

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15972	16183
Channel Y	15900	16376
Channel Z	16167	15841

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	1.19	0.18	2.38	0.46
Channel Y	0.15	-1.39	1.24	0.47
Channel Z	0.36	-1.22	1.42	0.42

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9



IMPORTANT NOTICE

USAGE OF THE DAE4

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE4 unit is fixed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:

Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:

Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:

To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.



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Accreditation No.: SCS 0108

Client **Tejet (Auden)**

Certificate No: DAE4-1226_May20

CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BM - SN: 1226

Calibration procedure(s): QA CAL-06.v30
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: May 15, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration):

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	03-Sep-19 (No:25849)	Sep-20
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	09-Jan-20 (in house check)	In house check: Jan-21
Calibrator Box V2.1	SE UMS 006 AA 1002	09-Jan-20 (in house check)	In house check: Jan-21

Calibrated by:	Name Eric Hainfeld	Function Laboratory Technician	Signature
Approved by:	Sven Kühn	Deputy Manager	

Issued: May 15, 2020

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Accreditation No.: SCS 0108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
 - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
 - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
 - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
 - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - *Input resistance:* Typical value for information; DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
 - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.644 \pm 0.02% (k=2)	404.410 \pm 0.02% (k=2)	404.128 \pm 0.02% (k=2)
Low Range	3.98010 \pm 1.50% (k=2)	4.00441 \pm 1.50% (k=2)	3.98517 \pm 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	283.5 $^{\circ}$ \pm 1 $^{\circ}$
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	200036.25	2.48	0.00
Channel X + Input	20007.54	2.38	0.01
Channel X - Input	-20005.86	0.51	-0.00
Channel Y + Input	200033.61	-0.21	-0.00
Channel Y + Input	20003.31	-1.72	-0.01
Channel Y - Input	-20007.95	-1.52	0.01
Channel Z + Input	200035.07	1.43	0.00
Channel Z + Input	20004.81	-0.10	-0.00
Channel Z - Input	-20007.44	-1.01	0.01

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2000.93	0.16	0.01
Channel X + Input	200.14	-0.66	-0.33
Channel X - Input	-199.83	-0.71	0.36
Channel Y + Input	2000.72	0.15	0.01
Channel Y + Input	199.44	-1.19	-0.59
Channel Y - Input	-200.55	-1.29	0.65
Channel Z + Input	2000.71	0.18	0.01
Channel Z + Input	200.02	-0.61	-0.31
Channel Z - Input	-199.97	-0.66	0.33

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	5.07	2.90
	-200	-2.74	-4.97
Channel Y	200	-8.89	-9.14
	-200	7.09	6.94
Channel Z	200	-7.29	-7.53
	-200	5.53	5.89

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	2.16	-3.66
Channel Y	200	8.16	-	3.69
Channel Z	200	9.32	5.65	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16032	12468
Channel Y	15897	17438
Channel Z	16001	15611

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	-0.38	-1.14	0.42	0.38
Channel Y	-0.09	-1.14	0.85	0.39
Channel Z	-0.31	-1.86	1.00	0.41

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9



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Accreditation No.: SCS 0108

Client **Sporton**

Certificate No: **EX3-3819_Apr20**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3819**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7
Calibration procedure for dosimetric E-field probes**

Calibration date: **April 30, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104775	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41495087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 30, 2020

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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values; i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3819

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.46	0.41	0.46	± 10.1 %
DCP (mV) ^B	104.6	101.5	102.0	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB/ $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Unc ^C (k=2)
0	CW	X	0.0	0.0	1.0	0.00	156.7	± 3.5 %	± 4.7 %
		Y	0.0	0.0	1.0		148.5		
		Z	0.0	0.0	1.0		139.2		

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSI, (see Page 5).

^B Numerical linearization parameter; uncertainty not required.

^C Uncertainty is determined using the r_{max} deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3819

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	113.9
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3819

