



America

Certification Exhibit

FCC ID: SM6-HUBTTU

FCC Rule Part: 15.247

TÜV SÜD Project Number: 72126877

Manufacturer: Mueller Systems
Model: MiHUB-TTU

RF Exposure

General Information:

Applicant: Mueller Systems
 Device Category: Mobile
 Environment: General Population/Uncontrolled Exposure

The MiHUB-TTU is collocated and transmits simultaneously with the MTSMC-H5 radio FCC ID: RI7HE910.

Technical Information:

Table 1: Technical Information

	<i>Device 1 Details (Mueller Systems, 900 MHz DTS, MiHUB-TTU, FCC ID: SM6- HUBTTU, IC: 9235A- HUBTTU)</i>	<i>Device 2 Details (Mueller Systems, 900 MHz DSS, MiHUB-TTU, FCC ID: SM6- HUBTTU, IC: 9235A- HUBTTU)</i>	<i>Device 3 Details (Telit Communications S.p.A., WWAN Module, Model HE910, FCC ID: RI7HE910, IC: 5131A-HE910)</i>	<i>Device 4 Details (Telit Communications S.p.A., WWAN Module, Model HE910, FCC ID: RI7HE910, IC: 5131A-HE910)</i>	<i>Device 5 Details (Telit Communications S.p.A., WWAN Module, Model HE910, FCC ID: RI7HE910, IC: 5131A-HE910)</i>
Frequency Band(s) (MHz)	903.65 - 915.73	912.31 - 927.01	824.2 - 824.2	1712.4 - 1752.6	1850.2 - 1909.8
			824.2 - 848.8		1850.2 - 1909.8
			826.4 - 846.4		1852.4 - 1907.6
Antenna Type(s)	Omni Directional Dipole	Omni Directional Dipole	Omni Directional Monopole	Omni Directional Monopole	Omni Directional Monopole
Antenna Gain (dBi)	8	8	-0.7	1.7	2.5
	6	6			
Conducted Power (dBm)	27.63	28.02	32.999	23.53	29.969
			29.987		25.798
			26.493		23.856
Conducted Power (mW)	579.43	633.87	1994.80	225.42	992.89
			997.01		380.01
			445.96		243.00
Maximum Peak EIRP (mW)	3655.95	3999.45	1697.85	333.43	1765.63
	2306.75	2523.48	848.59		675.77
			379.58		432.12
Maximum Peak ERP (mW)	2228.44	2437.81	1034.90	203.24	1076.22
	1406.05	1538.15	517.25		411.91
			231.37		263.39

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
903.65	27.63	0.60	579.43	8	6.310	28	0.371	A
912.31	28.02	0.61	633.87	8	6.310	28	0.406	B
824.2	32.999	0.55	1994.80	-0.7	0.851	28	0.172	C
1722.4	23.53	1.00	225.42	1.7	1.479	28	0.034	D
1850.2	29.969	1.00	992.89	2.5	1.778	28	0.179	E

Note: Where applicable, the highest antenna gain/RF output power is used to represent the overall worst configuration.

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	x	x	x			
Radio B				x	x	x
Radio C	x			x		
Radio D		x			x	
Radio E			x			x
Radio A MPE Ratio	0.615977827	0.615977827	0.615977827			
Radio B MPE Ratio				0.667456393	0.667456393	0.667456393
Radio C MPE Ratio	0.313640922			0.313640922		
Radio D MPE Ratio		0.033843407			0.033843407	
Radio E MPE Ratio			0.179214883			0.179214883
MPE Ratio Summation:	0.929618749	0.649821234	0.79519271	0.981097315	0.7012998	0.846671276