FCC PART 90S TEST REPORT

Report Number	BWTR-2140-NAPCE
FCC ID	2ADOBHLTE228E20
Applicant	Hisense International Co., Ltd.
Product Name	Mobile Phone
Marketing Name	Hisense E50 Lite 64GB
Brand Name	Hisense
Model Name	HLTE228E.20
Serial Number	No.1 (1st Source): 861639050000960 No.2 (2nd Source): 861639050000366
Test Standard	FCC 47 CFR Part 90 Subpart S
Tested Date	Sep. 29, 2021

CONTENTS

Revision History

Revision	Description	Issued Date
A	Initial issue of report	2021/09/29

1 Summary of Test Result

Report Section	FCC Section	Description	Result
3.1	90.635 (b)	RF Output Power and Effective Radiated Power	N/A
3.2	KDB 971168 D01 - 5.7	Peak to Average Power Ratio (PAPR)	N/A
3.3	90.209 (a)	Occupied Bandwidth	N/A
3.4	90.691	Spurious Emission at Antenna Terminal	N/A
3.5	90.691	Field Strength of Spurious Radiation	Pass
3.6	90.691	Band Edge	N/A
3.7	90.213	Frequency Stability	N/A

Note: Except for "Field Strength of Spurious Radiation", all other test results refer to the same contents in test report of model HLTE228E (Report No.: BWTR-2026-NAPCE). According to the declaration of manufacturer, the hardware and software of HLTE228E.20 and HLTE228E are very the same in LTE Band 26.

We, Beijing Boomwave Test Service Co. Ltd., would like to declare that the tested sample has been evaluated and in compliance with the requirements of applicable standards.

Prepared by:		2021.09.29 17:51:16 +08'00'
Reviewed by:		2021.09.29 17:57:15 +08'00'
Approved by:		2021.09.29 17:57:34 +08'00'

Rationale:
The test results in this report apply exclusively to the tested model / sample.
The electrical copy of test report is invalid without the signatures. The hard copy is invalid without seal.
The test report shall not be modified, republished or copied without the written authorization of the laboratory.

2 General Information

2.1 Applicant

Hisense International Co., Ltd.

Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China

2.2 Manufacturer

Hisense Communications Co., Ltd.

218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao, China

2.3 Product Feature of Equipment Under Test

Product Name	Mobile Phone
Marketing Name	Hisense E50 Lite 64GB
Model Name	HLTE228E.20
Sample Status	Production
Operating Frequency Range	814MHz~824MHz
Type of Wireless Technology	FDD LTE - Band 26
Modulation Type	QPSK, 16QAM
Channel Bandwidth	1.4MHz, 3MHz, 5MHz, 10MHz
Antenna Type	Internal Antenna
Antenna Gain	-0.81dBi
Extreme Operating Temperature	Minimum: -20℃
	Maximum: +55℃
Power Supply	Normal Voltage: 3.50V
	Lowest Voltage: 3.85V
	Highest Voltage: 4.40V
Hardware Version	FS180V0.5
Software Version	Hisense_HLTE228E_20_S03_01_01_MX06
Sample Received Date	2021/09/29

2.4 Ancillary Equipment

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

Support Unit	Li-Lon Battery
Manufacturer	Shenzhen Aerospace Electronic Co.,Ltd
Model Name	LPN440450
Capacity	4500mAh
Nominal Voltage	4.40V
Serial Number	---

Note: This battery model is only used by EUT No.1.

Support Unit	Li-Lon Battery
Manufacturer	DONGGUANG MILEY Electronic Co.,Ltd
Model Name	LPN440450
Capacity	4500mAh
Nominal Voltage	4.40V
Serial Number	---

Note: This battery model is only used by EUT No.2.

2.5 Description of Test Modes

The EUT has two sources whose differences are only the battery and camera.
The EUT was linked by base station simulator to work in continious trasmitting and receiving mode.
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, bandwidth, resource block (RB) and RB offset.

