

File Number: 0932-EX-CN-2022

August 22, 2022

Compliance of equipment RN-530 with ITU Resolution 243 OOB Limits as requested by NASA.

ITU Res 243 OOB limits requested by NASA:

Frequency band for the EESS (passive)	Frequency band for IMT stations	Unwanted emission mean power for IMT stations ¹	Recommended limits for IMT stations ¹
36-37 GHz	37-40.5 GHz	-43 dB(W/MHz) and -23 dB(W/GHz) within the frequency band 36-37 GHz	-30 dB(W/GHz)

¹ The unwanted emission power level is considered in terms of total radiated power (TRP). The TRP is to be understood here as the integral of the power transmitted from all antenna elements in different directions over the entire radiation sphere.

Below data is from the DVT (Design Verification Test) of the radio as done by the Qualcomm tools.



GNB_TxOBUE

Status: **PASS**

Meas Delay (ms)	Gain	SEM Category (A/B)	SEM Limit Type (Absolute/Relative)	Enable Temp Verification?	Target Tx Power (dBm)	DL Waveform	Tx Beam ID	Avg. Thermistor Temperature (C)	Time (s)
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	11	41.125	23.14
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	11	41.3125	24.70
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	11	42.125	23.08
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	11	42.25	26.41
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	11	43.5625	22.85
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	11	43.6125	25.47
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	139	43.875	23.52
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	139	43.9375	25.47
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	139	44.1875	22.64
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	139	44.1875	25.47
2000	0	CAT-A	Absolute	No	45.5	GNB_TM1.1	139	45.0625	23.27
2000	0	CAT-B	Absolute	No	45.5	GNB_TM1.1	139	45.0625	24.53

OBUE Details

DL Desc	Tx Beam ID	DL Freq (MHz)	SEM Category (A/B)	Mask Area	SEM Start Frequency (MHz)	SEM Stop Frequency (MHz)	MeasBW (MHz)	SEM Offset Margin Limit (dB)	SEM Offset Margin Limit Min	Time (s)
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-A	-2	-40.5	-1709.98	1	12.0412	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-A	-1	0.0	-40.5	1	23.0526	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-A	1	0.0	40.5	1	22.1718	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-A	2	40.5	3800.08	1	12.3621	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	-3	-805	-1709.98	10	24.078	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	-2	-40.5	-800.5	1	12.5276	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	-1	0.0	-40.5	1	22.8837	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	1	0.0	40.5	1	22.1474	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	2	40.5	800.5	1	12.2541	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2204999_TargetPower=45.5dBm	11	37350.00 37449.96 37549.92 37549.92	CAT-B	3	805	3800.08	10	15.7359	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-A	-2	-40.5	-2800.08	1	10.8902	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-A	-1	0.0	-40.5	1	21.2889	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-A	1	0.0	40.5	1	21.5804	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-A	2	40.5	2800.08	1	11.4951	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-B	-3	-805	-2800.08	10	24.2917	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-B	-2	-40.5	-800.5	1	10.8130	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-B	-1	-0.0	-40.5	1	21.2809	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-B	1	0.0	40.5	1	21.043	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201907_TargetPower=45.5dBm	11	30350.00 30450.04 30550.00 30549.96	CAT-B	2	40.5	800.5	1	11.014	0	

