Applicant: Kyocera Wireless Corp.
Correspondence Number: 4968
731 Confirmation Number: TC864792

Response to request for additional information

1Q) Updated grant information. Frequency for CDMA 800 appears incorrect. Frequency stability units for PCS appear incorrect. Please correct as appropriate.

1A) An updated grant is included at the end of this document.

2Q) Demonstration of compliance with 911 calling requirements. Information could not be located.

2A) When an emergency 911 call is originated by the user, the mobile will attempt to acquire any available system and originate the emergency call on that system, disregarding restrictions set by the roaming list. The FCC NPRM WT99-13, CC94-102 automatic analog A/B roaming option has been implemented for 911 emergency calls. Note that the KWC-5135 does not have Global Positioning System (GPS) support.

3Q) Plots showing compliance with band-edge requirements for CDMA800 and 1900.

3A) There are no band-edge requirements in Part 22 for CDMA800. The plots for the PCS band-edge requirements were included in Section 9 of the Kyocera test report and have been included at the end of this document.

4Q) Clarification of maximum conducted power. EMC measurements state .318 and .16 W for cell band and PCS respectively. Operational description states 28 and 30 dBm respectively. Please clarify. Further more AMPs plots suggest a conducted power of 26 dBm which differs from the .318 stated above.

4A) The maximum conducted power is .318 and .16 for cell band and PCS respectively. The numbers in the operational description were mistakenly left in from a previous report.

SAR

1Q) Updated user manual with revised body-worn statement. The user could easily misunderstand the statement “limited to accessories tested and approved by Kyocera”. Please refer specifically to the accessories tested for compliance.

1A) The specific accessories tested for compliance are included in an updated user’s manual at the end of this document.

2Q) Certificate for probe conversion factors used for muscle tissue. Certified conversion factors were found for head simulating liquid in the posted exhibits.

2A) The answer is on the following page.

2) Probe Factor for Muscle Tissues

Based on DASY3-user manual Page 49 and the email from Schmid & Partner Engineering AG, the probe conversion factor in muscle tissue was set to 3% lower than for brain tissue in 835MHz frequency, and 10% lower than for brain tissue in 1800MHz. The related pages of DASY3-user manual, SPEAG email are attached in the proceeding pages.

Note, currently, we do not have a probe calibrated for muscle tissues. We are in the progress in buying another new DASY 4 system with two fully calibrated probes. The new system will arrive in the time frame of November or December of this year. We plan to send the existing probe to Schmid & Partner Engineering AG for the calibration in brain tissue as well as in muscle tissue once the new probes arrive.

4.5.3 Connection between device, liquid, and probe parameters

The electric parameters of the simulation liquid are frequency dependent. Unluckily, this frequency dependency in the homogeneous simulation liquid is different than in the complex cellstructure of the simulated tissue. Since each solution can simulate the tissue only within a limited frequency range, several mixtures are necessary to cover the total MTE frequency range. Within a frequency bandwidth of at least 20%, the same solution can be used with small errors in the SAR. However, the measured parameters at the actual frequency should be used in the software (see RG: 2.3 Medium).

The DASY3 software checks the selected solution against the device frequency to prevent incorrect combinations which could lead to undetected measurement errors. To that purpose, each dataset for the media includes frequency range settings. If the frequency of the selected device is not within the range of the selected media, the system will issue an error message. It is highly recommended to use different media datasets for different frequencies, even for the same liquid. If one liquid is used for 835MHz and 900MHz two datasets with the corresponding parameters should be used (e.g., with frequency ranges 800 - 850 MHz and 870 - 920 MHz). The liquid parameters should be remeasured and adjusted in the software regularly (see RG: 2.3 Medium).

The probe conversion factor (and boundary effect) depends on the frequency and the liquid parameters. For each dosimetric probe, many different sets of conversion factors and boundary correction data can be defined (RG: 2.6.1 E-Field Probe). Each set includes range settings for permittivity, conductivity and frequency. The probe conversion factors can be selected manually or automatically (RG: 2.6.1 E-Field Probe). In the (recommended) automatic selection mode, the software searches for the first conversion factor in the list, whose permittivity and conductivity and frequency range covers the selected device frequency and liquid parameters. If no valid conversion factor can be found, the system will issue an error message when trying to measure SAR. The same error message appears if the manually selected conversion factors do not correspond with the device or the media.

Note: The system automatically selects the first valid conversion factor. If you define conversion factors with a reduced frequency and parameter range, make sure that this range is not already covered by an other set further up in the list.

The conversion factors are determined during probe calibration. SPEAG probes are by default calibrated at 900MHz and 1800MHz in brain simulating tissue. The range settings in the probe configuration file are selected to guarantee the specified probe uncertainties. If you want to perform SAR measurements in other liquids (e.g., 835MHz muscle tissue), the DASY3 system will complain. There are several ways to overcome the problem:

- Increase the range settings in the probe document, leaving the conversion factors as they are. This will permit the measurement, although with increased uncertainty. For small changes in the parameters or frequency the error is small (see box below).

- Add a new conversion factor set for the new liquid or frequency. The conversion factor can be estimated from the existing conversion factors (see box below).

- Order special calibrations for the probe.

The following sensitivities of the conversion factor can be used to estimate the conversion factor for other frequencies or media. They are assessed from special calibrations with the ET3DVx probe series. (They cannot be applied for other probe types!)

For frequency changes within the same media (not the same media parameters, they change also with the frequency and must be adjusted in the media settings!):

- In brain and muscle tissue between 750MHz and 1GHz, the conversion factor decreases approximately 1.3% per 100MHz frequency increase.
- In brain and muscle tissue between 1.6GHz and 2GHz, the conversion factor decreases approximately 1% per 100MHz frequency increase.

For muscle tissue around 900MHz (permittivity about 30% higher and conductivity about 15% higher than brain tissue):

- The conversion factor in muscle tissue is approximately 3% lower than for brain tissue for the same frequency.

For example:

An ET3DVx probe with a conversion factor 6.0 for 900MHz brain gives a conversion factor of 5.87 for 835MHz muscle tissue.

SPEAG's email

X-Sender: pokovic.speagcom@mail.speag.com
Message-Id: <v04210106b5530a3b8cba@[192.168.0.106]>
Date: Thu, 25 May 2000 18:53:22 +0200
To: llu@qualcomm.com
From: Katja Pokovic <pokovic@speag.com>
Subject: probe 1348 - estimate for muscle tissue
Cc: egger@speag.com
Content-Type: text/plain; charset="us-ascii" ; format="flowed"
X-UIDL: f094fb92ae0ff3f05efa23d23d38e279

hi,

i hope this time it will work out!

so the very quick estimate is that the conversion factor will be
about 10% lower for muscle tissue at 1800 MHz (eps=54.3, sig=1.45)
compared to the brain tissue at the same frequency (i.e.,at 1800 MHz
with eps=40.5, sig=1.69).
the document will be fax to you soon.
best, katja

Katja Pokovic
Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9707, Fax +41 1 245 9779
WWW http://www.speag.com

3Q) Manufacture validation date supporting target values.

