EMC
TEST REPORT

Report No. : EME-010936
Model No. : T7406
Issued Date : Dec. 5, 2001

Applicant : Tecom Co., Ltd.
23, R&D Road 2, Science-Based Industrial Park,
Hsin-chu, Taiwan, R.O.C.

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Ko-Tze-Nan Chia-Tung Li, Shiang-Shan District,
Hsinchu, Taiwan, R.O.C.

Test Engineer

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Approved By

J. T. CHEN
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1. General information

1.1 Identification of the EUT

Manufacturer	: Tecom Co., Ltd.
Product	: Cordless phone
Model No.	: T7406
FCC ID.	: D6XT7406
Frequency Bands	: Half of the 900 MHz ISM band: either 902 to 915 MHz or 915.1 to 928 MHz Lower band: 902~915MHz Upper band: 915.1~928MHz
Channel Number	: The lower band is from channel 1 through 25, and the upper band is from channel 30 through 54.
Frequency of Each Channel	: Please refer to the section 3.3 Frequency Plan of Technical Specification (technical spec.pdf)
Hopping sequence	: Please refer to the section 3.4 Hopping sequence of Technical Specification (technical spec.pdf)
Type of Modulation	: FSK
Power Supply	: 3.6Vdc (Handset)/120Vac Adapter (Base)
Power Cord	: N/A
Sample Received	: Nov. 14, 2001
Test Date(s)	: Nov. 17, 2001 to Dec. 4, 2001

A DOC report has been generated for the client.

1.2 Additional information about the EUT

The T7406 is a Frequency Hopping Spread Spectrum (FHSS) cordless telephone. The benefits of this technology are: improved rage, robustness and, less susceptibility to interference, fading and multi-path. The use of a common wall-mounted base station for multiple handsets allows you to position the base antennas for maximum performance and coverage.

1.3 Technical description about the Receiver compliance with FCC 15.247 (a)(1)

The receiver architecture is dual down-conversion, with intermediate frequencies of 243.95 MHz and 10.7 MHz. The first conversion is performed in the RF front-end circuit, the second conversion is performed in the IF integrated circuit, which generates its own LO signal using a 19.2 MHz crystal oscillator. The bandwidth of the receiving channel is 480 KHz and the channel separation is about 480 KHz.

A ceramic band-pass filter has been used at the antenna port of the radio receiver front-end. Note that the filter also appears in the transmission signal path. The selected filter has excellent out-of-band rejection to eliminate undesired signals received at the antenna, and to reduce emissions other than the desired RF output during transmission. The EUT does not transmit and receive simultaneously.

As mentioned above in the receiver section, this final filter in the transmission chain is also shared with the receive chain. The selected filter has excellent out-of-band rejection to reduce undesired emissions.

For more detail features, please refer to Technical Specification (technical spec.pdf) and User's manual (Installation guide.pdf).

1.4 Peripherals equipment

1. PBX
   Product No. : NT7B58AB-93
   Serial No. : NNTM040E5DW4
   Manufacturer : NORTEL

2. PLUS Compact ICS
   MFG : 9836BE0294
   Serial No. : A0737352
   Manufacturer : NORTEL

3. Signal Cable: RJ11 Cat.3 cable length 10m ×3

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.207、§15.209 、§15.247 and ANSI C63.4/1992.

2.2 Operation mode

According to the test method which provided from manufacture to perform the all tests.
Power on base unit and peripherals, and connect three RJ11 Cat.3 cables to the PBX. Handset unit used a full charge battery to perform all the tests. The EUT was continuous transmit during the all tests.

Note: User can not disable the hopping function by themselves.

Input / output cables were draped along the edge of the test table and bundle when necessary.

2.3 Modifications required for compliance

No modification were installed during test performance to bring the product into compliance (Please note that this list does not include changes made specifically by Tecom Co., Ltd. Prior to compliance testing.)

2.4 Test equipment

Equipment	Brand	Frequency range	Model No.	Series No.	Cal.Date
EMI Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	825788/014	01/05/29
Pulse Limiter	Rohde & Schwarz	9kHz~30MHz	ESH3-Z2	848.766/052	N/A
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	100137	01/07/9
Horn Antenna	EMCO	1GHz~18GHz	3115	9906-5822	01/09/10
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	159	01/06/21
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	3111	01/06/21
Turn Table	HDGmbH	N/A	DS 420S	420/669/01	N/A
Antenna Tower	HDGmbH	N/A	MA 240	240/573	N/A
RF Power Meter	Boonton	10kHz~100GHz	4230	27003	01/06/12
Power Sensor	Boonton	30MHz~8GHz	51011-EMC	30395	01/06/12
Power Sensor	Boonton	30MHz~8GHz	51011-EMC	30417	01/06/12

Note:
1. The calibration interval of the above instruments is 12 months.

