

Test Report

Product name: LED TV

Trademark: N/A

Model Name: 40Z65

Series Model(s): 40E5500B, SC40HTV, 40E5500G, E5500G

Report No: T241209031-RF02

Test Standards: Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.

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Manufacturer: Shenzhen Chuangwei-RGB Electronics Co., Ltd. Shiyuan Factory

Manufacturer Address: Skyworth Science and Industrial Park, Tangtou 1st Road, Shiyuan Street, Bao'an District Shenzhen, Guangdong, China

Date of Test Date: Dec 9, 2024 to Jan.9, 2025

Date of issue: Jul 14, 2025

Test result: Compliance

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The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of the preparer, reviewer and approver. Any objections must be raised to CSIC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Table of Contents

Page

1.TEST SUMMARY	3
1.1 TEST STANDARDS.....	3
1.2 TEST DESCRIPTION	3
1.3 TEST FACILITY.....	4
1.4 MEASUREMENT UNCERTAINTY	4
2.GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
2.2 DESCRIPTION OF TEST MODES AND TEST FREQUENCY	6
2.3 MEASUREMENT INSTRUMENTS LIST.....	8
2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL	8
2.5 CONSTRUCTION PROTECTION CONFIRMATION	9
3. TEST ITEM AND RESULTS	10
3.1 FREQUENCY ERROR	10
3.2 ANTENNA POWER.....	12
3.3 RADIATION POWER	14
3.4 OCCUPIED BANDWIDTH (99%)&SPREAD-SPECTRUM BANDWIDTH (90%)&SPREADING FACTOR	15
3.5 DWELL TIME.....	17
3.6 UNWANTED EMISSION INTENSITY MEASUREMENT	19
3.7 IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT.....	23
3.8 TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT.....	26
3.9 RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT	28
4. EUT TEST PHOTOS	29
5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL.....	30

1.TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

1.2 Test Description

Article 2 Paragraph 1 of Item 19			
Item	Clause	Result	Remark
Frequency Error	3.2	PASS	Note2
Antenna Power	3.2	PASS	Note2
Transmission Radiation power	3.6	PASS	Note2
Occupied Bandwidth (99%) Spread-spectrumBandwidth (90%) Spreading Factor	3.2	PASS	Note2
Dwell Time	3.2	PASS	Note2
Unwanted Emission Intensity	3.2	PASS	Note2
Limitation of Collateral Emission of Receiver	3.3	PASS	Note2
Transmission Radiation Angle Width (3dBBeamwidth)	3.2	N/A	Note1
Radio Interference Prevention Capability	3.4	PASS	Note2
Carrier Sense Capability	Note(2)	N/A	Note2
Construction Protection Confirmation	3.7	PASS	Note2

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2)Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

1.3 Test Facility

Shenzhen Central Standard International Center Co., Ltd.
Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community,
Dalang Street, Longhua District, Shenzhen.

The test facility is recognized, certified or accredited by the following organizations:

CNAS	Registration No.: L11671	
FCC	Registration No.: 0031378433	Designation Number: CN1317
IC	CAB identifier: CN0051	
A2LA	Lab Cert. No.: 6426.01	

1.4 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Central Standard International Center Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for Shenzhen Central Standard International Center Co., Ltd.

Test Items	Measurement Uncertainty	Notes
Frequency Error	$\pm 5.00\%$	(1)
Antenna Power Density	$\pm 1.08\text{ dB}$	(1)
Occupied Channel Bandwidth	$\pm 5.00\%$	(1)
Transmitter unwanted emissions in the spurious domain & Receiver spurious emissions	$\pm 4.54\text{ dB}(25\text{MHz}-1000\text{MHz})$ $\pm 4.84\text{ dB}(1\text{GHz}-26.5\text{GHz})$	(1)
Adaptivity	$\pm 5.00\%$	(1)

Note(1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2.GENERAL INFORMATION

2.1 General Description of EUT

Product Name:	LED TV
Trademark:	N/A
Model Name:	40Z65
Series Model(s):	40E5500B, SC40HTV, 40E5500G, E5500G
Power supply:	AC 100V, 50/60Hz
Remark:	
Product Description	
Operating Frequency:	2402MHz to 2480MHz
Bit Rate of Transmitter:	GFSK; $\pi/4$ -DQPSK; 8DPSK
Modulation Type:	FHSS
Channel number:	79 CH
Antenna Type:	Classic Bluetooth/BLE: BT_ANT: PIFA
Antenna Gain (Peak):	BT_ANT: 4.30dBi;
Hardware version:	A7K71J
Software version:	A.11.0.0_9602_JP_0.0.1_Sat_Jan_4_17:02:32_CST_2025

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Full tests were applied to sample T241209031-Y01/01 only in this document.

