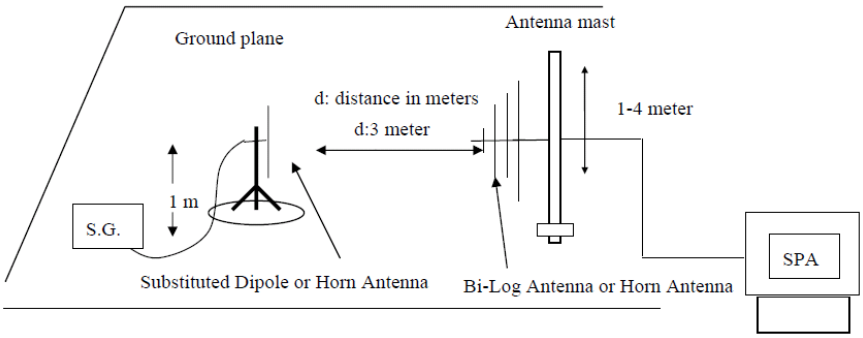
Test Mode: Traffic mode	PCS1900 (EGPRS 1 link)
Lowest channel	Highest channel

Test Mode: Traffic mode	WCDMA Band V (RMC 12.2Kbps link)
Lowest channel	Highest channel

Test Mode: Traffic mode	WCDMA Band II (RMC 12.2Kbps link)
	
Lowest channel	Highest channel

Test Mode: Traffic mode	WCDMA Band IV (RMC 12.2Kbps link)
Lowest channel	Highest channel

4.8 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b) , Part 27.54(h)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W WCDMA Band IV: 1W
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. 3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	26.86	38.45	Pass
			H	25.00		
		E1	V	27.12		
			H	25.55		
		E2	V	27.26		
			H	26.00		
	Middle	H	V	**27.95**	38.45	Pass
			H	25.29		
		E1	V	26.97		
			H	25.05		
		E2	V	26.48		
			H	25.16		
	Highest	H	V	27.17	38.45	Pass
			H	25.84		
		E1	V	26.85		
			H	24.83		
		E2	V	27.82		
			H	25.21		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (EGPRS 1 link)	Lowest	H	V	24.98	38.45	Pass
			H	23.01		
		E1	V	25.62		
			H	23.84		
		E2	V	25.41		
			H	24.02		
	Middle	H	V	25.52	38.45	Pass
			H	23.26		
		E1	V	25.45		
			H	23.68		
		E2	V	24.86		
			H	23.16		
	Highest	H	V	25.53	38.45	Pass
			H	23.82		
		E1	V	25.41		
			H	23.09		
		E2	V	**25.99**		
			H	23.41		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	29.75	33.01	Pass
			H	25.59		
		E1	V	29.63		
			H	26.45		
		E2	V	29.85		
			H	26.60		
	Middle	H	V	**30.00**	33.01	Pass
			H	26.93		
		E1	V	29.88		
			H	26.81		
		E2	V	29.24		
			H	27.40		
	Highest	H	V	29.85	33.01	Pass
			H	26.15		
		E1	V	29.09		
			H	26.18		
		E2	V	29.39		
			H	26.70		

