



TEST REPORT No.: (5214)199-0590

TEST REPORT

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Factory name:	SILVERLIT TOYS MANUFACTORY LTD.		
Location:	17th Floor World Trade Centre, 280 Gloucester Road, Causeway Bay, Hong Kong		
Product:	Bluetooth La Ferrari Model No.: 86069		
		Sample No:	(5214)199-0590
		Test Date(s):	July 30, 2014 to August 12, 2014
		Test Requested:	FCC Part 15 – 2012
		Test Method:	ANSI C63.4 – 2009
		FCC ID:	OYK-TX0002G4-1403
The results given in this report are related to the tested specimen of the described electrical apparatus.			
CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.			
Authorized Signature:			
			
Reviewed by: Keith Yeung		Approved by: Steven Tsang	
Date: September 12, 2014		Date: September 12, 2014	

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
(5214)199-0590	Original release	Sep. 12, 2014



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1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	Compliant
§15.207 (a)	Conducted Emission	N/A	EUT is powered by battery
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

2 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.74dB
	30MHz ~ 1GMHz	3.55dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



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3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth La Ferrari
MODEL NO.	86069
FCC ID	OYK-TX0002G4-1403
NOMINAL VOLTAGE	DC6V from Battery
MODULATION TYPE	GFSK, 8DPSK, $\pi/4$ DQPSK
OPERATING FREQUENCY	2402MHz ~ 2480MHz
ANTENNA TYPE	PCB Antenna, 0dBi Gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.:140730N001) for detailed product photo.



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3.2 DESCRIPTION OF TEST MODES

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2402 MHz
Middle	2441 MHz
High	2480 MHz

3.3 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:

FCC Part 15, Subpart C, Section 15.249 (2012-10)

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Verification). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without any other necessary accessories or support units.

3.5 TEST LABORATORY

BUREAU VERITAS SHENZHEN CO., LTD., DONGGUAN BRANCH

Chenwu Industrial Zone, Houjie Town, Dongguan, Guangdong, China



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4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, 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 20dB under any condition of modulation.



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4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4446A	MY46180622	Apr. 29,14	Apr. 28,15
EMI Test Receiver	Rohde&Schwarz	ESVS10	841431/004	May 17,14	May 16,15
Loop antenna (9kHz~30MHz)	Daze	ZN30900A	0708	Dec. 05,13	Dec. 04,14
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	27089	Jun. 27, 14	Jun. 26, 15
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	Oct. 18, 12	Oct. 17, 14
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Feb. 13,14	Feb. 12,15
Pre-Amplifier (9kHz~1GHz)	SONOMA	310D	186955	Mar. 05,14	Mar. 04,15
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,14	Jun. 24,15
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B	3008A00409	May 13,14	May 12,15
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,13	Nov. 03,14
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Jul. 27,14	Jul. 26, 15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 30, 13	Oct. 29, 14
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 966 Chamber.
3. The FCC Site Registration No. is 502831.



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4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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. The antenna is a broadband antenna, and its height 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

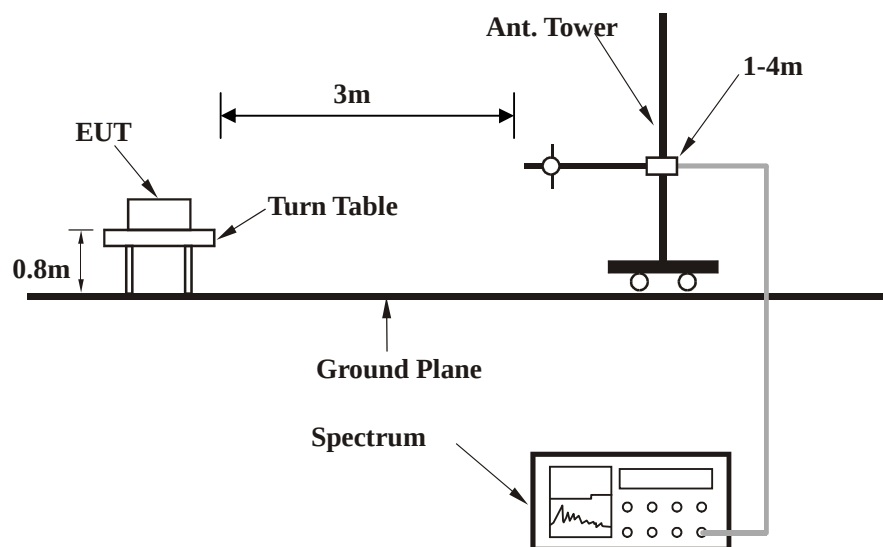
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

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4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.

