

RF TEST REPORT(BR)

Report No.....: AB26040050TW01

Applicant.....: Shenzhen Huipeng Supply Chain Management Co.,Ltd

Address.....: Room 702,Building 3,Weiyou Industrial Park, ShakengRoad,
Yangguang Community, XiliStreet,Nanshan District.Shenzhen

Manufacturer.....: Shenzhen Amesra Technology Co., Ltd.

Address.....: 401, Aohua Business Building, No.148 Huarong Road, Gaofeng
Community, Dalang Street, Longhua District, Shenzhen

Product Name.....: Digital Power Amplifier

Trade Mark.....: /

Model/Type Reference.....: M19 BT

Listed Model(s).....: AK380, AK35, AK45, AK55, AK390, LT21, M19 DT, XY-P15W, ZK-
1001UM, G12D, G12D Pro, G25D, G25D Pro

Standard.....: Article 2 paragraph 1 item 19
Notice No.88 Annex 43

Date of Receipt.....: 2026.03.10

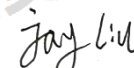
Date of Test Date.....: 2026.03.10-2026.03.17

Date of Issue.....: 2026.04.09

Test Result.....: Pass

Compiled by:
(Printed Name + Signature) Huaijie Li 

Supervised by:
(Printed Name + Signature) David Huang 

Approved by:
(Printed Name + Signature) Jay Liu 

Testing Laboratory Name.....: Aibo Standard Technology (Shenzhen) Co., Ltd.

Address.....: 101, Building B, Tuori New Energy Industrial Park, High-tech Park,
Tianliao Community, Yutang Street, Guangming District, Shenzhen
City, Guangdong Province, China

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RF TEST REPORT

EUT.....	: Digital Power Amplifier
Test Model.....	: M19 BT
Applicant	: Shenzhen Huipeng Supply Chain Management Co.,Ltd
Address.....	: Room 702,Building 3,Weiyou Industrial Park, ShakingRoad, Yangguang Community, XiliStreet,Nanshan District.Shenzhen
Manufacturer	: Shenzhen Amesra Technology Co., Ltd.
Address.....	: 401, Aohua Business Building, No.148 Huarong Road, Gaofeng Community, Dalang Street, Longhua District, Shenzhen
Factory	: Shenzhen Amesra Technology Co., Ltd.
Address.....	: 401, Aohua Business Building, No.148 Huarong Road, Gaofeng Community, Dalang Street, Longhua District, Shenzhen

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

1 Version

Version No.	Date	Description
AB26030091TW01	2026.03.17	Original
AB26040050TW01	2026.04.09	Comparing with the initial report AB26030091TW01, the applicant is different, and the rest are identical. So it is no need to retest. The data is copied from the report AB26030091TW01.

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3 Test summary

MIC Notice No.88 Appendix No.43 Article 2 Paragraph 1 Item 19		
Clause	Test Item	Result
3	Frequency Error	Pass
6	Antenna Power	Pass
6	Tolerances for antenna power	Pass
4	99% Occupied Bandwidth	Pass
4	Spread Spectrum Bandwidth	Pass
11	Spurious Emissions Intensity	Pass
7	Limit of Secondary Radiated Emissions	Pass
12	Interference Suppression	Pass
13	Hopping Frequency Dwell Time Measurement	Pass

Pass: The EUT complies with the carrier sense capability and radio interference prevention capability.

N/A: means not applicable

4 General information

4.1 General description of EUT

Product Name:	Digital Power Amplifier
Main Model:	M19 BT
Series Models:	AK380, AK35, AK45, AK55, AK390, LT21, M19 DT, XY-P15W, ZK-1001UM, G12D, G12D Pro, G25D, G25D Pro
Model Difference:	All models are the same circuit and RF module, except the model name.
Operation Frequency:	2402MHz~2480MHz
Channel Numbers:	79
Channel Separation:	1M
Modulation Type:	GFSK/ π /4-DQPSK/8DPSK
Rated Power:	/
Antenna Type:	External Antenna
Antenna Gain:	2dBi
Hardware version	V1.0
Software version	V2.0
Power supply:	DC 12-24V
Input:	/
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	
Note 2: The color of appearance and model name of series models listed are different from the main model, but the circuit and the electronic construction are the same, declared by the manufacturer.	

