

# RF exposure information

## Product description

Applicant	:	YAESU MUSEN CO., LTD.
Address	:	Tennozu Parkside Building, 2-5-8, Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-0002 Japan
FCC ID	:	K6620725X20
Model	:	FT3DR
Test item	:	144/430MHz DIGITAL/ANALOG TRANSCEIVER (Bluetooth)
Operating frequency range	:	2402 - 2480 MHz
Measured conducted output power	:	-0.1 dBm@2402 MHz, -0.2 dBm@2440 MHz, -1.6 dBm@ 2480 MHz (result is referred from test report WE190325BC1-14 issued by SGS Japan Inc.)
Maximum antenna gain	:	+2.14 dBi
Specification of maximum output power	:	+2 dBm
Specification of output power tolerance	:	(tolerance is included in specification of maximum output power)
Separation distance	:	No declaration by the applicant ( $\leq 5$ mm)

## Analysis for portable use

Standalone SAR test exclusion considerations are defined in the KDB 447498 v06 chapter4.3.1.

- a) For 100 MHz to 6 GHz and *test separation distances*  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$\left[ \frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \cdot \sqrt{f_{\text{GHz}}} \right] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,}^{30} \text{ where}$$

- $f_{\text{GHz}}$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation<sup>31</sup>
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is  $\leq 50$  mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is  $< 5$  mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

The measured maximum conducted output power is -0.1 dBm (0.98 mW).

The specification of maximum output power +2.0 dBm (1.58 mW), this value is highest so we use this value to calculation.

Applying above formula for this device,  $(1.58 \text{ mW} / 5 \text{ mm}) * \sqrt{2.480 \text{ GHz}} = 0.498$ , rounded to one decimal = 0.5

Result is less than 3.0, so YAESU MUSEN CO., LTD. 144/430MHz DIGITAL/ANALOG TRANSCEIVER (Bluetooth) (FT3DR) meets the SAR exclusion.

For reference, other frequency results are shown below.

General RF exposure =  $(1.58 \text{ mW} / 5 \text{ mm}) * \sqrt{2.402 \text{ GHz}} = 0.490$ , rounded to one decimal = 0.5

General RF exposure =  $(1.58 \text{ mW} / 5 \text{ mm}) * \sqrt{2.444 \text{ GHz}} = 0.494$ , rounded to one decimal = 0.5