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# RADIO TEST REPORT MIC Public Notice 88

Test report On Behalf of Dong Guan KaiMing Electronic Commerce Co., Ltd. For Car Audio player

Model No.: KAR7W, KAR7, KAR7W-1, KAR7D, KAR10A, KAR7S, KAR7M, KAR10S, KAR10W, KAR9W, KAR9A, KAB80, KAB81, KAB82

Prepared For : Dong Guan KaiMing Electronic Commerce Co., Ltd. Room 416, Building NO.1, 4th Industrial Northern Road NO.5, Songshan Lake District, Dongguan City, Guangdong Province, 523808, China

Prepared By :

Shenzhen HUAK Testing Technology Co., Ltd. 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

 Date of Test:
 Dec. 02, 2022 ~ Dec. 09, 2022

 Date of Report:
 Dec. 09, 2022

 Report Number:
 HK2212025438-3E

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Standards.....

## **TEST RESULT CERTIFICATION**

Applicant's name	.: Dong Guan KaiMing Electronic Commerce Co., Ltd.
Address	<ul> <li>Room 416, Building NO.1, 4th Industrial Northern Road NO.5,</li> <li>Songshan Lake District, Dongguan City, Guangdong Province, 523808, China</li> </ul>
Manufacture's Name	.: Dong Guan KaiMing Electronic Commerce Co., Ltd.
Address	<ul> <li>Room 416, Building NO.1, 4th Industrial Northern Road NO.5,</li> <li>Songshan Lake District, Dongguan City, Guangdong Province, 523808, China</li> </ul>
Product description	
Trade Mark:	KASUVAR
Product name	: Car Audio player
Model and/or type reference	. KAR7W, KAR7, KAR7W-1, KAR7D, KAR10A, KAR7S, KAR7M, KAR10S, KAR10W, KAR9W, KAR9A, KAB80, KAB81, KAB82
Standarda	MIC Public Notice 88:2004, annex 1 and annex 43

ARIB STD-T66 V3.7, Article 2 Paragraph 1 of Item 19

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Date of Test ..... Date (s) of performance of tests.... Dec. 02, 2022 ~ Dec. 09, 2022 Date of Issue ...... Dec. 09, 2022 Test Result ...... Pass

Prepared by:

ovin

Project Engineer

Reviewed by:

**Project Supervisor** 

Approved by:

Technical Director

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# \*\* Modified History \*\*

	Revision	Description	Issued Data	Remark
9	Revision 1.0	Initial Test Report Release	Dec. 09, 2022	Jason Zhou

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### **1. TEST SUMMARY**

1.1 TEST PROCEDURES AND RESULTS

Test procedures according to the technical standards:

Rule Section	Description of Test	Result	
O HUNK IL	Transmitter Parameters	0	
3.2 (2)	Antenna Power (EIRP Antenna Power)	Complies	
3.2 (3)	Tolerances for Antenna Power	Complies	
3.2 (4)	Frequency Tolerance	Complies	
3.2 (7)	Occupied Frequency Bandwidth	Complies	
3.2 (8)	Spread Bandwidth	Complies	
3.2 (9)	Process Gain		
3.2 (10)	Number of Carriers	N/A	
3.2 (11)	Dwell Time	Complies	
3.2 (6)	Spurious Emissions	Complies	
Tune	Interference prevention function	Complies	
1	Carrier Sensing function	N/A	
HUAK TESTING	Receiver Parameters	JAK TESTING	
3.3 (1)	Secondary Radiated Emissions	Complies	

### NOTE:

- 1) "N/A" denotes test is not applicable in this Test Report.
- 2) MIC Public Notice 88:2004, annex 1 and annex 43.
- 3) MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20.
- 4) Referenced in the standard ARIB STD-T66.

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1.2 INFORMATION OF THE TEST LABORATORY

Shenzhen HUAK Testing Technology Co., Ltd. Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization :

A2LA Accreditation Code is 4781.01. FCC Designation Number is CN1229. Canada IC CAB identifier is CN0045. CNAS Registration Number is L9589.

### 1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	±2.71dB
2	Radiated Emission Test	±4.26dB
3	RF power, conducted	±0.37dB
4	Spurious emissions, conducted	±2.20dB
5	All emissions, radiated(<1G)	±3.90dB
6	All emissions, radiated(>1G)	±4.28dB

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### 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Car Audio player
Model Name	KAR7W
Series Model	KAR7, KAR7W-1, KAR7D, KAR10A, KAR7S, KAR7M, KAR10S, KAR10W, KAR9W, KAR9A, KAB80, KAB81, KAB82
	All model's the function, software and electric circuit are the
Model Difference	same, only model named different. Test sample model:
	KAR7W
Antenna Type	Internal Antenna
Antenna Gain	3.45dBi
BT Operation frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK, Pi / 4DQPSK, 8-DPSK
Data Rate	1Mpbs, 2Mbps, 3Mbps
Power Source	DC 12V
Power Rating	DC 12V
Firmware Version	V5.1
Hardware Version	V5.1

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### 2.1.1 Carrier Frequency of Channels

STI	ve 🔘	Chann	el List 🕘	TING		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
00	2402	27	2429	54	2456	
01	2403	28	2430	55	2457	
02	2404	29	2431	56	2458	
03	2405	30	2432	57	2459	
04	2406	31	2433	58	2460	
05	2407	32	2434	59	2461	
06	2408	33	2435	60	2462	
07	2409	34	2436	61	2463	
08	2410	35	2437	62	2464	
09	2411	36	2438	63	2465	
10	2412	37	2439	64	2466	
11 px Tes	2413	38	2440	65	2467	
12	2414	39	2441	66	2468	
13	2415	40	2442	67	2469	
14	2416	41	2443	68	2470	
15	2417	42	2444	69	2471	
16	2418	43	2445	70	2472	
17	2419	44	2446	71	2473	
18	2420	45	2447	72	2474	
19	2421	46	2448	73	2475	
20	2422	47	2449	74	2476	
21	2423	48	2450	75	2477	
22	2424	49	2451	76	2478	
23	2425	50	2452	77	2479	
24	2426	51	2453	78	2480	
25	2427	52	2454		2000	
26	2428	53	2455	HO		

#### 2.2 Operation of EUT during testing

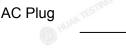
Tested mode, chan	nel, and data rate inform	nation	
Mode	Channel	Frequency (MHz)	
	CH0	2402	
Carrier Tx Mode	CH39	2441	
resting HUAK .	CH78	2480	
hopping on Tx Mode	CH0 to CH78	2402 to 2480	
	CH0	2402	
Tx Mode	CH39	2441	
TING HUM	CH78	2480	
Dy Mada	CH0	2402	
Rx Mode	CH78	2480	

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### 2.3 DESCRIPTION OF TEST SETUP





### 2.4 TEST CONDITIONS

The BT module was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Power Supply Voltage Fluctuation Test

Voltage mode	Input Voltage	Radio Unit Voltage	
HUNKT	DC 13.20V	3.31V	
DC Input	DC 12.00V	3.30V	
	DC 10.80V	3.30V	
105			

Note: 1 The radio unit Voltage with the module regulator IC regulator.

