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RF Exposure Evaluation Report

Report No. : CQASZ20200200098E-02
Applicant: Stillwater Designs & Audio ,Inc
Address of Applicant: 3100 N Husband Street, Stillwater OK 74075 United States of America
Equipment Under Test (EUT):
EUT Name: Marine Audio
Model No.: KMC2, KMC3
Test Model No.: KMC2
Brand Name: KICKER
FCC ID: RGR-46KMC2
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-03-02
Date of Test: 2020-03-02 to 2020-03-26
Date of Issue: 2020-03-26
Test Result : **PASS***

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

Tested By:

Tom Chen

(Tom Chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200200098E-02	Rev.01	Initial report	2020-03-26

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3 General Information

3.1 Client Information

Applicant:	Stillwater Designs & Audio ,Inc
Address of Applicant:	3100 N Husband Street, Stillwater OK 74075 United States of America
Manufacturer:	Eastern Partner Limited
Address of Manufacturer:	1002, 10/F, 189 Des Voeux Road, Central Hong Kong

3.2 General Description of EUT

Product Name:	Marine Audio
Model No.:	KMC2, KMC3
Test Model No.:	KMC2
Trade Mark:	KICKER
Hardware Version:	20200104 REV:06
Software Version:	20200106U2
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK
Transfer Rate:	1Mbps/2Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Test Software of EUT:	FCCAssist 2.4 (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-0.58dBi
Power Supply:	DC12V

Model No.: KMC2, KMC3

Only the model KMC2 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being appearance and model name.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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.

4.1.2 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:

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

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

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

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

4.1.3 EUT RF Exposure

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-4.930	-5.5±1	-4.5	0.355
Middle(2441MHz)	-5.310	-6.0±1	-5.0	0.316
Highest(2480MHz)	-4.600	-5.5±1	-4.5	0.355
$\pi/4$ DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-4.290	-5.0±1	-4.0	0.398
Middle(2441MHz)	-4.630	-5.5±1	-4.5	0.355
Highest(2480MHz)	-4.050	-5.0±1	-4.0	0.398

Worst case: $\pi/4$ DQPSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-4.290	-5.0±1	-4.0	0.398	0.123	3.0
Middle (2441MHz)	-4.630	-5.5±1	-4.5	0.355	0.111	
Highest (2480MHz)	-4.050	-5.0±1	-4.0	0.398	0.125	
Conclusion: the calculated value ≤ 3.0 , SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200200098E-01