RF Exposure evaluation

According to 447498 D01 General RF Exposure Guidance v05
The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
f(GHz) is the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation
The result is rounded to one decimal place for comparison

eirp = pt x gt = (EXd)2/30
where:
pt = transmitter output power in watts,
gt = numeric gain of the transmitting antenna (unitless),
E = electric field strength in V/m, --- 10((dBuV/m)/20)/106
d = measurement distance in meters (m)---3m
So pt = (EXd)2/30 x gt

RF Exposure evaluation for MX-2
Copied from the FCC test report: clause 3.10 Maximum Peak Output Power

Test Result:
GFSK(1Mbps)

Test channel	Frequency MHz	Reading level(dBm)	Conducted Output Power (dBm)	Limit dBm
CH 00	2402	2.945	5.745	30
CH 39	2441	2.686	5.486	30
CH 78	2480	2.596	5.396	30

Note: 1 watt=30dBm.
The channel separation > bandwidth.
Cable lose=2.8dB

π/4-DQPSK(2Mbps)

Test channel	Frequency MHz	Reading level(dBm)	Conducted Output Power (dBm)	Limit dBm
CH 00	2402	0.954	3.754	20.96
CH 39	2441	1.079	3.879	20.96
CH 78	2480	0.858	3.658	20.96

Note: 0.125 watt=20.96dBm.

The channel separation > 2/3 bandwidth.

Cable lose=2.8dB

8-DPSK (3Mbps

Test channel	**Frequency**	**Reading level(dBm)**	**Conducted Output Power (dBm)**	**Limit**
	MHz			**dBm**
CH 00	**2402**	**0.724**	**3.524**	**20.96**
CH 39	**2441**	**0.615**	**3.415**	**20.96**
CH 78	**2480**	**0.401**	**3.201**	**20.96**

Note: 0.125 watt=20.96dBm.

The channel separation > 2/3 bandwidth.

Cable lose=2.8dB

Then we choose GFSK(1Mbps) mode as the worst case of Maximum Peak Output Power:

GFSK(1Mbps)

Test channel	Frequency	Conducted Output Power (dBm)	Antenna gain/ dBi	EIRP/ dBm	EIRP / mW
	MHz				
CH 00	2402	5.745	0.5	6.245	4.212
CH 39	2441	5.486	0.5	5.986	3.968
CH 78	2480	5.396	0.5	5.896	3.887

Note: Cable lose=2.8dB.

EIRP/ dBm= Conducted Max Output Power/ dBm+ Antenna gain /dBi.

Since the EUT has two simple wire external antennas (3/4 wave antenna) and built outside the housing without any connectors, we choose the min. test separation distance = 5mm

General RF Exposure:

(4.212 mW)/5.0mm)x √2.402 GHz = 1.306

(3.968 mW)/5.0mm)x √2.441 GHz = 1.240

(3.887 mW)/5.0mm)x √2.480 GHz = 1.224

SAR requirement: S=3.0

General RF Exposure<3

Then SAR evaluation is not required