3. Modulated bandwidth test

3.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 60 %

3.2 Test setup & procedure

The maximum 20dB bandwidth per FCC §15.247(a)(1)(i) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100 kHz, the video bandwidth≧RBW, and the SPAN may equal to approximately 2 to 3 times the 20dB bandwidth. The test was performed at 3 channels (lowest, middle and highest channel). The maximum 20dB modulation bandwidth is in the following Table. See 20dB bandwidth plot.pdf

3.3 Measured data of modulated bandwidth test results

Base unit:

Channel	Frequency (MHz)	Bandwidth (KHz)	Limit
1	903.013	380	500kHz
25	913.989	380	500kHz
54	927.246	380	500kHz

＊ The EUT has its hopping function disable.

Handset unit:

Channel	Frequency (MHz)	Bandwidth (KHz)	Limit
1	903.024	384	500kHz
25	913.997	376	500kHz
54	927.254	376	500kHz

＊ The EUT has its hopping function disable.

4. Carrier frequency separation test

4.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 60 %

4.2 Test setup & procedure

The carrier frequency separation per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧1% of the span, the video bandwidth≧RBW, and the SPAN was wide enough to capture the peaks of two adjacent channels. The carrier frequency separation result is in the following Table. See carrier frequency separation plot.pdf

4.3 Measured data of carrier frequency separation test result

Base unit:

Channel	Frequency (MHz)	frequency separation (MHz)
1	903.0152	0.456
2	903.4712	

＊ The EUT has its hopping function enable.

Handset unit:

Channel	Frequency (MHz)	frequency separation (MHz)
1	903.0240	0.458
2	903.4820	

＊ The EUT has its hopping function enable.

Note: The measuring relative time at each hopping frequency were stated in section 6.0.

5. Number of hopping frequencies test

5.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 60 %

5.2 Test setup & procedure

The number of hopping frequencies per FCC § 15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at ≧1% of the span, the video bandwidth≧RBW, and the SPAN was the frequency band of operation. The carrier frequency separation result is in the following Table. See number of channels plot.pdf

5.3 Measured data of number of hopping frequencies test result

Base unit:

Operation Band	Frequency Range (MHz)	Number of hopping frequencies
lower	902~915	25
upper	915.1~928	25

＊ The EUT has its hopping function enable.

Handset unit:

Operation Band	Frequency Range (MHz)	Number of hopping frequencies
lower	902~915	25
upper	915.1~928	25

＊ The EUT has its hopping function enable.

6. Time of occupancy (Dwell time) test

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	60	%

6.2 Test setup & procedure

The time of occupancy (Dwell time) per FCC § 15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth≧RBW, and the zero span function of spectrum analyzer was enable. The EUT has its hopping function enable.

The time of occupancy (Dwell time) for base unit is 89 × 1.96ms = 174.44ms ＜0.4s in 10sec.
The time of occupancy (Dwell time) for handset unit is 89 × 2.72ms = 242.08ms ＜0.4s in 10sec.

See dwell time plot.pdf

7. Peak power output test

7.1 Operating environment

Temperature: 24 ℃
Relative Humidity: 58 %

7.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to spectrum analyzer. The RBW of spectrum analyzer set at 1MHz, span was set to 5MHz, record the highest power reading after the Maxhold function, cable loss correction (1.3 dB) was added to the reading. The test was performed at 3 channels (lowest, middle and highest channel). The Peak power measured result for modulated output power is in the following table.

See Peak Power Output plot.pdf

7.3 Measured data of peak power output test results

Base unit:

Channel	Frequency (MHz)	C.B.L. (dB)	Reading (dBm)	Power Output		Limit (W)
				(dBm)	(mW)	
1	903.021	1.3	19.63	20.93	123.88	0.25
25	914.003	1.3	19.24	20.54	113.24	0.25
54	927.23	1.3	19.04	20.34	108.14	0.25

＊ The EUT has its hopping function disable.

Handset unit:

Channel	Frequency (MHz)	C.B.L. (dB)	Reading (dBm)	Power Output		Limit (W)
				(dBm)	(mW)	
1	902.981	1.3	10.22	11.52	14.19	0.25
25	914.033	1.3	10.08	11.38	13.74	0.25
54	927.12	1.3	7.39	8.69	7.40	0.25

＊ The EUT has its hopping function disable.

