

# RF Exposure evaluation for mobile devices

## SPB620 module

FCC ID: X02-SPB620

IC: 8713A-SPB620

**Test Report Reference:** MDE\_HDW\_2304\_MPE\_01

**Test Laboratory:**

7layers GmbH  
Borsigstrasse 11  
40880 Ratingen  
Germany



Deutsche  
Akkreditierungsstelle  
D-PL-12140-01-01  
D-PL-12140-01-02  
D-PL-12140-01-03

**Note:**

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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## Administrative Data

### Testing Laboratory

Company Name: 7layers GmbH  
Address: Borsigstr. 11  
40880 Ratingen  
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The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no: DAkkS D-PL-12140-01-01| -02 | -03  
FCC Designation Number: DE0015  
FCC Test Firm Registration: 929146  
ISED CAB Identifier: DE0007; ISED#: 3699A  
Responsible for accreditation scope: Marco Kullik

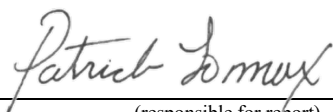
### Project Data

Responsible for report: Patrick Lomax  
Date of Report: 02/04/2024

### Applicant Data

Company Name: H&D Wireless AB  
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Report version control			
Version	Release date	Change Description	Version validity
initial	02/04/2024	--	valid
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(responsible for report)  
Patrick Lomax

Model: *SPB620*

FCC ID: *X02-SPB620*

IC: *8713A-SPB6201*

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310
RSS-102 Issue 6 – December 2023

### Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	Power density ( $mW/cm^2$ )
300 – 1,500	f/1500
1,500 – 100,000	1.0

Limits specified per RSS-102, Issue 5.

Frequency range (MHz)	Power density ( $W/m^2$ )	Power density ( $mW/cm^2$ )
300 – 6000	$0.02619 f^{0.6834}$	$mW/cm^2 = W/m^2 * 0.1$

Equation OET bulletin 65, page 18, edition 97-01:  $S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$

Where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna = 20cm

### Co-Location Considerations

The calculation below is used to consider situations in which simultaneous exposure to fields of different frequencies occur. The calculation is performed by the sum of each relative exposure for each equipment according to the following criteria.

$$\sum_{1}^N \frac{S_{eqn}}{S_{Limn}} = \frac{S_{eq1}}{S_{Lim1}} + \frac{S_{eq2}}{S_{Lim2}} + \dots + \frac{S_{eqN}}{S_{LimN}} \leq 1$$

Where:

$S_{eq}$  is the power density of the electromagnetic field at a given distance by a specific transmitter and a defined frequency.

$S_{lim}$  is the MPE limit for the frequency being evaluated.