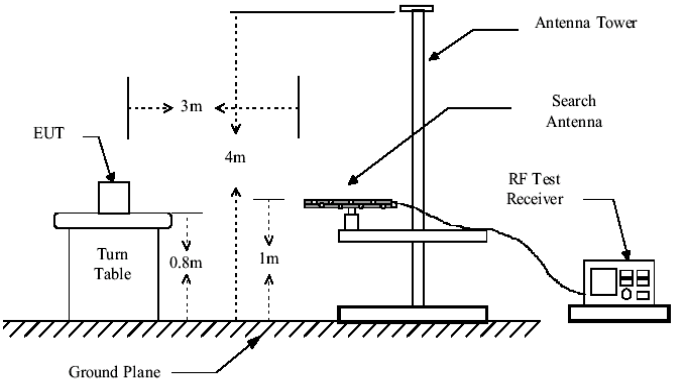
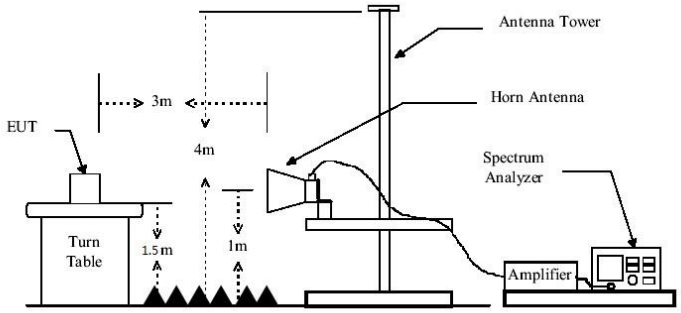
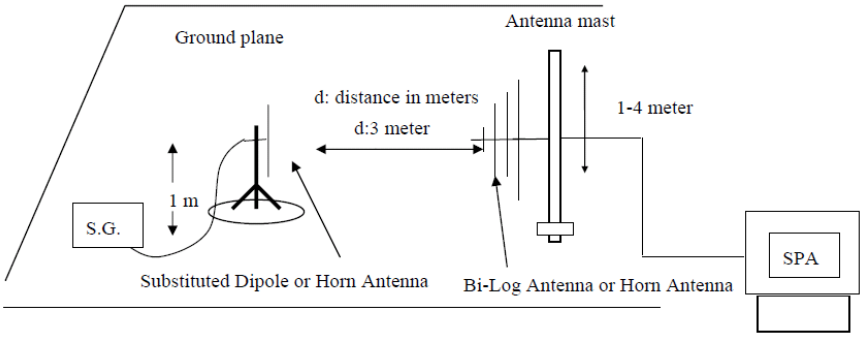
EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (EGPRS 1 link)	Lowest	H	V	26.93	33.01	Pass
			H	23.76		
		E1	V	27.03		
			H	24.64		
		E2	V	27.56		
			H	24.16		
	Middle	H	V	27.39	33.01	Pass
			H	24.61		
		E1	V	**27.66**		
			H	24.67		
		E2	V	27.03		
			H	25.04		
	Highest	H	V	27.57	33.01	Pass
			H	24.08		
		E1	V	27.26		
			H	24.32		
		E2	V	26.96		
			H	24.95		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
WCDMA Band V	Lowest	H	V	20.58	38.45	Pass
			H	20.43		
		E1	V	20.19		
			H	20.44		
		E2	V	20.89		
			H	20.34		
	Middle	H	V	20.81	38.45	Pass
			H	20.44		
		E1	V	**21.60**		
			H	20.12		
		E2	V	20.93		
			H	20.35		
	Highest	H	V	21.15	38.45	Pass
			H	19.51		
		E1	V	20.71		
			H	20.39		
		E2	V	21.08		
			H	20.30		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band II	Lowest	H	V	**21.56**	33.01	Pass
			H	20.74		
		E1	V	21.19		
			H	20.30		
		E2	V	21.43		
			H	20.59		
	Middle	H	V	20.58	33.01	Pass
			H	19.75		
		E1	V	20.97		
			H	20.71		
		E2	V	21.06		
			H	20.13		
	Highest	H	V	21.00	33.01	Pass
			H	20.14		
		E1	V	20.71		
			H	20.18		
		E2	V	20.84		
			H	19.69		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band IV	Lowest	H	V	**23.36**	33.01	Pass
			H	22.15		
		E1	V	21.84		
			H	21.76		
		E2	V	21.93		
			H	22.47		
	Middle	H	V	22.14	33.01	Pass
			H	22.08		
		E1	V	21.87		
			H	21.64		
		E2	V	21.38		
			H	20.96		
	Highest	H	V	21.81	33.01	Pass
			H	21.24		
		E1	V	21.77		
			H	21.61		
		E2	V	21.37		
			H	22.60		

4.9 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a), Part 27.54(h)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

