

SAR TEST REPORT

HCT CO., LTD

EUT Type:	USB Modem					
FCC ID:	XHG-U600					
Model:	U600	Trade Name	Diffon corporation			
Date of Issue:	Apr. 05, 2010					
Test report No.:	HCTA1004FS04					
Test Laboratory:	HCT CO., LTD. SAN 136-1, AMI-RI, BUBAL- TEL: +82 31 639 8565 FA	HCT CO., LTD. SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL: +82 31 639 8565 FAX: +82 31 639 8525				
Applicant :	Diffon corporation Digital Tower Aston 1505, 505-15 Gasan, Geumcheon, Seoul, Korea Tel: +82-2-2082-8222 Fax: +82-2-2082-8922					
Testing has been carried out in accordance with:	47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 2005 IEEE 1528-2003					
Test result:	The tested device complies subject to the test. The test The test report shall not be r laboratory.	s with the requirements in results and statements relat eproduced except in full, with	respect of all parameters e only to the items tested. nout written approval of the			
Signature	Report prepared by : Sun-Hee Kim Test Engineer of SAR Pa	Approvo : Jae-Sa rt Manage	ed by ang So r of SAR Part			



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1. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (r). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.



Figure 2. SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

 $\sigma E^2 / \rho$

	SAR	=
where:		

σ	=	conductivity of the tissue-simulant material (S/m)
ρ	=	mass density of the tissue-simulant material (kg/m ³)
E	=	Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.



2. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

ЕИТ Туре	USB Modem
FCC ID	XHG-U600
Model(s)	U600
Trade Name	Diffon corporation
Serial Number(s)	#1
Application Type	Certification
Modulation(s)	WIMAX2600
Tx Frequency	2 498.5 MHz – 2 687.5 MHz (5 MHz Bandwidth) 2 501.0 MHz – 2 685.0 MHz (10 MHz Bandwidth)
Rx Frequency	2 498.5 MHz – 2 687.5 MHz (5 MHz Bandwidth) 2 501.0 MHz – 2 685.0 MHz (10 MHz Bandwidth)
FCC Classification	Licensed Non-Broadcast Station Transmitter (TNB)
Production Unit or Identical Prototype	Prototype
Max. SAR	0.921 W/kg WIMAX2600 Body SAR
Date(s) of Tests	Mar. 26, 2010, May 5, 2010
Antenna Type	Intenna

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3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.3.1).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Pentium IV 3.0 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



Figure 3.1 HCT SAR Lab. Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.



3.2 DASY E-FIELD PROBE SYSTEM

3.2.1 ES3DV6 Probe Specification

Symmetrical design with triangular core Interleaved se	ensors
PEEK enclosure material (resistant to organic solvent	s, e.g., DGBE)
Basic Broad Band Calibration in air	
Conversion Factors (CF) for HSL 900 and HSL 1810	T
Additional CF for other liquids and frequencies upon r	equest
10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GH	Hz)
± 0.2 dB in HSL (rotation around probe axis)	
± 0.3 dB in tissue material (rotation normal to probe a	xis)
5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB	
Overall length: 330 mm (Tip: 20 mm)	
Tip diameter: 3.9 mm (Body: 12 mm)	
Distance from probe tip to dipole centers: 2.0 mm	-
General dosimetry up to 4 GHz	-
Dosimetry in strong gradient fields	14
Compliance tests of mobile phones	Figure 4.1 Photo
	Symmetrical design with triangular core Interleaved se Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 Additional CF for other liquids and frequencies upon r 10 MHz to 4 GHz; Linearity: \pm 0.2 dB (30 MHz to 4 GH \pm 0.2 dB in HSL (rotation around probe axis) \pm 0.3 dB in tissue material (rotation normal to probe at 5 μ W/g to > 100 mW/g; Linearity: \pm 0.2 dB Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones



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Figure 4.1 Photograph of the probe and the Phantom

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box

on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting.

The approach is stopped at reaching the maximum.



Figure 4.2 ES3DV6 E-field Probe

3.3 PROBE CALIBRATION PROCESS

3.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than \pm 10 %. The spherical isotropy was evaluated with the proper procedure and found to be better than \pm 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

where:

 Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

 ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;



Figure 3.4 E-Field and Temperature measurements at 900 MHz

$$SAR = \frac{|\mathbf{E}|^2 \cdot \sigma}{\rho}$$

where:

 σ = simulated tissue conductivity,

= Tissue density (1.25 g/cm³ for brain tissue)





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3.3.2 Data Extrapolation

The DASY4 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given like below;

$$V_{i} = U_{i} + U_{i}^{2} \cdot \frac{cf}{dcp_{i}}$$
 with V_{i} = compensated signal of channel i (i=x,y,z)
 U_{i} = input signal of channel i (i=x,y,z)
 Cf = crest factor of exciting field (DASY parameter)
 dcp_{i} = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:	with	Vi	= compensated signal of channel i (i = x,y,z)
p		Normi	= sensor sensitivity of channel i $(i = x, y, z)$
			$\mu V/(V/m)^2$ for E-field probes
$E_i = \sqrt{\frac{1}{N_{opp}}}$		ConvF	= sensitivity of enhancement in solution
Norm i Convr		Ei	= electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian magnitude):

 $E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$

The primary field data are used to calculate the derived field units.

$SAR = E^2 \cdot \frac{\sigma}{1}$	with	SAR	= local specific absorption rate in W/g
$\rho \cdot 1000$		Etot	= total field strength in V/m
<i>p</i> ====		σ	= conductivity in [mho/m] or [Siemens/m]
		ρ	= equivalent tissue density in g/cm ³

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{proc} = \frac{E_{tot}^{2}}{3770}$$
 with
$$P_{pwe} = \text{equivalent power density of a plane wave in W/cm}^{2}$$

$$= \text{total electric field strength in V/m}$$



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3.4 SAM Phantom

The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.



Shell Thickness Filling Volume Dimensions 2.0 mm about 30 L 810 mm x 1 000 mm x 500 mm (H x L x W)

Figure 3.6 SAM Phantom

3.5 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power),

the hand is omitted during the tests.



Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrove.

Ingredients		Frequency (MHz)										
(% by weight)	45	50	83	35	9′	15	1 9	000	2 4	50	26	00
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	60.8	69.83
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.3	0.00
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	38.9	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	30.17

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2	2-(2-butoxyeth	noxy) ethanol]
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-t	etramethylbut	yl)phenyl] ether

Table 3.1 Composition of the Tissue Equivalent Matter



3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE3	446	May 22, 2009	Annual	May 22, 2010
SPEAG	DAE3	466	July 21, 2009	Annual	July 21, 2010
SPEAG	DAE4	869	Sep. 18, 2009	Annual	Sep. 18, 2010
SPEAG	E-Field Probe ET3DV6	1631	Jun. 24, 2009	Annual	Jun. 24, 2010
SPEAG	E-Field Probe ET3DV6	1798	Feb. 23, 2010	Annual	Feb. 23, 2011
SPEAG	E-Field Probe ES3DV2	3017	July 22, 2009	Annual	July 22, 2010
SPEAG	Validation Dipole D450V2	1007	July 15, 2008	Biennial	July 15, 2010
SPEAG	Validation Dipole D835V2	441	May 25, 2009	Annual	May 25, 2010
SPEAG	Validation Dipole D1800V2	2d007	May 20, 2008	Biennial	May 20, 2010
SPEAG	Validation Dipole D1900V2	5d032	July 20, 2009	Annual	July 20, 2010
SPEAG	Validation Dipole D2450V2	743	Aug. 27, 2008	Biennial	Aug. 27, 2010
SPEAG	Validation Dipole D2600V2	1024	Aug. 12, 2009	Annual	Aug. 12, 2010
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 05, 2009	Annual	Nov. 05, 2010
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 05, 2009	Annual	Nov. 05, 2010
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 05, 2009	Annual	Nov. 05, 2010
R&S	Base Station CMU200	110740	July 26, 2009	Annual	July 26, 2010
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2010	Annual	Feb. 10, 2011
HP	Signal Generator E4438C	MY42082646	Dec. 24, 2009	Annual	Dec. 24, 2010
HP	Network Analyzer 8753C	3310J01394	Dec. 04, 2009	Annual	Dec. 04, 2010
Tescom	TC-3000/ Bluetooth	3000A490112	Jan. 11, 2009	Annual	Jan. 11, 2011

NOTE:

The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Validation measurement is performed by HCT Lab. before each test. The brain simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

The evaluation was performed with the following procedure:

- 1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.
- 2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.
- 3. Around this point, a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:
 - a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
- 4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5 %, the evaluation is repeated.



Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

5.1 HEAD POSITION

The device was placed in a normal operating position with the Point A on the device, as illustrated in following drawing, aligned with the location of the RE(ERP) on the phantom. With the ear-piece pressed against the head, the vertical center line of the body of the handset was aligned with an imaginary plane consisting of the RE, LE and M. While maintaining these alignments, the body of the handset was gradually moved towards the cheek until any point on the mouth-piece or keypad contacted the cheek. This is a cheek/touch position. For ear/tilt position, while maintain the device aligned with the BM and FN lines, the device was pivot against ERP back for 15° or until the device antenna touch the

phantom. Please refer to IEEE 1528-2003 illustration below.







Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with each accessory. If multiple accessory share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 5 mm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is then documented and used to perform Body SAR testing.

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5.3 Test Configurations

According to KDB 447498, the device that can be connected to a host through a cable must be tested with the device positioned in all applicable orientations against the flat phantom. And a separation distance \leq 0.5 cm is required for USB-dongle transmitters.



Figure 5.3 USB Connector Orientations Implemented on Laptop Computers

Therefore, the EUT was tested in following orientations;

1) Configuration 1: Front side of the EUT was tested with the direct-connection to the host device with Horizontal-Up (A), and separation distance between EUT and Phantom is 5 mm.

2) Configuration 2: Back side of the EUT was connected to the host device with Horizontal-Down (B) using a USB cable, and separation distance between EUT and Phantom is 5 mm.

3) Configuration 3: Right side of the EUT was connected to the host device with Vertical-Front (C)using a USB cable, and separation distance between EUT and Phantom is 5 mm.

4) Configuration **4:** Left side of the EUT was tested with the direct-connection to the host device with Vertical-Back (D), and separation distance between EUT and Phantom is 5 mm.

5) Configuration **5:** Top side of the EUT was tested with the direct-connection to the host device, and separation distance between EUT and Phantom is 5 mm.

Note;

This USB cable was used to operate this unit in the highest RF performance capability for SAR testing.



6. MEASUREMENT UNCERTAINTY

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than 15 % - 25 %.

According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of 1 dB to \pm 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least \pm 2 dB can be expected.

According to CENELEC, typical worst-case uncertainty of field measurements is 5 dB. For well-defined modulation characteristics the uncertainty can be reduced to \pm 3 dB.