Remark:
1. C.B.L.: cable loss
2. Power output (dBm) = C.B.L.(dB) + Reading (dBm)
3. Power output (mW) = $10^{(\text{Power output (dBm)}/10)}$

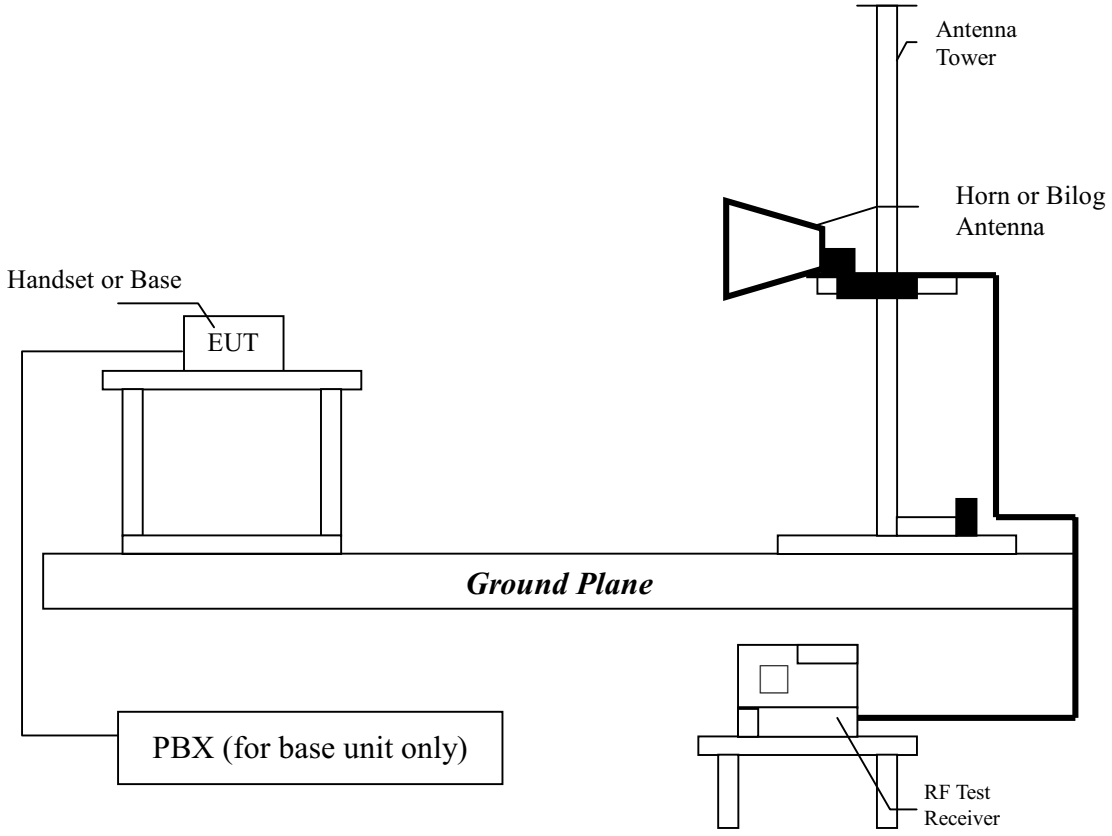
8. Radiated spurious emission test

8.1 Operating environment

Temperature:	24	℃
Relative Humidity:	58	%

8.2 Test setup & procedure: The EUT is continuous transmitting

The Diagram below shows the test setup, which is utilized to make these measurements.



The signal is maximized through rotation and placement in the three orthogonal axes. The EUT and its peripherals are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4/1992 on radiated measurement. Radiated emission measurement were performed from 30MHz to 40GHz or to the tenth harmonic of the highest fundamental frequency, which is lower.
The bandwidth below 1GHz setting on the field strength meter (ESMI) is 120kHz and above 1GHz is 1MHz.

8.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

   Uncertainty was calculated in accordance with NAMAS NIS 81. In the General Radiated Emission Test, the uncertainty is within ±2.5dB

8.4 Radiated spurious emission test data

8.4.1 Measurement results: frequencies equal to or less than 1 GHz

EUT : T7406
Test Mode : Transmit mode
Worst Case Condition : Channel 1 @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
42.49	QP	V	0	13	0	19.7	32.7	40	-7.3
803.812	QP	V	0	24.3	0	18.4	42.7	46	-3.3
830.81	QP	V	0	24.3	0	10.4	34.7	46	-11.3
881.3	QP	V	0	24.5	0	8.6	33.1	46	-12.9
830.86	QP	H	0	24.3	0	13.2	37.5	46	-8.5
881.32	QP	H	0	24.5	0	19.3	43.8	46	-2.2

＊ The EUT has its hopping function disable.

