

# Portable Radio Transmitters Module RF Exposure Proposal

## Per KDB 447498 Requirements

### 1. Purpose:

- a. To qualify portable radio transmitter modules against SAR requirements for specific host platforms based upon a minimum antenna separation distance and modular testing. Upon radio approval, as long as OEM/ODM instructions are followed and the restrictions detailed within this document are met, then no additional SAR evaluation or co-located RF exposure assessment is required.

### 2. Reference Document:

- a. KDB 447498: Mobile and Portable Device; RF exposure Procedures and Equipment Authorization Policies. Section 2)a)i) and Section 2)b)
- b. KDB 447498: Mobile and portable Device; RF exposure Procedure and Equipment authorization policy. Section 3)b)

### 3. Host Platform:

- a. Notebook / Netbook Computers with transmitting antenna built-in on the display section. Tablet computers are excluded.

### 4. Certified Applications Review:

- a. A summary of previously certified modules in a specific host has been made between Jan 01, 2009 to June 30, 2009.

No	FCC ID	Grant Date	Modular Approval	Host Type	Technology	Frequency Band	Power	Antenna-to-body	Screen Size	Highest SAR
1	PD9LEN512ANMU	5/29/2009	Yes	Netbook	802.11a/b/g/n	2.4GHz	19.8 dBm/Average	11.5 cm	10 inches	0.14 W/kg
						5 GH	19.2 dBm/Average	11.5 cm	10 inches	0.15 W/kg
2	I4L-N-NE771	3/12/2009	Yes	Netbook	802.11 b/g/n	2.4 GHz	17.15 dBm /Average	18 cm	10 inches	0.012 W/kg
3	QDS-BRCM1030	1/23/2009	Yes	Netbook	802.11 b/g	2.4 GHz	23 dBm/Peak	14.5 cm	10.2 inches	0.01 W/kg
4	QDS-BRCM1041	6/29/2009	Yes	Netbook	802.11 a/b/g/n	2.4 GHz	24.4 dBm/Peak	16 cm	10.1 Inches	0.117 W/kg
						5 GHz	25.5 dBm/Peak	16 cm	10.1 Inches	0.119 W/kg
5	QDS-BRCM1041	6/29/2009	Yes	Netbook	802.11 a/b/g/n	2.4 GHz	24.4 dBm/Peak	18 cm	10.2 inches	0.037 W/kg
						5 GHz	25.5 dBm/Peak	18 cm	10.2 inches	0.011 W/kg
6	HLZZG5WIIM	4/7/2009	Yes	Netbook	802.11 a/b/g/n	2.4 GHz	27.69 dBm/Peak	11 cm	8.9 inches	0.00638 W/kg

						5 GHz	25.28 dBm/Peak	11 cm	8.9 inches	0.147 W/kg
					WiMAX/802.16e	2.5 GHz	23.85 dBm/Average	11 cm	8.9 inches	0.03 W/kg
7	N89-MM230M	4/1/2009	Yes	UMPC with touch screen	802.11 b/g	2.4GHz	14.64 dBm/Average	0.4 cm	7 inches	0.0113 W/kg
8	HLZAR5BHB63	5/8/2009	Yes	Netbook	802.11 b/g	2.4 GHz	15.58 dBm/Average	6 cm (approx.)	10 inches	0.044 W/kg
9	HLZZG5	2/3/2009	Yes	NetBook	802.11 b/g	2.4GHz	21.06 dBm/Peak	13.5 cm	10 inches	0.128 W/kg
10	QDS-BRCM1030	4/3/2009	Yes	Netbook	802.11 b/g	2.4 GHz	23 dBm/Peak	15 cm	10 inches	0.019 W/kg
11	QDS-BRCM1031	4/4/2009	Yes	Netbook	802.11 b/g	2.4 GHz	23 dBm/Peak	16.1 cm	10 inches	0.028 W/kg
12	PPD-AR5BXB63	6/15/2009	Yes	Netbook	802.11 b/g	2.4GHz	20.7 dBm/Average	15 cm	10 inches	0.052 W/kg
13	J9CUNDP-1H	4/23/2009	Yes	Netbook	WWAN	850/1900 MHz	31.7 dBm/peak@850 MHz 32.6 dBm/Peak/@1900 MHz	5.2 cm	10 inches	0.12 W/kg@850 MHz; 0.106 W/kg@1900 MHz
14	VV7-MBMF3507G-2	03/03/2009	Yes	Netbook	WWAN	850/1900 MHz	32.8 dBm/peak/850 MHz; 29.7 dBm/peak/1900 MHz	18 cm	11 inches	0.076W/kg @850 MHz; 0.062W/kg @1900 MHz

