

BEC INCORPORATED

SAR EXCLUSION CALCULATION REPORT

**TEST STANDARDS:
FCC Part 15 Subpart C Intentional Radiator
KDB 447498 D01**

**EUT:
Legrand Model WNAL33 Adorne Wireless Home/Away Scene Controller
Switch with Netatmo and Legrand Model WNAL43 Adorne Wireless
Wake/Sleep Scene Controller Switch with Netatmo**

FCC ID: 2AU5D-AHAW5

REPORT#: BEC-2141-03

**CUSTOMER:
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Syracuse, NY 13209**

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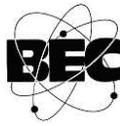


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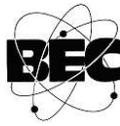
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Revision History

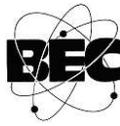
Revision #	Description of Changes	Date of Changes	Date Released
0	Test Report Initial Release	N/A	05/25/2021



1.0 Administrative Information

1.1 General Information Table

Project Number	BEC-2141
Manufacturer	Legrand
Model Numbers	WNAL33 and WNAL43
EUT Radios	Zigbee
EUT Serial Number	None
EUT Sample Number	2141-01 and 2141-03
Frequency of Operation	2405 – 2480 MHz
Antenna Gain	1.1 dBi
Radio Chip Manufacturer / Model Number	Atmel / SAMR21E
Software/Firmware Version	BNLT_42.bin
FCC ID	2AU5D-AHAWS
FCC Classification	DTS
Date Samples Received	05/06/2021
Condition of Samples Received	Suitable for test
Sample Type	Production unit
EUT Description	Legrand WNAL33 adorne Home/Away Wireless Smart Switch Legrand WNAL43 adorne Wake/Sleep Wireless Smart Switch
Applicable FCC Rules	47 CFR Part 2.1093, KDB 447498 D01



2.0 SAR Test Exclusion Parameters and Justification

From KDB 447498 D01:

4.3. General SAR test exclusion guidance

4.3.2. Standalone SAR test exclusion considerations

The Maximum Antenna Power used for the RF Exposure Threshold calculation is the highest measured output power shown in the following table. The table comes from the FCC Part 15C test report for this product.

WNAL33 (Sample #2141-01)

Channel	Modulation	Frequency (GHz)	Measured Level (dBm)	Cable # 962 Loss (dB)	Total		Limit		Margin		Result
					dBm	Watts	dBm	Watts	dBm	Watts	
11	O-QPSK	2405.0	4.10	0.47	4.57	0.0029	30.00	1.000	-25.43	-0.997	Pass
18		2440.0	4.23	0.47	4.70	0.0030	30.00	1.000	-25.30	-0.997	Pass
26		2480.0	4.23	0.47	4.70	0.0030	30.00	1.000	-25.30	-0.997	Pass

Channel	Modulation	Frequency (GHz)	Measured Level (dBm)	Cable # 962 Loss (dB)	Total		Limit		Margin		Result
					dBm	Watts	dBm	Watts	dBm	Watts	
11	None	2405.0	4.10	0.47	4.57	0.0029	30.00	1.000	-25.43	-0.997	Pass
18		2440.0	4.23	0.47	4.70	0.0030	30.00	1.000	-25.30	-0.997	Pass
26		2480.0	4.23	0.47	4.70	0.0030	30.00	1.000	-25.30	-0.997	Pass

WNAL43 (Sample #2141-03)

Channel	Modulation	Frequency (GHz)	Measured Level (dBm)	Cable # 962 Loss (dB)	Total		Limit		Margin	
					dBm	Watts	dBm	Watts	dBm	Watts
11	O-QPSK	2405.0	4.36	0.47	4.83	0.0030	30.00	1.000	-25.17	-0.997
18		2440.0	4.49	0.47	4.96	0.0031	30.00	1.000	-25.04	-0.997
26		2480.0	4.49	0.47	4.96	0.0031	30.00	1.000	-25.04	-0.997

Channel	Modulation	Frequency (GHz)	Measured Level (dBm)	Cable # 962 Loss (dB)	Total		Limit		Margin	
					dBm	Watts	dBm	Watts	dBm	Watts
11	None	2405.0	4.36	0.47	4.83	0.0030	30.00	1.000	-25.17	-0.997
18		2440.0	4.49	0.47	4.96	0.0031	30.00	1.000	-25.04	-0.997
26		2480.0	4.49	0.47	4.96	0.0031	30.00	1.000	-25.04	-0.997

The separation distance used in the calculation is 90 millimeters. This distance is derived from the usage of the product. The Legrand WNRLX3 is wall-mounted, adjacent to other electrical switches and controls used in homes and businesses. Users will not dwell within 90 mm of the device.



3.0 SAR Test Exclusion Calculation (05/19/2021)

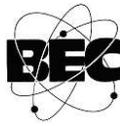
The following calculation, from paragraph 4.3.1 (b)(2) was used to determine the SAR Test Exclusion Threshold for 1-g body and 10-g extremity SAR Test Exclusion Threshold.

$$\{[\text{Power allowed at numeric threshold for 50 mm in step a)] + [(\text{test separation distance} - 50 \text{ mm}) * 10] \text{ mW}$$

WNAL33 (Sample #2141-01)

Channel	Modulation	1 g SAR numeric threshold	Separation Distance	Frequency	SAR Test Exclusion Threshold	EUT Power Output	Margin
		(mw)	(mm)	(MHz)	(mW)	(mW)	(mW)
11	O-QPSK	3	90	2405.0	403.0	2.9	-400.1
18				2440.0		3.0	-400.0
26				2480.0		3.0	-400.0
11	None			2405.0		2.9	-400.1
18				2440.0		3.0	-400.0
26				2480.0		3.0	-400.0

Channel	Modulation	10 g SAR numeric threshold	Separation Distance	Frequency	SAR Test Exclusion Threshold	EUT Power Output	Margin
		(mw)	(mm)	(MHz)	(mW)	(mW)	(mW)
11	O-QPSK	8	90	2405.0	408.0	2.9	-405.1
18				2440.0		3.0	-405.0
26				2480.0		3.0	-405.0
11	None			2405.0		2.9	-405.1
18				2440.0		3.0	-405.0
26				2480.0		3.0	-405.0



WNAL43 (Sample #2141-03)

Channel	Modulation	1 g SAR numeric threshold	Separation Distance	Frequency	SAR Test Exclusion Threshold	EUT Power Output	Margin
		(mw)	(mm)	(MHz)	(mW)	(mW)	(mW)
11	O-QPSK	3	90	2405.0	403.0	3.0	-400.0
18				2440.0		3.1	-399.9
26				2480.0		3.1	-399.9
11	None			2405.0		3.0	-400.0
18				2440.0		3.1	-399.9
26				2480.0		3.1	-399.9

Channel	Modulation	10 g SAR numeric threshold	Separation Distance	Frequency	SAR Test Exclusion Threshold	EUT Power Output	Margin
		(mw)	(mm)	(MHz)	(mW)	(mW)	(mW)
11	O-QPSK	8	90	2405.0	408.0	3.0	-405.0
18				2440.0		3.1	-404.9
26				2480.0		3.1	-404.9
11	None			2405.0		3.0	-405.0
18				2440.0		3.1	-404.9
26				2480.0		3.1	-404.9

Results: The Legrand Models WNAL33 and WNAL43, with Zigbee radio, comply with SAR Test Exclusion Thresholds shown in the tables for 1-g Body and 10-g Extremity, at a separation distance of 90 mm. Therefore, SAR evaluation is not required.