Test Mode : Transmit mode
Worst Case Condition : Channel 1 @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
81.84	QP	V	0	10.07	0	24.97	35.04	40	-4.96
86.97	QP	V	0	9.79	0	24.08	33.87	40	-6.13
92.1	QP	V	0	9.84	0	24.1	33.94	43.5	-9.56
179.04	QP	V	0	11.47	0	23.57	35.04	43.5	-8.46
189.3	QP	V	0	11.47	0	20.31	31.78	43.5	-11.72
199.56	QP	V	0	11.97	0	21.15	33.12	43.5	-10.38
81.84	QP	H	0	10.07	0	27.36	37.43	40	-2.57
86.97	QP	H	0	9.79	0	25.76	35.55	40	-4.45
92.1	QP	H	0	9.84	0	25.59	35.43	43.5	-8.07
179.04	QP	H	0	11.47	0	26.12	37.59	43.5	-5.91
189.3	QP	H	0	11.47	0	22.41	33.88	43.5	-9.62
199.56	QP	H	0	11.97	0	23.17	35.14	43.5	-8.36

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

8.4.2 Measurement results: frequency above 1GHz

Worst case radiated spurious emission
at Base unit Channel 54, 3709 MHz, margin: -0.31 dB

This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : T7406
Test Channel : 1
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1806.042	PK	V	0	31.73	0	40.79	72.52	74	-1.48
1806.042	AV	V	0	31.73	0	21.63	53.36	54	-0.64
2709.063	PK	V	0	33.79	0	27.4	61.19	74	-12.81
2709.063	AV	V	0	33.79	0	13.17	46.96	54	-7.04
3612.084	PK	V	0	37.08	0	29.41	66.49	74	-7.51
3612.084	AV	V	0	37.08	0	12.38	49.46	54	-4.54
4515.105	PK	V	0	38.57	0	11.24	49.81	74	-24.19
4515.105	AV	V	0	38.57	0	1.3	39.87	54	-14.13
5418.126	PK	V	0	41.42	0	-	-	74	-
5418.126	AV	V	0	41.42	0	-	-	54	-
1146.971	PK	V	0	27.1	0	25.73	52.83	74	-21.17
1146.971	AV	V	0	27.1	0	15.16	42.26	54	-11.74
2293.94	PK	V	0	32.12	0	7.21	39.33	74	-34.67
2293.94	AV	V	0	32.12	0	-1.2	30.92	54	-23.08

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 1
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1806.042	PK	H	0	31.73	0	35.53	67.26	74	-6.74
1806.042	AV	H	0	31.73	0	20.1	51.83	54	-2.17
2709.063	PK	H	0	33.79	0	23.44	57.23	74	-16.77
2709.063	AV	H	0	33.79	0	11.12	44.91	54	-9.09
3612.084	PK	H	0	37.08	0	25.17	62.25	74	-11.75
3612.084	AV	H	0	37.08	0	14.37	51.45	54	-2.55
4515.105	PK	H	0	38.57	0	13.41	51.98	74	-22.02
4515.105	AV	H	0	38.57	0	2.1	40.67	54	-13.33
5418.126	PK	H	0	41.42	0	-	-	74	-
5418.126	AV	H	0	41.42	0	-	-	54	-
1146.971	PK	H	0	27.1	0	24.71	51.81	74	-22.19
1146.971	AV	H	0	27.1	0	11.42	38.52	54	-15.48
2293.94	PK	H	0	32.12	0	8.44	40.56	74	-33.44
2293.94	AV	H	0	32.12	0	-2.1	30.02	54	-23.98

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 25
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1827.986	PK	V	0	31.73	0	37.62	69.35	74	-4.65
1827.986	AV	V	0	31.73	0	20.69	52.42	54	-1.58
2741.979	PK	V	0	33.79	0	16.41	50.2	74	-23.8
2741.979	AV	V	0	33.79	0	6.49	40.28	54	-13.72
3655.972	PK	V	0	37.08	0	22.41	59.49	74	-14.51
3655.972	AV	V	0	37.08	0	10.34	47.42	54	-6.58
4569.965	PK	V	0	38.57	0	12.22	50.79	74	-23.21
4569.965	AV	V	0	38.57	0	2.41	40.98	54	-13.02
5483.958	PK	V	0	41.42	0	-	-	74	-
5483.958	AV	V	0	41.42	0	-	-	54	-
1157.943	PK	V	0	27.1	0	24.41	51.51	74	-22.49
1157.943	AV	V	0	27.1	0	15.02	42.12	54	-11.88
2315.886	PK	V	0	32.12	0	9.81	41.93	74	-32.07
2315.886	AV	V	0	32.12	0	-2.33	29.79	54	-24.21

