Prüfbericht – Produkte
Test Report - Products

Prüfbericht-Nr.: *Test report no.:*	**IN25CSFD 001 / IN258K1F 001 / IN258337 001 / IN25DWD0 001 / IN25S64J 001**	**Auftrags-Nr.:** *Order no.*:	146976468 010	Seite 1 von 6 *Page 1 of 6*
Kunden-Referenz-Nr.: *Client reference no.:*	2384903	**Auftragsdatum:** *Order date:*	2024-10-22	
Auftraggeber: *Client:*	Devic Earth Private Limited Villa 7, Ground Floor Parkway Tivoli Apartment. Kadugodi Main Road.Seegehalli Whitefield Bangalore,560067.			
Prüfgegenstand: *Test item:*	Air Pollution Control Equipment			
Bezeichnung *Identification*	Transmitter PSDEACE			
Auftrags-Inhalt: *Order content*:	Testing & Issue of Test Report			
Prüfgrundlage: *Test specification:*	FCC Part1 1.1310, KDB 447498 D01 RSS 102 Issue 6			
Wareneingangsdatum: *Date of sample receipt:*	2024-11-04			
Prüfmuster-Nr.: *Test sample no:* **Serien -Nr.:** *Serial no.:*	A003846786-002 0036			
Prüfzeitraum: *Testing period:*	2024-11-04 - 2024-11-20			
Ort der Prüfung: *Place of testing:*	Wireless laboratory, Bangalore			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Banglore-560100, India			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von: *tested by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* **2025-01-17**	M.V. Naveen Kumar	**Ausstellatum:** *Issue date:* **2025-01-17**	M.K.N
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: *Condition of the test item at delivery:*	**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*

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4	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. *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.*

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/cm²)
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 ISED Canada

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m²)
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 1.31×10−2f0.6834W (adjusted for tune-up tolerance), where f is in MHz.

Friss Formula

Friss Transmission Formula: Pd = (Pout * G) / (4*pi*r²)

Where,

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 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/cm²)	Limit (mW/cm2)
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

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

***Note:**

1. Supplier has been declared tune up value as ±1dB for LTE & proprietary protocol and same as applied in above table.

Exception calculation for Simultaneous Operation:

RF Protocol	Calculated Pd(W/m²)	Total Pd(W/m²)	Limit(W/m2)
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).