Prüfbericht-Nr.: *Test report no.:*	IN23RLHX 001 / IN23WWR8 001 IN2393NU 001 / IN233SE0 001	**Auftrags-Nr.:** *Order no.*:	146741356 0010	Seite 1 von 5 *Page 1 of 5*
Kunden-Referenz-Nr.: *Client reference no.:*	2026143	**Auftragsdatum:** *Order date:*	2022-11-28	
Auftraggeber: *Client:*	TessolveDTS Inc 226 Airport Parkway Suite 100, Sanjose, CALIFORNIA, U.S.A, 95110,			
Prüfgegenstand: *Test item:*	Moter Automotive application Gateway			
Bezeichnung.: *Identification .:*	MT-V2001			
Auftrags-Inhalt: *Order content*:	Testing & issue of Test report with Grant			
Prüfgrundlage: *Test specification:*	FCC Part1 1.1310 KDB 447498 D01			
Wareneingangsdatum: *Date of sample receipt:*	2022-11-28			
Prüfmuster-Nr & Serien-Nr.: *Test sample no & serial no.*:	A003384947-001 Engineering Sample			
Prüfzeitraum: *Testing period:*	2022-11-30 - 2022-12-05			
Ort der Prüfung: *Place of testing:*	Wireless laboratory, Bangalore			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (India) Pvt.Ltd., 27/B, 2nd Cross, Electronic City Phase1 Bangalore -560 100, India FCC Test site registration number: 496599 ISED Test site registration number: 3466E-1			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von: *tested by:*		**genehmigt von:** *authorized by:*	
Datum: *Date:* 2023-04-17	M.V. Naveen Kumar	**Ausstellatum:** *Issue date:* 2023-04-26	M.K.N
Stellung / *Position:*	**M.V.Naveen Kumar** Engineer	**Stellung** / *Position:*	**Madhu K.N** Senior Engineer

Sonstiges / *Other:* FCC ID: 2A6PTMT2V1001

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*

1 RF Exposure Report

1.1 RF Exposure Measurement

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 RF Exposure Limit

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

1.2.1 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, we will know MPE value at distance 20cm.

1.2.2 EUT Operation condition

EUT was enabled to transmit and receive at lowest, middle and highest channels.

1.2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

Note: ± 1 dB tune up value is considered for MPE calculation.

Protocol: LTE,

1.3 Test Results

Manufacturer has declared the tune-up value as ±1 dB is considered in MPE calculation.

Antenna: External Antenna

Antenna Type	Frequency Range (MHz)	Antenna Gain (dBi)
External/ Diversity Antenna	700MHz to 2700MHz	3.0

Cellular: **Antenna Gain: 3 dBi;**
Gain in Linear scale: 1.995;

Table 2: Maximum permissible exposure

Mode	Channel Frequency (MHz)	Maximum average output power (dBm)	Maximum output power incuding Tune-up value (mW)	Power Density (mW/cm²)	FCC Limit (mW/cm²)
LTE Band 2	1851.50	24.32	340.408	0.1350	1
LTE Band 4	1732.50	24.45	350.751	0.1391	1
LTE Band 5	836.50	24.46	351.560	0.1394	0.557
LTE Band 7	2565	23.89	308.3188	0.1223	1
LTE Band 12	711.00	25.02	399.944	0.1586	0.474
LTE Band 13	779.50	23.45	278.612	0.1105	0.5197
LTE Band 14	795.50	23.52	283.1391	0.1123	0.5303
LTE Band 25	1860.00	24.46	351.560	0.1394	1
LTE Band 26	844.00	24.20	331.131	0.1313	0.5627
LTE Band 38	2615	19.90	123.0268	0.0488	1
LTE Band 41	2506.00	17.83	76.3835	0.0303	1
LTE Band 66	1720.00	27.79	756.8328	0.30028	1
LTE Band 71	665.50	24.24	334.1950	0.1325	0.4437
WCDMA Band 2	1852.4	23.26	266.6858	0.1058	1
WCDMA Band 4	1712.4	23.00	251.1886	0.0996	1
WCDMA Band 5	846.60	23.90	309.0295	0.1226	0.5644

Note:

For the above average power taken from the below mentioned report No.

Radio Protocol	Report Number
RF test report for FCC Part 22 - (This report)	**IN23RLHX 001**
RF test report for FCC Part 24	IN23WWR8 001
RF test report for FCC Part 27	IN2393NU 001
RF test report for FCC Part 90	IN233SE0 001

1.4 Conclusion

Hence, the RF exposure analysis concluded that the RF exposure is compliant as per the limit specified in clause 1.2 of this report