Test mode:	GPRS850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.58	V	-38.61	-13.00	Pass
2546.53	V	-34.64		
3395.09	V	-32.66		
4243.91	V	-32.12		
5092.88	V	-30.19		
1697.58	H	-38.15	-13.00	Pass
2546.38	H	-33.51		
3395.18	H	-32.57		
4243.61	H	-31.84		
5092.89	H	-29.49		
Test mode:	**EGPRS850**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.29	V	-38.21	-13.00	Pass
2546.43	V	-34.79		
3395.30	V	-32.78		
4243.62	V	-32.02		
5092.54	V	-30.39		
1697.43	H	-37.83	-13.00	Pass
2546.25	H	-34.04		
3395.05	H	-32.47		
4243.62	H	-31.96		
5092.53	H	-30.08		

Remark：

1. The emission behaviour belongs to narrowband spurious emission.
2. The above table only shows the worst case channel of each mode.
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	GPRS1900		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.71	V	-38.51	-13.00	Pass
5729.23	V	-35.07		
7639.23	V	-32.32		
9548.69	V	-32.17		
11458.61	V	-30.46		
3819.29	H	-38.17	-13.00	Pass
5729.19	H	-33.80		
7639.07	H	-32.47		
9548.80	H	-31.71		
11458.72	H	-29.54		
Test mode:	**EGPRS1900**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.54	V	-38.34	-13.00	Pass
5729.39	V	-34.87		
7639.27	V	-32.64		
9548.90	V	-32.15		
11458.85	V	-30.20		
3819.71	H	-37.81	-13.00	Pass
5729.47	H	-34.06		
7639.22	H	-32.25		
9549.02	H	-32.01		
11458.45	H	-29.99		

Remark：

1. The emission behaviour belongs to narrowband spurious emission.
2. The above table only shows the worst case channel of each mode.
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	WCDMA Band V		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.27	V	-38.48	-13.00	Pass
2539.54	V	-34.84		
3386.52	V	-32.78		
4233.11	V	-32.10		
5079.49	V	-30.24		
1693.37	H	-38.08	-13.00	Pass
2539.51	H	-33.95		
3386.21	H	-32.38		
4233.00	H	-32.01		
5079.62	H	-29.34		
Test mode:	**WCDMA Band V**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1672.52	V	-38.17	-13.00	Pass
2508.94	V	-34.92		
3345.21	V	-32.58		
4181.82	V	-31.98		
5018.12	V	-29.94		
1672.66	H	-38.18	-13.00	Pass
2509.28	H	-33.98		
3345.40	H	-32.32		
4181.68	H	-32.09		
5018.18	H	-29.80		
Test mode:	**WCDMA Band V**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.18	V	-38.39	-13.00	Pass
2539.64	V	-35.77		
3386.08	V	-35.38		
4233.19	V	-32.18		
5079.22	V	-29.94		
1693.37	H	-39.10	-13.00	Pass
2539.75	H	-37.15		
3386.16	H	-34.57		
4233.19	H	-33.11		
5079.47	H	-29.87		

Remark：

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	WCDMA Band II		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.49	V	-38.45	-13.00	Pass
5557.34	V	-34.92		
7409.44	V	-32.59		
9261.65	V	-32.25		
11114.02	V	-30.45		
3704.57	H	-37.98	-13.00	Pass
5556.98	H	-33.86		
7409.60	H	-32.35		
9261.67	H	-31.99		
11114.37	H	-29.72		
Test mode:	**WCDMA Band II**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3759.96	V	-38.01	-13.00	Pass
5639.96	V	-35.00		
7520.14	V	-32.64		
9400.07	V	-32.09		
11279.71	V	-30.31		
3759.73	H	-37.80	-13.00	Pass
5639.95	H	-33.97		
7520.11	H	-32.20		
9400.17	H	-32.23		
11280.19	H	-30.16		
Test mode:	**WCDMA Band II**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3814.84	V	-38.38	-13.00	Pass
5722.71	V	-35.93		
7630.03	V	-35.20		
9537.77	V	-32.52		
11445.20	V	-29.73		
3815.29	H	-38.95	-13.00	Pass
5722.42	H	-37.11		
7630.00	H	-35.00		
9537.76	H	-33.07		
11445.33	H	-29.75		