3A) The manufacture validation data supporting the target values are included on the next page.

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

835 MHz System Validation Dipole

Type:	**D835V2**
Serial Number:	**454**
Place of Calibration:	**Zurich**
Date of Calibration:	**February 11, 2002**
Calibration Interval:	**24 months**

asset # 039925

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

Approved by:

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

DASY

Dipole Validation Kit

Type: D835V2

Serial: 454

Manufactured: January 31, 2002
Calibrated: February 11, 2002

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with head simulating solution of the following electrical parameters at 835 MHz:

Relative Dielectricity	**41.9**	± 5%
Conductivity	**0.89 mho/m**	± 5%

The DASY3 System (Software version 3.1c) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.5 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 1. The results have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue: **10.4 mW/g**

averaged over 10 cm^3 (10 g) of tissue: **6.64 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well.

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.379 ns**	(one direction)
Transmission factor:	**0.989**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 835 MHz:	Re{Z} = **50.0 Ω**
	Im {Z} = **-3.4 Ω**
Return Loss at 835 MHz	**-29.5 dB**

4. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

5. Design

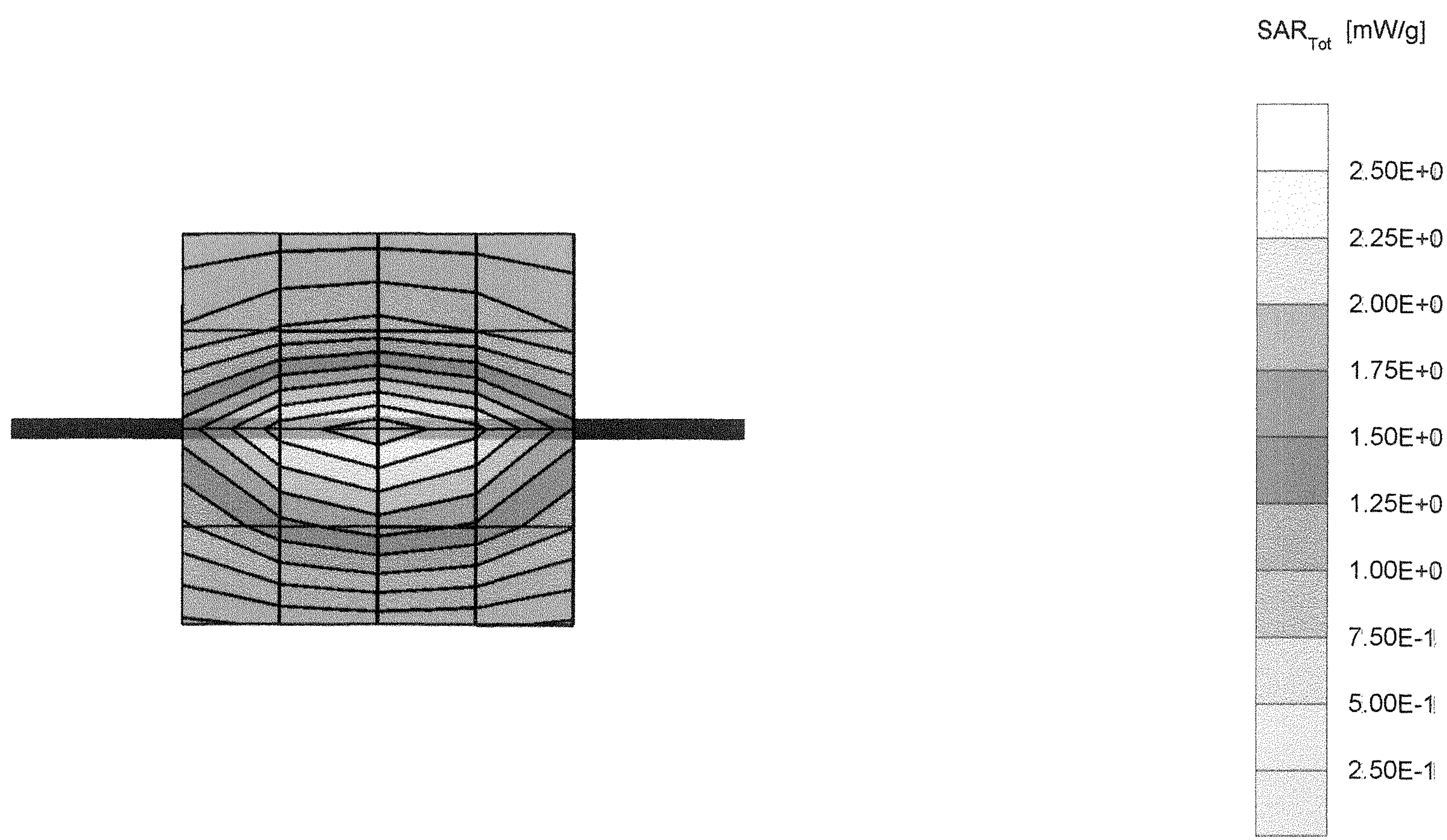
The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