4.2 Channel list

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
18	2420MHz	38	2440MHz	57	2459MHz	79	2479MHz
19	2421MHz	39	2441MHz	58	2460MHz	78	2480MHz

Test Channel	Frequency(MHz)
Lowest channel	2402.00
Middle channel	2440.00
Highest channel	2480.00

4.3 Test mode

POWER	Frequency		
	2402MHz	2440MHz	2480MHz
	Default	Default	Default

4.4 Test Voltage

Note: The EUT has its own voltage regulator principle from JMC3310, the output voltage of the chip is 3.3V and the fluctuation of power supply to the RF circuit of EUT is equal to or less than +/- 1%. So exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.

During the input supply voltage to the EUT from the external power source is varied by +/-10%, EUT only operated in normal, High and Low voltage to test all regulations.

External power supply	RF IC power supply
Normal voltage:DC 24V	DC 3.3V
High voltage:DC 26.4V	DC 3.3V
Low voltage:DC 10.8V	DC 3.3V
Temperature:	25 °C
Humidity:	79%
Atmospheric Pressure	1009hPa

4.5 Test location

All tests were performed at:
Test Lab: Aibo Standard Technology (Shenzhen) Co., Ltd. Address: 101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China Tel.: +(86) 755 85250797 E-mail: aibo@aibonorm.com Website: www.aibonorm.com

4.6 Other information requested by the customer

None.

4.7 Test instruments list

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
1	EMI Test Receiver	R&S	ESCI	101196	01/20/2026	01/19/2027
2	Loop Antenna	Schwarzbeck	FMZB 1519	1519-025	02/19/2026	02/18/2028
3	Power Amplifier	HZEMC	HPA-9K0133	HYP A23029	02/19/2026	02/18/2027
4	Broadband Antenna	Schwarzbeck	VULB 9168	01763	02/19/2026	02/18/2028
5	Attenuator	PRM	ATT50-6-3	ATT50-6-3	01/20/2026	01/19/2027
6	Spectrum Analyzer	R&S	FSV40-N	101365	01/20/2026	01/19/2027
7	Horn Antenna	Schwarzbeck	BBHA 9120 D	02786	02/19/2026	02/18/2028
8	Horn Antenna	Schwarzbeck	ZLB7-18-40G-777	072410839	02/19/2026	02/18/2028
9	Power Amplifier	HZEMC	PA0118-43	HYP A23030	02/19/2026	02/18/2027
10	Power Amplifier	HZEMC	PA01840-45	HYP A23031	02/19/2026	02/18/2027
11	Spectrum Analyzer	R&S	FSV40-N	101365	01/20/2026	01/19/2027
12	MXG Vector Signal Generator	Agilent	N5182A	MY47070153	01/20/2026	01/19/2027
13	MXA Signal Analyzer	Keysight	N9020A	MY52091389	01/20/2026	01/19/2027
14	RF Automatic Test System (Included Power Sensor)	MWRFTest	MW100-RFCB	MW220802AB-44	01/20/2026	01/19/2027
15	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW500	118780	01/20/2026	01/19/2027
16	DC POWER SUPPLY	MAISHENG	MT-305DS	2021040016	01/20/2026	01/19/2027
17	Const Temp. & Humidity Chamber	GRT	GR-HWX-150L	GR25010601	01/20/2026	01/19/2027
18	Digital Phosphor Oscilloscope	UNI-T	UPO3502CS	110401307680X	01/20/2026	01/19/2027

Note: The Cal. Interval was one year. The equipments were calibrated by CCIC (Shenzhen) Metrology & Testing Service CO.,LTD.

Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law".

☐ (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act.

☐ (b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act.

☒ (c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act.

☐ (d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above.

