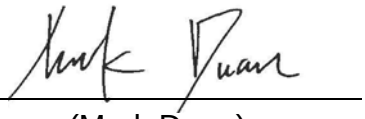
SAR Exclusion Evaluation Report

Applicant	:	Nippon Pop Rivets & Fasteners Ltd.
Product Type	:	Power Tool
Trade Name	:	STANLEY
Model Number	:	PB2500 Smart
Applicable Standard	:	ANSI/IEEE C95.1 / IEEE Std. 1528-2013 47 CFR Part §2.1093 KDB 865664 D01 / KDB 865664 D02 KDB 447498 D01 / KDB 248227 D01
Received Date	:	Nov. 27, 2019
Test Period	:	Jul. 14, 2020
Issued Date	:	Jul. 16, 2020

Issued by

Approved By : 

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Taiwan Accreditation Foundation accreditation number: 1330
Test Firm MRA designation number: TW0010

Note:

1. The test results are valid only for samples provided by customers and under the test conditions described in this report.
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3. The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

Revision History

Rev.	Issued Date	Revisions	Revised By
00	Mar. 30, 2020	Initial Issue	Jennifer Liu
01	Jul. 16, 2020	Revised Evaluation report P02 Delete Maximum Reported SAR Value P07-15 & P20-30 Delete data	Nicole Chu

Contents

1. General Information

1.1 Reference Applicable Standard

Standard	Description	Version
ANSI/IEEE C95.1	American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York.	1992
IEEE 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques.	2013
47 CFR Part §2.1093	Radiofrequency radiation exposure evaluation: portable devices.	-
KDB 865664 D01	SAR measurement requirement for 100 MHz to 6 GHz.	v01r04
KDB 865664 D02	RF exposure compliance reporting and documentation considerations.	v01r02
KDB 447498 D01	RF exposure procedures and equipment authorization policies for mobile and portable devices	v06
KDB 248227 D01	SAR guidance for IEEE 802.11 (Wi-Fi) transmitters	v02r02

1.2 Test Site Environment

Items	Required (IEEE 1528-2013)	Actual
Temperature (°C)	18-25	21-23

2. Description of Equipment under Test (EUT)

Applicant	Nippon Pop Rivets & Fasteners Ltd. Hosoda, Noyori-cho, Toyohashi-shi, Aichi, 441-8540, Japan	
Manufacture	Nippon Pop Rivets & Fasteners Ltd. Hosoda, Noyori-cho, Toyohashi-shi, Aichi, 441-8540, Japan	
Product Type	Power Tool	
Trade Name	STANLEY	
Model Number	PB2500 Smart	
FCC ID	2AWAW-PB2500SMART	
RF Function	Operate Bands	Operate Frequency (MHz)
	IEEE 802.11b / 802.11g / 802.11n 2.4 GHz 20 MHz	2412 - 2462
	IEEE 802.11n 2.4 GHz 40 MHz	2422 - 2452
	Bluetooth BR/EDR	2402 - 2480
	Bluetooth LE	2402 - 2480
Antenna Type	PCB Antenna	
Battery Option	Standard	
	Trade Name: DEWALT Model: DCB203 Spec: DC 20 V, 2.0 Ah, 40 Wh	
Device Category	Portable Device	
Application Type	Certification	

Note:The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. SAR Test Exclusion

As RF exposure evaluation of portable device, SAR test is not required when the evaluation results. According to KDB 447498 4.3.1, unless excluded by specific FCC test procedures, portable devices shall include SAR data for equipment approval. SAR test necessity will be based on the exclusion result.

The test exclusion refers KDB 447498 as below:

≤50 mm:

[(*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

>50 mm and <200 mm:

