

8. CONDUCTED SPURIOUS EMISSION

8.1 DESCRIPTION OF CONDUCTED SPURIOUS EMISSION MEASUREMENT

8.1.1 MEASUREMENT METHOD

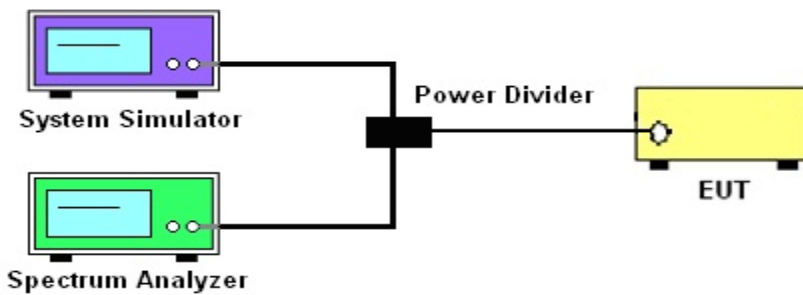
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For Band 7:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

8.1.2 TEST SETUP



8.1.3 TEST PROCEDURES

1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26 2015 Section 5.7.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement
4. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)} = [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}$.

For Band 7: $P(W) - [43 + 10\log(P)] \text{ (dB)} = -25\text{dBm}$

	NB-IoT	
NB-IoT BW	3.75K	15K
Span	Auto	Auto
RBW	1000kHz	1000kHz
VBW	3000kHz	3000kHz
Detector	PK	PK
Trace	Max	Max

8.1.4 TEST RESULTS

Note: Test chart See Appendix C

9. RADIATED SPURIOUS EMISSION

9.1 DESCRIPTION OF RADIATED SPURIOUS EMISSION

9.1.1 MEASUREMENT METHOD

The radiated spurious emission was measured by substitution method according to ANSI C63.26 2015. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. For Band 7 The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

9.1.2 TEST SETUP

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, $RSE = Rx (dBuV) + CL (dB) + SA (dB) + Gain (dBi) - 107 (dBuV \text{ to } dBm)$ The SA is calibrated using following setup.

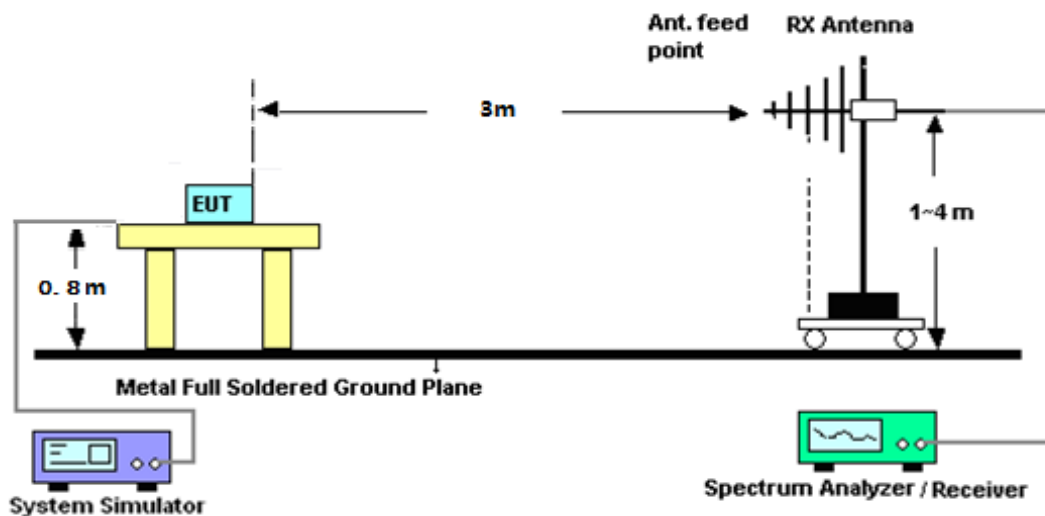
b) EUT was placed on 1.5 m non-conductive stand at a 3 m test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 m from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic measured with peak detector and 1MHz bandwidth.

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

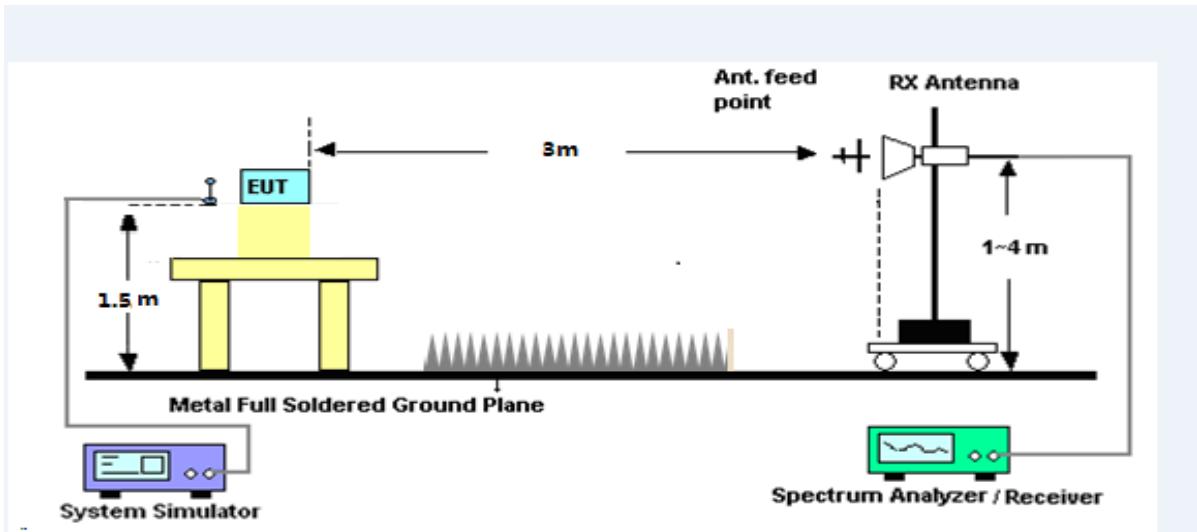
The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below:

$$\text{Power} = \text{PMea} + \text{ARpl}$$

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



9.1.3 TEST PROCEDURES

1. The testing FCC KDB 971168 D01 Section 7 and ANSI C63.26 2015 Section 5.5.
2. The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm

