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

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SAR Evaluation Report

Application No.:	SZEM1611010036CR
Applicant:	Creative Labs Inc.
Manufacturer:	Creative Labs Pte. Ltd.
Product Name:	SOUND BLASTER ROAR CLASSIC LITE
Model No.(EUT):	MF8172
Trade Mark:	Creative
FCC ID:	IBAMF8170
Standards:	47 CFR Part 1.1307 (2015)
	47 CFR Part 2.1093 (2015)
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2016-11-25
Date of Test:	2016-11-29 to 2016-12-14
Date of Issue:	2016-12-14
Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jack Zhang
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.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2016-12-14*		*Original*

Authorized for issue by:				
Tested By		Benson Wang **(Benson Wang) /Project Engineer**		2016-12-14 **Date**
Checked By		Eric Fu **(Eric Fu) /Reviewer**		2016-12-14 **Date**

3 Contents

4 General Information

4.1 Client Information

Applicant:	Creative Labs Inc
Address of Applicant:	1901 McCarthy Blvd, Milpitas, California, United States
Manufacturer:	Creative Labs Pte. Ltd.
Address of Manufacturer:	31, International Business Park, #03-01 Creative Resource, Singapore 609921

4.2 General Description of EUT

Product Name:	SOUND BLASTER ROAR CLASSIC LITE
Model No.:	MF8172
Trade Mark:	Creative
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V3.0
Test Software of EUT:	Blue Test 3
Test Power Grade:	255, 46 (manufacturer declare)
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	4.11dBi
Power Supply	Battery Model No.:BJ-ACEXX-3KXKUX-01 Li-ion Battery: DC 7.56V 2950mAh 22.3Wh (Charge by adatper) Adapter Model:FJ-SW1501600N INPUT: AC100-240V 50/60Hz 0.6A Max OUTPUT: DC15V 1600mA
Test Voltage	AC 120V 60Hz

Remark:

Model No.: MF8172

This test report (Ref. No.: SZEM1312006497010) is only valid with the original test report (Ref. No.: SZEM131200649702, SZEM131200649704, SZEM131200649706 and SZEM131200649708).

Review this report and original report, the major change filed under this application is:
1. Add Model No: MF8172, Product Name: SOUND BLASTER ROAR CLASSIC LITE
2. SOUND BLASTER ROAR CLASSIC LITE is a derivative model of CREATIVE SOUND BLASTER ROAR PRO with changes in product features. No other electrical differences other than those stated below. Mechanical design and construction are identical for both models.

	BEFORE	AFTER
Model No.	MF8171	MF8172
Product Name	SOUND BLASTER ROAR PRO	SOUND BLASTER ROAR CLASSIC LITE
Function / Feature	- Speaker - NFC - Aux in - Bluetooth - micro SD card slot - MP3 player - USB Audio - USB external smart phone charging	- Speaker - NFC - Aux in - Bluetooth
Input rating	15VDC 1.6A	15VDC 1.2A
Original Power Adapter	Model: GPE024W-150160-Z Input: 100-240Vac 50/60Hz 0.75A, Output: 15Vdc 1.6A	N/A
Alternate Power Adapter	Model: FJ-SW1501600N Input: 100-240Vac 50/60Hz 0.6A, Output: 15Vdc 1.6A	Model: FJ-SW1501600N Input: 100-240Vac 50/60Hz 0.6A, Output: 15Vdc 1.6A
Multifunction Button, Volume up/down, ROAR Button, Power ON/Standby	MS2160A	MS2160A

Board		
Main Board	MS2160B	MS2166B * For detail, pls refer to appendix
NFC Board	MS2160D	MS2160D
MP3 key board	MS2160E	Deleted

Review the SZEM131200649708 and original report, the major change filed under this application is:

1.Add alternate power adapter model FJ-SW1501600N.

	Before	After
Adapter	Model:GPE024W-150160-Z INPUT: AC 100-240V 50/60Hz 0.75A OUTPUT: DC 15V 1600mA 24W	Model:GPE024W-150160-Z INPUT: AC 100-240V 50/60Hz 0.75A OUTPUT: DC 15V 1600mA 24W
		Model: FJ-SW1501600N Input: 100-240V, 50/60Hz 0.6A Max output: DC 15V,1600mA

Review SZEM131200649706 and original report, the major change filed under this application is:

3. Add Model No: MF8171, Product Name CREATIVE SOUND BLASTER ROAR PRO.
4. CREATIVE SOUND BLASTER ROAR PRO is a derivative model of CREATIVE SOUND BLASTER ROAR SR20A with changes in product features, antenna gain and adapter. No other electrical differences other than those stated below. Mechanical design and construction are identical for both models.

