



RF Exposure evaluation for mobile devices

Report reference_MDE_UBLOX_2404_MPE_01

Report date: 10/10/2024

Models: **MAYA-W161-00B** FCC ID: **XPYMAYAW161** and **XPYMAYAW160**
MAYA-W160-00B IC: **8595A- MAYAW161** and **8595A- MAYAW160**

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310
RSS-102 Issue 5

Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	Power density (mW/cm ²)
300 – 1,500	f/1500
1,500 – 100,000	1.0

Limits specified per RSS-102, Issue 6.

Frequency range (MHz)	Power density (W/m ²)	Power density (mW/cm ²)
300 – 6000	$0.02619 f^{0.6834}$	$mW/cm^2 = W/m^2 * 0.1$

Equation OET bulletin 65, page 18, edition 97-01: $S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$

Where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna = 20cm

Co-Location Considerations

The calculation below is used to consider situations in which simultaneous exposure to fields of different frequencies occur. The calculation is performed by the sum of each relative exposure for each equipment according to the following criteria.

$$\sum_{i=1}^N \frac{S_{eqi}}{S_{Lim i}} = \frac{S_{eq1}}{S_{Lim1}} + \frac{S_{eq2}}{S_{Lim2}} + \dots + \frac{S_{eqN}}{S_{LimN}} \leq 1$$

Where:

S_{eq} is the power density of the electromagnetic field at a given distance by a specific transmitter and a defined frequency.

S_{lim} is the MPE limit for the frequency being evaluated.

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Operational Bands	Ant	Frequency (MHz)	Ant Gain (dBi)	Output Power -cond- (dBm)	P	IC Limit (mW/cm ²)	S	Power Density value (mW/cm ²)	Verdict	FCC (Seq / SLim)	ISED (Seq / SLim)
					Output Power -cond- (mW)		FCC Limit (mW/cm ²)				
BLE	1	2402	3	9.00	7.94	0.5351	1.00	0.0032	Pass	0.0032	0.0059
BLE	2	2402	4.1	9.00	7.94	0.5351	1.00	0.0041	Pass	0.0041	0.0076
BLE	3	2402	3.8	9.00	7.94	0.5351	1.00	0.0038	Pass	0.0038	0.0071
Classic BT	1	2402	3	11.00	12.59	0.5351	1.00	0.0050	Pass	0.0050	0.0093
Classic BT	2	2402	4.1	11.00	12.59	0.5351	1.00	0.0064	Pass	0.0064	0.0120
Classic BT	3	2402	3.8	11.00	12.59	0.5351	1.00	0.0060	Pass	0.0060	0.0112
WLAN	1	2412	3	19.00	79.43	0.5366	1.00	0.0315	Pass	0.0315	0.0588
WLAN	2	2412	4.1	19.00	79.43	0.5366	1.00	0.0406	Pass	0.0406	0.0757
WLAN	3	2412	3.8	19.00	79.43	0.5366	1.00	0.0379	Pass	0.0379	0.0706
WLAN UNII 1	1	5240	4	18.00	63.10	0.9119	1.00	0.0315	Pass	0.0315	0.0346
WLAN UNII 1	2	5240	5.1	18.00	63.10	0.9119	1.00	0.0406	Pass	0.0406	0.0445
WLAN UNII 1	3	5240	5.3	18.00	63.10	0.9119	1.00	0.0425	Pass	0.0425	0.0466
WLAN UNII 2A	1	5300	4	18.00	63.10	0.9190	1.00	0.0315	Pass	0.0315	0.0343
WLAN UNII 2A	2	5300	5.1	18.00	63.10	0.9190	1.00	0.0406	Pass	0.0406	0.0442
WLAN UNII 2A	3	5300	5.3	18.00	63.10	0.9190	1.00	0.0425	Pass	0.0425	0.0463
WLAN UNII 2C	1	5580	4	18.00	63.10	0.9519	1.00	0.0315	Pass	0.0315	0.0331
WLAN UNII 2C	2	5580	5.1	18.00	63.10	0.9519	1.00	0.0406	Pass	0.0406	0.0427
WLAN UNII 2C	3	5580	5.3	18.00	63.10	0.9519	1.00	0.0425	Pass	0.0425	0.0447
WLAN UNII 3	1	5825	4	18.00	63.10	0.9803	1.00	0.0315	Pass	0.0315	0.0322
WLAN UNII 3	2	5825	5.1	18.00	63.10	0.9803	1.00	0.0406	Pass	0.0406	0.0414
WLAN UNII 3	3	5825	5.3	18.00	63.10	0.9803	1.00	0.0425	Pass	0.0425	0.0434

Sum of (S _{eqn} / S _{Limn}) Max BT + Max 2.4 WLAN	0.0471	0.0877	Passed
Sum of (Seqn / SLimn) Max BT + Max 5 GHz WLAN	0.0490	0.0587	Passed

Considered antennas		Gains	
Ant #	Antenna name	2.4ghz	5.15-5.85
ant 1	Molex WIFI 6E flex cable balance antenna	3	4
ant 2	Linx ANT-DB1-RAF	4.1	5.1
ant 3	Taoglass GW.59.3153	3.8	5.3

Yours sincerely,

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