



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053

Fax: +86 (0) 755 2671 0594

Email: ee.shenzhen@sgs.com

Report No.: SZEM180400262004

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SAR Evaluation Report

Application No.: SZEM1804002620CR
Applicant: Creative Labs Pte. Ltd.
Address of Applicant: 31 International Business Park #03-01 CREATIVE RESOURCE SINGAPORE 609921
Manufacturer: Creative Labs Pte. Ltd.
Address of Manufacturer: 31 International Business Park #03-01 CREATIVE RESOURCE SINGAPORE 609921
Equipment Under Test (EUT):
EUT Name: CREATIVE NOVA
Model No.: MF8285
Trade mark: CREATIVE
FCC ID: 2AJIV-MF8285
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2018-04-10
Date of Test: 2018-04-10 to 2018-04-16
Date of Issue: 2018-05-07

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu
EMC Laboratory Manager



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-05-07		Original

Authorized for issue by:				
				
		<hr/>		
		Vincent Chen /Project Engineer		
				
		<hr/>		
		Eric Fu /Reviewer		



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4 General Information

4.1 General Description of EUT

Power supply:	Powered by Lithium-ion-battery: DC 14.8V, 2200mAh From Adapter model FJ-SW1802000N Input: AC 100-240V, 50/60Hz, 1.5A; Output: DC 18V, 2000mA
For BT:	
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	4.2 Single mode
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Antenna Type:	PCB Trace Antenna
Antenna Gain	-3.66dBi
For 2.4G wifi:	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	802.11b/g/n(HT20):11
Channel Separation:	5MHz
Type of Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n(HT20): OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	Flex PCB Antenna
Antenna Gain	Antenna 1: -0.5dBi; Antenna 2: -1.69dBi Two antennas can synchronous transmission.



4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

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

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.



5.1.2 Limits

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

1) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f_{\text{MHz}}/150)]\}$ mW, for 100 MHz to 1500 MHz

2) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}/x]$ W/kg, for *test separation distances* ≤ 50 mm;

where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distance* is > 50 mm.

When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.



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SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and > 50 mm

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	mm
100	474	481	487	494	501	507	514	521	527	534	541	547	554	561	567	mW
150	387	397	407	417	427	437	447	457	467	477	487	497	507	517	527	
300	274	294	314	334	354	374	394	414	434	454	474	494	514	534	554	
450	224	254	284	314	344	374	404	434	464	494	524	554	584	614	644	
835	164	220	275	331	387	442	498	554	609	665	721	776	832	888	943	
900	158	218	278	338	398	458	518	578	638	698	758	818	878	938	998	
1500	122	222	322	422	522	622	722	822	922	1022	1122	1222	1322	1422	1522	
1900	109	209	309	409	509	609	709	809	909	1009	1109	1209	1309	1409	1509	
2450	96	196	296	396	496	596	696	796	896	996	1096	1196	1296	1396	1496	
3600	79	179	279	379	479	579	679	779	879	979	1079	1179	1279	1379	1479	
5200	66	166	266	366	466	566	666	766	866	966	1066	1166	1266	1366	1466	
5400	65	165	265	365	465	565	665	765	865	965	1065	1165	1265	1365	1465	
5800	62	162	262	362	462	562	662	762	862	962	1062	1162	1262	1362	1462	

