

Client: Juniper Systems	Job Number: J72953
Model: BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number: T72992

RF Exposure Evaluation

Bluetooth Module BC04 alone

The output power is listed on the FCC grant for the Bluetooth module VSF19799AR as 0.01058 Watts, which is 10.2dBm. The application lists the antenna gain as being 0dBi. The eirp and output power are, therefore, identical and equal to 10.58mW. The FCC established a threshold below which SAR evaluation was not required for a transmitter used in a portable device. This threshold is calculated from the operating frequency, f in GHz, using the formula 60/f. For the Bluetooth module with a maximum operating frequency of 2480MHz the threshold is 24.2mW. As the module's output power is below the threshold no further evaluation of rf exposure is required.

Bluetooth and WiFi module installed together - Hand-Held Evaluation

References are made to the following FCC documents: FCC KDB 447498 D01 Mobile Portable RF Exposure v03r02 and FCC KDB 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05. Referencing paragraph 4(c) of FCC publication KDB447498, SAR evaluation is not required for hand-held transmitters that operate closer than 5 cm to the body when they have an output power that is $< 300 \{f(\text{GHz})\}^{-0.5} \text{ mW}$ ($< 191.2\text{mW}$ for $f = 2.462\text{GHz}$). SAR is not required for a stand-alone device operating at $P < 60/f$ (GHz) (24mW for $f = 2.48\text{GHz}$) or for devices that operate simultaneously with other transmitters that operate at $P < \frac{1}{2} 60/f$ (GHz) (12mW for $f = 2.48\text{GHz}$).

Band (MHz)	Module	Output Power dBm		Antenna gain	EIRP		Total EIRP		
		Peak	Average		dBm	W	W	mW	dBm
2400 - 2483.5	Bluetooth	10.24	-	0.0	10.2	0.0106	0.050	50.18	17.01
2401 - 2483.5	WiFi	15.98	-	0.0	16.0	0.0396			

The output power is listed on the FCC grant for the **Bluetooth module VSF19799AR** as 0.01058 Watts (10.58mW). The application lists the antenna gain as being 0dBi so the eirp is also 10.58mW. This power level is below the $\frac{1}{2} 60/f$ (GHz) threshold. The output power is listed on the FCC grant for the WiFi module (FCC ID VSF19782MX) as 0.0396 Watts (39.6mW). The application lists the antenna gain as being 0dBi, therefore the eirp is also 39.6mW. The power level is below the 191.2mW threshold that would require SAR for a hand-held device.

KDB 447498 states that the simultaneous transmission SAR evaluation procedures for cellphones in KDB 648474 may be applied to antennas that are built-in within a PDA or UMPC. The field PC should be considered as a Ultra mobile PC (UMPC). Based on the statement "When stand-alone SAR evaluation is not required and the antenna is >5 cm from other antennas, simultaneous transmission SAR evaluation is also not required for that antenna" in KDB 648474 v1r5, the assumption is that no SAR evaluation is required as the separation distance between the WiFi and Bluetooth antennas is approximately 10.8cm. Further the total output power from the combination of both WiFi and Bluetooth modules of 50.28mW is also below the threshold of 191.2mW above which SAR testing would be required for a hand-held device.

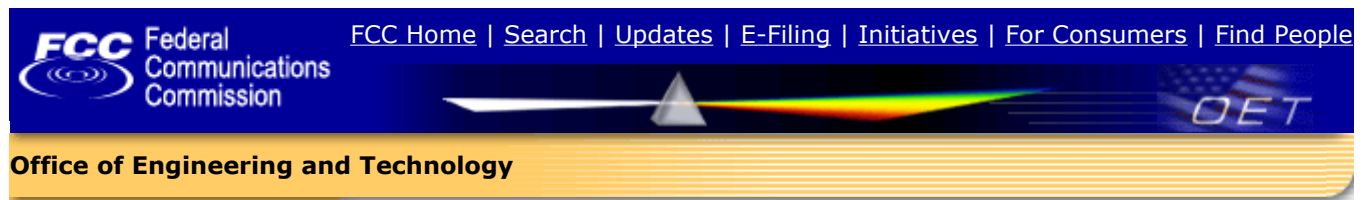
A KDB was entered with the FCC to confirm that SAR was not required and that the product was suitable for TCB approval (KDB tracking number **458876**). The affirmative response is attached.