Following channels were selected for test:

Channel Bandwidth	Low Channel		Mid Channel		High Channel	
	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.
1.4MHz	814.7	26697	819.0	26740	823.3	26783
3MHz	815.5	26705	819.0	26740	822.5	26775
5MHz	816.5	26715	819.0	26740	821.5	26765
10MHz	---		819.0	26740	---	

Following modes were selected as the worst case configuration for each test:

Test Items	Channel	BW (MHz)	RB Size	RB Offset	Modulation	Antenna Orientation
Field Strength of Spurious Radiation	M	10	1	0	QPSK	X axis

2.6 Applicable Standards

Standard	Version	Title
FCC 47 CFR Part 90 Subpart S	2020	Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz Bands
ANSI C63.26	2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

2.7 Test Facilities

Company Name: Beijing Boomwave Test Service Co. Ltd

Address: EMC Building, No.1 Wang Jing East Road, Chao Yang District Beijing, P.R. China 100102

FCC Test Firm Registration Number: 613197

ISED Canada Registration No.: 24289 (CAB Identifier: CN0010)

VCCI Registration No.: R-20062, G-20063, C-20050, T-20049

Test Site	Description	Dimension	Ground Plane Size
☐ SAC10	10m semi-anechoic chamber	19.5m×12.9m×8.6m	4m×4m
☒ SAC3	3m semi-anechoic chamber	9.6m×6.4m×6.0m	9.6m×6.4m
☐ SR#1	Shielding Room for EMS test	8.1m×4.05m×2.755m	8.1m×4.05m
☐ SR#2	Shielding Room for RF test	8.1m×4.05m×2.755m	---

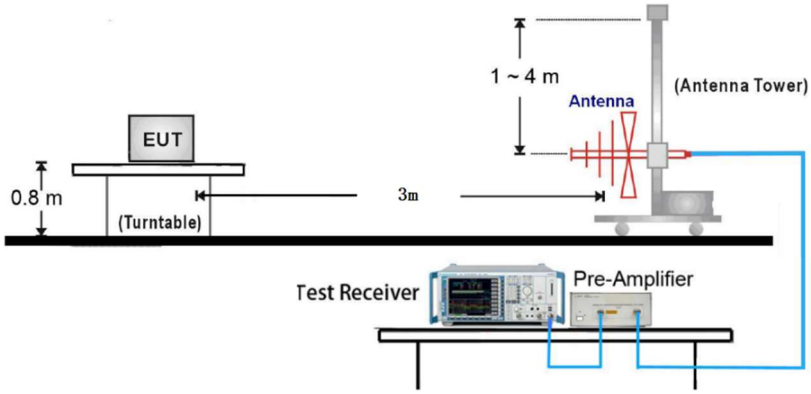
3 Test Result

3.1 Field Strength of Spurious Radiation

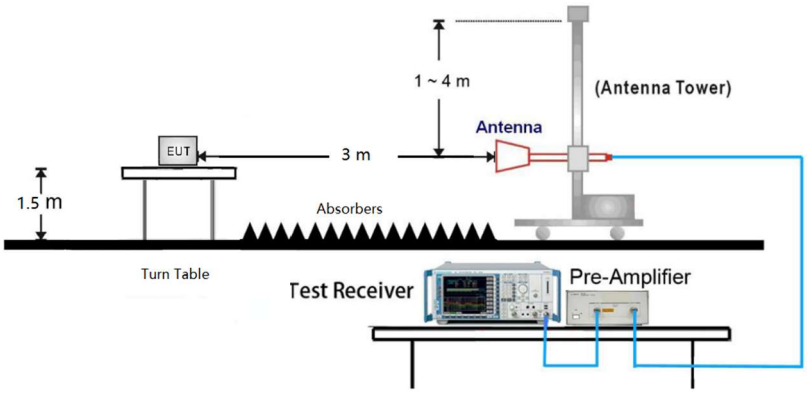
3.5.1. Limit

FCC 47 CFR Part 90 Subpart S - §90.691
For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

3.5.2. Test Setup



30MHz-1GHz Test Setup



Above 1GHz Test Setup

3.5.3. Test Procedures

1) The measurement procedure follows ANSI C63.26-2015, clause 5.5.2.5 and 5.5.3.
2) Pre-scan is performed to determine the general EUT radiated emissions characteristics and, when necessary, the EUT-to-measurement antenna orientation that produces the maximum emission amplitude.
3) Use the substitution method to measure the spurious emissions:
   (a) Place the EUT in the center of the turntable. The antenna of EUT shall be positioned to produces the worst-case emission at the fundamental operating frequency;
   (b) Each emission under consideration shall be evaluated:
      i) Raise and lower the measurement antenna to enable detection of the maximum emission amplitude relative to measurement antenna height.

ii) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.

iii) Return the turntable to the azimuth where the highest emission amplitude level was observed.

iv) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.

v) Record the measured emission amplitude level and frequency using the appropriate RBW.

