

Maximum Permissible Exposure Report

FCC ID: 2AVVT-CU413UCMPS1

Report No. : BTL-FCCP-5-2103T126B
Equipment : iTraMS CCU
Model Name : CU-41-3U-CM-PS1
Brand Name : Bosch
Applicant : Bosch Global Software Technologies Private Limited
Address : MS/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 : 2022/11/22

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

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**BTL Inc.**

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REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-5-2103T126	R00	Original Report.	2021/9/17	Invalid
BTL-FCCP-5-2103T126	R01	Revised Typo.	2021/9/27	Invalid
BTL-FCCP-5-2103T126	R02	Revised report to address TCB's comments.	2021/10/15	Valid
BTL-FCCP-5-2103T126B	R00	1. Added the fourth antenna. (MA173. A. LBI.001) 2. Modified applicant and address.	2022/11/22	Valid

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

Group IV:

Antenna	Manufacture	Part No.	Type	Connector	Gain (dBi)	Note
External antenna		MA173. A. LBI.001	N/A	SMA(M)ST	2.40	WCDMA Band II
					0.18	WCDMA Band V
					2.40	LTE Band 2
					2.40	LTE Band 4
					0.18	LTE Band 5
					0.98	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

Group IV:

Antenna	Manufacture	Part No.	Type	Connector	Frequency (MHz)	Gain (dBi)
External antenna		MA173. A. LBI.001	N/A	SMA(M)ST	2400-2500	1.31

Note: The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

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