2.2 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating conditions. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

RF Channel and Frequency of Bluetooth (BDR & EDR)

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402.00	20	2422.00	40	2442.00	60	2462.00
1	2403.00	21	2423.00	41	2443.00	61	2463.00
2	2404.00	22	2424.00	42	2444.00	62	2464.00
3	2405.00	23	2425.00	43	2445.00	63	2465.00
4	2406.00	24	2426.00	44	2446.00	64	2466.00
5	2407.00	25	2427.00	45	2447.00	65	2467.00
6	2408.00	26	2428.00	46	2448.00	66	2468.00
7	2409.00	27	2429.00	47	2449.00	67	2469.00
8	2410.00	28	2430.00	48	2450.00	68	2470.00
9	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	78	2480.00
19	2421.00	39	2441.00	59	2461.00		

Table For Parameters Of Test Software Setting

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. the RF output power selection is for the setting of RF output power expected by the customer and going to be fixed on the firmware of the final end product.

Test Software Version	SecureCRT V7.0.4 (build 537)		
Frequency	2402MHz	2441MHz	2480MHz
GFSK/ π /4-DQPSK /8DPSK	4	4	4

Test Conditions

The RF 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 Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input AC Power	100V	110V	90V
IC Power	3.3V	3.3V	3.3V

Note: Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage) / Output Normal Voltage * 100

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%.

2.3 Measurement Instruments List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	May. 26, 2025
2	Power sensor	KEYSIGHT	U2021XA	MY55080015	May. 26, 2025
3	Vector Signal Generator	Agilent	N5182A	MY50140130	May. 26, 2025
4	Power sensor Box	MWRFTest	N/A	N/A	N/A
5	RF Switch Box	MWRFTest	MW100-RFCB	N/A	N/A
6	Temperature Humidity Chamber	Angui Testing	AG1000L	2304061049	May. 26, 2025
7	Inverter power supply	AKE	AKE-2003-P2	N/A	May. 26, 2025
8	Hygrothermograph	ELECALL	EC807	N/A	May. 30, 2025
9	MTS 8310	MWRFTest	V: 2.0.0.0		

Note:

1. The cable loss has calculated in test result which connection between each test instruments.
2. The instruments used are calibrated by CCIC (Shenzhen) Metrology & Testing Service Co., Ltd.

2.4 Description Test Peripheral And Eut Peripheral

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

Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Laptop	DELL	Vostro 3400	N/A	AE

Support Cable

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	N/A	N/A

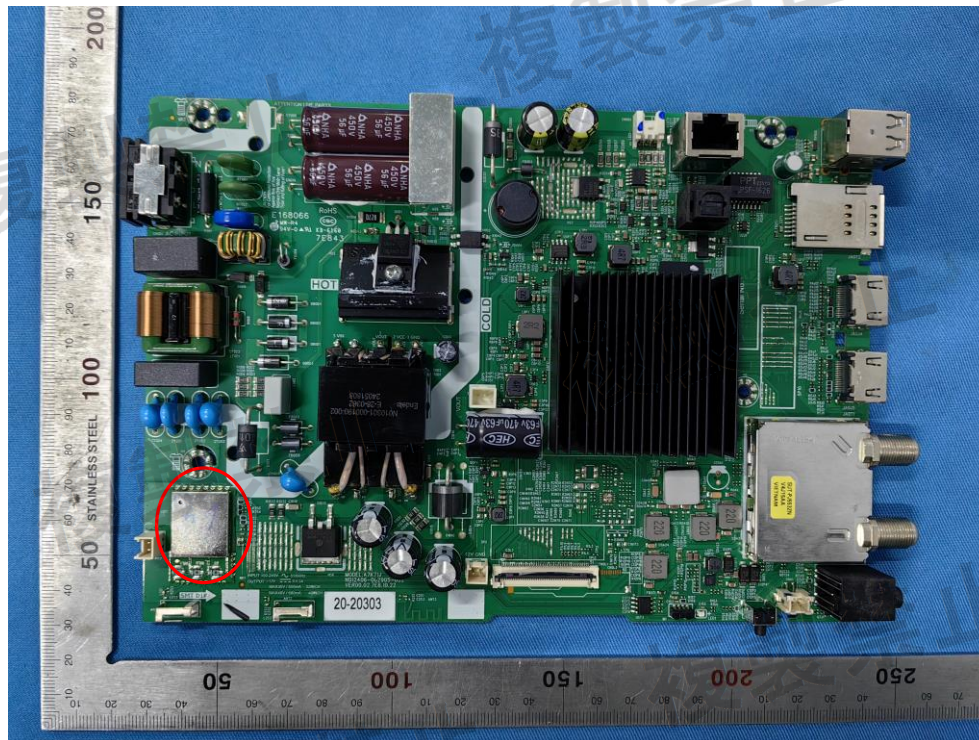
Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. For detachable type I/O cable should be specified the length in cm in 『Length』 column.
3. "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.5 Construction Protection Confirmation