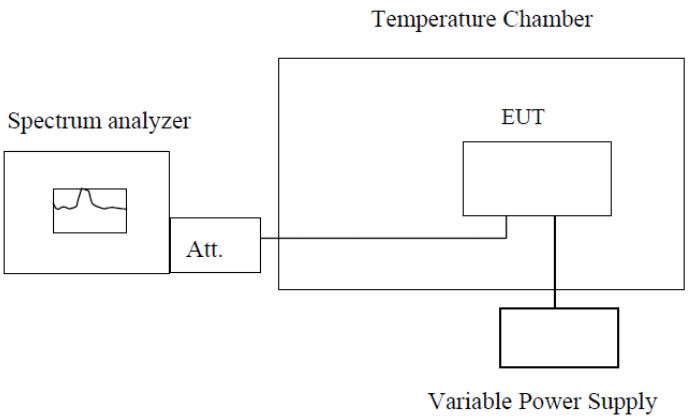
Remark：

1. The emission behaviour belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	WCDMA Band IV		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3424.97	V	-38.32	-13.00	Pass
5136.82	V	-34.64		
6849.62	V	-32.76		
8561.67	V	-32.07		
10274.53	V	-30.37		
3424.89	H	-38.21	-13.00	Pass
5137.18	H	-33.77		
6849.35	H	-32.43		
8562.12	H	-32.13		
10274.51	H	-29.60		
Test mode:	**WCDMA Band IV**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3464.52	V	-37.90	-13.00	Pass
5196.87	V	-34.92		
6929.27	V	-32.74		
8662.01	V	-32.16		
10394.08	V	-29.98		
3464.57	H	-37.95	-13.00	Pass
5196.94	H	-34.32		
6929.48	H	-32.39		
8661.83	H	-32.00		
10394.35	H	-30.20		
Test mode:	**WCDMA Band IV**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3505.27	V	-38.60	-13.00	Pass
5257.79	V	-35.74		
7010.56	V	-35.56		
8762.94	V	-32.57		
10515.46	V	-29.99		
3505.35	H	-38.66	-13.00	Pass
5257.47	H	-36.98		
7010.08	H	-34.85		
8762.65	H	-32.78		
10515.20	H	-29.66		

Remark：
1. The emission behaviour belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

4.10 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20	9	0.0108	2.5	Pass
	-10	8	0.0096		
	0	7	0.0084		
	10	3	0.0036		
	20	16	0.0191		
	30	11	0.0131		
	40	2	0.0024		
	50	4	0.0048		
	60	11	0.0131		

Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20	5	0.0060	2.5	Pass
	-10	4	0.0048		
	0	10	0.0120		
	10	9	0.0108		
	20	22	0.0263		
	30	10	0.0120		
	40	3	0.0036		
	50	4	0.0048		
	60	16	0.0191		

Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.8	-20	10	0.0053	2.5	Pass
	-10	11	0.0059		
	0	5	0.0027		
	10	-36	-0.0191		
	20	15	0.0080		
	30	10	0.0053		
	40	-10	-0.0053		
	50	6	0.0032		
	60	12	0.0064		

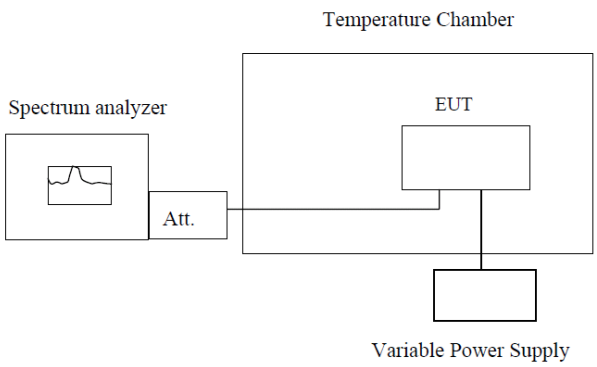
Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.8	-20	5	0.0027	2.5	Pass
	-10	7	0.0037		
	0	2	0.0011		
	10	-30	-0.0160		
	20	13	0.0069		
	30	11	0.0059		
	40	-10	-0.0053		
	50	0	0.0000		
	60	9	0.0048		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20	8	0.0096	2.5	Pass
	-10	8	0.0096		
	0	12	0.0143		
	10	4	0.0048		
	20	20	0.0239		
	30	11	0.0131		
	40	-1	-0.0012		
	50	4	0.0048		
	60	14	0.0167		