Calibration Parameter Determined in Head Tissue Simulating Media

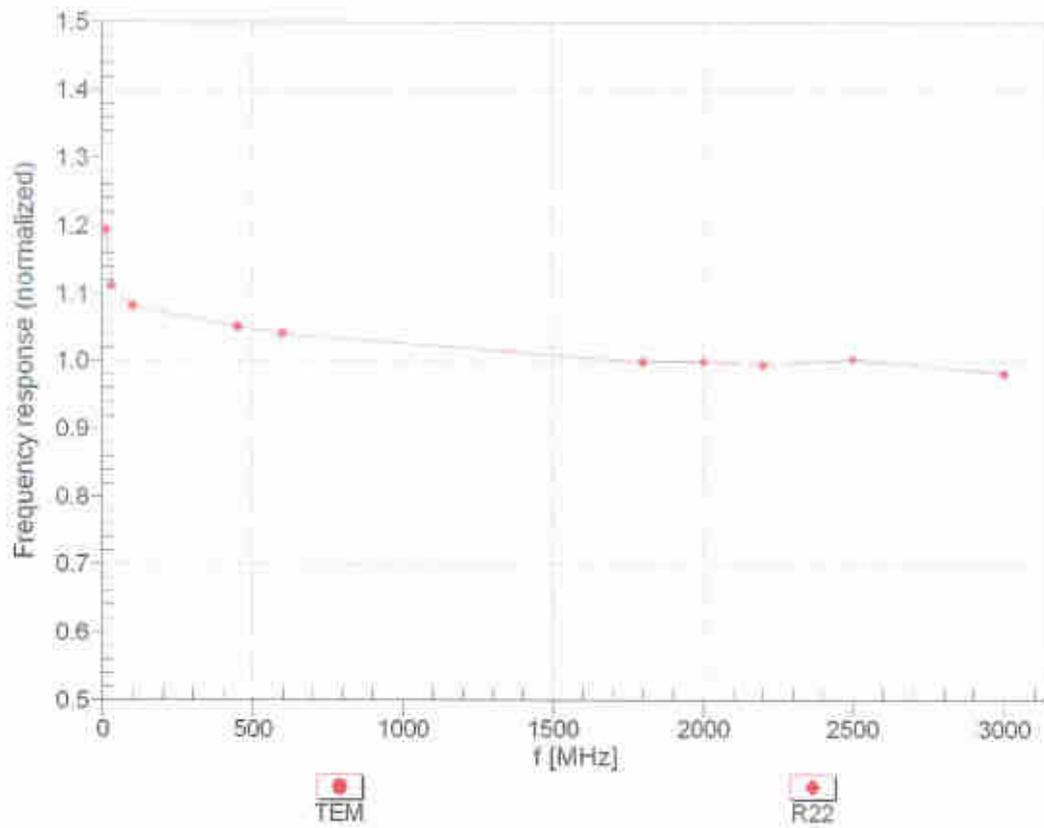
f (MHz) ^c	Relative Permittivity ^f	Conductivity (S/m) ^f	ConvF X	ConvF Y	ConvF Z	Alpha ^g	Depth (mm) ^g	Unc (k=2)
750	41.9	0.89	9.64	9.64	9.64	0.52	0.80	± 12.0 %
835	41.5	0.90	9.39	9.39	9.39	0.50	0.80	± 12.0 %
900	41.5	0.97	9.26	9.26	9.26	0.39	0.96	± 12.0 %
1750	40.1	1.37	8.43	8.43	8.43	0.34	0.80	± 12.0 %
1900	40.0	1.40	8.10	8.10	8.10	0.37	0.80	± 12.0 %
2000	40.0	1.40	7.95	7.95	7.95	0.30	0.88	± 12.0 %
2300	39.5	1.67	7.66	7.66	7.66	0.32	0.90	± 12.0 %
2450	39.2	1.80	7.42	7.42	7.42	0.38	0.90	± 12.0 %
2600	39.0	1.96	7.22	7.22	7.22	0.38	0.90	± 12.0 %
3300	38.2	2.71	6.91	6.91	6.91	0.20	1.20	± 14.0 %
3500	37.9	2.91	6.84	6.84	6.84	0.25	1.20	± 14.0 %
3700	37.7	3.12	6.75	6.75	6.75	0.25	1.25	± 14.0 %
3900	37.5	3.32	6.40	6.40	6.40	0.30	1.60	± 14.0 %
4100	37.2	3.53	6.39	6.39	6.39	0.30	1.60	± 14.0 %
4400	36.9	3.84	6.07	6.07	6.07	0.30	1.60	± 14.0 %
4600	36.7	4.04	5.98	5.98	5.98	0.30	1.70	± 14.0 %
4800	36.4	4.25	5.88	5.88	5.88	0.45	1.80	± 14.0 %
4950	36.3	4.40	5.72	5.72	5.72	0.45	1.80	± 14.0 %
5250	35.9	4.71	5.02	5.02	5.02	0.40	1.80	± 14.0 %
5600	35.5	5.07	4.56	4.56	4.56	0.40	1.80	± 14.0 %
5750	35.4	5.22	4.63	4.63	4.63	0.40	1.80	± 14.0 %

^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^f At frequencies up to 6 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^g Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



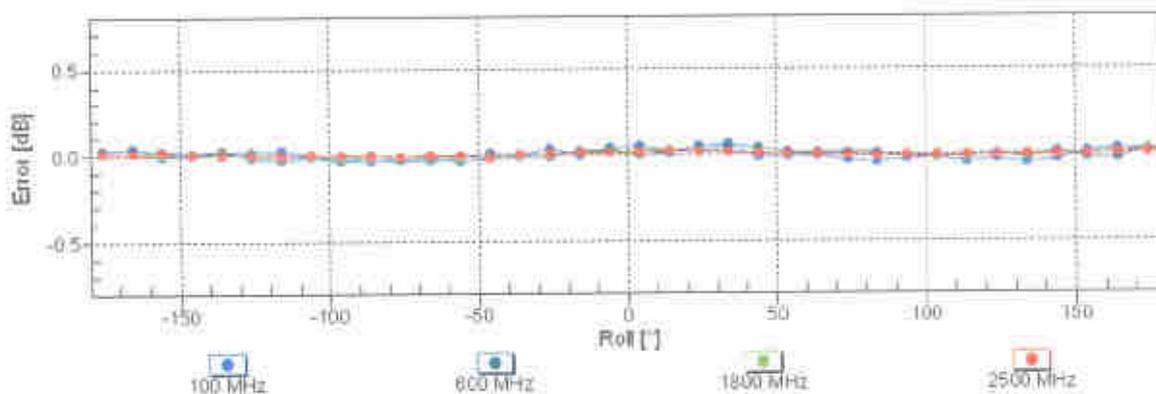
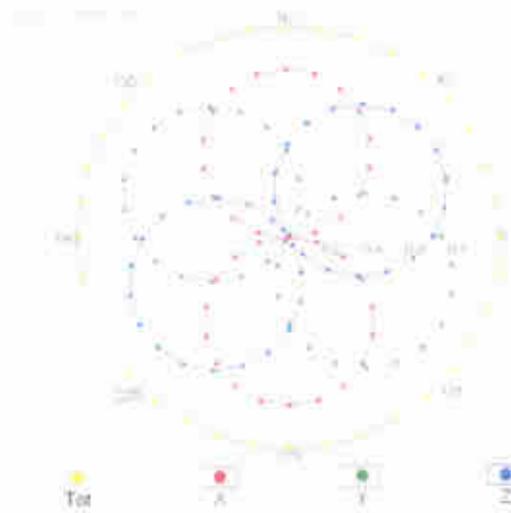
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

