



Certification Exhibit

FCC ID: AU792U13A16861

FCC Rule Part: 47 CFR Part 2.1091

TÜV SÜD Project Number: 72129187

**Manufacturer: Multi-Tech Systems, Inc.
Model: MTCAP-LNA3**

RF Exposure

General Information:

Applicant: Multi-Tech Systems, Inc.
 Device Category: Mobile
 Environment: General Population/Uncontrolled Exposure

The MTCAP contains a LoRa transceiver and an LTE/WCDMA bands module. The TELIT LTE/WCDMA is a pre-approved module, FCC ID RI7LE910NAV2.

Technical Information:**Table 1: Technical Information**

	Telit Communications, S.p.A. LTE modem Model LE910-NA2 FCC ID: RI7LE910NAV2	LoRa Module FCCID: AU792U13A16861
Frequency Bands (MHz) & Conducted Power (dBm)	LTE Band 12: 699 MHz – 716 MHz Conducted Power = 24.00 dBm	923.3 to 927.5 MHz Conducted Power = 24.44 dBm
	LTE Band 17: 704 MHz – 715.9 MHz Conducted Power = 24.00 dBm	
	LTE Band 13: 777 MHz – 787 MHz Conducted Power = 24.00 dBm	
	LTE Band 5/WCDMA/HSPA: 824.47MHz – 848.3 MHz Conducted Power = 24.50 dBm	
	LTE Band 4: 1710.7 MHz – 1754.3 MHz Conducted Power = 24.00 dBm	
	LTE Band 2/WCDMA/HSPA: 1850.7 MHz – 1909.3 MHz Conducted Power = 24.50 dBm	
Antenna Type(s)	PCB Trace antenna	Stamped Metal SMT Antenna
Antenna Gain (dBi)	700MHz Band = 0.9 dBi	1 dBi
	800MHz Band = 0.9 dBi	
	1700MHz Band = 2.8 dBi	
	1900MHz Band = 2.8 dBi	

MPE Calculation:

The Power Density (mW/cm²) is calculated as follows:

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

Where:

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 center of radiation of the antenna (appropriate units, e.g., cm)

Table 2: MPE Calculation (Including Collocated Devices)

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)	Radio
699	24	0.47	251.19	0.9	1.230	20	0.061	A
704	24	0.47	251.19	0.9	1.230	20	0.061	B
777	24	0.52	251.19	0.9	1.230	20	0.061	C
826.4	24.5	0.55	281.84	0.9	1.230	20	0.069	D
1710.7	24	1.00	251.19	2.8	1.905	20	0.095	E
1852.4	24.5	1.00	281.84	2.8	1.905	20	0.107	F
923.3	24.44	0.62	277.97	1	1.259	20	0.070	G

Summation of MPE ratios – Simultaneous Transmissions

This device contains multiple transmitters which can operate simultaneously; therefore the maximum RF exposure is determined by the summation of MPE ratios. The limit is such that the summation of MPE ratios is ≤ 1.0.

Table 3: Summation of MPE Ratios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Radio A (Telit Band 12)	x					
Radio B (Telit Band 17)		x				
Radio C (Telit Band 13)			x			
Radio D (Telit Band 5)				x		
Radio E (Telit Band 4)					x	
Radio F (Telit Band 2)						x
Radio G (LoRa Radio)	x	x	x	x	x	x
Radio A MPE Ratio	0.131930202					
Radio B MPE Ratio		0.130993198				
Radio C MPE Ratio			0.118686244			
Radio D MPE Ratio				0.125207717		
Radio E MPE Ratio					0.095220431	
Radio F MPE Ratio						0.106839081
Radio G MPE Ratio	0.113104157	0.113104157	0.113104157	0.113104157	0.113104157	0.113104157
MPE Ratio Summation:	0.245034359	0.244097355	0.231790401	0.238311874	0.208324589	0.219943238