17. Test Conditions and Results – RF EXPOSURE REQUIREMENTS

21	TEST: RF Exposure Requirements		PASS
Parameters required prior to the test		Laboratory Ambient Temperature (°C)	15 to 35 °C
		Relative Humidity (%)	30 to 60 %
Parameters recorded during the test		Laboratory Ambient Temperature (°C)	---
		Relative Humidity (%)	---
		Air pressure (hPa)	1020
—		Frequency	Application Point
Fully configured sample tested at the power line frequency		24Vdc	Enclosure
Equipment mode:		Operation mode	#1 #2 #3
FCC Standard		§15.247	

General Test Configuration

Calculation uses the free space transmission formula:

$$S = \frac{PG}{4\pi r^2}$$ or equivalent $$S = \frac{EIRP}{4\pi r^2}$$

where
P = input power of the antenna
G = antenna gain relative to an isotropic antenna
r = distance from the antenna to the point of investigation.
EIRP = Effective Isotropic Radiated Power

Summary of Results

Device COMPLIES with Power Density requirements at 20cm separation

Directional Gain Calculation

Antenna: 3.11dBi (see pag.8)

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≥ 50 mm **447498 D01 General RF Exposure Guidance v06 – Appendix A**						
MHz	**50**	60	70	80	90	mm
100	474	481	487	494	501	SAR Test Exclusion Threshold (mW)
150	387	397	407	417	427	
300	274	294	314	334	354	
450	224	254	284	314	344	
835	164	220	275	331	387	
900	158	218	278	338	398	
1500	122	222	322	422	522	
1900	108	209	309	409	509	
2450	96	196	296	**396**	496	
3600	79	179	279	379	479	
5200	66	166	266	366	466	
5400	65	165	265	365	465	
5800	62	162	262	362	462	

The *test separation distances* ≥ *80 mm* is applied to determine SAR test exclusion.

Protocol b (worst case)

RESULTS			
CH	**TX Frequency (MHz)**	**Measured Power at Antenna Connector (dBm)**	**Antenna Gain (dBi)**
1	2412	16.603	3.11

CH	TX Frequency (MHz)	Radiated power (dBm)	E.I.R.P. (mW)	Distance (mm)	{[Power allowed at numeric threshold for 80 mm in step a)] + [(test separation distance – 80 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz	Limits
1	2412	19.713	94	80	94mW	328mW

Average Power at the Antenna	0.046 watts
Antenna Gain in dBi	3.11 dBi
Distance to the Area of Interest	2.62 feet 0.7986 metres
Frequency of Operation	2412 MHz
Are Ground Reflections Calculated?	No
Estimated RF Power Density	0.0012 mW/cm^2

	Controlled Environment	**Uncontrolled Environment**
Maximum Permissible Exposure (MPE)	5.005 mW/cm^2	1.005 mW/cm^2
Distance to Compliance From Centre of Antenna	0.0902 feet 0.0275 metres	0.1398 feet 0.0426 metres
Does the Area of Interest Appear to be in Compliance?	yes	yes