Operational Bands	Ant	Frequency (MHz)	Antenna Gain (dBi)	Output Power - conducted- (dBm)	P	S	Power Density value (mW/cm <sup>2</sup> )	Verdict	FCC (Seq / SLim)	ISED (Seq / SLim)	
					Output Power - conducted- (mW)	IC Limit (mW/cm <sup>2</sup> )					FCC Limit (mW/cm <sup>2</sup> )
BLE	1	2402	1.3	4.40	2.75	0.5351	1.00	0.0007	Pass	0.0007	0.0014
BLE	2	2402	3.2	4.40	2.75	0.5351	1.00	0.0011	Pass	0.0011	0.0021
BLE	3	2402	3.8	4.40	2.75	0.5351	1.00	0.0013	Pass	0.0013	0.0025
BLE	4	2402	2	4.40	2.75	0.5351	1.00	0.0009	Pass	0.0009	0.0016
Classic BT	1	2402	1.3	5.30	3.39	0.5351	1.00	0.0009	Pass	0.0009	0.0017
Classic BT	2	2402	3.2	5.30	3.39	0.5351	1.00	0.0014	Pass	0.0014	0.0026
Classic BT	3	2402	3.8	5.30	3.39	0.5351	1.00	0.0016	Pass	0.0016	0.0030
Classic BT	4	2402	2	5.30	3.39	0.5351	1.00	0.0011	Pass	0.0011	0.0020
WLAN 2.4 GHz	1	2412	1.3	16.00	39.81	0.5366	1.00	0.0107	Pass	0.0107	0.0199
WLAN 2.4 GHz	2	2412	3.2	16.00	39.81	0.5366	1.00	0.0165	Pass	0.0165	0.0308
WLAN 2.4 GHz	4	2412	2	16.00	39.81	0.5366	1.00	0.0126	Pass	0.0126	0.0234
WLAN 2.4 GHz	3	2412	3.8	16.00	39.81	0.5366	1.00	0.0190	Pass	0.0190	0.0354
WLAN 5 GHz UNII 1	1	5240	2.3	14.60	28.84	0.9119	1.00	0.0097	Pass	0.0097	0.0107
WLAN 5 GHz UNII 1	2	5240	4.25	14.60	28.84	0.9119	1.00	0.0153	Pass	0.0153	0.0167
WLAN 5 GHz UNII 1	3	5240	5.3	14.60	28.84	0.9119	1.00	0.0194	Pass	0.0194	0.0213
WLAN 5 GHz UNII 1	4	5240	2	14.60	28.84	0.9119	1.00	0.0091	Pass	0.0091	0.0100
WLAN 5 GHz UNII 2A	1	5300	2.3	14.60	28.84	0.9190	1.00	0.0097	Pass	0.0097	0.0106
WLAN 5 GHz UNII 2A	2	5300	4.25	14.60	28.84	0.9190	1.00	0.0153	Pass	0.0153	0.0166



WLAN 5 GHz UNII 2A	3	5300	5.3	14.60	28.84	0.9190	1.00	0.0194	Pass	0.0194	0.0212	
WLAN 5 GHz UNII 2A	4	5300	2	14.60	28.84	0.9190	1.00	0.0091	Pass	0.0091	0.0099	
WLAN 5 GHz UNII 2C	1	5580	2.3	14.10	25.70	0.9519	1.00	0.0087	Pass	0.0087	0.0091	
WLAN 5 GHz UNII 2C	2	5580	4.25	14.10	25.70	0.9519	1.00	0.0136	Pass	0.0136	0.0143	
WLAN 5 GHz UNII 2C	3	5580	5.3	14.10	25.70	0.9519	1.00	0.0173	Pass	0.0173	0.0182	
WLAN 5 GHz UNII 2C	4	5580	2	14.10	25.70	0.9519	1.00	0.0081	Pass	0.0081	0.0085	
WLAN 5 GHz UNII 3	1	5825	2.3	15.30	33.88	0.9803	1.00	0.0114	Pass	0.0114	0.0117	
WLAN 5 GHz UNII 3	2	5825	4.25	15.30	33.88	0.9803	1.00	0.0179	Pass	0.0179	0.0183	
WLAN 5 GHz UNII 3	3	5825	5.3	15.30	33.88	0.9803	1.00	0.0228	Pass	0.0228	0.0233	
WLAN 5 GHz UNII 3	4	5825	2	15.30	33.88	0.9803	1.00	0.0107	Pass	0.0107	0.0109	
										Sum of ( $S_{eqn} / S_{Limn}$ ) Max BT + Max 2.4 WLAN	0.0206	0.0553
										Passed		
										Sum of ( $S_{eqn} / S_{Limn}$ ) Max BT + Max 5 GHz WLAN	0.0245	0.0263
										Passed		

<b>Distance to Antenna (R) in cm:</b>	<b>20</b>
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SPB620 is approved with the following antennas:

Brand	Model	Type	Cable Length	Gain @ 2.4GHz	Gain @ 5GHz
Molex	204281-1300	Flex Antenna	300 mm	1.3	2.3
Molex	146153-1050	Flex Antenna	50 mm	3.2	4.25
Taoglas	GW.59.3153	Dipole RP-SMA		3.8	5.3
Laird	001-0012	Dipole RP-SMA		2.0	2.0