## 5. Approval Strategy:

- Portable radio transmitter modules may be approved as a single modular approval.
- Individual Antenna gain shall be < 6dBi
- When the module is used in mobile configuration (antenna-to-body > 20cm), no additional filing and testing are required.
- When the module is used in portable configuration (antenna-to-body >= 5 cm), no additional SAR evaluations are required.
- If this module is going to be co-located with other radio devices where the antenna-to-body is >= 5 cm, if individual SAR of all co-located transmitters are less than 0.4 W/kg, then co-located SAR assessment is not required.
- Class II permissive change shall be allowed to enable certified module within the specific host to perform additional stand alone SAR evaluation to qualify portable modular approval.
- When the module is used in a portable configuration (antenna-to-body >= 5 cm) with two or more transmitting antennas separated by 5cm or more then no additional RF exposure assessments are required.
- When the module is used in a portable configuration (antenna-to-body >= 5 cm) with two or more Mobile transmitting antennas separated within 5cm and once the configuration

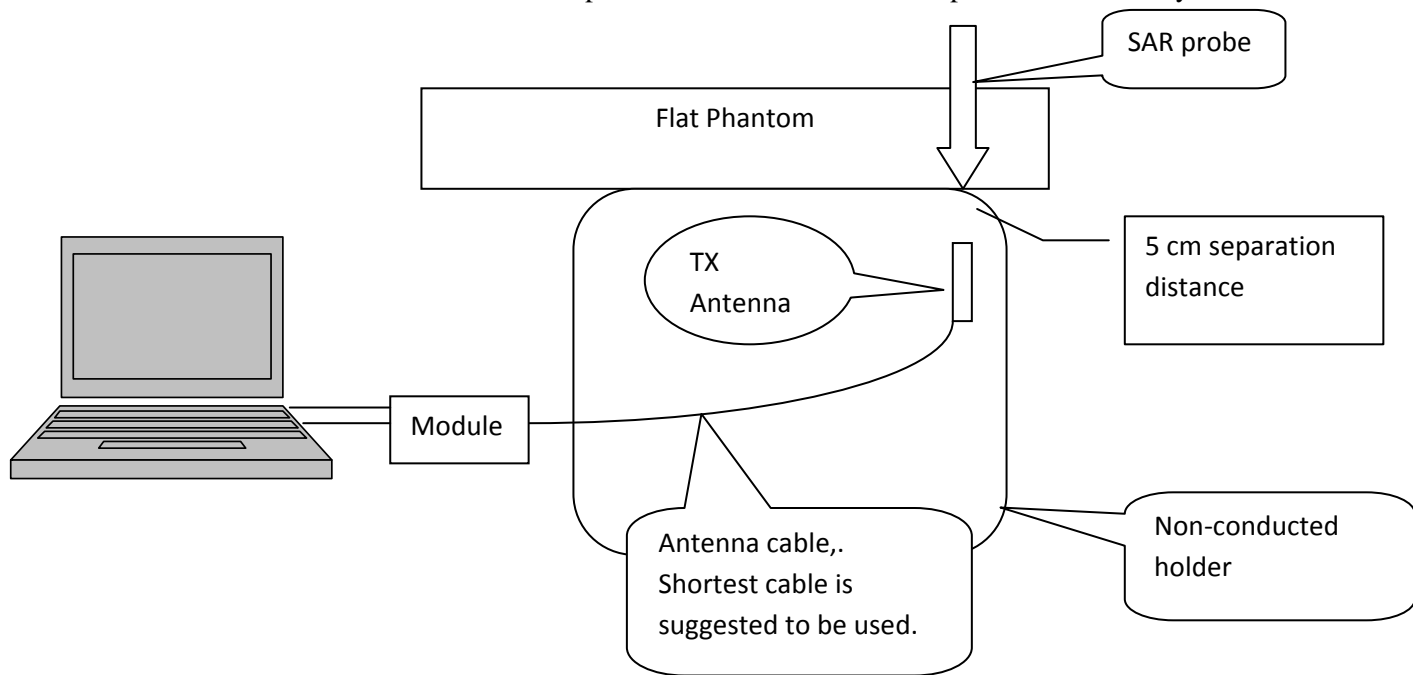
completed the Equipment Authorization with the highest transmitting power, then no additional RF exposure assessments and filing are required