For Band 7:

The limit line is derived from $55 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= [30 + 10\log(P)]$ (dBm) - $[55 + 10\log(P)]$ (dB)
 $= -25$ dBm

$P_{Mea} = S.G \text{ Level} + \text{Ant-Cable loss}; \text{Margin} = P_{Mea} - \text{Limit.}$



9.1.4 TEST RESULTS

NB-IoT Band 2 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3700.14	-33.77	12.60	12.93	-34.10	-13.00	-21.10	H
5550.31	-34.96	13.10	17.11	-38.97	-13.00	-25.97	H
7400.63	-32.25	11.50	22.20	-42.95	-13.00	-29.95	H
3700.14	-34.52	12.60	12.93	-34.85	-13.00	-21.85	V
5550.31	-34.99	13.10	17.11	-39.00	-13.00	-26.00	V
7400.63	-31.91	11.50	22.20	-42.61	-13.00	-29.61	V
NB-IoT Band 2 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3759.94	-34.09	12.60	12.93	-34.42	-13.00	-21.42	H
5639.86	-35.47	13.10	17.11	-39.48	-13.00	-26.48	H
7520.30	-33.52	11.50	22.20	-44.22	-13.00	-31.22	H
3759.94	-34.59	12.60	12.93	-34.92	-13.00	-21.92	V
5639.86	-33.80	13.10	17.11	-37.81	-13.00	-24.81	V
7520.30	-31.89	11.50	22.20	-42.59	-13.00	-29.59	V
NB-IoT Band 2 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit (dBm)	Margin (dBm)	Polarity
3819.50	-33.49	12.60	12.93	-33.82	-13.00	-20.82	H
5729.74	-34.70	13.10	17.11	-38.71	-13.00	-25.71	H
7639.49	-33.08	11.50	22.20	-43.78	-13.00	-30.78	H
3819.50	-35.08	12.60	12.93	-35.41	-13.00	-22.41	V
5729.74	-34.33	13.10	17.11	-38.34	-13.00	-25.34	V
7639.49	-32.38	11.50	22.20	-43.08	-13.00	-30.08	V



NB-IoT Band 2 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3700.55	-34.30	12.60	12.93	-34.63	-13.00	-21.63	H
5550.34	-34.89	13.10	17.11	-38.90	-13.00	-25.90	H
7400.59	-32.60	11.50	22.20	-43.30	-13.00	-30.30	H
3700.55	-35.06	12.60	12.93	-35.39	-13.00	-22.39	V
5550.34	-34.68	13.10	17.11	-38.69	-13.00	-25.69	V
7400.59	-32.21	11.50	22.20	-42.91	-13.00	-29.91	V
NB-IoT Band 2 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3760.00	-33.46	12.60	12.93	-33.79	-13.00	-20.79	H
5639.91	-35.31	13.10	17.11	-39.32	-13.00	-26.32	H
7520.11	-33.46	11.50	22.20	-44.16	-13.00	-31.16	H
3760.00	-35.78	12.60	12.93	-36.11	-13.00	-23.11	V
5639.91	-34.57	13.10	17.11	-38.58	-13.00	-25.58	V
7520.11	-31.83	11.50	22.20	-42.53	-13.00	-29.53	V
NB-IoT Band 2 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3819.51	-34.71	12.60	12.93	-35.04	-13.00	-22.04	H
5729.61	-34.07	13.10	17.11	-38.08	-13.00	-25.08	H
7639.31	-33.44	11.50	22.20	-44.14	-13.00	-31.14	H
3819.51	-35.04	12.60	12.93	-35.37	-13.00	-22.37	V
5729.61	-35.24	13.10	17.11	-39.25	-13.00	-26.25	V
7639.31	-32.66	11.50	22.20	-43.36	-13.00	-30.36	V



NB-IoT Band 2 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3700.28	-34.22	12.60	12.93	-34.55	-13.00	-21.55	H
5550.29	-34.95	13.10	17.11	-38.96	-13.00	-25.96	H
7400.78	-33.10	11.50	22.20	-43.80	-13.00	-30.80	H
3700.28	-35.69	12.60	12.93	-36.02	-13.00	-23.02	V
5550.29	-33.81	13.10	17.11	-37.82	-13.00	-24.82	V
7400.78	-32.73	11.50	22.20	-43.43	-13.00	-30.43	V
NB-IoT Band 2 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3759.67	-34.39	12.60	12.93	-34.72	-13.00	-21.72	H
5640.19	-34.90	13.10	17.11	-38.91	-13.00	-25.91	H
7520.24	-32.43	11.50	22.20	-43.13	-13.00	-30.13	H
3759.67	-35.38	12.60	12.93	-35.71	-13.00	-22.71	V
5640.19	-34.36	13.10	17.11	-38.37	-13.00	-25.37	V
7520.24	-33.17	11.50	22.20	-43.87	-13.00	-30.87	V
NB-IoT Band 2 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3819.82	-33.45	12.60	12.93	-33.78	-13.00	-20.78	H
5729.60	-34.21	13.10	17.11	-38.22	-13.00	-25.22	H
7639.68	-33.19	11.50	22.20	-43.89	-13.00	-30.89	H
3819.82	-35.80	12.60	12.93	-36.13	-13.00	-23.13	V
5729.60	-34.26	13.10	17.11	-38.27	-13.00	-25.27	V
7639.68	-32.26	11.50	22.20	-42.96	-13.00	-29.96	V



