

RF Exposure Evaluation

FCC ID: 2AJ5B-C77

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.	:	C77, C77Q, C77D, BH478A, BH478B, BH478C	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is appearance color.	
Sample ID	:	20201118-14-3#& 20201118-14-4#	
Product Description	:	Operation Frequency:	Bluetooth V5.0: 2402~2480 MHz
	:	Antenna Gain:	-0.68dBi Chip Antenna
Power Rating	:	Input: DC 12-24V USB Output: QC3.0(DC 5V 3A, 9V2A, 12V1.5A) Type-C Output: PD3.0(DC 5V 3A, 9V2A, 12V1.5A) Shared Output: DC 5V4.8A(MAX)	
Software Version	:	N/A	
Hardware Version	:	N/A	
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	1.046	1±1	2	1.585	0.491	3.0
2.441	1.149	1±1	2	1.585	0.495	3.0
2.480	0.594	1±1	2	1.585	0.499	3.0

Test separation: 5mm						
Bluetooth Mode (π /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	0.159	0±1	1.0	1.259	0.390	3.0
2.441	0.432	0±1	1.0	1.259	0.393	3.0
2.480	-0.258	0±1	1.0	1.259	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	0.407	0±1	1.0	1.259	0.390	3.0
2.441	0.551	0±1	1.0	1.259	0.393	3.0
2.480	-0.062	0±1	1.0	1.259	0.315	3.0

So the worst RF Exposure Evaluation is calculated as **0.499 < 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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