2 The radio unit less than 1%, so the test only rated voltage (Normal voltage) with the DC power.

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

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### 2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2022	1 Year
2.	LISN	Schwarz Beck	NSLK 8126	8126377	Feb. 18, 2022	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2022	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2022	1 Year
6.	Trilog Broadband Antenna	Schwarz Beck	VULB9163	VULB 9163-289	Feb. 18, 2022	1 Year
7. TES	Pre-amplifier	Compliance Direction	PAP-0203	22008	Feb. 18, 2022	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9. 🗥	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2022	1 Year
10.	LISN	Schwarz Beck	NSLK 8126	8126377	Feb. 18, 2022	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2022	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2022	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 18, 2022	1 Year
15.	LISN	Schwarz Beck	NSLK 8126	8126377	Feb. 18, 2022	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 18, 2022	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	,∭o N/A	N/A	N/A
18.	Power Meter	R&S	NRVD	SEL0069	Feb. 18, 2022	1 Year
19.	Power Sensor	R&S	URV5-Z2	SEL0071	Feb. 18, 2022	1 Year
20.	Power Sensor	R&S	URV5-Z2	SEL0072	Feb. 18, 2022	1 Year
21.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
22.	Log-periodic	Amplifier Reasearch	AIFS-IP780	SEL0073	N/A	N/A
23.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
24.	High Gain Horn Antenna(0.8-5GHz )	Amplifier Reasearch	AT4002A	SEL0075	N/A	N/A

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	10.				
Spectrum analyzer	Agilent	N9020A	MY499110 048	Feb. 18, 2022	1 Year
Spectrum analyzer	Agilent	E4407B	MY461843 26	Feb. 18, 2022	1 Year
DC power supply	Agilent	E3646A	N/A	Feb. 18, 2022	1 Year
Frequency Meter	KEYSIGHT	53230A	53200	Feb. 18, 2022	1 Year
	Spectrum analyzer	Spectrum analyzer     Agilent       DC power supply     Agilent	Spectrum analyzerAgilentE4407BDC power supplyAgilentE3646A	Spectrum analyzerAgilentN9020A048Spectrum analyzerAgilentE4407BMY461843 26DC power supplyAgilentE3646AN/A	Spectrum analyzerAgilentE4407BMY461843 26Feb. 18, 2022DC power supplyAgilentE3646AN/AFeb. 18, 2022

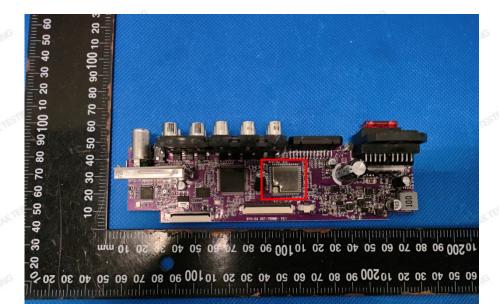
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### 3. RF SHIELDING METHOD

We apply the product for Japan RF certification. The RF part is protected by shielding cover, which is not easily removed. Please refer to following for photo for details.



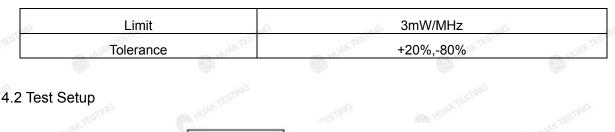
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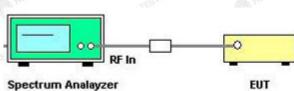
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### 4 Antenna Power

4.1 Limit





- 4.3 Test Procedure
  - (1) Configure EUT and assistant system according clause 2.2 and 4.3
  - (2) Set EUT work in test mode as described in clause 2.2
  - (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

- Resolution BW: 1MHz (above 6dB bandwidth of signal)
- Video BW: 1MHz.

Span: Wide enough to cover the complete power envelope of the signal of the EUT. Detector: Peak.

Trace Mode: Max Hold.

(4) When the trace is complete, find the peak value of the power envelope and record.

Note: The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.

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### 4.4 Test Result

10 VVV		and you'
Car Audio player	Test Date:	Dec. 05, 2022
25ºC	Tested by:	Kevin Pan
55 % RH	Test Voltage	Normal Voltage
	25°C	25°C Tested by:

Operation Mode:	Conducted RF output power (dbm)	Conducted RF output power (mW)	Spread Bandwidth	Conducted RF output power density (mW/MHz)	Limit	Rated power density (mW/MHz)	Antenna Power Error (%)
GFSK mode	3.296	2.136	70.996	0.0301	3mW/MHz	0.1	-69.91%
Pi / 4DQPSK mode	2.472	1.767	71.289	0.0248	3mW/MHz	0.1	-75.22%
8-DPSK mode	2.767	1.891	70.856	0.0267	3mW/MHz	0.1	-73.31%
Limit : +20	%, -80% (Bas	e on manufac	turer declare	antenna pow	er density)	0.	

	Operation Mode:	Conducted RF output power density (mW/MHz)	Conducted RF output power density (dBm/MHz)	Antenna Gain (dBi)	EIRP(dBm/MHz)	Limit(dBm/MHz)
	GFSK mode	0.0301	-15.214	3.45	-11.764	6.91
n's	Pi / 4DQPSK mode	0.0248	-16.055	3.45	-12.605	6.91
	8-DPSK mode	0.0267	-15.735	3.45	-12.285	6.91

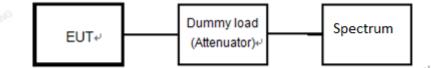
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### **5 Frequency Tolerance**

- 5.1 Limit
  - +/- 50x 10<sup>-6</sup> or less (50ppm)
- 5.2 Test Setup



#### 5.3 Test Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. The EUT was directly connected to the Spectrum.

#### 5.3 EUT OPERATION DURING TEST

The EUT was placed on the test table and programmed in un-modulation function.