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4.1.7 TEST RESULTS

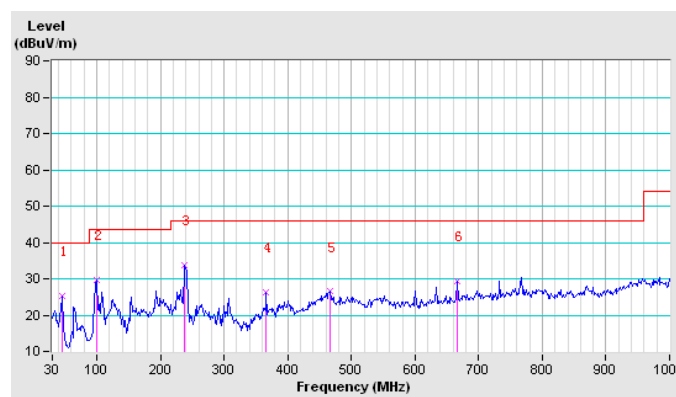
BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Low Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	46.17	25.2 QP	40.0	-14.8	1.00 H	50	13.52	11.71
2	99.52	29.8 QP	43.5	-13.7	1.00 H	37	17.87	11.90
3	238.55	33.7 QP	46.0	-12.3	1.00 H	20	20.27	13.42
4	366.27	26.3 QP	46.0	-19.7	1.00 H	111	7.88	18.44
5	466.50	26.5 QP	46.0	-19.5	1.00 H	87	5.17	21.34
6	666.97	29.3 QP	46.0	-16.7	1.00 H	70	3.77	25.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



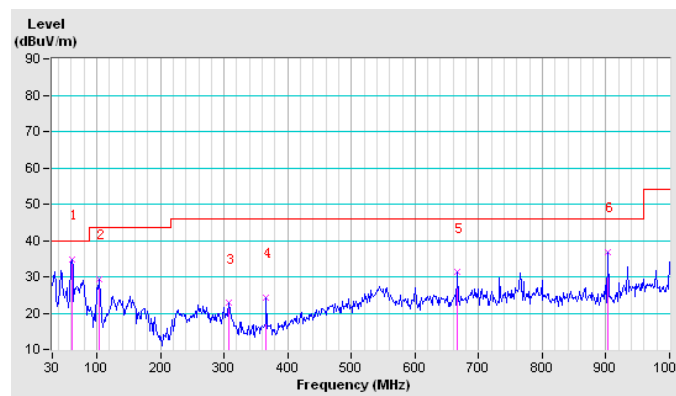
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CHANNEL	TX Low Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	60.72	34.7 QP	40.0	-5.3	1.00 V	291	28.60	6.09
2	104.37	29.3 QP	43.5	-14.2	1.00 V	277	16.85	12.43
3	308.07	22.8 QP	46.0	-23.2	1.00 V	156	6.05	16.72
4	366.27	24.3 QP	46.0	-21.7	1.00 V	264	5.86	18.44
5	666.97	31.3 QP	46.0	-14.7	1.00 V	248	5.77	25.50
6	903.00	36.9 QP	46.0	-9.1	1.00 V	229	8.12	28.81

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





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ABOVE 1GHz WORST-CASE DATA: BT_GFSK

