

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	OEM SYSTEMS COMPANY INC.
Address of applicant:	135 SOUTH ROCK BLVD, SUITE #310 RENO, NEVADA 89502-7168
Manufacturer:	Jiangmen Daoan Car Audio Co., Ltd
Address of manufacturer:	No.8 Nuociken,DuruanTown,Jiangmen,Guangdong,China

General Description of EUT:

Product Name:	Multimedia MP5 Player
Trade Name:	/
Model No.:	MS-21
Adding Model(s):	/
Rated Voltage:	DC 12V
Power Adapter	
FCC ID:	2A6TL-MS-21
Equipment Type:	Fixed device

Technical Characteristics of EUT:

Wi-Fi

Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	15.22dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	External Antenna
Antenna Gain:	3dBi

Bluetooth

Bluetooth Version:	V4.1(BR/EDR/BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	4.86dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK
Channel Separation:	2MHz
Type of Antenna:	External Antenna
Antenna Gain:	3dBi

1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density

1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm²)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator,
the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

For Wi-Fi

Maximum Tune-Up output power: 15.5(dBm)

Maximum peak output power at antenna input terminal: 35.48(mW)

Prediction distance: >20(cm)

Prediction frequency: 2437 (MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.00

The worst case is power density at prediction frequency at 20cm: 0.0141(mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

For Bluetooth

Maximum Tune-Up output power: 5.0(dBm)

Maximum peak output power at antenna input terminal: 3.16(mW)

Prediction distance: >20(cm)

Prediction frequency: 2480(MHz)

Antenna gain: 3 (dBi)

Directional gain (numeric gain): 2.00

The worst case is power density at prediction frequency at 20cm: 0.0013(mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

WIFI and BT is the use the same antenna cannot simultaneous transmission.

Result: Pass