FCC Test Report

(Co-located)

Report No.:	RFBCKS-WTW-P22090987-5
FCC ID:	2A82RMARK3
Test Model:	Mark 3
Received Date:	Oct. 17, 2022
Test Date:	Nov. 10, 2022
Issued Date:	Dec. 12, 2022
Applicant:	Arable Labs Inc.
Address:	51 Federal St., San Francisco, CA 94107, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P22090987-5	Original Release	Dec. 12, 2022

1 Certificate of Conformity

Product:	Arable Mark 3
Brand:	Arable Labs
Test Model:	Mark 3
Sample Status:	Engineering Sample
Applicant:	Arable Labs Inc.
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10-2013 FCC Part 22, Subpart H FCC Part 24, Subpart E FCC Part 27, Subpart C, H, F, L FCC Part 90, Subpart I, S FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Vera Huang , **Date:** Dec. 12, 2022

Vera Huang / Specialist

Approved by : Jeremy Lin , **Date:** Dec. 12, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247) FCC Part 22, Subpart H FCC Part 24, Subpart E FCC Part 27, Subpart C, H, F, L FCC Part 90 FCC Part 2			
FCC Clause	Test Item	Result	Remarks
15.205 /15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.9 dB at 2363.66 MHz.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -33.2 dB at 1672.80 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Arable Mark 3	
Brand	Arable Labs	
Test Model	Mark 3	
Status of EUT	Engineering Sample	
Power Supply Rating	3.7Vdc (Battery*2pcs) 5.0Vdc (Solar panels or host)	
Modulation Type	BT LE	GFSK
	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	LTE	QPSK, 16QAM
	NB-IoT	BPSK, QPSK (Subcarrier Spacing: 3.75kHz,15kHz)
Data Rate	BT LE	Up to 2 Mbps
Operating Frequency	BT LE	2402 ~ 2480 MHz
	GSM850	824.2MHz ~ 848.8MHz
	GSM1900	1850.2MHz ~1909.8MHz
	eMTC	
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7MHz ~ 1909.3MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5MHz ~ 1908.5MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5MHz ~ 1907.5MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0MHz ~ 1905.0MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5MHz ~ 1902.5MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0MHz ~ 1900.0MHz
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7MHz ~ 1754.3MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5MHz ~ 1753.5MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5MHz ~ 1752.5MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0MHz ~ 1750.0MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5MHz ~ 1747.5MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0MHz ~ 1745.0MHz
	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7MHz ~ 715.3MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5MHz ~ 714.5MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5MHz ~ 713.5MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0MHz ~ 711.0MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5MHz ~ 784.5MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0MHz

Operating Frequency	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1850.7MHz ~ 1914.3MHz
	LTE Band 25 (Channel Bandwidth: 3 MHz)	1851.5MHz ~ 1913.5MHz
	LTE Band 25 (Channel Bandwidth: 5 MHz)	1852.5MHz ~ 1912.5MHz
	LTE Band 25 (Channel Bandwidth: 10 MHz)	1855.0MHz ~ 1910.0MHz
	LTE Band 25 (Channel Bandwidth: 15 MHz)	1857.5MHz ~ 1907.5MHz
	LTE Band 25 (Channel Bandwidth: 20 MHz)	1860.0MHz ~ 1905.0MHz
	LTE 26 (Channel Bandwidth: 1.4 MHz) (Part 22)	824.7 ~ 848.3 MHz
	LTE 26 (Channel Bandwidth: 3 MHz) (Part 22)	825.5 ~ 847.5 MHz
	LTE 26 (Channel Bandwidth: 5 MHz) (Part 22)	826.5 ~ 846.5 MHz
	LTE 26 (Channel Bandwidth: 10 MHz) (Part 22)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 15 MHz) (Part 22)	831.5 ~ 841.5 MHz
	LTE 26 (Channel Bandwidth: 1.4 MHz) (Part 90)	814.7MHz ~ 823.3MHz
	LTE 26 (Channel Bandwidth: 3 MHz) (Part 90)	815.5MHz ~ 822.5MHz
	LTE 26 (Channel Bandwidth: 5 MHz) (Part 90)	816.5MHz ~ 821.5MHz
	LTE 26 (Channel Bandwidth: 10 MHz) (Part 90)	819.0MHz
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1779.3 MHz
	LTE Band 66 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1778.5 MHz
	LTE Band 66 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1777.5 MHz
	LTE Band 66 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1775.0 MHz
	LTE Band 66 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1772.5 MHz
	LTE Band 66 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1770.0 MHz
	LTE Band 85 (Channel Bandwidth: 5 MHz)	700.5MHz ~ 713.5MHz
	LTE Band 85 (Channel Bandwidth: 10 MHz)	703.0MHz ~ 711.0MHz
	NB-IoT Standalone	
	NB-IoT Band 2	1850.2MHz ~ 1909.8MHz
	NB-IoT Band 4	1710.2MHz ~ 1754.8MHz
	NB-IoT Band 5	824.2MHz ~ 848.8MHz
	NB-IoT Band 12	699.2MHz ~ 715.8MHz
	NB-IoT Band 13	777.2MHz ~ 786.8MHz
	NB-IoT Band 25	1850.2MHz ~ 1914.8 MHz
	NB-IoT Band 66	1710.2MHz ~ 1779.8MHz
	NB-IoT Band 71	663.2MHz ~ 697.8MHz
	NB-IoT Band 85	698.2MHz ~ 715.8MHz
Number of Channel	BT LE	40
Antenna Type	Refer to Note	
Antenna Connector	Refer to Note	
Accessory Device	Refer to Note	
Data Cable Supplied	Refer to Note	

