TEST REPORT

FCC ID: 2AHZN-926BT

For

Shenzhen Keshangda Electronics Technology Co.,Ltd

Car Multimedia Player

Model No.	:	ST-926BT, 3236, 3242, 3243, 3245, 3246, 3247, 3248, 3249, 3250
Trade Name	:	N/A
Prepared for	:	Shenzhen Keshangda Electronics Technology Co.,Ltd
Address	:	6/F, 6Unit, PaiBang ShanTang Industrial, HengGang, LongGang Dist. ShenZhen, 518115 China
Prepared by	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road, Bao'an, Shenzhen, China
Report No.	:	T1860467 01
Date of Receipt	:	April 01, 2016
Date of Test	:	April 01-14, 2016
Date of Report	:	April 15, 2016
Version Number	:	REV0

Contents

1. General Information 5
1.1. Description of Device (EUT) 5
1.2. Accessories of device (EUT) 6
1.3. Test Lab information 6
2. Summary of test 7
2.1. Summary of test result 7
2.2. Assistant equipment used for test 7
2.3. Block Diagram 8
2.4. Test mode 8
2.5. Test Conditions 9
2.6. Measurement Uncertainty (95% confidence levels, k=2) 9
2.7. Test Equipment 10
3. Maximum Peak Output power 11
3.1. Limit 11
3.2. Test Procedure 11
3.3. Test Setup 11
3.4. Test Result 11
4. Bandwidth 12
4.1. Limit 12
4.2. Test Procedure 12
4.3. Test Result 12
5. Carrier Frequency Separation 18
5.1. Limit 18
5.2. Test Procedure 18
5.3. Test Result 18
6. Number Of Hopping Channel 21
6.1. Limit 21
6.2. Test Procedure 21
6.3. Test Result 21
7. Dwell Time 24
7.1. Test limit 24
7.2. Test Procedure 24
7.3. Test Results 24
8. Radiated emissions 31
8.1. Limit 31
8.2. Block Diagram of Test setup 32
8.3. Test Procedure 33
8.4. Test Result 33
9. Band Edge Compliance 45
9.1. Block Diagram of Test Setup 45
9.2. Limit 45
9.3. Test Procedure 45
9.4. Test Result 45

10. Power Line Conducted Emissions 64
10.1. Block Diagram of Test Setup 64
10.2. Limit 64
10.3. Test Procedure 64
10.4. Test Result 65
11. Antenna Requirements 66
11.1. Limit 66
11.2. Result 66
12. Test setup photo 67
12.1. Photos of Radiated emission 67
13. Photos of EUT 68

DECLARATION

Applicant	:	Shenzhen Keshangda Electronics Technology Co.,Ltd
Manufacturer	:	Shenzhen Keshangda Electronics Technology Co.,Ltd
Product	:	Car Multimedia Player
(A) Model No.	:	ST-926BT, 3236, 3242, 3243, 3245, 3246, 3247, 3248, 3249, 3250
(B) Trade Name	:	N/A
(C) Power supply	:	DC 12V From Battery

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2015, ANSI C63.4:2014

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Reak Yang Test Engineer	Reak Yang ……
Approved by (name + signature)…....:	Simple Guan Project Manager	……
Date of issue…… ……..:		April 15, 2016

1. General Information

1.1. Description of Device (EUT)

EUT	:	Car Multimedia Player
Model No.	:	ST-926BT, 3236, 3242, 3243, 3245, 3246, 3247, 3248, 3249, 3250
Trade mark	:	N/A
Power supply	:	DC 12V From Battery
Radio Technology	:	Bluetooth 2.1 + EDR
Operation frequency	:	2402-2480MHz
Modulation	:	GFSK, π /4 DQPSK, 8- DPSK
Antenna Type	:	Integrated Antenna, max gain 0dBi.
Hardware REV.	:	2.0
Software REV.	:	keshabgda_weiyide_20150330_v1.0
Applicant	:	Shenzhen Keshangda Electronics Technology Co.,Ltd
Address	:	6/F, 6Unit, PaiBang ShanTang Industrial, HengGang, LongGang Dist. ShenZhen, 518115 China
Manufacturer	:	Shenzhen Keshangda Electronics Technology Co.,Ltd
Address	:	6/F, 6Unit, PaiBang ShanTang Industrial, HengGang, LongGang Dist. ShenZhen, 518115 China

1.2. Accessories of device (EUT)

Accessories : N/A

Type : N/A

1.3. Test Lab information

Shenzhen Alpha Product Testing Co., Ltd.

2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China

FCC Registered No.: 203110

2. Summary of test

2.1. Summary of test result

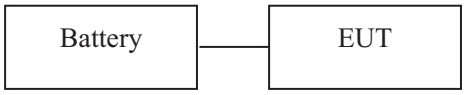
Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2014	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2014	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2014	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2014	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2014	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2014	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2014	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2014	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
Note: Test with the test procedure Blue tool.		

2.2. Assistant equipment used for test

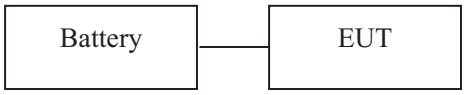
Description	:	N/A
Manufacturer	:	N/A
Model No.	:	N/A
Remark: FCC DOC approved		

2.3. Block Diagram

1, For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground for blew 1GHz, 1.5 meter high above ground for above 1GHz. EUT was be set into BT test mode by adb.exe software before test.



2, For Power Line Conducted Emissions Test



2.4. Test mode

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode.

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
π /4 DQPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
8- DPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

2.5. Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.71dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.90dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.28dB	Polarize: H
	4.26dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for conducted RF Power	0.16dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Cal. Due day	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2017.01.16	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2017.01.16	1Year
Receiver	R&S	ESCI	101165	2017.01.16	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2018.01.18	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2018.01.18	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2018.01.18	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2017.01.16	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2017.01.16	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.01.16	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.01.16	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	2017.01.16	1Year
Power sensor	Anritsu	ML2491A	32516	2017.01.16	1Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	2017.01.16	1Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	2017.01.16	1Year

3. Maximum Peak Output power

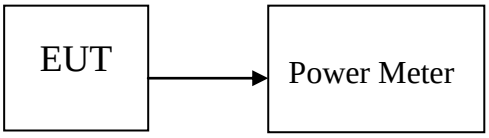
3.1. Limit

Please refer section15.247.
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

EUT: Car Multimedia Player M/N: ST-926BT					
Test date: 2016-04-07		Test site: RF site Tested by: Reak			
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Margin (dB)
GFSK	2402	1.68	1.472	21	19.320
	2441	2.58	1.811	21	18.420
	2480	2.94	1.968	21	18.060
π /4 DQPSK,	2402	1.56	1.432	21	19.440
	2441	1.96	1.570	21	19.040
	2480	2.43	1.750	21	18.570
8- DPSK	2402	1.54	1.426	21	19.460
	2441	1.97	1.574	21	19.030
	2480	2.48	1.770	21	18.520
Conclusion: PASS					

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, 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. Test Procedure

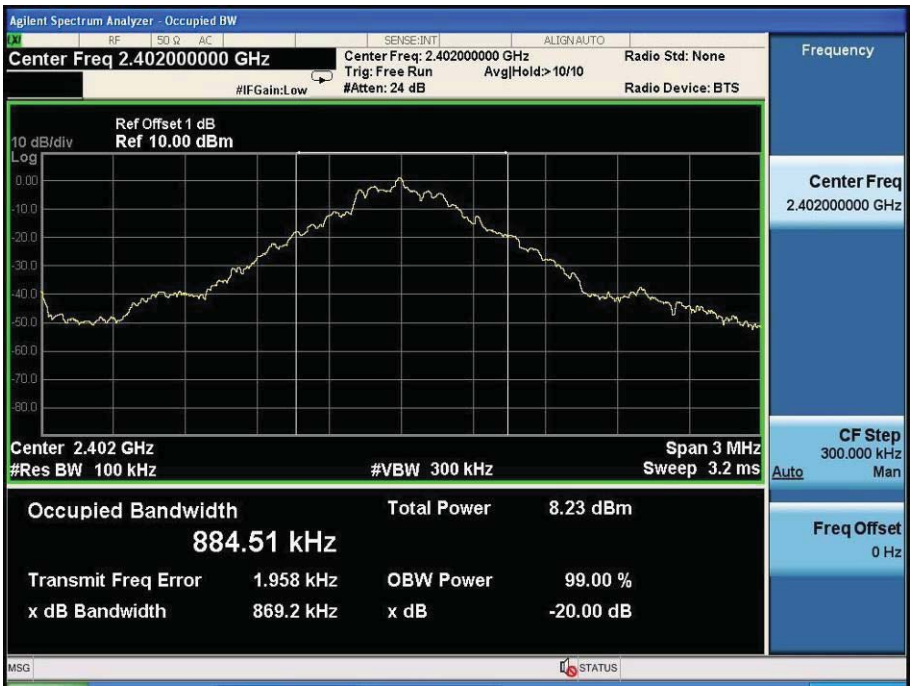
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB. Peak detector is used