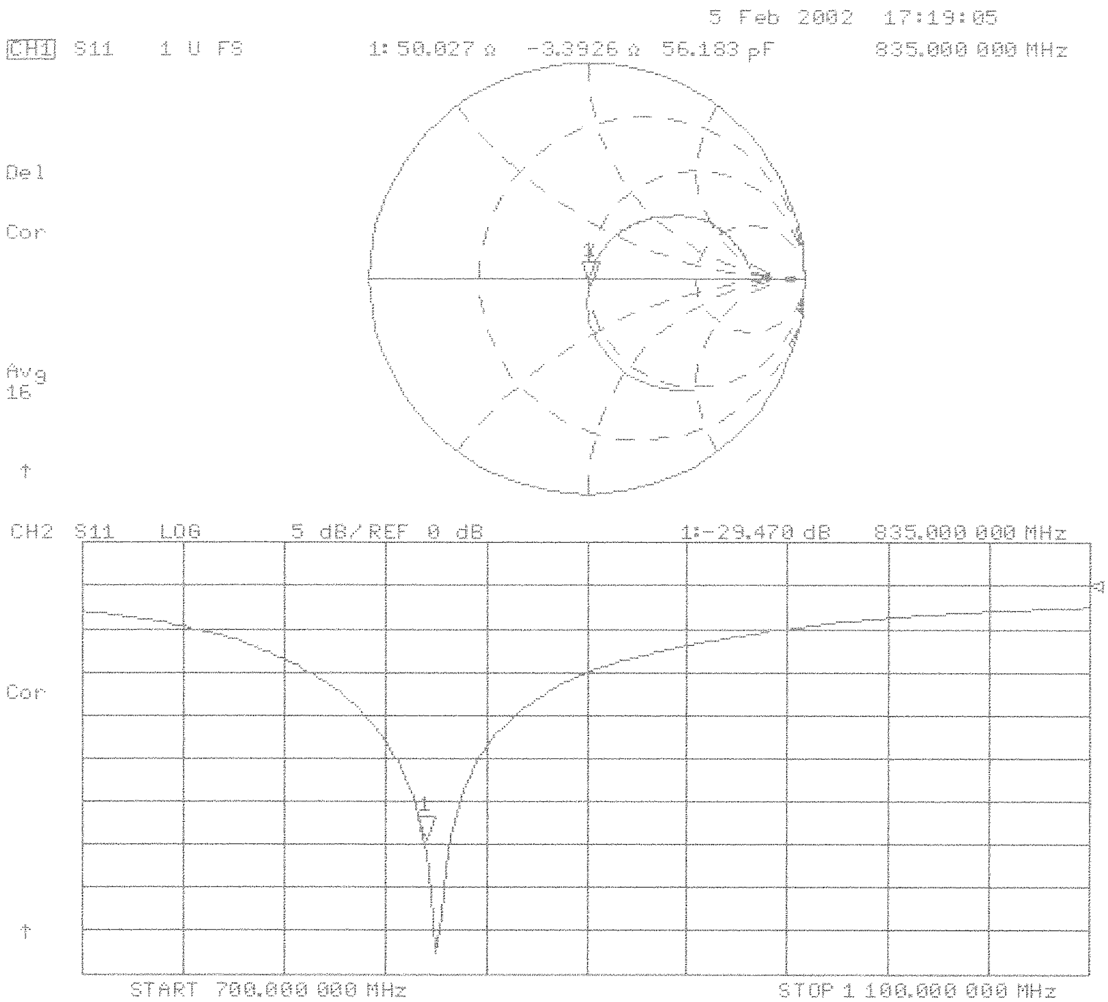
6. Power Test

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

idation Dipole D835V2 SN:454, d = 15 mm

uency: 835 MHz; Antenna Input Power: 250 [mW]
Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
e: ET3DV6 - SN1507; ConvF(6.50,6.50,6.50) at 900 MHz; IEEE1528 835 MHz; σ = 0.89 mho/m ε_r = 41.9 ρ = 1.00 g/cm^3
es (2): Peak: 4.14 mW/g ± 0.03 dB, SAR (1g): 2.59 mW/g ± 0.00 dB, SAR (10g): 1.66 mW/g ± 0.02 dB, (Worst-case extrapolation)
etration depth: 12.2 (10.8, 13.9) [mm]
erdrift: -0.03 dB




5 Feb 2002 17:19:05
CH1 S11 1 U FS 1: 50.027 Ω -3.3926 Ω 56.183 pF 835.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF 0 dB 1:-29.470 dB 835.000 000 MHz
Cor
START 700.000 000 MHz
STOP 1 100.000 000 MHz

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

1900 MHz System Validation Dipole

Type:	**D1900V2**
Serial Number:	**5d003**
Place of Calibration:	**Zurich**
Date of Calibration:	**February 20, 2002**
Calibration Interval:	**24 months**

asset # 039924

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:	Vetterli Nico
Approved by:	[signature]

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

DASY3

Dipole Validation Kit

Type: D1900V2

Serial: 5d003

Manufactured: February 14, 2002
Calibrated: February 20, 2002

1. Measurement Conditions

The measurements were performed in the flat section of the new generic twin phantom filled with brain simulating sugar solution of the following electrical parameters at 1900 MHz:

Relative permitivity	**39.1**	± 5%
Conductivity	**1.47 mho/m**	± 10%

The DASY3 System (Software version 3.1d) with a dosimetric E-field probe ET3DV6 (SN:1507, conversion factor 5.3) was used for the measurements.

The dipole feedpoint was positioned below the center marking and oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the head phantom according to the measurement conditions described in section 1. The results (see figure) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**45.6 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**23.0 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well. The estimated sensitivities of SAR-values and penetration depths to the liquid parameters are listed in the DASY Application Note 4: 'SAR Sensitivities'.

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.185 ns**	(one direction)
Transmission factor:	**0.993**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 1900 MHz:	Re{Z} = **51.2 Ω**
	Im {Z} = **0.9 Ω**
Return Loss at 1900 MHz	**- 36.7 dB**

4. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

Small end caps have been added to the dipole arms in order to improve matching when loaded according to the position as explained in Section 1. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