Note:

1. The EUT uses following accessories.

Solar panels	
Brand	Model
Voltaic Systems	P293
M8 to USB Cable	
Specification	
2.5m non-shielded without core	
Battery	

Brand	Model	Specification
K2 Energy	K2B3V7EB	Power Rating : 3.7Vdc, 7.5Ah (2pcs)

2. The antenna information for host is listed as below.

BT LE

Gain (dBi)	Antenna Type	Connector Type
2.40	Dipole Antenna	N Plug

WWAN

Type	Dipole
Connector	N Plug

Antenna gain (dBi)											
GSM 850	GSM 1900	eMTC Band 26	NB-IoT Band 71	eMTC / NB-IoT Band							
				2	4	5	12	13	25	66	85
1.8	3.2	1.8	1.8	3.2	3.2	1.8	1.8	1.8	3.2	3.2	1.8

* Detail antenna specification please refer to antenna datasheet or an antenna gain measurement report.

3. After pre-test, Part 22 GSM 850MHz was the worst for the final tests.

3.2 Description of Test Modes

For BT-LE

40 channels are provided for BT-LE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

For GSM 850

3 channels are provided for GSM 850

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.2	189	836.4	251	848.8

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to		Description
	RE≥1G	RE<1G	
-	√	√	-

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement RE<1G: Radiated Emission below 1GHz

Note:

1. The Power Supply have the following modes: Battery/Solar panels/host. Pre-scan these modes of Power Supply and find the worst case as a representative test condition. The worst case was found in host mode.

2. Radiated emission test items chosen the worst maximum power channel from Bluetooth and WWAN bands.

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology
-	BT LE + GSM850	2402 ~ 2480	0, 19, 39	0 + 189	GFSK
		824.2 ~ 848.8	128, 189, 251		GPRS

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

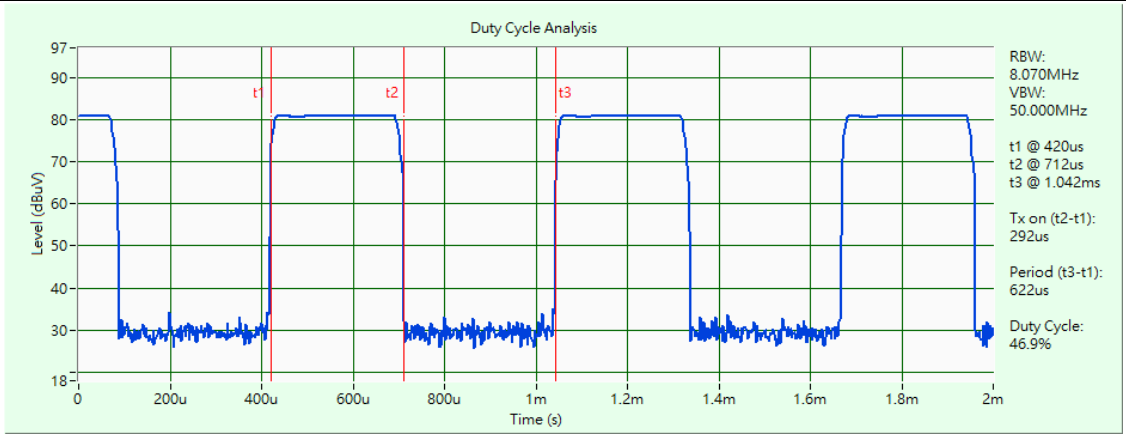
EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology
-	BT LE + GSM850	2402 ~ 2480	0, 19, 39	0 + 189	GFSK
		824.2 ~ 848.8	128, 189, 251		GPRS

