Washington Laboratories, Ltd.
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May 28, 2025

Test Letter: #19112-01 REV 2 (Reference WL Report #19110-01)

Applicant: Stanley Black & Decker, Inc.

Exempt RF Device: BLE Module, P/N: NA557427

FCC ID: YJ7-NA557427

ISED ID: 9082A-NA557427

Exemption Summary: The NA557427 Module is categorically excluded from SAR testing.

EUT Transmitter Details:

Peak output power, conducted at the antenna port:	-0.64 dBm
Manufacturing tune-up tolerance:	± 0.65 dB
SMT, Ceramic Chip Antenna, Peak Gain:	+2.93 dBi (max)
Peak Power, adjusted for tune-up tolerance:	0.01 dBm
Peak EIRP, adjusted for tune-up tolerance:	2.94 dBm

EUT transmitter timing information is provided on the following page.

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The applicant has provided the following details regarding the EUT transmitter duty factor:

The NA557427 Bluetooth Low Energy (BLE) module design includes the ability to connect to a central device for data transfer. The device operates in its highest transmit duty cycle in this mode. The maximum transmit duty cycle is locked in by the device's firmware (hard-coded) and cannot be influenced by the BT central (network).

Connected Data Transfer

Minimum connection interval is 7.5ms
Maximum MTU is 252 bytes (2,016 bits)

- 1Mbps TX time = 2.016ms
- 2Mbps TX time = 1.008ms

At 1Mbps, TX duty cycle maximum is: 2.016ms / 7.5ms = **26.9%**

At 2Mbps, TX duty cycle maximum is: 1.008ms / 7.5ms = **13.4%**

Advertising

When not connected, the NA557427 module transmits interleaved standard advertisements and ESRs. Since these alternate every two seconds, this scenario is detailed as:

Event Time	Advertisement	Duration
0ms	ESR	2.112ms
2000ms	Standard	0.376ms

This cycle will occur 90 times in a 6 minute interval (360 seconds / 4 second cycle).
Advertising maximum duty cycle = (2.112ms + 0.376ms)*90 / 360,000ms = **0.062%**

Please note that the customer has provided the information on the duty factor. The test laboratory is not responsible for verifying the accuracy of this information.

EUT Time-Averaged Power:

Mode	Duty Cycle	DCCF
Data Transfer, 1Mbps	26.9 %	-5.7 dB
Data Transfer, 2Mbps	13.4 %	-8.7 dB
Advertising	0.062 %	-32.1 dB

Worst-Case DCCF = 10LOG(.269) = -5.7 dB

Time-Averaged, Total Channel Power:

FCC: 0.01 dBm + (-5.7) = -5.69 dBm (average conducted power)

ISED: 2.94 dBm + (-5.7) = -2.76 dBm (average EIRP)

therefore,

FCC: -5.69 dBm = 0.31 mW (conducted)

ISED: -2.76 dBm = 0.60 mW (EIRP)

from,

mW $= 10^{(dBm \div 10)}$

EIRP $= P_{dBm} + Gain_{dBi}$

EUT Time-Averaged Power, Summary:

FCC: 0.31 mW

ISED: 0.60 mW (rounded to 1mW)

Stand-Alone, Time-Averaged Exclusion for FCC:

Per FCC Rule Part §1.1307(b)(3)(i)(A): a single RF source is exempt from routine environmental evaluation for RF exposure if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

FCC Final Result: 0.31 mW < 1mW The EUT is excluded from routine exposure evaluation.

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Time-Averaged Exclusion for ISED Canada:

Reference: RSS-102, Issue 6 (12/2023) Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands). -- SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in RSS-102. These limits are provided below.

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

The limits of Table 11, as provided in RSS-102, Issue 6 are based on RF port conducted power, or EIRP, whichever is higher. When the operating frequency of the device is between two frequencies, linear interpolation shall be applied for the applicable separation distance. If the separation distance of the device is between two distances located in the table, linear interpolation may be applied for the applicable frequency. Alternatively, the limit corresponding to the smaller distance may be employed.

The interpolated limit shall be calculated from 2480 MHz, as this frequency produces the strictest limit.

$$y = y_1 + (x - x_1)\frac{(y_2 - y_1)}{(x_2 - x_1)}$$

where,

x_1 and y_1	is the first set of coordinates (e.g., 2450 MHz and 3 mW, respectively).
x_2 and y_2	is the second set of coordinates (e.g., 3500 MHz and 2 mW, respectively).
x	is the EUT transmit frequency of 2480 MHz
y	is the final limit (e.g., interpolated value).

therefore,

y	= 3 + (2480 – 2450) * ((2 – 3) ÷ (3500 – 2450))
y	= 2.97 mW

finally, 2.97 mW is the time-averaged exemption limit for ISED Canada.

ISED Canada Final Result:

0.60 mW (rounded to 1mW) < 2.97 mW, the EUT is excluded from routine exposure evaluation.

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Conclusion:

The FCC time-averaged blanket exclusion limit is 1mW.
The EUT has a time-averaged conducted power of 0.31 mW.

The ISED Canada time-averaged SAR exclusion limit is 2.97 mW.
The EUT has a time-averaged EIRP of 0.6mW, rounded to 1mW.

The NA557427 Module is categorically excluded from SAR testing.

The Washington Laboratories, Ltd., test facility is located at 4840 Winchester Boulevard, Frederick MD 21703 (USA). Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Certificate AT-1448 as an independent test laboratory. These tests/calculations are accredited and meet the requirements of ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board.

Prepared By:

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