NB-IoT Band 2 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3700.52	-34.87	12.60	12.93	-35.20	-13.00	-22.20	H
5550.64	-34.78	13.10	17.11	-38.79	-13.00	-25.79	H
7400.46	-32.75	11.50	22.20	-43.45	-13.00	-30.45	H
3700.52	-35.26	12.60	12.93	-35.59	-13.00	-22.59	V
5550.64	-33.87	13.10	17.11	-37.88	-13.00	-24.88	V
7400.46	-32.68	11.50	22.20	-43.38	-13.00	-30.38	V
NB-IoT Band 2 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3759.74	-34.13	12.60	12.93	-34.46	-13.00	-21.46	H
5639.90	-35.36	13.10	17.11	-39.37	-13.00	-26.37	H
7520.34	-33.23	11.50	22.20	-43.93	-13.00	-30.93	H
3759.74	-35.20	12.60	12.93	-35.53	-13.00	-22.53	V
5639.90	-34.16	13.10	17.11	-38.17	-13.00	-25.17	V
7520.34	-32.78	11.50	22.20	-43.48	-13.00	-30.48	V
NB-IoT Band 2 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3819.77	-34.82	12.60	12.93	-35.15	-13.00	-22.15	H
5729.68	-34.79	13.10	17.11	-38.80	-13.00	-25.80	H
7639.60	-33.18	11.50	22.20	-43.88	-13.00	-30.88	H
3819.77	-35.25	12.60	12.93	-35.58	-13.00	-22.58	V
5729.68	-34.23	13.10	17.11	-38.24	-13.00	-25.24	V
7639.60	-32.04	11.50	22.20	-42.74	-13.00	-29.74	V



NB-IoT Band 4 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3420.06	-33.59	12.90	12.56	-33.25	-13.00	-20.25	H
5130.11	-34.83	13.10	16.32	-38.05	-13.00	-25.05	H
6840.22	-32.83	12.33	21.13	-41.63	-13.00	-28.63	H
3420.06	-35.47	12.90	12.56	-35.13	-13.00	-22.13	V
5130.11	-33.82	13.10	16.32	-37.04	-13.00	-24.04	V
6840.22	-32.14	12.33	21.13	-40.94	-13.00	-27.94	V
NB-IoT Band 2 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3495.05	-33.92	12.90	12.56	-33.58	-13.00	-20.58	H
5242.62	-34.08	13.10	16.32	-37.30	-13.00	-24.30	H
6990.11	-33.26	12.33	21.13	-42.06	-13.00	-29.06	H
3495.05	-35.84	12.90	12.56	-35.50	-13.00	-22.50	V
5242.62	-34.31	13.10	16.32	-37.53	-13.00	-24.53	V
6990.11	-32.52	12.33	21.13	-41.32	-13.00	-28.32	V
NB-IoT Band 4 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3510.21	-34.06	12.90	12.56	-33.72	-13.00	-20.72	H
5764.74	-34.85	13.10	16.32	-38.07	-13.00	-25.07	H
7019.85	-32.95	12.33	21.13	-41.75	-13.00	-28.75	H
3510.21	-35.25	12.90	12.56	-34.91	-13.00	-21.91	V
5764.74	-35.23	13.10	16.32	-38.45	-13.00	-25.45	V
7019.85	-32.80	12.33	21.13	-41.60	-13.00	-28.60	V



NB-IoT Band 4 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3420.03	-34.16	12.90	12.56	-33.82	-13.00	-20.82	H
5130.36	-35.05	13.10	16.32	-38.27	-13.00	-25.27	H
6840.51	-33.52	12.33	21.13	-42.32	-13.00	-29.32	H
3420.03	-36.01	12.90	12.56	-35.67	-13.00	-22.67	V
5130.36	-34.28	13.10	16.32	-37.50	-13.00	-24.50	V
6840.51	-32.19	12.33	21.13	-40.99	-13.00	-27.99	V
NB-IoT Band 4 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3494.86	-34.42	12.90	12.56	-34.08	-13.00	-21.08	H
5242.32	-35.34	13.10	16.32	-38.56	-13.00	-25.56	H
6989.85	-33.43	12.33	21.13	-42.23	-13.00	-29.23	H
3494.86	-35.63	12.90	12.56	-35.29	-13.00	-22.29	V
5242.32	-34.61	13.10	16.32	-37.83	-13.00	-24.83	V
6989.85	-32.66	12.33	21.13	-41.46	-13.00	-28.46	V
NB-IoT Band 4 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3510.05	-34.35	12.90	12.56	-34.01	-13.00	-21.01	H
5765.22	-34.79	13.10	16.32	-38.01	-13.00	-25.01	H
7020.01	-33.57	12.33	21.13	-42.37	-13.00	-29.37	H
3510.05	-35.29	12.90	12.56	-34.95	-13.00	-21.95	V
5765.22	-34.81	13.10	16.32	-38.03	-13.00	-25.03	V
7020.01	-32.46	12.33	21.13	-41.26	-13.00	-28.26	V



