Prüfbericht-Nr.: *Test report no.:*	**IN24TRDD 001/IN24QRE8 001/IN24778M 001/IN249G94 001/IN244I1B 001/IN2443F6 001**	**Auftrags-Nr.:** *Order no.*:	146873078 090	
Kunden-Referenz-Nr.: *Client reference no.:*	2026143	**Auftragsdatum:** *Order date:*	2024-01-19	
Auftraggeber: *Client:*	Schneider Electric 7262 Marconi Street Montreal, QC H2R 2Z5 Canada			
Prüfgegenstand: *Test item:*	Ecostruxure Flex-Server			
Bezeichnung *Identification*	Main Model: ESXBFXSVRBCW008 Associated Model: ESXBFXSVRBCW016, ESXBFXSVRBCW032			
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:*	2024-01-23			
Prüfmuster-Nr.: *Test sample no:* **Serien -Nr.:** *Serial no.:*	A003649514-001 Engineering Sample			
Prüfzeitraum: *Testing period:*	2024-01-24 - 2024-02-09			
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:* **2024-07-08**	M.V. Naveen Kumar	**Ausstellatum:** *Issue date:* **2024-07-08**	M.K.N
Stellung / *Position:*	**M.V.Naveen Kumar** **Senior Engineer**	**Stellung** / *Position:*	**Madhu K.N** **Assistant Manager**

Sonstiges / *Other:* **FCC ID: 2BATG-ESXBFXSVRBCW**
IC: 30486-ESXBFXSVRBCW
HVIN: ESXBFXSVRBCW008; ESXBFXSVRBCW016; ESXBFXSVRBCW032

Zustand des Prüfgegenstandes bei Anlieferung: **Prüfmuster vollständig und unbeschädigt**
Condition of the test item at delivery: ***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*

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

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 Range (MHz)	Antenna Gain (dBi)
LTE, WCDMA, GSM	Primary Antenna (External)	600-700	-0.5
		700-810	1.4
		820-960	1.0
		1700-2170	2.3
		2300-2400	1.5
		2400-2500	1.6
		2500-2690	2.8
Wi-Fi 2.4GHz & 5GHz	Dipole Antenna	2412-2462	2
		5150-5250	2
		5250-5350	2
		5470-5725	2
		5725-5850	2

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	1857.5	25.92	390.8409	1.6982	20	0.1320	1
	B4	1753.5	25.28	337.2873	1.6982	20	0.1140	1
	B5	836.5	25.75	375.8374	1.2589	20	0.0941	0.5577
	B7	2562.5	26.22	418.7936	1.9055	20	0.1588	1
	B12	700.50	24.76	299.2265	1.3804	20	0.0822	0.4670
	B13	782.00	25.17	328.8516	1.3804	20	0.0903	0.5213
	B25	1882.5	25.27	336.5116	1.6982	20	0.1137	1
	B26(814-824)	819.00	25.74	374.9730	1.3804	20	0.1030	0.5460
	B26(824-849)	825.50	24.82	303.3891	1.2589	20	0.0760	0.5503
	B38	2577.50	25.92	390.8409	1.9055	20	0.1482	1
	B41	2506.00	18.83	76.3836	1.9055	20	0.0290	1

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	B2	1907.6	23.93	247.1724	1.6982	20	0.0835	1
	B4	1752.60	23.38	217.7710	1.6982	20	0.0736	1
	B5	846.60	23.61	229.6149	1.2589	20	0.0575	0.5644
GSM	850	848.80	29.70	933.2543	1.2589	20	0.2337	0.5659
	PCS 1900	1909.8	30.3	1071.5193	1.6982	20	0.3620	1
Wi-Fi	2.4GHz	2437	26.47	443.6086	1.5849	20	0.1399	1
	UNII-1	5240	18.66	73.4514	1.5849	20	0.0232	1
	UNII-2a	5320	16.1	40.7380	1.5849	20	0.0128	1
	UNII-2c	5580	18.16	65.4636	1.5849	20	0.0206	1
	UNII-3	5825	18.19	65.9174	1.5849	20	0.0208	1

Test Results for ISED:

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)(W/m²)	Limit (W/m2)
LTE	B2	1857.5	25.92	390.8409	1.6982	20	1.3200	4.4887
	B4	1753.5	25.28	337.2873	1.6982	20	1.1400	4.3154
	B5	836.5	25.75	375.8374	1.2589	20	0.9410	2.6022
	B7	2562.5	26.22	418.7936	1.9055	20	1.5880	5.5926
	B12	700.50	24.76	299.2265	1.3803	20	0.8220	2.3051
	B13	782.00	25.17	328.8516	1.3803	20	0.9030	2.4852
	B25	1882.5	25.27	336.5116	1.6982	20	1.1370	4.5299
	B26(814-824)	819.00	25.74	374.9730	1.3804	20	1.0300	2.5649
	B26(824-849)	825.50	24.82	303.3891	1.2589	20	0.7600	2.5788
	B38	2577.50	25.92	390.8409	1.9054	20	1.4820	5.6150
	B41	2506.00	18.83	76.3836	1.9054	20	0.2900	5.5081

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)(W/m²)	Limit (W/m2)
WCDMA	B2	1907.6	23.93	247.1724	1.6982	20	0.8350	4.5711
	B4	1752.60	23.38	217.7710	1.6982	20	0.7360	4.3139
	B5	846.60	23.61	229.6149	1.2589	20	0.5750	2.6237
GSM	850	848.80	29.70	933.2543	1.2589	20	2.3370	2.6283
	PCS 1900	1909.8	30.3	1071.5193	1.6982	20	3.6200	4.5747
Wi-Fi	2.4GHz	2437	26.47	443.6086	1.5849	20	0.1399	5.4039
	UNII-1	5240	18.66	73.4514	1.5849	20	0.0232	9.1185
	UNII-2a	5320	16.1	40.7380	1.5849	20	0.0128	9.2134
	UNII-2c	5580	18.16	65.4636	1.5849	20	0.0206	9.5188
	UNII-3	5825	18.19	65.9174	1.5849	20	0.0208	9.8025

***Note:** Supplier has been declared tune up value as 1dB and same as applied in above table.

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.