5. Design

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

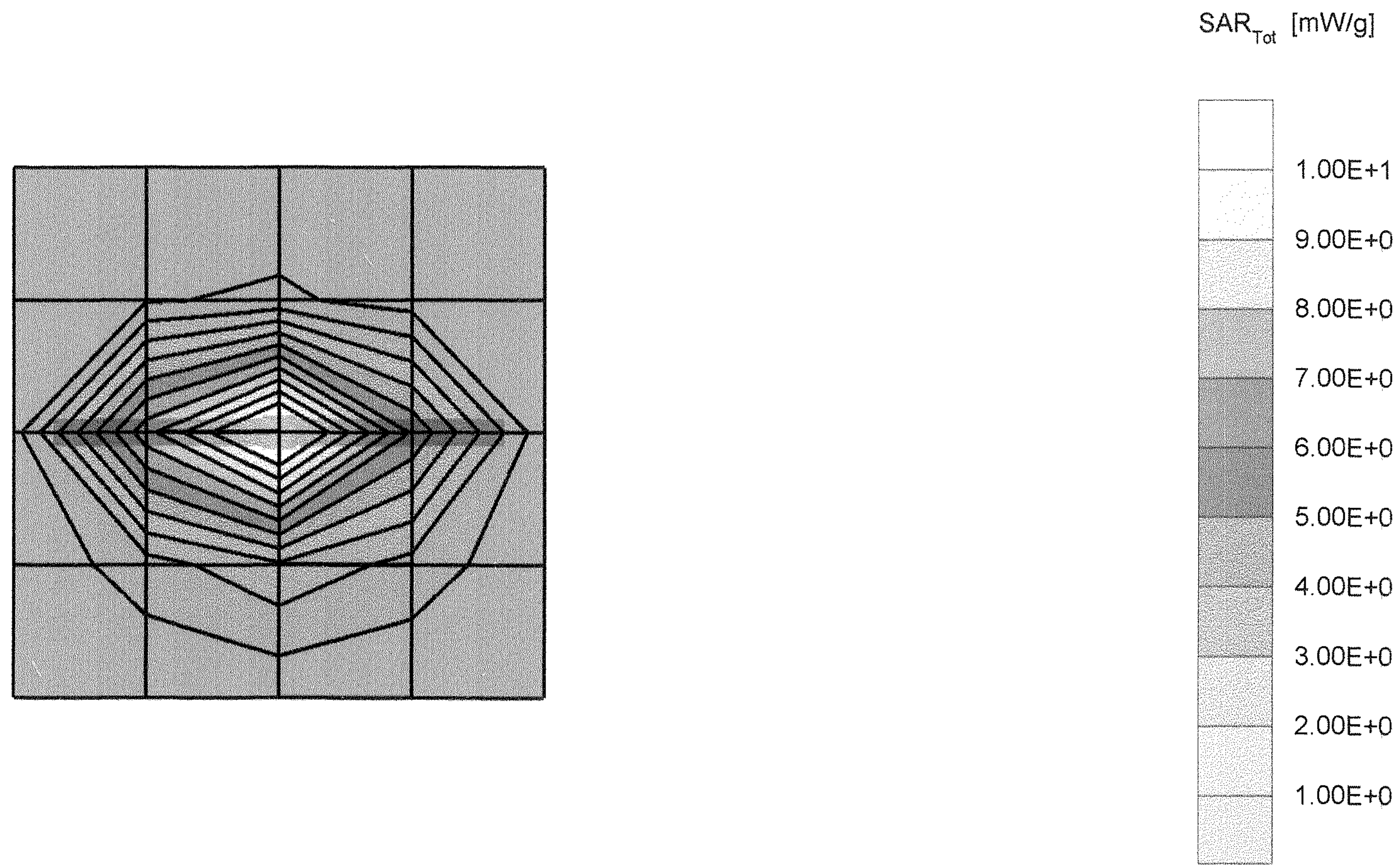
6. Power Test

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

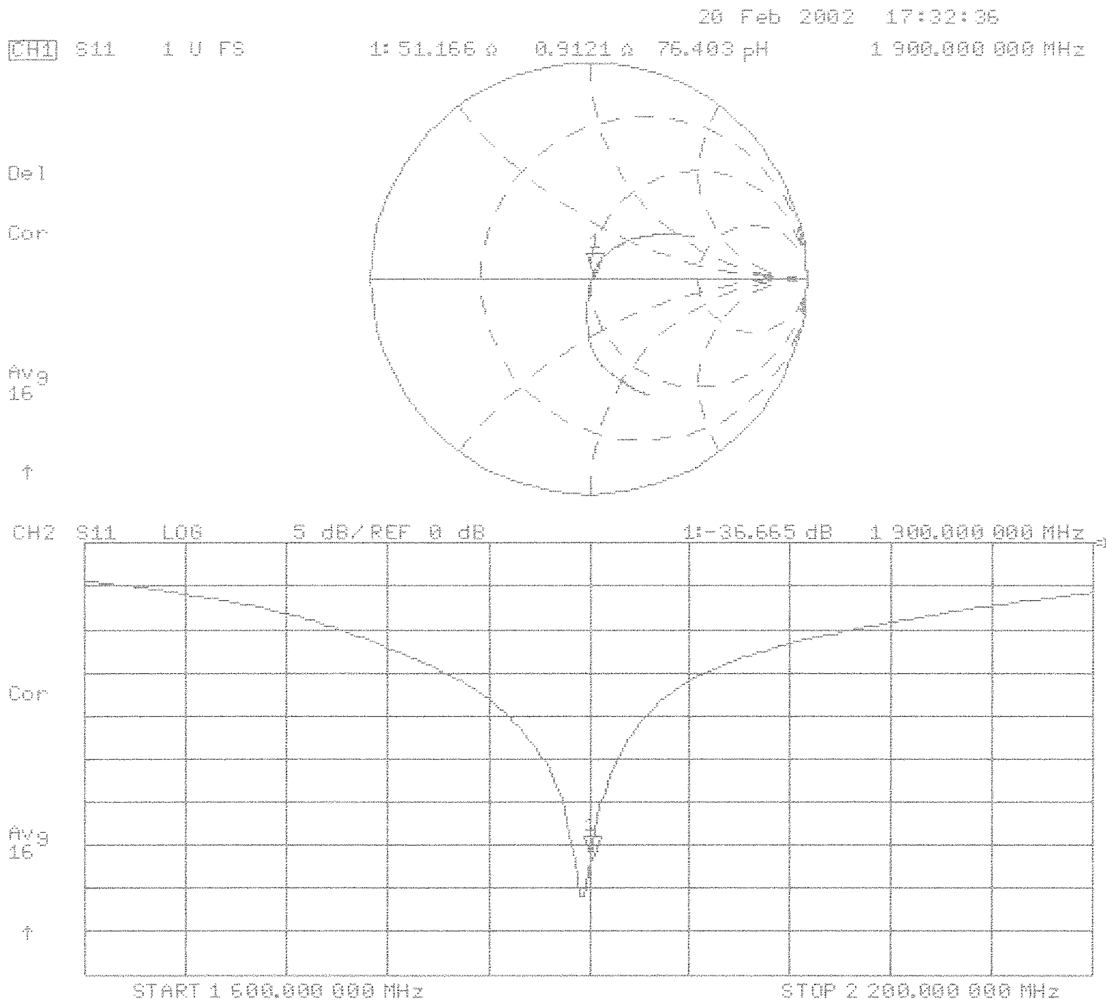
)/02

idation Dipole D1900V2 SN:5d003, d = 10 mm

uency: 1900 MHz; Antenna Input Power: 250 [mW]
Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
e: ET3DV6 - SN1507; ConvF(5.30,5.30,5.30) at 1800 MHz; IEEE1528 1900 MHz ; σ = 1.47 mho/m ε_r = 39.1 ρ = 1.00 g/cm^3
ɪs (2): Peak: 22.0 mW/g ± 0.06 dB, SAR (1g): 11.4 mW/g ± 0.01 dB, SAR (10g): 5.76 mW/g ± 0.03 dB, (Worst-case extrapolation)
ɪtration depth: 7.9 (7.5, 8.8) [mm]
ɪrdrift: -0.04 dB



ɪid & Partner Engineering AG, Zurich, Switzerland


20 Feb 2002 17:32:36
CH1 S11 1 U FS 1: 51.166 Ω 0.9121 Ω 76.403 pH 1 900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF 0 dB 1:-36.665 dB 1 900.000 000 MHz
Cor
Avg
16
START 1 600.000 000 MHz
STOP 2 200.000 000 MHz

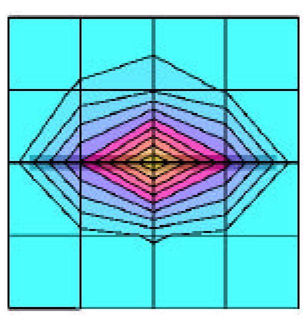
4Q) Second SAR value where two clear hotspots are shown in the PCS head measurements.