Freques cy	Emor	Tol	Prob.			S tandard		Combined		Expand ed
	Description		dist.	Div.	q	Uscertaisty	v _{er}	Uscentaisty	k	STD Uncertainty
(AffE)		(±96)				(# %)		(# %))		(= %)
	1 Mean reneatSystem									
	Probe Calibration	5.50	N	1	1	5.50	-			
	Axial hotopy	4.70	R	1.73	0.7	1.90	8			
	Herrispherical hotopy	9.60	R	1.73	0.7	3.88	8			
	Boundary Effects	1.00	R	1.73	1	0.58	8			
	Lineerity	4.70	R	1.73	1	2.71	8			
	System Detection Limits	1.00	R	1.73	1	0.58	8			
	Readout Electronica	030	N	1.00	1	0.30	8			
	Response Time	0.8	R	1.73	1	0.46	80			
	Integration Time	2.6	R	1.73	1	1.50	8			
	RF Ambient Noise	3.00	R	1.73	1	1.73	8			
	RF Ambient Reflection	3.00	R	1.73	1	1.73	88			
	Probe Positioner	0.40	R	1.73	1	0.23	8			
	Probe Positioning	2.90	R	1.73	1	1.67	-			
	Max SAR Eval	1.00	R	1.73	1	0.58	8			
	2.TextSample Related									
	Deni ce Positi oning	1.80	N	1.00	1	1.80	9			
	Deni ce Holder	3.60	N	1.00	1	3.60	- 5			
	Power Drift	5.00	R	1.73	1	2.89	88			
	3.Phanton and Setup		_		_					
	PhantomUncertainty	4.00	R	1.73	1	2.31	80			
	Liquid Conductivity(target)	5.00	R	1.73	0.61	1.85	80			
	Liquid Permitivity(taget)	5.00	R	1.73	0.6	1.73	8			
835	Liquid Conductivity(meas.)	122	N	1	0.64	0.78	-	10.32	2	20.65
(Head)	Liquid Permitivity(meas)	1.45	N	1	0.6	0.87	8		•	20.00
835	Liquid Conductivity(meas.)	0.21	N	1	0.64	0.13	8	10.29	2	20.57
(Body)	Liquid Permitivity(meas)	1.43	N	1	0.6	0.86	88		-	
1900	Liquid Conductivity(meas.)	0.00	N	1	0.61	0.00	80	10.49	2	20.99
(Head)	Liquid Permitivity(meas)	3.75	N	1	0.6	2.25	88		-	
1900	Liquid Conductivity(meas.)	1.97	N	1	0.64	1.26	-	10.33	2	20.67
(Body)	Liquid Permitivity(meas)	0.60	N	1	0.6	0.36	-		-	
2600	Liquid Conductivity(meas.)	3.06	N	1	0.64	1.96	-	10.62	2	21.25
(Head)	Liquid Permitivity(meas)	3.33	N	1	0.6	2.00	-		_	
2600	Liquid Conductivity(meas.)	0.93	N	1	0.64	0.60	88	10.49	2	20.99
(Body)	Liquid Permitivity(meas)	3.62	N	1	0.6	2.17	-	av. 17	•	av.27

Table 6.1 Breakdown of Errors



7. ANSI/ IEEE C95.1 - 2005 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)	
SPATIAL PEAK SAR * (Brain)	1.60	8.00	
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40	
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00	

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

- * The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- ** The Spatial Average value of the SAR averaged over the whole-body.
- *** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

8. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
2600		Hood	21.4	εr	39	37.7	- 3.33	± 5
2600 Mar.26, 2010 H	пеац	21.4	σ	1.96	2.20	+ 3.06	± 5	
2600	2600 Mar 26, 2010 Ba	Pody	Dody 21.4		52.5	50.60	- 3.62	± 5
2600 Mar.26, 20	Wai.20, 2010	Body	21.4	σ	2.16	2.18	+ 0.93	± 5
2600		Head	lead 21.3	εr	39	38.1	- 2.31	± 5
2600 Ma	May 5, 2010	пеаа		σ	1.96	1.90	- 3.06	± 5
2600 May 5, 201	May 5, 2010	5, 2010 Body	21.3	εr	52.5	51.4	- 2.10	± 5
	way 5, 2010			σ	2.16	2.17	+ 0.46	± 5

8.2 System Validation

Prior to assessment, the system is verified to the \pm 10 % of the specifications at 2 600MHz by using the system validation kit. (Graphic Plots Attached)

*Input Power: 100 mW

Freq. [MHz]	Date	Liquid	Liquid Temp. [°C]	SAR Average	Target Value (SPEAG) (mW/g)	* Measured Value (mW/g)	Deviation [%]	Limit [%]
2 600	Mar.26, 2010	Head	21.3	1 g	57.3	5.90	+ 2.97	± 10
2 600	May 5, 2010	Head	21.3	1 g	57.3	5.85	+ 2.09	± 10

9.Devices with WIMAX

UL Zone Types (FUSC, PUSC,

OFUSC, OPUSC, AMC, TUSC1,

TUSC2)

9.1 802.16e/WiMAX Device and System Operating Parameters

Table 1: 802	Operating Parameters				
Description	Para	meter	Comment		
FCC ID	XHG-U600		Identify all related FCC ID		
Radio Service	Part 27 s	ubpart M	Rule parts		
Transmit Frequency Range (MHz)	2496MHz-	-2690MHz	System parameter		
System/Channel Bandwidth (MHz)	5MHz	10MHz	System parameter		
System Profile	Revisio	on 1.7.0	Defined by WiMax Forum		
Modulation Schemes	QPSK,	16QAM	Identify all applicable UL modulations		
Sampling Factor	28/	/25	System parameter		
Sampling Frequency (MHz)	5.6MHz	11.2MHz	(Fs)		
Sample Time (ns)	178.58ns 89.3ns		(1/Fs)		
FFT Size (Nfft)	512 1024		(Nfft)		
Sub-Carrier Spacing (MHz)	10.9375kHz		(Δf)		
Useful Symbol time (µs)	91.4	13µs	$(T_b=1/\Delta f)$		
Guard Time (µs)	11.4	13us	$(T_g=T_b/cp); cp = cyclic prefix$		
OFDMA Symbol time (µs)	102.85714us		$(T_s=T_b+T_g)$		
Frame Size (ms)	5r	ns	System parameter		
TTG + RTG (us or number of symbols)	165.7	143µs	Idle time, system parameter		
Number of DL OFDMA symbols per Frame	29		Identify the allowed & maximum symbols including both traffic & control symbols		
Number of UL OFDMA Symbols per Frame	1	8			
DL:UL Symbol Ratios	29	:18	Identify all applicable DL:UL ratios; used to determine UL duty factor		
Power Class (dBm)	Power Class	2, 23±1dBm	Identify power class and tolerance		
Wave1 / Wave2	Wave2, 2Rx+1Tx Diversity		Describe antenna diversity info and MIMC requirements separately		

HCT CO., LTD. SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL : +82 31 639 8565 FAX : +82 31 639 8525 www.hct.co.kr

Segmented PUSC

Unsegmented PUSC

the symbol

sub-carrier/sub-channel structures applicable

and

Describe separately

to each zone type

HCT1004FS04 FCC ID: XHG-U600 Date of Issue: Apr. 05. 2010 **Report No.:** UL Identify the allowed and tested or to be Maximum Number of 409 841 Sub-carriers tested include separated parameters; Measured UL Burst Maximum 5 MHz 16QAM1/2: 23.49 dBm the symbol explanations on control Average Power 10 MHz 16QAM1/2: 23.12 dBm configuration used in the power measurements and show the maximum UL Control Symbol 3 PUSC symbols (used for ranging, CQICH and power level is determined for the control Configuration symbols ACK/NACK) UL Control Symbol Maximum 65.69 mW 29.30 mW Average Power UL Burst Peak-to-Average For 5 MHz Channel BW is Identify the expected range and Power Ratio (PAR) between 6.24~6.43 dB(ANT1) measured/tested PAR; explain separately the 5.89~6.49 dB(ANT2) methods used or to be used to address SAR For 10 MHz Channel BW is probe calibration and measurement error between 6.28~6.40 dB(ANT1) issues 6.32~6.42 dB(ANT2) Frame Averaged UL Show calculations separately and explain **Duty Factor** Transmission Duty Factor (%) = 15 * 102.86us / 5000us how the applicable cf factor (duty factor) = 30.86 % used or to be use in the SAR measurements CF= 3.24 is derived and how the control symbols are 5000 us/15*102.857 us accounted for



9.2. Information on Test Equipment and Measurement Results

Equipment/Results	Description						
Test Software	Test Software						
Signal Generator	For the purposes of measuring SAR an Agilent Signal Generator (specify model number) is used to						
Communication	emulate the Base Station. The signal generator is loaded with a frame that simulates the						
Test Set, Protocol	Basestation downlink. A drawing of the setup is shown below.						
Simulator	E4438C Vector Signal Generator Vector Signal Generator RX2 Beceem Card						
	1. Drawing of test setup						
	The DUT receives and demodulates the DL frame. This frame instructs the DUT to transmit during						
	the UL frame, with a specified data burst size, in a specific zone (PUSC) and a specific modulation						
	(QPSK ¹ / ₂ ³ / ₄ or 16QAM ¹ / ₂ ³ / ₄).						
	The DUT is configured using the Beceem Diagnostic Control Panel. This is a software tool which						
	runs on the laptop that is connected to the dongle. The Diagnostic Control panel instructs the						
	Dongle to transmit at maximum power and tells the dongle which antenna to transmit with						
	(Antenna 1 or Antenna 2).						
	Decem Diagnostic Control Panel Image: State VM MAC ID Utilizes Image: State Image: State Option ID Option Value Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State Image: State						

Table 2: Information on Test Equipment and Measurement Results



FCC ID: XHG-U600

Date of Issue:

Apr. 05. 2010

Signal Generator

Frame Profile loaded in Vector Signal Generator:

Tast Vactor Filo Namo	BW	DL/UL
Test vector rue ivame	В₩	Symbols
T_10_D29U18_4Q12	10 MHz	29/18
T_10_D29U18_4Q34	10 MHz	29/18
T_10_D29U18_16Q12	10 MHz	29/18
T_10_D29U18_16Q34	10 MHz	29/18
T_5_D29U18_4Q12	5 MHz	29/18
T_5_D29U18_4Q34	5 MHz	29/18
T_5_D29U18_16Q12	5 MHz	29/18
T_5_D29U18_16Q34	5 MHz	29/18

Agilent ESG Vector Signal Generator / Model :E4438C is used in conjunction with Diffon supplied radio profile to configure the Diffon WiMAX U600 module for the SAR evaluation. ESG Vector Signal Generator is loaded with the downlink signal, containing the respective FCH, DL-MAP and UL-MAP required by the test device to configure the uplink transmission. The waveform is configured for a DL:UL symbol ratio of 29:18 , but since there was no energy in the control symbols, the effective power is only across 15 data symbols. On the PC and downloaded to the VSG. The test device can synchronize itself to the signal received from VSG, both in frequency and time. It then modulates the DL-MAP and UL-MAP transmitted in the downlink sub-frame and determine the DL:UL symbol ratio. The downlink burst is repeated in each frame, every 5 ms, to simulate the normal transmission from a WiMAX base station. The UL-MAP received by the device is used to configure the uplink burst with all data symbols and sub-channels active. For TDD systems, both uplink and downlink transmissions are at the same frequency. The output power of the VSG is kept at least 80 dB lower than the test device to avoid interfering with the SAR measurements. The ESG is connected directly into the WiMAX card so as to allow the card to enter into transmit mode.

Communication Test Set

Modulation and channel bandwidth selection is loaded to Vector Signal Generator. when evaluating QPSK/16QAM with 10MHz channel Bandwidth, radio profile name "T_10_D29U18_4Q12,T_10_D29U18_4Q34,T_10_D29U18_16Q12,T_10_D29U18_16Q34" is active on the Vector Signal Generator.

when evaluating QPSK/16QAM with 5MHz channel Bandwidth, radio profile name "T_5_D29U18_4Q12, T_5_D291U18_4Q34, T_5_D291U18_16Q12, T_5_D29U18_16Q34" is active on the Vector Signal Generator.



Apr. 05. 2010

Value Band Width		Frame definition for 10 MHz RC10						
Value Band Width	Test Vector Name							
Band Width	T_10_D29U18_4Q12	T_10_D29U18_4	Q34 T_10_D290	J18_16Q12	T_10_D29U18_16Q34			
	10MHz	10MHz	10MHz		10MHz			
FFT size	1024	1024	1024		1024			
DL/UL ratio	29/18	29/18	29/18	29/18				
Down link								
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – I	PUSC	Zone 1 – PUSC			
Burst profile /	MCS: QPSK R1/2	MCS: QPSK R3	3/4 MCS: QA	M16 R1/2	MCS : QAM16 R3/4			
MCS								
Up Link								
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – I	PUSC	Zone 1 – PUSC			
Burst profile /	MCS: QPSK R1/2	MCS: QPSK R3	3/4 MCS: QA	M16 R1/2	MCS : QAM16 R3/4			
MCS								
	Frame definition for 5 MHz RCT							
Parameter	Test Vector Name							
Value	T_5_D29U18_4Q1	T_5_D29U18_4Q3	T_5_D29U18_16Q1	T_5_D29	1U18_16Q34			
	2	4	2					
Band Width	5MHz	5MHz	5MHz	5MHz				
FFT size	512	512	512	512				
DL/UL ratio	29/18	29/18	29/18	29/18				
Down link								
Zone profiles	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 -	- PUSC			
Burst profile /	MCS: QPSK	MCS: QPSK	MCS:QAM16	MCS:QA	AM16 R3/4			
MCS	R1/2	R3/4	R1/2					
Up Link								
7 61	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 – PUSC	Zone 1 –	PUSC			
Zone profiles	MCS: QPSK	MCS: QPSK	MCS:QAM16	MCS:QA	AM16 R3/4			
Burst profile /	-	_	-	-				
Burst profile /	R1/2	R3/4	R1/2					

