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August 8, 2012

To whom it may concern:

The enclosed *Source Based Time Average Transmitter Power Evaluation* (SBTA) is provided to substantiate the following in relation to the VINVOX device designated VRB101 (FCC ID B8OVRB101):

- SAR is not required for the GSM850 band as the output power is less than the limit for SAR applicability
- SAR is not required for the GSM1900 band as the output power is less than the limit for SAR applicability

We also declare that the information provided in support of the SBTA Duty Factor Calculation is correct regarding the descriptive operation of the device, duty cycle, power output and usage conditions.

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Chief Financial Officer

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Source Based Time Average transmitter Power Evaluation

Device: OBD-II Vehicle Unit

Device Name: VRB101

FCC ID: B8OVRB101

The device under test supports GSM technologies in GPRS mode. The device maximum uplink timeslots are 2 and the device multi-slot class is 10. It is not possible for the user or installer to configure the device to deviate from the operation uplink description outlined in this document.

The device uses 2 timeslots to transmit. Therefore, a source based time average calculation is used to deduce the calculated average transmit power. If a single GSM/GPRS burst is 8 and only 2 of these are used during transmission, the duty factor is therefore = 2/8.

The device is self-contained and has no user control interface. It connects directly to the OBD-II connector in a vehicle. Among all the signals provided by the OBD-II connector, only four are passed through to the device: Battery, Ground, CAN High and CAN Low. Two LEDs are used to indicate the status of the device.

All communications are initiated by the device. The device requests data such as the Vehicle Identification Number (VIN) and status information from the vehicle. The data is encrypted and then transmitted to a remote server through a GSM network. The number of calls per day is defined by the remote server, but is typically once per day. The length of each transmission depends on the amount of data needed to be transferred. An average transfer is approximately 75 bytes. However, the maximum buffer size is 1K (1024) bytes which dictates the largest number of bytes to be sent per transmission. The remote server acknowledges each data transfer and the device enters sleep mode once an acknowledgement is received. In the event that an acknowledgement is not received, the device will retry, up to two times, before entering sleep mode. During sleep mode, no data is exchanged between the device and the vehicle, nor is there any transmission between the vehicle and the remote server.

General specification of GPRS Class 10:

Technology	Download (kbit/s)	Upload (kbit/s)	TDMA Timeslots allocated (DL+UL)
GPRS	60.0	40.0 (Class 10 and CS-4)	3+2

If the worst case of 1024 bytes = 8192 bits is sent using 2 uplink time slots at a speed of 40.0kbps, it will take 205ms to transmit. The manufacturer has declared that the normal tx time is 30 seconds, which is enough to allow for the maximum data transmission and a network handoff. The device repeats or retries the transmission at 10 minute (600 second) intervals.

- Source based time average duty factor = $30/600 = 0.05$ equ (1)
- GPRS Class 10 operation duty factor = $2/8 = 0.25$ equ (2)
- Maximum duty factor = equ(1) * equ (2) = $0.05*0.25 = 0.0125$ equ (4)

- At 850MHz the device measured average power = 2000 mW equ (5)
- With duty factor applied average power = equ (4) * equ (5) = $0.0125*2000 = 25\text{mW}$ equ (6)
- At 1900MHz the device measured average power = 1000mW equ (7)
- With duty factor applied average power = equ (4) * equ (7) = $0.0125*1000 = 12.5\text{mW}$ equ (8)

The limit for SAR applicability is $60/f(\text{GHz})$

- At 850 MHz: $60/0.85 = 70.6\text{ mW}$
- At 1900 MHz: $60/1.9 = 31.6\text{ mW}$

Conclusions:

- SAR is not required at GSM850 band as output power < $60/f$
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