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RF EXPOSURE INFORMATION

Date: Thursday July 7th, 2016

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RE: Certification Application
FCC ID: 2AGMK-TD1508

The device is designed as module to be installed in and used in a mobile exposure host platform. The analysis provided in this document only covers mobile exposure conditions and for that the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter except in the conditions described in this document.

MPE Exposure Limits

The table below is excerpted from Table 1(B) of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density (mW/cm²)	Averaging time (minutes)
300-1500	F (MHz) / 1500	30

As all the operating frequencies of this device are higher than 902 MHz, the applicable maximum permissive exposure is: **0.601 mW/cm²**.

Using the equation $S = \dfrac{PG}{4\pi R^2}$ to calculate the exposure to electromagnetic fields,
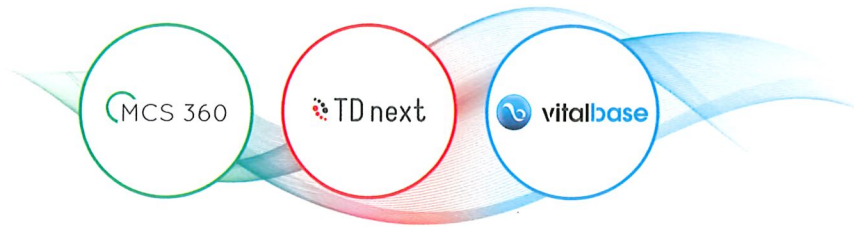
Where:

- 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)

Compliance with FCC maximum permissive exposure limits is demonstrated based on the following calculations.

1   Standalone Operations Analysis

Frequency Band (MHz)	Frequency Range (MHz)	Reference frequency (Lowest freq.) (MHz)	Maximum conducted output power (dBm)	Antenna gain (dBi)	Evaluation distance for compliance with MPE limits (cm)	$S = \dfrac{PG}{4\pi R^2}$	FCC MPE limit (mW/cm²)	COMPLIANCE (S<S$_{Limit}$)	RELATIVE EXPOSURE MPE ratio (S/S$_{Limit}$)
902-928	902.2 – 904.7	902.2	25.33	2.7	20	0.126	0.601	COMPLIANT	0.210

Under all conditions the equipment complies with the FCC MPE limits and the maximum MPE ratio obtained is **0.210**.

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2 Co-location Analysis

2.1 Co-location with other transmitter in mobile exposure conditions

According to KDB 447498 D01 General RF Exposure Guidance v06, 7.2:

> *Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is ≤ 1.0.*

As the maximum calculated MPE ratio for the device is **0.210**, the product can be co-located with other antennas providing that the sum of the MPE ratios for all the other simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density is ≤ 1.0 − **0.210** = **0.790**.

2.2 Co-location with other transmitter in mixed mobile and portable host platform exposure conditions

According to KDB 447498 D01 General RF Exposure Guidance v06, 7.2:

> *When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.*
>
> - *The [∑ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [∑ of MPE ratios] is ≤ 1.0.*
>
> - *The SAR to peak location separation ratios of all simultaneous transmitting antenna pairs operating in portable exposure conditions are all ≤ 0.04 and the [∑ of MPE ratios] is ≤ 1.0.*

As the maximum calculated MPE ratio for the device is **0.210**, the equipment can be co-located with other transmitters in a mixed mobile and portable conditions providing that the exposure of the co-located transmitter complies with:

- The [∑ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [∑ of MPE ratios] is ≤ 1.0 − **0.210** = **0.790**

OR

- The SAR to peak location separation ratios of all simultaneous transmitting antenna pairs operating in portable exposure conditions are all ≤ 0.04 and the [∑ of MPE ratios] is ≤ 1.0 − **0.210** = **0.790**

Yours faithfully

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