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 25
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1827.986	PK	H	0	31.73	0	35.95	67.68	74	-6.32
1827.986	AV	H	0	31.73	0	19.98	51.71	54	-2.29
2741.979	PK	H	0	33.79	0	23.9	57.69	74	-16.31
2741.979	AV	H	0	33.79	0	12.04	45.83	54	-8.17
3655.972	PK	H	0	37.08	0	25.22	62.3	74	-11.7
3655.972	AV	H	0	37.08	0	11.74	48.82	54	-5.18
4569.965	PK	H	0	38.57	0	10.24	48.81	74	-25.19
4569.965	AV	H	0	38.57	0	-1.32	37.25	54	-16.75
5483.958	PK	H	0	41.42	0	-	-	74	-
5483.958	AV	H	0	41.42	0	-	-	54	-
1157.943	PK	H	0	27.1	0	23.08	50.18	74	-23.82
1157.943	AV	H	0	27.1	0	10.82	37.92	54	-16.08
2315.886	PK	H	0	32.12	0	6.19	38.31	74	-35.69
2315.886	AV	H	0	32.12	0	-	-	54	-

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 54
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1854.5	PK	V	0	31.73	0	31.04	62.77	74	-11.23
1854.5	AV	V	0	31.73	0	16.78	48.51	54	-5.49
2781.75	PK	V	0	33.79	0	28.04	61.83	74	-12.17
2781.75	AV	V	0	33.79	0	14.98	48.77	54	-5.23
3709	PK	V	0	37.08	0	25.56	62.64	74	-11.36
3709	AV	V	0	37.08	0	16.61	53.69	54	-0.31
4636.25	PK	V	0	38.57	0	13.42	51.99	74	-22.01
4636.25	AV	V	0	38.57	0	2.11	40.68	54	-13.32
5563.5	PK	V	0	41.42	0	-	-	74	-
5563.5	AV	V	0	41.42	0	-	-	54	-
1171.2	PK	V	0	27.1	0	23.85	50.95	74	-23.05
1171.2	AV	V	0	27.1	0	13.32	40.42	54	-13.58
2342.4	PK	V	0	32.12	0	12.92	45.04	74	-28.96
2342.4	AV	V	0	32.12	0	1.42	33.54	54	-20.46

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 54
Test Mode : Transmit mode @Base unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1854.5	PK	H	0	31.73	0	27.47	59.2	74	-14.8
1854.5	AV	H	0	31.73	0	13.43	45.16	54	-8.84
2781.75	PK	H	0	33.79	0	24.8	58.59	74	-15.41
2781.75	AV	H	0	33.79	0	13.19	46.98	54	-7.02
3709	PK	H	0	37.08	0	24.29	61.37	74	-12.63
3709	AV	H	0	37.08	0	11.82	48.9	54	-5.1
4636.25	PK	H	0	38.57	0	13.04	51.61	74	-22.39
4636.25	AV	H	0	38.57	0	1.48	40.05	54	-13.95
5563.5	PK	H	0	41.42	0	-	-	74	-
5563.5	AV	H	0	41.42	0	-	-	54	-
1171.2	PK	H	0	27.1	0	19.6	46.7	74	-27.3
1171.2	AV	H	0	27.1	0	11.38	38.48	54	-15.52
2342.4	PK	H	0	32.12	0	12.3	44.42	74	-29.58
2342.4	AV	H	0	32.12	0	1.1	33.22	54	-20.78

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 1
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1806.042	PK	V	0	31.73	0	35.04	66.77	74	-7.23
1806.042	AV	V	0	31.73	0	20.95	52.68	54	-1.32
2709.063	PK	V	0	33.79	0	32.2	65.99	74	-8.01
2709.063	AV	V	0	33.79	0	13.84	47.63	54	-6.37
3612.084	PK	V	0	37.08	0	17.78	54.86	74	-19.14
3612.084	AV	V	0	37.08	0	4.23	41.31	54	-12.69
4515.105	PK	V	0	38.57	0	9.19	47.76	74	-26.24
4515.105	AV	V	0	38.57	0	-1.34	37.23	54	-16.77
5418.126	PK	V	0	41.42	0	-	-	74	-
5418.126	AV	V	0	41.42	0	-	-	54	-
1146.971	PK	V	0	27.1	0	19.04	46.14	74	-27.86
1146.971	AV	V	0	27.1	0	14.66	41.76	54	-12.24
2293.94	PK	V	0	32.12	0	8.1	40.22	74	-33.78
2293.94	AV	V	0	32.12	0	-0.9	31.22	54	-22.78