Test Condition:

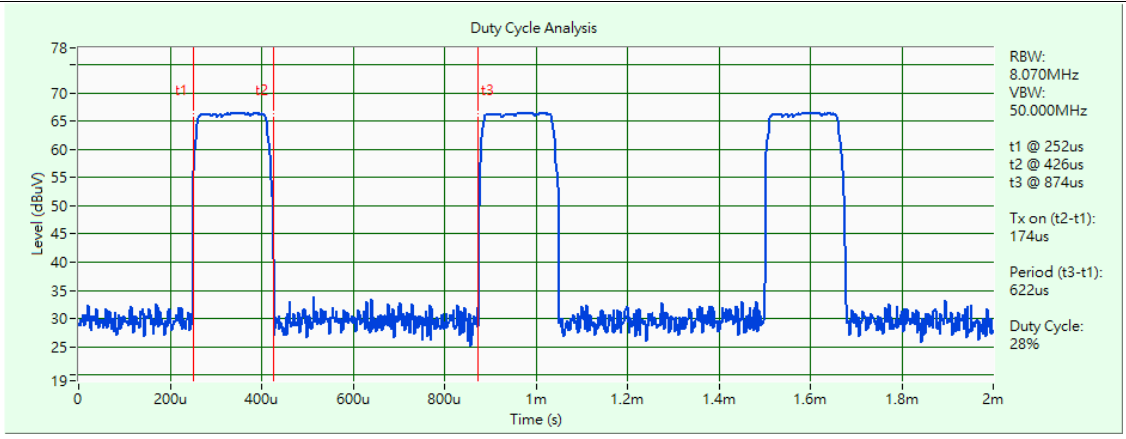
Applicable to	Environmental Conditions	Input Power (System)	Tested by
RE≥1G	23 deg. C, 71 % RH	120 Vac, 60 Hz	Vincent Chen
RE<1G	23 deg. C, 71 % RH	120 Vac, 60 Hz	Vincent Chen

3.3 Duty Cycle of Test Signal

BT-LE 1M: Duty cycle = 0.292 ms / 0.622 ms x 100% = 46.9%, duty factor = 10 * log (1/Duty cycle) = 3.28 dB
BT-LE 2M: Duty cycle = 0.174 ms / 0.622 ms x 100% = 28.0%, duty factor = 10 * log (1/Duty cycle) = 5.53 dB