Receiving Pattern (ϕ), $\theta = 0^\circ$

f=600 MHz,TEM

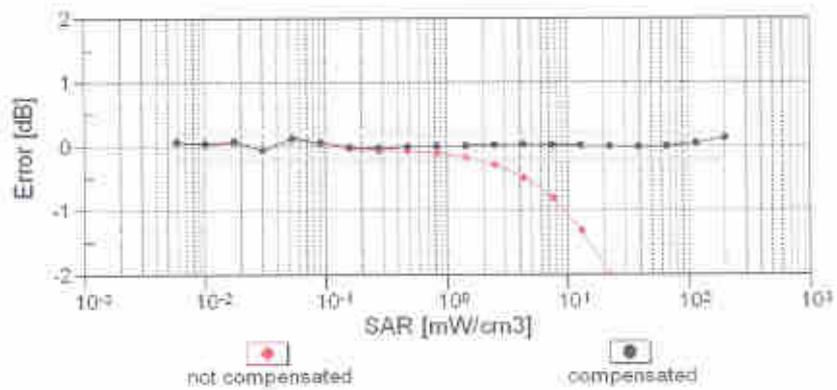
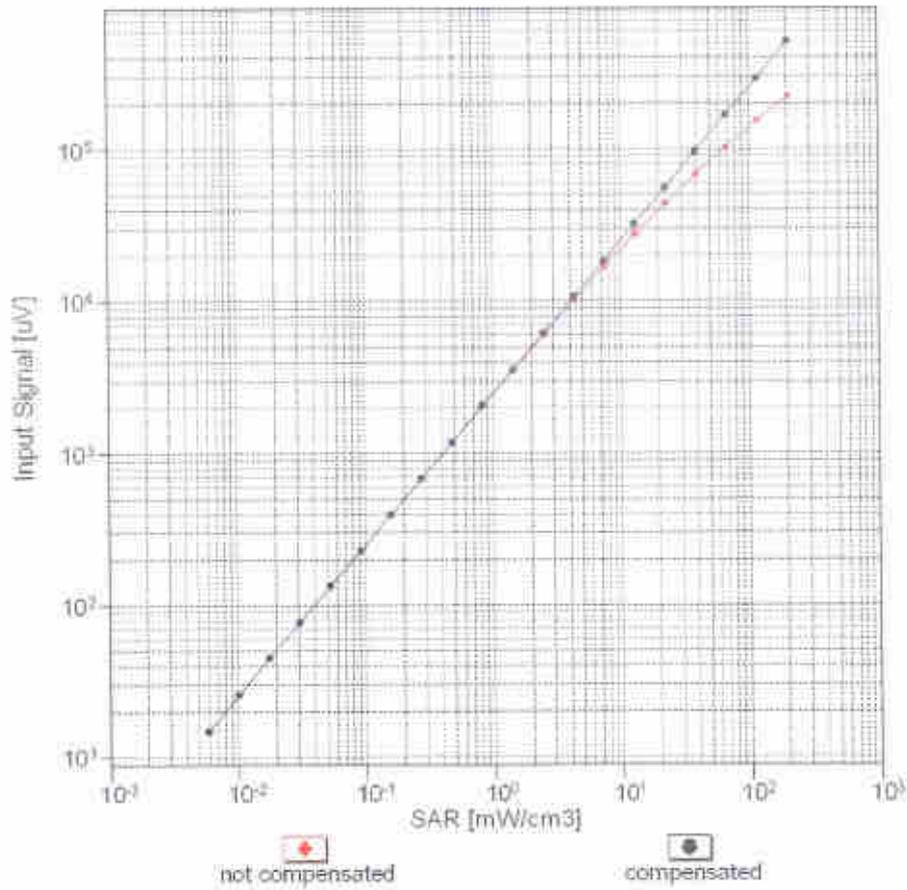


f=1800 MHz,R22



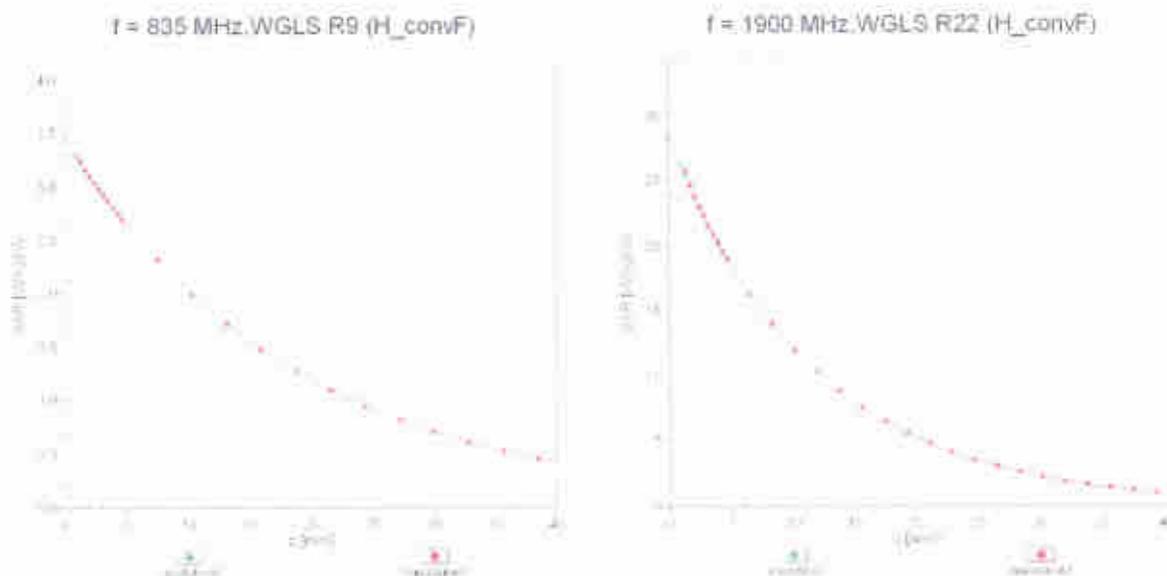
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$)

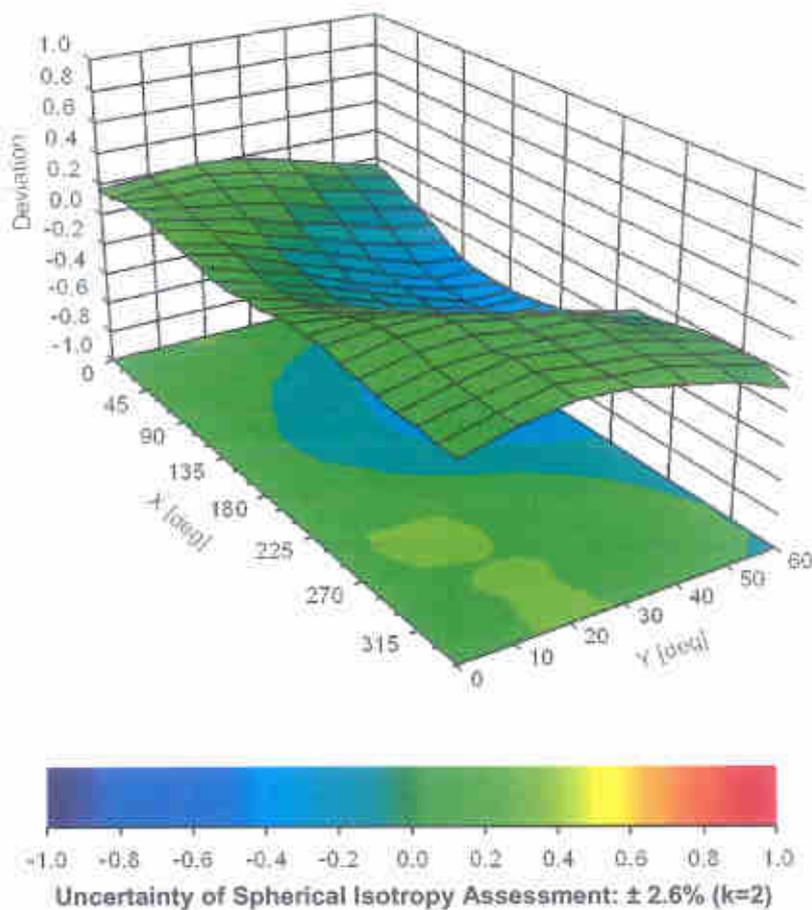


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, θ), f = 900 MHz





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Accreditation No.: **SCS 0108**

