

Maximum Permissible Exposure Report

1. Product Information

FCC ID:	2A06C-SU376B
Product name	Assist Monitoring System SekurIt
List Model	SU376B
Power supply	DC 12.0V (with internal DC 3.70V battery)
Modulation Type	GMSK for GSM/GPRS, 8-PSK for EDGE,QPSK for UMTS
Hardware version	/
Software version	/
GSM/EDGE/GPRS Operation Frequency Band	GSM850/PCS1900/GPRS850/GPRS1900/EDGE850/EDGE1900
UMTS Operation Frequency Band	UMTS FDD Band II/V
GSM/EDGE/GPRS	Supported GSM/GPRS/EDGE
GSM Release Version	R99
GSM/EDGE/GPRS Power Class	GSM850:Power Class 4/ PCS1900:Power Class 1
GPRS/EDGE Multislot Class	GPRS/EDGE: Multi-slot Class 12
GPRS operation mode	Class B
WCDMA Release Version	R8
HSDPA Release Version	Release 7
HSUPA Release Version	Release 6
DC-HSUPA Release Version	Not Supported
Antenna Type	Internal Antenna, 0dBi(Max.) for BT/2.4G/2G/3G
BT Modulation Type	GFSK (BT LE V4.2)
2.4G Modulation Type	GFSK
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Device
Model Declaration	/

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3.1 Refer Evaluation Method

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to 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

5. Antenna Information

SU376B can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna type and antenna number	Technology	Operate frequency band	Maximum antenna gain
Antenna 0	Internal Antenna	GSM/UMTS	800 MHz – 2500 MHz	0 dBi
Antenna 1	Internal Antenna	BT	2000 MHz – 2500 MHz	0 dBi
Antenna 2	Internal Antenna	2.4G Transmitter	2000 MHz – 2500 MHz	0 dBi

6. Conducted Power

[BT LE]

Test Mode	Channel	Frequency (MHz)	Measured Peak Output Power (dBm)
GFSK – BT LE	0	2402	1.171
	19	2440	2.036
	39	2480	2.098

[GSM/EDGE]

GSM 850		Burst Average Conducted power (dBm)		
		Channel/Frequency(MHz)		
		128/824.2	190/836.6	251/848.8
GPRS (GMSK)	1TX slot	32.61	32.57	32.59
	2TX slot	30.41	30.52	30.44
	3TX slot	28.97	28.98	28.91
	4TX slot	27.47	27.52	27.48
EDGE(8PSK)	1TX slot	26.01	26.16	26.08
	2TX slot	25.02	25.29	25.22
	3TX slot	24.53	24.49	24.50
	4TX slot	23.98	23.81	23.99

GSM 1900		Burst Average Conducted power (dBm)		
		Channel/Frequency(MHz)		
		512/1850.2	661/1880	810/1909.8
GPRS (GMSK)	1TX slot	29.58	29.74	29.61
	2TX slot	28.47	28.53	28.38
	3TX slot	27.00	27.21	27.39
	4TX slot	26.49	26.66	26.50
EDGE (8PSK)	1TX slot	25.62	25.97	25.92
	2TX slot	24.49	24.52	24.44
	3TX slot	23.99	23.73	23.90
	4TX slot	22.47	22.49	22.53

[WCDMA]

Item	band	WCDMA Band II result (dBm)			WCDMA Band V result (dBm)		
		Channel/Frequency(MHz)			Channel/Frequency(MHz)		
	sub-test	9262/ 1852.4	9400/ 1880	9538/ 1907.6	4132/ 826.4	4183/ 836.6	4233/ 846.6
RMC	12.2kbps RMC	23.57	23.65	23.45	23.50	23.82	23.44
HSDPA	Sub –Test 1	22.98	22.94	22.90	22.81	22.94	22.78
	Sub –Test 2	22.11	21.28	21.35	21.95	21.76	21.84
	Sub –Test 3	21.98	21.77	21.85	21.69	21.72	21.65
	Sub –Test 4	21.94	21.87	21.81	21.98	21.67	21.97
HSUPA	Sub –Test 1	21.88	21.91	21.96	21.79	21.86	21.60
	Sub –Test 2	21.04	21.14	21.23	21.53	21.24	21.11
	Sub –Test 3	21.09	21.01	21.12	21.64	21.78	21.63
	Sub –Test 4	21.91	21.85	21.78	21.29	21.12	21.17
	Sub –Test 5	21.58	21.67	21.48	21.49	21.83	21.65

[2.4G Transmitter]

Test Mode	Channel	Frequency (MHz)	Field Strength of Fundamental (dBuV/m)
2.4G Transmitter	1	2406	87.34

7. Manufacturing Tolerance

[BT LE]

GFSK – BT LE (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	2.0	2.0	2.0
Tolerance \pm (dB)	1.0	1.0	1.0

[GSM]

