

Maximum Permissible Exposure Report

FCC ID: 2AVVT-CU413UCMPS1

Report No. : BTL-FCCP-5-2103T126
Equipment : iTraMS CCU
Model Name : CU-41-3U-CM-PS1
Brand Name : Bosch
Applicant : Robert Bosch Engineering and Business Solutions Private Limited
Address : RBEI/PAC, Ban 601, Post Box No 3000 Hosur Road, Adugodi, Bengaluru, Karnataka-560030, India.

FCC Rule Part(s) : FCC Guidelines for Human Exposure IEEE C95.1

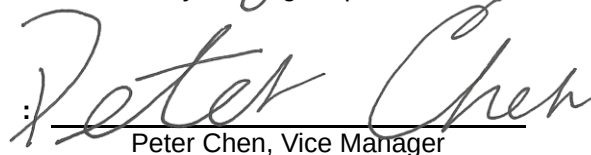
Date of Receipt : 2021/4/6
Date of Test : 2021/4/6 ~ 2021/5/12
Issued Date : 2021/10/15

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by

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REVISION HISTORY

Report No.	Version	Description	Issued Date
BTL-FCCP-5-2103T126	R00	Original Report.	2021/9/17
BTL-FCCP-5-2103T126	R01	Revised Typo.	2021/9/27
BTL-FCCP-5-2103T126	R02	Revised report to address TCB's comments.	2021/10/15

MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

WWAN Antenna:

Group I:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna		MA250.A.LBI.001	Dipole	SMA(M)ST	3.79	WCDMA Band II
					1.29	WCDMA Band V
					3.79	LTE Band 2
					3.79	LTE Band 4
					1.29	LTE Band 5
					0.72	LTE Band 12

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna		TG.08.0723	Dipole	Fakra Code D	3.55	WCDMA Band II (RX only)
					1.82	WCDMA Band V (RX only)
					3.55	LTE Band 2 (RX only)
					3.43	LTE Band 4 (RX only)
					1.82	LTE Band 5 (RX only)
					-1.96	LTE Band 12 (RX only)

Group II:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
Built-in antenna		N/A	N/A	Integrated (Through Hole)	5.7	WCDMA Band II
					-0.6	WCDMA Band V
					5.7	LTE Band 2
					4.6	LTE Band 4
					-0.6	LTE Band 5
					-1.5	LTE Band 12

Group III:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna		MA240.LBI.001	N/A	SMA(M)ST	-0.33	WCDMA Band II
					0.98	WCDMA Band V
					-0.33	LTE Band 2
					2.46	LTE Band 4
					0.98	LTE Band 5
					3.11	LTE Band 12

BT & WLAN Antenna:

Group I:

Antenna	Manufacture	Part No.	Type	Connector	Frequency (MHz)	Gain (dBi)
External antenna		MA250.A.LBI.001	Dipole	SMA(M)ST	2400-2500	2.72

Group II:

Antenna	Manufacture	Part No.	Type	Connector	Frequency (MHz)	Gain (dBi)
Stubby antenna		TG.08.0723	Dipole	SMA(M)ST	2400-2500	3.29

Group III:

Antenna	Manufacture	Part No.	Type	Connector	Frequency (MHz)	Gain (dBi)
Wi-Fi 2.4GHz antenna		MA240.LBI.001	Dipole	SMA(M)	2400-2500	2.70

Band	Maximum Gain to comply FCC Limit	Maximum Gain to comply IC Limit	Maximum Gain to comply all Limit
WCDMA Band II	14.37	10.97	10.97
WCDMA Band V	11.52	8.26	8.26
LTE Band 2	13.6	10.19	10.19
LTE Band 4	13.47	9.78	9.78
LTE Band 5	10.43	7.11	7.11
LTE Band 12	9.88	6.84	6.84

Output power including tune up tolerance

Function	Target power (dBm)	Tolerance (dB)
WLAN 2.4G	20	±1
WCDMA	21.5	±2
LTE Band 2, 4, 12	22	±2
LTE Band 5	22.5	±2

CALCULATED RESULTS

Mode	Band	Frequency Range (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Test Result
WCDMA	Band II	1907.6	23.5	3.79	0.1066	1.0000	Complies
WCDMA	Band V	826.4	23.5	1.29	0.0599	0.5509	Complies
LTE	Band 2	1860.0	24	5.7	0.1621	1.0000	Complies
LTE	Band 4	1732.5	24	4.6	0.1296	1.0000	Complies
LTE	Band 5	836.5	24.5	1.29	0.0755	0.5577	Complies
LTE	Band 12	704.0	24	3.11	0.1023	0.4693	Complies

Mode	Band	Frequency Range (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Test Result
WLAN	-	2437	21	3.29	0.0535	1.0000	Complies

Mode	Band	Frequency Range (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Test Result
BT	-	2441	6.82	3.29	0.0020	1.0000	Complies

Mode	Band	Frequency Range (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Test Result
BLE	-	2440	2.03	3.29	0.0007	1.0000	Complies

Note:

1. The calculated distance is 20 cm.

COLLOCATED POWER DENSITY CALCULATIONS

So for simultaneous transmission (WWAN+WLAN+BT): $0.1196/1+0.0535/1+0.0020/1=0.1751<1$.

End of Test Report