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FCC RF Exposure Information Per KDB Inquiry Tracking Number 360152

Operational Description

The AMS ScramGPS GPS-600 is an ankle worn offender monitoring and tracking device. The device combines cellular, GPS, and RF technologies to ascertain the offender's current location and verify compliance with program requirements. This information can be gathered at variable rates with the nominal maximum location data rate of 1 locate per minute and the maximum transmission frequency of 1 per minute. The time required to transmit a single packet of location data is constant regardless of the transmission frequency. A typical rate plan locates an offender once each minute and transmits the location data once every 10 minutes.

RF Exposure Conditions

The GPS-600 offender monitoring and tracking device is intended for operation in the general population in an uncontrolled RF exposed environment.

Antenna Separation Distances

~10.16mm from cellular antenna to ankle
~25.95mm from GHSS antenna to ankle

Transmission Mode

The Locator utilizes an internal cellular 3G UMTS/GSM transmitter as well as an FHSS transmitter for communication back to the base station.

Duty Cycle

The device features variable location and transmission rates with a **maximum** location rate of once per minute and a **maximum** transmission rate of once per 10 minutes. The on air transmission time from 1 location is 3 seconds. This leads to an on air duty cycle of 0.5%.

Derived by direct measurement of the transmit completion time on the device of nominal operation for various rate plans. A typical rate plan of 1 location per minute and transmits on 10 minute intervals is shown below

$$\text{Duty Cycle} = \text{Transmission Time} / \text{TOTAL Time} = 3\text{s}/600\text{s} = 0.005$$

$$\text{Duty Cycle} = 0.5\%$$





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RF Output Power Comparison

Cellular TRP WCDMA FDD2

Frequency = 1.9076GHz

Maximum Measured Conducted Output Power = 19dBm, 79.43mW

Source Based Time Averaged Duty Cycle = 0.5%

Source Based Time Averaged Output Power = 79.43mW x .005 = 0.39715mW

$(1\text{mW}) / (10\text{mm}) \times \sqrt{(1.9076\text{GHz})} = 0.138 \leq 7.5$; exempt from 10-g extremity SAR

FHSS Radio - 903MHz ISM Band

Frequency = 0.903GHz

Maximum Measured Conducted Output Power = 0.711mW

Source Based Time Averaged Duty Cycle = $(1.25\text{ms}) / (15.9\text{ms}) \times 100\% = 7.9\%$

Source Based Time Averaged Output Power = 0.711mW x 0.079 = 0.0056mW

$(1\text{mW}) / (26\text{mm}) \times \sqrt{(0.903\text{GHz})} = 0.036 \leq 7.5$; exempt from 10-g extremity SAR

Simultaneous Transmission Consideration

Both the cellular antenna and FHSS antenna can transmit at the same time. Per KDB 447498 D01 v06 4.3.2 "When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration."

$0.138 + 0.036 = 0.174 \leq 7.5$; exempt from 10-g extremity SAR.