symbols. Inside the uplink, 15 of the symbols are used for data, and three of the symbols are information, so did not contribute to the total energy transmitted. The correct duty factor si be (15°102.86 us/5000 us=30.86 %. This agrees with the above calculated duty cycle (30.86) this device. Using this calculation method eliminates all the other transmit time, guard time and only uses the transmit time. The DUT does not transmit during the control symbols. Hence a correction needs to be applitive SAR measurements to account for this. Datput Power deasurement 1. Description of how the power is measured. Time gated using MXA(N9020A) Functionality – 20 Hz to 3.6, 8.4, 13.6 or 2.6.5 GHz - Up to 300% faster than other mid-performance class spectrum and signal analyze – Analog backaton IQ inputs with 40 MILz baseband bandwidth (optional) – View configuration choices for MXA Instrument Hardware Performance - #0.23 dB absolute amplitude accuracy - #15 dBm third order interpet (TOI) 178 dBc W-CDMA ACLR dynamic range (with noise correction on) Measurement Applications & Software - LTE, W-CDMA, HSDPA/HSUPA, Phase noise and more. - Advanced analysis of more for general purpose data analysis, visualiza and measurement atomation. Automation configuration configuration probas data analysis, visualiza and ensurement atomatic on configuration spectrum analysis, visualiza and measurement atomatic on configuration spectrum probased the MX/ - MAdvanced analysis of more for general purpose data analysis, visualiza and measurement atomatic on configuration configuratis probasedation configuration configuration probased badwidth (di	Report No.:	HCT1004FS04	FCC ID	: XHG-U60	0 <u> </u>	Date of Issue:	Apr. 05. 2010			
Dutput Power 1. Description of how the power is measured. Time gated using MXA(N9020A) Functionality - 20 Hz to 3.6, 8.4, 13.6 or 26.5 GHz - Up to 300% faster than other mid-performance class spectrum and signal analyze - Analog baseband IQ inputs with 40 MHz baseband bandwidth (optional) - View configuration choices for MXA Instrument Hardware Performance - #0.23 dB absolute amplitude accuracy - #15 dBm third order intercept (TOI) - -154 dBm displayed average noise level (DANL) - -78 dBc W-CDMA ACLR dynamic range (with noise correction on) Measurement Applications & Software - LXF, W-CDMA, HSDPA/HSUPA, phase noise and more. - Advanced analysis of more than 70 signal formats, software runs inside the MX/ - MATLAB® data analysis software for general purpose data analysis, visualize and measurement automation. Automation & Communication Interface - LXF (lease C compliant, SCPI and IVI-COM - USB 2.0, 1000Base-T LAN, GPIB - Programming remote language compatibility with PSA, 8566/68, and 856x - Common X-Series user interface / Open Windows® XP operating system The maximum average conducted output power was measured at uplink burst-on period different modulation. The same setup and device operation configurations wer		symbols. Insi- for sending c no informatio be (15*102.80 this device. U and only uses The DUT doe the SAR mean	de the uplink, ontrol informat n, so did not co 6 us)/5000 us= Using this calcu the transmit ti es not transmit surements to ac	15 of the symbolic tion to the netwo ontribute to the 30.86 %. This a ulation method me. during the cont ccount for this.	ols are used for ork. During the total energy trar grees with the a eliminates all th rol symbols. He	data, and three of testing, the contr asmitted. The corr bove calculated d ne other transmit ence a correction n	the symbols are used of the symbols contained by the symbols contained by the symbols contained by the symbols contained by the symbols of th			
Functionality-20 Hz to 3.6 , 8.4, 13.6 or 26.5 GHz-Up to 300% faster than other mid-performance class spectrum and signal analyze-Analog baseband IQ inputs with 40 MHz baseband bandwidth (optional)-View configuration choices for MXA Instrument HardwarePerformance ± 0.23 dB absolute amplitude accuracy-+15 dBm third order intercept (TOI)78 dBc W-CDMA ACLR dynamic range (with noise correction on)Measurement Applications & Software-LTE, W-CDMA, HSDPA/HSUPA, phase noise and moreAdvanced analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-MATLAB® data analysis of more than 70 signal formats, software runs inside the MX/-LXI class C compliant, SCPI and IVI-COM-UXI class C compliant, SCPI and IVI-COM-VXI class C compliant, SCPI and IVI-COM-Programming remote language compatibility with PSA, 8566/68, and 856x-Common X-Series user interface / Open Windows® XP operating systemThe maximu	Jutnut Power	1. Desc	ription of how	the power is me	easured. Time g	ated using MXA(N9020A)			
The maximum average conducted output power was measured at uplink burst-on period different modulation. The same setup and device operation configurations were used for SA EMC power Measurements. Power was Measured with a spectrum analyzer (N9020A) and device was connected to the vector signal generator through a circulator.ANT 1ChannelFrequency (MHz)QPSK 1/2 (dBm)QPSK 3/4 (dBm)16QAM 1/2 (dBm)16QAM 3/4 (dBm)low 2498.523.44 23.4423.45 23.0423.99 23.9122.97 22.97high 2687.52687.523.07 23.0723.04 23.0423.11 23.1122.99 22.97IO MHz Channel BWChannelFrequency (MHz)QPSK 1/2 (dBm)QPSK 3/4 (dBm)16QAM 1/2 (dBm)16QAM 3/4 (dBm)low 250122.98 23.0423.04 23.1222.99IO MHz Channel BWChannel MHz)Frequency (MHz)QPSK 1/2 (dBm)QPSK 3/4 (dBm)16QAM 1/2 (dBm)16QAM 3/4 (dBm)low250122.98 23.0423.0423.12 22.9622.96middle259322.87 22.6322.75 22.7022.70high268523.75 22.7022.7023.74	Measurement	Func - - - Perfo - - - Mea - - - - - - - - - - - - -	 Functionality 20 Hz to 3.6, 8.4, 13. 6 or 26.5 GHz Up to 300% faster than other mid-performance class spectrum and signal analyzers Analog baseband IQ inputs with 40 MHz baseband bandwidth (optional) View configuration choices for MXA Instrument Hardware Performance ±0.23 dB absolute amplitude accuracy +15 dBm third order intercept (TOI) -154 dBm displayed average noise level (DANL) -78 dBc W-CDMA ACLR dynamic range (with noise correction on) Measurement Applications & Software LTE, W-CDMA, HSDPA/HSUPA, phase noise and more. Advanced analysis of more than 70 signal formats, software runs inside the MXA. MATLAB® data analysis software for general purpose data analysis, visualization and measurement automation. Automation & Communication Interface LXI class C compliant, SCPI and IVI-COM USB 2.0, 1000Base-T LAN, GPIB Programming remote language compatibility with PSA, 8566/68, and 856x Common X-Series user interface / Open Windows® XP operating system 							
5 MHz Channel BW Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2498.5 23.44 23.45 23.49 23.36 middle 2593 23.11 23.15 23.09 22.97 high 2687.5 23.07 23.04 23.11 22.99 10 MHz Channel BW Channel Frequency QPSK 1/2 QPSK 3/4 16QAM 1/2 16QAM 3/4 (MHz) (dBm) (dBm) (dBm) (dBm) (dBm) 22.99 10 MHz Channel BW (MHz) (dBm) (dBm) (dBm) (dBm) (dBm) (MHz) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70 high 2685 23.75 22.70 23.74 23.74		The maximum average conducted output power was measured at uplink burst- different modulation. The same setup and device operation configurations were u EMC power Measurements. Power was Measured with a spectrum analyzer (NS device was connected to the vector signal generator through a circulator.								
Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2498.5 23.44 23.45 23.49 23.36 middle 2593 23.11 23.15 23.09 22.97 high 2687.5 23.07 23.04 23.11 22.99 I0 MHz Channel BW Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70 high 2685 23.75 23.79 23.77 23.74			5 MHz Channel BW							
Iow 2498.5 23.44 23.45 23.49 23.36 middle 2593 23.11 23.15 23.09 22.97 high 2687.5 23.07 23.04 23.11 22.99 IO MHz Channel BW Channel Frequency QPSK 1/2 QPSK 3/4 16QAM 1/2 16QAM 3/4 (MHz) (dBm) (dBm) (dBm) (dBm) (dBm) (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70		Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)			
middle 2593 23.11 23.15 23.09 22.97 high 2687.5 23.07 23.04 23.11 22.99 I0 MHz Channel BW Channel Frequency QPSK 1/2 QPSK 3/4 16QAM 1/2 16QAM 3/4 MHz (MHz) (dBm) (dBm) (dBm) (dBm) (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70		low	2498.5	23.44	23.45	23.49	23.36			
high 2687.5 23.07 23.04 23.11 22.99 I0 MHz Channel BW Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70		middle	2593	23.11	23.15	23.09	22.97			
10 MHz Channel BW 10 MHz Channel BW Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70 high 2685 22.75 22.70 22.74 22.74		high	2687.5	23.07	23.04	23.11	22.99			
Channel Frequency (MHz) QPSK 1/2 (dBm) QPSK 3/4 (dBm) 16QAM 1/2 (dBm) 16QAM 3/4 (dBm) low 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70 high 2685 23.75 23.70 23.77 23.74				10 MI	Hz Channel BW	1	1			
Iow 2501 22.98 23.04 23.12 22.96 middle 2593 22.87 22.63 22.75 22.70 high 2685 22.75 22.70 22.77 22.74		Channel	Frequency (MHz)	QPSK 1/2 (dBm)	QPSK 3/4 (dBm)	16QAM 1/2 (dBm)	16QAM 3/4 (dBm)			
middle 2593 22.87 22.63 22.75 22.70 high 2685 22.75 22.70 22.77 22.74		low	2501	22.98	23.04	23.12	22.96			
high 2685 22.75 22.75 22.75 22.75 22.75		middle	2593	22.23	22.63	22.75	22.70			
		high	2575	22.07	22.05	22.75	22.70			



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9.3 Scaling Factor

	ANT	Maximum Power of 3 Control Symbol	Correction Factor
			(73.82 * 3 + Maximum rated output power * 15)/
5 MHz	1	73.82	(Actual Measured Output Power *15)
3 MHZ			(73.82 * 3 + Maximum rated output power * 15)/
	2	73.82	(Actual Measured Output Power *15)
			(35.86 * 3 + Maximum rated output power * 15)/
10 MHz	1	35.86	(Actual Measured Output Power * 15)
			(35.86 * 3 + Maximum rated output power * 15)/
	2	35.86	(Actual Measured Output Power * 15)

For example;

Max rated power of **5 MHz** is 24 dBm =251 mW

The maximum power in 5 MHz control traffic is 73.82 mW (5/17 of 251 mW)

At 2498.5 MHz , 16QAM 1/2

Scaled factor for 5 MHz bandwidth = (73.82 mW * 3 + 15 * 251 mW)/(15 * 223.36 mW) =1.190

Max rated power of 10 MHz is 24 dBm = 251 mW

The maximum power in 10 MHz control traffic is 35.86 mW (5/35 of 251 mW)

At 2501 MHz, 16QAM 1/2

Scaled factor for 10 MHz bandwidth = (35.86 mW * 3 + 15 * 251 mW)/(15 * 198.15 mW) =1.303



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BW	5	MHz
ВW	5	MHz

TX antenna		AN	Т 1	ANT 2		
Channel (GHz)	Modulation	Measured Average Power (dBm)	Scaling Factor	Measured Average Power (dBm)	Scaling Factor	
	QPSK 1/2	23.44	1.204	23.31	1.240	
2408 5	QPSK 3/4	23.45	1.201	23.32	1.237	
2498.3	16QAM 1/2	23.49	1.190	23.49	1.190	
	16QAM 3/4	23.36	1.226	23.33	1.235	
	QPSK 1/2	23.11	1.299	23.12	1.296	
2503	QPSK 3/4	23.15	1.287	23.20	1.272	
2393	16QAM 1/2	23.09	1.305	23.27	1.252	
	16QAM 3/4	22.97	1.341	23.10	1.302	
	QPSK 1/2	23.07	1.311	22.98	1.338	
2687 5	QPSK 3/4	23.04	1.320	22.99	1.335	
2007.3	16QAM 1/2	23.11	1.299	23.16	1.284	
	16QAM 3/4	22.99	1.335	23.07	1.311	

BW 10 MHz

TX anten	ina	AN	T 1	AN	T 2
Channel (GHz)	Modulation	Measured Average Power (dBm)	Scaling Factor	Measured Average Power (dBm)	Scaling Factor
	QPSK 1/2	22.98	1.300	22.76	1.367
2501	QPSK 3/4	23.04	1.282	22.74	1.374
2501	16QAM 1/2	23.12	1.259	22.97	1.303
	16QAM 3/4	22.96	1.306	22.90	1.324
	QPSK 1/2	22.87	1.333	22.60	1.419
2503	QPSK 3/4	22.63	1.409	22.57	1.429
2393	16QAM 1/2	22.75	1.371	22.63	1.409
	16QAM 3/4	22.70	1.386	22.60	1.419
	QPSK 1/2	22.75	1.371	22.68	1.393
2685	QPSK 3/4	22.79	1.358	22.66	1.399
2005	16QAM 1/2	22.77	1.364	22.57	1.429
	16QAM 3/4	22.74	1.374	22.54	1.438