BT-LE 1M



BT-LE 2M

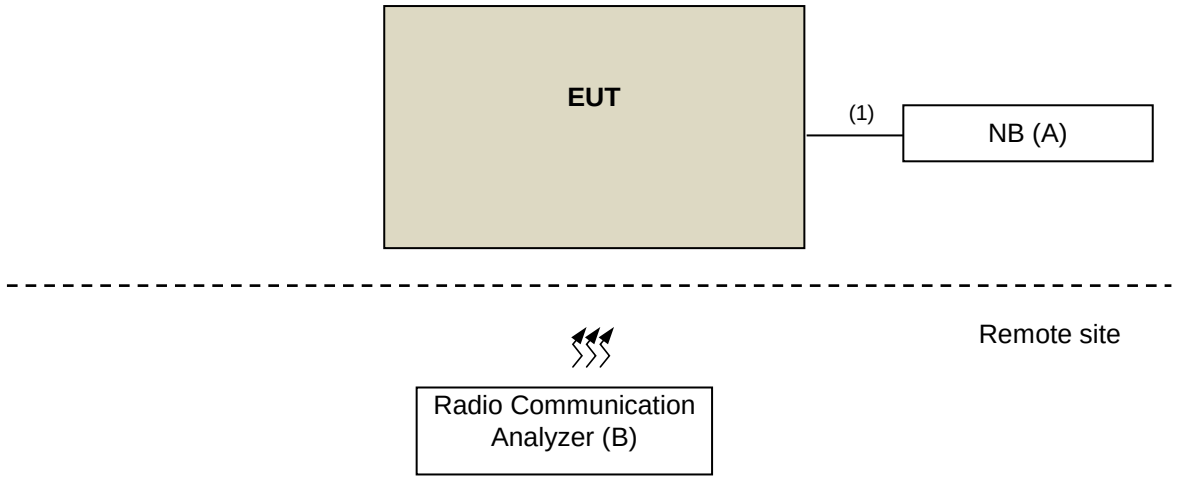
3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	NB	Lenovo	80Q7	PF0KUGU6	N/A	Provided by Lab
B	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	M8 to USB Cable	1	2.5	N	0	Accessory of EUT

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test Standard:
FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013
FCC 47 CFR Part 2
FCC 47 CFR Part 22
FCC 47 CFR Part 24
FCC 47 CFR Part 27
FCC 47 CFR Part 90
ANSI 63.26-2015
ANSI/TIA/EIA-603-E 2016
All test items have been performed and recorded as per the above standards.

References Test Guidance:
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 971168 D01 Power Meas License Digital Systems v03r01
KDB 971168 D02 Misc Rev Approv License Devices v02r01
All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

For BT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

For WWAN

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit is equal to -13 dBm.

4.1.2 Test Instruments

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver Agilent	N9038A	MY51210129	Apr. 08, 2022	Apr. 07, 2023
Signal Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Pre-amplifier EMCI	EMC001340	980201	Sep. 23, 2022	Sep. 22, 2023
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	Jan. 15, 2022	Jan. 14, 2023
Preamplifier EMCI	EMC 330H	980112	Oct. 01, 2022	Sep. 30, 2023
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 21, 2022	Oct. 20, 2023
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 01, 2022	Sep. 30, 2023
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 01, 2022	Sep. 30, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-8000	171005	Oct. 01, 2022	Sep. 30, 2023
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 01, 2022	Sep. 30, 2023
RF FLITER MICRO-TRONICS	BRM50716	060	Jan. 10, 2022	Jan. 09, 2023
RF FLITER MICRO-TRONICS	BRM17690	004	Jan. 10, 2022	Jan. 09, 2023
Pre-Amplifier EMCI	EMC 184045	980116	Oct. 01, 2022	Sep. 30, 2023
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 14, 2021	Nov. 13, 2022
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-440H	AT93021705	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller Max-Full	MF-7802	NA	NA	NA
Boresight antenna tower fixture BV	BAF-02	7	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2022	Mar. 02, 2023

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HY - 966 chamber 5.

4.1.3 Test Procedures

For BT

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

1. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

6. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.

2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.

3. For WLAN: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

   (LE 1M: RBW = 1 MHz, VBW = 5.1 kHz)

4. All modes of operation were investigated and the worst-case emissions are reported.

For WWAN

1. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
4. Following C63.26 section 5.5 and 5.2.7

   EIRP (dBm) = E (dBμV/m) + 20log(D) - 104.8; where D is the measurement distance (in the far field region) in m.

   ERP (dBm) = E (dBμV/m) + 20log(D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:

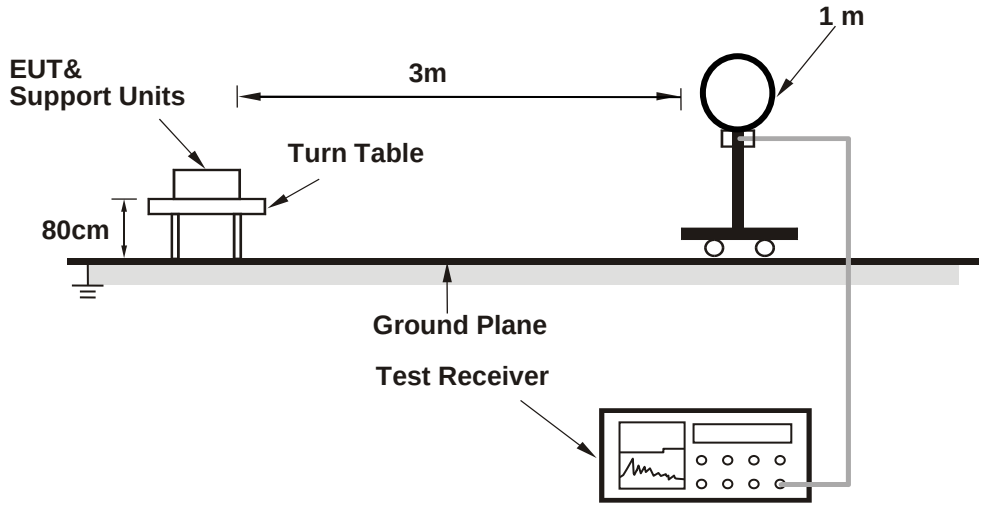
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.1.4 Deviation from Test Standard

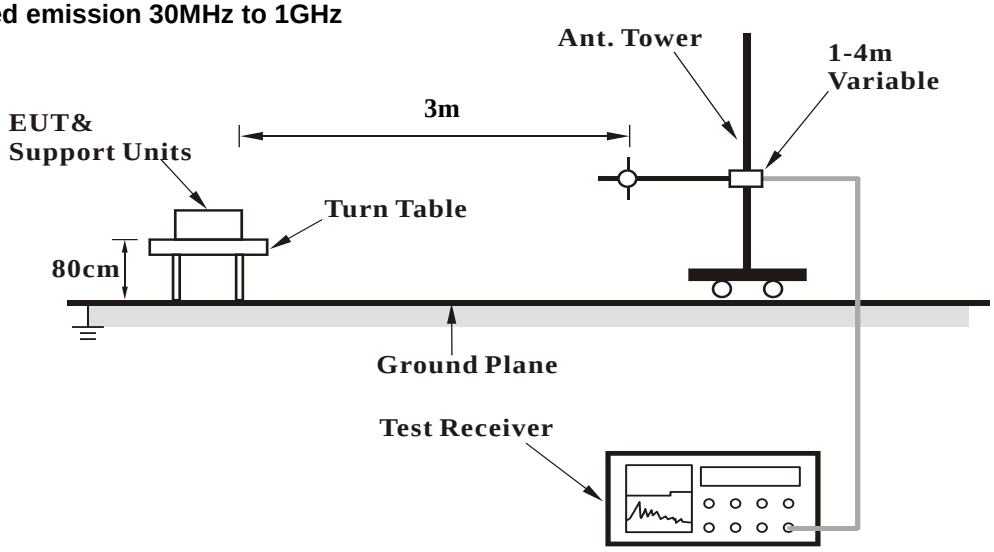
No deviation.

4.1.5 Test Setup

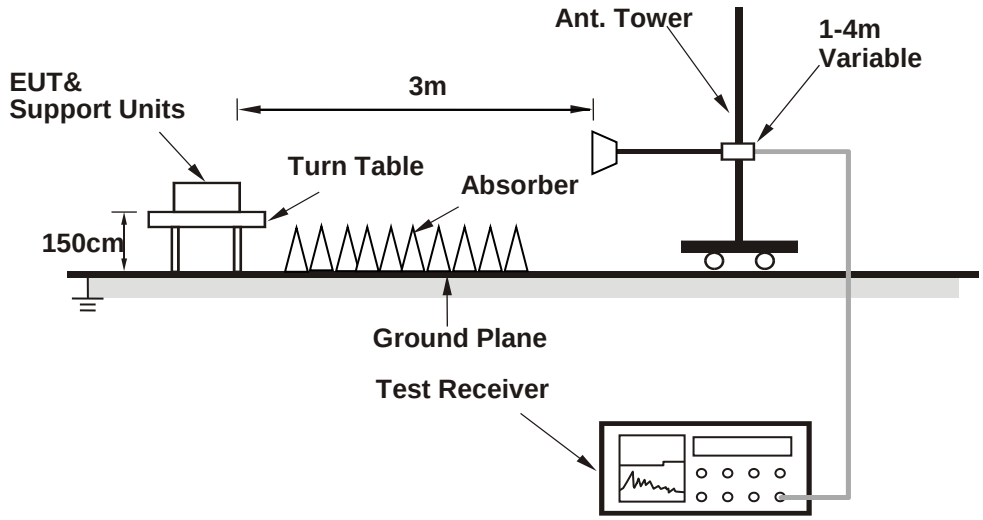
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