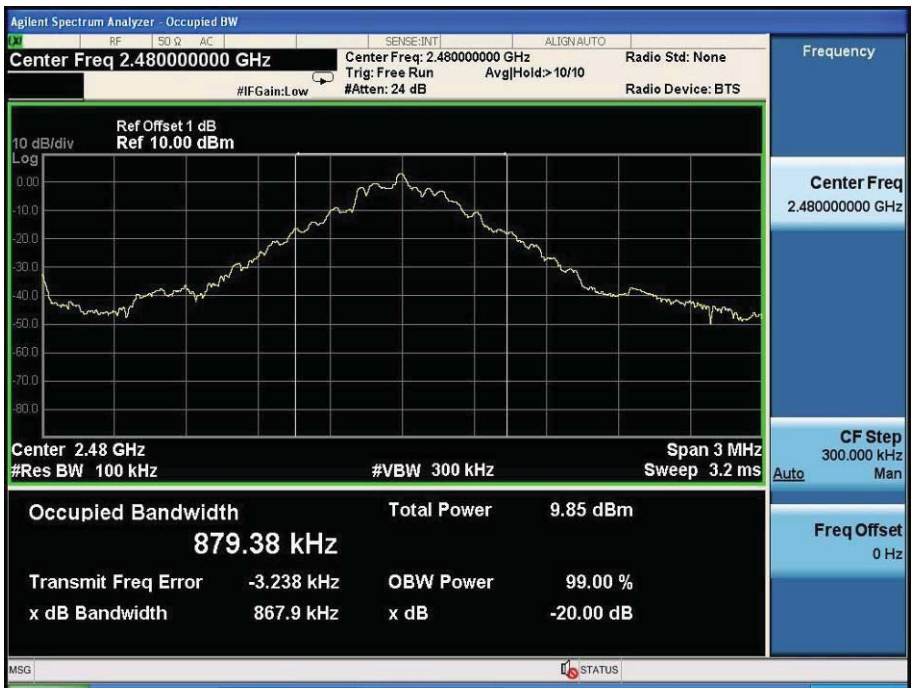
4.3. Test Result

EUT: Car Multimedia Player M/N: ST-926BT				
Test date: 2016-04-07	Test site: RF site		Tested by: Reak	
Mode	Freq (MHz)	20dB Bandwidth (KHz)	Limit (kHz)	Conclusion
GFSK	2402	869.2	/	PASS
	2441	853.9	/	PASS
	2480	867.9	/	PASS
π /4 DQPSK	2402	1217	/	PASS
	2441	1234	/	PASS
	2480	1229	/	PASS
8- DPSK	2402	1209	/	PASS
	2441	1211	/	PASS
	2480	1212	/	PASS

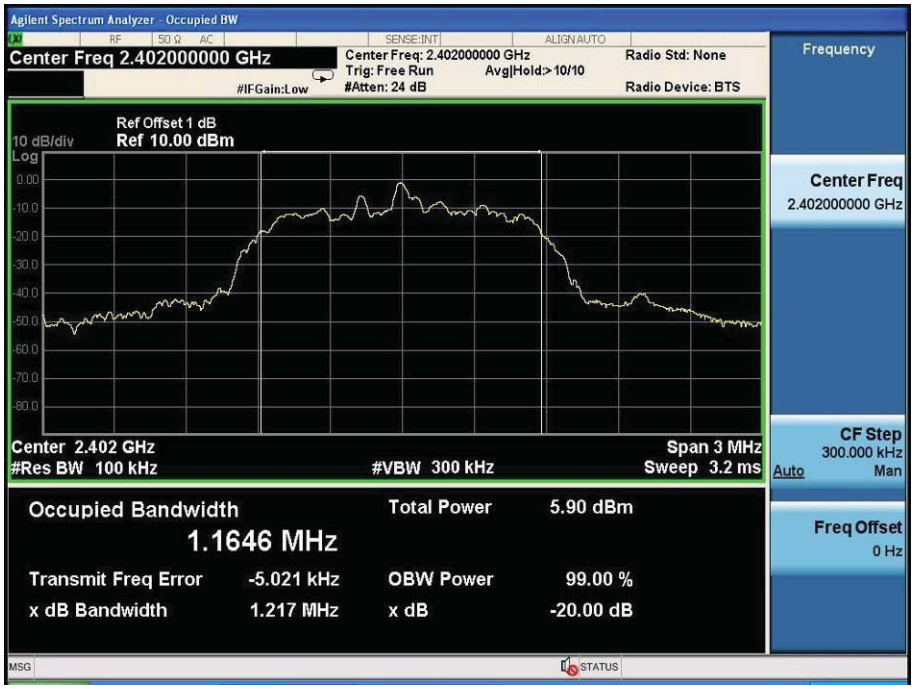
Orginal Test data For 20dB bandwidth

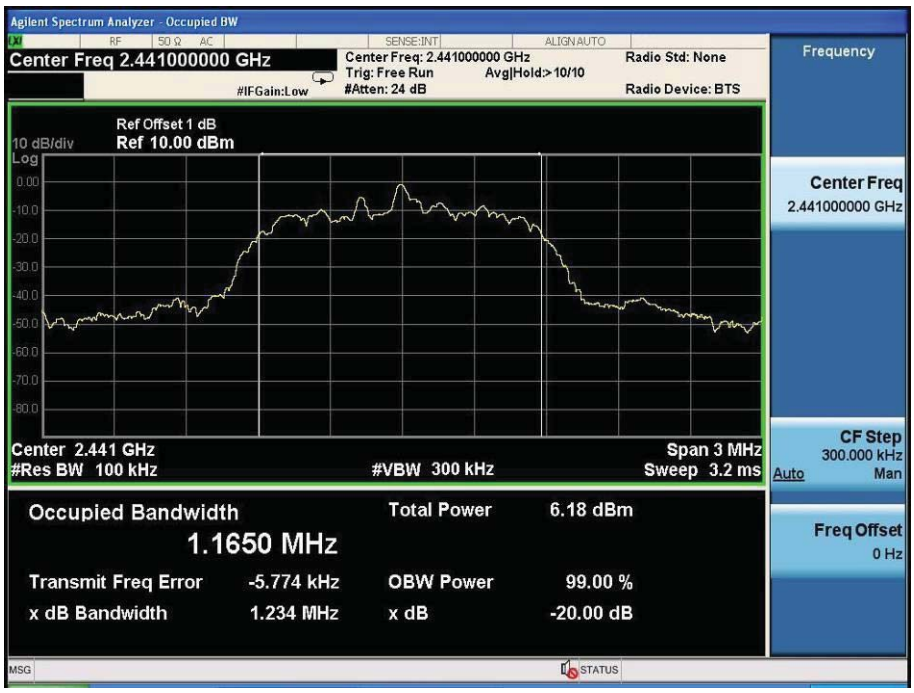
GFSK:

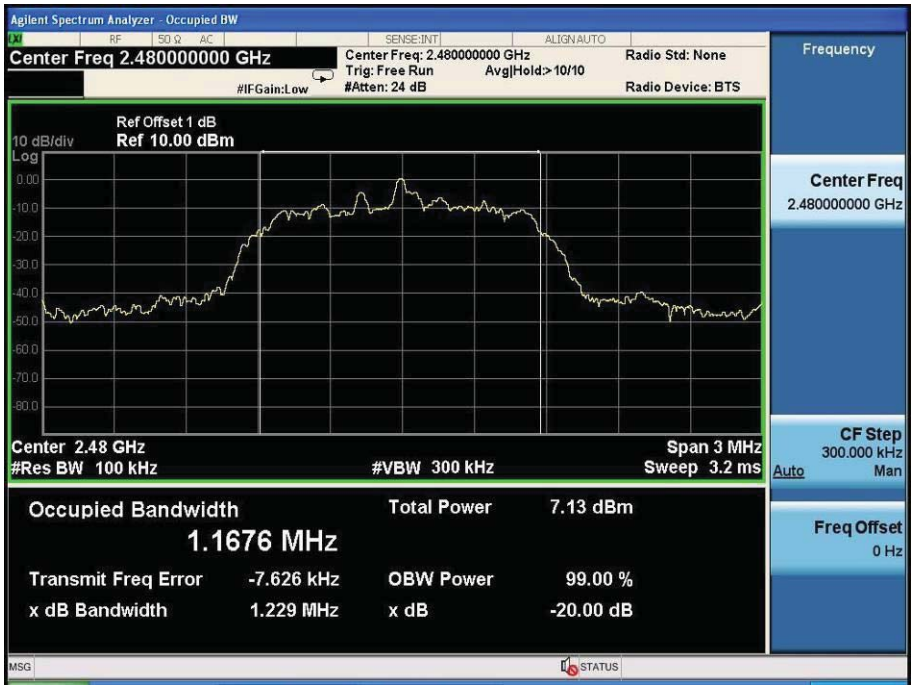



Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
879.38 kHz
Total Power 9.85 dBm
Transmit Freq Error -3.238 kHz
OBW Power 99.00 %
x dB Bandwidth 867.9 kHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