### 5.4 Test Result

EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25ºC	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage
Operation Mode:	Carrier Tx mode		HUAKTES

	Test Frequency	Measured	Tolerance	Result	Limit
5	(MHz)	(MHz)	(MHz)	(ppm)	(ppm)
	2402	2401.996	-0.004	-1.6653	+/-50
	2441	2440.996	-0.004	-1.6387	+/-50
	2480	2479.996	-0.004	-1.6129	+/-50

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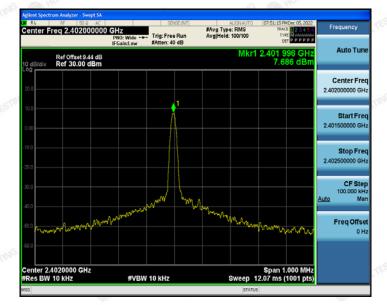
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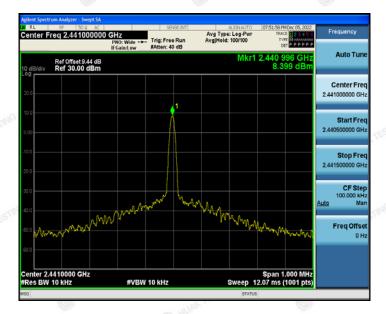
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### Report No.: HK2212025438-3E

CH00: 2402MHz



#### CH39: 2441MHz



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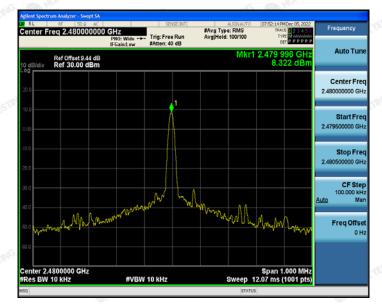
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### Report No.: HK2212025438-3E

FICATION

CH78: 2480MHz



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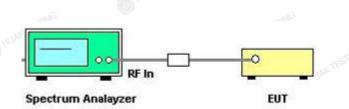


### 6 Occupied Frequency Bandwidth

### 6.1 Limit

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz.

### 6.2 Test Setup



#### 6.3 Test Procedure

(1) Configure EUT and assistant system according clause 2.2 and 6.3

(2) Set EUT work in carrier Tx mode as described in clause 2.2

(3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test. Resolution BW: 1MHz

Video BW: 1MHz

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Detector: Peak.

Trace Mode: Max Hold.

(4) When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

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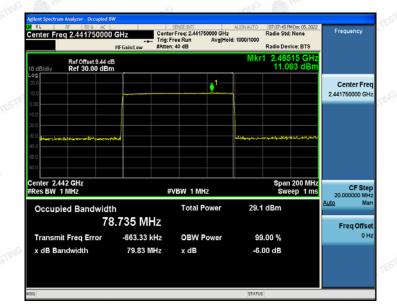
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### 6.4 Test Result

EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage

	105	29497	105	2007	105
,C	Operation Mode (MHz)	Test Frequency (MHz)	Test Result[MHz]	Limit [MHz]	Verdict
100	Hopping GFSK TX Mode	/ 0 HUE	78.735	<=83.5	PASS
	Hopping Pi / 4DQPSK TX Mode	1	78.770	<=83.5	PASS
	Hopping 8-DPSK TX Mode	/ HOLE	78.490	<=83.5	PASS
1	-19			14	- 6

GFSK TX Mode



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### Report No.: HK2212025438-3E

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#### Pi / 4DQPSK TX Mode

Center Fred	q 2.441750000 C	IFGain:Low		e Run	60000 GHz Avg Hol	d: 1000/1000	Radio Std Radio Dev		Freque	ncy
10 dB/div	Ref Offset 9.44 dB Ref 30.00 dBm					Mkr		815 GHz 27 dBm		
.0g 20.0 10.0		~~~~~		*****	1	1			Cent 2.441750	
0.0										
2.0	and the antimesta	*				1194/mine (res	dydyr of the order	u, el al bacher en el		
0.0										
enter 2.44 Res BW 1			#VE	3W 1 MI	Hz			200 MHz ep 1 ms	C 20.000	F Ste
Occupie	ed Bandwidth			Total F	ower	28.4	dBm		<u>Auto</u>	M
	78.	770 M	Hz						Freq	Offs
Transmit	Freq Error	-681.30	kHz	OBW	Power	99	.00 %			01
x dB Ban	ndwidth	79.80	ИНz	x dB		-6.	00 dB			

8-DPSK TX Mode

Center Fre	eq 2.441750000	GHz #IFGain:Low	Cente Trig: F	SENSE:INT r Freq: 2.4417 ree Run :: 40 dB		ALIGNAUTO	Radio Ste	PMDec 05, 2022 f: None vice: BTS	Frequency
10 dB/div	Ref Offset 9.44 de Ref 30.00 dBm					Mkr		395 GHz 109 dBm	
20.0			r	~~~~~	1 	1			Center Free 2.441750000 GH
0.00 -10.0 -20.0									
-40.0	k la anglas ng manand ng ma	~				heresterent		9944-44 	
Center 2.4	42.04-						-	200 8514-	
#Res BW			#	VBW 1 MH	iz			n 200 MHz eep 1 ms	CF Step 20.000000 MH:
Occup	ied Bandwidt			Total P	ower	28.3	dBm		<u>Auto</u> Mar
	78	3.490 M	Hz						Freq Offse
Transm	it Freq Error	-527.79	kHz	OBW F	ower	99	.00 %		0 H:
x dB Ba	ndwidth	79.46	MHz	x dB		-6.	00 dB		

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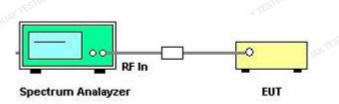


### 7 Spread Bandwidth

### 7.1 Limit

In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more.

### 7.2 Test Setup



### 7.3 Test Procedure

(1) Configure EUT and assistant system according clause 2.2 and 7.3

(2) Set EUT work in carrier Tx mode as described in clause 2.2

(3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Detector: Peak.

Trace Mode: Max Hold.

(4) When the trace is complete, measure the spread bandwidth (90% bandwidth) with spectrum analyzer's bandwidth measure function.

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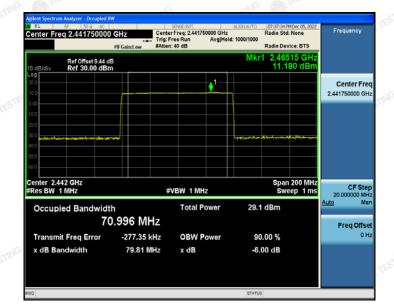


### 7.4 Test Result

One he	Mar HOM	and the	HUM IN M
EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation Mode (MHz)	Test Channel	Test Result[MHz]	Limit [MHz]	Spread Factor	Verdict
Hopping GFSK TX Mode	STING CHUAK TE	70.996	>=0.5	70.996	PASS
Hopping Pi / 4DQPSK TX Mode	1	71.289	>=0.5	35.645	PASS
Hopping 8-DPSK TX Mode	(TEST.	70.856	>=0.5	35.428	PASS

GFSK TX Mode



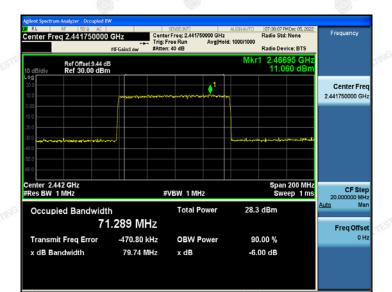
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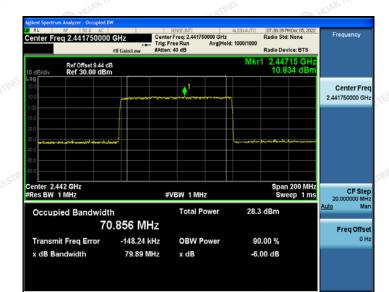


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#### Pi / 4DQPSK TX Mode



8-DPSK TX Mode



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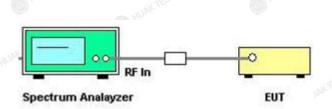


### 8 Dwell time

### 8.1 Limit

Frequency dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less.