1. Placed the EUT on the testing table.
2. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data :

BT LE, Ch0 + GSM850, Ch189

Frequency Range	1 GHz ~ 25 GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.0 PK	74.0	-14.0	1.42 H	89	25.9	34.1
2	2390.00	50.5 AV	54.0	-3.5	1.42 H	89	16.4	34.1
3	*2402.00	102.8 PK			1.42 H	89	68.8	34.0
4	*2402.00	102.2 AV			1.42 H	89	68.2	34.0
5	4804.00	51.4 PK	74.0	-22.6	1.87 H	122	55.7	-4.3
6	4804.00	44.2 AV	54.0	-9.8	1.87 H	122	48.5	-4.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2363.66	60.8 PK	74.0	-13.2	1.57 V	66	26.7	34.1
2	**2363.66**	**53.1 AV**	**54.0**	**-0.9**	**1.57 V**	**66**	**19.0**	**34.1**
3	*2402.00	113.2 PK			1.57 V	66	79.2	34.0
4	*2402.00	112.4 AV			1.57 V	66	78.4	34.0
5	4804.00	57.3 PK	74.0	-16.7	1.42 V	287	61.6	-4.3
6	4804.00	52.9 AV	54.0	-1.1	1.42 V	287	57.2	-4.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

Frequency Range	1 GHz ~ 18 GHz

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-46.6	-13.0	-33.6	1.82 H	163	71.7	-118.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-46.2	-13.0	-33.2	2.13 V	214	72.0	-118.2

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

Below 1GHz data:

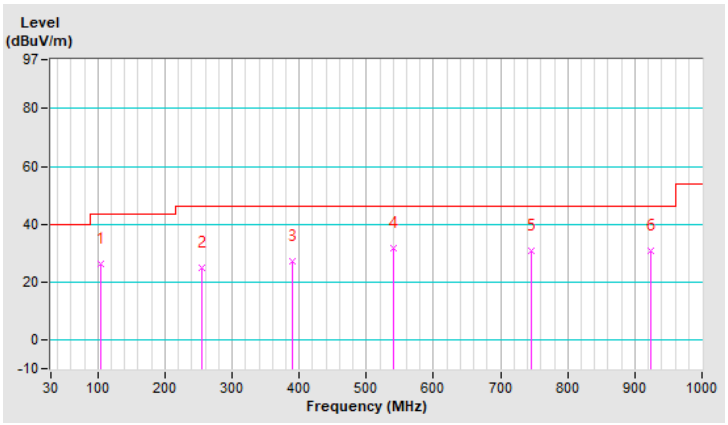
BT LE, Ch0 + GSM850, Ch189

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	103.72	26.2 QP	43.5	-17.3	2.00 H	143	42.3	-16.1
2	254.07	25.1 QP	46.0	-20.9	1.00 H	214	38.5	-13.4
3	389.87	27.0 QP	46.0	-19.0	1.50 H	71	36.7	-9.7
4	540.22	31.7 QP	46.0	-14.3	1.00 H	276	37.9	-6.2
5	745.86	30.7 QP	46.0	-15.3	1.50 H	2	32.8	-2.1
6	924.34	30.7 QP	46.0	-15.3	2.00 H	84	31.4	-0.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