CHANNEL	TX Low Channel	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	62.4 PK	74.0	-11.6	1.22 H	344	26.42	35.98
2	2400.00	38.3 AV	54.0	-15.7	1.22 H	344	2.32	35.98
3	*2402.00	98.2 PK	114	-15.8	1.34 H	226	62.12	35.98
4	*2402.00	74.1 AV	94	-19.9	1.34 H	226	38.02	35.98
5	4804.00	53.4 PK	74.0	-20.6	1.32 H	244	14.04	39.36
6	4804.00	29.3 AV	54.0	-24.7	1.32 H	244	-10.06	39.36
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	64.4 PK	74.0	-9.6	1.52 V	202	28.42	35.98
2	2400.00	40.3 AV	54.0	-13.7	1.52 V	202	4.32	35.98
3	*2402.00	103.4 PK	114	-10.6	1.52 V	202	67.32	35.98
4	*2402.00	79.3 AV	94	-14.7	1.52 V	202	43.22	35.98
5	4804.00	50.7 PK	74.0	-23.3	1.20 V	344	11.34	39.36
6	4804.00	26.6 AV	54.0	-27.4	1.20 V	344	-12.76	39.36

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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CHANNEL	TX Middle Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	98.1 PK	114	-15.9	1.55 H	234	62.02	36.03
2	*2441.00	74.0 AV	94	-20	1.55 H	234	37.92	36.03
3	4882.00	50.5 PK	74.0	-23.5	1.34 H	216	11.12	39.38
4	4882.00	26.4 AV	54.0	-27.6	1.34 H	216	-12.98	39.38
5	7323.00	53.6 PK	74.0	-20.4	1.33 H	256	10.88	42.75
6	7323.00	29.5 AV	54.0	-24.5	1.33 H	256	-13.22	42.75
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	101.4 PK	114	-12.6	1.18 V	256	65.32	36.03
2	*2441.00	77.3 AV	94	-16.7	1.18 V	256	41.22	36.03
3	4882.00	49.4 PK	74.0	-24.6	1.21 V	283	10.01	39.38
4	4882.00	25.3 AV	54.0	-28.7	1.21 V	283	-14.09	39.38
5	7323.00	54.2 PK	74.0	-19.8	1.24 V	255	11.43	42.75
6	7323.00	30.1 AV	54.0	-23.9	1.24 V	255	-12.67	42.75

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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CHANNEL	TX High Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	99.2 PK	114	-14.8	1.22 H	235	63.12	36.08
2	*2480.00	75.1 AV	94	-18.9	1.22 H	235	39.02	36.08
3	2483.50	52.3 PK	74.0	-21.7	1.22 H	235	16.23	36.09
4	2483.50	28.2 AV	54.0	-25.8	1.22 H	235	-7.87	36.09
5	4960.00	49.7 PK	74.0	-24.3	1.22 H	294	10.32	39.39
6	4960.00	25.6 AV	54.0	-28.4	1.22 H	294	-13.78	39.39
7	7440.00	52.8 PK	74.0	-21.2	1.32 H	309	10.18	42.65
8	7440.00	28.7 AV	54.0	-25.3	1.32 H	309	-13.92	42.65
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	102.7 PK	114	-11.3	1.12 V	214	66.62	36.08
2	*2480.00	78.6 AV	94	-15.4	1.12 V	214	42.52	36.08
3	2483.50	56.6 PK	74.0	-17.5	1.12 V	214	20.46	36.09
4	2483.50	32.5 AV	54.0	-21.6	1.12 V	214	-3.64	36.09
5	4960.00	49.8 PK	74.0	-24.2	1.41 V	288	10.45	39.39
6	4960.00	25.7 AV	54.0	-28.3	1.41 V	288	-13.65	39.39
7	7440.00	53.1 PK	74.0	-20.9	1.31 V	304	10.48	42.65
8	7440.00	29.0 AV	54.0	-25.0	1.31 V	304	-13.62	42.65

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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BT 8DPSK