Can0_FR2_DL_100MHz_QPSK_Channel_2201687_TargetPower=45.5dBm	11	38350.00 38450.04 38550.00 38549.96	CAT-B	3	805	2800	10	19.2924	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-A	-2	-40.5	-3800.02	1	9.15507	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-A	-1	0.0	-40.5	1	19.8818	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-A	1	0.0	40.5	1	21.1073	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-A	2	40.5	1800.04	1	10.3487	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	-3	-805	-2800.02	10	23.0238	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	-2	-40.5	-800.5	1	8.7524	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	-1	-0.0	-40.5	1	19.8343	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	1	0.0	40.5	1	21.124	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	2	40.5	800.5	1	10.069	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2206333_TargetPower=45.5dBm	11	38350.04 38450.00 38549.96 38549.92	CAT-B	3	805	1800.04	10	13.9973	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-A	-2	-40.5	-1709.98	1	11.3012	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-A	-1	-0.0	-40.5	1	22.9549	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-A	1	0.0	40.5	1	22.1871	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-A	2	40.5	3800.08	1	12.7476	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	-3	-805	-1709.98	10	25.2093	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	-2	-40.5	-800.5	1	11.1264	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	-1	-0.0	-40.5	1	21.8646	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	1	0.0	40.5	1	22.258	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	2	40.5	800.5	1	12.612	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2234999_TargetPower=45.5dBm	139	37350.00 37449.96 37549.92 37549.92	CAT-B	3	805	3800.08	10	17.5857	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201687_TargetPower=45.5dBm	139	38350.00 38450.04 38550.00 38549.96	CAT-A	-2	-40.5	-2800.06	1	9.25644	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201687_TargetPower=45.5dBm	139	38350.00 38450.04 38550.00 38549.96	CAT-A	-1	-0.0	-40.5	1	19.8952	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201687_TargetPower=45.5dBm	139	38350.00 38450.04 38550.00 38549.96	CAT-A	1	0.0	40.5	1	20.7436	0	
Can0_FR2_DL_100MHz_QPSK_Channel_2201687_TargetPower=45.5dBm	139	38350.00 38450.04 38550.00 38549.96	CAT-A	2	40.5	2800	1	10.3712	0	

Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	-3	-895	-2800.06	10	24.8618	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	-2	-40.5	-800.5	1	9.31338	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	-1	-0.5	-40.5	1	19.9761	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	1	0.5	-40.5	1	20.8607	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	2	40.5	800.5	1	10.2549	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2251667_TargetPower=45.5dbm	139	38350.08	38450.04	38550.00	CAT-B	3	805	2800	10	20.2055	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-A	-2	-40.5	-3800.02	1	7.44366	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-A	-1	-0.5	-40.5	1	18.2347	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-A	1	0.5	-40.5	1	20.7096	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-A	2	40.5	1800.04	1	10.5466	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	-3	-805	-3800.02	10	25.5164	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	-2	-40.5	-800.5	1	7.08598	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	-1	-0.5	-40.5	1	17.8364	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	1	0.5	-40.5	1	20.8638	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	2	40.5	800.5	1	10.4912	0	
Can0_FR2_DL_100kHz_GPSK_Channel_2298333_TargetPower=45.5dbm	139	39350.04	39450.00	39549.96	CAT-B	3	805	1800.04	10	17.115	0	

OBUE Margin Summary

Carrier ID	Tx Beam ID	DL Freq (MHz)			Carr Power(dBm)	Worst OBUE Offset	Worst OBUE Margin	Worst OBUE Margin Min	Time (s)
0	11	37350.00	37449.96	37549.92	37649.88	45.4548	2	12.3621	0
0	11	37350.00	37449.96	37549.92	37649.88	45.4489	2	12.2541	0
0	11	38350.08	38450.04	38550.00	38649.96	45.6769	-2	10.6902	0
0	11	38350.08	38450.04	38550.00	38649.96	45.6519	-2	10.8139	0
0	11	39350.04	39450.00	39549.96	39649.92	45.7864	-2	9.15597	0
0	11	39350.04	39450.00	39549.96	39649.92	45.7441	-2	8.77824	0
0	139	37350.00	37449.96	37549.92	37649.88	45.4712	-2	11.3612	0
0	139	37350.00	37449.96	37549.92	37649.88	45.4775	-2	11.1254	0
0	139	38350.08	38450.04	38550.00	38649.96	45.9128	-2	9.25844	0
0	139	38350.08	38450.04	38550.00	38649.96	45.9478	-2	9.31338	0
0	139	39350.04	39450.00	39549.96	39649.92	45.3049	-2	7.44366	0
0	139	39350.04	39450.00	39549.96	39649.92	45.2944	-2	7.08598	0

As can be seen from the plots and the above data, our radio meets the ITU 243 OBE limits as requested by NASA.

Thanks

Srinivas Bokka