




RF EXPOSURE REPORT



Report No.: 14020873-FCC-H1-V1
Supersede Report No.: N/A

Applicant	Kohler Co.	
Product Name	Kohler DTV Plus Amplifier	
Model No.	K-99696-NA	
Test Standard	FCC 2.1091	
Test Date	October 10 to October 20, 2014	
Issue Date	October 27, 2014	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification	<input checked="" type="checkbox"/>	
Equipment did not comply with the specification	<input type="checkbox"/>	
		
Deon Dai Test Engineer	Alex Liu Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:
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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

Test Report No.	14020873-FCC-H1-V1
Page	3 of 8

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CONTENTS

1	REPORT REVISION HISTORY.....	5
2	CUSTOMER INFORMATION	5
3	TEST SITE INFORMATION.....	5
4	EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5	FCC §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	7

1 Report Revision History

Report No.	Report Version	Description	Issue Date
14020873-FCC-H1-V1	NONE	Original	October 27, 2014

2 Customer information

Applicant Name	Kohler Co.
Applicant Add	444 Highland Drive Kohler, WI 53044 United Status
Manufacturer	Dayton Audio
Manufacturer Add	705 Pleasant Valley Drive Springboro, Ohio 45066

3 Test site information

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	986914
IC Test Site No.	4842B-1
Test Software	Labview of SIEMIC version 1.0

4 Equipment under Test (EUT) Information

Description of EUT:	Kohler DTV Plus Amplifier
Main Model:	K-99696-NA
Serial Model:	N/A
Date EUT received:	August 28, 2014
Test Date(s):	October 10 to October 20, 2014
Output power	-1.73dBm (0.67mW)
Antenna Gain:	4 dBi
Type of Modulation:	Bluetooth: GFSK& π /4DQPSK&8DPSK
RF Operating Frequency (ies):	Bluetooth: 2402-2480 MHz
Number of Channels:	Bluetooth: 79CH
Port:	Power Port, LAN Port, +R--L+ Port, AUDIO IN Port*2, AUDIO OUT Port
Input Power:	Adapter: Model: KSAS0452400188D5 Input Power: 100-240Vac 50/60Hz 1.2A Output Power:24Vdc 1.88A
Trade Name :	Kohler
FCC ID:	N82-KOHLER010

5 FCC §2.1091 - Maximum Permissible exposure (MPE)

Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	BT	Low	2402	-1.73	-1.0±1
		Mid	2441	-2.53	-2.0±1
		High	2480	-4.01	-3.5±1

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

BT

The maximum peak output power (turn-up power) in low channel of Bluetooth is 0 dBm

Maximum peak output power (turn-up power) at antenna input terminal: 1.00 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2402(MHz) lowest frequency

Antenna Gain (typical): 4 (dBi)

Antenna Gain (typical): 2.512 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0005(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0005 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

The maximum peak output power (turn-up power) in Middle channel of Bluetooth is -1.0 dBm

Maximum peak output power (turn-up power) at antenna input terminal: 0.79 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2441(MHz) lowest frequency

Antenna Gain (typical): 4 (dBi)

Antenna Gain (typical): 2.512 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0004(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0004 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

The maximum peak output power (turn-up power) in High channel of Bluetooth is -2.5dBm

Maximum peak output power (turn-up power) at antenna input terminal: 0.56 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2480(MHz) lowest frequency

Antenna Gain (typical): 4 (dBi)

Antenna Gain (typical): 2.512 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0003(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0003 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

Result: Pass