NB-IoT Band 4 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3419.93	-34.06	12.90	12.56	-33.72	-13.00	-20.72	H
5130.09	-34.25	13.10	16.32	-37.47	-13.00	-24.47	H
6840.59	-32.87	12.33	21.13	-41.67	-13.00	-28.67	H
3419.93	-35.54	12.90	12.56	-35.20	-13.00	-22.20	V
5130.09	-34.60	13.10	16.32	-37.82	-13.00	-24.82	V
6840.59	-32.20	12.33	21.13	-41.00	-13.00	-28.00	V
NB-IoT Band 4 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3494.82	-33.87	12.90	12.56	-33.53	-13.00	-20.53	H
5242.49	-35.42	13.10	16.32	-38.64	-13.00	-25.64	H
6990.27	-32.44	12.33	21.13	-41.24	-13.00	-28.24	H
3494.82	-35.91	12.90	12.56	-35.57	-13.00	-22.57	V
5242.49	-35.06	13.10	16.32	-38.28	-13.00	-25.28	V
6990.27	-32.33	12.33	21.13	-41.13	-13.00	-28.13	V
NB-IoT Band 4 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3510.19	-33.86	12.90	12.56	-33.52	-13.00	-20.52	H
5765.20	-34.75	13.10	16.32	-37.97	-13.00	-24.97	H
7020.05	-33.58	12.33	21.13	-42.38	-13.00	-29.38	H
3510.19	-35.14	12.90	12.56	-34.80	-13.00	-21.80	V
5765.20	-34.22	13.10	16.32	-37.44	-13.00	-24.44	V
7020.05	-32.66	12.33	21.13	-41.46	-13.00	-28.46	V



NB-IoT Band 4 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3420.38	-33.47	12.90	12.56	-33.13	-13.00	-20.13	H
5130.48	-35.33	13.10	16.32	-38.55	-13.00	-25.55	H
6840.59	-33.21	12.33	21.13	-42.01	-13.00	-29.01	H
3420.38	-34.58	12.90	12.56	-34.24	-13.00	-21.24	V
5130.48	-33.82	13.10	16.32	-37.04	-13.00	-24.04	V
6840.59	-31.93	12.33	21.13	-40.73	-13.00	-27.73	V
NB-IoT Band 4 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3495.10	-33.86	12.90	12.56	-33.52	-13.00	-20.52	H
5242.33	-34.57	13.10	16.32	-37.79	-13.00	-24.79	H
6990.18	-32.51	12.33	21.13	-41.31	-13.00	-28.31	H
3495.10	-34.91	12.90	12.56	-34.57	-13.00	-21.57	V
5242.33	-34.96	13.10	16.32	-38.18	-13.00	-25.18	V
6990.18	-32.64	12.33	21.13	-41.44	-13.00	-28.44	V
NB-IoT Band 4 / BPSK / 15KHz / 1 @ 0 / The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
3510.05	-33.78	12.90	12.56	-33.44	-13.00	-20.44	H
5765.19	-35.00	13.10	16.32	-38.22	-13.00	-25.22	H
7019.91	-33.33	12.33	21.13	-42.13	-13.00	-29.13	H
3510.05	-34.69	12.90	12.56	-34.35	-13.00	-21.35	V
5765.19	-34.56	13.10	16.32	-37.78	-13.00	-24.78	V
7019.91	-32.20	12.33	21.13	-41.00	-13.00	-28.00	V



NB-IoT Band 5 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1648.38	-33.53	9.56	9.72	-33.69	-13.00	-20.69	H
2471.85	-35.35	10.50	10.86	-35.71	-13.00	-22.71	H
3296.51	-32.69	12.78	11.57	-31.48	-13.00	-18.48	H
1648.38	-34.75	9.56	9.72	-34.91	-13.00	-21.91	V
2471.85	-34.63	10.50	10.86	-34.99	-13.00	-21.99	V
3296.51	-32.18	12.78	11.57	-30.97	-13.00	-17.97	V
NB-IoT Band 5 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.95	-34.78	9.56	9.72	-34.94	-13.00	-21.94	H
2509.35	-35.24	10.50	10.86	-35.60	-13.00	-22.60	H
3346.02	-32.20	12.78	11.57	-30.99	-13.00	-17.99	H
1672.95	-35.57	9.56	9.72	-35.73	-13.00	-22.73	V
2509.35	-34.26	10.50	10.86	-34.62	-13.00	-21.62	V
3346.02	-32.22	12.78	11.57	-31.01	-13.00	-18.01	V
NB-IoT Band 5 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.82	-34.31	9.56	9.72	-34.47	-13.00	-21.47	H
2546.68	-34.09	10.50	10.86	-34.45	-13.00	-21.45	H
3395.63	-32.19	12.78	11.57	-30.98	-13.00	-17.98	H
1697.82	-35.08	9.56	9.72	-35.24	-13.00	-22.24	V
2546.68	-34.49	10.50	10.86	-34.85	-13.00	-21.85	V
3395.63	-32.04	12.78	11.57	-30.83	-13.00	-17.83	V



NB-IoT Band 5 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1647.95	-34.30	9.56	9.72	-34.46	-13.00	-21.46	H
2472.03	-35.20	10.50	10.86	-35.56	-13.00	-22.56	H
3296.58	-33.58	12.78	11.57	-32.37	-13.00	-19.37	H
1647.95	-35.35	9.56	9.72	-35.51	-13.00	-22.51	V
2472.03	-33.93	10.50	10.86	-34.29	-13.00	-21.29	V
3296.58	-33.13	12.78	11.57	-31.92	-13.00	-18.92	V
NB-IoT Band 5 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.78	-34.71	9.56	9.72	-34.87	-13.00	-21.87	H
2509.40	-34.41	10.50	10.86	-34.77	-13.00	-21.77	H
3345.95	-32.28	12.78	11.57	-31.07	-13.00	-18.07	H
1672.78	-35.66	9.56	9.72	-35.82	-13.00	-22.82	V
2509.40	-34.63	10.50	10.86	-34.99	-13.00	-21.99	V
3345.95	-32.53	12.78	11.57	-31.32	-13.00	-18.32	V
NB-IoT Band 5 / BPSK / 3.75KHz / 1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.49	-33.82	9.56	9.72	-33.98	-13.00	-20.98	H
2546.61	-34.55	10.50	10.86	-34.91	-13.00	-21.91	H
3395.67	-33.26	12.78	11.57	-32.05	-13.00	-19.05	H
1697.49	-35.48	9.56	9.72	-35.64	-13.00	-22.64	V
2546.61	-34.07	10.50	10.86	-34.43	-13.00	-21.43	V
3395.67	-31.80	12.78	11.57	-30.59	-13.00	-17.59	V



