Microtest
微测检测

MPE REPORT

FCC ID: 2ASJR-CM2-1112120

Date of issue: June 15, 2019

Report Number:	MTi190614E101
Sample Description:	GT-Sense SMA Connectors
Model(s):	CM2-1112120, CM2-1102120
Applicant:	Globetracker, ApS
Address:	Strandgade 91, 4th Floor, DK-1401 Copenhagen K, DK
Date of Test:	Feb 25, 2019 to June 15, 2019

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TEST RESULT CERTIFICATION	
Applicant's name:	Globetracker, ApS
Address:	Strandgade 91, 4th Floor, DK-1401 Copenhagen K, DK
Manufacture's Name:	Danchell
Address:	Lyngvej 8-DK-4450 4450 Jyderup Denmark
Product name:	GT-Sense SMA Connectors
Trademark:	GT-Sense
Model and/or type reference:	CM2-1112120
Serial Model:	CM2-1102120
RF Exposure Procedures:	KDB 447498 D01 v06

This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by: Demi Mu June. 15, 2019

Reviewed by: Blue Zheng June. 15, 2019

Approved by: Smith Chen June. 15, 2019

RF EXPOSURE EVALUATION

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)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $Pd= (Pout*G)\ (4*pi*R^2)$

Where

Pd= Power density in mW/cm2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1415926

R= distance between observation point and center of the radiator in cm (20cm)

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

Measurement Result

R=20cm

BLE

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
2402	GFSK	-1.622	-1±1	0	1.000	0.5	1.12	0.0002	1
2440		-1.570	-1±1	0	1.000	0.5	1.12	0.0002	1
2480		-2.267	-1±1	0	1.000	0.5	1.12	0.0002	1

GPRS850:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
128	32.31	32±1	33	1995.262	1.8	1.51	0.6008	1
190	32.40	32±1	33	1995.262	1.8	1.51	0.6008	1
251	32.46	32±1	33	1995.262	1.8	1.51	0.6008	1

EGPRS850:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
128	26.72	26±1	27	501.187	1.8	1.51	0.1509	1
190	26.94	26±1	27	501.187	1.8	1.51	0.1509	1
251	26.95	26±1	27	501.187	1.8	1.51	0.1509	1

GPRS1900:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
			tune-up power		Gain			
			(dBm)	(mW)	(dBi)	Numeric		
512	29.87	29±1	30	1000.00	3.8	2.40	0.4772	1
661	29.98	29±1	30	1000.00	3.8	2.40	0.4772	1
810	29.75	29±1	30	1000.00	3.8	2.40	0.4772	1

EGPRS1900:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
			tune-up power		Gain			
			(dBm)	(mW)	(dBi)	Numeric		
512	27.09	28±1	29	794.328	3.8	2.40	0.3791	1
661	27.41	28±1	29	794.328	3.8	2.40	0.3791	1
810	27.17	28±1	29	794.328	3.8	2.40	0.3791	1

WCDMA BAND II:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
			tune-up power		Gain			
			(dBm)	(mW)	(dBi)	Numeric		
9262	23.81	23±1	24	251.189	3.8	2.40	0.1199	1
9400	23.56	23±1	24	251.189	3.8	2.40	0.1199	1
9538	23.57	23±1	24	251.189	3.8	2.40	0.1199	1

WCDMA BAND IV:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
			tune-up power		Gain			
			(dBm)	(mW)	(dBi)	Numeric		
1312	23.05	23±1	24	251.189	3.9	2.45	0.1227	1
1413	23.52	23±1	24	251.189	3.9	2.45	0.1227	1
1513	23.70	23±1	24	251.189	3.9	2.45	0.1227	1

WCDMA BAND V:

Channel	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
			tune-up power		Gain			
			(dBm)	(mW)	(dBi)	Numeric		
4132	22.89	23±1	24	251.189	1.8	1.51	0.0756	0.55
4182	23.25	23±1	24	251.189	1.8	1.51	0.0756	0.56
4233	22.86	23±1	24	251.189	1.8	1.51	0.0756	0.56

LTE:

Band	Channel Freq. (MHz)	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2	1880	24.04	24±1	25	316.228	3.8	2.40	0.1509	1
4	1752.5	24.12	24±1	25	316.228	3.9	2.45	0.1544	1
12	699.7	23.92	24±1	25	316.228	1.1	1.29	0.0810	0.47

Simultaneous transmit:

BT+ GPRS850 =0.0002+0.6008=0.601 mW/cm2

BT+ EGPRS850 =0.0002+0.1509=0.1511 mW/cm2

BT+ GPRS1900 =0.0002+0.4772=0.4774 mW/cm2

BT+ EGPRS1900 =0.0002+0.3791=0.23793 mW/cm2

BT+ WCDMA BAND II =0.0002+0.1199=0.1201 mW/cm2

BT+ WCDMA BAND IV=0.0002+0.1227=0.1229 mW/cm2

BT+ (WCDMA BAND V/ Power density Limits) =0.0002+(0.0756/0.55)=0.0002+0.1375=0.13765 mW/cm2

BT+ LTE Band 2 = 0.0002+0.1509=0.1511 mW/cm2

BT+ (LTE Band 12/ Power density Limits) = 0.0002+(0.0810/0.47)=0.0002+0.1723=0.1725mW/cm2

Conclusion:

For the max result: 0.1725≤ 1.0 for 1g SAR, No SAR is required.

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