Test Software		
Software name	Model	Version
Radiated Emission Measurement Software	FASLAB	V4.1
Bluetooth and WIFI Test System	MTS 8310	V3.0.0.0

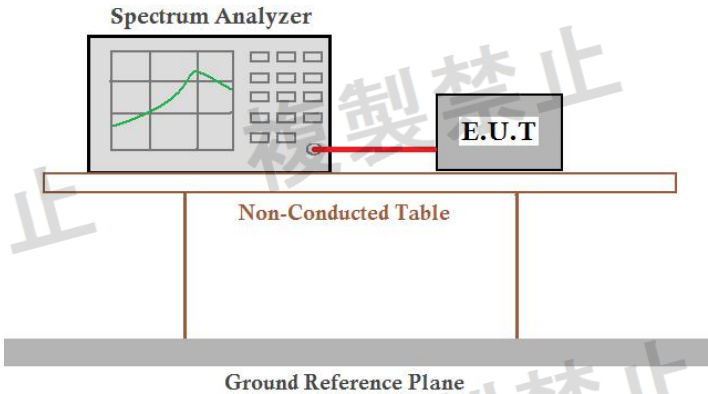
4.8 Measurement uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) $K=1.96$ or $K=2$ (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal).

Parameter	Uncertainty
RF frequency	$\pm 6 \times 10^{-7}$
Total RF power, conducted	$\pm 0.8\text{dB}$
Spurious emissions, conducted	$\pm 0.8\text{dB}$
DC and low frequency voltages	$\pm 3\%$
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$

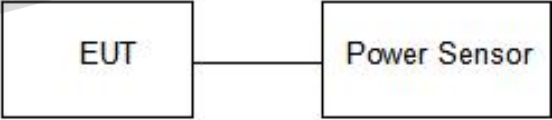
5 Test results and measurement data

5.1 Frequency error

Test condition:	Without modulation, continuously transmitting.
Spectrum set:	Test Frequency: test channel, RBW=VBW=10KHz, Span=1MHz, Sweep time=Auto, Detector mode=Positive peak
Limit:	±50ppm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 4.7 for details
Test results:	Pass

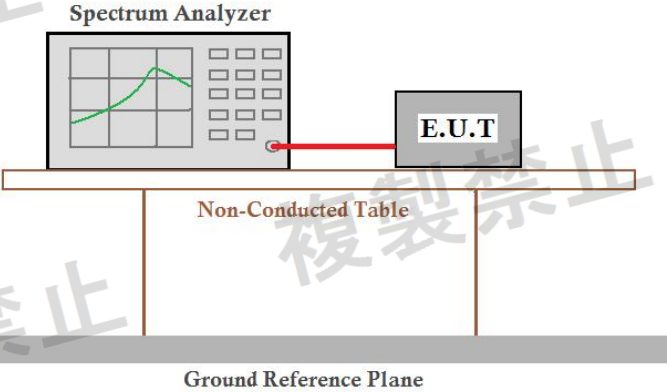
Measurement Data: The detailed test data see Appendix D

5.2 Antenna power

Test condition:	Test diffusion code and modulate with standard coding test signal
Spectrum set:	Measurement procedure 1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power Meter.
Limit:	3mW/MHz
Test setup:	 <pre> graph LR EUT[EUT] --- PS[Power Sensor] </pre>
Test Instruments:	Refer to section 4.7 for details
Test results:	Pass

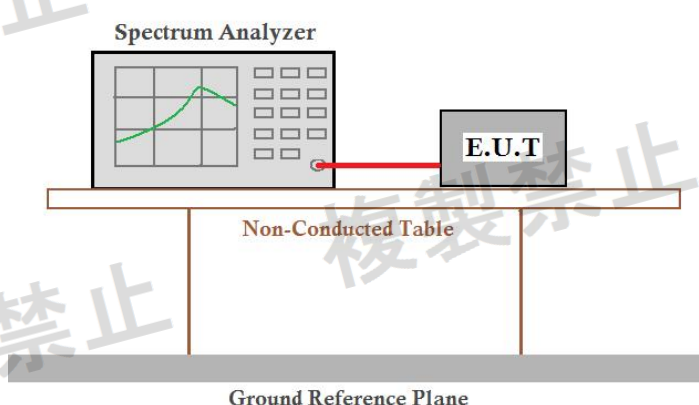
Measurement Data: The detailed test data see Appendix D

