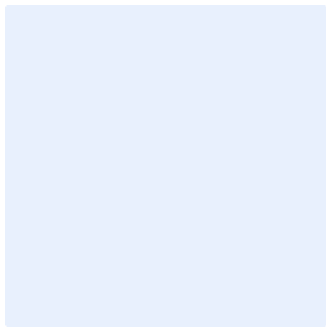


Prüfbericht-Nr.: <i>Test report no.:</i>	IN2524D1 001	Auftrags-Nr.: <i>Order no.:</i>	146919891 010	Seite 1 von 5 Page 1 of 5
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2390953	Auftragsdatum: <i>Order date:</i>	2024-05-24	
Auftraggeber: <i>Client:</i>	Proxim Wireless Corporation 2114 Ringwood Avenue, San Jose, California 95131			
Prüfgegenstand: <i>Test item:</i>	Stratum™ X1 & Stratum™ X3			
Bezeichnung <i>Identification</i>	SX3-1020A-US & SX3-1021A-US & SX1-1023C-US SX3-1020A-WD & SX3-1021A-WD & SX1-1023C-WD			
Auftrags-Inhalt: <i>Order content:</i>	Maximum Permissible Exposure			
Prüfgrundlage: <i>Test specification:</i>	FCC 1.1310, and RSS 102 Issue 6 KDB 447498 D01			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-07-02			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003759215-012 & A003759215-05			
Serien -Nr.: <i>Serial no.:</i>	Engineering Sample			
Prüfzeitraum: <i>Testing period:</i>	2024-08-05 - 2024-10-20			
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B, 2nd cross road, Electronic city Phase 1, Bangalore-560100, India FCC Test Site Registration No: 496599 IC Test Site Registration No: 27711			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2025-02-18	Ausstellatum: <i>Issue date:</i> 2025-02-18			
Stellung / Position:	M.V.Naveen Kumar Senior Engineer	Stellung / Position:	Madhu K.N Assistant Manager	
Sonstiges / Other:	FCC ID: HZB-MEGA2 IC: 1856A-MEGA2 Contains FCC ID: HZB-MEGA5 Contains IC: 1856A-MEGA5 HVIN: Megabit 5 single & Megabit 5 multi			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft			
	P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet			
* Legend:	1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor			
	P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht - Nr.:

Test Report No.:

IN2524D1 001

Seite 2 von 5

Page 2 of 5

- | | |
|---|---|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</p> <p>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.</p> <p>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird.</p> <p><i>The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.</i></p> |

1 Maximum Permissible Exposure

1.1 RF Exposure Compliance Requirement

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

1.2 RF Exposure Limits:

1.2.1 For FCC

1. According to FCC Part 1 Subpart I 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b) showed in Table 1.

Table 1: Limits for Maximum Permissible Exposure (MPE) as per FCC			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 - 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 - 100000	--	--	1.0

F or f = Frequency in MHz

Friss Formula

Friss Transmission Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation.

Prüfbericht - Nr.:
Test Report No.:

IN2524D1 001

Seite 4 von 5
Page 4 of 5

Test Results:

Antenna details:

For BLE uses Chip Antenna with Antenna Gain 1.5dBi

Note:

The Conducted output power including Tune-up Tolerance as below, which was declared by manufacturer.

Antenna Model	Frequency Range (MHz)	Conducted Output Power including tune-up Tolerance (dBm)
Chip Antenna	2402MHz to 2480MHz	4.30

Radio Protocol	Antenna Model	Frequency (MHz)	Maximum measured RF output power with tune-up procedure (dBm)	Max power Including tune-up tolerance * (mW)	Antenna Gain in linear	Min Separation distance (CM)	Power Density (Pd)(mW/cm ²)	FCC Limit (mW/cm ²)
BLE	Chip Antenna	2402 to 2480	4.3	2.6915	1.4125	20	0.0008	1

Exemption calculation for simultaneous Operation:

RF Protocol	Calculated MPE	Final MPE	Limit
Wi-Fi 5GHz + BLE	0.3887 + 0.0008	0.3895	<1

Note:

1. For above table, to calculate MPE following formula is used

$MPE_{RF1} / Limit_{RF1} + MPE_{RF2} / Limit_{RF2} + \dots + MPE_{RFn} / Limit_{RFn} < 1$

2. For Wi-Fi 5GHz Maximum conducted output power taken from test Report No: **IN25YR31 001**

Prüfbericht - Nr.:
Test Report No.:

IN2524D1 001

Seite 5 von 5
Page 5 of 5

1.2.2 For IC

According to IC RSS 102 Issue 6: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radiofrequency (RF) radiation as specified in section 4 showed in Table 4.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

Radio Protocol	Antenna Model	Frequency (MHz)	Maximum measured RF output power with tune-up procedure (dBm)	Max power including tune-up tolerance * (mW)	Antenna Gain in linear	Min Separation distance (CM)	Power Density (Pd)(W/m ²)	IC Limit (W/m ²)
BLE	Chip Antenna	2402 to 2480	4.3	2.6915	1.4125	20	0.0076	5.3508

Result: The minimum distance will be more than above distance

Exemption calculation for simultaneous Operation:

RF Protocol	Calculated Power density (Pd)(W/m ²)	Final Power density (Pd) (W/m ²)	Limit
Wi-Fi 5GHz + BLE	3.8867 + 0.008	3.8947	5.3508

1.3 Conclusion

The Power density of the EUT is less than defined limit as shown above, hence EUT is exempted from routine SAR.