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 1
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1806.042	PK	H	0	31.73	0	32.96	64.69	74	-9.31
1806.042	AV	H	0	31.73	0	19.53	51.26	54	-2.74
2709.063	PK	H	0	33.79	0	28.47	62.26	74	-11.74
2709.063	AV	H	0	33.79	0	12.62	46.41	54	-7.59
3612.084	PK	H	0	37.08	0	18.49	55.57	74	-18.43
3612.084	AV	H	0	37.08	0	4.6	41.68	54	-12.32
4515.105	PK	H	0	38.57	0	10.43	49	74	-25
4515.105	AV	H	0	38.57	0	-1.3	37.27	54	-16.73
5418.126	PK	H	0	41.42	0	-	-	74	-
5418.126	AV	H	0	41.42	0	-	-	54	-
1146.971	PK	H	0	27.1	0	18.9	46	74	-28
1146.971	AV	H	0	27.1	0	13.4	40.5	54	-13.5
2293.94	PK	H	0	32.12	0	14.5	46.62	74	-27.38
2293.94	AV	H	0	32.12	0	2	34.12	54	-19.88

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 25
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1827.986	PK	V	0	31.73	0	37.2	68.93	74	-5.07
1827.986	AV	V	0	31.73	0	15.44	47.17	54	-6.83
2741.979	PK	V	0	33.79	0	31.4	65.19	74	-8.81
2741.979	AV	V	0	33.79	0	14.85	48.64	54	-5.36
3655.972	PK	V	0	37.08	0	17.53	54.61	74	-19.39
3655.972	AV	V	0	37.08	0	3.87	40.95	54	-13.05
4569.965	PK	V	0	38.57	0	11.87	50.44	74	-23.56
4569.965	AV	V	0	38.57	0	1.89	40.46	54	-13.54
5483.958	PK	V	0	41.42	0	-	-	74	-
5483.958	AV	V	0	41.42	0	-	-	54	-
1157.943	PK	V	0	27.1	0	20.5	47.6	74	-26.4
1157.943	AV	V	0	27.1	0	16.1	43.2	54	-10.8
2315.886	PK	V	0	32.12	0	15.4	47.52	74	-26.48
2315.886	AV	V	0	32.12	0	3.9	36.02	54	-17.98

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 25
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1827.986	PK	H	0	31.73	0	31.8	63.53	74	-10.47
1827.986	AV	H	0	31.73	0	15.36	47.09	54	-6.91
2741.979	PK	H	0	33.79	0	29.2	62.99	74	-11.01
2741.979	AV	H	0	33.79	0	13.68	47.47	54	-6.53
3655.972	PK	H	0	37.08	0	18.21	55.29	74	-18.71
3655.972	AV	H	0	37.08	0	3.97	41.05	54	-12.95
4569.965	PK	H	0	38.57	0	11.19	49.76	74	-24.24
4569.965	AV	H	0	38.57	0	1.07	39.64	54	-14.36
5483.958	PK	H	0	41.42	0	-	-	74	-
5483.958	AV	H	0	41.42	0	-	-	54	-
1157.943	PK	H	0	27.1	0	24.6	51.7	74	-22.3
1157.943	AV	H	0	27.1	0	13.12	40.22	54	-13.78
2315.886	PK	H	0	32.12	0	15.4	47.52	74	-26.48
2315.886	AV	H	0	32.12	0	2.7	34.82	54	-19.18

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 54
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1854.5	PK	V	0	31.73	0	38.26	69.99	74	-4.01
1854.5	AV	V	0	31.73	0	17.55	49.28	54	-4.72
2781.75	PK	V	0	33.79	0	34.01	67.8	74	-6.2
2781.75	AV	V	0	33.79	0	13.79	47.58	54	-6.42
3709	PK	V	0	37.08	0	17.94	55.02	74	-18.98
3709	AV	V	0	37.08	0	4.32	41.4	54	-12.6
4636.25	PK	V	0	38.57	0	12.11	50.68	74	-23.32
4636.25	AV	V	0	38.57	0	1.23	39.8	54	-14.2
5563.5	PK	V	0	41.42	0	-	-	74	-
5563.5	AV	V	0	41.42	0	-	-	54	-
1171.2	PK	V	0	27.1	0	25.11	52.21	74	-21.79
1171.2	AV	V	0	27.1	0	13.5	40.6	54	-13.4
2342.4	PK	V	0	32.12	0	12.35	44.47	74	-29.53
2342.4	AV	V	0	32.12	0	4.15	36.27	54	-17.73