## 6. SAR Measurement procedures:

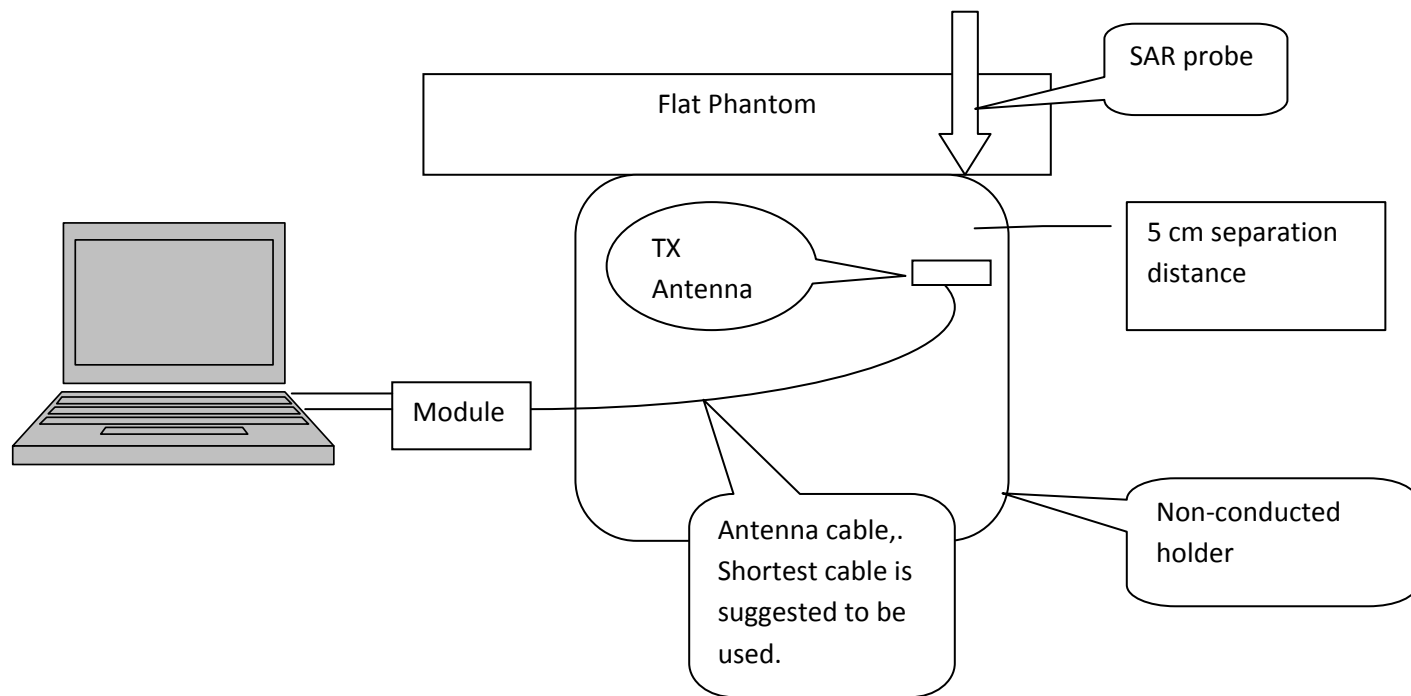
- a. Portable radio transmitter modules manufacturer shall provide a way to fix the transmitting antenna(s) on a non-conducted fixture.
- b. Transmitting antenna (horizontal and vertical) of portable radio transmitter module shall be placed on this non-conducted fixture with 5 cm separation distance to the flat phantom.
- c. Portable radio transmitter modules manufacturer shall provide a daughter card so radio parameter can be controlled via daughter board with cable to the host computer.
- d. SAR test lab shall perform SAR evaluation per section 2)b) of KDB 447498. At 5 cm antenna-to-body separation distance, the max. SAR value allowed is 0.4 W/kg.
- e. SAR test lab shall perform additional SAR evaluation to evaluate energy coupling by increasing the separation distance with 5mm step until the 1-g SAR value is 50% below of the value measured at 5 cm separation distance.