8.2 Test Setup



8.3 Test Procedure

(1) Configure EUT and assistant system according clause 2.2 and 8.3

(2) Set EUT work in carrier Tx mode as described in clause 2.2

(3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the middle hopping channel.

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: Zero span. Detector: Peak.

Trace Mode: Max Hold.

Sweep: Video Trigger

(4) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.

(5) Calculate dwell time follow below formula:

Dwell time =(0.4(s) x spreading rate x sending time of 1 burst(s))/(burst cycle(s) x No. of hopping channel)

Spreading rate = Spread bandwidth (actual measurement value)/Transmission rate.

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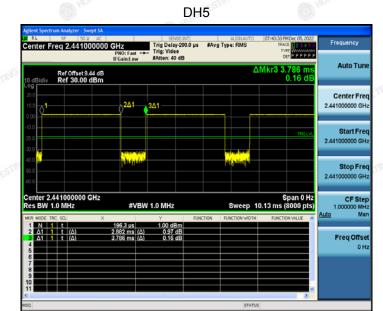


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### 8.4 Test Result

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EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage
Operation Mode:	Hopping mode		

Test Condition	Test Mode	Ant	transmission time of 1 burst (ms)	burst cycle (ms)	spreading rate	Dwell Time[s]	Limit[s]	Verdict
TNVN	DH5	Ant1	2.88	3.79	70.996	0.2732	<0.4	PASS
TNVN	2DH5	Ant1	2.89	3.79	35.645	0.1376	<0.4	PASS
TNVN	3DH5	Ant1	2.89	3.79	35.428	0.1368	<0.4	PASS



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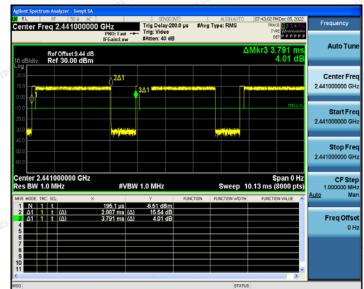


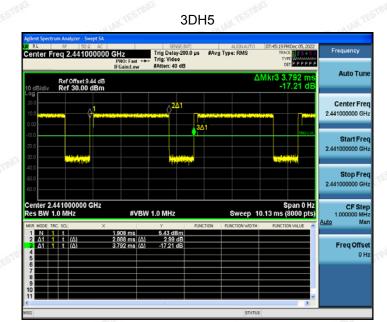
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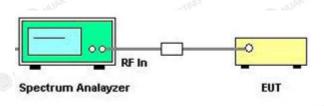


### 9 Process gain

### 9.1 Limit

Process gain (value obtained by dividing the spread bandwidth by a frequency equal to the transmission rate of the modulation signal; this also applies hereafter) in the spread spectrum system shall be 5 or more.

#### 9.2 Test Setup



#### 9.3 Test Procedure

- (1) Configure EUT and assistant system according clause 2.2 and 9.3
- (2) Set EUT work in carrier Tx mode as described in clause 2.2

### 9.4 Test Result

EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage
Test result:	CONFORM		

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10 Transmitter Spurious Emissions (conducted)

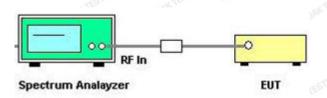
10.1 Limit

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

a. 2,387MHz  $\leq$  f  $\leq$  2,400MHz and 2,483.5MHz < f  $\leq$  2,496.5MHz  $25 \mu$ W or less

b. 2,387MHz > f and 2,496.5MHz < f  $2.5 \mu$ W or less

10.2 Test Setup



#### 10.3 Test Procedure

(1) Configure EUT and assistant system according clause 2.2 and 11.3

(2) Set EUT work in carrier Tx mode as described in clause 2.2

(3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
For below 1G:
Resolution BW: 100KHz.
Video BW: 100KHz.
Detector: Peak.
Trace Mode: Max Hold
For above 1G:
Resolution BW: 1MHz.
Video BW: 1MHz.
Detector: Peak.
Trace Mode: Max Hold
(4) When the trace is complete, measure the Transmitter Spurious Emissions (conducted) with spectrum analyzer's bandwidth measure function.

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# 10.4 Test Result

EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation	Test						
Mode	Frequency	StartFre[MHz]	StopFre[MHz]	Max.Level[dBm]	Max.Level[µW]	Limit[µW]	Verdict
(MHz)	(MHz)		-51	100		-51	
O ***	2402	30	2387	-62.06	0.0006	<2.5	PASS
	2402	2387	2400	-46.60	0.0219	<25	PASS
6	2402	2483.5	2496.5	-59.66	0.0011	<25	PASS
0	2402	2496.5	13000	-55.37	0.0029	<2.5	PASS
	2441	30	2387	-62.70	0.0005	<2.5	PASS
GFSK TX	2441	2387	2400	-62.98	0.0005	<25	PASS
Mode	2441	2483.5	2496.5	-59.61	0.0011	<25	PASS
~	2441	2496.5	13000	-54.46	0.0036	<2.5	PASS
ring H	2480	30	2387	-62.59	0.0006	<2.5	PASS
	2480	2387	2400	-59.98	0.0010	<25	PASS
	2480	2483.5	2496.5	-54.78	0.0033	<25	PASS
	2480	2496.5	13000	-55.86	0.0026	<2.5	PASS
	2402	30	2387	-62.21	0.0006	<2.5	PASS
	2402	2387	2400	-36.28	0.2355	<25	PASS
O HUAK !!	2402	2483.5	2496.5	-59.54	0.0011	<25	PASS
Pi /	2402	2496.5	13000	-55.68	0.0027	<2.5	PASS
4DQPSK TX Mode	2441	30	2387	-62.79	0.0005	<2.5	PASS
	2441	2387	2400	-63.59	0.0004	<25	PASS
	2441	2483.5	2496.5	-59.75	0.0011	<25	PASS
	2441	2496.5	13000	-55.22	0.0030	<2.5	PASS

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CIEVES HULAN	2480	30	2387	-49.94	0.0101	<2.5	PASS
	2480	2387	2400	-60.58	0.0009	<25	PASS
	2480	2483.5	2496.5	-55.27	0.0030	<25	PASS
HU	2480	2496.5	13000	-55.58	0.0028	<2.5	PASS
	2402	30	2387	-59.45	0.0011	<2.5	PASS
-51	2402	2387	2400	-35.81	0.2624	<25	PASS
O HUAK IL	2402	2483.5	2496.5	-60.34	0.0009	<25	PASS
	2402	2496.5	13000	-54.93	0.0032	<2.5	PASS
CRUG	2441	30	2387	-39.51	0.1119	<2.5	PASS
8-DPSK TX	2441	2387	2400	-62.90	0.0005	<25	PASS
Mode	2441	2483.5	2496.5	-60.23	0.0009	<25	PASS
	2441	2496.5	13000	-55.32	0.0029	<2.5	PASS
0"	2480	30	2387	-63.24	0.0005	<2.5	PASS
	o 2480	2387	2400	-61.44	0.0007	<25	PASS
HUAKTESI	2480	2483.5	2496.5	-55.60	0.0028	<25	PASS
<b>W</b>	2480	2496.5	13000	-55.45	0.0029	<2.5	PASS

Note: All mode has been test, Low and High channel is worst case.