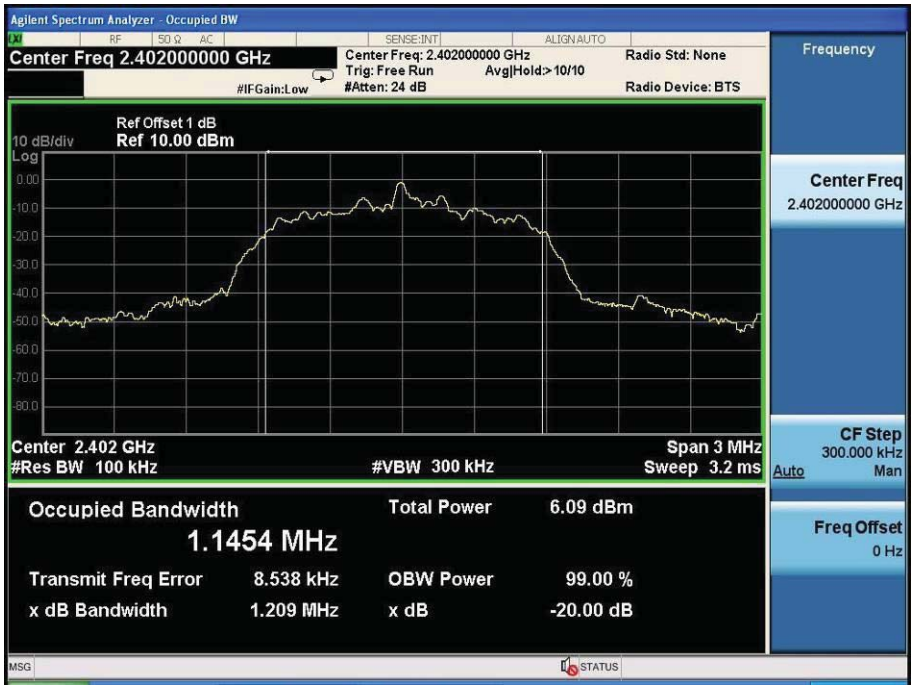
π /4 DQPSK:

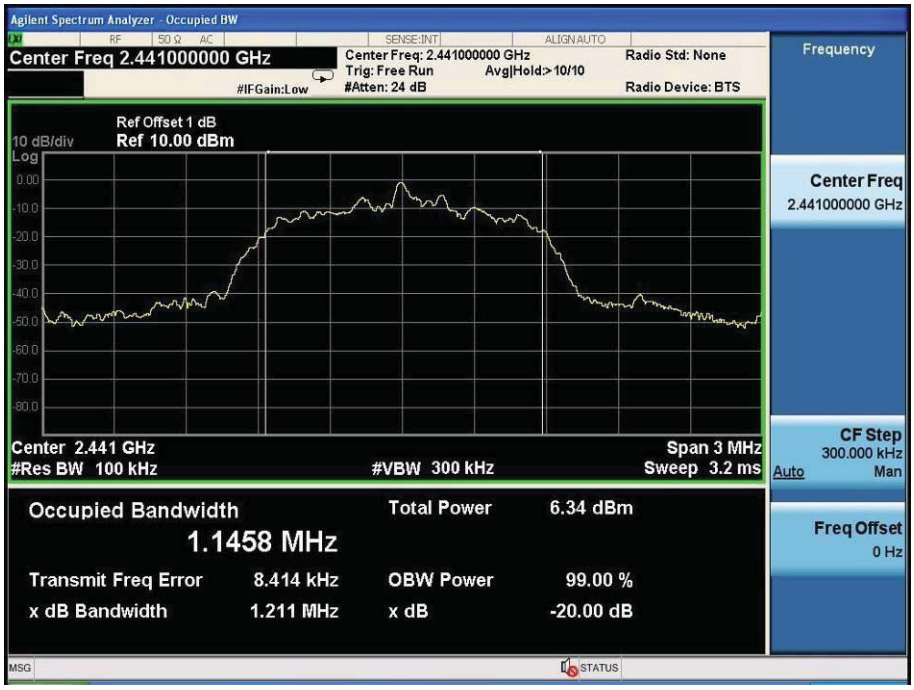

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.402000000 GHz
Center Freq: 2.402000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.402000000 GHz
Center 2.402 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1646 MHz
Total Power 5.90 dBm
Transmit Freq Error -5.021 kHz
OBW Power 99.00 %
x dB Bandwidth 1.217 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.441000000 GHz
Center Freq: 2.441000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.441000000 GHz
Center 2.441 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1650 MHz
Total Power 6.18 dBm
Freq Offset
0 Hz
Transmit Freq Error -5.774 kHz
OBW Power 99.00 %
x dB Bandwidth 1.234 MHz
x dB -20.00 dB
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1676 MHz
Total Power 7.13 dBm
Freq Offset
0 Hz
Transmit Freq Error -7.626 kHz
OBW Power 99.00 %
x dB Bandwidth 1.229 MHz
x dB -20.00 dB
MSG
STATUS

8- DPSK:


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.402000000 GHz
Center Freq: 2.402000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.402000000 GHz
Center 2.402 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1454 MHz
Total Power 6.09 dBm
Transmit Freq Error 8.538 kHz
OBW Power 99.00 %
x dB Bandwidth 1.209 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.441000000 GHz
Center Freq: 2.441000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.441000000 GHz
Center 2.441 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1458 MHz
Total Power 6.34 dBm
Transmit Freq Error 8.414 kHz
OBW Power 99.00 %
x dB Bandwidth 1.211 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
Log
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1506 MHz
Total Power 7.52 dBm
Transmit Freq Error 9.931 kHz
OBW Power 99.00 %
x dB Bandwidth 1.212 MHz
x dB -20.00 dB
Freq Offset
0 Hz
MSG
STATUS

5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

5.2. Test Procedure

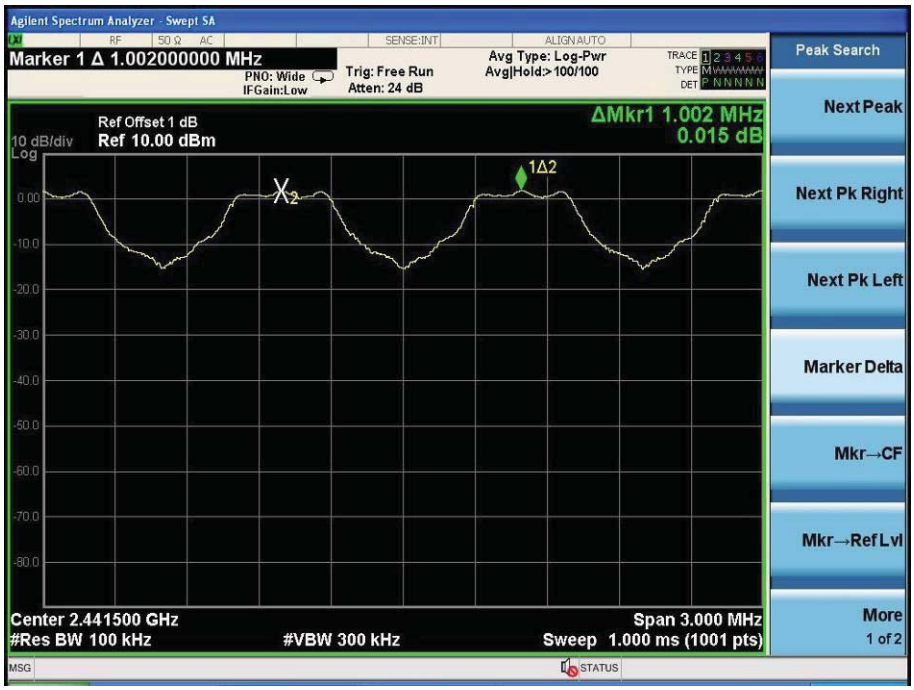
The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

