TEST REPORT
EN62311:2008

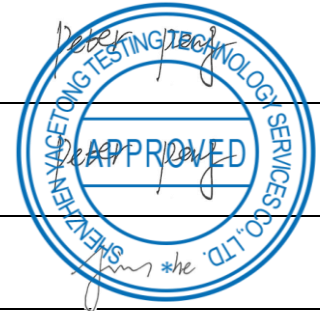|	
Report Reference No......................:	ATT2020SZ061005E1
Compiled by (position+printed name+signature)..:	File administrators Peter peng
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Date of issue.....................................:	June.03, 2020

Testing Laboratory Name ....:	**Shenzhen Yacetong Testing Technology Services Co., Ltd.**
Address ....:	Room 5009 Baode Industry Center,Baode Industry Center,Lixin South Road,Huaide Community Fuyong Baoan District,Shenzhen,China

Applicant's name............................:	**SHENZHEN ITOONER TECHNOLOGY CO., LTD**
Address ....:	Building 2&Building 3(The 3rd and 4th Floor) GangZai Road, Shangxing Community,Xinqiao Street,Baoan District, Shenzhen, Guangdong, China

Test specification ....:	
Standard ....:	**EN62311:2008**

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Test item description ....:	AP
Trade Mark ....:	N/A
Manufacturer ....:	**SHENZHEN ITOONER TECHNOLOGY CO., LTD**
Model/Type reference.......................:	GNT-AP290
List Model ....:	GNT-AP280,GNT -AP270,GNT-AP260,GNT-AP690,GNT-AP535,GNT-AP520,GNT-XP502GE,GNT-XP401GE
Ratings ....:	DC 12V From Adapter
Result..:	**PASS**

T E S T   R E P O R T

Test Report No. :	ATT2020SZ061005E1	Jun.03, 2020
		Date of issue

Equipment under Test	:	AP
Model /Type	:	GNT-AP290
Listed Models	:	GNT-AP280, GNT-AP270,GNT-AP260,GNT-AP690,GNT-AP535
		,GNT-AP520,GNT-XP502GE,GNT-XP401GE
Applicant	:	**SHENZHEN ITOONER TECHNOLOGY CO., LTD**
Address	:	Building 2&Building 3(The 3rd and 4th Floor) GangZai Road, Shangxing Community,Xinqiao Street,Baoan District, Shenzhen, Guangdong, China
Manufacturer	:	**SHENZHEN ITOONER TECHNOLOGY CO., LTD**
Address	:	Building 2&Building 3(The 3rd and 4th Floor) GangZai Road, Shangxing Community,Xinqiao Street,Baoan District, Shenzhen, Guangdong, China

Test Result	PASS

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.

Contents

1 . S U M M A R Y

Date of receipt of test sample	:	May.25, 2020
Testing commenced on	:	May.25, 2020
Testing concluded on	:	Jun.03, 2020

1.1. Product Description

Product Name:	AP
Trade Mark:	N/A
Model/Type reference:	GNT-AP290
List Model:	GNT-AP280, GNT-AP270,GNT-AP260,GNT-AP690,GNT-AP535, GNT-AP520,GNT-XP502GE,GNT-XP401GE
Power supply:	DC 12V From Adapter
Auxiliary testing adapter information (Supplied by Test Lab）：	Model: XH1200-1500LG Input: AC 100-240V～50/60Hz 0.5A Output:DC 12V 1.5A
2.4GWIFI	
WLAN	Supported 802.11b/802.11g/802.11n HT20
WLAN CE Operation frequency	IEEE 802.11b:2412-2472MHz IEEE 802.11g:2412-2472MHz IEEE 802.11n HT20:2412-2472MHz
WLAN CE Modulation Type	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)
Channel number:	13
Channel separation:	5MHz
5G WIFI	
Operation frequency	802.11a/n/ac (20MHz): 5180~5825MHz 802.11n/ac(40MHz):5190~5795MHz 802.11ac(HT80):5210~5775MHz
Modulation Type	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM
Operation frequency	5745MHz-5825MHz
Modulation Type	OFDM(64QAM, 16QAM, QPSK, BPSK)
Remark: The products are identical in interior structure, electrical circuits and components, just model names are different.	

1.2. Equipment under Test

Power supply system utilised

Power supply voltage	:	◯ 230V / 50 Hz	◯ 115V / 60Hz
		◯ 12 V DC	◯ 24 V DC
		● Other (specified in blank below)	

DC 12V From Adapter AC 230V/50Hz

1.3. EUT operation mode

The EUT and test equipment were configured for testing While transmitting

2. <u>T E S T   E N V I R O N M E N T</u>

2.1. Address of the test laboratory

Shenzhen Yacetong Testing Technology Services Co., Ltd..
Room 5009 Baode Industry Center,Baode Industry Center,Lixin South Road,Huaide Community
Fuyong Baoan District,Shenzhen,China

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

2.3. Statement of the 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 compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Yacetong Testing Technology Services 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.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3． Method of measurement

3.1. Applicable Standard

EN62311: Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz) Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0Hz to 300GHz) (Official Journal L 197 of 30 July 1999).