Our products apply for Japanese radio frequency (rf) certification. The use of shielded, it is not easy to open it.



3. TEST ITEM AND RESULTS

3.1 Frequency Error

Limit

Item	Limits
Frequency Error	±50ppm

Test Procedures

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

Test Setup



Eut Operation During Test

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

Test Result

PASS

Test data refer Appendix A.

Temperature:	24.0°C	Humidity:	44.0% RH
Operation Mode:	Unmodulation transmitting mode		

GFSK					
Test Conditions		Channel	Reading	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V nom (V)	100	2402	2402.0035	1.457	±50
		2441	2441.0030	1.229	±50
		2480	2480.0030	1.210	±50
π/4-DQPSK					
Test Conditions		Channel	Reading	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V nom (V)	100	2402	2402.0035	1.457	±50
		2441	2441.0030	1.229	±50
		2480	2480.0030	1.210	±50
8DPSK					
Test Conditions		Channel	Reading	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V nom (V)	100	2402	2402.0030	1.249	±50
		2441	2441.0030	1.229	±50
		2480	2480.0030	1.210	±50

Note:

Tolerance = (Reading – Channel Frequency) / Channel Frequency * 10⁶.

3.2 Antenna Power

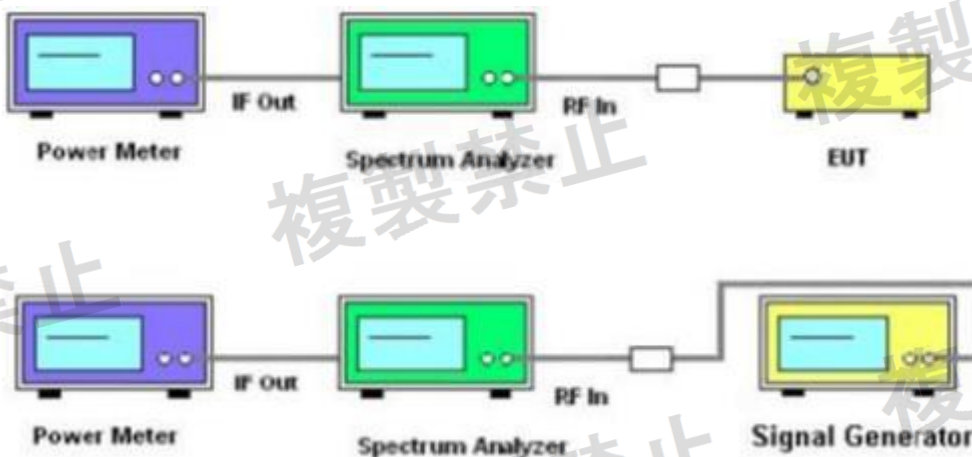
Limit

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400 – 2483.5 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz,802.11b/g/n HT20) $\leq 5\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz,802.11n HT40) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Power Error	+20%, -80% (Base on manufacturer declare power)

Test Procedure

1. EUT turn to test frequency channel and keep continuous transmitting.
2. Reading the output power from the Power meter as P_{EUT} .
3. Turn the Signal generator to frequency channel the same as the EUT.
4. Turn the level of Signal generator, scan with the power meter until the power equal to P_{EUT} , the level of Signal generator recorded as "P".
5. The antenna power of EUT is "P".
6. EIRP power="P"+antenna gain.