	BEFORE	AFTER
Model No	1. MF8170	1. MF8170 2. MF8171
Product Name	SOUND BLASTER ROAR SR20, SOUND BLASTER ROAR SR20A	SOUND BLASTER ROAR SR20 (Model No: MF8170) SOUND BLASTER ROAR SR20A (Model No: MF8170) SOUND BLASTER ROAR PRO (Model No: MF8171)
Antenna Gain	0.25 dBi	No change for SOUND BLASTER ROAR SR20 and SOUND BLASTER ROAR SR20A.

<table>
<tr><td></td><td></td><td>SOUND BLASTER ROAR PRO: 4.11 dBi</td></tr>
<tr><td>Main Board</td><td>MS2160B
REV A (0514116)</td><td>No change for SOUND BLASTER ROAR SR20 and SOUND BLASTER ROAR SR20A.

SOUND BLASTER ROAR PRO:
MS2160B Rev A (081520) & MS2165B Rev 1P (001521): Add C334 (10PF), C335 (10PF), C336 (10PF), C337 (10PF), C339 (10PF)
Change: R162 (12K to 100R), R203 (12K to 100R), R142 (22K to 15K), R143 (22K to 15K), R219 (10K to 12K), R116 (330K to 300K)
Remove: R92 (10K), R93 (10K), C72 (820PF), C77 (820PF).

<table>
<tr><td>Version</td><td>Old Volume IC</td><td>New Volume IC</td></tr>
<tr><td>Main board</td><td>MS2160B
Rev A (081520)</td><td>MS2165B
Rev 1P (001521)</td></tr>
<tr><td>Volume IC</td><td>MP61545 (U17)</td><td>NJU72431 (U4)</td></tr>
<tr><td>R214</td><td>Not Mounted</td><td>4K7</td></tr>
<tr><td>C313</td><td>Not Mounted</td><td>10UF</td></tr>
<tr><td>R324</td><td>Not Mounted</td><td>10K</td></tr>
</table>
</td></tr>
<tr><td>Mp3 Key Board</td><td>SOUND BLASTER ROAR SR20:
MS2160E, REV A (031404)

SOUND BLASTER ROAR SR20A:
MS2160E, REV A (041422)</td><td>No change for SOUND BLASTER ROAR SR20 and SOUND BLASTER ROAR SR20A.

SOUND BLASTER ROAR PRO: MS2165E, REV A (011520).</td></tr>
<tr><td>Product Feature</td><td>SOUND BLASTER ROAR SR20:
Loud Sounds

SOUND BLASTER ROAR SR20A:
Remove Loud Sounds. Add Link Security and Tera Bass.</td><td>No change for SOUND BLASTER ROAR SR20 and SOUND BLASTER ROAR SR20A.

SOUND BLASTER ROAR PRO:
Remove Link Security. Add EQ – Warm / Neutral / Energetic.</td></tr>
</table>

Additionally, just updated the below standards.

Original report standards	The newest report standards
47 CFR Part 1.1307(2013)	47 CFR Part 1.1307 (2015)
47 CFR Part 2.1093 (2013)	47 CFR Part 2.1093 (2015)
KDB447498D01 General RF Exposure Guidance v05	KDB447498D01 General RF Exposure Guidance v06
KDB447498D01 General RF Exposure Guidance v05r02	

4.3 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.

4.4 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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

• **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.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

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

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation[17]
The result is rounded to one decimal place for comparison

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 is applied to determine SAR test exclusion

5.1.3 EUT RF Exposure

The Max Conducted Peak Output Power is -1.13dBm in middle channel(2.441GHz);

The best case gain of the antenna is 4.11dBi.

EIRP= -1.13dBm + 4.11dBi = 2.98dBm

2.98dBm logarithmic terms convert to numeric result is nearly 1.986mW

According to the formula. calculate the EIRP test result:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)]

General RF Exposure = (1.986mW / 5 mm) x √2.441GHz = 0.62①

SAR requirement:

S= 3.0 ② ;

① < ②.

So the SAR report is not required.