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20	6	0.0032	2.5	Pass
	-10	11	0.0059		
	0	1	0.0005		
	10	-33	-0.0176		
	20	13	0.0069		
	30	12	0.0064		
	40	-8	-0.0043		
	50	-1	-0.0005		
	60	12	0.0064		

Reference Frequency: WCDMA Band IV Middle channel=1450 channel=1740.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.8	-20	-6	-0.0034	2.5	Pass
	-10	-2	-0.0011		
	0	6	0.0034		
	10	-12	-0.0069		
	20	-6	-0.0034		
	30	-14	-0.0080		
	40	7	0.0040		
	50	0	0.0000		
	60	8	0.0046		

4.11 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	FCC Part2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/-15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

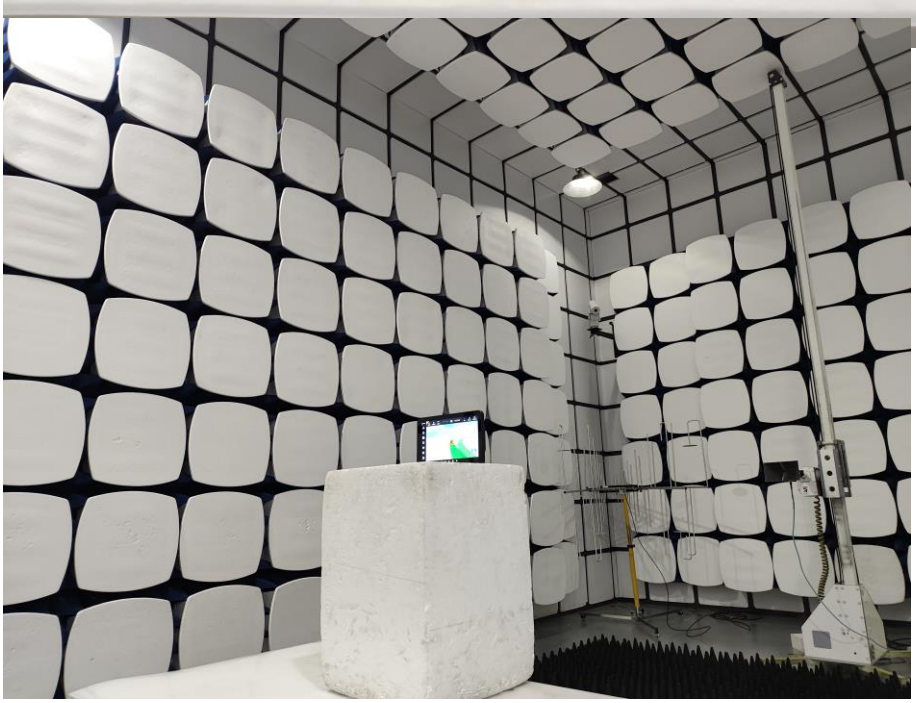
Measurement Data

Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	10	0.0120	2.5	Pass
	24	9	0.0108		
	9	5	0.0060		
Reference Frequency: GSM850 (EGPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	3	0.0036	2.5	Pass
	24	-2	-0.0024		
	9	12	0.0143		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	7	0.0037	2.5	Pass
	24	11	0.0059		
	9	7	0.0037		
Reference Frequency: PCS1900 (EGPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	-10	-0.0053	2.5	Pass
	24	0	0.0000		
	9	9	0.0048		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	6	0.0072	2.5	Pass
	24	17	0.0203		
	9	9	0.0108		
Reference Frequency: WCDMA Band II Middle channel=940 channel=1880.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	11	0.0059	2.5	Pass
	24	-6	-0.0032		
	9	5	0.0027		
Reference Frequency: WCDMA Band IV Middle channel=1450 channel=1740.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	24	9	0.0052	2.5	Pass
	24	-16	-0.0092		
	9	-6	-0.0034		

5 Test Setup Photo

Radiated Emission



-------END OF REPORT-------