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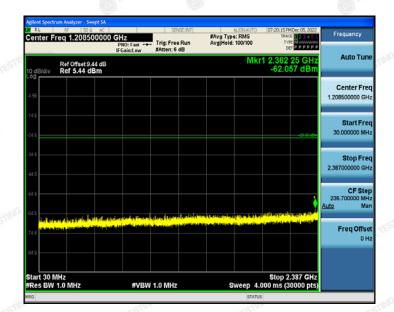
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### Report No.: HK2212025438-3E

EST H

### GFSK Tx Mode 2402MHz



RL	rum Analyzer - Swept SA RF 50 Q AC		SB	ISE:INT	#Avg Type	ALIGNAUTO		MDec 05, 2022	Frequency
	req 2.393500000 Ref Offset 9.44 dB	PNO: Fast ++- IFGain:Low	Trig: Free #Atten: 6		Avg Hold:	100/100	D 2.399 99	PE MULLION	Auto Tune
10 dB/div Log	Ref 5.44 dBm						-40.5	97 abm	Center Free 2.393500000 GH
-14.6								-16.00 dBn	Start Free 2.387000000 GH
-34.6									Stop Free 2.400000000 GH
-54.6	a sala a di Janga kana ilaya saar	nint Viscond India	obiel and			ten bert		a a a a a a a a a a a a a a a a a a a	CF Step 1.300000 MH <u>Auto</u> Mar
-74.6		nana na na katalan kat Katalan katalan k	(Indeense)	i ninte foranj r	, great all is	The result			Freq Offse 0 H
	7000 GHz 1.0 MHz	#VBW	1.0 MHz		s	weep 2	Stop 2.40 2.000 ms (3		
MSG		****	TTO THITLE			STAT		10000 pt3/	

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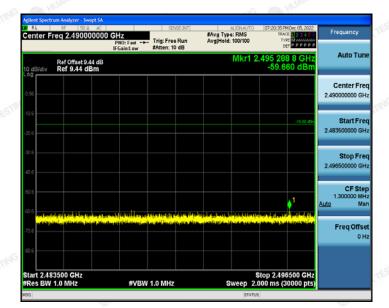
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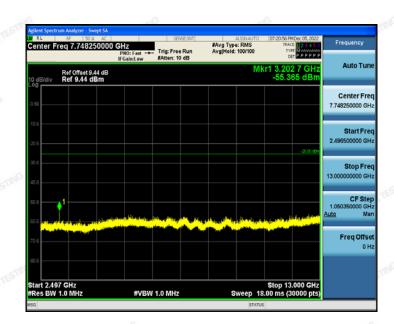


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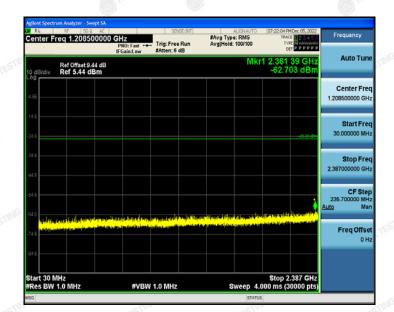
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Т 691

### GFSK Tx Mode 2441MHz



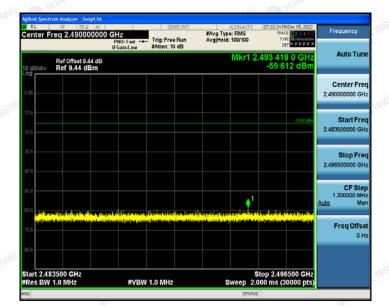
RL	RF 50 g AC		SENS	SE:INT		ALIGNAUTO	07:22:14 Pf	MDec 05, 2022	-
enter F	req 2.39350000	PNO: Fast ++	Trig: Free		#Avg Type Avg[Hold:		TRAC		Frequency
0 dB/div	Ref Offset 9.44 dB Ref 5.44 dBm	IFGain:Low	#Atten: 6 d	8		Mkr1 2	2.388 92		Auto Tun
<b>og</b> 4.56									Center Free 2.393500000 GH
24.6								-16.00 @	Start Fre 2.387000000 GH
44.6									Stop Fre 2.400000000 GH
54.6		eithe ware backet	a si ki da a k	enternet	ti est kinken	and the set	table blaste		CF Ste 1.300000 MH <u>Auto</u> Ma
74.6	and the second				No. 4. Jan Bill of	and the state of the state	a Batalan		Freq Offse 0 H
84.6 Start 2.38	7000 GHz						Stop 2.400 .000 ms (3		

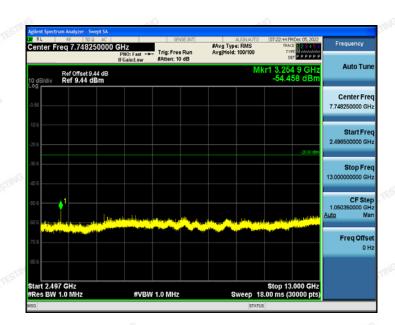
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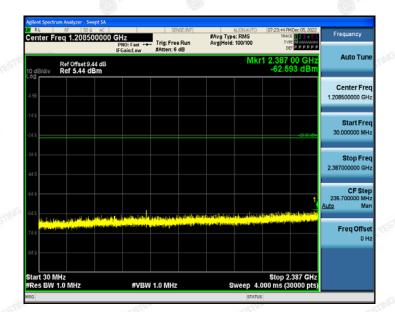
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### GFSK Tx Mode 2480MHz



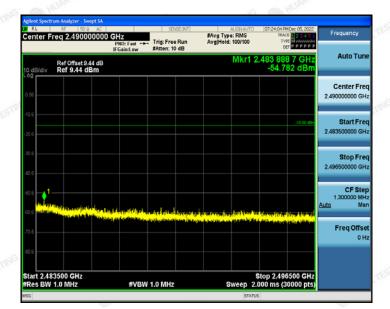
Agiler R		im Analyz RF	er - Swa 50.9				SE	SE:INT		ALIGNAUTO	07:23:54 P	4Dec 05, 2022	
Cen	nter Fr	eq 2.3				Fast ++-	Trig: Fre	Run	#Avg Type Avg[Hold:	e: RMS	TRA		Frequency
	_	Ref Off	set 9.4	4 dB	IFGain	clow	#Atten: 6	dB		Mkr1 2	.399 86		Auto Tune
10 de Log	B/div	Ref 5.	44 dE	ŝm							-59.9	//авт	
-4.56													Center Freq 2.393500000 GHz
-14.6												-16.00 cBm	
-24.6													Start Freq 2.387000000 GHz
-34.6													Stop Freq
-44.6													2.400000000 GHz
-54.6													CF Step
-54.6	a fit field as	. 18 . 14 .		and a selling	4	control for the	a dan Band ba	a hebililari	a faithe de ser a de seta	and also table	turnati	and the state	1.300000 MHz <u>Auto</u> Man
												100	
-74.6													Freq Offset
													0 Hz
-84.6													
		7000 G 1.0 MH				#1/D14	1.0 MHz					0000 GHz	
#Re	5 DW	I.V WIH	2			#VBW	1.0 MHz		5	statu		0000 pts)	