Client **Sporton**

Certificate No: **EX3-7576_Jan20**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7576**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 22, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-19 (No. 217-02894)	Apr-20
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Calibrated by:	Name Jeton Kasrati	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature
			Issued: January 25, 2020
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



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Accreditation No.: SCS 0108

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Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}; A, B, C, D** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7576

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.48	0.63	0.63	$\pm 10.1 \%$
DCP (mV) ^B	103.8	99.8	103.6	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB/ μV	C	D dB	VR mV	Max dev.	Unc (k=2) ^E
0	CW	X	0.0	0.0	1.0	0.00	164.4	$\pm 2.7 \%$	$\pm 4.7 \%$
		Y	0.0	0.0	1.0		161.8		
		Z	0.0	0.0	1.0		164.7		

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 5).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7576**Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle (°)	112.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7576

Calibration Parameter Determined in Head Tissue Simulating Media

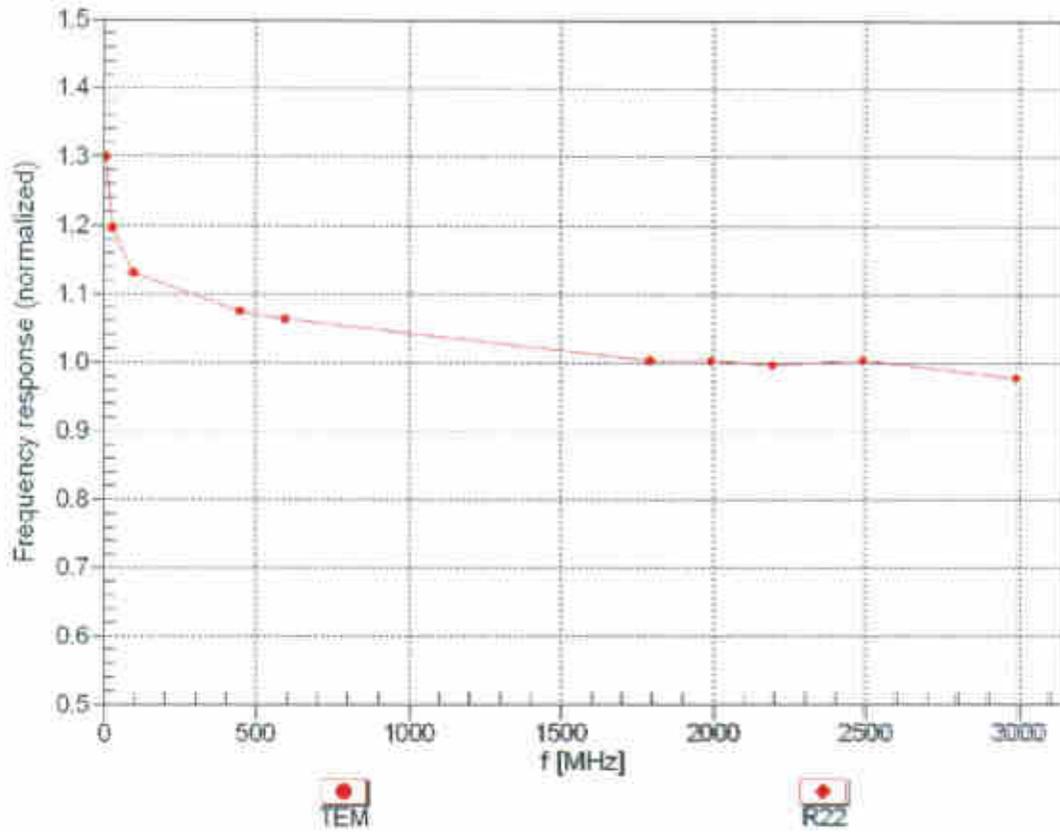
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth (mm) ^D	Unc (k=2)
750	41.9	0.89	10.71	10.71	10.71	0.62	0.80	± 12.0 %
835	41.5	0.90	10.45	10.45	10.45	0.46	0.94	± 12.0 %
900	41.5	0.97	10.16	10.16	10.16	0.33	1.09	± 12.0 %
1750	40.1	1.37	8.88	8.88	8.88	0.42	0.86	± 12.0 %
1900	40.0	1.40	8.58	8.58	8.58	0.38	0.86	± 12.0 %
2000	40.0	1.40	8.48	8.48	8.48	0.39	0.86	± 12.0 %
2300	39.5	1.67	8.03	8.03	8.03	0.41	0.90	± 12.0 %
2450	39.2	1.80	7.76	7.76	7.76	0.44	0.90	± 12.0 %
2600	39.0	1.96	7.47	7.47	7.47	0.41	0.96	± 12.0 %
3300	38.2	2.71	7.08	7.08	7.08	0.30	1.35	± 14.0 %
3500	37.9	2.91	6.77	6.77	6.77	0.30	1.35	± 14.0 %
3700	37.7	3.12	6.74	6.74	6.74	0.30	1.35	± 14.0 %
3900	37.5	3.32	6.56	6.56	6.56	0.40	1.40	± 14.0 %
4100	37.2	3.53	6.26	6.26	6.26	0.40	1.40	± 14.0 %
4400	36.9	3.84	6.19	6.19	6.19	0.40	1.60	± 14.0 %
4600	36.7	4.04	6.06	6.06	6.06	0.40	1.60	± 14.0 %
4800	36.4	4.25	5.89	5.89	5.89	0.40	1.80	± 14.0 %
4950	36.3	4.40	5.59	5.59	5.59	0.40	1.80	± 14.0 %
5250	35.9	4.71	5.20	5.20	5.20	0.40	1.80	± 14.0 %
5600	35.5	5.07	4.62	4.62	4.62	0.40	1.80	± 14.0 %
5750	35.4	5.22	4.83	4.83	4.83	0.40	1.80	± 14.0 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies up to 6 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^D Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

