Excellence in Compliance Testing

Certification Exhibit

FCC ID: HSW-DNT2400P

FCC Rule Part: 47 CFR Part 2.1091

ACS Project Number: 16-0346

Manufacturer: Murata Electronics North America
Models: DNT2400PC, DNT2400PP

RF Exposure

General Information:

Applicant: Murata Electronics North America
Device Category: Mobile/Portable
Environment: General Population/Uncontrolled Exposure

Technical Information - Mobile:

Max Antenna Gain: 9 dBi
Maximum Transmitter Conducted Power: 17.84 dBm, 60.81 mW
Maximum System EIRP: 26.84 dBm, 483.06 mW
Exposure Conditions: 20 centimeters or greater

Technical Information - Portable:

Max Antenna Gain: 3.47 dBi
Maximum Transmitter Conducted Power: 17.84 dBm, 60.81 mW
Maximum System EIRP: 21.31 dBm, 135.21 mW
Exposure Conditions: Less than 20 centimeters

Antenna Type Information:

Antenna Type / Gain: Dipole, 9dBi (Mobile)
Patch, 6dBi (Mobile)
Patch, 3.47dBi (Portable)

MPE Calculation – Mobile Exposure

The Power Density (mW/cm^2) 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 1: MPE Calculation

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)
2441.11	17.84	1.00	60.81	9	7.943	20	0.096

Maximum Transmit Duty Cycle / Power Calculation – Portable Exposure

Operating Parameters:

Maximum Transmitter Conducted Power	17.84 dBm (61 mW)
Maximum Antenna Gain (Portable Conditions)	3.47 dBi peak
Maximum packet length	90 bytes
Hop time (dwell time)	10 milliseconds
Bit duration	2 microseconds

Maximum packet size the radio can transmit on a given hop is:
Maximum data payload + overhead (5 bytes) = 95 bytes

The maximum Length of transmission per hop is:
(95*8)*2us = 1.52 ms

The Portable unit can transmit only once per hop. The resulting transmitter duty cycle is:
1.52ms / 10ms = 15.2%

Source-Based Time-Averaged Power is: 61mW* 0.152 = 9.3 mW

Justification for SAR Test Exclusion:

Standalone SAR Test Exclusion:
Per KDB 447498 D01 General RF Exposure Guidance v06, the standalone 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

= (9.3 / 5.0)*(√2.48) = 2.9
2.9 **< 3.0**

Standalone SAR test exclusion is applied.