

RF Exposure Evaluation

FCC ID: 2AJ5B-BT23

1. Client Information

Applicant	:	SAGE HUMAN ELECTRONICS INTERNATIONAL CO.,LTD.
Address	:	4F.,A Building,Rongli Industrial Park,No.2 Guiyuan Rd.Guihua Community,Guanlan Town,Longhua New Dist. Shenzhen, China
Manufacturer	:	SAGE HUMAN ELECTRONICS INTERNATIONAL CO.,LTD.
Address	:	4F.,A Building,Rongli Industrial Park,No.2 Guiyuan Rd.Guihua Community,Guanlan Town,Longhua New Dist. Shenzhen, China

2. General Description of EUT

EUT Name	:	Bluetooth FM Transmitter for Car	
Models No.	:	BT23	
Model Difference	:	N/A	
Product Description	:	Operation Frequency:	Bluetooth V5.0: 2402~2480 MHz
	:	Antenna Gain:	-0.68dBi PCB Antenna
Power Rating	:	Input: DC 12V-24V. Output: 5V/2.4A + 5V/3A	
Software Version	:	CGBT1854_ATS2819_(shijie_BT23)_2020-08-17_bypass_V0.0.6_[CGF]	
Hardware Version	:	BT23_2819_8027_V1.0	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note: More test information about the EUT please refer the RF Test Report.

SAR Test Exclusion Calculations

1. FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

- (1) Clause 4.3: General SAR test reduction and exclusion guidance

- Sub clause 4.31: Standalone SAR test exclusion considerations

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance ≤ 5 mm are determined by:

- $$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation, mm})] * [\sqrt{f_{\text{(GHz)}}}] \leq 3.0 \text{ for 1-g SAR}$$

- $$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation, mm})] * [\sqrt{f_{\text{(GHz)}}}] \leq 7.5.0 \text{ for 10-g SAR}$$

2. Calculation:

Test separation: 5mm						
Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	0.123	0 ± 1	1.0	1.2589	0.390	3.0
2.441	0.165	0 ± 1	1.0	1.2589	0.393	3.0
2.480	-0.202	0 ± 1	1.0	1.2589	0.315	3.0

Test separation: 5mm						
Bluetooth Mode ($\pi/4$ -DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-0.388	0 ± 1	1.0	1.2589	0.390	3.0
2.441	-0.342	0 ± 1	1.0	1.2589	0.393	3.0
2.480	-0.777	0 ± 1	1.0	1.2589	0.315	3.0

Test separation: 5mm						
Bluetooth Mode (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-3.185	-3 ± 1	-2.0	0.6310	0.196	3.0
2.441	-1.017	-1 ± 1	0	1.0000	0.312	3.0
2.480	-1.387	-1 ± 1	0	1.0000	0.315	3.0

So the worst RF Exposure Evaluation is calculated as **0.393 < limit 3.0**.

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

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