NB-IoT Band 5 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1648.08	-34.33	9.56	9.72	-34.49	-13.00	-21.49	H
2472.00	-34.28	10.50	10.86	-34.64	-13.00	-21.64	H
3296.23	-32.34	12.78	11.57	-31.13	-13.00	-18.13	H
1648.08	-35.05	9.56	9.72	-35.21	-13.00	-22.21	V
2472.00	-34.82	10.50	10.86	-35.18	-13.00	-22.18	V
3296.23	-31.87	12.78	11.57	-30.66	-13.00	-17.66	V
NB-IoT Band 5 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1672.77	-34.02	12.90	12.56	-33.68	-13.00	-20.68	H
2509.38	-34.14	13.10	16.32	-37.36	-13.00	-24.36	H
3345.91	-33.09	12.33	21.13	-41.89	-13.00	-28.89	H
1672.77	-34.98	12.90	12.56	-34.64	-13.00	-21.64	V
2509.38	-35.07	13.10	16.32	-38.29	-13.00	-25.29	V
3345.91	-32.07	12.33	21.13	-40.87	-13.00	-27.87	V
NB-IoT Band 5 / QPSK / 15KHz / 1 @ 0 / The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.69	-33.72	9.56	9.72	-33.88	-13.00	-20.88	H
2546.52	-34.14	10.50	10.86	-34.50	-13.00	-21.50	H
3395.65	-33.36	12.78	11.57	-32.15	-13.00	-19.15	H
1697.69	-35.13	9.56	9.72	-35.29	-13.00	-22.29	V
2546.52	-34.31	10.50	10.86	-34.67	-13.00	-21.67	V
3395.65	-32.00	12.78	11.57	-30.79	-13.00	-17.79	V



NB-IoT Band 5 / BPSK / 15KHz / 1@0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1648.06	-33.74	9.56	9.72	-33.90	-13.00	-20.90	H
2472.03	-34.41	10.50	10.86	-34.77	-13.00	-21.77	H
3296.34	-33.33	12.78	11.57	-32.12	-13.00	-19.12	H
1648.06	-35.75	9.56	9.72	-35.91	-13.00	-22.91	V
2472.03	-34.76	10.50	10.86	-35.12	-13.00	-22.12	V
3296.34	-32.72	12.78	11.57	-31.51	-13.00	-18.51	V
NB-IoT Band 5 / BPSK / 15KHz / 1@0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1673.15	-33.46	9.56	9.72	-33.62	-13.00	-20.62	H
2509.31	-34.91	10.50	10.86	-35.27	-13.00	-22.27	H
3346.23	-33.53	12.78	11.57	-32.32	-13.00	-19.32	H
1673.15	-35.54	9.56	9.72	-35.70	-13.00	-22.70	V
2509.31	-34.11	10.50	10.86	-34.47	-13.00	-21.47	V
3346.23	-33.16	12.78	11.57	-31.95	-13.00	-18.95	V
NB-IoT Band 5 / BPSK / 15KHz / 1@0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1697.64	-34.75	9.56	9.72	-34.91	-13.00	-21.91	H
2546.80	-35.39	10.50	10.86	-35.75	-13.00	-22.75	H
3395.54	-32.55	12.78	11.57	-31.34	-13.00	-18.34	H
1697.64	-35.49	9.56	9.72	-35.65	-13.00	-22.65	V
2546.80	-34.69	10.50	10.86	-35.05	-13.00	-22.05	V
3395.54	-32.55	12.78	11.57	-31.34	-13.00	-18.34	V



NB-IoT Band 12 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1398.37	-33.97	8.17	9.34	-35.14	-13.00	-22.14	H
2097.46	-34.54	9.53	10.42	-35.43	-13.00	-22.43	H
2796.51	-33.49	11.27	11.12	-33.34	-13.00	-20.34	H
1398.37	-34.64	8.17	9.34	-35.81	-13.00	-22.81	V
2097.46	-34.64	9.53	10.42	-35.53	-13.00	-22.53	V
2796.51	-32.32	11.27	11.12	-32.17	-13.00	-19.17	V
NB-IoT Band 12 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1415.00	-33.55	8.17	9.34	-34.72	-13.00	-21.72	H
2122.60	-34.64	9.53	10.42	-35.53	-13.00	-22.53	H
2829.72	-32.94	11.27	11.12	-32.79	-13.00	-19.79	H
1415.00	-35.53	8.17	9.34	-36.70	-13.00	-23.70	V
2122.60	-34.64	9.53	10.42	-35.53	-13.00	-22.53	V
2829.72	-33.09	11.27	11.12	-32.94	-13.00	-19.94	V
NB-IoT Band 12 / QPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1431.66	-34.48	8.17	9.34	-35.65	-13.00	-22.65	H
2147.71	-35.37	9.53	10.42	-36.26	-13.00	-23.26	H
2863.76	-32.28	11.27	11.12	-32.13	-13.00	-19.13	H
1431.66	-35.75	8.17	9.34	-36.92	-13.00	-23.92	V
2147.71	-34.39	9.53	10.42	-35.28	-13.00	-22.28	V
2863.76	-32.24	11.27	11.12	-32.09	-13.00	-19.09	V