9.4 Duty Cycle & Time Vector Slots

	5 MHz Channel BW													
	Frequency	QPSK 1/2	QPSK 3/4	16QAM 1/2	16QAM 3/4									
Channel	(MHz)	(%)	(%)	(%)	(%)									
low	2498.5	30.82	30.70	30.70	30.82									
middle	2593	30.46	30.82	31.06	30.70									
high	2687.5	30.70	30.58	30.82	30.70									
		10 MHz	z Channel BW											
Channel	Frequency	QPSK 1/2 (dBm)	QPSK 3/4	16QAM 1/2	16QAM 3/4									
Channel	(MHz)	(%)	(%)	(%)	(%)									
low	2501	30.58	30.70	30.66	30.96									
middle	2593	30.89	30.70	30.89	30.70									
high	2685	31.01	30.58	31.06	30.73									

Duty Cycle calculated formula = (mark 3 – Mark 2) / (Mark 4 – Mark 1) * 100 %

Spectrum Analyzer setting

Sweep time 6 ms

RBW 8 MHz

VBW 3 MHz

Span 0 Hz

HCT COLLTD

5MHz 2498.5 MHz QPSK 1/2

💴 Agilent Spectrum A	nalyzer - Swept SA					
LXI 50 Ω		AC SENSE:I	NT	ALIGN AUTO	a la n Dum	10:29:09 AM Mar 17, 201
Center Freq 2	.498500000 GHZ Input: RF IF	PNO: Fast ↔→ Tri FGain:Low #At	g: Periodic ten: 34 dB	Ext Gain:	e: Log-Pwr : -16.50 dB	
10 dB/div Ref	40.00 dBm					Mkr1 408.0 µs -15.87 dBm
30.0 20.0						
10.0 0.00		<mark>∙ k J, j∥</mark> ^{jil} , te <mark>k</mark> () [×]				
-10.0						¥
-30.0						
-50.0					ան անություն։	
Center 2.49850 Res BW 8 MHz	0000 GHz	#VBW 3.0) MHz		Sweep	Span 0 Hz 6.000 ms (1001 pts
MKR MODE TRC SCL	X (00.0	Y I	FUNCTION	FUNCTION WIDTH	FU	NCTION VALUE
1 N 1 t 2 N 1 t 3 N 1 t	408.0 µs 774.0 µs 2.316 ms 5.412 ms	-15.87 dBm 9.81 dBm 7.02 dBm -14 89 dBm				
5	<u> </u>					
8 9 10						
11 12				STATUS		

5MHz 2498.5 MHz QPSK 3/4

D Ag	ilent S	ipect	rum /	Analyzer -	Swept SA							
LXI			50 Ω			AC	SENSE:	INT		ALIGN AUTO	Burn	10:27:24 AM Mar 17, 2010
Cen	iter	Fre	q	2.4985	500000 GHz	DNO: Fast	Tr	ia: Perio	dic	AVg I	ype: Log-Pwr	TYPE W
					Inpuc KF	IFGain:Low	#A	tten: 34	dB	Ext Ga	in: -16.50 dB	DET <mark>N N N N N N</mark>
												Mkr4 5.424 ms
10 d	B/div		Ref	40.00	dBm							-13.19 dBm
Log				⟨)2								
30.0						and the second second						- i - i - i - i - i - i - i - i - i - i
20.0							. 2					
10.0				<mark> ↓ </mark>	. I LA	مر او با وارا هر راغانه المراجع	₩) —					<mark>blik</mark> #
0.00	-		-									
-10.0	<u> </u>		₿ <mark>⊢</mark>									↓
-20.0								b 41				
-30.0	dina.	alb de										
-40.0							ر بر الع	ور المرادية	. الديم	يريد المراجع		teres to a la
50.0	1000						1		יין ייין		and the state of the	
-30.0												
Cen	ter	2.49	9851	00000	GHz							Span 0 Hz
Res	BW	81	٧Hz			#	VBW 3.	0 MHz			Swee	ep 6.000 ms (1001 pts)
MKR	MODE	TRC	SCL		×		Y	FUN	CTION	FUNCTION WIDTH		FUNCTION VALUE
1	N	1	t		420.0	µs -14	1.50 dBm					
2	N	1	t t		2.316	us Ju ms f	<u>5.11 dBm</u>					
4	N	1	t		5.424	ms -13	3.19 dBm					
5												
7												
8												
10												
11												
12												
MSG										STATUS		

Report No.:

FCC ID: XHG-U600

5MHz 2498.5 MHz 16QAM 1/2

🗾 Agil	ent Spe	ctrum	Analyzer - Swept	t SA								
LXI		50 S	2		AC	SENSE:IN	JT	ALIG	in auto		10:31:53	3 AM Mar 17, 201
Cent	ter F	req	2.4985000	00 GHz	DNO: E	- Tric	: Periodic		Avg Typ	e: Log-Pwr	TR 1	ACE 1 2 3 4 5 YPE WWW
		_		nput: KF	FGain:Low	#Ati	ten:34 dB		Ext Gain	:: -16.50 dB		DET N N N N N
											Mkr4	5.412 ms
10 dE	3/div	Ref	40.00 dBm	1							-11	.59 dBn
Log												مله
30.0				in the first of a second s								(peur
20.0			± 2	. است منا ا	I JEE							
10.0												
0.00												4
-10.0						3						
-20.0	here a she	-∲-				2 <mark>parakapen</mark>	the state of the second	والمراجع والمتعاد	والمغا الطلا	والدوامية والمرومة بروار	والالتقادية والمتعادية	
-30.0		_				-						
-40.0	فلطناغ	0. ¹				ار در مار _{ار ا}	ار المشالية	الرأهم غرزأن للالم	Liste one state	را بالاسانين جاز راييز . بدأر ادوال <mark>أنا</mark>	الأحلق إنريق وأردأ	
-50.0		· II						<u> </u>	<u> </u>			
A		1005	00000 011-									On an A 11-
Res	er 2.4 Riai s	1980 MH7	00000 GHZ		#V	BW 3.0	MHZ			Sween	6 000 ms	Span V H2 (1001 nts
Luxel										encep		(1001 pts
MKH M	N 1	IC SUL		× 396.0 us	-25.0	5 dBm	FUNCTION	FUNCTIO	IN WIDTH	FUI	NCTION VALUE	
2	N 1	t		774.0 µs	14.7	5 dBm						
4	N 1 N 1	t		<u>2.310 ms</u> 5.412 ms	-22.0	<u>/ dBm</u> 9 dBm						
5												
7												
8												
10												
11												
LIGO .									STATUS			

5MHz 2498.5 MHz 16QAM 3/4

D Agi	lent S	pectr	um /	inalyzer - Swept	t SA											
LXI			50 Ω			AC	SENSE:	INT		AL1	IGN AUTO		•	10:30:	43 AM Mar	17, 2010
Cen	ter	Fre	q 2	2.4985000	00 GHz	DNO: Fast	Tr	ia: Peria	dic		AVgiy	be: Log-H	wr		TYPE WW	3456
					nput: KF	FGain:Low	#A	tten: 34	dB		Ext Gair	n: -16.50 (dB		DET N	INNNN
														Mkr4	5.38	3 ms
10 dl	3/div	F	Ref	40.00 dBm	1									-1	7.17	dBm
Log						\ \	`\ <mark>3</mark>									
30.0					and and a sector lab											
20.0				- 🗘											+	
10.0				<u>[1] ²³, [20,]</u>],	, ili shikadari	المرز والقرين										-444
0.00	<u> </u>		-		•											
-10.0	<u> </u>		→ <mark>-</mark>												▲4 —	
-20.0	_		100	<u> </u>												' <u> </u>
-30.0		len '	4	1 47				and the	lilana ida			and they				<u> </u>
40.0																
-40.0	الثنار	1					. hue	, 1 1. 11.	and de	rung (and the second	17 J.	ARCIN LA A		
-50.0																
Cen	ter 2	2.49	850	00000 GHz		1									Spar	0 Hz
Res	BW	8 IV	ΊHz			#\	/BW 3.	0 MHz					Swee	p 6.000 m	s (100	1 pts)
MKR	MODE	TRC	SCL		×	Y		FUN	CTION	FUNCT	ION WIDTH		Fl	JNCTION VALUE		
1	N	1	t		396.0 µs	-14.	75 dBm									
2	N	1	t t		<u>750.0 μs</u> 2 292 ms	13.	<u>50 dBm</u> B3 dBm									
4	N	1	t		5.388 ms	-17.	17 dBm									
5																
7																
8																
10																
11																
12																
MSG											STATUS					



5MHz 2593 MHz QPSK 1/2

🗊 Agilent Spectrum Analyzer - Swept	SA				
<mark>LXI</mark> 50 Ω	AC	SENSE:INT	ALIGN AUTO		10:37:12 AM Mar 17, 2010
Center Freq 2.5930000	00 GHz pput: RF PNO: Fast IFGain:Low	↔ Trig: Periodic #Atten: 34 dB	Avg Ty Ext Gai	rpe: Log-Pwr n: -16.50 dB	TRACE 1 2 3 4 5 6 TYPE WWWWWM DET N N N N N N
					Mkr4 5.400 ms
10 dB/div Ref 40.00 dBm					-16.48 dBm
		<mark>∕)³</mark>			
0.00					
-10.0					⁴
		high shiften in the set	واريار ومطاوره ورايا الأورين	الأجادة ويحدور بالتلحقين	condition of the line of
-30.0			· · · · ·		
-40.0 <mark>jinturita d</mark>		ورجه ارتار واعتل ويجأ فأناقها وأثنا أتلا	ور المتأليم التأخل بالمال	فأوار بقار المركل الأرام وروايا وأحد	indukain.
-50.0					
Center 2.593000000 GHz Res BW 8 MHz	#	VBW 3.0 MHz		Sween	Span 0 Hz 6 000 ms (1001 nts)
				өлсер	0.000 m3 (1001 pt3)
MKR MODE THE SEL	396.0 us -16	35 dBm	FUNCTION WIDTH	FUN	CTION VALUE
2 N 1 t	762.0 µs 4	.52 dBm			
3 N 1 t 4 N 1 t	<u>2.286 ms 10</u> 5 400 ms -16	.09 dBm 48 dBm			
5					
6					
8					
10					
11					
MSG			STATUS		

5MHz 2593 MHz QPSK 3/4

🗾 Agi	lent S	ipect	rum /	nalyzer - Sv	vept SA									
LXI			50 Ω			AC	SENSE	INT		ALIGN AUT	2		10:38:	31 AM Mar 17, 2010
Cen	ter	Fre	q	2.59300	0000 GHz	DNO: East		ig: Perio	dic	AVg	Type	: Log-Pwr		TYPE WWWWWWW
					inpuc Ki	IFGain:Low	#P	tten: 34	dB	Ext	Gain: ·	-16.50 dB		DETNNNNN
													Mkr4	5.388 ms
<u>10 di</u>	3/div		Ref	40.00 d	Bm								-1	4.15 dBm
Log				_										
30.0				, al ser										(Private in the second se
20.0				H										
10.0	\vdash			^{عل} ر ^{ال} ال	فكرا فاقلتهم والعات	i di	i							┼─── <mark>╢┶╢∕╝</mark>
0.00	\vdash		. 1	+			2							4
-10.0	<u> </u>	<	<u>}</u>				•							
-20.0			رينغم	n a se a s					<u> </u>					alaster an
-30.0	1 an						.	inter for the	ellenne.			I THE REPORT OF		•
-40 N							ر و الار ال	a island	يداريك		لل من ا	ىيىلىرى بىلەرمايلەر بى	. وقا ما	
-50.0		10							1	ال الله الأحداث	week.		<u>t tul nom</u>	
-30.0														
Cen	ter:	2.5	9301	00000 GI	Ηz									Span 0 Hz
Res	BW	81	ИHz			#\	/BW 3.	0 MHz				Swee	p 6.000 m	s (1001 pts)
MKR	MODE	TRC	SCL		х	Y		FUN	CTION	FUNCTION WID	ГН	FI	UNCTION VALUE	
1	N	1	t		396.0	us -13.	<u>13 dBm</u>							
2	N	1	ţ		2 286 m	1 <u>S 30</u> . 15 -13	05 dBm							
4	N	1	t		5.388 n	1s -14.	15 dBm							
5														
67														
8														
9														
10														
12														
MSG		_								STAT	US			