CHANNEL	TX Low Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	61.8 PK	74.0	-12.2	1.08 H	227	25.86	35.98
2	2400.00	37.7 AV	54.0	-16.3	1.08 H	227	1.76	35.98
3	*2402.00	98.1 PK	114	-15.9	1.08 H	227	62.02	35.98
4	*2402.00	74.0 AV	94	-20	1.08 H	227	37.92	35.98
5	4804.00	51.5 PK	74.0	-22.5	1.42 H	344	12.14	39.36
6	4804.00	27.4 AV	54.0	-26.6	1.42 H	344	-11.96	39.36
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	63.7 PK	74.0	-10.3	N/A V	N/A	27.76	35.98
2	2400.00	39.6 AV	54.0	-14.4	N/A V	N/A	3.66	35.98
3	*2402.00	99.8 PK	114	-14.2	1.32 V	231	63.72	35.98
4	*2402.00	75.7 AV	94	-18.3	1.32 V	231	39.62	35.98
5	4804.00	50.4 PK	74.0	-23.6	1.28 V	306	11.04	39.36
6	4804.00	26.3 AV	54.0	-27.7	1.28 V	306	-13.06	39.36

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	97.9 PK	114	-16.1	1.38 H	267	61.82	36.03
2	*2441.00	73.8 AV	94	-20.2	1.38 H	267	37.72	36.03
3	4882.00	50.4 PK	74.0	-23.6	1.09 H	331	11.06	39.38
4	4882.00	26.3 AV	54.0	-27.7	1.09 H	331	-13.04	39.38
5	7323.00	53.7 PK	74.0	-20.3	1.08 H	242	10.99	42.75
6	7323.00	29.6 AV	54.0	-24.4	1.08 H	242	-13.11	42.75
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	101.4 PK	114	-12.6	1.44 V	202	65.32	36.03
2	*2441.00	77.3 AV	94	-16.7	1.44 V	202	41.22	36.03
3	4882.00	49.1 PK	74.0	-24.9	1.33 V	226	9.72	39.38
4	4882.00	25.0 AV	54.0	-29.0	1.33 V	226	-14.38	39.38
5	7323.00	54.7 PK	74.0	-19.3	1.41 V	310	11.97	42.75
6	7323.00	30.6 AV	54.0	-23.4	1.41 V	310	-12.13	42.75

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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CHANNEL	TX High Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	99.1 PK	114	-14.9	1.47 H	268	63.02	36.08
2	*2480.00	75.0 AV	94	-19	1.47 H	268	38.92	36.08
3	2483.50	52.1 PK	74.0	-22.0	1.47 H	268	15.96	36.09
4	2483.50	28.0 AV	54.0	-26.1	1.47 H	268	-8.14	36.09
5	4960.00	49.6 PK	74.0	-24.4	1.12 H	325	10.23	39.39
6	4960.00	25.5 AV	54.0	-28.5	1.12 H	325	-13.87	39.39
7	7440.00	52.4 PK	74.0	-21.6	1.29 H	334	9.78	42.65
8	7440.00	28.3 AV	54.0	-25.7	1.29 H	334	-14.32	42.65
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	102.6 PK	114	-11.4	1.33 V	288	102.6	36.08
2	*2480.00	78.5 AV	94	-15.5	1.33 V	288	42.42	36.08
3	2483.50	54.9 PK	74.0	-19.1	1.26 V	330	18.81	36.09
4	2483.50	30.8 AV	54.0	-23.2	1.26 V	330	-5.29	36.09
5	4960.00	49.6 PK	74.0	-24.4	1.13 V	269	10.25	39.39
6	4960.00	25.5 AV	54.0	-28.5	1.13 V	269	-13.85	39.39
7	7440.00	52.9 PK	74.0	-21.1	1.26 V	330	10.25	42.65
8	7440.00	28.8 AV	54.0	-25.2	1.26 V	330	-13.85	42.65

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



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4.2 20dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 25,13	Nov. 24,14
Spectrum Analyzer (9KHz-25GHz)	Agilent	E7405A	MY45118807	May 14,14	May 13,15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 31,13	Oct. 30,14
Bluetooth tester	Rohde&Schwarz	CBT	100325	N/A	N/A

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test site was performed in RF OVEN room.



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4.2.3 TEST PROCEDURE

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations.