NB-IoT Band 12 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1398.07	-34.09	8.17	9.34	-35.26	-13.00	-22.26	H
2097.19	-34.30	9.53	10.42	-35.19	-13.00	-22.19	H
2796.35	-32.17	11.27	11.12	-32.02	-13.00	-19.02	H
1398.07	-35.99	8.17	9.34	-37.16	-13.00	-24.16	V
2097.19	-33.81	9.53	10.42	-34.70	-13.00	-21.70	V
2796.35	-31.79	11.27	11.12	-31.64	-13.00	-18.64	V
NB-IoT Band 12 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1414.91	-34.18	8.17	9.34	-35.35	-13.00	-22.35	H
2122.42	-34.95	9.53	10.42	-35.84	-13.00	-22.84	H
2829.82	-32.61	11.27	11.12	-32.46	-13.00	-19.46	H
1414.91	-35.25	8.17	9.34	-36.42	-13.00	-23.42	V
2122.42	-33.99	9.53	10.42	-34.88	-13.00	-21.88	V
2829.82	-32.73	11.27	11.12	-32.58	-13.00	-19.58	V
NB-IoT Band 12 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1431.90	-33.50	8.17	9.34	-34.67	-13.00	-21.67	H
2147.78	-35.32	9.53	10.42	-36.21	-13.00	-23.21	H
2863.78	-32.47	11.27	11.12	-32.32	-13.00	-19.32	H
1431.90	-35.03	8.17	9.34	-36.20	-13.00	-23.20	V
2147.78	-34.11	9.53	10.42	-35.00	-13.00	-22.00	V
2863.78	-32.22	11.27	11.12	-32.07	-13.00	-19.07	V



NB-IoT Band 12 / QPSK / 15KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1398.42	-33.91	8.17	9.34	-35.08	-13.00	-22.08	H
2097.04	-35.19	9.53	10.42	-36.08	-13.00	-23.08	H
2796.35	-33.44	11.27	11.12	-33.29	-13.00	-20.29	H
1398.42	-35.48	8.17	9.34	-36.65	-13.00	-23.65	V
2097.04	-34.88	9.53	10.42	-35.77	-13.00	-22.77	V
2796.35	-32.09	11.27	11.12	-31.94	-13.00	-18.94	V
NB-IoT Band 12 / QPSK / 15KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1415.11	-33.75	8.17	9.34	-34.92	-13.00	-21.92	H
2122.58	-35.15	9.53	10.42	-36.04	-13.00	-23.04	H
2830.12	-32.33	11.27	11.12	-32.18	-13.00	-19.18	H
1415.11	-35.73	8.17	9.34	-36.90	-13.00	-23.90	V
2122.58	-34.91	9.53	10.42	-35.80	-13.00	-22.80	V
2830.12	-32.68	11.27	11.12	-32.53	-13.00	-19.53	V
NB-IoT Band 12 / QPSK / 15KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1431.72	-34.86	8.17	9.34	-36.03	-13.00	-23.03	H
2147.75	-34.18	9.53	10.42	-35.07	-13.00	-22.07	H
2863.73	-33.21	11.27	11.12	-33.06	-13.00	-20.06	H
1431.72	-35.47	8.17	9.34	-36.64	-13.00	-23.64	V
2147.75	-34.18	9.53	10.42	-35.07	-13.00	-22.07	V
2863.73	-32.23	11.27	11.12	-32.08	-13.00	-19.08	V



NB-IoT Band 12 / BPSK / 15KHz /1@0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1398.16	-34.49	8.17	9.34	-35.66	-13.00	-22.66	H
2097.34	-34.19	9.53	10.42	-35.08	-13.00	-22.08	H
2796.59	-33.19	11.27	11.12	-33.04	-13.00	-20.04	H
1398.16	-35.39	8.17	9.34	-36.56	-13.00	-23.56	V
2097.34	-35.07	9.53	10.42	-35.96	-13.00	-22.96	V
2796.59	-31.91	11.27	11.12	-31.76	-13.00	-18.76	V
NB-IoT Band 12 / BPSK / 15KHz /1@0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1415.03	-33.74	8.17	9.34	-34.91	-13.00	-21.91	H
2122.58	-34.34	9.53	10.42	-35.23	-13.00	-22.23	H
2830.19	-32.85	11.27	11.12	-32.70	-13.00	-19.70	H
1415.03	-34.70	8.17	9.34	-35.87	-13.00	-22.87	V
2122.58	-34.22	9.53	10.42	-35.11	-13.00	-22.11	V
2830.19	-33.15	11.27	11.12	-33.00	-13.00	-20.00	V
NB-IoT Band 12 / BPSK / 15KHz /1@0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1431.60	-34.82	8.17	9.34	-35.99	-13.00	-22.99	H
2147.65	-34.51	9.53	10.42	-35.40	-13.00	-22.40	H
2863.67	-32.82	11.27	11.12	-32.67	-13.00	-19.67	H
1431.60	-35.12	8.17	9.34	-36.29	-13.00	-23.29	V
2147.65	-33.82	9.53	10.42	-34.71	-13.00	-21.71	V
2863.67	-32.52	11.27	11.12	-32.37	-13.00	-19.37	V



NB-IoT Band 13 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1554.05	-48.72	9.56	9.72	-48.88	-13.00	-35.88	H
2331.26	-47.09	10.50	10.86	-47.45	-13.00	-34.45	H
3018.42	-45.45	12.78	11.57	-44.24	-13.00	-31.24	H
1554.05	-47.59	9.56	9.72	-47.75	-13.00	-34.75	V
2331.26	-46.33	10.50	10.86	-46.69	-13.00	-33.69	V
3018.42	-46.63	12.78	11.57	-45.42	-13.00	-32.42	V
NB-IoT Band 13 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1564.23	-47.50	9.56	9.72	-47.66	-40.00	-7.66	H
2345.70	-46.46	10.50	10.86	-46.82	-13.00	-33.82	H
3127.83	-46.31	12.78	11.57	-45.10	-13.00	-32.10	H
1564.23	-48.86	9.56	9.72	-49.02	-40.00	-9.02	V
2345.70	-46.16	10.50	10.86	-46.52	-13.00	-33.52	V
3127.83	-45.54	12.78	11.57	-44.33	-13.00	-31.33	V
NB-IoT Band 13 / QPSK / 3.75KHz / 1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1573.57	-47.89	9.56	9.72	-48.05	-40.00	-8.05	H
2360.86	-46.09	10.50	10.86	-46.45	-13.00	-33.45	H
3147.47	-45.74	12.78	11.57	-44.53	-13.00	-31.53	H
1573.57	-48.47	9.56	9.72	-48.63	-40.00	-8.63	V
2360.86	-47.32	10.50	10.86	-47.68	-13.00	-34.68	V
3147.47	-46.14	12.78	11.57	-44.93	-13.00	-31.93	V