5.3 Occupy bandwidth (99%)

Test condition:	Test diffusion code and modulate with standard coding test signal
Spectrum set:	Test Frequency: test channel, RBW=1MHz,VBW=1MHz, Span=120MHz, Sweep time=Auto, Detector mode=Positive peak
Limit:	83.5MHz or less
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 4.7 for details
Test mode:	Transmitting mode
Test results:	Pass

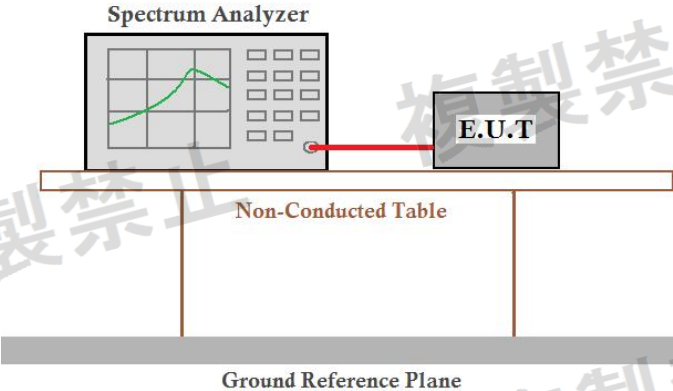
Measurement Data: The detailed test data see Appendix D

5.4 Spread spectrum bandwidth (90%)

Test condition:	Test diffusion code and modulate with standard coding test signal
Spectrum set:	Test Frequency: test channel, RBW=VBW=300KHz, Span=120MHz, Sweep time=Auto, Detector mode=Positive peak
Limit:	N/A
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 4.7 for details
Test mode:	Transmitting mode
Test results:	Pass

Measurement Data: The detailed test data see Appendix D

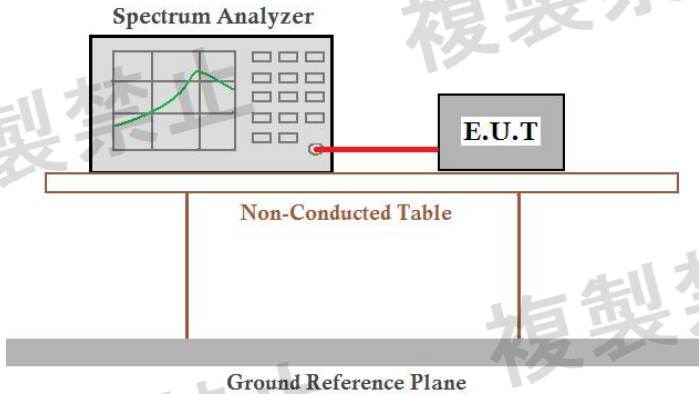
5.5 Spurious emission intensity

Test condition:	Test diffusion code and modulate with standard coding test signal
Measurement procedure:	Step 1 All spurious are measured from 30MHz to 13GHz by peak mode. Step 2 If the value measured by Step1 is 3dB or less to the limit, measure in average mode.
Spectrum set:	Step 1: Test Frequency: test channel, RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Positive peak Step 2: Test Frequency: spurious frequency RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Sample, Span=0Hz
Limit:	Below 2387 MHz: 2.5 μ W/MHz or less 2387 to 2400 MHz: 25 μ W/MHz or less 2483.5 through 2496.5 MHz: 25 μ W/MHz or less Over 2496.5 MHz: 2.5 μ W/MHz or less
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer and an E.U.T. (Equipment Under Test) are connected by a cable. They are positioned on a 'Non-Conducted Table'. This table is supported by a 'Ground Reference Plane'.
Test Instruments:	Refer to section 4.7 for details
Test results:	Pass

Note1:SA set to from 2.4965GHz to 13GHz, plot shows from 2.497GHz to 13GHz as of SA' s default format.