The spectrum analyzer was receiving the maximum emission level. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

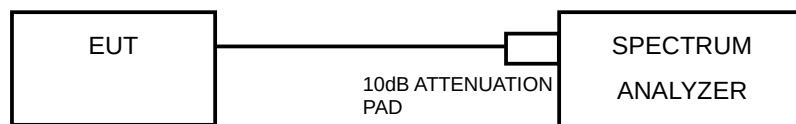
4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



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4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

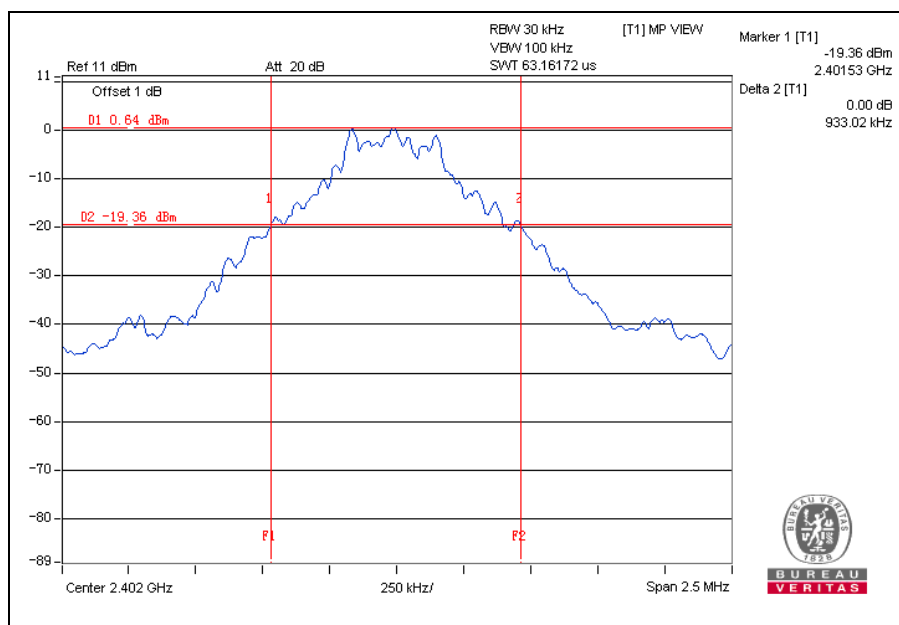
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4.2.7 TEST RESULTS

GFSK DH5

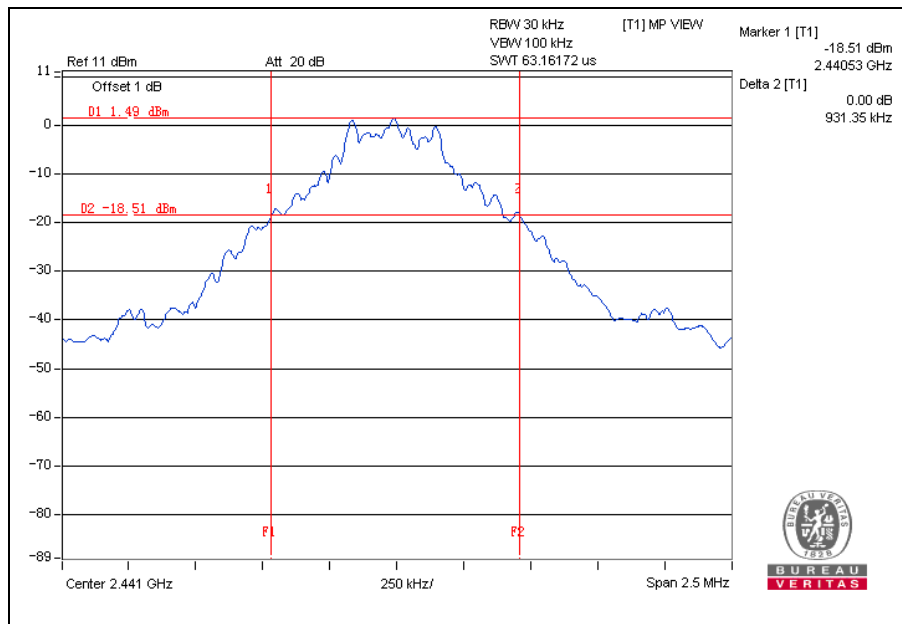
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	0.933
Middle	2441	0.931
High	2480	0.934