4A) The SAR results for the second hotspot are included in the following pages.

Dipole 1900MHz

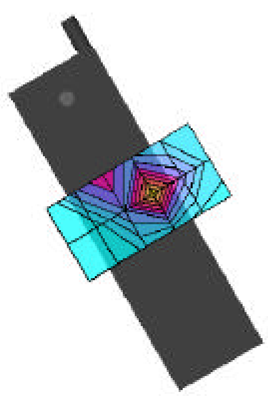
Dipole validation:

for f < 1 GHz, distance to the liquid d = 10 mm
for f > 1 GHz, distance to the liquid d=15 mm
SAM Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.43 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 0.471 mW/g ± 0.14 dB, SAR (10g): 0.213 mW/g ± 0.32 dB, (Worst-case extrapolation)
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: -0.00 dB



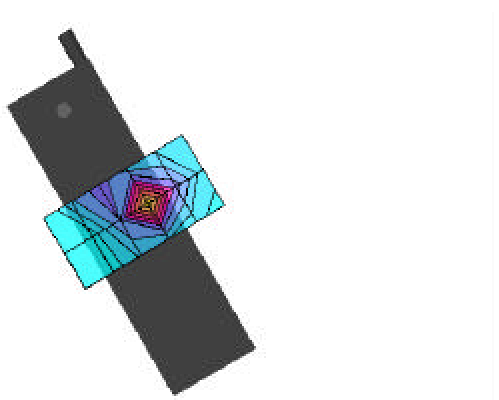
Opal

5135 FCC #02TC, PCS ch25 Right Cheek(2nd hot spot-smallest), Air Temp: 21.2 C   Liquid Temp:22.3 C
Conducted power before=22.16dBm, Conducted power after=22.25dBm, Hdet=73
SAM Phantom; Righ Hand Section; Position: (90°,300°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.43 mho/m ϵ_r = 39.9 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.258 mW/g, SAR (10g): 0.115 mW/g, (Worst-case extrapolation)
Coarse: Dx = 19.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.25 dB



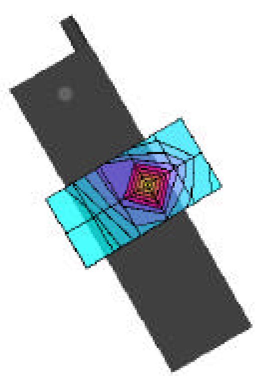
Opal

5135 FCC #02TC, PCS ch600 Right Cheek(2nd hot spot-smallest), Air Temp: 21.2 C   Liquid Temp:22.3 C
Conducted power before=22.11dBm, Conducted power after=22.17dBm, Hdet=68
SAM Phantom; Righ Hand Section; Position: (90°,300°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.43 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.252 mW/g, SAR (10g): 0.116 mW/g, (Worst-case extrapolation)
Coarse: Dx = 19.0, Dy = 15.0, Dz = 10.0
Powerdrift: 0.22 dB



Opal

5135 FCC #02TC, PCS ch1175 Right Cheek(2nd hot spot-smallest), Air Temp: 21.2 C   Liquid Temp:22.3 C
Conducted power before=22.02dBm, Conducted power after=22.09dBm, Hdet=78
SAM Phantom; Righ Hand Section; Position: (90°,300°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1618; ConvF(5.30,5.30,5.30); Crest factor: 1.0; 1900 MHz Brain: σ = 1.43 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.213 mW/g, SAR (10g): 0.0980 mW/g, (Worst-case extrapolation)
Coarse: Dx = 19.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.02 dB

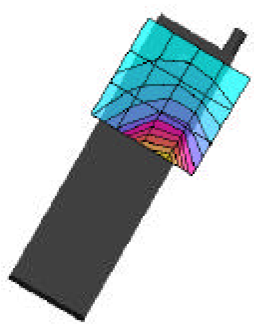


5Q) At least one SAR plot for 835 head which covers the entire top half of the phone to demonstrate there are no hotspots in this apparently unscanned region.

5A) The 835 head SAR plot for the entire top half of the phone are included on the following pages.

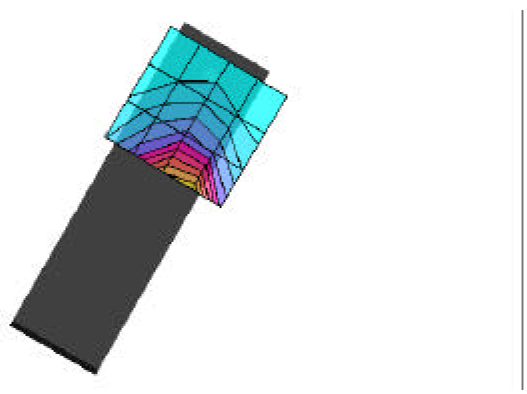
Opal

5135 FCC #02TC, FM ch383 Left Cheek(Upper Half of Phone), 09-12-02
Air Temp: 21.2 C   Liquid Temp:22.3 C
conducted power = 25.15 dBm
SAM Phantom; Left Hand Section; Position: (80°,60°); Frequency: 835 MHz
Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: σ = 0.88 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.973 mW/g * , SAR (10g): 0.564 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 19.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.06 dB



Opal

5135 FCC #02TC, FM ch383 Left Cheek(Upper Half of Phone), 09-12-02
Air Temp: 21.2 C   Liquid Temp:22.3 C
conducted power = 25.15 dBm
SAM Phantom; Left Hand Section; Position: (80°,60°); Frequency: 835 MHz
Probe: ET3DV6 - SN1618; ConvF(6.80,6.80,6.80); Crest factor: 1.0; 835 MHz Brain: σ = 0.88 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.770 mW/g * , SAR (10g): 0.439 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 19.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.23 dB



TCB

GRANT OF EQUIPMENT AUTHORIZATION
Certification
Issued Under the Authority of the Federal Communications Commission
By:

TCB

American TCB, Inc.
6731 Whittier Avenue
Suite C110
McLean, VA 22101

Date of Grant: 08/05/2002

Application Dated: 08/05/2002

Kyocera Wireless Corp
10290 Campus Pointe Drive
San Diego, CA 92121
Attention: Jay Moulton

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: OVFKWC-5135
Name of Grantee: Kyocera Wireless Corp

Equipment Class: **Licensed Non-Broadcast Transmitter Held to Ear**

Notes: **Trimode Dual Band Cellular Phone**

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
BC	22H	824.04 - 848.97	0.366	2.5 PM	40K0F8D
BC	22H	824.04 - 848.97	0.366	2.5 PM	40K0F1D
	22.901(d)	824.7 - 848.31	0.365	2.5 PM	1M25F9W
	24E	1851.25 - 1908.75	0.337	2.5 Hz	1M25F9W

Power Output is ERP for Part 22 and EIRP for Part 24. Body worn operations are restricted to belt clips/holsters/accessories tested for this filing. End-Users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. The highest reported SAR values are: Part 22 Head:1.31W/kg CDMA; Body-worn 0.648W/kg AMPS; Part 24 Head: 0.834W/kg CDMA.