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

EUT : T7406
Test Channel : 54
Test Mode : Transmit mode @Handset unit

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Average Factor (dB)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
1854.5	PK	H	0	31.73	0	34.97	66.7	74	-7.3
1854.5	AV	H	0	31.73	0	18.74	50.47	54	-3.53
2781.75	PK	H	0	33.79	0	29.86	63.65	74	-10.35
2781.75	AV	H	0	33.79	0	12.8	46.59	54	-7.41
3709	PK	H	0	37.08	0	11.6	48.68	74	-25.32
3709	AV	H	0	37.08	0	4.1	41.18	54	-12.82
4636.25	PK	H	0	38.57	0	8.42	46.99	74	-27.01
4636.25	AV	H	0	38.57	0	-2.1	36.47	54	-17.53
5563.5	PK	H	0	41.42	0	-	-	74	-
5563.5	AV	H	0	41.42	0	-	-	54	-
1171.2	PK	H	0	27.1	0	23.27	50.37	74	-23.63
1171.2	AV	H	0	27.1	0	12.45	39.55	54	-14.45
2342.4	PK	H	0	32.12	0	11.4	43.52	74	-30.48
2342.4	AV	H	0	32.12	0	3.72	35.84	54	-18.16

＊ The EUT has its hopping function disable.

Remark:
1.Corrected Level = Reading Level + Correction Factor＋Average Factor＋Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. All Readings below 1GHz are Peak, above are average value
4. All the Harmonics don’t show on the above table were undetectable.
5. “-“ means the value was undetectable.

8.5 Radiated spurious emission configuration photograph

For electronic filing, the radiated spurious emission configuration photograph is saved with filename: spurious set-up photo.pdf

9. Emission on the band edge §FCC 15.247(C)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

See band-edge plot.pdf

10. RF Exposure calculations

10.1 Base unit

From §FCC 1.1310 table 1A, the maximum permissible RF exposure for an uncontrolled environment is 1mW/(cm*cm), where, (cm*cm) = square cm.
The electric field generated for a 1mW/(cm*cm) exposure (S) is calculated as follows:

S = E*E/Z where, S = Power density
E = Electric field
Z = Impedance
so, 1mW/(cm*cm) = 10 W/(m*m)

Z is 377 ohm of the impedance of free space, where E and H field are perpendicular.
Thus the Electric field to produce a 1mW/(cm*cm) exposure is:
$E = (10 \times 377)^{1/2} = 61.4$ V/m, which is equivalent to 1mW/(cm*cm)

Maximum conducted peak output power is 20.93 dBm (Refer to Page 12 of test report) and maximum antenna gain is 0 dBi. The maximum radiated output power resulted in 123.88 mW.

Using the relationship between electric field E, effective radiated power in watts P, and distance in meters D, the corresponding distance D to produce a 1mW/(cm*cm) is calculated in the following expression:

$D = (P \times 30)^{1/2} / E = (123.88 \times 10 \times 30)^{1/2} / 61.4 = 3.139$ cm
where, P: maximum effective radiated power measured, 20.93 dBm (123.88 mW)
E: electric field equivalent to 1mW/(cm*cm), 61.4 V/m

Notice in Installation guide (Installation guide.pdf):
While installing and operating this transmitter, the radio frequency exposure limit of 1mW/(cm*cm) may be exceeded at distances close to the transmitter. therefore, the user must maintain a minimum distance of 4 cm from the device at all time.

The table below identifies the distance where the 1mW/(cm*cm) exposure limits may be exceeded during continuous transmission using this device.

Peak output power		calculated RF Exposure Separation Distance(cm)	Minimum RF Exposure Separation Distance(cm)
dBm	mW	3.139	4
20.93	123.88		

Note: The RF exposure also stated in installation guide (installation guide.pdf)

10.2 Handset unit

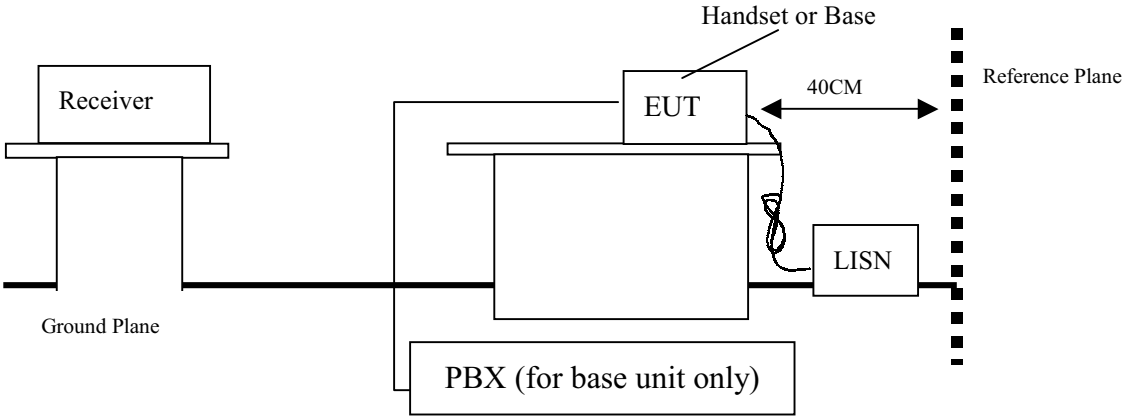
The handset unit under evaluation has an external antenna of 0 dBi gain with a measured output power of 14.19mW at antenna terminal. Due to the low power of EUT, no SAR measurement is required.

