

TEST REPORT

EN IEC 62311:2020

 Report Reference No..... : **RLT2307021-07R1**

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Applicant's name.....: Shenzhen Mingshun Technology Co., Ltd.

Address.....: B1015G5, Zhongshen Garden, No. 2010 Caitian Road, Fushan Community, Futian Street, Futian District, Shenzhen

Test specification.....:

 Standard.....: **EN IEC 62311:2020**
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Test item description.....: Camera

Trade Mark.....: N/A

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

Model/Type reference.....: E27

List Model.....: E27-3、E27-AP、V8、Q7、Q7S、Q5、Q8、Q10Y、Q12、K6、X5、M6、M8、M18、M88、M68

Ratings.....: DC5V , Class III

Result.....: PASS

The test report merely corresponds to the test sample.

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

TEST REPORT

Equipment under Test : Camera

Model /Type : E27

Listed Models : E27-3、E27-AP、V8、Q7、Q7S、Q5、Q8、Q10Y、
Q12、K6、X5、M6、M8、M18、M88、M68

Applicant : N/A

Address : Shenzhen Mingshun Technology Co., Ltd.

Manufacturer : B1015G5, Zhongshen Garden, No. 2010 Caitian Road, FushanCommunity, Futian Street, Futian District, Shenzhen

Address : Shenzhen Mingshun Technology Co., Ltd.

B1015G5, Zhongshen Garden, No. 2010 Caitian Road, FushanCommunity, Futian Street, Futian District, Shenzhen

Test Result:	PASS
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1. GENERAL INFORMATION

1.1. Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 KPa

1.2. Product Description

Product Name:	Camera			
Model:	E27			
Serial Model:	E27-3、E27-AP、V8、Q7、Q7S、Q5、Q8、Q10Y、Q12、K6、X5、M6、M8、M18、M88、M68			
Model Difference:	N/A			
Trade Mark:	N/A			
WIFI 5G:	N/A			
Frequency range:	WIFI: 2.412GHz-2.484GHz			
Modulation Type:	802.11b:CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n:OFDM			
WIFI 5.8G	/			
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	802.11a 802.11n 802.11ac	802.11n 802.11ac	802.11ac	N/A
Operation frequency:	5745MHz- 5825MHz	5755MHz, 5795MHz	5775MHz	N/A
Power Supply:	DC5V , Class III			

2. METHOD OF MEASUREMENT

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 Aug 1999 on the limitation of exposure of the general public to electromagnetic fields (0Hz to 300GHz) (Official Journal L 197 of 30 Aug 1999).

Limit

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 Seq(W/m ²)
0-1Hz	--	3.2×10^4	4×10^4	--
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. 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 t_p 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	--	3.2×10^4	4×10^4	--
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 1cm² 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 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 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 mass is 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 be used in computational dosimetry but may present difficulties for direct physical measurements. As imple geometry such as cubical tissue mass can be used provided that 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 exceed 10mJ/kg averaged over 10g of tissue.

9. Power densities are to be averaged over any 20cm² 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 1cm² should not exceed 20 times the value of 50W/m².

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 (Article 3(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 between 100kHz and 10GHz, S_{eq} , E, H, and I_L are to be averaged over any six-minute period.

3. For frequencies exceeding 10GHz, S_{eq} , E, H and I_L are 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 can 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 multiplying the relevant rms values by 10, where $a = (0.665 \log(f/10) + 0.176)$, f in Hz.

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 biological interactions 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.

EMF Assessment Method

Prediction 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 source-based 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, $r = 20\text{cm}$, as well as the gain of the used antenna is that Gain: 0.00dBi, the RF power density can be obtained.

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 WIFI	20.00	12.61	0.01824	1	61	3.70
WIFI 5G	20.00	10.97	0.01250	1	61	3.62
WIFI 5.8G	20.00	9.17	0.00826	1	61	2.49

Conclusion

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

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