BC: **The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed.**

3A) answer to question 3

2. Spurious Emission at Antenna Terminals

Out of Band Spurious Emission Measurement Procedures

(a) 1 MHz band immediately adjacent to the PCS band

We performed a numerical integration of the power as performed by the spectrum analyzer (HP8594E) in the 1 MHz band immediately outside of the PCS block. As specified in Part 24.238 of the rules, we used a Resolution Bandwidth of 1% of the fundamental emission bandwidth, which in this instance equates to the measurement bandwidth of 12.5 kHz.

The ACPR (Adjacent Channel Power Ratio) function of the HP CDMA measurement personality was used on spectrum analyzer, which provides the power integration. The ACPR function and the spectrum analyzer settings used to complete the measurement will be addressed in section (c).

(b) 2nd 1 MHz band adjacent to PCS Block

As specified in Part 24.238 of the rules, the 2nd 1 MHz band outside of the PCS block was measured using a resolution bandwidth of 1 MHz.

The ACPR function of the HP CDMA measurement personality was used to complete the measurement. See section (c) for the ACPR function and the spectrum analyzer settings.

(c) ACPR measurement and spectrum analyzer settings

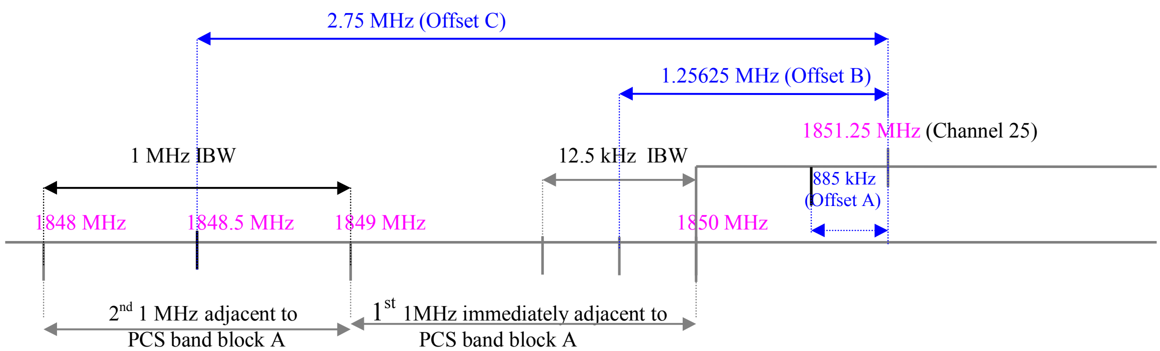
The ACPR (Adjacent Channel Power Ratio) is the power contained in a specified frequency-channel bandwidth relative to the total carrier power. It can measure up to three pairs of offset channels and relates them to the carrier power. ACPR measurement uses an integration bandwidth method (IBW) to measure the carrier power and the offset powers. IBW method performs a frequency sweep through the bandwidth of integration (set up by the user) using a resolution bandwidth (automatically set) much narrower than the channel bandwidth (e.g. 30 kHz RBW for a channel bandwidth of 1.25 MHz). The measurement computes an average power of the channel over a specified number of sweeps, automatically compensating for noise and scaling.

The following settings were used in the ACPR integration bandwidth method to complete the above measurements (a) and (b). An example to explain the settings is given.

Settings used in ACPR measurement

	Frequency (Hz)	Offset Limit	IBW (Hz)	Offset Span (Hz)	Comments
Offset A	± 885k	n/a	n/a	n/a	not required on a mobile station
Offset B	±1.25625M	-35dB (43+10logP)	12.5k	25k	setup for 1 MHz band immediately adjacent to PCS band
Offset C	± 2.75M	-35dB (43+10logP)	1M	2M	setup for 2nd 1 MHz band adjacent to PCS band

As an example of channel 25, the center frequency is 1851.25 MHz. The interpretation of the settings in the above table is shown in following drawing.



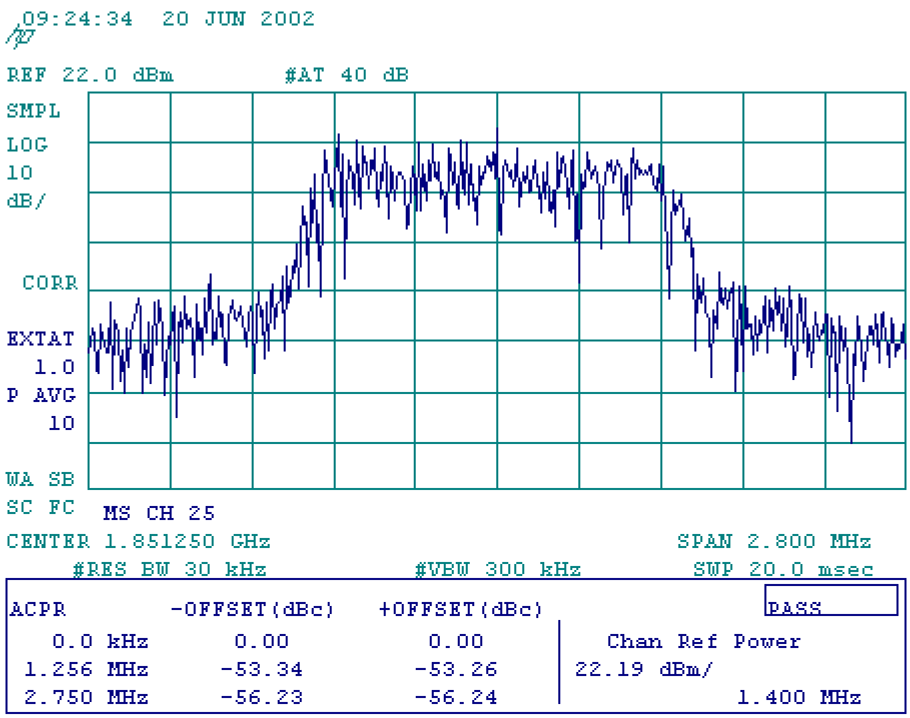
Note: The above drawing is not in scale.