3.2. Limit

Basic restriction for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	Magnetic flux density (mT)	Current density (mA/m^2)	Whole body average SAR(W/kg)	Localised SAR (head and trunk)(W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m^2)
0Hz	40	--	--	--	--	--
>0-1Hz	--	8	--	--	--	--
1-4Hz	--	8/f	--	--	--	--
4-1000Hz	--	2	--	--	--	--
1000Hz-100khz	--	f/500	--	--	--	--
100khz-10Mhz	--	f/500	0.08	2	4	--
10Mhz-10Ghz	--	--	0.08	2	4	--
10-300Ghz	--	--	--	--	--	10

Notes:
1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1cm2 perpendicular to the current direction.
4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by $\sqrt{2}$(=1.414). For pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated as=1/ (2t_p)
5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservation values relative to the exposure guidelines.
8. For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as=1/(2t_p). Additionally, for pulsed exposures, in the frequency range 0,3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that SA should not exceed 2mJ kg-1 averaged over 10g of tissue.

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (uT)	Equivalent plane wave power density $S_{eq}(W/m^2)$
0-1Hz	--	$3.2{\times}10^4$	$4{\times}10^4$	--
1-8Hz	10000	$3.2{\times}10^4/f^2$	$4{\times}10^4/f^2$	--
8-25Hz	10000	4000/f	5000/f	--
0.025-0.8KHz	250/f	4/f	5/f	--
0.8-3KHz	250/f	5	6.25	--
3-150KHz	87	5	6.25	--
0.15-1MHz	87	0.73/f	0.92/f	--
1-10MHz	$87/f^{1/2}$	0.73/f	0.92/f	--
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$0.0046f^{1/2}$	f/200
2-300GHz	61	0.16	0.20	10

Notes: 1. As indicated in the frequency range column.

2. For frequencies between 100kHz and 10GHz, S_{eq}, E^2, H^2 and B^2 are to be averaged over any six-minute period.

3. For frequencies exceeding 10GHz, S_{eq}, E^2, H^2 and B^2 are to be averaged over any $68/f^{1.05}$-minute period (.in GHz).

4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

Occupational Exposure limit and action values for relectromahnetic fields

Exposure limit values(Article3(1)).All conditions to be satisfied

Frequency range	Current density for head and trunk J (mA/m^2) (rms)	Whole body average SAR(W/kg)	Localised SAR (head and trunk)(W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m^2)
Up to 1Hz	40	--	--	--	--
1-4Hz	40/f	--	--	--	--
4-1000Hz	10	--	--	--	--
1000Hz-100kHz	f/100	--	--	--	--
100kHz-10MHz	f/100	0.4	10	20	--
10MHz-10GHz	--	0.4	10	20	--
10-300GHz	--	--	--	--	50

Notes:

1. f is the frequency in Hz.

2. The exposure limit values on the current density are intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body.The exposure limit values in the frequency range 1Hz to 10MHz are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the exposure limit values for exposure of short duration. However, since the exposure limit values refer to adverse effects on the central nervous system, these exposure limit values may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.

3. Because of the electrical in homogeneity of the body,current densities should be calculated as averages over across-section of $1cm^2$ perpendicular to the current direction.

4. For frequencies up to 100kHz,peak current density values can be obtained by multiplying the rms value by $(2)^{1/2}$.

5. For frequencies up to 100kHz and for pulsed magneticfields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density.The induced current density can then be compared with the appropriate exposure limit value. For pulses of duration t_p, the equivalent frequency to apply for the exposure limit values should be calculated as $f=1/(2t_p)$.

6. All SAR values are to be averaged over any six-minute period.

7. Localised SAR averaging massis any 10 g of contiguous tissue; the maximum SAR so obtained should be the value used for estimating exposure. These 10 g of tissue are intended to be a mass of contiguous tissue

with nearly homo-geneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can beused in computational dosimetry but may present difficulties for direct physical measurements. As implegeometry such as cubict issue mass can be used providedth at the calculated dosimetric quantities have conservative values relative to the exposure guidelines.

8. For pulsed exposures in the frequency range 0.3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion,an additional exposure limit value is recommended.This is that the SA should not exceed10mJ/kg averaged over 10g of tissue.

