



RF Exposure Evaluation Declaration

Product Name : DriveScape
Model No. : DS300NA
FCC ID : 2AFGD-DS3NA1

Applicant : Cambridge Mobile Telematics
Address : 314 Main Street, Suite 1200, Cambridge,
MA 02142, USA

Date of Receipt : Aug. 18, 2021
Issued Date : Sep. 16, 2021
Report No. : 2180742R-RF-US-P20V01
Report Version : V1.0

The test results presented in this report relate only to the object tested.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit,
It is not necessary to account the uncertainty associated with the measurement result.

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Test Report Certification

Issued Date: Sep. 16, 2021

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Applicant : Cambridge Mobile Telematics
Address : 314 Main Street, Suite 1200, Cambridge, MA 02142,
USA
Manufacturer : Cambridge Mobile Telematics
Address : 314 Main Street, Suite 1200, Cambridge, MA 02142,
USA
Model No. : DS300NA
Trademark : 
FCC ID : 2AFGD-DS3NA1
Applicable Standard : KDB 447498D01V06
FCC Part1.1310
Test Result : Complied
Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,
215006, Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Designation Number: CN1199

Documented By :



(Project Engineer: Scott Shen)

Approved By :



(Supervisor: Jack Zhang)

1. RF Exposure Evaluation

1.1.Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	DriveScape
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna Information:

BLUETOOTH

Antenna model / type number	N/A			
Antenna serial number	N/A			
Antenna Delivery	☒	1TX + 1RX		
	☐	2TX + 2RX		
	☐	Others:.....		
Antenna technology.....	☒	SISO		
	☐	MIMO	☐	CDD
			☐	Beam-forming
			☐	
Antenna Type	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☒	Chip
			☐	PCB
			☐	Dipole
Antenna Gain.....	1 dBi			

GSM/WCDMA/LTE

Antenna model / type number.....	N/A			
Antenna serial number.....	N/A			
Antenna Delivery	☒	1TX + 1RX		
	☐	2TX + 2RX		
Antenna technology	☒	Diversity		
Antenna Type.....	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	PIFA
			☒	PCB for main antenna
			☒	Ceramic Chip for diversity antenna
			☐	Others.....
Antenna Gain.....	Main: -3.03 dBi for WCDMA Band V, LTE Band 5, 12, 13, 26 -3.32 dBi for WCDMA Band II, IV, LTE Band 2, 4, 25 Diversity: 2 dBi for WCDMA Band V, LTE Band 5, 12, 13, 26 2 dBi for WCDMA Band II, IV, LTE Band 2, 4, 25			

Power Density

For Bluetooth, the tune-up power tolerance is 1dB, so the maximum conducted power we used to calculate RF exposure is 2.67 dBm.

For WCDMA, LTE, the maximum conducted power is from certified module MPE report, which FCC ID is XMR201909EG91NAX.

Standalone modes:

Operation Mode	Frequency Range (MHz)	Maximum Conducted Power	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
WCDMA Band 2	1850 ~ 1910	24	20.68	0.023	1
WCDMA Band 4	1710 ~ 1755	24	20.68	0.023	1
WCDMA Band 5	824 ~ 849	24	20.97	0.025	0.55
LTE Band 2	1850 ~ 1910	24.5	21.18	0.026	1
LTE Band 4	1710 ~ 1755	24.5	21.18	0.026	1
LTE Band 5	824 ~ 849	24.5	21.47	0.028	0.55
LTE Band 12	699 ~ 716	24.5	21.47	0.028	0.47
LTE Band 13	777 ~ 787	24.5	21.47	0.028	0.52
LTE Band 25	1850 ~ 1915	25	21.68	0.029	1
LTE Band 26	814 ~ 849	25	21.97	0.031	0.54
Bluetooth	2400 ~ 2483.5	2.67	3.67	0.0005	1

Simultaneous transmission:

Wireless Configuration	Maximum EIRP (dBm)		Limit of Power Density S(mW/cm ²)		Power Density S at R = 20 cm (mW/cm ²)		Rate	Limit
	BT	LTE	BT	LTE	BT	LTE		
BT + LTE Band 12	3.67	21.47	1	0.47	0.0005	0.028	0.06	1

The EUT support simultaneously transmit with BT + WCDMA / LTE

The worst combination is shown in the report. The simultaneously safety distance is 20cm for installed for DriveScape without any other radio equipment.

The End