PSB Singapore

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TÜV SÜD PSB Pte Ltd - 1 Science Park Drive, Singapore 118221

Maximum Permissible Exposure

Date: 26 July 2017

E-LOG and Fleet Management Device
Host: DC200S
Contains FCC ID: A4C01005A & QIPPXS8

Rules:

1.
47 CFR 1.1310 Table 1B of– Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Power density (mW/cm²)
300 – 1500	f/1500
1,500 – 100000	1.0

$S = P*G / (4*pi*R^2)$
S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the centre of radiation of the antenna

Results:
MPE of each transmitter under standalone operation does not reach maximum allowed MPE value. Please refer to page 2 for calculation procedures.

2.
KDB 447498 D01 General RF Exposure Guidance v06, clause 7.2. Transmitters used in mobile device exposure conditions for simultaneous transmission operations

Results:
Σ of MPE ratios is = 0.551 ≤ 1.0 so simultaneous transmission MPE test exclusion applies for device.

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Calculations 850 MHz band

Maximum average output power at Antenna terminal: **30.49 dBm**
(Max average power = 33.50 dBm – 3.01 dBm duty cycle)
G = 0.51dBi
Prediction distance R: 20 cm

Prediction frequency: 824.20 MHz
MPE limit S: 0.5495 mW/cm²

$S = P*G / (4*pi*R^2) = 0.251$ mW/cm²

Calculations 1900 MHz band

Maximum average output power at Antenna terminal: **27.29 dBm**
(Max average power = 30.30 dBm – 3.01 dBm duty cycle)
G = 2.09 dBi
Prediction distance R: 20 cm

Prediction frequency: 1880.00 MHz
MPE limit S: 1 mW/cm²

$S = P*G / (4*pi*R^2) = 0.172$ mW/cm²

Calculations 2400 MHz band

Maximum average output power at Antenna terminal:
P: 117.5 mW [WLAN 2412 – 2462 MHz] (averaged over 30 min)
P: 68 mW [Bluetooth 2402 – 2480 MHz] (averaged over 30 min)
P: 23 mW [Bluetooth LE 2402 – 2480 MHz] (averaged over 30 min)
D: Duty cycle: 100 % = 1
G = 6 dBi = 4 (Highest array gain for MiMo with 2 antennas)
Prediction distance R: 20 cm

Prediction frequency: 2400.00 MHz
MPE limit S: 1 mW/cm²

$S = P*G / (4*pi*R^2) = 0.094$ mW/cm²