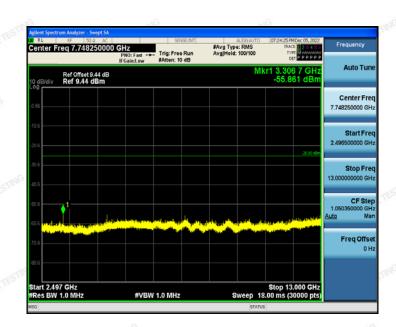
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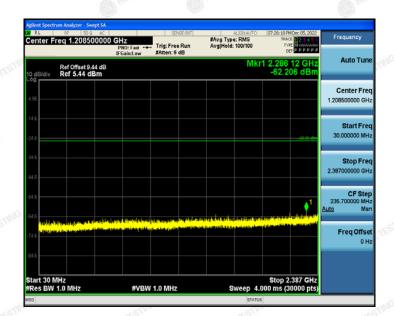


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# Pi / 4DQPSK TX Mode 2402MHz



		um Analyz											
Cer		<sup>RF</sup> req 2.3	50 A 93500					ISE:INT	#Avg Type		TRJ	PMDec 05, 2022	Frequency
10 d	B/div	Ref Off Ref 5.	set 9.44 44 dBi	l dB m	PNO: Fast IFGain:Lov	( - <b>≯</b> - ₩	Trig: Free #Atten: 6		Avg Hold:		2.399 99	7 0 GHz 276 dBm	Auto Tun
Lõg -4.56													Center Free 2.393500000 GH
-14.6 -24.6												-16.00 c <del>Cm</del>	Start Free 2.387000000 GH
-34.6 -44.6													Stop Free 2.400000000 GH
-54.6		44 114		بالاحداد	فالبردادي	بالماد	a) la ministra	مارونا و ا	N shareshi	oi suà i		e de la constante de la consta	CF Step 1.300000 MH <u>Auto</u> Ma
-74.6	apar la				and the second	and of	alian i ha con		and the second				Freq Offse 0 H
-84.6 Star	+ 2 38	7000 G	H7								Stop 2.40	00000 GHz	
		1.0 MH			#\	/BW	1.0 MHz		S	weep 2	2.000 ms (	30000 GH2	
MSG										STAT	US		

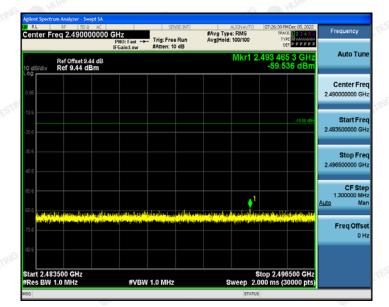
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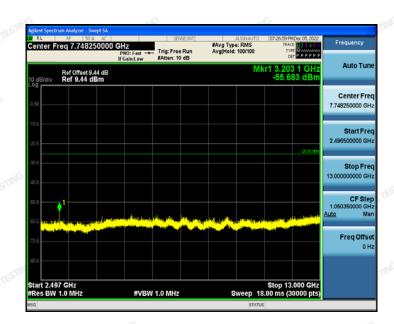
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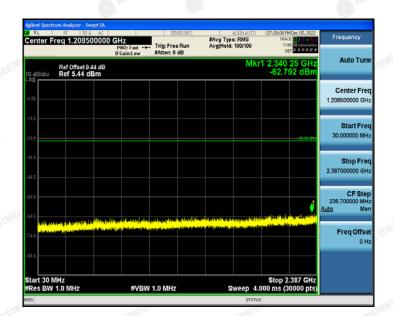


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## Pi / 4DQPSK TX Mode 2441MHz

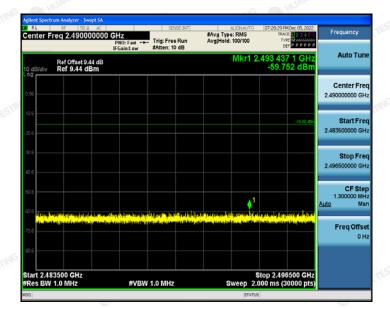


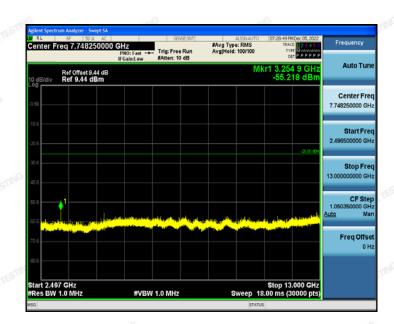
RL	trum Analyzer - Swept SA RF 50 Q AC		SENSE:INT	ALIGNAUTO	07:28:19 PMDec 05, 2022	-
enter	Freq 2.393500000	PNO: Fast -	Trig: Free Run	#Avg Type: RMS Avg[Hold: 100/100	TRACE 23456 TYPE MUNICIPALITY DET PPPPPP	Frequency
0 dB/div	Ref Offset 9.44 dB Ref 5.44 dBm	IFGain:Low	#Atten: 6 dB	Mkr1 2	2.389 372 6 GHz -63.587 dBm	Auto Tun
. <b>og</b> 4.56						Center Fre 2.393500000 GH
24.6					-16.00.48m	Start Fre 2.387000000 GH
34.6 44.6						Stop Fre 2.400000000 GH
54.6			de nordent or	skin filmaska naprila, sna fastastaj		CF Ste 1.300000 MH <u>Auto</u> Ma
74.6						Freq Offse 0 H
84.6 Start 2.3	87000 GHz				Stop 2.400000 GHz	
	1.0 MHz	#VBW	1.0 MHz		.000 ms (30000 pts)	

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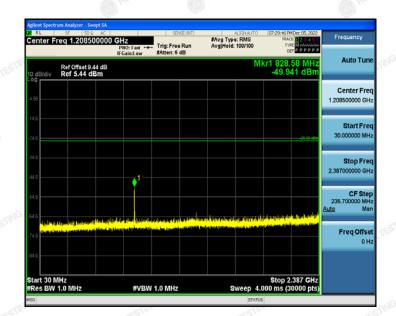
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# Pi / 4DQPSK TX Mode 2480MHz