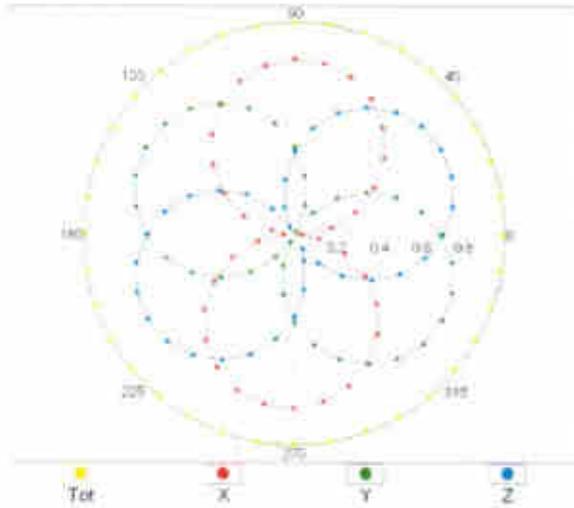
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



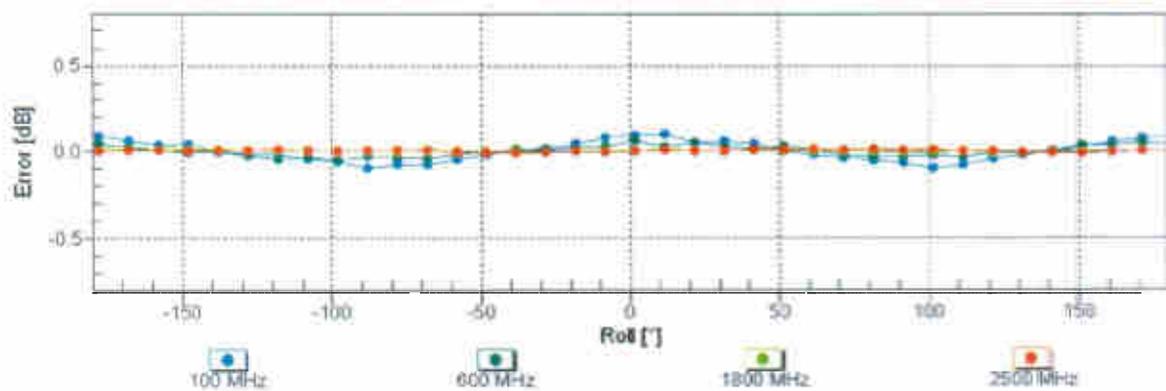
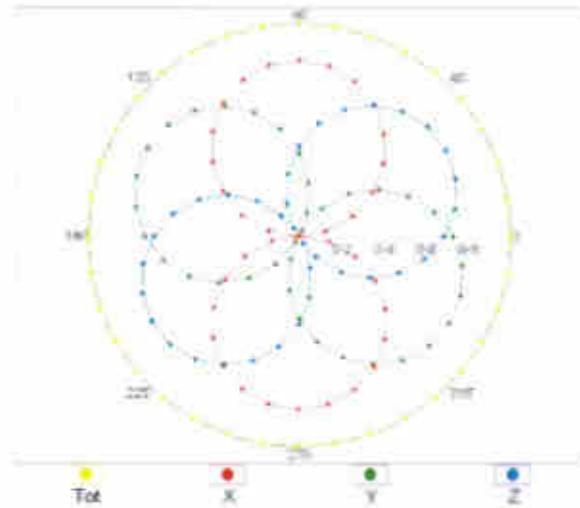
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\theta = 0^\circ$

f=600 MHz,TEM

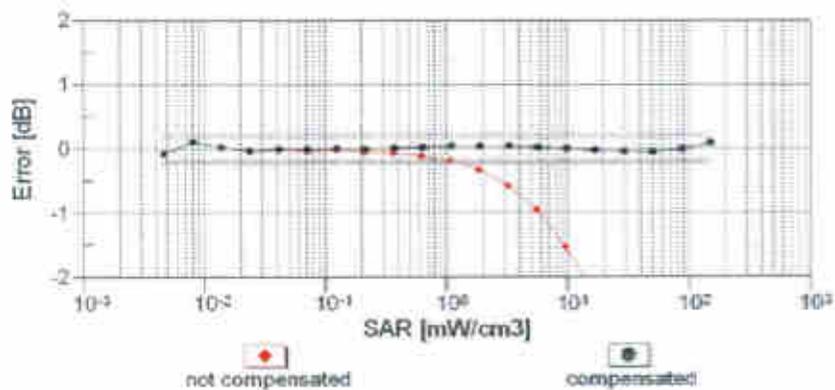
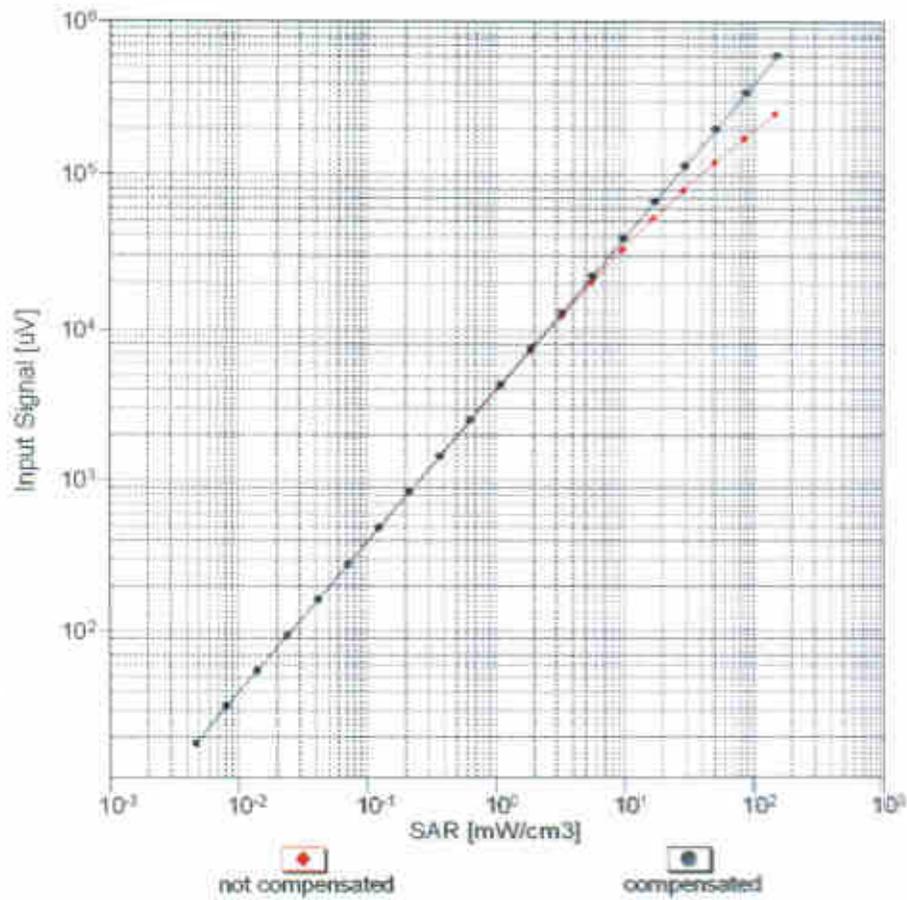


