

	 MARKING ELECTROMAGNETIC COMPATIBILITY ELECTRICAL SAFETY LASER SPECTROSCOPY ENVIRONMENTAL PHYSICS	G.S.D. S.r.l. Certified in accordance with UNI EN ISO 9001:2008 by TÜV Rheinland Italia S.r.l. Certificate N. 39 00 1850509
G.S.D. S.r.l. PISA - Italy	Technical file n. 15850-TCF	Rev. 00
Manufacturer	Power-One Italy S.p.A.	
Address	Via San Giorgio, 642 52028 Terranuova Bracciolini (AR) Italy	
Test Family Name	Cellular Card	
FCC ID	X6W-3N89E contains FCC ID: UDV-SIM7100A	
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INDEX	
1.MAXIMUM PERMISSIBLE EXPOSURE.....	3

1. MAXIMUM PERMISSIBLE EXPOSURE

Prediction of Maximum Permissible Exposure (MPE) limit at a given distance has been performed

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g. mW)

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

R = distance to the centre of radiation of the antenna (appropriate units, e.g. cm)

MPE limit has been calculated according to General Population/Uncontrolled rules.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Calculation were performed with values from mpe calculation of FCC ID:UDV-SIM7100A and FCC ID: X6W-3N89E

Results				
WiFi Worst Case				
Frequency	MPE Limit	Maximum EIRP	Distance	Maximum Power Density at 20 cm
(MHz)	$(\frac{mW}{cm^2})$	(dBm)	(cm)	$(\frac{mW}{cm^2})$
2400	1	16.8	20	0.0077
LTE/WCDMA Worst case (LTE BAND V, 824-849 MHz, Duty Cycle 100%)				
Frequency	MPE Limit	Maximum EIRP	Distance	Maximum Power Density at 20 cm
(MHz)	$(\frac{mW}{cm^2})$	(dBm)	(cm)	$(\frac{mW}{cm^2})$
824	0.55	27.35	20	0.1100
Conclusion:				
Both of the WLAN and LTE device can transmit simultaneously, the formula of calculated MPE is:				
CPD ₁ /LPD ₁ +CPD ₂ /LPD ₂ < 1				
CPD = Calculation Power Density				
LPD = Limit of Power Density				
Therefore, the worst-case situation is 0.0077/1 + 0.11/0.55 = 0.2077, which is less than “1”.				
This confirmed that the device comply with FCC 1.1310 MPE Limit				