5.3. Test Result

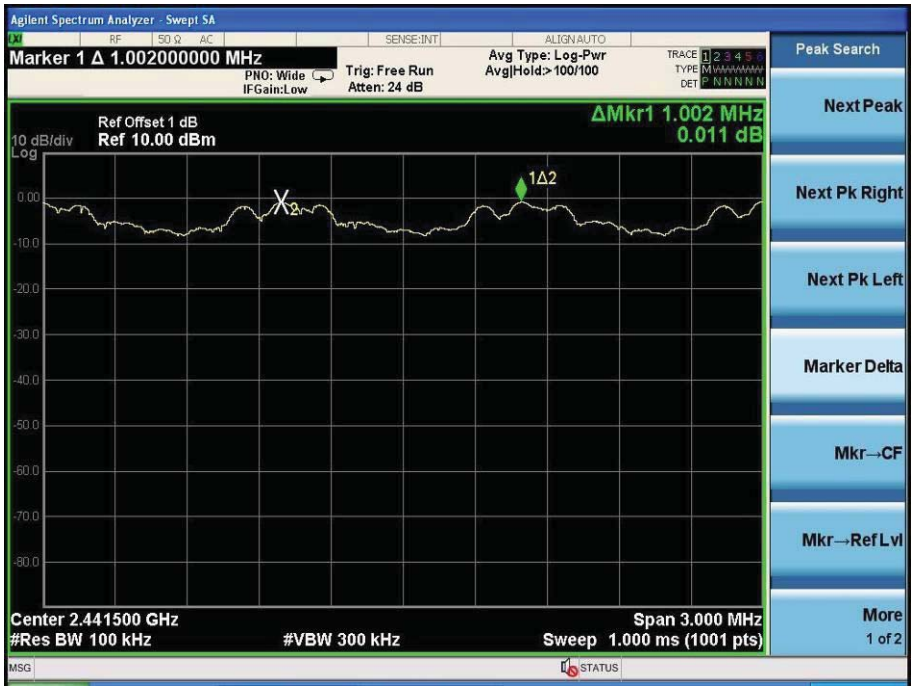
EUT: Car Multimedia Player M/N: ST-926BT				
Test date: 2016-04-07		Test site: RF site	Tested by: Reak	
Mode/Channel	Channel separation (MHz)	20dB Bandwidth (KHz)	Limit (KHz) 2/3 20dB bandwidth	Conclusion
GFSK	1.002	869.2	579.467	PASS
π /4 DQPSK	1.002	1234	822.667	PASS
8- DPSK	1.002	1212	808	PASS

Orginal test data for channel separation

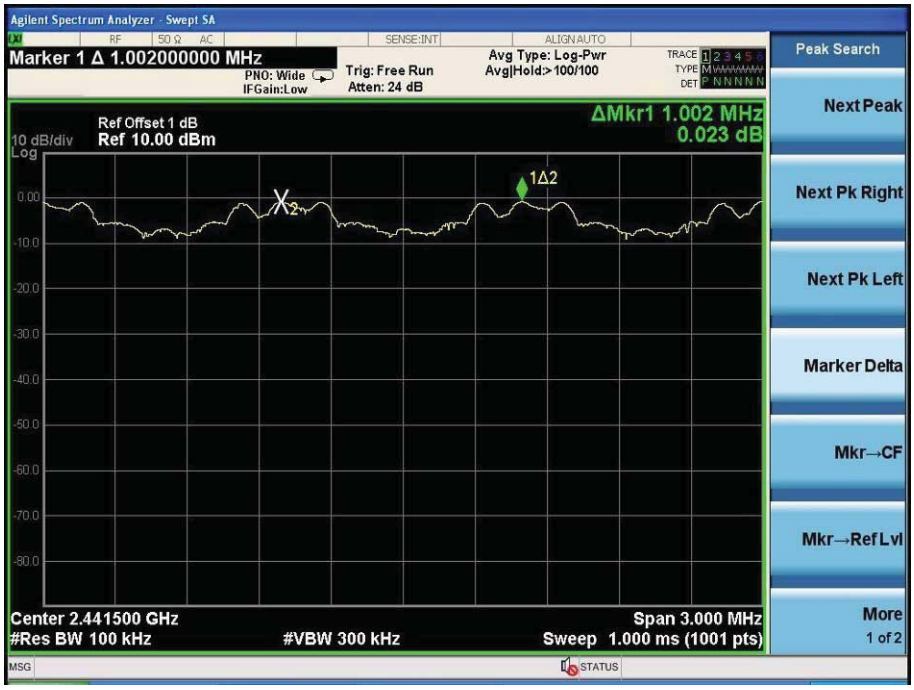
GFSK



π /4 DQPSK



8- DPSK:


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 1.002000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 1.002 MHz
0.023 dB
1Δ2
Center 2.441500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3.000 MHz
Sweep 1.000 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

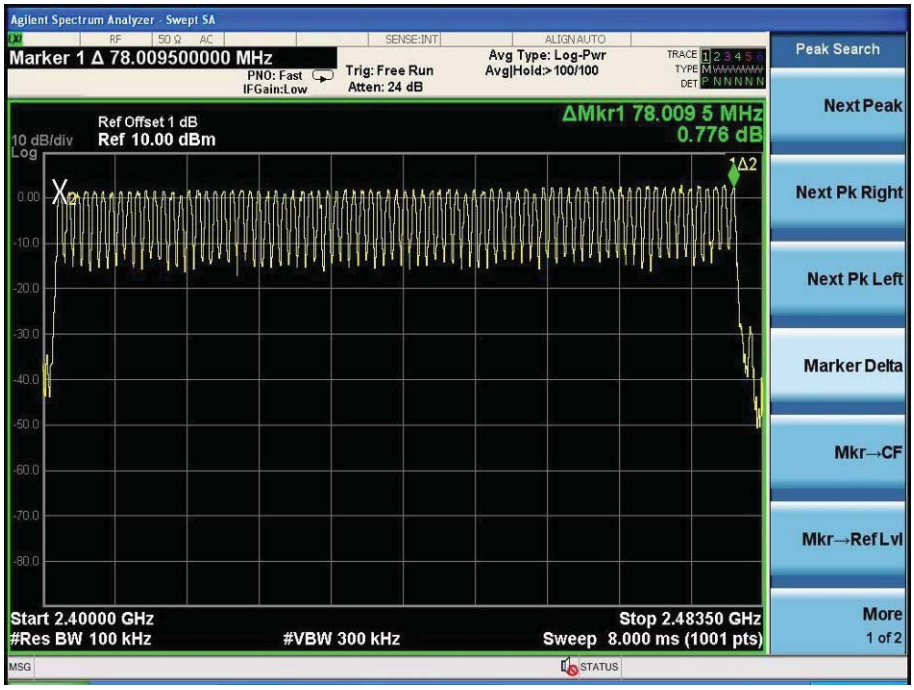
6.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW.

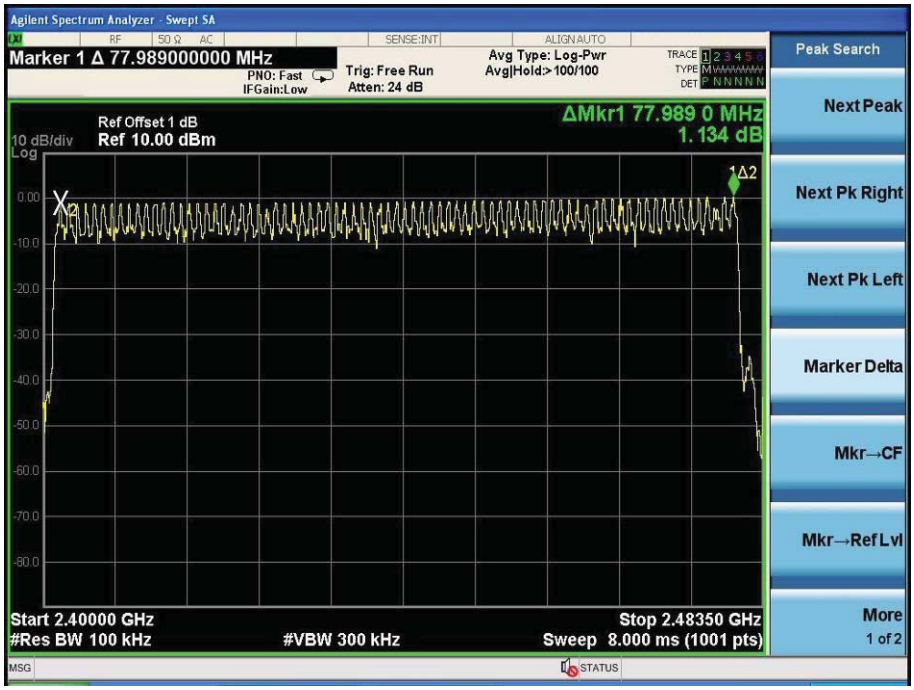
6.3. Test Result

EUT: Car Multimedia Player M/N: ST-926BT			
Test date: 2016-04-07	Test site: RF site	Tested by: Reak	
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
π /4 DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS

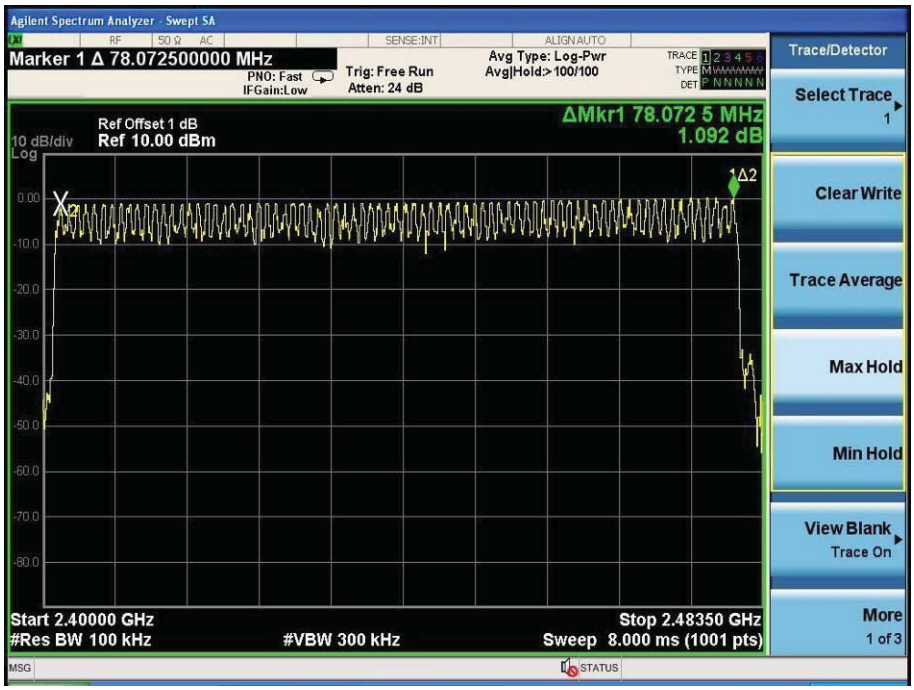
Original test data for hopping channel number
GFSK



π /4 DQPSK



8- DPSK:


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 78.072500000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 78.072 5 MHz
1.092 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)
Trace/Detector
Select Trace
Clear Write
Trace Average
Max Hold
Min Hold
View Blank
Trace On
More
1 of 3

7. Dwell Time

7.1. Test limit

Please refer section15.247

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

7.2.5. Repeat above procedures until all frequency measured were complete.

7.3. Test Results

PASS.

Detailed information please see the following page.

EUT: Car Multimedia Player M/N: ST-926BT						
Test date: 2016-04-07		Test site: RF site Tested by: Reak				
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2441	0.417	0.267	<0.4	PASS
	DH3	2441	1.672	0.357	<0.4	PASS
	DH5	2441	2.922	0.374	<0.4	PASS
π /4 DQPSK	DH1	2441	0.428	0.274	<0.4	PASS
	DH3	2441	1.676	0.358	<0.4	PASS
	DH5	2441	2.923	0.374	<0.4	PASS
8- DPSK	DH1	2441	0.425	0.272	<0.4	PASS
	DH3	2441	1.672	0.357	<0.4	PASS
	DH5	2441	2.926	0.375	<0.4	PASS

Note: 1 A period time = 0.4 (s) * 79 = 31.6(s)

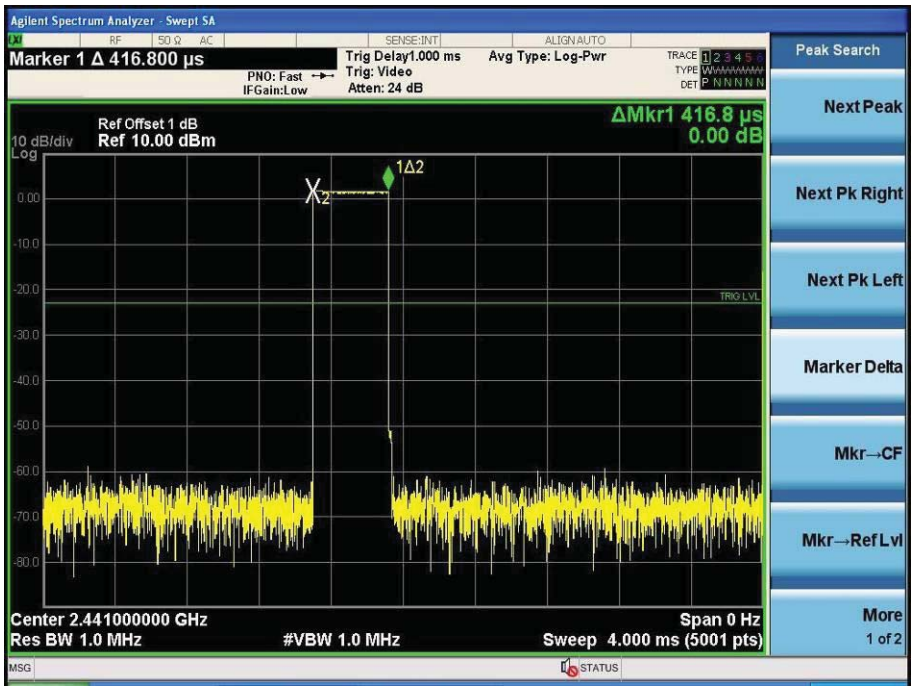
2 DH1 time slot = Pulse Duration * (1600/(1*79)) * A period time/1000

DH3 time slot = Pulse Duration * (1600/(3*79)) * A period time/1000

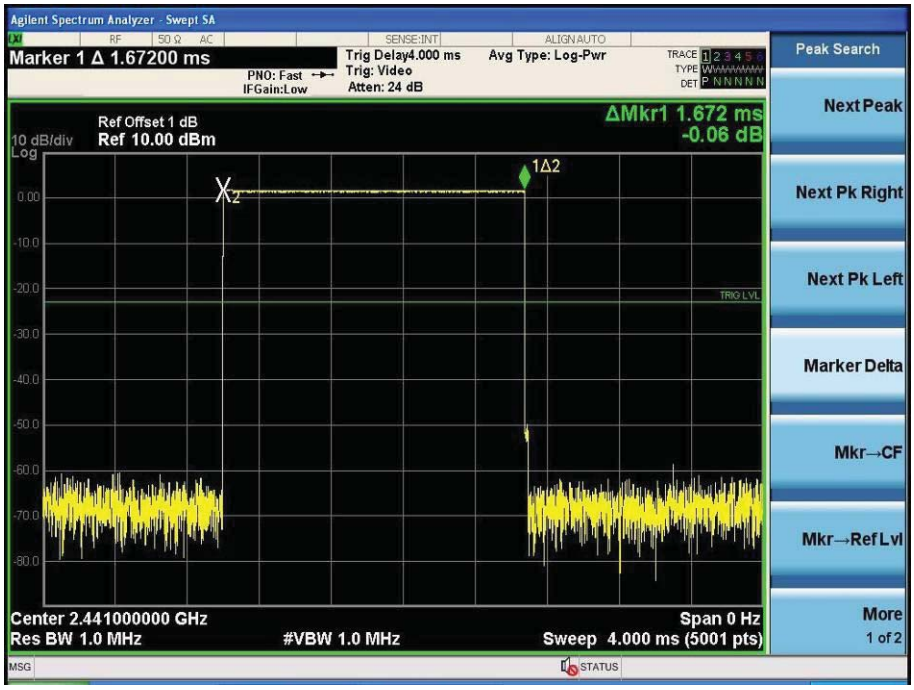
DH5 time slot = Pulse Duration * (1600/(5*79)) * A period time/1000

GFSK

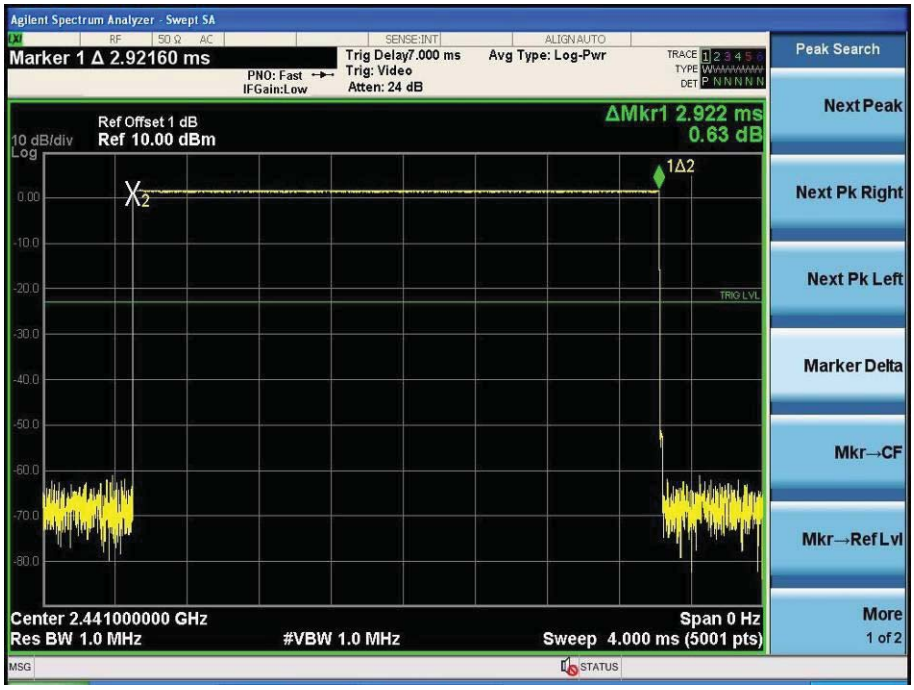
DH1:


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 416.800 µs
PNO: Fast
IFGain:Low
Trig Delay1.000 ms
Trig: Video
Atten: 24 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 416.8 µs
0.00 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

DH3:

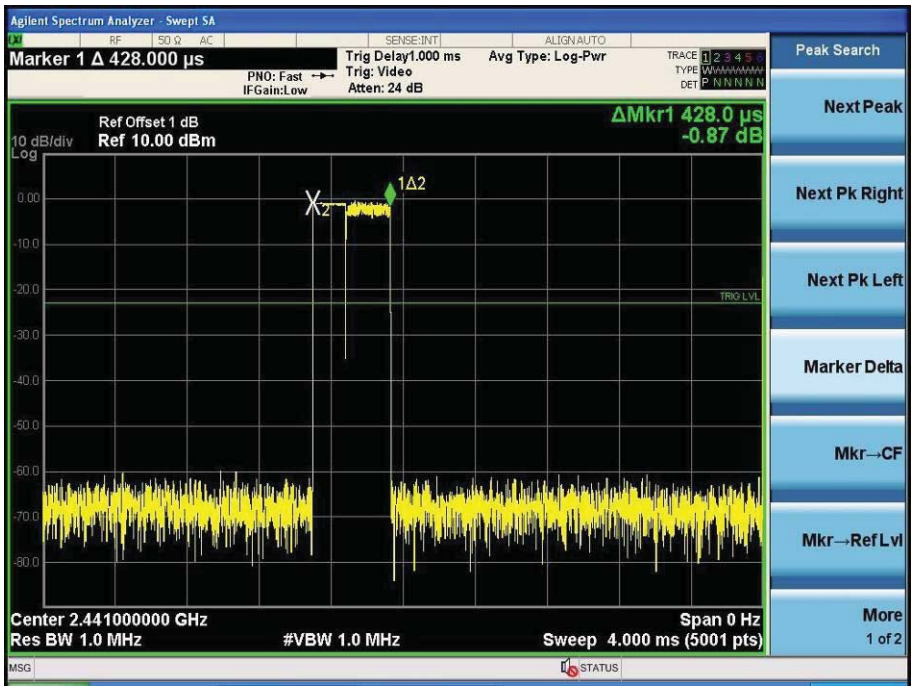

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 1.67200 ms
PNO: Fast
IFGain:Low
Trig Delay4.000 ms
Trig: Video
Atten: 24 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 1.672 ms
-0.06 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

DH5

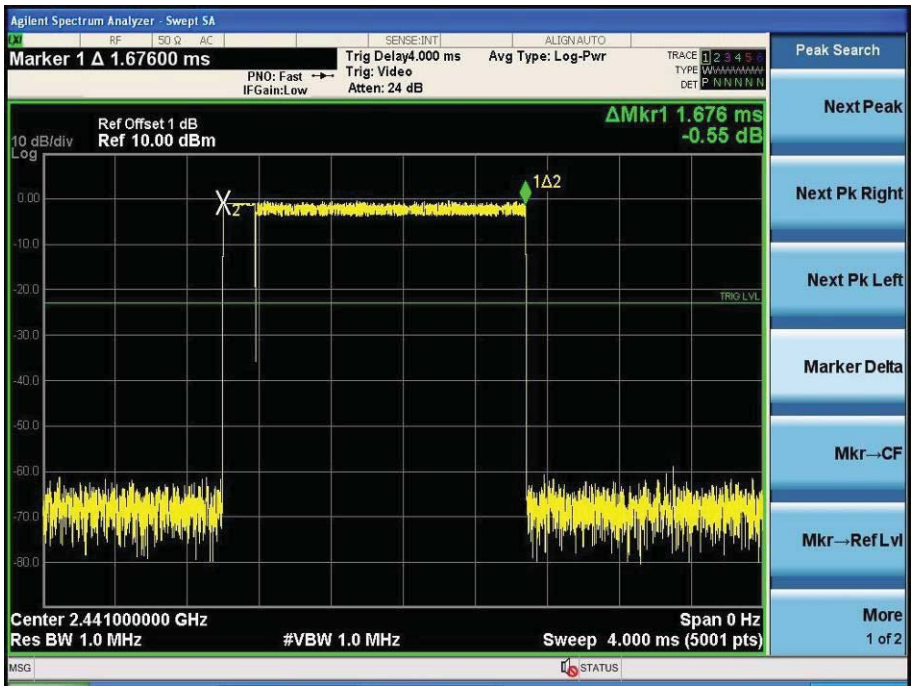


π /4 DQPSK

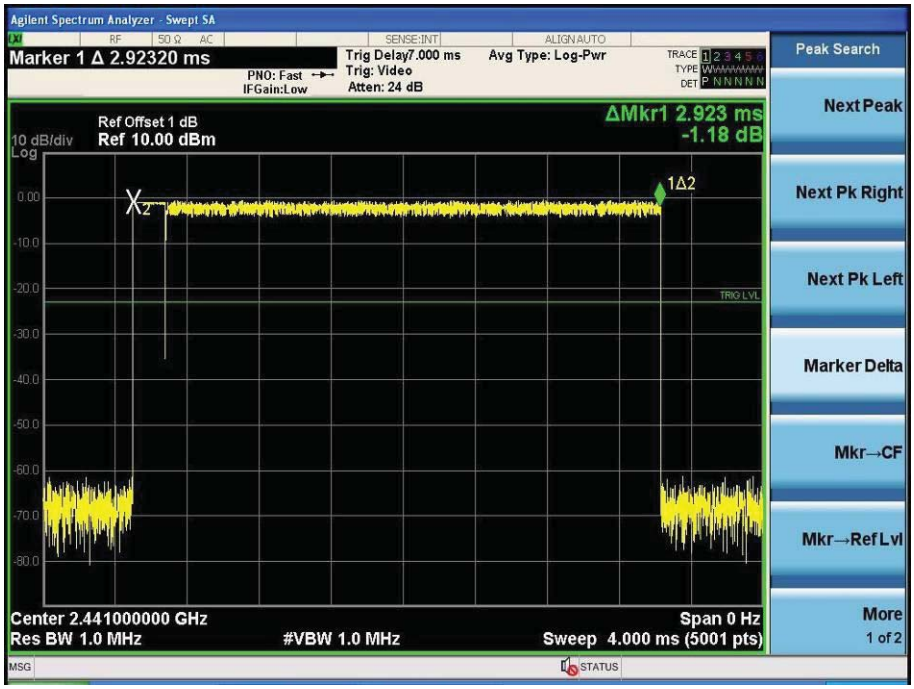
DH1



DH3

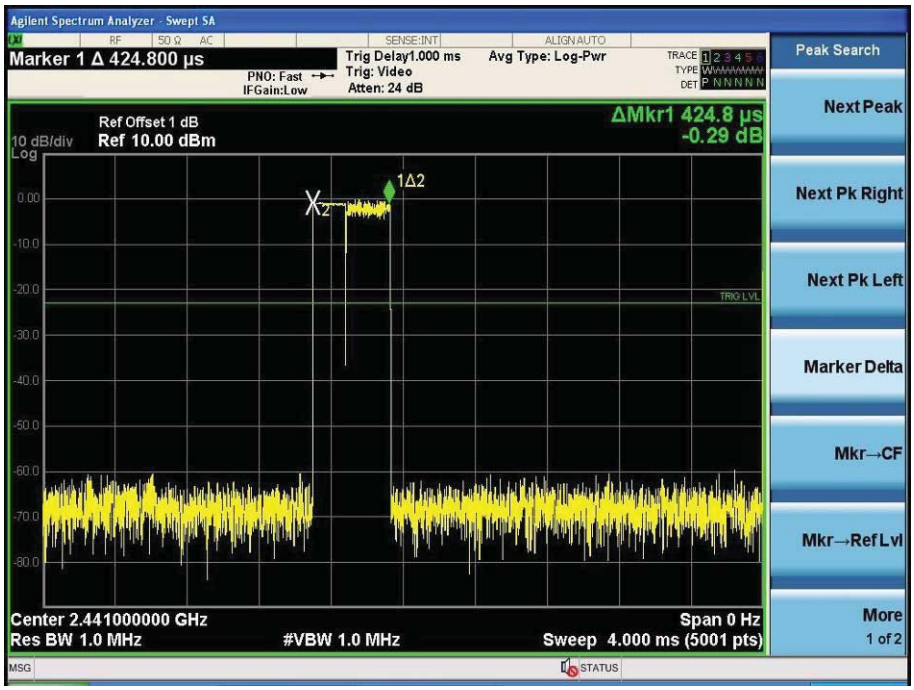

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 1.67600 ms
PNO: Fast
IFGain:Low
Trig Delay4.000 ms
Trig: Video
Atten: 24 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 1.676 ms
-0.55 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