NB-IoT Band 13 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1554.49	-48.46	9.56	9.72	-48.62	-13.00	-35.62	H
2331.12	-47.29	10.50	10.86	-47.65	-13.00	-34.65	H
3018.53	-45.96	12.78	11.57	-44.75	-13.00	-31.75	H
1554.49	-48.63	9.56	9.72	-48.79	-13.00	-35.79	V
2331.12	-47.03	10.50	10.86	-47.39	-13.00	-34.39	V
3018.53	-45.52	12.78	11.57	-44.31	-13.00	-31.31	V
NB-IoT Band 13 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1563.94	-48.12	9.56	9.72	-48.28	-40.00	-8.28	H
2345.85	-46.61	10.50	10.86	-46.97	-13.00	-33.97	H
3128.13	-45.81	12.78	11.57	-44.60	-13.00	-31.60	H
1563.94	-48.42	9.56	9.72	-48.58	-40.00	-8.58	V
2345.85	-46.76	10.50	10.86	-47.12	-13.00	-34.12	V
3128.13	-45.95	12.78	11.57	-44.74	-13.00	-31.74	V
NB-IoT Band 13 / BPSK / 3.75KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1573.90	-47.53	9.56	9.72	-47.69	-40.00	-7.69	H
2360.53	-47.19	10.50	10.86	-47.55	-13.00	-34.55	H
3147.44	-45.62	12.78	11.57	-44.41	-13.00	-31.41	H
1573.90	-48.82	9.56	9.72	-48.98	-40.00	-8.98	V
2360.53	-46.65	10.50	10.86	-47.01	-13.00	-34.01	V
3147.44	-46.36	12.78	11.57	-45.15	-13.00	-32.15	V



NB-IoT Band 13 / QPSK / 15KHz /1 @0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1554.49	-47.77	9.56	9.72	-47.93	-13.00	-34.93	H
2331.33	-46.77	10.50	10.86	-47.13	-13.00	-34.13	H
3018.63	-46.37	12.78	11.57	-45.16	-13.00	-32.16	H
1554.49	-48.29	9.56	9.72	-48.45	-13.00	-35.45	V
2331.33	-47.46	10.50	10.86	-47.82	-13.00	-34.82	V
3018.63	-46.65	12.78	11.57	-45.44	-13.00	-32.44	V
NB-IoT Band 13 / QPSK / 15KHz /1 @0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1564.32	-47.79	9.56	9.72	-47.95	-40.00	-7.95	H
2345.66	-46.77	10.50	10.86	-47.13	-13.00	-34.13	H
3127.83	-45.37	12.78	11.57	-44.16	-13.00	-31.16	H
1564.32	-48.74	9.56	9.72	-48.90	-40.00	-8.90	V
2345.66	-47.03	10.50	10.86	-47.39	-13.00	-34.39	V
3127.83	-45.41	12.78	11.57	-44.20	-13.00	-31.20	V
NB-IoT Band 13 / QPSK / 15KHz /1 @0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1573.97	-47.58	9.56	9.72	-47.74	-40.00	-7.74	H
2360.65	-46.51	10.50	10.86	-46.87	-13.00	-33.87	H
3147.37	-46.40	12.78	11.57	-45.19	-13.00	-32.19	H
1573.97	-48.48	9.56	9.72	-48.64	-40.00	-8.64	V
2360.65	-46.48	10.50	10.86	-46.84	-13.00	-33.84	V
3147.37	-45.26	12.78	11.57	-44.05	-13.00	-31.05	V



NB-IoT Band 13 / BPSK / 15KHz /1@0/ The Worst Test Results for Lowest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1554.07	-48.14	9.56	9.72	-48.30	-13.00	-35.30	H
2331.33	-46.98	10.50	10.86	-47.34	-13.00	-34.34	H
3018.41	-45.35	12.78	11.57	-44.14	-13.00	-31.14	H
1554.07	-48.12	9.56	9.72	-48.28	-13.00	-35.28	V
2331.33	-46.36	10.50	10.86	-46.72	-13.00	-33.72	V
3018.41	-46.54	12.78	11.57	-45.33	-13.00	-32.33	V
NB-IoT Band 13 / BPSK / 15KHz /1@0/ The Worst Test Results for Middle							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1563.88	-48.01	9.56	9.72	-48.17	-40.00	-8.17	H
2346.10	-47.42	10.50	10.86	-47.78	-13.00	-34.78	H
3128.14	-45.59	12.78	11.57	-44.38	-13.00	-31.38	H
1563.88	-47.78	9.56	9.72	-47.94	-40.00	-7.94	V
2346.10	-46.04	10.50	10.86	-46.40	-13.00	-33.40	V
3128.14	-46.34	12.78	11.57	-45.13	-13.00	-32.13	V
NB-IoT Band 13 / BPSK / 15KHz /1@0/ The Worst Test Results for Highest							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea	Limit	Margin	Polarity
				(dBm)	(dBm)	(dBm)	
1573.83	-48.88	9.56	9.72	-49.04	-40.00	-9.04	H
2360.49	-47.16	10.50	10.86	-47.52	-13.00	-34.52	H
3147.45	-46.19	12.78	11.57	-44.98	-13.00	-31.98	H
1573.83	-47.79	9.56	9.72	-47.95	-40.00	-7.95	V
2360.49	-46.90	10.50	10.86	-47.26	-13.00	-34.26	V
3147.45	-46.52	12.78	11.57	-45.31	-13.00	-32.31	V