GSM 850 GPRS (GMSK) (Burst Average Power)				
Channel		128	190	251
1 Txslot	Target (dBm)	32.0	32.0	32.0
	Tolerance \pm (dB)	1.0	1.0	1.0
2 Txslot	Target (dBm)	30.0	30.0	30.0
	Tolerance \pm (dB)	1.0	1.0	1.0
3 Txslot	Target (dBm)	28.0	28.0	28.0
	Tolerance \pm (dB)	1.0	1.0	1.0
4 Txslot	Target (dBm)	27.0	27.0	27.0
	Tolerance \pm (dB)	1.0	1.0	1.0
GSM 850 EDGE (8PSK) (Burst Average Power)				
Channel		128	190	251
1 Txslot	Target (dBm)	26.0	26.0	26.0
	Tolerance \pm (dB)	1.0	1.0	1.0
2 Txslot	Target (dBm)	25.0	25.	25.0
	Tolerance \pm (dB)	1.0	1.0	1.0
3 Txslot	Target (dBm)	24.0	24.0	24.0
	Tolerance \pm (dB)	1.0	1.0	1.0
4 Txslot	Target (dBm)	23.0	23.0	23.0
	Tolerance \pm (dB)	1.0	1.0	1.0
GSM 1900 GPRS (GMSK) (Burst Average Power)				
Channel		512	661	810
1 Txslot	Target (dBm)	29.0	29.0	29.0
	Tolerance \pm (dB)	1.0	1.0	1.0
2 Txslot	Target (dBm)	28.0	28.0	28.0
	Tolerance \pm (dB)	1.0	1.0	1.0
3 Txslot	Target (dBm)	27.0	27.0	27.0
	Tolerance \pm (dB)	1.0	1.0	1.0
4 Txslot	Target (dBm)	26.0	26.0	26.0
	Tolerance \pm (dB)	1.0	1.0	1.0
GSM 1900 EDGE (8PSK) (Burst Average Power)				
Channel		512	661	810
1 Txslot	Target (dBm)	25.0	25.0	25.0
	Tolerance \pm (dB)	1.0	1.0	1.0
2 Txslot	Target (dBm)	24.0	24.0	24.0
	Tolerance \pm (dB)	1.0	1.0	1.0
3 Txslot	Target (dBm)	23.0	23.0	23.0
	Tolerance \pm (dB)	1.0	1.0	1.0
4 Txslot	Target (dBm)	22.0	22.0	22.0
	Tolerance \pm (dB)	1.0	1.0	1.0

[WCDMA]

UMTS Band V				
Channel	Channel 4132	Channel 4182	Channel 4233	
Target (dBm)	23.0	23.0	23.0	
Tolerance \pm (dB)	1.0	1.0	1.0	
UMTS Band V HSDPA(sub-test 1)				
Channel	Channel 4132	Channel 4182	Channel 4233	
Target (dBm)	22.0	22.0	22.0	
Tolerance \pm (dB)	1.0	1.0	1.0	
UMTS Band V HSDPA(sub-test 2)				
Channel	Channel 4132	Channel 4182	Channel 4233	
Target (dBm)	21.0	21.0	21.0	
Tolerance \pm (dB)	1.0	1.0	1.0	
UMTS Band V HSDPA(sub-test 3)				
Channel	Channel 4132	Channel 4182	Channel 4233	
Target (dBm)	21.0	21.0	21.0	
Tolerance \pm (dB)	1.0	1.0	1.0	
UMTS Band V HSDPA(sub-test 4)				
Channel	Channel 4132	Channel 4182	Channel 4233	
Target (dBm)	21.0	21.0	21.0	
Tolerance \pm (dB)	1.0	1.0	1.0	

UMTS Band V HSUPA(sub-test 1)			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band V HSUPA(sub-test 2)			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band V HSUPA(sub-test 3)			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band V HSUPA(sub-test 4)			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band V HSUPA(sub-test 5)			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	23.0	23.0	23.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSDPA(sub-test 1)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	22.0	22.0	22.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSDPA(sub-test 2)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSDPA(sub-test 3)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSDPA(sub-test 4)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSUPA(sub-test 1)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSUPA(sub-test 2)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSUPA(sub-test 3)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSUPA(sub-test 4)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0
UMTS Band II HSUPA(sub-test 5)			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	21.0	21.0	21.0
Tolerance \pm (dB)	1.0	1.0	1.0

8. Measurement Results

8.1 Standalone MPE

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r = 20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[Antenna 0]

Communication Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW					
GPRS850	24.99	315.5005	0	1.0000	100%	0.0628	0.5667
EDGE850	20.99	125.6030	0	1.0000	100%	0.0250	0.5667
GPRS1900	23.99	250.6019	0	1.0000	100%	0.0499	1.0000
EDGE1900	19.99	90.7700	0	1.0000	100%	0.0199	1.0000
WCDMA Band V	24.00	251.1886	0	1.0000	100%	0.0500	0.5667
WCDMA Band II	24.00	251.1886	0	1.0000	100%	0.0500	1.0000

[Antenna 1]

Communication Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW					
GFSK – BT LE	3.00	1.9953	0	1.0000	100%	0.0004	1.0000

[Antenna 2]

According to KDB 412172 D01 Determining ERP and EIRP format;
 $eirp = p_t \times g_t = (E \times d)^2 / 30$

Where:

p_t = transmitter output power in watts,

g_t = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m,

d = measurement distance in meters (m).

EIRP = 87.34 dBuV/m = 0.1623 mW = -7.87 dBm

Communication Type	EIRP Output power		Duty Cycle	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW			
2.4G Transmitter	-7.87	0.1623	100%	0.0001	1.0000

Remark:

1. Output power including tune-up tolerance;

2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

3. For GSM/GPRS/EDGE, the division factor as follows;

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03 dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02 dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26 dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01 dB

8.2 Simultaneous Transmission MPE

The sample support GSM/UMTS, BT, 2.4GHz and GPS modular, GSM/UMTS, BT, 2.4GHz transmitter modular share difference antenna, GPS modular only for receiver function, need consider simultaneous transmission for GSM/UMTS/BT/2.4GHz transmitter modular;

Maximum Simultaneous transmission MPE Ratio for GSM/UMTS/BT/2.4GHz Transmitter modular

Maximum MPE Ratio _{GSM/UMTS}	Maximum MPE Ratio _{BT}	Maximum MPE Ratio _{2.4GHz}	\sum MPE ratios	Limit	Results
0.1108	0.0004	0.0001	0.2	1.0	PASS

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----THE END OF REPORT-----