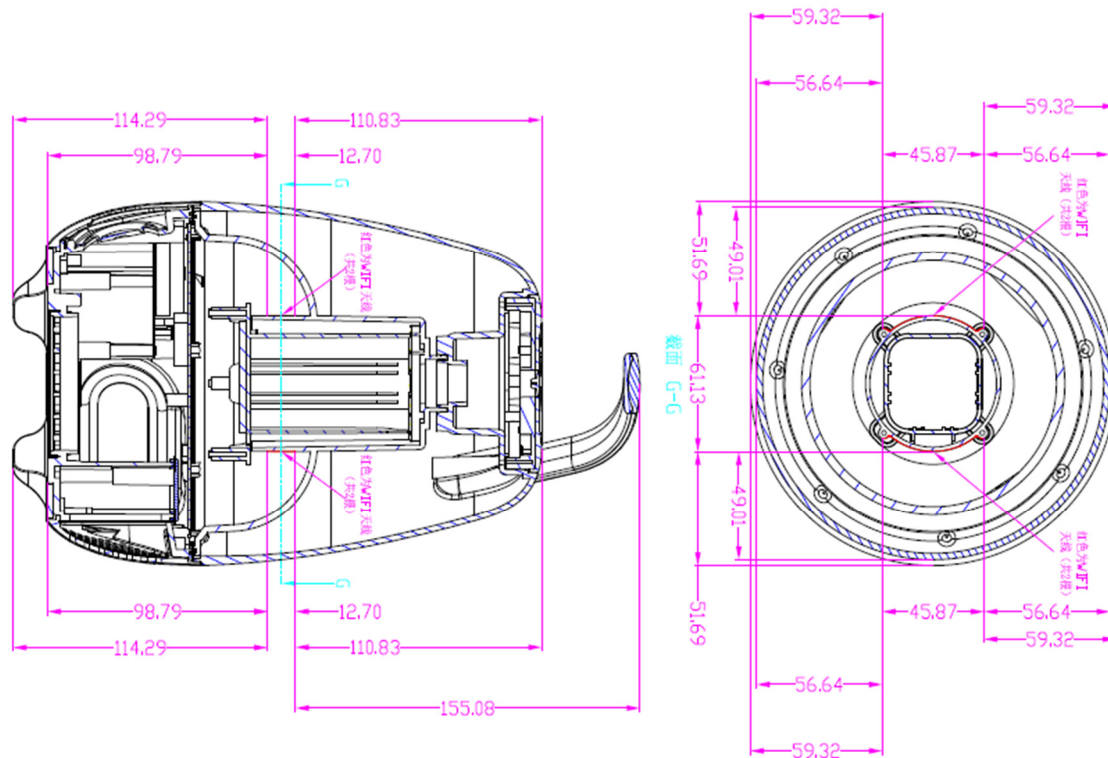


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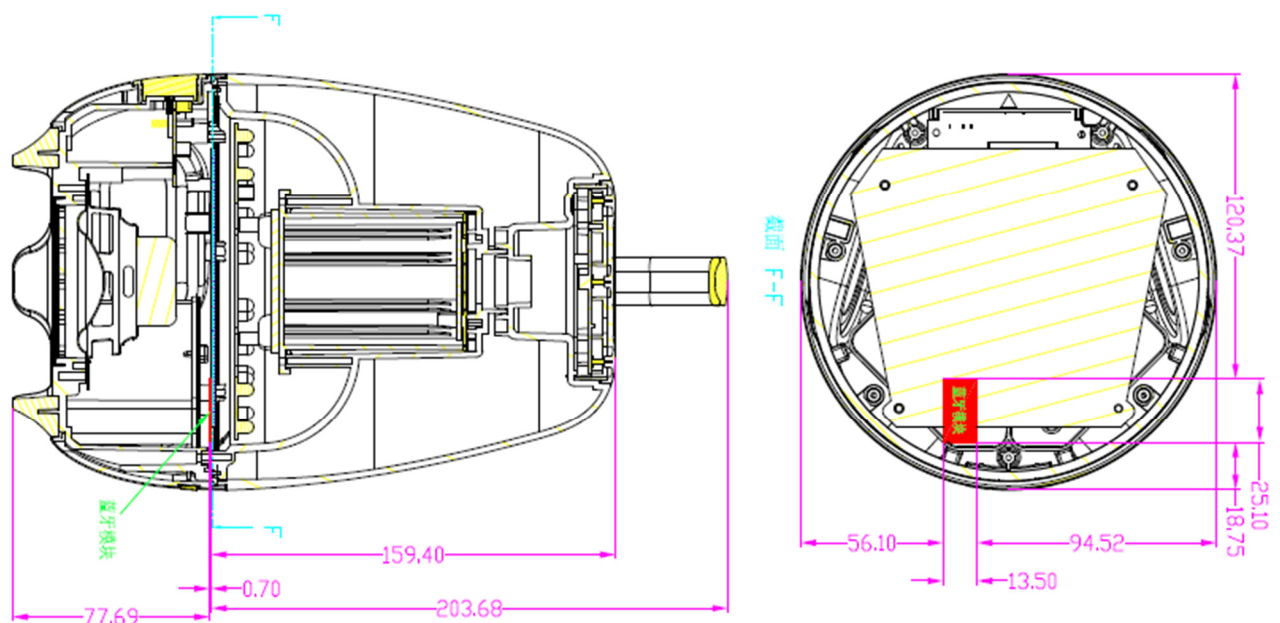
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Test separation distances as below(Wifi):



According to the $\{[Power\ allowed\ at\ numeric\ threshold\ for\ 50\ mm\ in\ step\ a)] + [(test\ separation\ distance - 50\ mm) \cdot 10]\}$ mW is 112.9mW.

Test separation distances as below(Bluetooth):





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SAR test exclusion for standalone mode:

For 2.4G WIFI

Antenna 1: -0.5dBi; Antenna 2: -1.69dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.89 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm) (including tune-up tolerance)	Output Power to Antenna (mW)	Limit(mW)	Result
Lowest	1	2412MHz	19.71	93.54	112.9	PASS

Note: Refer to report No. SZEM180400262003 for EUT test Max Conducted Peak Output Power value. so the Average power is less than 112.9mW too.

For BT

Antenna: -3.66dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.43 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

The Max Conducted Peak Output Power is	-2.55 dBm on the lowest channel	2.402	GHz
-2.55 dBm logarithmic terms convert to numeric result is nearly 0.56 mW			
According to the formula. calculate the test exclusion thresholds:			
[(max. power of channel, including tune-up tolerance, mW)/			
(min. test separation distance, mm)] · [√f(GHz)]			
General RF Exposure = (0.56 mW / 5 mm) x √2.402 GHz = 0.17			
SAR requirement:			
S = 3.0			
(1) < (2)			
So the SAR report is not required.			

Note: Refer to report No. SZEM180400262002 for EUT test Max Conducted Peak Output Power value.



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SAR test exclusion for simultaneously transmitting mode:

For 2.4G WIFI

Because the min test separation distance is $>50\text{mm}$, so the SAR values is 0.4 W/kg .

For BT

Because the min test separation distance is $\leq 50\text{mm}$, so the SAR values is $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}/x}] \text{ W/kg} = (0.56/5) \cdot (\sqrt{2.402/7.5}) \text{ W/kg} = 0.023\text{W/kg}$.

Exposure conditions for simultaneous transmission operations

Simultaneous transmission SAR test is not required, because the sum of estimated SAR for BT and WIFI is $(0.023+0.4)\text{W/kg}=0.423\text{W/kg} < 1.6\text{ W/kg}$.

- End of the Report -