f=1800 MHz,R22



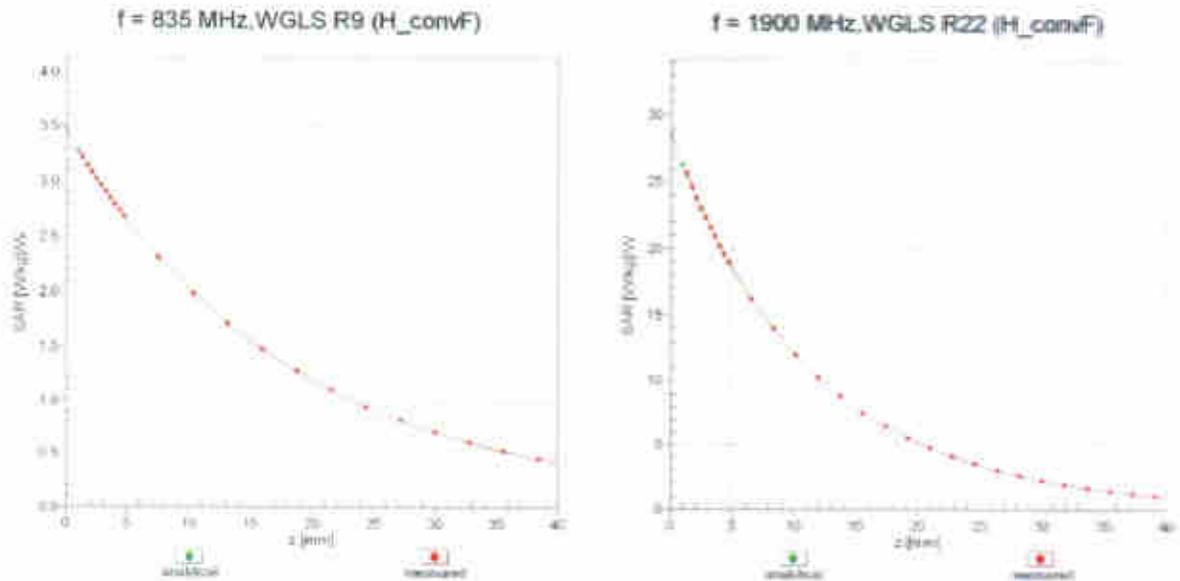
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$)



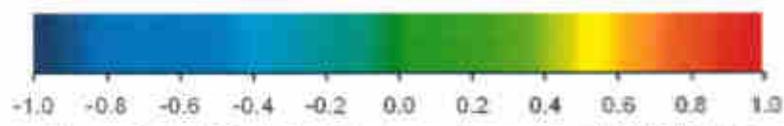
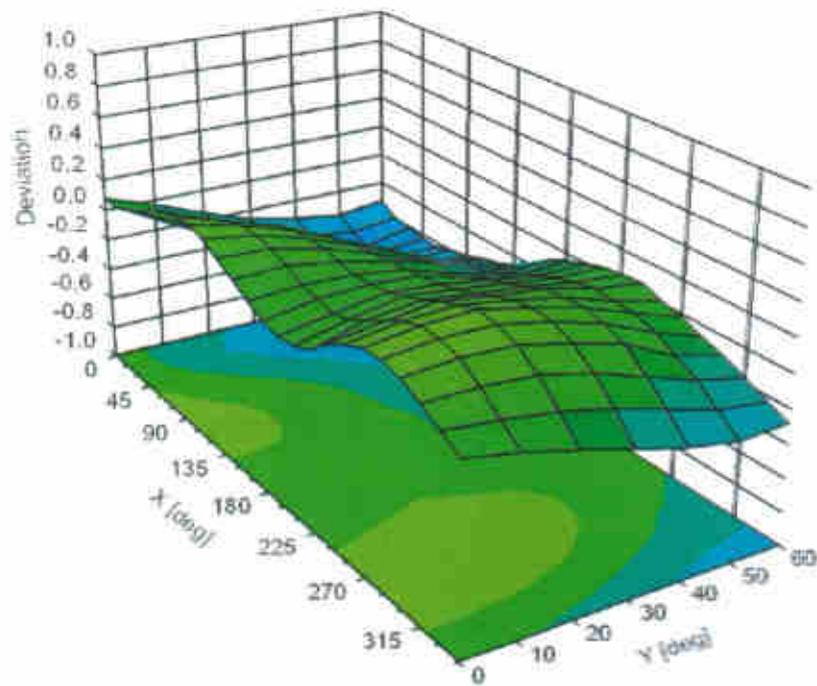
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

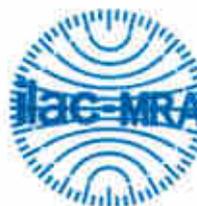
Error (ϕ, θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ (k=2)



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CNAS L0570

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com [Http://www.chinattl.cn](http://www.chinattl.cn)

Client **Auden**

Certificate No: **Z20-60166**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN : 3826**

Calibration Procedure(s) **FF-Z11-004-01
Calibration Procedures for Dosimetric E-field Probes**

