RF Exposure / MPE Calculation

No.	:	12069762H-A-R1
Applicant	:	Komatsu Ltd.
Type of Equipment	:	KOMTRAX Terminal
Model No.	:	KDTG200
FCC ID	:	X4QKDTG200

Komatsu Ltd. declares that Model: KDTG200 complies with FCC radiation exposure requirement specified in the FCC Rule 2.1091 (for mobile).

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided with the "KDTG200" as calculated from (B) Limits for General Population / Uncontrolled Exposure of TABLE 1- LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) of §1.1310 Radiofrequency radiation exposure limits.

[WLAN(2.4 GHz) part]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

P = 16.33 mW (Maximum average output power)

☐ Time average was used for the above value in consideration of 6-minutes time-averaging

☑ Burst power average was used for the above value in consideration of worst condition.

G = 2.559 Numerical Antenna gain; equal to 4.08dBi

r = 20 cm (Separation distance)

Power Density Result ***S*** **= 0.00831 mW/cm^2**

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KDTG200 contains certified iridium module (FCC ID: Q639523N).
The WLAN(2.4 GHz) module and the iridium module both transmit simultaneously in their respective bands. Compliance for simultaneous transmission are shown by the following calculations.
Therefore, the output power value listed in this declaration adopted from the value of RF Exposure Calculation Report (FCC ID: Q639523N).

Reference
[Iridium]

This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1mW/cm^2 uncontrolled exposure limit. The Friis formula used was:

$$S = \frac{P \times G}{4 \times \pi \times r^2}$$

Where

P = 607.94 mW (Maximum average output power)

☑ Time average was used for the above value in consideration of 6-minutes time-averaging

☐ Burst power average was used for the above value in consideration of worst condition.

G = 1.995 Numerical Antenna gain; equal to 3dBi

r = 20 cm (Separation distance)

Power Density Result S = **0.24132 mW/cm^2**

Therefore, if WLAN 2.4 GHz and iridium transmit simultaneously,
S=0.00831 mW/cm^2 + 0.24132 mW/cm^2
=0.24963 mW/cm^2

Even taking into account the tolerance, this device can be satisfied with the limits.

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