Test Setup



Test Deviation

There is no deviation with the original standard.

Test Result

PASS

Temperature:		24.0°C			Humidity:	44.0% RH	
Operation Mode:		TX mode					
GFSK							
Test Conditions		Channel	Meas. Power	Ant. Power	Declared Power	Tolerance	Limit
		MHz	dBm	mW/MHz	mW/MHz	%	mW/MHz
V nom (V)	100	2402	0.081	0.014	0.02	-30.00	3
		2441	0.042	0.014	0.02	-30.00	3
		2480	0.265	0.015	0.02	-25.00	3
π/4-DQPSK							
Test Conditions		Channel	Meas. Power	Ant.Power	Declared Power	Tolerance	Limit
		MHz	dBm	mW/MHz	mW/MHz	%	mW/MHz
V nom (V)	100	2402	0.333	0.015	0.02	-25.00	3
		2441	0.135	0.014	0.02	-30.00	3
		2480	0.231	0.015	0.02	-25.00	3
8DPSK							
Test Conditions		Channel	Meas. Power	Ant.Power	Declared Power	Tolerance	Limit
		MHz	dBm	mW/MHz	mW/MHz	%	mW/MHz
V nom (V)	100	2402	0.393	0.015	0.02	-25.00	3
		2441	0.179	0.015	0.02	-25.00	3
		2480	0.278	0.015	0.02	-25.00	3

Note :

Ant Power (mW/MHz) = $10^{(\text{Meas. Power (dBm)} / 10) / \text{Spreading Bandwidth (MHz)}}$

Tolerance = (Ant. Power - Declared Power) / Declared Power * 100%.

3.3 Radiation power Limit

Item	Limits
Radiation power EIRP	FH form 2400 – 2483.5 MHz, EIRP $\leq$ 6.91dBm/MHz(4.91mW/MHz) CCK/OFDM/DBPSK (2400~2483.5MHz) OFDM or DS other than (802.11b/g/n HT20) EIRP $\leq$ 12.14 dBm/MHz (16.37mW/MHz) OFDM or DS other than (802.11n HT40) EIRP $\leq$ 9.13dBm/MHz (8.19mW/MHz) Other from 2400~2483.5MHz: 12.14 dBm/MHz(16.37mW/MHz) or less

Test Result

PASS

Temperature:	24.0°C	Humidity:	44.0% RH
Operation Mode:	TX mode		

GFSK						
Test Conditions		Channel	Ant. Power	Gain	EIRP Power	Limit
		MHz	mW/MHz	dBi	mW/MHz	mW/MHz
V nom (V)	100	2402	0.014	4.30	0.038	4.91
		2441	0.014	4.30	0.038	4.91
		2480	0.015	4.30	0.040	4.91
π/4-DQPSK						
Test Conditions		Channel	Ant.Power	Gain	EIRP Power	Limit
		MHz	mW/MHz	dBi	mW/MHz	mW/MHz
V nom (V)	100	2402	0.015	4.30	0.040	4.91
		2441	0.014	4.30	0.038	4.91
		2480	0.015	4.30	0.040	4.91
8DPSK						
Test Conditions		Channel	Ant.Power	Gain	EIRP Power	Limit
		MHz	mW/MHz	dBi	mW/MHz	mW/MHz
V nom (V)	100	2402	0.015	4.30	0.040	4.91
		2441	0.015	4.30	0.040	4.91
		2480	0.015	4.30	0.040	4.91

Note:

EIRP power = Ant power(mW/MHz) * $10^{(Gain/10)}$.

Gain: 4.30dBi.

3.4 Occupied Bandwidth (99%)&Spread-spectrum Bandwidth (90%)&Spreading Factor Limit

Item	Limits
Occupied Band Width:	$\leq 83.5\text{MHz}$ (FH;FH+DS;FH+OFDM) $\leq 26\text{MHz}$ (Others)
Spreading Bandwidth:	$\geq 500\text{ kHz}$

Test Procedures

- Setting of SA is following as: GFSK/ π /4-DPSK/8 DPSK RB: 1MHz / VB: 1MHz / SPAN: 83.5MHz / AT: 25dB Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For FH or OFDM Device) or 83.5MHz (For FHSS Device).
- SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
- Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
- Spread Spectrum Factor limit is greater than 5.

Test Setup



Test Deviation

There is no deviation with the original standard.

EUT Operation During Test

The EUT was programmed to be in normal transmitting mode.