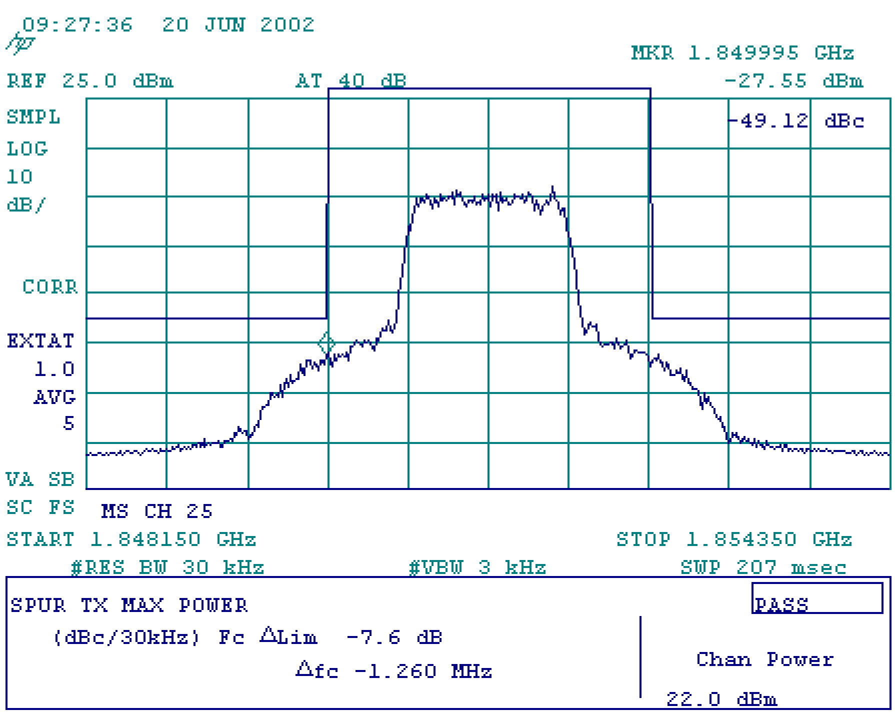
(d) Spurious emission up to 10th harmonic of the transmitting frequency

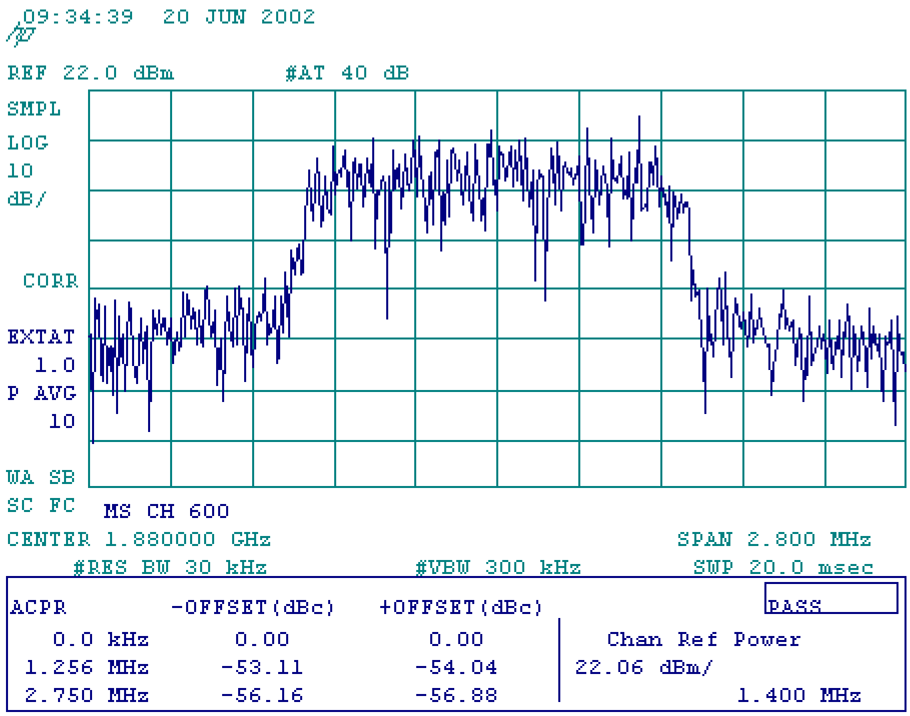
The harmonic and spurious emissions from 0 Hz to 22 GHz were measured using a RBW of 1 MHz and a VBW of 1 MHz on the spectral analyzer.

