



RF Exposure evaluation

Model: TCUFCA02SN

Contains FCC ID: N7NAR7582V1

Contains IC: 2417C- AR7582V1

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310
RSS-102 Issue 5 – March 2015

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 5.

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



Operational Bands	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain -numeric- (mW/cm ²)	Output Power -conducted- (dBm)	Output Power -conducted- (mW)	IC Limit (mW/cm ²)	FCC Limit (mW/cm ²)	Power Density value (mW/cm ²)	Margin to FCC Limit (mW/cm ²)	Margin to IC Limit (mW/cm ²)
GSM 850	824	0.21	1.0495	27.99	629.51	0.2576	0.55	0.1314	0.4186	0.1261
GSM 1900	1850	-2.25	0.5957	25.99	397.19	0.4476	1.00	0.0471	0.9529	0.4006
FDDII	1850	-2.25	0.5957	25.70	371.54	0.4476	1.00	0.04	0.9560	0.4036
FDDIV	1710	-2.51	0.5610	25.70	371.54	0.4242	1.00	0.04	0.9585	0.3827
FDDV	824	0.21	1.0495	26.70	467.74	0.2576	0.55	0.10	0.4523	0.1599
eFDD2	1850	-2.25	0.5957	25.20	331.13	0.4476	1.00	0.04	0.9608	0.4084
eFDD4	1710	-2.51	0.5610	25.20	331.13	0.4242	1.00	0.0370	0.9630	0.3872
eFDD5	824	0.21	1.0495	26.20	416.87	0.2576	0.55	0.0870	0.4630	0.1705
eFDD7	2500	-1.42	0.7211	25.20	331.13	0.5499	1.00	0.0475	0.9525	0.5024
eFDD12	699	0.21	1.0495	26.20	416.87	0.2302	0.47	0.0870	0.3790	0.1431
eFDD13	777	0.21	1.0495	26.20	416.87	0.2474	0.52	0.0870	0.4310	0.1604
eFDD17	704	0.21	1.0495	26.20	416.87	0.2313	0.47	0.0870	0.3820	0.1443
WLAN 2.4 GHz	2437	3	1.9953	4.70	2.95	0.5404	1.00	0.0012	0.9988	0.5392
WLAN 5 GHz	5755	4	2.5119	10.40	10.96	0.9722	1.00	0.0055	0.9945	0.9667

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.

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

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.



Assessment of Co-Location transmission for FCC

	GSM 850	WLAN 5 GHz
(S_{eq} / S_{Lim})	0.23898	0.00548
Sum of (S_{eqn} / S_{Limn})	0.24446	
Limit	1	
Assessment	passed	

Assessment of Co-Location transmission for IC

	GSM 850	WLAN 5 GHz
(S_{eq} / S_{Lim})	0.51033	0.00564
Sum of (S_{eqn} / S_{Limn})	0.51597	
Limit	1	
Assessment	passed	

Yours sincerely,

A handwritten signature in blue ink that reads 'T. S. Sunar'.

Teoman Soner Sunar