Test Result

PASS

Test data refer Appendix A.

Temperature:		24.0°C		Humidity:		44.0% RH	
Operation Mode:		Hopping mode					
GFSK							
Test Conditions		Occupied Bandwidth	Spreading Bandwidth	Spread rate	Spreading factor	Limit	
		MHz	MHz	Mbps	/	/	
V Nor (V)	100	78.723	71.730	1	71.772	≥5	
π/4-DQPSK							
Test Conditions		Occupied Bandwidth	Spreading Bandwidth	Spread rate	Spreading factor	Limit	
		MHz	MHz	Mbps	/	/	
V nom (V)	100	78.757	71.701	2	35.935	≥5	
8DPSK							
Test Conditions		Occupied Bandwidth	Spreading Bandwidth	Spread rate	Spreading factor	Limit	
		MHz	MHz	Mbps	/	/	
V nom (V)	100	78.790	71.616	3	23.947	≥5	

Note:

Spreading factor = (Spreading bandwidth) / (Frequency corresponding to transmission rate)

GFSK: Frequency corresponding to transmission rate=1MHz

π/4-DQPSK: Frequency corresponding to transmission rate=2MHz

8DPSK: Frequency corresponding to transmission rate=3MHz.

3.5 Dwell Time

Limit

Item	Limits
Hopping Freq. Dwell Time	$\leq 0.4 \text{ sec (In } 0.4 \text{ sec} \times \text{ spreading rate)}$

Test Procedures

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep	Continuous

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT for DH5, DH3 and DH1 packet transmitting.
8. Measure the maximum time duration of one single pulse.
9. Dwell time = [Spreading Bandwidth / 79] x duty-cycle x 0.4 seconds. (to be determined for each mode, DH1, DH3, DH5)

Test Setup



Test Result

PASS

Test data refer Appendix A.

Temperature:	24.0°C	Humidity:	44.0% RH
Test Mode:	Hopping mode		

GFSK								
Test Conditions		Type	Spreading Bandwidth	Ton	Tp	Duty cycle	Dwell Time	Limits
		/	MHz	ms	ms	%	s	s
V nom (V)	100	DH1	71.730	0.390	2.490	15.66	0.06	0.4
		DH3	71.730	1.665	2.505	66.47	0.24	0.4
		DH5	71.730	2.910	4.995	58.26	0.21	0.4
π/4-DQPSK								
Test Conditions		Type	Spreading Bandwidth	Ton	Tp	Duty cycle	Dwell Time	Limits
		/	MHz	ms	ms	%	s	s
V nom (V)	100	2DH1	71.701	0.390	2.490	15.66	0.06	0.4
		2DH3	71.701	1.665	2490	66.87	0.24	0.4
		2DH5	71.701	2.925	5.010	58.38	0.21	0.4
8DPSK								
Test Conditions		Type	Spreading Bandwidth	Ton	Tp	Duty cycle	Dwell Time	Limits
		/	MHz	ms	ms	%	s	s
V nom (V)	100	3DH1	71.616	0.405	2.505	16.17	0.06	0.4
		3DH3	71.616	1.650	2.490	66.27	0.24	0.4
		3DH5	71.616	2.925	5.010	58.38	0.21	0.4

Note:

Dwell time = [Spreading Bandwidth /79] x Duty-cycle x 0.4 seconds.

Duty-cycle = Ton/ Tp*100%

3.6 Unwanted Emission Intensity Measurement

Limit

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W}/-36\text{dBm}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W}/-26\text{dBm}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W}/-16\text{dBm}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W}/-16\text{dBm}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 2.5 \mu\text{W}/-26\text{dBm}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

Test Procedures

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	100KHz / 100KHz (Below 1GHz)
RB / VB	1MHz / 1MHz (Above 1GHz)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: Below 1GHz RB:100KHz / VB:100KHz, Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz. Then to mark peak reading value + cable loss shall be less than 0.25 μW .
- Setting of SA is following as 1000MHz and stop frequency 2387MHz. Then to mark peak reading value + cable loss shall be less than 2.5 μW .
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
- SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
- When we tested 30MHz-1GHz, we used the RB 100KHz setting for the test. The limit on the test chart was converted. The conversion formula: $-26\text{dBm} + 10 \cdot \log(100\text{K}/1\text{M}) = -36\text{dBm}$.
- If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

Test Setup



Test Deviation

There is no deviation with the original standard.