9. Power densities are to be averaged over any $20cm^2$ of exposed area and any $68/f^{1.05}$-minute period (where f is in GHz) to compensate for progressively shorter penetration depth as the frequency increases.Spatial maximum power densities averaged over $1cm^2$ should not exceed 20 times the value of $50W/m^2$.

10. With regard to pulsed or transient electromagnetic fields,or generally with regard to simultaneous exposure to multiple frequency fields,appropriate methods of assessment,measurement and/or calculation capable of analysing the characteristics of the waveforms and nature of biological interactions have to be applied,taking account of European harmonised standards developed by Cenelec.

The action values referred to in Table are obtained from the exposure limit values according to the rationale used by the International Commission on Non-ionising Radiation Protection(ICNIRP) in its guidelines on limiting exposure to non-ionising radiation(ICNIRP7/99).

Action values (Article3(2))(unperturbed rms values)

Frequency range	Electric field strength, E(V/m)	Magnetic field strength, H(A/m)	Magnetic field strength, H(A/m)	Equivalent plane wave power density, $S_{eq}(W/m^2)$	Contact current, I_C(mA)	Limb induced current, I_L(mA)
0-1Hz	-	1.63×10^5	2×10^5	-	1.0	-
1-8Hz	20000	$1.63 \times 10^5/f^2$	$2 \times 10^5/f^2$	-	1.0	-
8-25Hz	20000	$2 \times 10^4/f$	$2.5 \times 10^4/f$	-	1.0	-
0.025-0.82kHz	50/f	20/f	25/f	-	1.0	-
0.82-2.5kHz	500/f	24.4	30.7	-	1.0	-
2.5-65kHz	610	24.4	30.7	-	0.4f	-
65-100kHz	610	1600/f	2000/f	-	0.4f	-
0.1-1MHz	610	1.6/f	2/f	-	40	-
1-10MHz	610/f	1.6/f	2/f	-	40	-
10-110MHz	61	0.16	0.2	10	40	100
110-400MHz	61	0.16	0.2	10	-	-
400-2000MHz	$3f^{1/2}$	$0.008f^{1/2}$	$0.01f^{1/2}$	f/40	-	-
2-300GHz	137	0.36	0.45	50	-	-

Notes: 1. As indicated in the frequency range column.

　　　2. For frequencies between100kHz and 10GHz,S_{eq},E,H,Band I_L are to be averaged over any six-minute period.

　　　3. For frequencies exceeding 10GHz, S_{eq},E,H and Bare to be averaged over any $68/f^{1.05}$-minute period(f in GHz)..

　　　4. For frequencies up to 100kHz,peak action values for the field strength scan be obtained by multiplying the rms value by $(2)^{1/2}$. For pulses of duration t_p,the equivalent frequency to apply for the action values should be calculated as $f=1/(2t_p)$.

For frequencies between 100kHz and 10MHz,peak action values for the field strengths are calculated by multi-plying the relevant rms values by 10,where a=(0.665log(f/10)+0.176),finHz.

For frequencies between 10MHz and 300GHz, peak action values are calculated by multiplying the corresponding rms values by 32 for the field strengths and by 1000 for the equivalent planewave power density.

　　　5. With regard to pulsed or transient electromagnetic fields,or generally with regard to simultaneous exposure to multiple frequency fields, appropriate methods of assessment, measurement and/or calculation capable of analysing the characteristics of the waveforms and nature of biologica linter actions have to be applied, taking account of harmonised European standards developed by Cenelec.

　　　6. For peak values of pulsed modulated electromagnetic fields, it is also suggested that, for carrier frequencies exceeding 10MHz, S_{eq} as averaged over the pulse width should not exceed 1000 times the S_{eq} action values or that the field strength should not exceed 32 times the field strength action values for the carrier frequency.

3.3. EMF Assessment Method

Predication of MPE limit at a given distance
Equation from page 51 of EN50383, Edition 2002

$$E= \frac{\sqrt{30PG}}{r}$$

Where: E= E-field strength (V/m)
P=power input to antenna(Watt)
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
r=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, as well as the gain of the used antenna is that 2.4GWIFIGain :0.0dBi, 5.2G-5.7G WIFIGain :3.0dBi, 5.8GWIFIGain :0.0dBi, the RF power density can be obtained.

4. Test Result

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (W)	Antenna Gain (Nemeric)	E-field Strength Limit (V/m)	E-field Strength At 20cm (V/m)
2.4G	20.00	15.13	0.03258	1.995	61	6.98
5G Band 1，Band 2, Band 3	20.00	20.26	0.10617	1.995	61	12.60
5G Band 4	20.00	12.21	0.01663	1.995	61	4.99

5. Conclusion

The measurement results comply with the relevant limits for gerenal exposure specified as reference levels in the Council Recommendation 1999/5/EC.

......................End of Report.......................