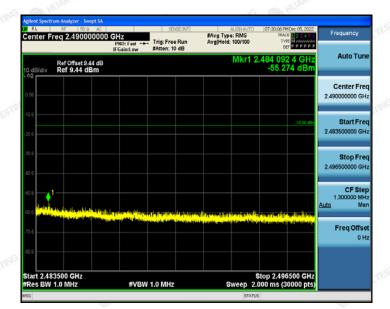
Frequency	1Dec 05, 2022 1 1 2 3 4 5 6 2 M	TRAC		#Avg Typ Avg Hold		Trig: Free	<b>iz</b> NO:Fast ↔	AC 10000 GI	n Analyzer - Sv RF 50 G 9q 2.3935	L	×
Auto Tune		399 824	Mkr1 2		dB	#Atten: 6	Gain:Low	4 dB	Ref Offset 9. Ref 5.44 d	B/div	
Center Free 2.393500000 GH											Log -4.5
Start Free 2.387000000 GH:	-16.00 <del>dDn</del>										
Stop Free 2.40000000 GH;											
CF Step 1.300000 MH: <u>Auto</u> Mar											
Freq Offse 0 H:											
	0000 GHz 0000 pts)	top 2.400 000 ms (3		5		1.0 MHz	#VBW		000 GHz .0 MHz		

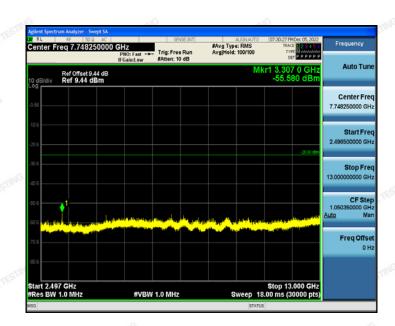
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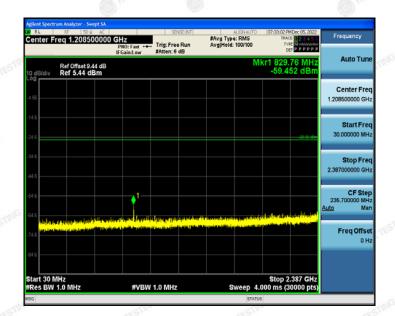
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EST -

# 8-DPSK TX Mode 2402MHz



Cen			50 R AC	00 GHz	Fast ++-		Run	#Avg Type Avg[Hold:	ALIGNAUTO 100/100	TRA	PF M MANA	Frequen	icy
10 di	B/div	Ref Offs Ref 5.4	et 9.44 dB 4 dBm	IFGai	ncLow	#Atten: 6	₫B		Mkr1	2.399 99	5 2 GHz 10 dBm	Auto	Tune
Log -4.56												Cente 2.39350000	
-14.6 -24.6											-16.00 d <del>en</del>	Star 2.38700000	t Freq 00 GHz
-34.6												Stop 2.40000000	p <b>Freq</b> 00 GHz
-54.6							mandar	ais Lad BARRY	hanna	u de la substituí	a start and a start and a start	CF 1.30000 <u>Auto</u>	F Step 00 MHz Man
-64.6 -74.6	dina dina articipita						A PROPERTY.	and h for the	ulle sa si en	(). (Chain		Freq	Offset 0 Hz
-84.6													
		7000 GH 1.0 MHz	z		#VBW	1.0 MHz		s	weep 2	Stop 2.40	0000 GHz 30000 pts)		

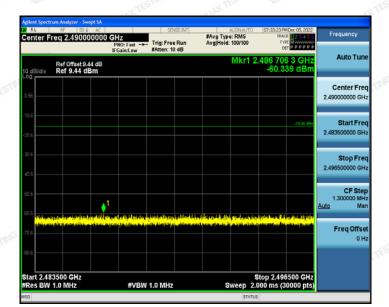
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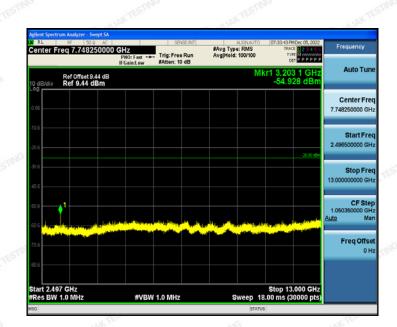
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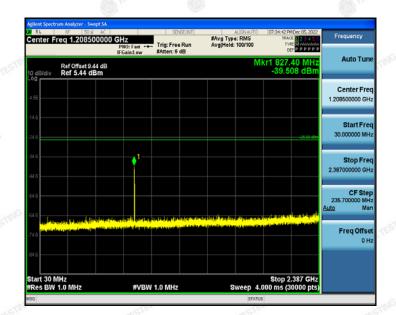


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# 8-DPSK TX Mode 2441MHz

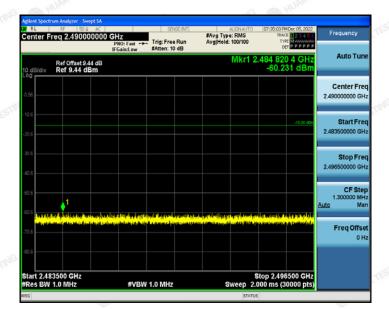


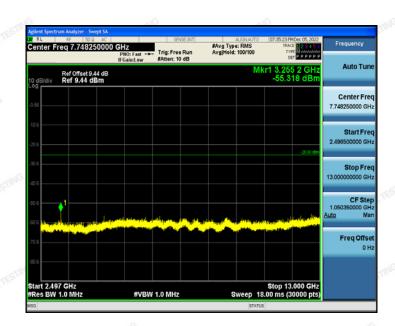
RL	rum Analyzer - Swept SA RF 50 R AC req 2.393500000			SE:INT	#Avg Type		TRA	MDec 05, 2022	Frequency
10 dB/div	Ref Offset 9.44 dB Ref 5.44 dBm	PNO: Fast ++ IFGain:Low	#Atten:6		Avg Hold:		.395 00	7 8 GHz 96 dBm	Auto Tune
-4.56									Center Freq 2.393500000 GHz
-14.6								-16.00 dBm	Start Freq 2.387000000 GHz
-34.6									Stop Freq 2.40000000 GHz
-54.6					<b>∳</b> <sup>1</sup>				CF Step 1.300000 MHz <u>Auto</u> Man
-74.6			ar maladaria Ar ang				and Property II	inder Epsenie Seconder albert	Freq Offset 0 Hz
-84.6	7000 GHz						Stop 2.40	0000 GHz	
#Res BW		#VBW	1.0 MHz		S	weep 2.	000 ms (3	0000 pts)	

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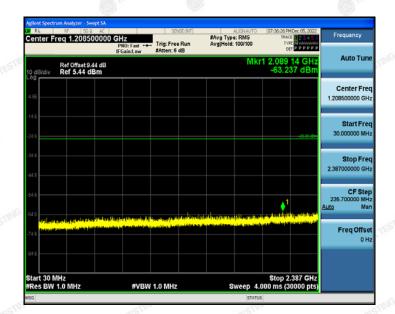
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# 8-DPSK TX Mode 2480MHz



