

FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission’s guideline.

According to FCC KDB 447498 D01 Mobile Portable RF Exposure v04 section 5, Push-to-talk (PTT) devices:

a) RF exposure is evaluated with a duty factor of 50% when the actual operating duty factor is $\leq 50\%$. Devices supporting higher duty factors shall be evaluated at the maximum duty factor; for example, devices supporting operator-assisted PSTN calls. Contact the FCC Laboratory when unable to test a device at the required duty factor due to hardware limitations or other reasons.

b) Portable PTT devices

i) The power thresholds and operating conditions in Table 1 are used to determine SAR test requirements for PTT radios required to comply with the general population exposure limit. When the occupational exposure limit applies, these power thresholds are increased by a factor of five (5) to determine the test requirements. SAR is required for PTT devices with maximum output power greater than these thresholds.28 SAR evaluation is also required for separation distances smaller than those in Table 1. Contact the FCC Laboratory to determine if SAR evaluation is necessary for other frequencies or when the SAR is very low.

Table 1 - SAR Evaluation Power Thresholds for PTT devices, $f \leq 0.5$ GHz

Exposure Conditions	mW
Held to face ≥ 2.5 cm	250
Body-worn ≥ 1.5 cm	200
Body-worn ≥ 1.0 cm	150

Notes:
 1. The time-averaged output power, corresponding to the required PTT duty factor, is compared with these thresholds.
 2. The closest distance between the user and the device or its antenna is used to determine the power thresholds.

SAR Evaluation Power Thresholds for PTT devices, $f \leq 0.5$ GHz

Exposure Conditions	mW (for uncontrolled)	mW (for occupational)
Held to face ≥ 2.5 cm	250	1250
Body-worn ≥ 1.5 cm	200	1000
Body-worn ≥ 1.0 cm	150	750

ii) Additional SAR evaluation with a SAM phantom is required for PTT devices with held-to-ear operating mode.29 Contact the FCC Laboratory for device operating and test configurations.

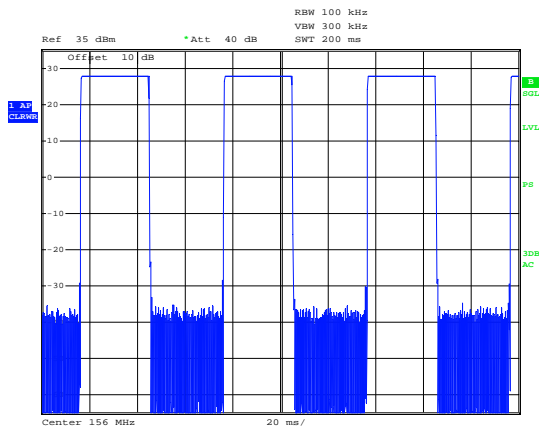
Routine SAR evaluation refers to that specifically required by §2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Result:

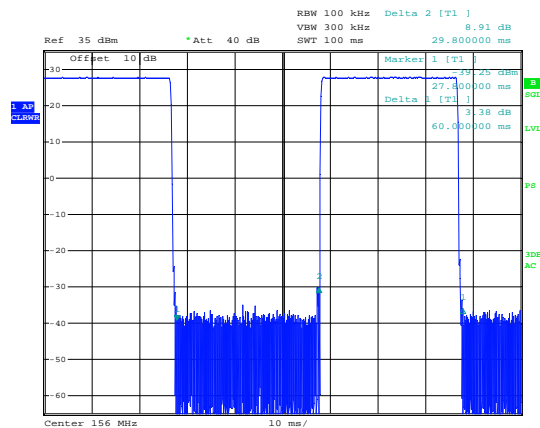
1. The distance between the antenna and the users is 2.3cm for boby worn,and 2.5cm for face
2. The output power:

Mode	Frequency (MHz)	Peak Output Power (dBm)	Average Output Power (mW)	Duty Cycle (%)	Average Output Power (mW)	Comments
Analog Modulation (FM)	136.5	30.00	1000	50.00	500	High Power
	138.5	30.00	1000	50.00	500	High Power
	146.5	30.40	1096	50.00	603	High Power
	147.5	30.45	1109	50.00	616	High Power
	155.5	30.24	1057	50.00	560	High Power
	159.5	30.53	1130	50.00	638	High Power
	160.5	30.52	1127	50.00	637	High Power
	167.5	30.36	1086	50.00	592	High Power
Digital Modulation (4FSK)	173.5	30.07	1016	50.00	518	High Power
	136.5	30.01	1002	49.68	498	High Power
	138.5	30.01	1002	49.68	498	High Power
	146.5	30.43	1104	49.68	603	High Power
	147.5	30.49	1119	49.68	623	High Power
	155.5	30.25	1059	49.68	558	High Power
	159.5	30.57	1140	49.68	646	High Power
	160.5	30.57	1140	49.68	646	High Power
	167.5	30.39	1094	49.68	592	High Power
173.5	30.08	1019	49.68	516	High Power	





Date: 21.DEC.2012 18:52:09



Date: 21.DEC.2012 18:53:16

Note: duty cycle= $Ton/Tp=29.8ms/60ms=0.4968$ (49.68%) for 4FSK modulation, worst case at data transmitting mode

Conclusion:

The maximum time-averaged output power is 646 mW <the exclusion thresholds is 1000 mW

According to FCC KDB 447498 D01 Mobile Portable RF Exposure v04 section 5, Push-to-talk (PTT) devices, the SAR evaluation is not required.