DH5

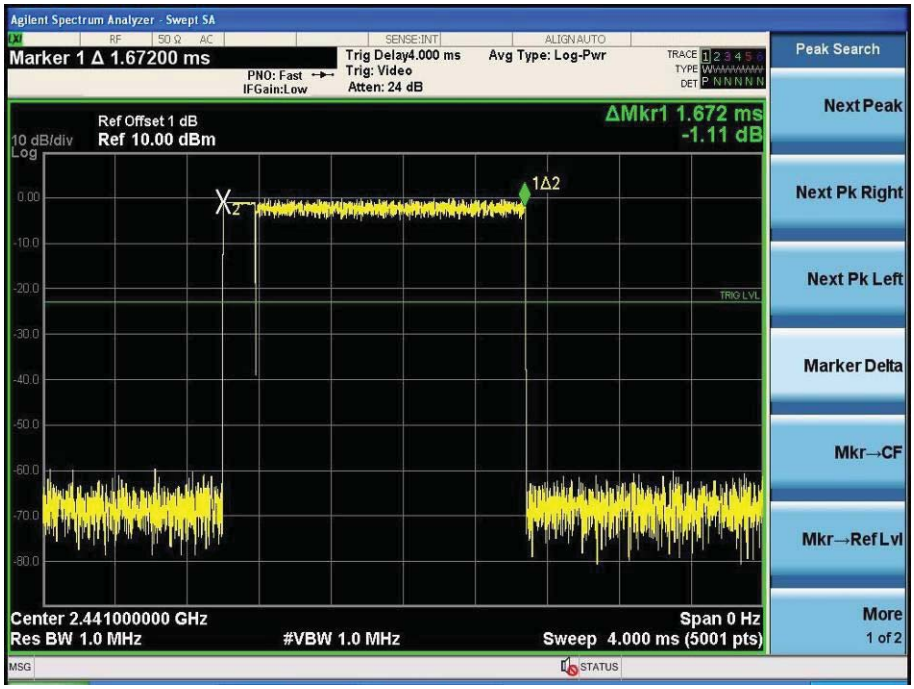

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.92320 ms
PNO: Fast
IFGain:Low
Trig Delay7.000 ms
Trig: Video
Atten: 24 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 2.923 ms
-1.18 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8- DPSK:

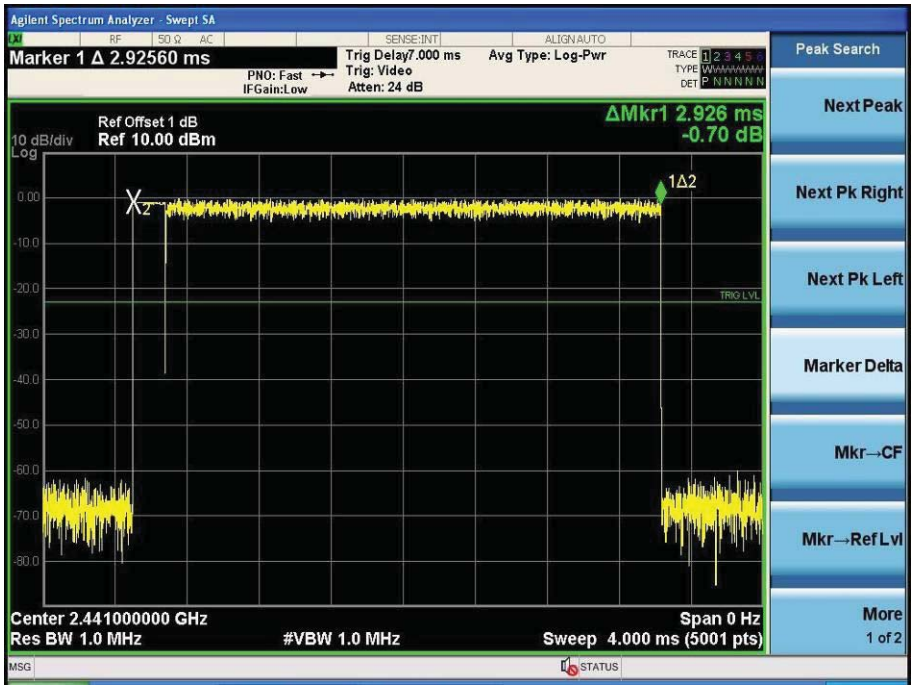
DH1:



DH3:



DH5:


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.92560 ms
PNO: Fast
IFGain:Low
Trig Delay7.000 ms
Trig: Video
Atten: 24 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 10.00 dBm
ΔMkr1 2.926 ms
-0.70 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8. Radiated emissions

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

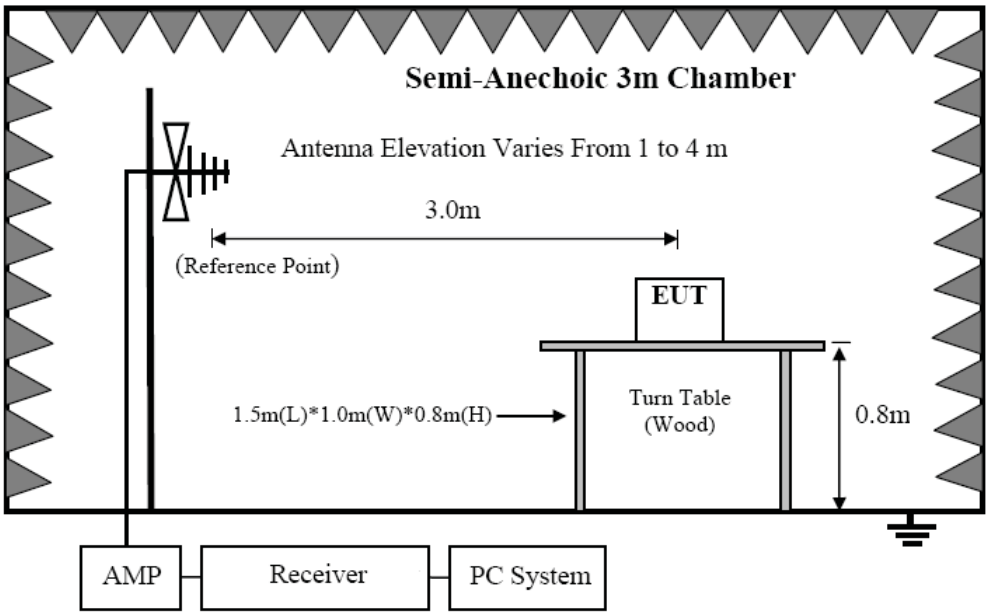
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

15.209 Limit

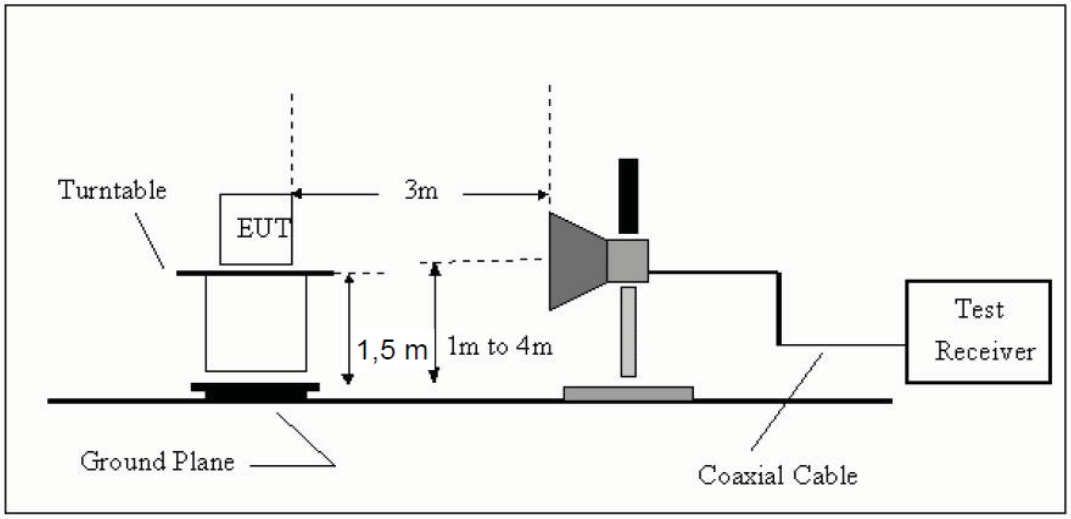
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