(c) Repeat step (b) for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.

(d) Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement

(e) Connect a signal generator to the substitution antenna. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.

(f) For each emission that was detected and measured in the initial test [in step (b) and step (c)].

(g) Repeat step (f) with the measurement antenna oriented in the opposite polarization.

(h) Calculate the emission power in dBm referenced to a half-wave dipole using the following equation: Pe = Ps(dBm) − cable loss (dB) + antenna gain (dBd)

where

Pe = equivalent emission power in dBm

Ps = source (signal generator) power in dBm

(i) Correct the antenna gain of the substitution antenna if necessary, to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from: gain (dBd) = gain (dBi) − 2.15 dB. If necessary, the antenna gain can be calculated from calibrated antenna factor information

3.5.4. Test Result

Test Engineer	Chen Rui	**Test Date**	2021/09/29
Temperature	25.6°C	**Relative Humidity**	44.7%
Pressure	104.1kPa	**Test Sample Selected**	No.1

Frequency (MHz)	Generator Level (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
1638.000000	-74.47	1.43	9.5	-66.40	-13.00	53.40	200.0	H	339.0
2458.000000	-69.98	1.23	10.28	-60.93	-13.00	47.93	300.0	V	89.0
3276.000000	-65.69	1.92	11.44	-56.17	-13.00	43.17	100.0	H	98.0
4763.000000	-70.44	1.81	12.59	-59.66	-13.00	46.66	100.0	V	1.0
6464.857143	-68.06	2.02	12.01	-58.07	-13.00	45.07	200.0	V	328.0
8650.571429	-61.43	2.35	10.79	-52.99	-13.00	39.99	100.0	V	308.0

Test Engineer	Chen Rui	**Test Date**	2021/09/29
Temperature	25.6°C	**Relative Humidity**	44.7%
Pressure	104.1kPa	**Test Sample Selected**	No.2

Frequency (MHz)	Generator Level (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
1638.000000	-73.27	1.43	9.50	-65.20	-13	52.20	300	H	326
2458.000000	-69.00	1.23	10.28	-59.95	-13	46.95	200	V	97
3276.000000	-66.75	1.92	11.44	-57.23	-13	44.23	200	V	83
4763.000000	-70.80	1.81	12.59	-60.02	-13	47.02	100	V	26
6464.857143	-67.57	2.02	12.01	-57.58	-13	44.58	100	H	198
8650.571429	-61.64	2.35	10.79	-53.20	-13	40.20	200	V	311

3.5.5. Uncertainty

Frequency (MHz)	U_{lab}	k
Below 1GHz	3.24	2
1GHz - 18GHz	3.40	2

4 Test Instruments

Description	Model Name	S/N	Manufacturer	Next Cal Date
EMI Test Receiver	ESR26	101320	R&S	2022/01/11
Hybrid antenna	VULB9163	01266	SCHWARZBECK	2022/07/03
Hybrid antenna	VULB9163	01292	SCHWARZBECK	2022/07/03
Pre-Amplifier	PE15A1009	V00140120181115 E852	Pasternack Enterprises	2022/01/11
Pre-amplifier	TAP-011858	AP19L806047	TONSCEND	2022/04/06
Double Ridged Broadband Horn Antenna	BBHA 9120D	1276	SCHWARZBECK	2022/04/06
Double-Ridged Waveguide Horn Antenna	HF907	100096	R&S	2022/04/06
Signal Generator	E8257D	MY46520023	Agilent	2023/01/11
Digital display temperature and humidity recorder	TM320	015080	DICKSON	2022/05/11
Aneroid barometer	DYM3	00868	Shanghai Boji	2022/05/05

--- End of Test Report ---