Agilent Spectr	um Analyzer - Swept SA								
Center E	RF 50 R AC reg 2.393500000	GH7	SEN	ISE:INT	#Avg Typ	ALIGNAUTI 8: RMS	0 07:36:36 P	MDec 05, 2022	Frequency
oontor n	100 2.000000000	PNO: Fast ++ IFGain:Low	Trig: Free #Atten: 6		Avg Hold:		D		Auto Tune
10 dB/div	Ref Offset 9.44 dB Ref 5.44 dBm					MKr1	2.399 65 -61.4	29 GHZ 41 dBm	
-4.56									Center Free 2.393500000 GH
-14.6								-16.00 cBm	
-24.6									Start Free 2.387000000 GH
-34.6									Stop Free 2.400000000 GH
.54.6									CF Step
-64.6									1.300000 MH: <u>Auto</u> Mar
.746	alati dina ala tabida d								Freq Offse
-/4.6									0 H:
-84.6									
Start 2.38	7000 GHz						Stop 2.40	0000 GHz	
#Res BW		#VBW	1.0 MHz		S	weep	2.000 ms (3		
150						STA	TUS		

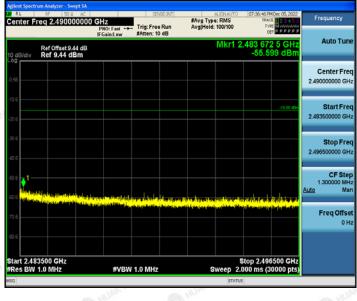
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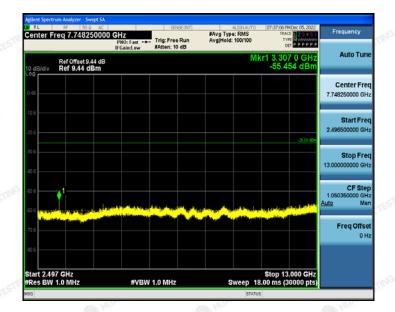
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#### Report No.: HK2212025438-3E





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## 11 Interference prevention function

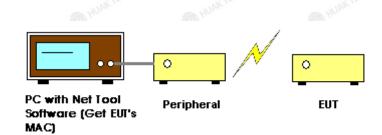
11.1 Limit

Item	Limits				
Identification code	$\geq$ 48 bits	and a second sec	O Hu		

## 11.2 Measuring ID Code Software

Item	Limits				
MAC IP List	MAC Scan				

11.3 Test Setup



## 11.4 Test Procedure

- (1) In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT.
- b. Check the transmitted identification codes with the demodulator.
- (2) In the case of receiving the identification code:
- a. Transmit the predetermined identification codes form the counterpart.
- b . Check if communication is normal.
- c. Transmit the signals other than predetermined ID codes form the counterpart.d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

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TIN

**-||**-

# 11.5 Test Result

EUT :	Car Audio player	Test Date:	Dec. 05, 2022	
Temperature:	25°C	Tested by:	Kevin Pan	STIN
Humidity:	55 % RH	Test Voltage	Normal Voltage	UAKTL
Test result:	CONFORM(MAC: 51F14A0	00CB75)	-116	

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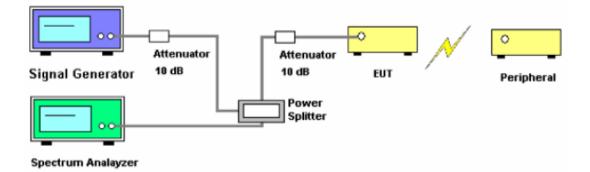
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- 12 Carrier sensing function
- 12.1 Limit

The device shall not transmit radio wave when receiving 100Mw/m

- 12.2 Test Setup
  - Measurement System Diagram



- Conditions of Application Equipment (EUT)
  - The EUT state shall be "normal mode link with wireless router".
- 12.3 Test Procedure

(1) SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is (on 22.79+G-20\*log(f)dBm)(G is the antenna gain, f is the test frequency).

(2) Turn off the RF signal of the SG.

(3) EUT have transmitted the maximum modulation signal and fixed channelize.

(4) Setting of SA :RBW/VBW=1MHz/1MHz,Span=50MHz,Sweep time=auto,

Sweep mode=continuous, Detect mode=positive peak

(5) SG RF signal on.

(6) EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous

12.4	Test	Result

	ALC		ALC: NO.	A Pro-
EUT :	Car Audio player	Test Date:	O HUM	O HO
Temperature:	25°C	Tested by:	/	
Humidity:	55 % RH	Test Voltage	TESTING	TESTING
Test result:	Not applicable other than OF	DM modulation.		

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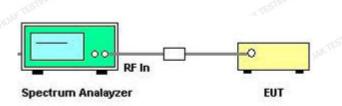


## 13 Secondary Radiated Emissions

## 13.1 Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

## 13.2 Test Setup



## 13.3 Test Procedure

(1) Configure EUT and assistant system according clause 2.2 and 14.2

(2) Set EUT work in carrier Rx mode as described in clause 2.2

(3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
For below 1G:
Resolution BW: 100KHz.
Video BW: 100KHz.
Detector: Peak.
Trace Mode: Max Hold
For above 1G:

Resolution BW: 1MHz. Video BW: 1MHz. Detector: Peak. Trace Mode: Max Hold (4) When the trace is complete, measure the Secondary Radiated Emissions with spectrum analyzer's bandwidth measure function.

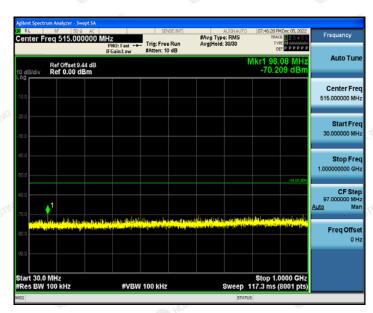
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# 13.4 Test Result

	89		AND ANY
EUT :	Car Audio player	Test Date:	Dec. 05, 2022
Temperature:	25°C	Tested by:	Kevin Pan
Humidity:	55 % RH	Test Voltage	Normal Voltage
ALAK			

Note: The worst test channel of all channels was showed as the follow.





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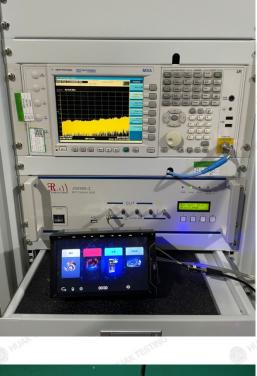
TEL:+86-755 2302 9901 FAX:+86-755 2302 9901 E-mail: service@cer-mark.com

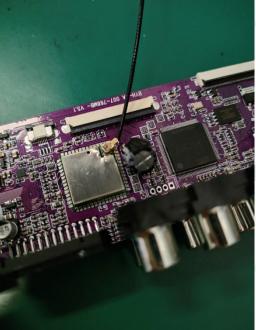


ACATION

# 14 PHOTOGRAPH OF TEST







----End of report-----

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