# 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)] · [$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

= (9.3 / 5.0)*( $\sqrt{2.48}$) = 2.9
2.9 **< 3.0**

Standalone SAR test exclusion is applied.