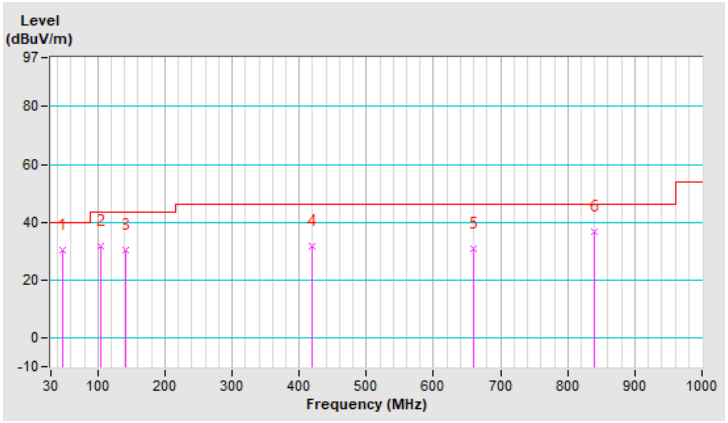


Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.46	30.4 QP	40.0	-9.6	1.00 V	285	42.7	-12.3
2	104.69	31.9 QP	43.5	-11.6	1.50 V	338	47.9	-16.0
3	141.55	30.2 QP	43.5	-13.3	2.00 V	60	42.8	-12.6
4	419.94	31.7 QP	46.0	-14.3	1.50 V	143	40.7	-9.0
5	660.50	30.8 QP	46.0	-15.2	1.00 V	197	35.1	-4.3
6	839.95	36.9 QP	46.0	-9.1	2.00 V	317	38.4	-1.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

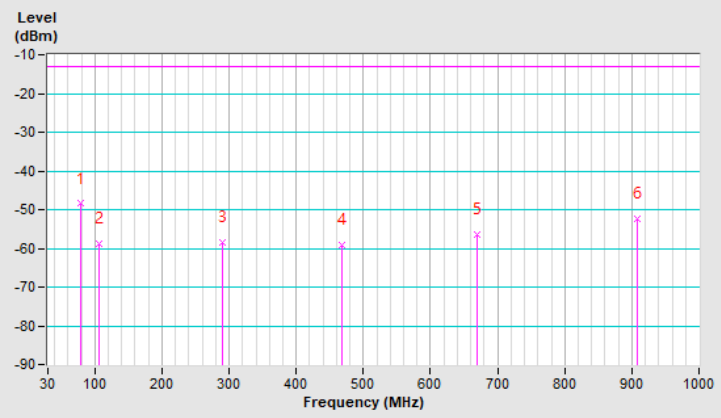


Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	78.50	-48.5	-13.0	-35.5	1.50 H	54	65.4	-113.9
2	106.63	-58.8	-13.0	-45.8	1.50 H	111	54.2	-113.0
3	290.93	-58.6	-13.0	-45.6	2.00 H	2	50.9	-109.5
4	467.47	-59.2	-13.0	-46.2	1.00 H	2	46.0	-105.2
5	670.20	-56.4	-13.0	-43.4	1.50 H	10	45.3	-101.7
6	907.85	-52.5	-13.0	-39.5	1.00 H	93	46.0	-98.5

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 – 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

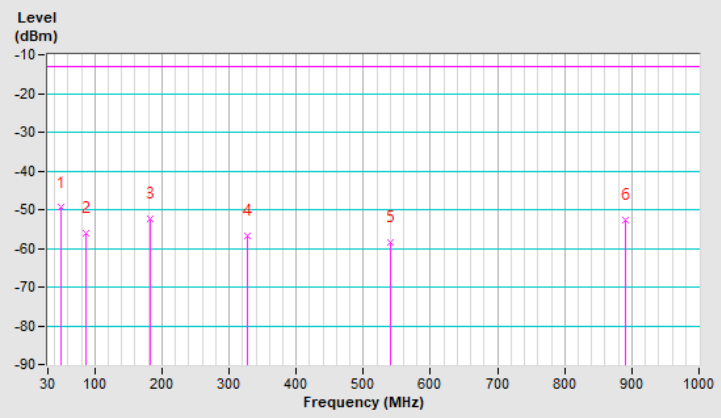


Frequency Range	Below 1000 MHz

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	50.37	-49.5	-13.0	-36.5	2.00 V	36	60.3	-109.8
2	87.23	-56.0	-13.0	-43.0	1.00 V	287	59.5	-115.5
3	182.29	-52.3	-13.0	-39.3	1.50 V	354	59.5	-111.8
4	326.82	-56.8	-13.0	-43.8	2.00 V	278	51.8	-108.6
5	541.19	-58.4	-13.0	-45.4	1.00 V	350	45.4	-103.8
6	890.39	-52.8	-13.0	-39.8	1.50 V	292	45.8	-98.6

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 – 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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