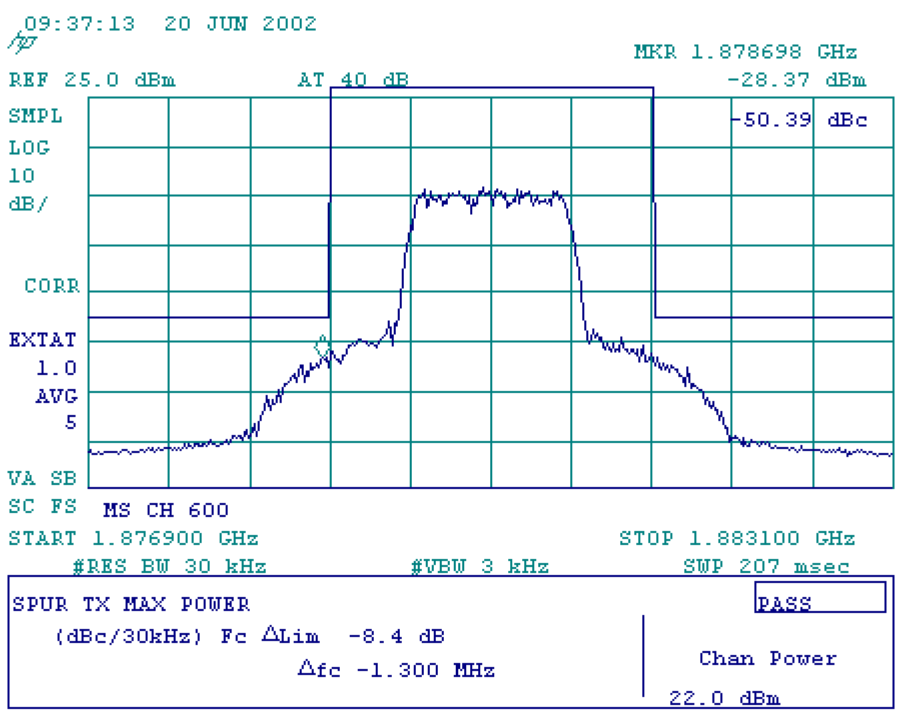
Test Results

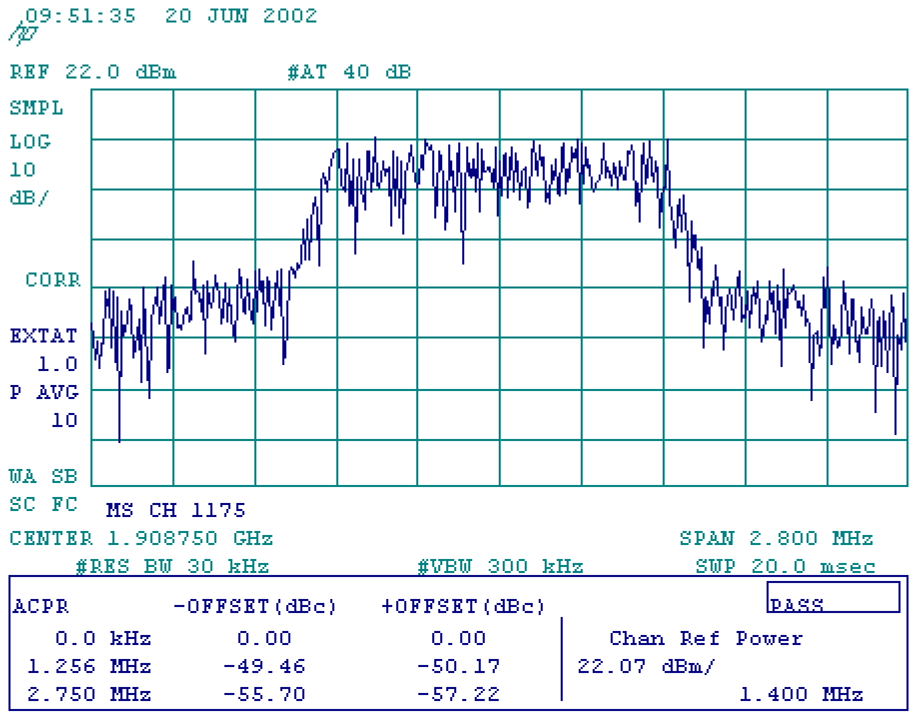
ACPR measurement (1st and 2nd 1MHz adjacent to PCS)

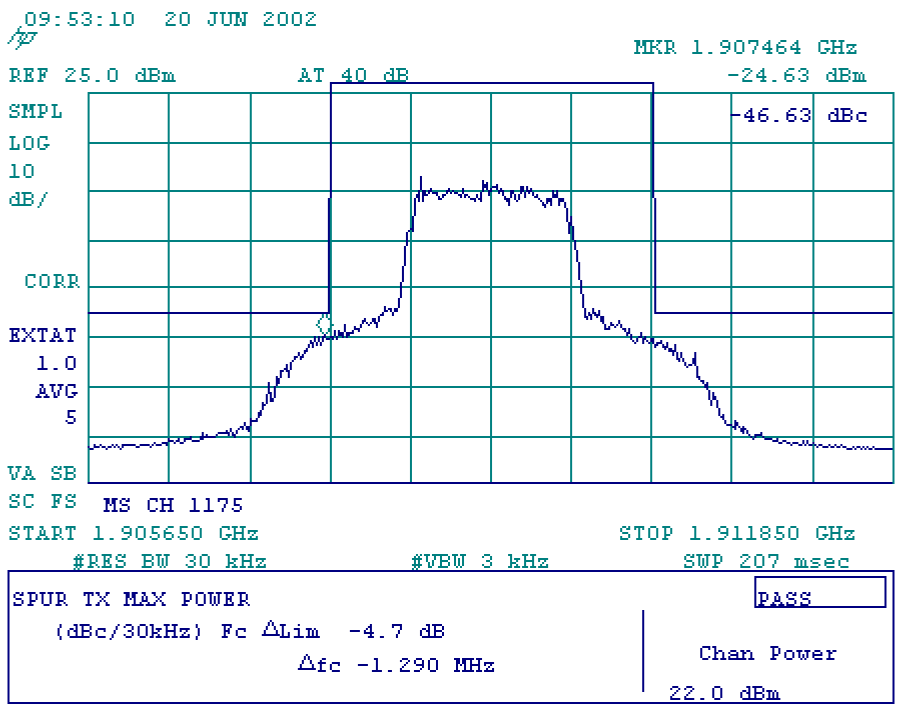





09:34:39 20 JUN 2002
REF 22.0 dBm
#AT 40 dB
SMPL
LOG
10
dB/
CORR
EXTAT
1.0
P AVG
10
WA SB
SC FC
MS CH 600
CENTER 1.880000 GHz
SPAN 2.800 MHz
#RES BW 30 kHz
#VBW 300 kHz
SWP 20.0 msec
ACPR
-OFFSET(dBc)
+OFFSET(dBc)
PASS
0.0 kHz 0.00 0.00
1.256 MHz -53.11 -54.04
2.750 MHz -56.16 -56.88
Chan Ref Power
22.06 dBm/
1.400 MHz


09:37:13 20 JUN 2002
MKR 1.878698 GHz
REF 25.0 dBm
AT 40 dB
-28.37 dBm
-50.39 dBc
SMPL
LOG
10
dB/
CORR
EXTAT
1.0
AVG
5
VA SB
SC FS
MS CH 600
START 1.876900 GHz
STOP 1.883100 GHz
#RES BW 30 kHz
#VBW 3 kHz
SWP 207 msec
SPUR TX MAX POWER
PASS
(dBc/30kHz) Fc ΔLim -8.4 dB
Δfc -1.300 MHz
Chan Power
22.0 dBm


09:51:35 20 JUN 2002
REF 22.0 dBm
#AT 40 dB
SMPL
LOG
10
dB/
CORR
EXTAT
1.0
P AVG
10
WA SB
SC FC
MS CH 1175
CENTER 1.908750 GHz
SPAN 2.800 MHz
#RES BW 30 kHz
#VBW 300 kHz
SWP 20.0 msec
ACPR
-OFFSET(dBc)
+OFFSET(dBc)
PASS
0.0 kHz 0.00 0.00
1.256 MHz -49.46 -50.17
2.750 MHz -55.70 -57.22
Chan Ref Power
22.07 dBm/
1.400 MHz


09:53:10 20 JUN 2002
MKR 1.907464 GHz
REF 25.0 dBm
AT 40 dB
-24.63 dBm
-46.63 dBc
SMPL
LOG
10
dB/
CORR
EXTAT
1.0
AVG
5
VA SB
SC FS
MS CH 1175
START 1.905650 GHz
STOP 1.911850 GHz
#RES BW 30 kHz
#VBW 3 kHz
SWP 207 msec
SPUR TX MAX POWER
PASS
(dBc/30kHz) Fc ΔLim -4.7 dB
Δfc -1.290 MHz
Chan Power
22.0 dBm