Calibration date: **May 20, 2020**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	18-Jun-19(CTTL, No.J19X05125)	Jun-20
Power sensor NRP-Z91	101547	18-Jun-19(CTTL, No.J19X05125)	Jun-20
Power sensor NRP-Z91	101548	18-Jun-19(CTTL, No.J19X05125)	Jun-20
Reference 10dBAttenuator	18N50W-10dB	10-Feb-20(CTTL, No.J20X00525)	Feb-22
Reference 20dBAttenuator	18N50W-20dB	10-Feb-20(CTTL, No.J20X00526)	Feb-22
Reference Probe EX3DV4	SN 3617	30-Jan-20(SPEAG, No.EX3-3617_Jan20/2)	Jan-21
DAE4	SN 1556	4-Feb-20(SPEAG, No.DAE4-1556_Feb20)	Feb-21

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	18-Jun-19(CTTL, No.J19X05127)	Jun-20
Network Analyzer E5071C	MY46110673	10-Feb-20(CTTL, No.J20X00515)	Feb-21

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: May 22, 2020

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com [Http://www.chinattl.cn](http://www.chinattl.cn)

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), $\theta=0$ is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta=0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}; A,B,C** are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).



DASY/EASY – Parameters of Probe: EX3DV4 – SN:3826

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc ($k=2$)
Norm($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.48	0.41	0.36	$\pm 10.0\%$
DCP(mV) ^B	100.2	99.8	103.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc ^E ($k=2$)
0	CW	X	0.0	0.0	1.0	0.00	160.2	$\pm 2.7\%$
		Y	0.0	0.0	1.0		141.6	
		Z	0.0	0.0	1.0		130.8	

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor $k=2$, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).

^B Numerical linearization parameter; uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



DASY/EASY – Parameters of Probe: EX3DV4 – SN:3826

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	9.37	9.37	9.37	0.40	0.80	±12.1%
835	41.5	0.90	9.12	9.12	9.12	0.17	1.26	±12.1%
900	41.5	0.97	9.10	9.10	9.10	0.18	1.30	±12.1%
1750	40.1	1.37	7.98	7.98	7.98	0.19	1.14	±12.1%
1900	40.0	1.40	7.67	7.67	7.67	0.22	1.14	±12.1%
2000	40.0	1.40	7.77	7.77	7.77	0.24	1.10	±12.1%
2300	39.5	1.67	7.35	7.35	7.35	0.51	0.73	±12.1%
2450	39.2	1.80	7.12	7.12	7.12	0.53	0.72	±12.1%
2600	39.0	1.96	6.94	6.94	6.94	0.45	0.85	±12.1%
3500	37.9	2.91	6.62	6.62	6.62	0.39	0.98	±13.3%
5250	35.9	4.71	5.09	5.09	5.09	0.45	1.30	±13.3%
5600	35.5	5.07	4.66	4.66	4.66	0.45	1.40	±13.3%
5750	35.4	5.22	4.68	4.68	4.68	0.45	1.40	±13.3%

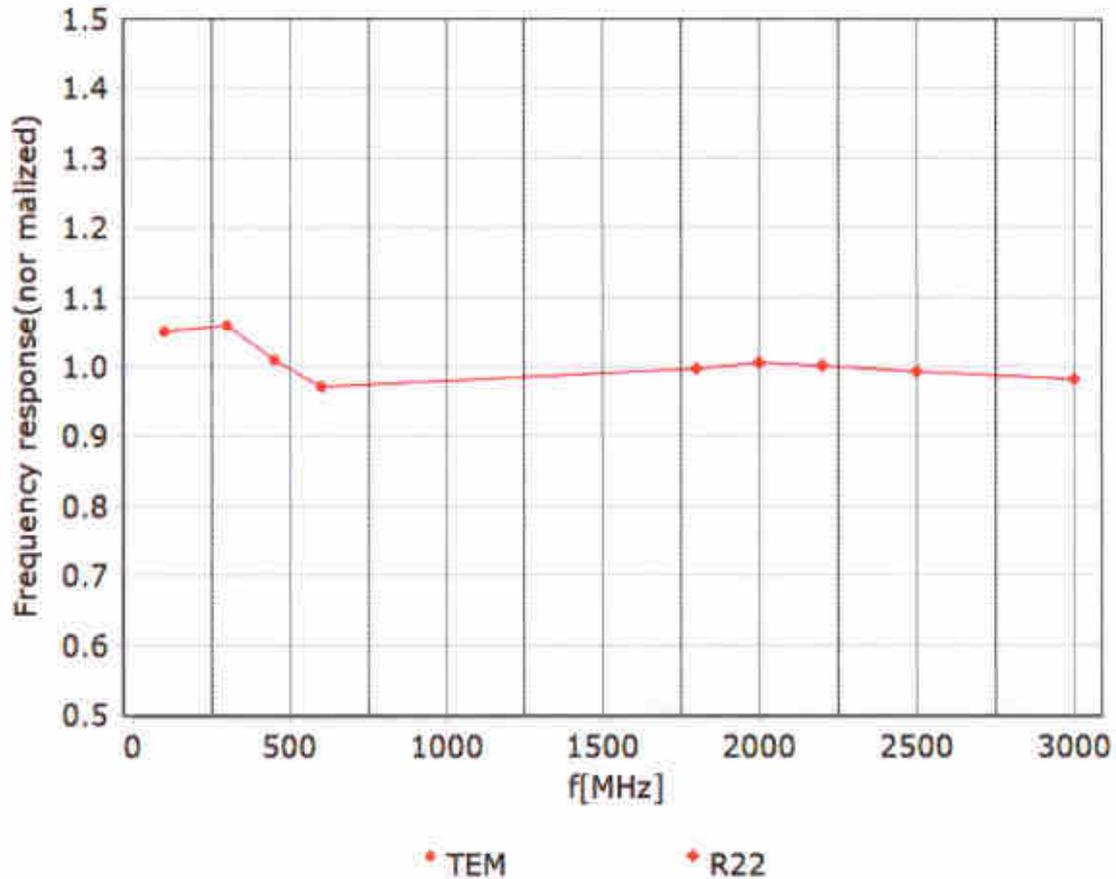
^C Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