HCT CO_LITE

 Report No.:
 HCT1004FS04
 FCC ID:
 XHG-U600
 Date of Issue:
 Apr. 05. 2010

5MHz 2593 MHz 16QAM 1/2

🗾 Agi	lent S	pectr	um /	Inalyze	r - Swept	t SA											
LXI			50 Ω				AC	SENSE	EINT		ALI	IGN AUTO			10:33	:51 AM Mar	17, 2010
Cen	ter	Fre	q	2.59	30000	100 GHz nput: RF	PNO: Fast IFGain:Low	⊶⊷ T #.	'rig: Perio Atten: 34	dic dB		Avg Typ Ext Gain	e: Log-Pwi : -16.50 dB	•		TRACE 1	2 3 4 5 6 Mariana N N N N N
10 dl Log	3/div		Ref	40.0	0 dBn	1				1					Mkr4 -1	5.41: 3.18	2 ms dBm
30.0 20.0						oranda una esta da d	ette ette terretti										
0.00			. 1		╨║╢┑┞			1 3								4	
-10.0 -20.0) 														
-30.0	Tere pr								er er prær			a la c	and a first second			M	
-40.0 -50.0	⁶ 161							ul lese	nis Hilist		je na sljenej	a lig <mark>i</mark> ka itala		<u>i n</u> ir	uni ili stipp		
Cen Res	ter 2 BW	2.59 8 N	300 1Hz	0000) GHz		#	VBW 3	8.0 MHz			<u> </u>	s	wee	p 6.000 m	Spar s (100	1 0 Hz 1 pts)
MKR	MODE	TRC	SCL			×		Y	FUN	CTION	FUNCT	ION WIDTH		FL	JNCTION VALUE		
1 2 3	N N N	1 1 1	t t t			408.0 (762.0 (2.316 m	15 -13 15 15 15 -4	3.26 dBn 3.26 dBn 3.57 dBn	n n								
4 5 6 7	N	1	t			5.412 m	18 -13	3.18 dBn									
9 10 11																	
12 MSG												STATUS					

5MHz 2593 MHz 16QAM 3/4

🗾 Agi	lent S	ipect	rum i	Analyzer - Swe	pt SA										
LXI			50 Ω			AC	SENSE	INT		ALIGN AUTO			10:35:4	47 AM Mar	17, 2010
Cen	ter	Fre	pe	2.593000	000 GHz		т.	ia: Poria	ماله	Avg 1	[ype:	Log-Pwr	т	TYPE WA	3456
					Input: RF	PNO: Fast	⊨⊷ #A	tten: 34	dB	Ext G	ain: -′	16.50 dB		DET N N	NNNN
						II Galli.20W							BALend	E 400	
														5.400) ms
10 di	B/div		Ref	40.00 dB	m	_							-14	4.22 (звш
20.0															
30.0					اه جريعة جاريو ريريه .	1977 DE 1979 DE 1977 D									- 1 .1, 6 .
20.0				∣ ≬. ∣											
10.0	<u> </u>				للوراعة وإماري وإرار فأ	اللزارك كريري									
0.00															
10.0							3							4	
-10.0		,	1	de la constante			2							Variation of the	
-20.0	hardh.	ad an	/				بيا المقدور			ويعافر وحار بالتحر وبلار	la bata	والمركبة والمركبة والمركبة	الرجار الأفريد والرجمار	a straight	
-30.0			_					-							
-40.0	un i	л., й					يرد الرائيل	يار بالعال	Liirt .or t	والمتعاطية لطف	a a	a an ai sasarini a	a sa sa sa sa sa sa sa		
50.0	1						en tule t			a ka chang	1.11	Less We der der		ſ	
-30.0															
Cen	ter :	2.59	930	00000 GHz	7							1		Span	0 Hz
Res	BW	81	VIHz			#\	/BW 3.	0 MHz				Swee	p 6.000 ms	s (100 ⁻	1 pts)
MKD	MODE	TPC	e Ci l		~	v		EUM	CTION		1	E			
1	N	1	f		396.0 u	s -23.	53 dBm	TON	CHON	TONCTION WIDT		10	DINCTION VALUE		
2	Ň	1	t		762.0 μ	s 12.	48 dBm								
3	N	1	t		2.298 m	s -16.	27 dBm								
4	N	1	<u>т</u>		5.400 m	s -14.	22 aBm								
6															
7															
8															
10															
11															
12															
MSG										STATU	s				

HCT CO., LTD. SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL : +82 31 639 8565 FAX : +82 31 639 8525 www.hct.co.kr HCTCO,LTD

 Report No.:
 HCT1004FS04
 FCC ID:
 XHG-U600
 Date of Issue:
 Apr. 05. 2010

5MHz 2687.5 MHz QPSK 1/2

🗾 Agi	ent Sp	ectrum	Analyzer - Swep	ot SA						
L X I		50 :	5		AC	SENSE:INT		ALIGN AUTO		10:42:33 AM Mar 17, 2010
Cen	ter F	req	2.6875000	DOO GHZ Input: RF I	PNO: Fast ↔ FGain:Low	_, Trig: Per #Atten: 3	iodic 4 dB	Avg Ty Ext Gai	pe: Log-Pwr n: -16.50 dB	TRACE 1 2 3 4 5 6 TYPE WWWWAAA DET N N N N N N
10 dE	3/div	Re	f 40.00 dBr	n						Mkr4 5.388 ms -15.07 dBm
30.0 20.0 10.0				alan atan matan <mark>Tan Mujad</mark> Mana	n an	2				
0.00 -10.0 -20.0	110.04	1 			•••••		-	an a star of design of a		4
-30.0 -40.0 -50.0		i _{lt}				an <mark>ilina da</mark> ni	Martin			
Cent Res	ter 2 BW	.6875 8 MH	00000 GHz z		#VE	SW 3.0 MH	z		Swee	Span 0 Hz 6.000 ms (1001 pts)
MKR N	10DE 1	FRC SCL		×	Y	FU	INCTION	FUNCTION WIDTH	FL	NCTION VALUE
1 2 3 4 5 6 7 8	N N N	1 t 1 t 1 t 1 t		<u>396.0 µs</u> 750.0 µs 2.286 ms 5.388 ms	-12.85 11.00 -4.02 -15.07	dBm 2 dBm 2 dBm 4 dBm				
10										
11										
MSG								STATUS		

5MHz 2687.5 MHz QPSK 3/4

D Agi	lent S	pectru	im A	nalyzer - Swept	SA										
IXI		5	50 Ω	075000		AC	SENSE	INT		ALIGN	AUTO		10:4	0:16 AM Mar	17, 2010
Cen	ter	Fred	1 2	.6875000 Ii	OU GHZ nput: RF	PNO: Fast FGain:Low	Ti #/	ig: Perio Atten: 34	dic dB	Ë	Avg Typ Ext Gain:	-16.50 dB		TYPE WW DET N	23456 WWWWA NNNNN
													Mkr	4 5.40	0 ms
10 dł	3/div	R	lef	40.00 dBm	1									15.59	dBm
Log							⊘ 3								
20.0				يار جريم ل ور	an la colo anta a	distant de la company									17 - 11
10.0				at colorite	ing, literatural	أرعر وارام والرجار	LI I								at no d
0.00															111
-10.0		A	1											4	
-20.0		Y												Note t	1
-30.0		illpre -	wh	հե			- Allen He	in a that is	in the th	la la secola de la constante	of the letter	di municipare	and down bland	^{ra} tetuti,	k l
-40.0	1.1.								ر ا د د ما ر	ran dir i			and a share of		
-50.0	20						n Int	I. B. John	Links.	ul nade vie	nd the se		a de la constatul		
00.0															
Cen	ter 2	2.68	/50	0000 GHz				0 B4U -				G		Span	0 Hz
Res	BW	8 IV	ΗZ			#	VBW J	U WINZ				SW	еер 6.000 г	ns (100	1 pts)
MKR I	MODE	TRC S	CL	>	396.0 µc	15	(39.dBm	FUN	CTION	FUNCTION	WIDTH		FUNCTION VALUE		
2	N	1	t		762.0 µs	s <u>10</u>	. <u>14 dBm</u>								
3	N N	<u>1</u> 1	t t		<u>2.292 ms</u> 5.400 ms	s <u>28</u> s -15	. <u>67 dBm</u> .59 dBm								
5															
7															
8															
10															
12															
MSG										5	STATUS				

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5MHz 2687.5 MHz 16QAM 1/2

D Ag	ilent !	Spect	rum <i>l</i>	Analyzer - Swep	t SA											
LXI			50 Ω			AC	SENSE	INT		ALIGN	AUTO			10:44:5	58 AM Ma	ar 17. 2010
Cer	nter	Fre	q	2.6875000	100 GHz nput: RF	PNO: Fast IFGain:Low	Ti ##	rig: Perio Atten: 34	dic dB	Ē	Avg Typ Ext Gain	e: Log-Pwr : -16.50 dB		T	RACE 1 TYPE W DET N	23456 NNNNN
10 d	B/div	,	Ref	40.00 dBn	1									Mkr4 -1	5.40 0.81	0 ms dBm
LUg				<u></u> 2												
30.0 20.0 10.0 -10.0 -20.0 -30.0 -40.0 -50.0			} 1						na mpilan Tara ja t						4	
Cer Res	nter BM	2.68 / 8	375) VIHz	00000 GHz		#	VBW 3	.0 MHz				Sw	eep	6.000 m	Spa s (100	n 0 Hz)1 pts)
MKR	MODE	TRC	SCL		×		Y	FUN	CTION	FUNCTION	WIDTH		FUN	CTION VALUE		
1 2 3 4 5 6 7 8 9 10 11 12					402.0 µs 744.0 µs 2.286 ms 5.400 ms	s -14 s 25 s 12 s -10	I.96 dBm 5.34 dBm 2.97 dBm 3.81 dBm									
MSG											STATUS					

5MHz 2687.5 MHz 16QAM 3/4

D Agi	lent S	pectri	um A	nalyzer - Swep	t SA											
LXI			50 Ω			AC	SENSE:	INT		ALI	IGNAUTO			10:43:	48 AM Mar	17, 2010
Cen	ter	Fre	q 2	2.6875000	000 GHz	BNO E	Tr	ia: Perio	dic		Avgiy	pe: L	og-Pwr		TYPE WW	3456
					nput: RF	IFGain:Low	#A	tten: 34	dB		Ext Gai	n: -16	.50 dB		DET N N	INNNN
														Mkr4	5.40) ms
10 dl	B/div	F	lef	40.00 dBn	n									-1	3.90	dBm
20 O				⊘ 2			⊘ 3									
30.0					ار عن يعمن اربل بر به	an Calability in the second										
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10.0					and by she is											
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-10.0		— \													Viewerk	
-20.0	Hula	, na se	<u>itt</u>				(Linear	-Nelson	a la da di	بالمخمار	dadimi atta		<mark>te Bandhada d</mark>	dentes d'Angela	lin and the	, <u> </u>
-30.0																
-40.0	i, pai	a de la					المقر المحر <mark>ا</mark>	<mark>iti pili j</mark>	وأنتشاتهم	يار طار أنه	الاأخار وأبدأ	- Politica	n ji i ini	وأغلبا وأناعيك وارار		
-50.0	⊢		_								<u> </u>					
Con	tor '	0 60	750	0000 CH2											Snan	0 117
Res	BW	2.08 8 M	Hz	OUOU GHZ		#	VBW 3.	0 MHz					Swee	p 6.000 m	s (100	1 pts)
MKB	MODE	TRC :	SCL		x		(FUN	CTION	FUNCT	ION WIDTH		FL	JNCTION VALUE		
1	N	1	t		396.0 µ	s -14	.81 dBm									
2	N	1	t		<u>756.0 µ</u>	s 29	.37 dBm									
4	N	1	t		<u>2.292 m</u> 5.400 m	s <u>29</u> s -13	.01 dBm .90 dBm									
5																
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9																
10																
12																
MSG											STATUS					
Mod											514105					

HCT CO., LTD. SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL : +82 31 639 8565 FAX : +82 31 639 8525 www.hct.co.kr HCTCO,LTD.