Note2:Measurement Data: The detailed test data see Appendix D

5.6 Secondary radiated emissions

Test condition:	Receiving mode
Measurement procedure:	Step 1 All spurious are measured from 30MHz to 13GHz by peak mode. Step 2 If the value measured by Step1 is 3dB or less to the limit, measure in average mode.
Spectrum set:	Step 1: Test Frequency: test channel, Below 1GHz, RBW=VBW=100KHz; Above 1GHz, RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Positive peak Step 2: Test Frequency: spurious frequency Test Frequency: test channel, Below 1GHz, RBW=VBW=100KHz; Above 1GHz, RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Sample, Span=0Hz
Limit:	Below 1GHz: 4.0nW or less Above 1GHz: 20nW or less
Test setup:	
Test Instruments:	Refer to section 4.7 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix D

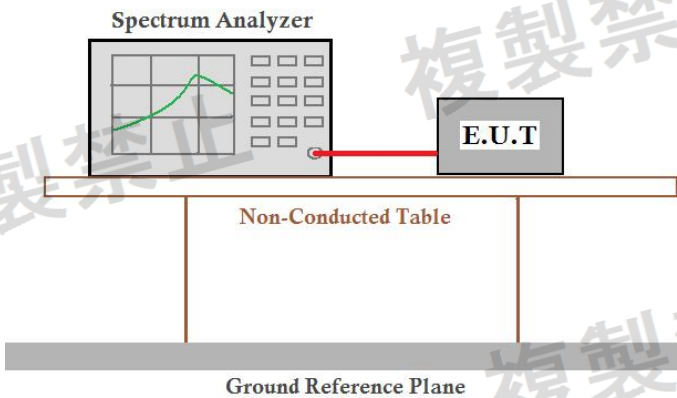
5.7 Interference suppression

Test condition:	Test diffusion code and modulate with standard coding test signal
Measurement procedure:	(1) The radio equipment with automatic transmitting function of identification code a) Transmit the assigned identification code from the radio equipment. b) Confirm the identification code received by the demodulator. (2) The radio equipment with automatic receiving function of identification code a) Transmit the assigned identification code from the opposite equipment. b) Confirm that the usual communication is available. c) Transmit the identification code distinct from the assigned one from the opposite equipment. d) Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.
Test setup:	Radio equipment Dummy load Attenuator) Demodulator
Test Instruments:	Refer to section 4.7 for details
Test results:	Pass

Measurement data:

Identification function:	Good; The MAC address is FC:11:10:DD:7F:84
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5.8 Hopping frequency dwell time measurement

Test condition:	Test diffusion code and modulate with standard coding test signal
Measurement procedure:	a. The transmitter output (antenna port) was connected to the spectrum analyzer. b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz. c. Use a video trigger with the trigger level set to enable triggering only on full pulses. d. Sweep Time is more than once pulse time. e. Set the center frequency on any frequency would be measure and set the frequency span to zero span. f. Measure the maximum time duration of one single pulse. Set the EUT for 1DH5, 2DH5 and 3DH5 packet transmitting. h. Measure the maximum time duration of one single pulse. i. Dwell time = burst time * burst number.
Spectrum set:	Please refer to section 5 in this report. The following table is the setting of the spectrum analyzer. Attenuation: Auto; Span Frequency: 0 MHz; RB: 1 MHz; VB: 1 MHz Detector: Peak; Trace: Max Hold; Sweep: Continuous.
Limit:	0.4 sec
Test setup:	
Test Instruments:	Refer to section 4.7 for details
Test mode:	Transmitting mode
Test results:	Pass

Measurement Data: The detailed test data see Appendix D

6 Test setup photo

Please refer to separated files for Appendix A test setup photos.

7 EUT constructional details

Please refer to separated files for Appendix B and Appendix C photos of EUT.

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