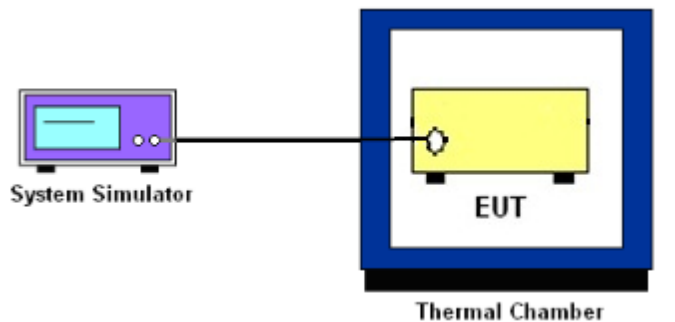
10. FREQUENCY STABILITY

10.1 DESCRIPTION OF FREQUENCY STABILITY MEASUREMENT

10.1.1 MEASUREMENT METHOD

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

10.1.2 TEST SETUP



10.1.3 TEST PROCEDURES FOR TEMPERATURE VARIATION

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

10.1.4 TEST PROCEDURES FOR VOLTAGE VARIATION

1. The testing follows FCC KDB 971168 D01v01r03 Section 9.
2. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.



10.1.5 TEST RESULTS

NB-IoT Band 2 (QPSK) / 1880MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	14.11	0.008	2.5ppm	PASS
40		11.76	0.006		
30		13.44	0.007		
20		27.35	0.015		
10		31.96	0.017		
0		16.87	0.009		
-10		18.72	0.010		
-20		26.00	0.014		
-30		35.76	0.019		
20	Maximum Voltage	33.81	0.018		
20	BEP	20.69	0.011		

NB-IoT Band 2 (QPSK) / 1880MHz / 15KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	36.48	0.019	2.5ppm	PASS
40		27.11	0.014		
30		15.82	0.008		
20		12.18	0.006		
10		33.40	0.018		
0		14.77	0.008		
-10		26.47	0.014		
-20		28.15	0.015		
-30		29.66	0.016		
20	Maximum Voltage	26.82	0.014		
20	BEP	17.41	0.009		



NB-IoT Band 4 (QPSK) / 1732.5MHz / 3.75KHz/1 @0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	35.08	0.019	2.5ppm	PASS
40		22.78	0.012		
30		18.11	0.010		
20		18.72	0.010		
10		32.35	0.017		
0		14.31	0.008		
-10		14.72	0.008		
-20		30.33	0.016		
-30		18.97	0.010		
20		Maximum Voltage	21.39		
20	BEP	11.90	0.006		

NB-IoT Band 4 (QPSK) / 1732.5MHz / 15KHz/1 @0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	26.58	0.014	2.5ppm	PASS
40		27.21	0.014		
30		15.03	0.008		
20		22.55	0.012		
10		29.34	0.016		
0		31.65	0.017		
-10		35.31	0.019		
-20		18.46	0.010		
-30		27.60	0.015		
20		Maximum Voltage	36.12		
20	BEP	24.70	0.013		



NB-IoT Band 5 (QPSK) / 836.5MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	31.41	0.017	2.5ppm	PASS
40		27.63	0.015		
30		16.30	0.009		
20		31.10	0.017		
10		12.84	0.007		
0		33.69	0.018		
-10		33.88	0.018		
-20		36.41	0.019		
-30		16.16	0.009		
20		Maximum Voltage	28.00		
20	BEP	18.71	0.010		

NB-IoT Band 5 (QPSK) / 836.5MHz / 15KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	26.48	0.014	2.5ppm	PASS
40		21.72	0.012		
30		24.09	0.013		
20		30.82	0.016		
10		27.21	0.014		
0		32.31	0.017		
-10		26.27	0.014		
-20		24.44	0.013		
-30		18.98	0.010		
20		Maximum Voltage	26.96		
20	BEP	14.72	0.008		



NB-IoT Band 12 (QPSK) / 707.5MHz / 3.75KHz/1 @0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	20.01	0.011	2.5ppm	PASS
40		16.93	0.009		
30		22.16	0.012		
20		31.67	0.017		
10		21.39	0.011		
0		34.90	0.019		
-10		29.71	0.016		
-20		12.38	0.007		
-30		19.65	0.010		
20		Maximum Voltage	12.82		
20	BEP	13.74	0.007		

NB-IoT Band 12 (QPSK) / 707.5MHz / 15KHz/1 @0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	28.36	0.015	2.5ppm	PASS
40		26.12	0.014		
30		21.40	0.011		
20		33.60	0.018		
10		29.04	0.015		
0		24.45	0.013		
-10		13.05	0.007		
-20		35.45	0.019		
-30		27.09	0.014		
20		Maximum Voltage	25.59		
20	BEP	30.32	0.016		



NB-IoT Band 13 (QPSK) / 782MHz / 3.75KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	18.19	0.010	2.5ppm	PASS
40		25.57	0.014		
30		14.71	0.008		
20		20.03	0.011		
10		14.51	0.008		
0		34.43	0.018		
-10		19.59	0.010		
-20		25.03	0.013		
-30		17.46	0.009		
20		Maximum Voltage	16.68		
20	BEP	17.11	0.009		

NB-IoT Band 13 (QPSK) / 782MHz / 15KHz/1@0					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	15.81	0.008	2.5ppm	PASS
40		19.99	0.011		
30		24.12	0.013		
20		13.78	0.007		
10		15.50	0.008		
0		20.88	0.011		
-10		19.49	0.010		
-20		30.94	0.016		
-30		34.94	0.019		
20		Maximum Voltage	28.71		
20	BEP	23.99	0.013		



APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