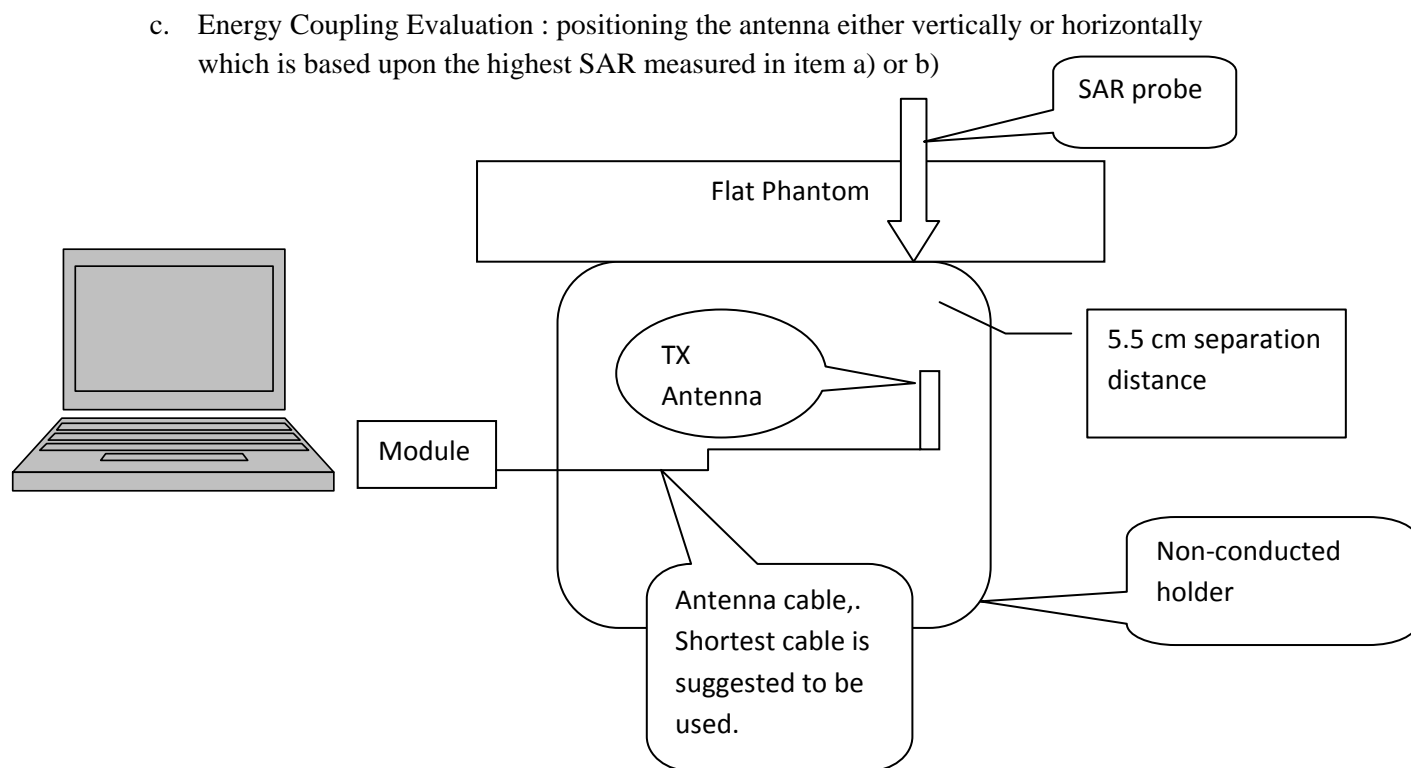
## 7. SAR Measurement Setup Diagram

- a. Initial SAR evaluation at 5 cm separation distance with antenna positioned vertically.



b. Initial SAR evaluation at 5 cm separation distance with antenna positioned horizontally.





**8. [EXAMPLE] OEM/ODM instructions to be provided by the approvals applicant where a Portable Radio Transmitter Module approval route was taken:**

**USA-Federal Communications Commission (FCC)**

**FCC Radio-Frequency Exposure & Approval Conditions:**

1. Antennas must be installed in the display section of notebook computer to provide at least 5 cm separation distance from the transmitting antenna to the body of user during normal operating condition.
2. Transmitting antenna(s) can only be installed at the display section of computer. When this device is installed other than notebook computers, at least 20 cm separation distance shall be maintained between the transmitting antenna(s) to the body of user or nearby person.
3. The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter within a host device, except in accordance with FCC multi-transmitter product procedures.
4. Only those antennas filed under this FCC ID number can be used with this device.
5. The Host user manual must include an FCC user guide statement detailing that the antenna position is in the screen and at an antenna-to-body position of  $\geq 5\text{cm}$  during normal operation.
6. The regulatory label on the final system must include the statement: "Contains FCC ID: XXXXXX "or using electronic labeling method as documented in KDB 784748.

7. The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system.

8. The final host manual shall include the following regulatory statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the distance between the equipment and the receiver.

- Connect the equipment to outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## **9. Suggested TCB grant conditions:**

Power output listed is conducted. The antenna(s) used for mobile exposure conditions of this device must be installed to provide a separation distance of at least 20 cm from all persons. This device has been evaluated with antenna-to-body separation distance  $\geq 5$  cm to simulate the antenna positioned in the display section of notebook computer. This device must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance. Highest measured near-body @ 5 cm SAR value as documented in this filing is 0.XX W/kg.

## 10. Example of Host implementation