Bluetooth and WiFi module installed together - MPE (rest of body)

For body exposure, the following MPE calculation is being submitted to demonstrate compliance with rf exposure requirements for a separation distance of at least 20cm from the body/head:

Frequency	eirp (total)	Power density at 20cm	Limit
2400-2483.5MHz	50.180 mW	0.010 mw/cm ²	1.0 mw/cm ²

Delivered-To: mbriggs@elliottlabs.com
 Date: Wed, 22 Oct 2008 17:11:21 -0400 (EDT)
 From: oetech@fccsun27w.fcc.gov
 To: mbriggs@elliottlabs.com
 Subject: Response to Inquiry to FCC (Tracking Number 458876) (TCB)



Inquiry:

I would like to confirm that the following configuration is exempt from SAR and suitable for TCB approval. The host system is a hand-held ruggedized PC with no accessories to allow for it to be used as a body-worn device. It is intended for hand-held and tripod use. The device will incorporate a Bluetooth or Bluetooth and WiFi (2.4GHz only) modules. We are about to file for C2PCs to both existing modular approvals to allow installation of both modules in the new host device. The FCC IDs for the modules are VSF19799AR and VSF19782MX. EMC spurious emissions have been evaluated with both modules installed in the host and include confirmation that there are no inter-modulation products caused by both devices transmitting simultaneously. The Bluetooth device with a maximum output power of 10.5mW, is below the 60/f power threshold and therefore exempt from SAR. The WiFi module has an output power of 39.6mW which is below the $300/f^{0.5}$ threshold (191.2mW) for extremity SAR. The combined output power from both modules (50.1mW) is also below the $300/f^{0.5}$ threshold. The antenna separation is approximately 10.8cm, exceeding the 5cm minimum requirement in KDB447498. Based on all of the above it seems that SAR would not be required for either transmitter even when operating simultaneously, therefore the device should be suitable for approval by a TCB. Please advise if more information is required. Regards, Mark

Response:

Yes, your are correct based on your description;
 On the TCB exclusion list, Transmitter Category VIII), All Other Categorically Excluded Portable Transmitters, Section d) i) prohibits TCB Certification of a device if the device or its antenna operates at less than 5 cm for a persons's body and its peak conducted or radiated output power exceeds 1 Watt at less than 500 MHZ. But other general requirement also applies:
 A transmitter operating in or with a laptop or similar computer may be considered as a mobile or a portable device, depending on the design, operating configurations and exposure conditions of the composite setup. Output power levels do not determine if a device is mobile or portable. 3. Palm top computers are typically considered as portable or hand-held and hand-operated only devices, depending on its design, operating configurations and exposure conditions. For hand-held and hand-operated only configurations, SAR requirements would apply to the hand and wrist and if the device can provide at least 20 cm from the person's body and there are ways to ensure this, MPE requirements would apply for the rest of the body. 4. Bluetooth transmitters are required to satisfy the RF exposure requirements of 15.247(b)(4). We typically do not expect RF exposure test data to be submitted with a filing to demonstrate compliance. In some cases, applicants may choose to include such test data to expedite a filing. However, sufficient information should be included to satisfy the requirements of 15.247(b)(4), which would typically include specific operating and installation instructions/requirements, warning/caution instructions and/or labels when applicable. Based on the supporting info, and according to the operating configurations and exposure conditions of the host and final products that would operate with the Bluetooth transmitter module, if compliance cannot be ensured or determined, SAR or MPE evaluation may be requested with respect to 1.1307(d). Rule Parts:15.247(b)(4) 20010302-002

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