

Prüfbericht-Nr.: <i>Test report no.:</i>	IN25CSFD 001 / IN258K1F 001 / IN258337 001 / IN25DWD0 001 / IN25S64J 001		Auftrags-Nr.: <i>Order no.:</i>	146976468 010	Seite 1 von 6 Page 1 of 6
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2384903		Auftragsdatum: <i>Order date:</i>	2024-10-22	
Auftraggeber: <i>Client:</i>	Devic Earth Private Limited Villa 7, Ground Floor Parkway Tivoli Apartment. Kadugodi Main Road.Seegehalli Whitefield Bangalore,560067.				
Prüfgegenstand: <i>Test item:</i>	Air Pollution Control Equipment				
Bezeichnung <i>Identification</i>	Transmitter PSDEACE				
Auftrags-Inhalt: <i>Order content:</i>	Testing & Issue of Test Report				
Prüfgrundlage: <i>Test specification:</i>	FCC Part1 1.1310, KDB 447498 D01 RSS 102 Issue 6				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-11-04				
Prüfmuster-Nr.: <i>Test sample no:</i>	A003846786-002				
Serien -Nr.: <i>Serial no.:</i>	0036				
Prüfzeitraum: <i>Testing period:</i>	2024-11-04 - 2024-11-20				
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 Phase1, Bangalore-560100, India				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>				
Datum: <i>Date:</i> 2025-01-17			Ausstellatum: <i>Issue date:</i> 2025-01-17 		
Stellung / Position:	M.V.Naveen Kumar Senior Engineer		Stellung / Position: Madhu K.N Assistant Manager		
Sonstiges / Other:	FCC ID: 2BL5B-PSDEACE IC: 33453-PSDEACE HVIN: Transmitter PSDEACE				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged				
* 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>					

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|---|---|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüflabors 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 RF Exposure Evaluation

1.1 RF Exposure Compliance Requirement

The limit for Maximum Permissible Exposure (MPE) specified in FCC Part 1 Subpart I 1.1310 is followed. The gain of the antennas used in the product are 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 Test Reference Limits

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)

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

Table 2: Limits for Maximum Permissible Exposure (MPE) as per ICSED Canada

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)
Limits for Occupational / controlled Exposures			
100-6000	$15.60f^{0.25}$	$0.04138f^{0.25}$	$0.6455f^{0.5}$
Limits for General population / Uncontrolled Exposure			
300-6000	$3.142 f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$

F or f = Frequency in MHz

According to IC **RSS 102 Issue 6 clause 6.6**: Field reference level exposure exemption limits:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz.

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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.

Test Results:

Antenna details:

Protocol	Antenna Type	Frequency Band (MHz)	Antenna Gain (dBi)
LTE; WCDMA & GSM	Dipole Antenna (External)	2	1.87
		4	3.12
		5	0.91
		12	0.95
		13	2.23
		25	1.87
		26	0.91
		41	2.90
		66	3.12
Proprietary Protocol	Omni Directional Whip Antenna	2425-2425	5

Radio Protocol	Band	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)	Limit (mW/cm ²)
LTE	B2	1860.00	25.63	365.59	1.5382	20	0.1119	1.0000
	B4	1720.00	25.63	365.59	2.0512	20	0.1492	1.0000
	B5	829.00	26.41	437.52	1.2331	20	0.1073	0.5527
	B12	699.70	26.00	398.11	1.2445	20	0.0986	0.4665
	B13	782.00	26.16	413.05	1.6711	20	0.1373	0.5213
	B25	1860.00	25.57	360.58	1.5382	20	0.1103	1.0000
	B26(814-824)	819.00	27.04	505.82	1.2331	20	0.1241	0.5460
	B26(824-849)	824.70	26.04	401.79	1.2331	20	0.0986	0.5498
	B41	2501.00	24.44	277.97	1.9498	20	0.1078	1.0000
	B66	1720.00	25.97	395.37	2.0512	20	0.1613	1.0000

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Radio Protocol	Band	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/cm²)	Limit (mW/cm²)
WCDMA	2	1852.40	24.86	306.1963	1.54	20	0.0938	1.0000
	4	1712.40	23.75	237.1374	2.05	20	0.0967	1.0000
	5	826.40	23.76	237.6840	1.23	20	0.0582	0.5509
GSM	850	824.20	24.15	260.0160	1.23	20	0.0636	0.5495
	1900	1850.20	22.50	177.8279	1.87	20	0.0662	1.0000
Proprietary protocol	2.4GHz	2425.00	9.06	8.05	3.1623	20	0.0051	1.0000

Note: The duty correction factor of 9.03 dB is subtracted from the measured power for GSM.

Test Results for ISED:

Radio Protocol	Band	Frequency (MHz)	Maximum measured RF output power with tune-up value (dBm)	Max power Including tune-up tolerance * (mW)	Antenna Gain in linear	Min Separation distance (CM)	Power Density (Pd)(W/m²)	Limit (W/m²)
LTE	B2	1860.00	25.63	365.59	1.5382	20	1.1187	4.4928
	B4	1720.00	25.63	365.59	2.0512	20	1.4919	4.2589
	B5	829.00	26.41	437.52	1.2331	20	1.0733	2.5863
	B12	699.70	26.00	398.11	1.2445	20	0.9857	2.3033
	B13	782.00	26.16	413.05	1.6711	20	1.3732	2.4852
	B25	1860.00	25.57	360.58	1.5382	20	1.1034	4.4928
	B26(814-824)	819.00	27.04	505.82	1.2331	20	1.2409	2.5649
	B41	2501.00	24.44	277.97	1.9498	20	1.0783	5.5006
	B66	1720.00	25.97	395.37	2.0512	20	1.6134	4.2589
WCDMA	2	1852.40	24.86	306.1963	1.54	20	0.9381	4.4803
	4	1712.40	23.75	237.1374	2.05	20	0.9671	4.2460
	5	826.40	23.76	237.6840	1.23	20	0.5816	2.5807
GSM	850	824.20	24.15	260.0160	1.23	20	0.6363	2.5760
	1900	1850.20	22.50	177.8279	1.87	20	0.6616	4.4800
Proprietary protocol	2.4GHz	2425.00	9.06	8.05	3.1623	20	0.507	5.3858

*Note: The duty correction factor of 9.03 dB is subtracted from the measured power for GSM

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***Note:**

1. Supplier has been declared tune up value as $\pm 1\text{dB}$ for LTE & proprietary protocol and same as applied in above table.

Exception calculation for Simultaneous Operation:

RF Protocol	Calculated Pd(W/m ²)	Total Pd(W/m ²)	Limit(W/m ²)
Proprietary + LTE	1.6134+0.0507	1.6641	2.3033

1.3 Conclusion

The Power density of the EUT is less than defined limit as shown above. Hence, it's meeting the RF Exposure evaluation.

The max. output power also less than Field reference level exposure exemption limits (2.67W for 2400MHz).