Test Data: Low channel

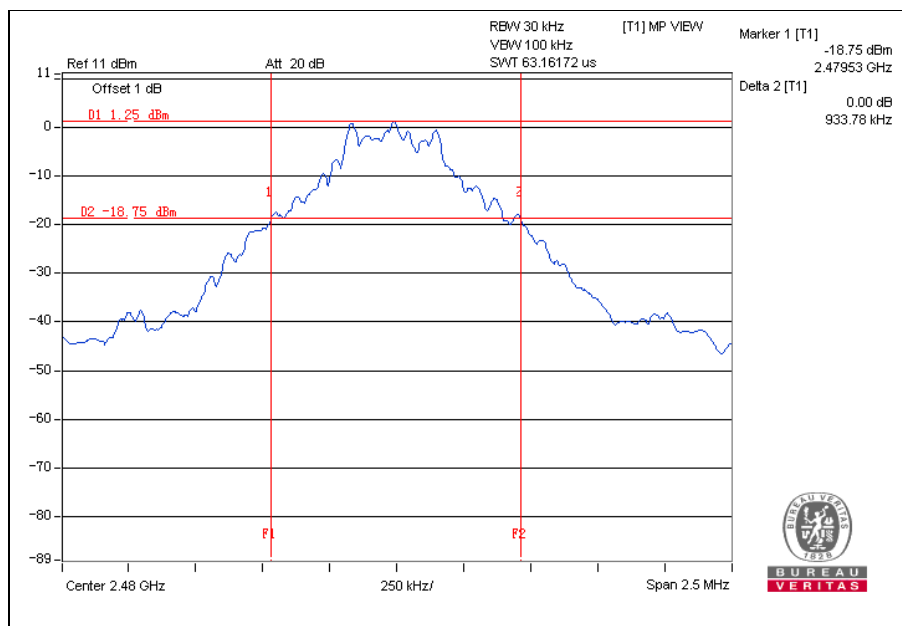


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Test Data: Middle channel



Test Data: High channel

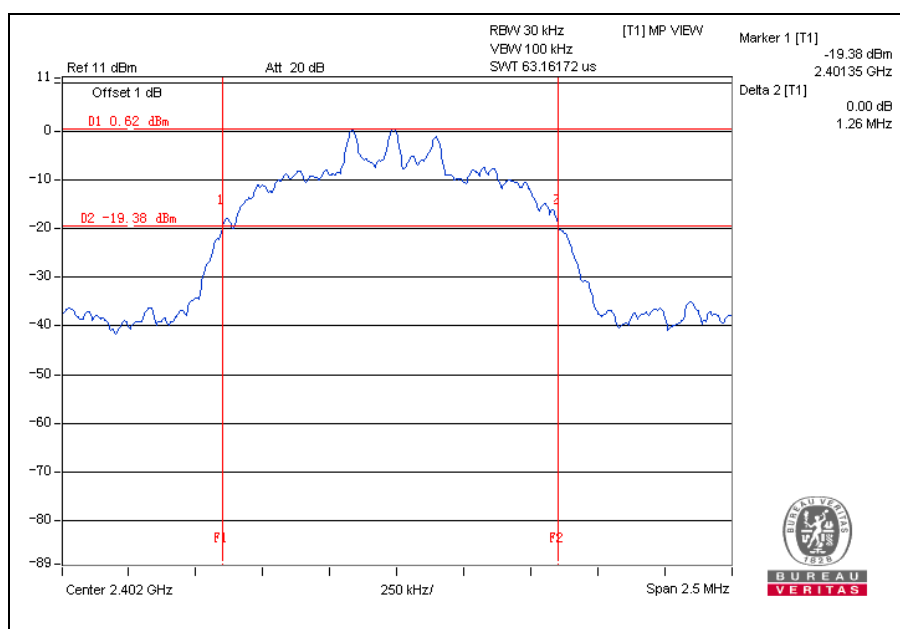


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8DPSK DH5

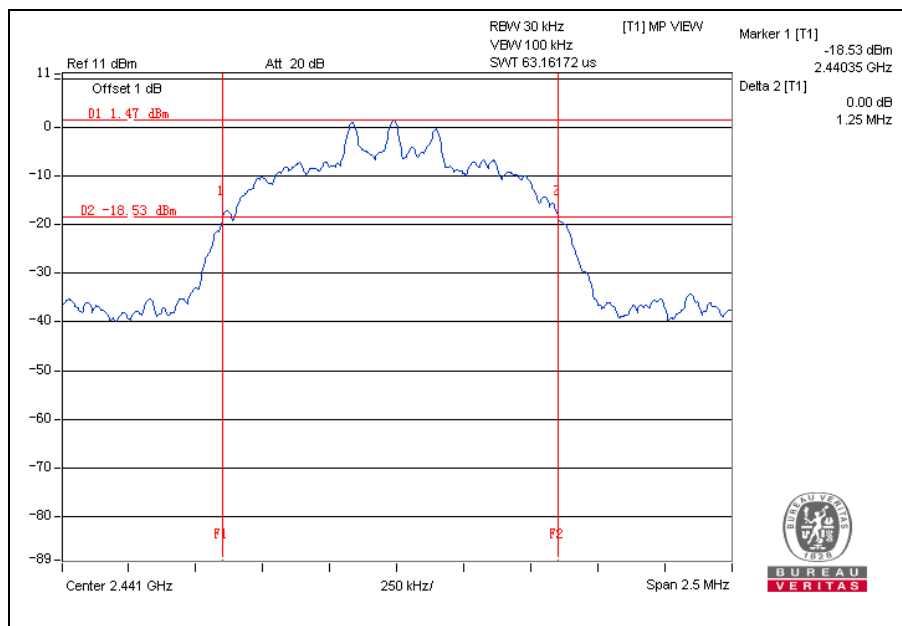