a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz

b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

3.1 Conducted Power

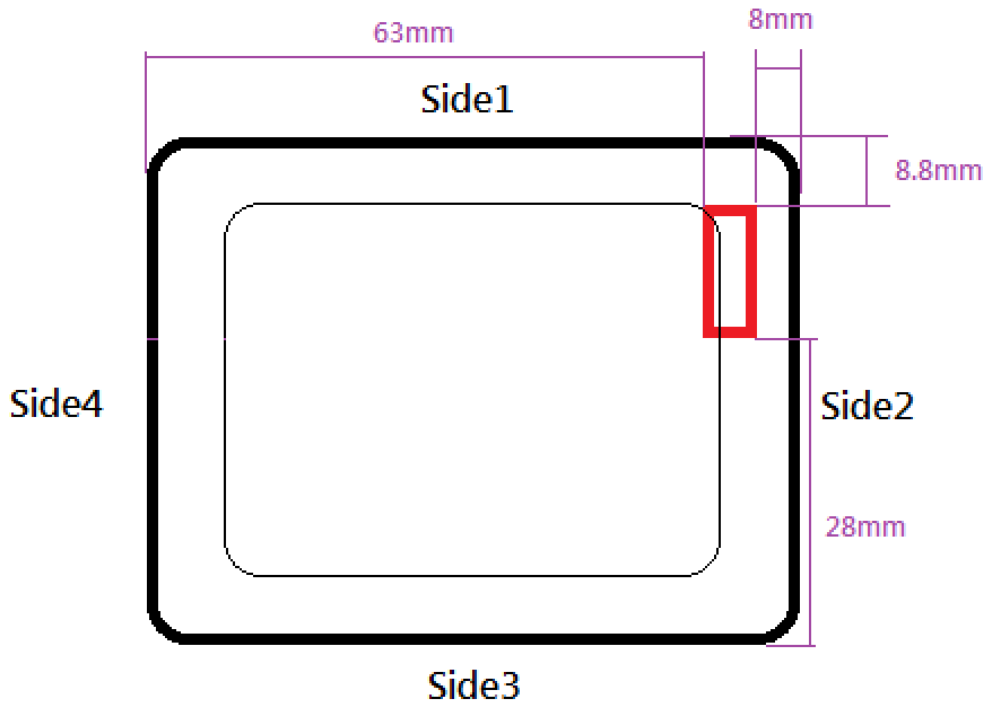
Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11b	1 M	1	2412.0	**10.09**
		6	2437.0	8.29
		11	2462.0	6.09
IEEE 802.11g	6 M	1	2412.0	**10.59**
		6	2437.0	9.59
		11	2462.0	8.58
IEEE 802.11n 2.4 GHz 20 MHz	6.5 M	1	2412.0	**10.48**
		6	2437.0	9.58
		11	2462.0	8.54
IEEE 802.11n 2.4 GHz 40 MHz	13.5 M	3	2422.0	**10.31**
		6	2437.0	9.28
		9	2452.0	8.96

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth BR GFSK	0	2402.0	DH1	2.62
			DH3	2.66
			DH5	**2.69**
	39	2441.0	DH1	1.82
			DH3	1.84
			DH5	1.88
	78	2480.0	DH1	0.43
			DH3	0.47
			DH5	0.50
Bluetooth EDR π/4-DQPSK	0	2402.0	2DH1	2.55
			2DH3	2.61
			2DH5	**2.65**
	39	2441.0	2DH1	1.57
			2DH3	1.61
			2DH5	1.69
	78	2480.0	2DH1	0.17
			2DH3	0.22
			2DH5	0.26
Bluetooth EDR 8DPSK	0	2402.0	3DH1	2.60
			3DH3	2.64
			3DH5	**2.68**
	39	2441.0	3DH1	1.62
			3DH3	1.68
			3DH5	1.73
	78	2480.0	3DH1	0.31
			3DH3	0.35
			3DH5	0.40
Bluetooth LE	0	2402.0	---	-2.88
	19	2440.0		**-1.20**
	39	2480.0		-2.47

3.2 Antenna location

Ant	Antenna to user distance (mm)					
	Front	Back	Side 1	Side 2	Side 3	Side 4
WLAN ANT	5	250	8.8	8	28	63
Bluetooth ANT	5	250	8.8	8	28	63

Antenna location



3.3 Standalone SAR Test Exclusion Calculation

Ant. Used	Band	Frequency	Tune-Power		Distance of Ant. To User (mm)					
		(GHz)	(dBm)	(mW)	Front	Back	Side1	Side2	Side3	Side4
Bluetooth Antenna	BT	2.480	3	2	5	250	8.8	8	28	63
WLAN Antenna	2.4 GHz WLAN	2.462	11	13	5	250	8.8	8	28	63

Ant. Used	Band	Frequency	Tune-Power		Calculated value and evaluated result						
		(GHz)	(dBm)	(mW)	Front	Back	Side1	Side2	Side3	Side4	Exclusion threshold
Bluetooth Antenna	BT	2.480	3	2	0.6	2095.0 mW	0.4	0.4	0.1	225.0 mW	7.5
					EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	
WLAN Antenna	2.4 GHz WLAN	2.462	11	14	4.1	2096.0 mW	2.3	2.6	0.7	226.0 mW	7.5
					EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	

Exclusion Considerations: SAR is not required

Note:

1. The test reduction for distance less than 50mm and more than 50mm. Use the max power to make sure minimum distance by evaluated for SAR testing.
2. For 100 MHz to 6 GHz and test separation distances > 50 mm, According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.Calculated Value include string "mW",that is meam through compare output power with threshold, if the output power more than threshold value the SAR test should be perform. Otherwise,the SAR test could be exempt. (> 50mm)
3. 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:According to KDB 447498, if the calculated threshold value are >3 then Body SAR and >7.5 then Limbs SAR testing are required. Calculated Value only inculde number format, that is mean through compare output power with threshold, if the Calculated value more than 3, the SAR test should be perform. Otherwise, the SAR test could be exempt. (<50mm)
4. When an antenna qualifies for the standalone SAR test exclusion of KDB 447498 section 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to KDB 447498 section "4.3.2. Simultaneous transmission SAR test exclusion considerations b)"
5. We used highest frequency and power,that result should be evaluated the worst case.
6. Power and distance are rounded to the nearest mW and mm before calculation.
7. The result is rounded to one decimal place for comparison.

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