

Applicant: Apple Inc

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Apple Inc: Reply Comments March 3, 2011

The feb23 "reply to questions" exhibit includes a simult.-transmit table identifying six combinations, which for this corresp. we re-write as items 1) to 6) in the following list form. When identifying such combinations, note that as we understand "HotSpot Mode" should be considered to be "WiFi HotSpot Mode".

Yes, we changed the title to "WiFi Hotspot" as requested

Further to item 6) of 2/18/11 corresp. in this filing, the below list shows also other head and body simult.-transmit combinations for which compliance needs to be addressed if supported by a device. 1) body - GSM Voice, EGPRS or HSDPA one-at-a-time 2) body - GSM Voice, WiFi or BT one-at-a-time 3) body - GSM Voice, HotSpot Mode 4) body - EGPRS or HSDPA one-at-a-time, WiFi or BT one-at-a-time 5) body - EGPRS or HSDPA one-at-a-time, HotSpot Mode 6) body - WiFi or BT one-at-a-time, HotSpot Mode 7) body - W-CDMA voice, EGPRS or HSDPA/HSUPA one-at-a-time 8) body - W-CDMA voice, WiFi or BT one-at-a-time 9) body - W-CDMA voice, WiFi HotSpot Mode 10) body - (W-CDMA voice + HSDPA/HSUPA data), WiFi HotSpot Mode 11) head - (W-CDMA voice + HSDPA/HSUPA data), WiFi HotSpot Mode At minimum we expect combination 11) of above list needs to be addressed in 8.3 of SAR report - please explain and/or revise SAR report and/or other portions of filing where appropriate. B) If our understanding is correct that "HotSpot Mode" should be considered to be "WiFi HotSpot Mode", it seems unclear whether/how e.g. combination 6) from above list is applicable - please explain and/or revise where appropriate a list or table of simultaneous-transmit combinations supported by this device. More clarity is provided below on the use cases.

See the updated tables and Info below for clarity

WIFI HotSpot ON - Simultaneous Transmission					
	GSM voice	GPRS/Edge	UMTS voice	HSDPA/HSUPA	WIFI 2.4 GHz
GSM Voice	N/A	N	N	N	N
GPRS/Edge	N	N/A	N	N	Y
UMTS voice	N	N	N/A	Y	Y
HSDPA/HSUPA	N	N	Y	N/A	Y
WIFI 2.4	N	Y	Y	Y	N/A

Note:

- BT and WIFI time-share same antenna and cannot transmit simultaneously

The following information describes the “Y” simultaneous transmission cases for this device.

- Wifi + GPRS/Edge data (body) – See Hotspot test report page 20.
- WiFi + UMTS voice (body & head) – See Original Filing test report page 30.
- WiFi + HSDPA/HSUPA data (body) - Not required because the standalone SAR for HSDPA and HSUPA was not required per KDB 941225-D01. See Original Filing test report page 29 and 30 for more clarification.
- WiFi + HSDPA/HSUPA data + UMTS voice (head) - We have investigated this test case at our outside test lab's. UL-CCS and Cetecom and they do not have equipment to support testing this configuration.
- HS-DPCCH+EDCH Max power test case already requires R99 channels to be added as per 34.121, 5.2B test case which is nothing but MRAB call. As per 34.121, test case 5.2B, UE will lower the MAX power as compared to CS only to compensate for the peak to average increase due to the additional Channels which are active during MRAB call. Power on the device is backed off based on cubic metric as shown below:

5.2B.2 Minimum Requirements

The UE Maximum Power Reduction (MPR) for the nominal maximum output power shall be within the value and tolerance specified in table 5.2B.1 for when the values of β_c , β_d , β_{hs} , β_{ec} and β_{ed} is fully or partially transmitted during a DPCCH timeslot.

Table 5.2B.1: Maximum Output Power with HS-DPCCH and E-DCH

UE transmit channel configuration	CM (dB)	MPR (dB)
For all combinations of; DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH	$0 \leq CM \leq 3.5$	MAX (CM-1, 0)
Note 1: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_{ec} = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

Where Cubic Metric (CM) is based on the UE transmit channel configuration and is given by

$$CM = \text{CEIL} \{ [20 * \log_{10} ((v_{\text{norm}})^3)_{\text{rms}}] - 20 * \log_{10} ((v_{\text{norm_ref}})^3)_{\text{rms}} \} / k, 0.5 \}$$

Where

- $\text{CEIL}\{x, 0.5\}$ means rounding upwards to closest 0.5dB, i.e. $CM \in [0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5]$
- k is 1.85 for signals where all channelisations codes meet the following criteria $C_{SF,N}$ where $N < SF/2$
- k is 1.56 for signals where any channelisations codes meet the following criteria $C_{SF,N}$ where $N \geq SF/2$
- v_{norm} is the normalized voltage waveform of the input signal
- $v_{\text{norm_ref}}$ is the normalized voltage waveform of the reference signal (12.2 kbps AMR Speech) and $20 * \log_{10} ((v_{\text{norm_ref}})^3)_{\text{rms}} = 1.52 \text{ dB}$

The normative reference for this requirement is TS 25.101 [1] clause 6.2.2.

MRAB testing is already covered as part of HSPA testing as per 34.121....

WIFI HotSpot OFF - Simultaneous Transmission					
	GSM voice	GPRS/ EDGE	UMTS voice	HSDPA/ HSUPA	WIFI 2.4 GHz
GSM Voice	N/A	N	N	N	Y
GPRS/ EDGE	N	N/A	N	N	N
UMTS voice	N	N	N/A	Y	Y
UMTS data	N	N	Y	N/A	N
WIFI 2.4	Y	N	Y	N	N/A

Note:

- BT and WIFI time-share same antenna and cannot transmit simultaneously

The following information describes the “Y” simultaneous transmission cases for this device.

- Wifi + GSM voice (body & head) – See Original Filing test report page 38.
- WiFi + UMTS voice (body & head) – See Original Filing test report page 30.
- HSDPA/HSUPA data + UMTS voice (head) - We have investigated this test case at our outside test lab's. UL-CCS and Cetecom and they do not have equipment to support testing this configuration.