

# RF Exposure Evaluation

## FCC ID: 2AJ5B-C78

### 1. Client Information

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

### 2. General Description of EUT

<b>EUT Name</b>	:	Bluetooth FM Transmitter for Car	
<b>Models No.</b>	:	C78, C78Q, C78S, BH477A, BH477B, BH477C	
<b>Model Difference</b>	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is appearance color.	
<b>Sample ID</b>	:	20201118-14-5#& 20201118-14-6#	
<b>Product Description</b>	:	Operation Frequency:	Bluetooth V5.0: 2402~2480 MHz
	:	Antenna Gain:	-0.68dBi Chip Antenna
<b>Power Rating</b>	:	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)	
<b>Software Version</b>	:	N/A	
<b>Hardware Version</b>	:	C78_2819-V1.0	
<b>Remark</b>	:	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  $\leq 5$  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	1.141	1±1	2	1.585	0.491	3.0
2.441	1.177	1±1	2	1.585	0.495	3.0
2.480	0.609	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	0.186	0±1	1.0	1.259	0.390	3.0
2.441	0.340	0±1	1.0	1.259	0.393	3.0
2.480	-0.196	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	0.515	0±1	1.0	1.259	0.390	3.0
2.441	0.670	0±1	1.0	1.259	0.393	3.0
2.480	0.151	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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