8.2. Block Diagram of Test setup

8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
(2) Setup EUT and simulator as shown in section 1.4 and 6.1
(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
(a) Change work frequency or channel of device if practicable.
(b) Change modulation type of device if practicable.
(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 :2014on Radiated Emission test.
(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

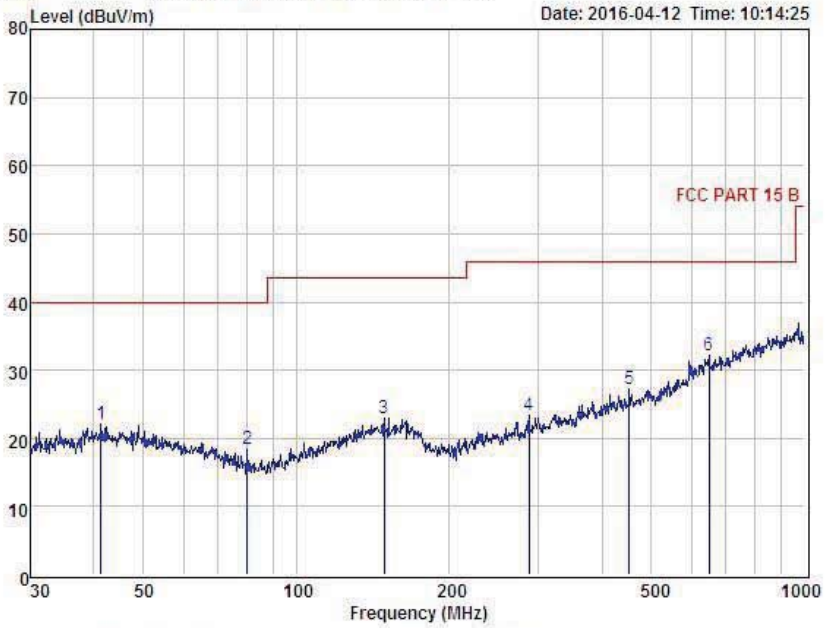
From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

From 30MHz to 1000MHz: Conclusion: PASS

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn

Data: 5 File: D:\REPORT DATA\1\16.04.12.EM6 (17)



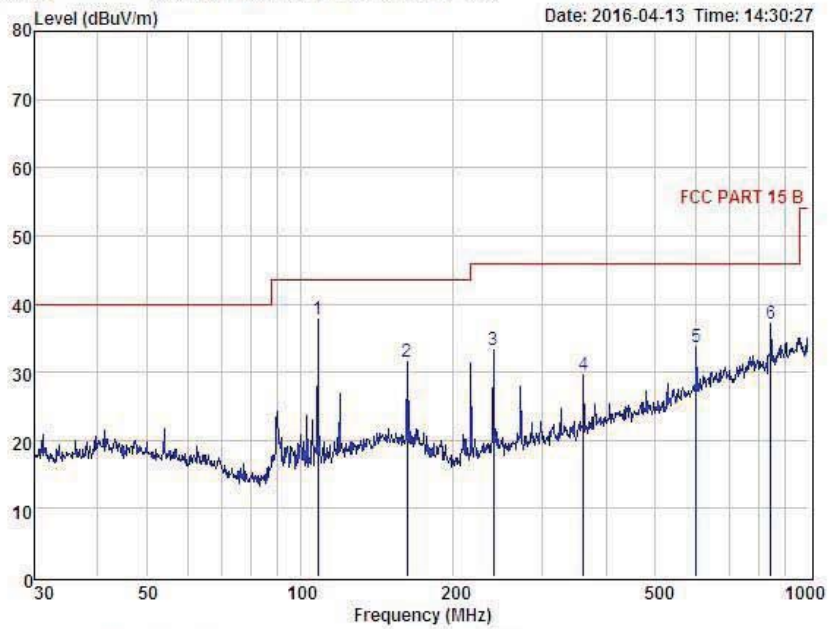
Condition : FCC PART 15 B 3m POL: VERTICAL
EUT :
Model No :
Test Mode :
Power : DC 12V
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	41.28	38.76	13.93	30.85	0.19	22.03	40.00	-17.97	Peak
2	80.08	39.06	9.29	29.96	0.14	18.53	40.00	-21.47	Peak
3	148.96	38.02	14.03	29.45	0.35	22.95	43.50	-20.55	Peak
4	286.98	38.18	12.54	28.06	0.72	23.38	46.00	-22.62	Peak
5	452.72	37.67	16.01	27.52	1.15	27.31	46.00	-18.69	Peak
6	649.66	37.24	19.09	25.45	1.25	32.13	46.00	-13.87	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn

Data: 10 File: D:\REPORT DATA\1\16.04.12.EM6 (17)



Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode :
Power : DC 12V
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	108.27	56.22	11.13	29.96	0.41	37.80	43.50	-5.70	Peak
2	162.61	46.23	13.95	29.15	0.45	31.48	43.50	-12.02	Peak
3	239.99	49.57	11.45	28.25	0.53	33.30	46.00	-12.70	Peak
4	360.45	42.58	14.03	27.65	0.66	29.62	46.00	-16.38	Peak
5	601.43	40.22	18.36	25.89	1.07	33.76	46.00	-12.24	Peak
6	842.13	39.28	20.98	24.84	1.69	37.11	46.00	-8.89	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

- 10 -

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2402MHz was listed in this report.

1GHz—25GHz Radiated emissison Test result									
EUT: Car Multimedia Player M/N: ST-926BT									
Power: DC 12V From Battery									
Test date: 2016-04-12 Test site: 3m Chamber Tested by: Reak									
Test mode: GFSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	45.37	33.95	10.18	34.26	55.24	74	18.76	PK
2	4804	33.25	33.95	10.18	34.26	43.12	54	10.88	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	47.95	33.95	10.18	34.26	57.82	74	16.18	PK
2	4804	35.61	33.95	10.18	34.26	45.48	54	8.52	AV
3	7206	/							
4	9608	/							
5	12010	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

1GHz—25GHz Radiated emissison Test result									
EUT: Car Multimedia Player M/N: ST-926BT									
Power: DC 12V From Battery									
Test date: 2016-04-12 Test site: 3m Chamber Tested by: Reak									
Test mode: GFSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	45.74	33.93	10.2	34.29	55.58	74	18.42	PK
2	4882	33.54	33.93	10.2	34.29	43.38	54	10.62	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	47.88	33.93	10.2	34.29	57.72	74	16.28	PK
2	4882	35.75	33.93	10.2	34.29	45.59	54	8.41	AV
3	7323	/							
4	9764	/							
5	12205	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

1GHz—25GHz Radiated emissison Test result									
EUT: Car Multimedia Player M/N: ST-926BT									
Power: DC 12V From Battery									
Test date: 2016-04-12 Test site: 3m Chamber Tested by: Reak									
Test mode: GFSK Tx CH79 2480MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	44.99	33.98	10.22	34.25	54.94	74	19.06	PK
2	4960	33.26	33.98	10.22	34.25	43.21	54	10.79	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	47.17	33.98	10.22	34.25	57.12	74	16.88	PK
2	4960	34.78	33.98	10.22	34.25	44.73	54	9.27	AV
3	7440	/							
4	9920	/							
5	12400	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

1GHz—25GHz Radiated emissison Test result									
EUT: Car Multimedia Player M/N: ST-926BT									
Power: DC 12V From Battery									
Test date: 2016-04-12 Test site: 3m Chamber Tested by: Reak									
Test mode: π /4 DQPSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	43.54	33.95	10.18	34.26	53.41	74	20.59	PK
2	4804	31.37	33.95	10.18	34.26	41.24	54	12.76	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	46.47	33.95	10.18	34.26	56.34	74	17.66	PK
2	4804	34.59	33.95	10.18	34.26	44.46	54	9.54	AV
3	7206	/							
4	9608	/							
5	12010	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

1GHz—25GHz Radiated emissison Test result									
EUT: Car Multimedia Player M/N: ST-926BT									
Power: DC 12V From Battery									
Test date: 2016-04-12 Test site: 3m Chamber Tested by: Reak									
Test mode: π /4 DQPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	43.07	33.93	10.2	34.29	52.91	74	21.09	PK
2	4882	31.86	33.93	10.2	34.29	41.7	54	12.3	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	45.98	33.93	10.2	34.29	55.82	74	18.18	PK
2	4882	34.83	33.93	10.2	34.29	44.67	54	9.33	AV
3	7323	/							
4	9764	/							
5	12205	/							

Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.