BEC INCORPORATED

SAR EXEMPTION REPORT

TEST STANDARDS:
FCC Part 15 Subpart C Intentional Radiator

EUT:
Legrand Model 067695
Four Scene Pocket Remote Controller

FCC ID: 2AU5D-067695

REPORT# BEC-2183-02 REV2

CUSTOMER:
Pass & Seymour/Legrand
50 Boyd Avenue
Syracuse, NY 13209

PREPARED BY: _____
Paul Banker**,** Test Engineer

REVIEWED and APPROVED BY: _____
Steve Fanella**,** Quality Manager

ACCREDITED
Testing Cert #2557.01

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Revision History

Revision #	Description of Changes	Date of Changes	Date Released
0	Test Report Initial Release	N/A	01/27/2022
1	Corrections: Add SAR Calculation Formula, corrected Maximum Conducted Output Power (Average) table	04/18/2022	04/18/2022
2	Changed "Max Output Level compared to Calculated SAR Threshold" table. Removed mW labels in columns 6 and 7. Re-labeled column 6. Rounded values in columns 7 and 8 to one decimal place. Corrected "Results" and Rev. 1 changes.	05/02/2022	05/02/2022

1.0 Administrative Information

1.1 General Information Table

Project Number	BEC-2183
Manufacturer	Legrand
Model Number	067695
EUT Radio	Zigbee
EUT Serial Number	None
EUT Sample Number	2183-03
Frequency of Operation	2405 – 2480 MHz
Antenna Gain	+ 3.3 dBi
Zigbee Radio Chip Manufacturer	Atmel
Zigbee Radio Chip Model	SAMR21E
Firmware Version	TestRadio_WNRL23.bin
FCC ID	2AU5D-067695
FCC Classification	DTS, Mobile Device
Date Samples Received	01/13/2022
Condition of Samples Received	Suitable for test
Sample Type	Production unit
EUT Description	Four Scene Pocket Remote Controller
Applicable FCC Rules	KDB 447498 D01, RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

1.2 SAR Test Exemption Threshold Separation Distance

The minimum test distance of 5 mm was used to determine the SAR Test Exemption Threshold. "RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices," KDB 447498 D01 v06, specifies the 5 mm distance in Section 4.3.1.a).

The device under test (DUT) is designed to be hand-held to actuate remote lighting controls. The plastic enclosure maintains the 5 mm separation between transmit antenna and the hand. When the device is stored in a pocket of a user's clothing, activation of the control buttons is prevented by the design of the DUT. The control buttons are recessed below a dual ridge of plastic on opposing sides.

There is no tune up tolerance associated with the EUT.

1.3 SAR Exemption Calculation

The formula, defined in Section 4.3.1 a) of KDB 447498 D01, is applied using a separation distance of 5 mm. The maximum conducted output power at each of the low, middle and high transmitter frequencies are included in the first table.

The following calculation was used to determine the 10-g SAR test exclusion threshold:

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:

[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,[30] where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation[31]
- 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.

The second table shows the calculated value SAR of each transmission frequency, based upon the above calculation. The calculated value is then compared to the for 10-g extremity SAR.

Maximum Conducted Output Power (Average)

Channel	Modulation	Frequency (MHz)	Measured Level (dBm)	Cable # 962 Loss (dB)	Total	
					dBm	Watts
11	O-QPSK	2405.0	4.49	0.47	4.96	0.0031
18		2440.0	4.43	0.47	4.90	0.0031
26		2480.0	4.35	0.47	4.82	0.0030

Max Output Level compared to Calculated SAR Threshold

Channel	Modulation	Frequency	Max Conducted Output Power (Average)		Calculated Exclusion Level	SAR 10-g Extremity Exemption Threshold
		MHz	dBm	mW		
11	O-QPSK	2405	4.96	3	0.9	7.5
18		2440	4.90	3	0.9	7.5
26		2480	4.82	3	0.9	7.5

Antenna power is the highest measured level among the low, middle and high frequencies of the Zigbee transmitter.

Results: The highest calculated exclusion level value for the Zigbee radio contained in the Legrand Model 067695 is 0.9. This complies with the exemption threshold of 7.5 from Section 4.3.1 of KDB 447498 D01.