FCC ID: XHG-U600

10MHz 2501 MHz QPSK 1/2

D Agi	lent S	pect	rum <i>i</i>	Analyzer - Swept S	A											
LXI			50 Ω	0.50400000		AC	SEN	ISE:INT		AL	IGN AUTO		o m Duum	11:04:	01 AM Mar	17, 2010
Cen	ter	Fre	eq.	2.50100000 Inp	UGHZ ut: RF I	PNO: Fast Gain:Low	•••	Trig: Perio #Atten: 34	dic dB		Ext Gai	in: -16	50 dB			
10 di	3/div		Ref	40.00 dBm										Mkr4 -1	5.424 5.55 (4 ms dBm
Log 30.0						i da esta esta sita sita	<mark> </mark>									
20.0 10.0					alle, s.e. (and b	د. در در ما مر مدر	,									b 1
0.00 -10.0			0 <mark>1</mark>												↓ ⁴	
-20.0 -30.0	l ur r	t datu		(Lad				la bita tildar	ant here	al tonge	u le gle te		lat dina nat de	ante attitute e	11 Jahren	
-40.0	الأسفان	4De	_				بانار	National de la constantial de la constantia de la constantia de la constantia de la constantia de la constanti La constantia de la consta	i to i to	in chi	للأر مقل	(لرز أرأ	պետաներ	ik adalahisti		
-50.0																
Cen Res	ter 2 BW	2.50 8 ľ)10) MHz	00000 GHz		#	₩	3.0 MHz					Sweep	o 6.000 m	Span s (100	0 Hz 1 pts)
MKR	MODE	TRC	SCL	×			Y	FUN	CTION	FUNCT	ION WIDTH		FL	INCTION VALUE		
1	N	1	t		<u>420.0 µs</u> 786.0 µs	-15	5.76 dE 1.14 dE	3m 3m								
3	Ň	1	t		2.316 ms	2	7.45 dE	3m								
4	N	-	-		5.424 ms	-15	5.55 aE	sm								
6																
8																
9																
10																
12																
MSG											STATUS					

10MHz 2501 MHz QPSK 3/4

🗾 Agilent Spectrum Analyzer - Swept SA					
	AC SENSE:	NT	ALIGN AUTO	a la m Dum	11:02:16 AM Mar 17, 2010
Center Freq 2.501000000 GH	Z PNO: Fast +++ Tri	g: Periodic	Avgiyp	e: Log-Pwr	
	IFGain:Low #A	tten: 34 dB	Ext Gain:	-16.50 dB	DET
					Mkr4 5.424 ms
10 dB/div Ref 40.00 dBm					-14.86 dBm
	ter e transferte transfer				
20.0					
0.00					
-10.0					4
-20.0					
-30.0	<mark>-01010</mark>			tedes as tel dife de	
			at the second second second		
			استثلاث الارتبا فاعطاها	an a	
-50.0					
Center 2.501000000 GHz					Span 0 Hz
Res BW 8 MHz	#VBW 3.	0 MHz		Swee	o 6.000 ms (1001 pts)
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	FL	INCTION VALUE
1 N 1 t 420	.0 µs -15.24 dBm				
3 N 1 t 2.31	6 ms 27.94 dBm				
4 N 1 t 5.42	4 ms -14.86 dBm				
6					
7					
10 10					
11					
MSG			STATUS		



10MHz 2501 MHz 16QAM 1/2

🗾 Agi	ilent Spec	trum A	nalyzer - Swept	t SA								
LXI		50 Ω			AC	SENSE:1	NT		ALIGN AUTO		11:19:2	4 AM Mar 17, 2010
Cen	iter Fr	eq 2	2.5010000	100 GHz nput: RF	PNO: Fast FGain:Low	⊶ Tri #At	g: Periodio tten: 34 dB		Avg Typ Ext Gair	oe: Log-Pwr 1: -16.50 dB	Tf	RACE 123456 TYPE WWWWWWW DET NNNNNN
10 di	B/div	Ref	40.00 dBm	ŋ							Mkr4 -1	5.454 ms 5.32 dBm
30.0 20.0			2 			3 "						
10.0 0.00		<u>1</u>	the state	<mark>ang ang ang ang ang ang ang ang ang ang </mark>	ala dagi ya ang pi							
-10.0 -20.0								kalist	11 m m m m m m m m m m m m m m m m m m	41.1 . 6		4
-30.0 -40.0 -50.0	n, kinter						l na statistica.	Triler	and particular de la		n la mais la la mais a	
Cen Res	ter 2.5 BW 8	0100 MHz	0000 GHz		#`	VBW 3.0	0 MHz			Swee	p 6.000 ms	Span 0 Hz s (1001 pts)
MKR	MODE TRI	SCL		×	Y	,	FUNCTIO	IN F	UNCTION WIDTH	FI	JNCTION VALUE	
1 2 3 4 5 6 7 8 9 10 11	N 1 N 1 N 1 N 1			444.0 μs 804.0 μs 2.340 ms 5.454 ms	-11 28 28 28 3 -15	.65 dBm .36 dBm .89 dBm .32 dBm						
MSG									STATUS			

10MHz 2501 MHz 16QAM 3/4





10MHz 2593 MHz QPSK 1/2

🗾 Agi	ilent Sj	pectr	um A	nalyzer - Swe	pt SA											
LXI	_		50 Ω			AC	SENSE:	INT		ALI	GNAUTO	P.		10:57	:49 AM Ma	ar 17, 2010
Cen	iter	Fre	q 2	593000	Input: RF	PNO: Fast IFGain:Low	⊶⊶ Tri #A	ig: Perio tten: 34	dic dB		Ext Gain	e: Log-Pv 1: -16.50 dE	vr 3			23456 ////////////////////////////////////
10 di	B/div	F	Ref -	40.00 dB	m									Mkr4	5.41 4.04	2 ms dBm
30.0 20.0																
10.0 0.00				li ettatio	ىلەر <u>بايە ئەرسىمە يەلەر يە</u>	مار استام <mark>بر از را مار</mark>	uu ↓ 3									_ <mark>ւղվ</mark> լյ
-10.0 -20.0	L		> 						a. 1		a a ahadha a		lubu - A		4	
-30.0 -40.0	ulida						, jų bittarij	inden eiter	in it is a	Manadal I	uid dia dal	i sikasista j	a stalle from	a ha li baiku ina		
-50.0																
Cen Res	ter 2 BW	2.59 8 Ⅳ	300 IHz	0000 GH	2	#	VBW 3.	0 MHz					Swee	o 6.000 n	Spa ns (100	n 0 Hz 01 pts)
MKR	MODE	TRC	SCL		X 400.0 v		Y 100 JDm	FUN	CTION	FUNCT	ON WIDTH		Fl	INCTION VALUE		
2	N N	1	<u>t</u> t		768.0 µ 2.310 m	s -10 s 21 s -10	7.98 dBm 7.98 dBm 0.33 dBm									
4 5 6 7					5.41211	-14	4.04 abm									
8 9 10																
11 12																
MSG											STATUS					

10MHz 2593 MHz QPSK 3/4

D Ag	ilent S	ipect	rum /	Analyze	r - Swepi	t SA												×
L XI			50 Ω				AC		SENSE:INT			AL	IGN AUTO			11:01	:06 AM Mar 17, 2	2010
Cen	ter	Fre	q	2.593	30000	00 GHz			Taina	n: .			Avg T	/pe: l	Log-Pwr		TRACE 1 2 3 4	56
					h	nput: RF	PNO: Fa IFGain:L	ist ↔ ow	#Atte	n: 34	dB		Ext Gai	in: -1	6.50 dB		DET N N N N	NN
																Mkr4	5.424 n	ns
<u>1</u> 0 d	B/div		Ref	40.0	0 dBn	า										-1	3.65 dB	m
Log					2			0	3									
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-10.0			Y															
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-30.0																		
-40.0	N/	إغاثه	<u> </u>					<mark>,</mark>	فقراقه	د ال	الالتكتار	أوعديها	ومشابلة أيزا	<mark>dela</mark> n a	إلاما والارمايات	<mark>Nami Nama</mark>	W	
-50.0	┝																	
Cen	ter :	2.59	9300	0000) GHz	<u> </u>			1								Span 0 l	H7
Res	BW	8	ИHz					#VB	W 3.0 I	MHz					Swee	ep 6.000 n	ns (1001 pi	ts)
MKR	MODE	TRC	SCL			×		Y		FUN	CTION	FUNCT	ION WIDTH		l	FUNCTION VALUE		_
1	N	1	t			420.0	us	-13.25	dBm									
2	N	1	t			2 316	us	28.82	dBm									
4	N	1	t			5.424 r	ns	-13.65	dBm									
5																		
6							_											
8																		
9																		
10																		
11																		
MSG													STATUS					=
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HCT CO.,LTD.

D: XHG-U600

Apr. 05. 2010

10MHz 2593 MHz 16QAM 1/2

💴 Agile	ent Spectrum	Analyzer - Swe	pt SA							
	50 s	2 502000		AC S	ENSE:INT		ALIGN AUTO	ne:Log-Pwr	10:53:59 TR	AM Mar 17, 2010
Cent	erFreq	2.595000	Input: RF	PNO: Fast ↔↔ FGain:Low	Trig: Period #Atten: 34 d	lic IB	Ext Gai	n: -16.50 dB	Т	
10 dB	/div Rei	f 40.00 dBi	m						؛ Mkr4 13-	5.400 ms .82 dBm
30.0										
20.0 - 10.0 -		- U Matala	<mark>i andra sia</mark> da k	let duth para						
0.00 - -10.0 -	{									4
-20.0 -30.0	Harater 🗋					et di data			rinn the state	t planta part
-40.0 <mark> </mark> -50.0 -	n ng de				allinder gestelleren.	<mark>i ^{land}hi</mark>	and the fight of the second	iner pland, mai	uline kii, juliyi e b	
Cent Res I	er 2.5930 BW 8 MH:	00000 GHz z	2	#VB\	N 3.0 MHz			Swee	p 6.000 ms	Span 0 Hz (1001 pts)
MKR M	ODE TRC SCL		X	Y	FUNC	TION	FUNCTION WIDTH	Fl	JNCTION VALUE	
1 2 3	N 1 t N 1 t N 1 t		408.0 μs 762.0 μs 2.304 ms	-13.88 0 13.38 0 26.67 0	dBm dBm dBm					
5 6 7			5.400 ms	-13.02 (
8 9										
11 12										
MSG							STATUS			

10MHz 2593 MHz 16QAM 3/4

D Ag	ilent S	ipecti	rum <i>I</i>	Analyzer - Swe	pt SA											
LXI			50 Ω			AC	SENSE:	INT		ALI	IGN AUTO		D	10:55:	36 AM Mar	17, 2010
Cen	ter	Fre	q 2	2.593000	000 GHz	DNO: Feet	- Tr	ia: Perio	dic		Avgiy	pe: Log	-Pwr		TYPE WW	3456
					input: KF	IFGain:Low	#A	tten: 34	dB		Ext Gair	n: -16.50	dB		DET <mark>N N</mark>	INNNN
														Mkr4	5.412	2 ms
10 d	B/div	,	Ref	40.00 dB	m									-1	5.82 (dBm
Log				<mark>2</mark>			∆ 3									
30.0																and the
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10.0																
0.00			. 1													
-10.0	\vdash	\neg	2												\	
-20.0	. المراد	de me	And the	, etc.			- Andrea	ومعرور	ا میں ا	يت الدراسيا	مريدا مارد	- 14. I. I.I.	بالمتحد بتعالم	المحالية المعالم	المار الرابي	
-30.0										1	- 1-1-1					<u> </u>
-40.0	ية الما	An air an						فأطا للاماد با	والمسلمة الأرقار ور	a stilent a	يمارين خطواقا	անե	دار العظ الم	الأله أأرادا وارتديهم		
-50.0		la il						d. 1 k		an Ial		" "				
Cen	ter :	2.59)30(00000 GH:	Z								-		Span	0 Hz
Res	BW	81	ИHZ			#	VBW 3.	0 MHz					Swee	p 6.000 m	s (100	1 pts)
MKR	MODE	TRC	SCL		Х	\ 	Y	FUN	CTION	FUNCT	ION WIDTH		Fl	JNCTION VALUE		
1	N	1	t		408.0 (768.0 (<u>is -15</u> is 27	<u>.62 dBm</u> 77 dBm									
3	N	1	t		2.304 n	is 27	7.70 dBm									
4	N	1	t		5.412 n	<u>is -15</u>	<u>.82 dBm</u>									
6																
7																
9																
10 11																
12																
MSG											STATUS					

HCT CO., LTD. SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL : +82 31 639 8565 FAX : +82 31 639 8525 www.hct.co.kr

38 of 199

Report No.:

FCC ID: XHG-U600

10MHz 2685 MHz QPSK 1/2

D Agi	lent Sp	pectri	um A	nalyzer - Swept SA										
	tor		50 Ω		AC	SE	INSE:INT		ALIO	GNAUTO Ava Ti	npe:L	og-Pwr	10:48	:38 AM Mar 17, 2010 TRACE 1 2 3 4 5 6
CEII			4 4	Input: RF	PNO: Fast IFGain:Low		Trig: Peri #Atten: 34	dic dB		Ext Gai	in: -16	3.50 dB		
10 dE	3/div	F	?ef	40.00 dBm									Mkr4 -1	5.388 ms 2.31 dBm
Log				<u>∆2</u>		∧ <mark>3</mark>								
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-30.0							10 A 1 1	4				Included to the s	Adda and a	
-40.0	للتولل	uu.				Nili	initia in tara	ألما أغرار	i india ji kin	a da anda a	Albanda	Liphing and it	وألأسا أباها المرار	4
-50.0		· ·						-				I	<u> </u>	
Cen	ter 🤈	68	500	0000 GHz										Snan 0 Hz
Res	BW	8 M	Hz		\$	¢VB₩	3.0 MHz	:				Swee	p 6.000 m	is (1001 pts)
MKR N	10DE	TRC :	SCL	×		Y	FUN	CTION	FUNCTI	ON WIDTH		Fl	JNCTION VALUE	
1	N	1	t •	396.0	us -1:	2.13 d	Bm							
3	N	1	t	2.292 ו	us 2 ns 2	<u>6.38 d</u>	Bm							
4	N	1	t	5.388 ו	ns -1:	2.31 d	Bm							
6														
7														
8														
10														
11														
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MSG										STATUS				

10MHz 2685 MHz QPSK 3/4

🗊 Agilen	t Spect	rum A	nalyzer - Swep	t SA									
L X I		50 Ω			AC	SENSE:	INT		ALIG	NAUTO	Design of the second se	10:50:	06 AM Mar 17, 2010
Cente	r Fre	q	2.6850000	DOO GHZ nput: RF	PNO: Fast FGain:Low	⊶⊷ Tr #A	ig: Perio tten: 34	dic dB		Ext Gain:	e: Log-Pwr -16.50 dB		TYPE WWWWWWW DET N N N N N N
												Mkr4	5.400 ms
10 dB/d	liv	Ref	40.00 dBn	n								-1	1.86 dBm
			<mark>2</mark>										
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-20.0	المربيل ال					Malana	للسما	a dahar	or and the	lala di tan		lilling and some the	
-30.0													
-40.0	u lih h					- <mark>Nj-turi</mark>	անլ լ <mark>ին</mark> ո	h Minite	tu ⁿ ite di	فبرياداتها	<mark>i simali ju da</mark> i	لار الفروكتين أث	
-50.0													
Cente	r 2.68	3500	0000 GHz										Span 0 Hz
Res B	W 8 I	٧Hz			#	VBW 3.	0 MHz				Swe	ep 6.000 m	s (1001 pts)
MKR MOD	DE TRC	SCL		x	`	7	FUN	CTION	FUNCTIO	N WIDTH		FUNCTION VALUE	
1 N	1	t		<u>396.0 µs</u>	-12	.28 dBm							
2 N 3 N	1	t		<u>/56.0 μs</u>	28	<u>1.69 dBm</u>							
4 N	1	ť		5.400 ms	-11	.86 dBm							
5													
6													
6													
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12													
MSG										STATUS			



10MHz 2685 MHz 16QAM 1/2

🗩 Agi	lent Spe	ctrum	Analyzer - Swep	t SA							
LXI		50 \$			AC	SENSE:I	NT		ALIGN AUTO	markan Dum	10:52:46 AM Mar 17, 201
Cen	ter Fi	req	2.6850000	NUU GHZ nput: RF	PNO: Fast IFGain:Low	⊶ Tri #At	g: Perio ten: 34	dic dB	Ext Ga	in: -16.50 dB	TYPE WWWWWW DET N N N N N
10 di	Bidiy	Rei	40.00 dBn	n							Mkr4 5.412 ms -11.84 dBr
Log											
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00.0											
Cen Res	ter 2.0 BW 8	5850 MH:	00000 GHz z		#	VBW 3.0) MHz			Swee	Span 0 Hz p 6.000 ms (1001 pts
MKR	MODE TF	IC SCL		x		r	FUNC	TION	FUNCTION WIDTH	FI	JNCTION VALUE
1	N 1	t		408.0 µ	s -11	<u>.97 dBm</u>					
3	N 1	t		2.316 m	s -13	.18 dBm					
4	<u>N 1</u>	t		5.412 m	s -11	.84 dBm					
6											
8											
9											
11											
12											
MSG									STATUS		

10MHz 2685 MHz 16QAM 3/4

D Ag	ilent S	pecti	um A	nalyzer - Swej	pt SA											
	tor	Ero	50 Ω	2 695000		AC	SENSE:	INT		AL:		ne l	og-Pwr	10:51:	41 AM Mar RACE	17,2010
Gel	llel		Ч ²	2.005000	Input: RF	PNO: Fast FGain:Low	► Tr #A	ig: Perio tten: 34	dic dB		Ext Gai	n: -16	6.50 dB		TYPE WY DET N N	INNN
				10.00 -10-										Mkr4	5.40	0 ms dBm
Log	Blaiv		Rei				۸ २							•		abiii
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20.0	<u> </u>											\rightarrow				-
10.0	-				<mark>Yr wei de bleide b Bleide bleide bl</mark>	<mark>, Linka, Lapi</mark>										- <mark>b_i Lud</mark>
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-30.0																
-40.0	նթն	llir'r					"Phylat	اللم الأنداد	<u>i i i i i i i i i i i i i i i i i i i </u>	A BARA	A MARINE	hilip	u di	prite prijek	v	
-50.0	Ľ															
Cen	ter 2	2.68	500	00000 GHz											Span	1 0 Hz
Res	BW	8 N	ЛНz			#\	/BW 3.	0 MHz					Sweep	o 6.000 m	s (100	1 pts)
MKR	MODE	TRC	SCL		×	Y		FUN	CTION	FUNCT	ION WIDTH		FL	NCTION VALUE		
1 2	N	1	t		<u>402.0 μs</u> 756.0 μs	-21.0	<u>56 dBm</u> 31 dBm									
3	N	1	t		2.292 ms	27.	75 dBm									
5	N	1	t		5.400 ms	-14.	<u>28 aBm</u>									
6			\rightarrow													
8																
9 10																
11																
MSG											STATUS					
WibG											314105					



9.5 PAPR and SAR Error Considerations

9.5.1 PEAK TO AVERAGE Conducted Power RATIO

BW 5 MHz

TX	Antenna		ANT 1			ANT 2	
Channel (GHz)	Modulation	Average Power (dBm)	Peak Power (dBm)	PAR (dB)	Average Power dBm)	Peak Power (dBm)	PAR (dB)
	QPSK 1/2	23.44	29.80	6.36	23.31	29.72	6.41
2408 5	QPSK 3/4	23.45	29.86	6.41	23.32	29.57	6.25
2490.3	16QAM 1/2	23.49	29.80	6.31	23.49	29.66	6.17
	16QAM 3/4	23.36	29.68	6.32	23.33	29.63	6.30
	QPSK 1/2	23.11	29.39	6.28	23.12	29.55	6.43
2502	QPSK 3/4	23.15	29.58	6.43	23.20	29.41	6.21
2393	16QAM 1/2	23.09	29.39	6.30	23.27	29.49	6.22
	16QAM 3/4	22.97	29.29	6.32	23.10	29.36	6.26
	QPSK 1/2	23.07	29.38	6.31	22.98	29.47	6.49
2697 5	QPSK 3/4	23.04	29.45	6.41	22.99	29.30	6.31
2007.3	16QAM 1/2	23.11	29.35	6.24	23.16	29.05	5.89
	16QAM 3/4	22.99	29.29	6.30	23.07	29.34	6.27

BW 10 MHz

TX	Antenna		ANT 1			ANT 2	
Channel (GHz)	Modulation	Average Power (dBm)	Peak Power (dBm)	PAR (dB)	Average Power dBm)	Peak Power (dBm)	PAR (dB)
	QPSK 1/2	22.98	29.36	6.38	22.76	29.15	6.39
2501	QPSK 3/4	23.04	29.35	6.31	22.74	29.09	6.35
2301	16QAM 1/2	23.12	29.52	6.40	22.97	29.36	6.39
	16QAM 3/4	22.96	29.27	6.31	22.90	29.32	6.42
	QPSK 1/2	22.87	29.15	6.28	22.60	28.92	6.32
2502	QPSK 3/4	22.63	28.95	6.32	22.57	28.92	6.35
2595	16QAM 1/2	22.75	29.12	6.37	22.63	28.97	6.34
	16QAM 3/4	22.70	29.01	6.32	22.60	29.01	6.42
	QPSK 1/2	22.75	29.13	6.38	22.68	29.02	6.34
2695	QPSK 3/4	22.79	29.10	6.31	22.66	28.98	6.32
2685	16QAM 1/2	22.77	29.17	6.40	22.57	28.96	6.39
	16QAM 3/4	22.74	29.10	6.36	22.54	28.93	6.38



9.5.2 SAR Error considerations

The SAR probe used in the measurements is calibrated with a sinusoidal CW signal. Since the DL:UL symbol ratio configuration used in the SAR tests provides a periodic uplink burst, the duty factor can be compensated by selecting the correct conversion factor (cf) for the SAR measurements. If the duty factor were non-periodic, compensation is typically not possible and substantial SAR measurement error could be expected. The high PAPR of OFDM/OFDMA is expected to introduce additional SAR measurement errors because the SAR probe is not calibrated for this type of random noise-like signals with large amplitude and phase variations within the bursts. The SAR error is also expected to vary with the average power and average PAPR at each measurement point, both temporally and spatially. In order to estimate the measurement error due to PAPR issues, the configuration with the highest SAR in each channel bandwidth and frequency band is measured at various power levels, from approximately 10 mW or less, in 3 dB steps, until the maximum power level is reached. As shown by the results and plot below, SAR is linear to power only when the probe sensors are operating within the square-law region. As power continues to increase, the measured SAR error becomes increasingly larger. Since these are single point peak SAR values measured with the probe positioned at the peak SAR location, at 2 mm from the phantom surface, the values are substantially higher than the 1-g SAR required to determine compliance. The results indicate that at approximately 200 mW SAR could be overestimated by 8 %. This type of measurement error is dependent on the signal characteristics; the results demonstrate that there is no SAR underestimation.

5 MHz 16QAM 1/2 was used for single point SAR measurement since it was the highest one. Test Configuration: Horizontal A

Average Power (mW)	10	20	40	80	160	200
Single Point SAR (W/kg)	0.069	0.112	0.201	0.399	0.769	0.957
Reference Line (W/kg)	0.069	0.112	0.198	0.370	0.714	0.886
Deviation (%) from Ref. Line	0	0	1.52	7.84	7.70	8.01



Reference Line (Red Line) Measured SAR value (Blue point) 10 % from the Reference Line (Green Line)

According to the linearity calculation, estimated SAR value was calculated as follow;

y = a * x + ba = (0.112-0.069)/(20-10) = 0.0043 b = y-0.0043 * x = 0.112- (0.0043 * 20) = 0.026 \therefore y = 0.0043 * x + 0.026



HCT1004FS04

XHG-U600

FCC ID:

Date of Issue:

Apr. 05. 2010

10 MHz 16QAM 1/2

Average Power (mW)	10	20	40	80	160	200
Single Point SAR (W/kg)	0.061	0.099	0.178	0.353	0.680	0.846
Reference Line (W/kg)	0.061	0.099	0.175	0.327	0.631	0.783
Deviation (%) from Ref. Line	0	0	1.55	7.87	7.72	7.99



5 MHz QPSK 1/2

Average Power (mW)	10	20	40	80	160	200
Single Point SAR (W/kg)	0.065	0.105	0.188	0.374	0.721	0.897
Reference Line (W/kg)	0.065	0.105	0.185	0.345	0.665	0.825
Deviation (%) from Ref. Line	0	0	1.88	8.44	8.41	8.71



HCTCO,LTD

Report No.:	HCT1004FS04	FCC ID:	XHG-U600	Date of Issue:	Apr. 05. 2010

10 MHz QPSK 1/2

Average Power (mW)	10	20	40	80	160	200
Single Point SAR (W/kg)	0.066	0.108	0.197	0.385	0.750	0.935
Reference Line (W/kg)	0.066	0.108	0.192	0.360	0.696	0.864
Deviation (%) from Ref. Line	0	0	2.66	7.04	7.79	8.19