11. AC Line conducted emission §FCC 15.207

11.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 58 %

11.2 Test setup & procedure



Handset unit was tested with the charger and connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

Emission Limit

FCC Part 15 Paragraph 15.207		
Freq. (MHz)	Maximum RF Line Voltage	
	uV	dBuV
0.45 - 30	250	48.0

11.3 Conducted emission data

The conduction results of handset and charger are very low the limit.

See conduction-base plot.pdf and conduction-handset plot.pdf.

Worst case conducted emission
at base unit Channel 1, Line 3.586MHz ,margin:-0.8 dB

This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : T7406
Test Channel : 1
Test Mode : Transmit mode @ base unit

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.514	44.9	48	-3.10
LINE	1.538	45.5	48	-2.50
LINE	2.562	45.7	48	-2.30
LINE	3.33	40.8	48	-7.20
LINE	3.586	47.2	48	-0.80
LINE	4.61	43.8	48	-4.20
LINE	13.826	43	48	-5.00
NEUTRAL	0.514	45.3	48	-2.70
NEUTRAL	1.538	45	48	-3.00
NEUTRAL	2.562	44.9	48	-3.10
NEUTRAL	3.586	46.3	48	-1.70
NEUTRAL	4.61	40.3	48	-7.70
NEUTRAL	12.802	41.6	48	-6.40
NEUTRAL	13.826	42.1	48	-5.90

＊ The EUT has its hopping function disable.

Remark:
1. The reading value including cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81. In the Conducted Emission Test, the uncertainty is within ±2dB
3. The average measurement was not performed when the peak measured data under the limit of average detection.

EUT : T7406
Test Channel : 25
Test Mode : Transmit mode @ base unit

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.514	44.5	48	-3.5
LINE	1.538	45.3	48	-2.7
LINE	2.562	47.0	48	-1.0
LINE	2.818	43.3	48	-4.7
LINE	5.634	41.8	48	-6.2
LINE	6.658	43.1	48	-4.9
LINE	12.802	39.6	48	-8.4
NEUTRAL	0.514	43.4	48	-4.6
NEUTRAL	1.538	43.4	48	-4.6
NEUTRAL	2.562	46.3	48	-1.7
NEUTRAL	2.818	43.1	48	-4.9
NEUTRAL	5.634	40.3	48	-7.7
NEUTRAL	6.658	41.2	48	-6.8
NEUTRAL	13.826	40.0	48	-8.0

＊ The EUT has its hopping function disable.

Remark:
1. The reading value including cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81. In the Conducted Emission Test, the uncertainty is within ±2dB
3. The average measurement was not performed when the peak measured data under the limit of average detection.

EUT : T7406
Test Channel : 54
Test Mode : Transmit mode @ base unit

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.514	42.5	48	-5.5
LINE	1.538	43.4	48	-4.6
LINE	2.562	46.5	48	-1.5
LINE	2.818	44.1	48	-3.9
LINE	5.634	41.2	48	-6.8
LINE	6.658	42.5	48	-5.5
LINE	12.802	41.4	48	-6.6
NEUTRAL	0.514	42.7	48	-5.3
NEUTRAL	1.538	42.9	48	-5.1
NEUTRAL	2.562	45.7	48	-2.3
NEUTRAL	2.818	42.8	48	-5.2
NEUTRAL	5.634	39.9	48	-8.1
NEUTRAL	6.658	40.9	48	-7.1
NEUTRAL	17.922	40.5	48	-7.5

＊ The EUT has its hopping function disable.

Remark:
1. The reading value including cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81. In the Conducted Emission Test, the uncertainty is within ±2dB
3. The average measurement was not performed when the peak measured data under the limit of average detection.

11.4 AC Line conducted emission configuration photograph

For electronic filing, the worst-case conducted emission configuration photograph is saved with filename: conducted set-up photo.pdf