Test Result

PASS

Test data refer Appendix A.

Temperature:	24.0°C	Humidity:	44.0% RH
Operation Mode:	TX mode		

GFSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	810.61	-57.295	-36	Pass
		1GHz-2.387GHz (1MHz)	1927.28	-46.279	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2400.00	-42.399	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2491.95	-46.544	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12405.50	-42.795	-26	Pass
	39	30MHz-1GHz (100kHz)	907.51	-56.775	-36	Pass
		1GHz-2.387GHz (1MHz)	2196.77	-46.336	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2395.81	-46.668	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2487.50	-46.504	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12451.50	-42.788	-26	Pass
	78	30MHz-1GHz (100kHz)	525.91	-57.578	-36	Pass
		1GHz-2.387GHz (1MHz)	2136.37	-44.648	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2399.25	-46.705	-16	Pass
		2.4835GHz-2.496GHz	2491.18	-45.987	-16	Pass

	(1MHz)				
	2.497GHz-12.5GHz (1MHz)	12459.5	-42.225	-26	Pass

$\pi/4$ -DQPSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	794.60	-57.059	-36	Pass
		1GHz-2.387GHz (1MHz)	2101.56	-45.578	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2399.99	-30.521	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2495.78	-45.585	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12419.50	-42.802	-26	Pass
	39	30MHz-1GHz (100kHz)	995.20	-57.674	-36	Pass
		1GHz-2.387GHz (1MHz)	2274.79	-46.034	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2396.69	-46.365	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2492.47	-46.232	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12443.50	-42.452	-26	Pass
	78	30MHz-1GHz (100kHz)	700.76	-57.057	-36	Pass
		1GHz-2.387GHz (1MHz)	2349.69	-46.080	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2391.06	-46.700	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2483.65	-46.404	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12430.50	-40.915	-26	Pass

8DPSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	944.13	-58.025	-36	Pass
		1GHz-2.387GHz (1MHz)	2082.21	-45.983	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2399.98	-31.494	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2493.55	-45.167	-16	Pass
		2.497GHz-12.5GHz (1MHz)	2520.50	-29.520	-26	Pass
	39	30MHz-1GHz (100kHz)	930.21	-57.312	-36	Pass
		1GHz-2.387GHz (1MHz)	2213.35	-46.264	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2393.93	-46.732	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2484.80	-45.597	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12478.00	-43.333	-26	Pass
	78	30MHz-1GHz (100kHz)	781.36	57.547	-36	Pass
		1GHz-2.387GHz (1MHz)	2199.69	-46.144	-26	Pass
		2.387GHz-2.4GHz (1MHz)	2392.52	-46.616	-16	Pass
		2.4835GHz-2.496GHz (1MHz)	2485.55	-46.100	-16	Pass
		2.497GHz-12.5GHz (1MHz)	12415.00	-42.163	-26	Pass

3.7 Imitation Of Collateral Emission Of Receiver Measurement

Limit

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}/-54\text{dBm}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}/-47\text{dBm}$ ($1\text{GHz} \leq f$)

Test Procedures

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- EUT have the continuous reception mode and fixed only one channelize.
- Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW.
- SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12750MHz. Search to mark peak reading value + cable loss shall be less than 20nW.
- If power level of lower emissions are more than 1/10 of limit (0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

Test Result

PASS

Test data refer Appendix A.

Temperature:	24.0°C	Humidity:	44.0% RH
Operation Mode:	TX mode		

GFSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	784.18	-89.729	-54	Pass
		1GHz-12.5GHz (1MHz)	12221.13	-74.332	-47	Pass
	39	30MHz-1GHz (100kHz)	921.53	-89.596	-54	Pass
		1GHz-12.5GHz (1MHz)	12257.93	-74.433	-47	Pass
	78	30MHz-1GHz (100kHz)	825.16	-89.893	-54	Pass
		1GHz-12.5GHz (1MHz)	12381.55	-74.984	-47	Pass

$\pi/4$ -DQPSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	971.82	-89.073	-54	Pass
		1GHz-12.5GHz (1MHz)	12467.226	-74.767	-47	Pass
	39	30MHz-1GHz (100kHz)	516.41	-88.823	-54	Pass
		1GHz-12.5GHz (1MHz)	12287.25	-73.465	-47	Pass
	78	30MHz-1GHz (100kHz)	856.97	-89.705	-54	Pass
		1GHz-12.5GHz (1MHz)	11828.98	-73.733	-47	Pass