10. SAR TEST DATA SUMMARY

10.1 Measurement Results (WIMAX2600 5MHz 16QAM 1/2) Ant 1

Frequency	Conducted	Power (dBm)	Configuration	Separation	Antenna	Measured	Scaling	Scaled	
MHz	Begin	End		Distance	Гуре	SAR(mW/g)	Factor	SAR(mW/g)	
2 593	23.09	23.08	Horizontal up	5 mm	Intenna	0.252	1.305	0.329	
2498.5	23.49	23.35	Horizontal down	5 mm	Intenna	0.324	1.190	0.386	
2 593	23.09	23.01	Horizontal down	5 mm	Intenna	0.660	1.305	0.861	
2687.5	23.11	23.09	Horizontal down	5 mm	Intenna	0.338	1.299	0.439	
2 593	23.09	23.16	Vertical front	5 mm	Intenna	0.356	1.305	0.465	
2 593	23.09	23.21	Vertical back	5 mm	Intenna	0.136	1.305	0.177	
2 593	23.09	23.05	Тор	5 mm	Intenna	0.041	1.305	0.054	

ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population

Body 1.6 W/kg (mW/g) Averaged over 1 gram

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration □ With Holster ⊠ Without Holster
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 10 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

Frequency MHz	Conducted F Begin	Power (dBm) End	Configuration	Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)
2 593	22.97	22.89	Horizontal up	5 mm	Intenna	0.239	1.341	0.320
2498.5	23.36	23.44	Horizontal down	5 mm	Intenna	0.289	1.226	0.354
2 593	22.97	23.01	Horizontal down	5 mm	Intenna	0.657	1.341	0.881
2687.5	22.99	23.08	Horizontal down	5 mm	Intenna	0.339	1.335	0.453
2 593	22.97	23.08	Vertical front	5 mm	Intenna	0.339	1.341	0.455
2 593	22.97	22.99	Vertical back	5 mm	Intenna	0.141	1.341	0.189
2 593	22.97	22.87	Тор	5 mm	Intenna	0.039	1.341	0.052
Unc	ANSI/ IEEE	E C95.1 200 Spatial F Exposure/	05 – Safety Lim ^v eak General Popula		B 1.6 W/k Averaged	ody g (mW/g) d over 1 gram		

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration
 □ With Holster
 ⊠ Without Holster
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 10 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

Frequency	Conducted F	Power (dBm)	Configuration	Separation	Antenna	Measured	Scaling	Scaled
MHz	Begin	End		Distance	турс	OAI(IIIW/g)	1 40101	OAR(IIIW/g)
2 593	23.11	23.04	Horizontal up	5 mm	Intenna	0.243	1.299	0.316
2498.5	23.44	23.51	Horizontal down	5 mm	Intenna	0.299	1.204	0.360
2 593	23.11	23.01	Horizontal down	5 mm	Intenna	0.675	1.299	0.877
2687.5	23.07	23.08	Horizontal down	5 mm	Intenna	0.338	1.311	0.443
2 593	23.11	23.26	Vertical front	5 mm	Intenna	0.325	1.299	0.422
2 593	23.11	23.24	Vertical back	5 mm	Intenna	0.142	1.299	0.184
2 593	23.11	23.12	Тор	5 mm	Intenna	0.041	1.299	0.053
	ANSI/ IEEE	E C95.1 200	05 – Safety Lim	it		В	ody	
Unc	controlled	Spatial F /Exposure	Peak General Popula		1.6 W/k Averaged	g (mW/g) d over 1 gram		

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration □ With Holster ⊠ Without Holster The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

10.4 Measurement Results (WIMAX2600 5MHz QPSK 3/4) Ant 1

Frequency	Conducted F	Power (dBm)	Configuration	Separation	Antenna	Measured	Scaling	Scaled
MHz	Begin	End		Distance	Туре	SAR(mvv/g)	Factor	SAR(mvv/g)
2 593	23.15	23.01	Horizontal up	5 mm	Intenna	0.241	1.287	0.310
2498.5	23.45	23.31	Horizontal down	5 mm	Intenna	0.302	1.201	0.363
2 593	23.15	23.02	Horizontal down	5 mm	Intenna	0.672	1.287	0.865
2687.5	23.04	23.15	Horizontal down	5 mm	Intenna	0.355	1.320	0.469
2 593	23.15	23.25	Vertical front	5 mm	Intenna	0.299	1.287	0.385
2 593	23.15	23.19	Vertical back	5 mm	Intenna	0.137	1.287	0.176
2 593	23.15	23.05	Тор	5 mm	Intenna	0.038	1.287	0.049
	ANSI/ IEEE	E C95.1 20	05 – Safety Lim		В	ody		
Und	controlled	Spatial F /Exposure	Peak General Popula	1.6 W/kg (mW/g) Averaged over 1 gram				

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration □ With Holster ⊠ Without Holster The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 10 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).



10.5 Measurement Results (WIMAX2600 10MHz 16QAM 1/2) Ant 1

Frequency	Conducted Power (dBm)		Configuration Distance		Antenna	Measured	Scaling	Scaled	
MHz	Begin	End		Distance	туре	SAR(IIIW/g)	Factor	SAR(IIIW/g)	
2 593	22.75	22.83	Horizontal up	5 mm	Intenna	0.267	1.371	0.366	
2 501	23.12	22.99	Horizontal down	5 mm	Intenna	0.269	1.259	0.339	
2 593	22.75	22.91	Horizontal down	5 mm	Intenna	0.672	1.371	0.921	
2 685	22.77	22.87	Horizontal down	5 mm	Intenna	0.372	1.364	0.507	
2 593	22.75	22.79	Vertical front	5 mm	Intenna	0.252	1.371	0.345	
2 593	22.75	22.85	Vertical back	5 mm	Intenna	0.140	1.371	0.192	
2 593	22.75	22.67	Тор	5 mm	Intenna	0.038	1.371	0.052	
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population					Body 1.6 W/kg (mW/g) Averaged over 1 gram				

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is 15.0 cm \pm 0.2 cm.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration □ With Holster ⊠ Without Holster
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).



10.6 Measurement Results (WIMAX2600 10MHz 16QAM 3/4) Ant 1

Frequency	Conducted Power (dBm)		Configuration	Separation	Antenna	Measured SAR(mW/g)	Scaling	Scaled	
MHz	Begin	End		Distance	туре	SAR(mW/g)	Factor	SAR(mW/g)	
2 593	22.70	22.84	Horizontal up	5 mm	Intenna	0.321	1.386	0.445	
2 501	22.96	23.01	Horizontal down	5 mm	Intenna	0.267	1.306	0.349	
2 593	22.70	22.89	Horizontal down	5 mm	Intenna	0.625	1.386	0.866	
2 685	22.74	22.77	Horizontal down	5 mm	Intenna	0.313	1.374	0.430	
2 593	22.70	22.75	Vertical front	5 mm	Intenna	0.419	1.386	0.581	
2 593	22.70	22.82	Vertical back	5 mm	Intenna	0.131	1.386	0.182	
2 593	22.70	22.85	Тор	Top 5 mm Intenna 0.035		1.386	0.049		
ANSI/ IEEE C95.1 2005 – Safety Limit					Body				
Spatial Peak Uncontrolled Exposure/ General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration □ With Holster ⊠ Without Holster The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 10 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

Frequency MHz	Conducted F Begin	Power (dBm) Configuration		Separation Distance	Antenna Type	Measured SAR(mW/g)	Scaling Factor	Scaled SAR(mW/g)	
2 593	22.87	22.98	Horizontal up	5 mm	Intenna	0.242	1.333	0.323	
2 501	22.98	23.03	Horizontal down	5 mm	Intenna	0.276	1.300	0.359	
2 593	22.87	22.89	Horizontal down	5 mm	Intenna	0.625	1.333	0.833	
2 685	22.75	22.90	Horizontal down	5 mm	Intenna	0.309	1.371	0.424	
2 593	22.87	22.96	Vertical front	5 mm	Intenna	0.420	1.333	0.560	
2 593	22.87	22.88	Vertical back	5 mm	Intenna	0.131	1.333	0.175	
2 593	22.87	22.79	Тор	5 mm	Intenna	0.036	1.333	0.048	
ANSI/ IEEE C95.1 2005 – Safety Limit					Body				
Spatial Peak Uncontrolled Exposure/ General Population						1.6 W/k Averaged	g (mW/g) d over 1 gram		

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).



10.8 Measurement Results (WIMAX2600 10MHz QPSK 3/4) Ant 1

Frequency	Conducted Power (dBm)		Configuration Distance		Antenna	Measured	Scaling	Scaled	
MHz	Begin	End	Ŭ	Distance	Туре	SAR(mW/g)	Factor	SAR(mW/g)	
2 593	22.63	22.75	Horizontal up	5 mm	Intenna	0.229	1.409	0.323	
2 501	23.04	23.01	Horizontal down	5 mm	Intenna	0.280	1.282	0.359	
2 593	22.63	22.65	Horizontal down	5 mm	Intenna	0.618	1.409	0.871	
2 685	22.79	22.84	Horizontal down	5 mm	Intenna	0.333	1.358	0.452	
2 593	22.63	22.59	Vertical front	5 mm	Intenna	0.420	1.409	0.592	
2 593	22.63	22.68	Vertical back	5 mm	Intenna	0.133	1.409	0.187	
2 593	22.63	22.66	Top 5 mm		Intenna	0.037	1.409	0.052	
ANSI/ IEEE C95.1 2005 – Safety Limit					Body				
Spatial Peak Uncontrolled Exposure/ General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

10.9 Measurement Results(WIMAX2600 5MHz) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation	Antenna	Modulation	Measured	Scaling	Scaled
MHz	Begin	End		Distance	туре		SAR(IIIW/g)	Facior	SAR(IIIW/g)
2 593	23.27	23.14	Horizontal down	5 mm	Intenna	16QAM1/2	0.076	1.252	0.095
2 593	23.10	23.05	Horizontal down	5 mm	Intenna	16QAM3/4	0.078	1.302	0.102
2 593	23.12	23.05	Horizontal down	5 mm	Intenna	QPSK1/2	0.076	1.296	0.098
2 593	23.20	23.13	Horizontal down	5 mm	Intenna	QPSK3/4	0.112	1.272	0.142
2 593	23.20	23.15	Horizontal up	5 mm	Intenna	QPSK3/4	0.032	1.272	0.041
2 593	23.20	23.12	Vertical front	5 mm	Intenna	QPSK3/4	0.009	1.272	0.011
2 593	23.20	23.09	Vertical back	5 mm	Intenna	QPSK3/4	0.017	1.272	0.022
2 593	23.20	23.24	Тор	5 mm	Intenna	QPSK3/4	0.017	1.272	0.022
ANSI/ IEEE C95.1 2005 – Safety Limit						1.6	Body	(a)	

Spatial Peak **Uncontrolled Exposure/ General Population** ο w/κg (mw/g) Averaged over 1 gram

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical 1 configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported. 2
- 3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- Test Signal Call Mode ☑ Base Station Simulator 6 □ Manual Test cord
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 **Test Configuration** □ With Holster ⊠ Without Holster
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR 10 measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

10.10 Measurement Results(WIMAX2600 10MHz) Ant 2

Frequency	Conducted Power (dBm)		Configuration	Separation	Antenna	Modulation		Scaling	Scaled	
MHz	Begin	End		Distance	Type		SAR(IIIW/g)	Factor	SAR(IIIW/g)	
2 593	22.63	22.75	Horizontal down	5 mm	Intenna	16QAM1/2	0.075	1.409	0.106	
2 593	22.60	22.74	Horizontal down	5 mm	Intenna	16QAM3/4	0.068	1.419	0.096	
2 593	22.60	22.55	Horizontal down	5 mm	Intenna	QPSK1/2	0.070	1.419	0.099	
2 593	22.57	22.60	Horizontal down	5 mm	Intenna	QPSK3/4	0.071	1.429	0.101	
ANS Uncont	SI/ IEEE rolled E	C95.1 Spatia Exposu	2005 – Safety I al Peak re/ General Po	Limit pulation	Body 1.6 W/kg (mW/g) Averaged over 1 gram					

- 1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is $15.0 \text{ cm} \pm 0.2 \text{ cm}$.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode □ Manual Test cord ⊠ Base Station Simulator
- 7 All side of the phone were tested and the worst-case side is reported.
- 9 Test Configuration 🗆 With Holster 🛛 Without Holster
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 10 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).



11. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 2005.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.



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