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	1.26
Middle	2441	1.25
Hight	2480	1.25

Test Data: Low channel

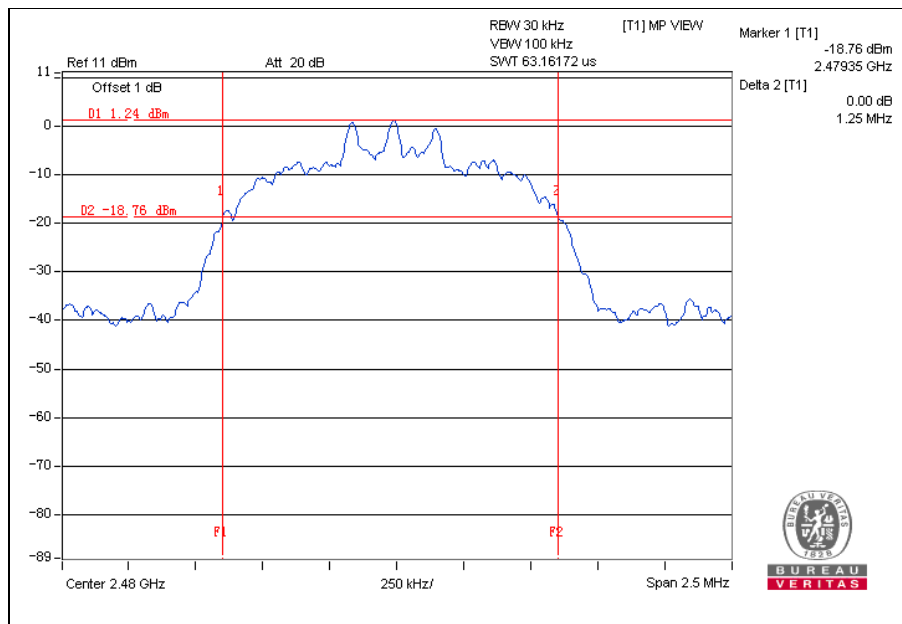


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Test Data: Middle channel



Test Data: High channel





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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---