8DPSK mode						
Test Condition	Channel	Test Band (RBW)	Reading		Limit (dBm/MHz)	Result
			Frequency (MHz)	Amplitude (dBm/MHz)		
NV	00	30MHz-1GHz (100kHz)	932.44	-89.491	-54	Pass
		1GHz-12.5GHz (1MHz)	12425.25	-74.774	-47	Pass
	39	30MHz-1GHz (100kHz)	904.50	-89.728	-54	Pass
		1GHz-12.5GHz (1MHz)	12407.43	-74.012	-47	Pass
	78	30MHz-1GHz (100kHz)	821.52	-88.569	-54	Pass
		1GHz-12.5GHz (1MHz)	12426.98	-74.225	-47	Pass

3.8 Transmission Radiation Angle Width (3db Beamwidth) Measurement

Limit

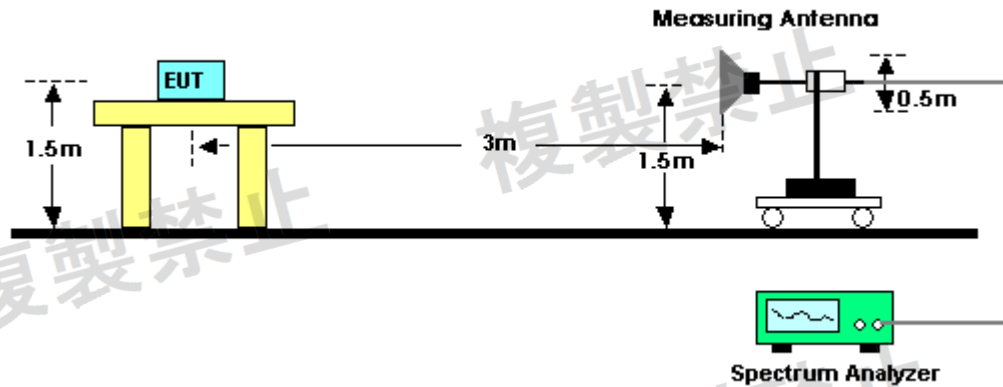
Item	Limits
3dB antenna beam width	$\theta \leq 360/A$ (The A is 10 in maximum) $A = \{ \text{EIRP Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power}(10\text{mW /MHz}, 3\text{mW/MHz})\} \}$ Shall be 1 when A is lower than 1
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

Test Procedures

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. "E" is the half-power beam width (angle between two points at which radiated power becomes 1/2)
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{ \text{EIRP Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power}(10\text{mW /MHz}, 3\text{mW/MHz})\} \}$
 Shall be 1 when A is lower than 1

Test Setup



Test Deviation

There is no deviation with the original standard.

Eut Operation During Test

The EUT was programmed to be in continuously transmitting mode.

Test Result

Note: The max EIRP less than 4.91mW/MHz, not applicable.

3.9 Radio Interference Prevention Capability Measurement

Limit

Item	Limits
Identification code	≥ 48 bits

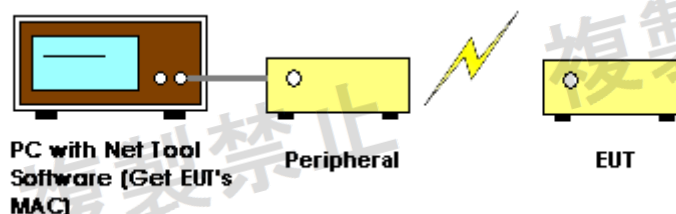
Measuring Id Code Software

Item	Limits
MAC IP List	MAC Scan

Test Procedures

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 ocde:
 - 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 idnetification codes are different from the predetermined ones.

Test Setup



Test Deviation

There is no deviation with the original standard.

Eut Operation During Test

The EUT was programmed to be in normal transmitting mode.

Test Result Of Radio Interference Prevention Capabilit

The Result is Compliant.

MAC address: c4:bd:8d:da:53:2a

Note: EUT works with the only paired device through the pairing code.



4. EUT TEST PHOTOS

Remark: Please refer to Test setup photo_T241209031.



5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Remark: Please refer to External Photos_T241209031 and Internal Photos_T241209031.

*****THE END*****