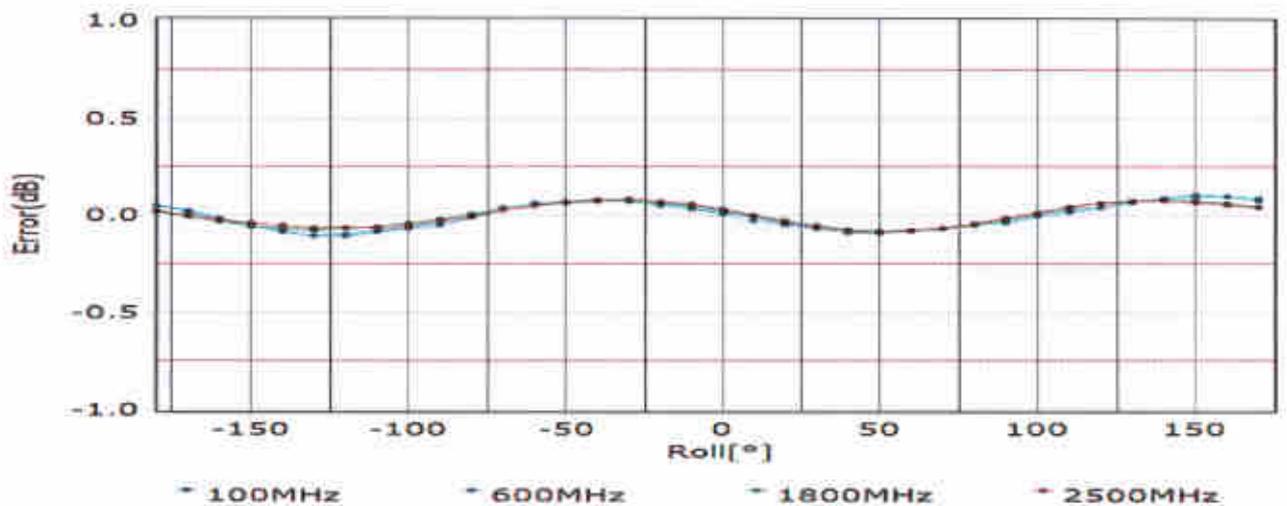
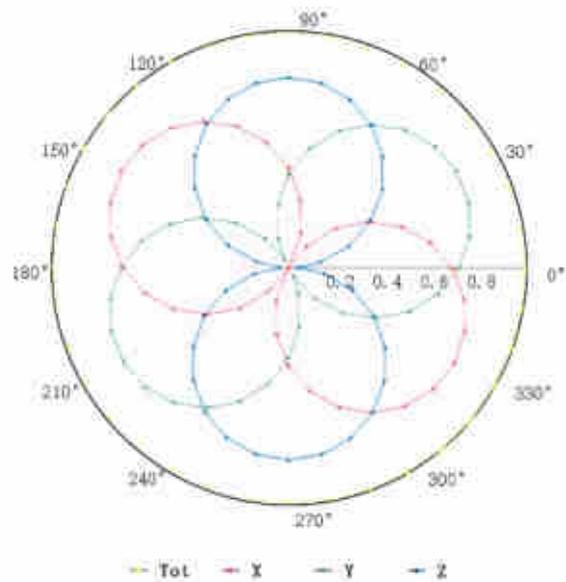
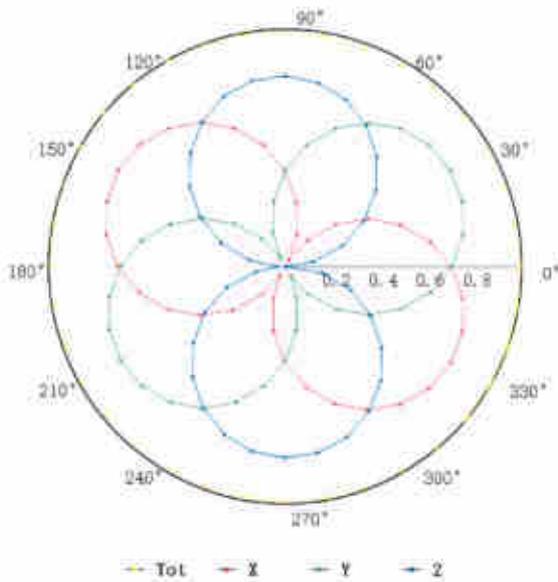
Uncertainty of Frequency Response of E-field: $\pm 7.4\%$ ($k=2$)



Receiving Pattern (Φ), $\theta=0^\circ$

f=600 MHz, TEM

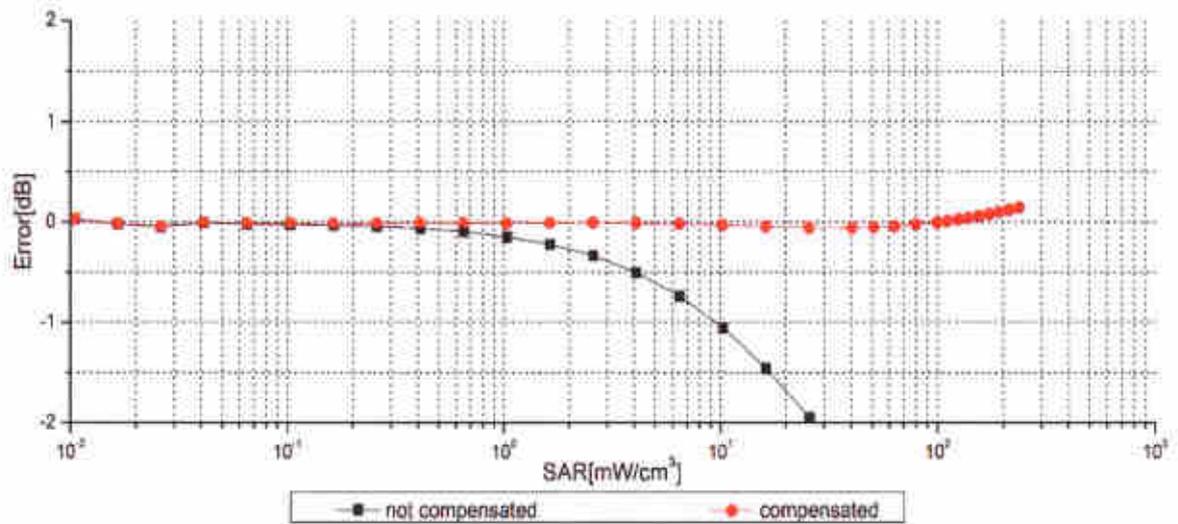
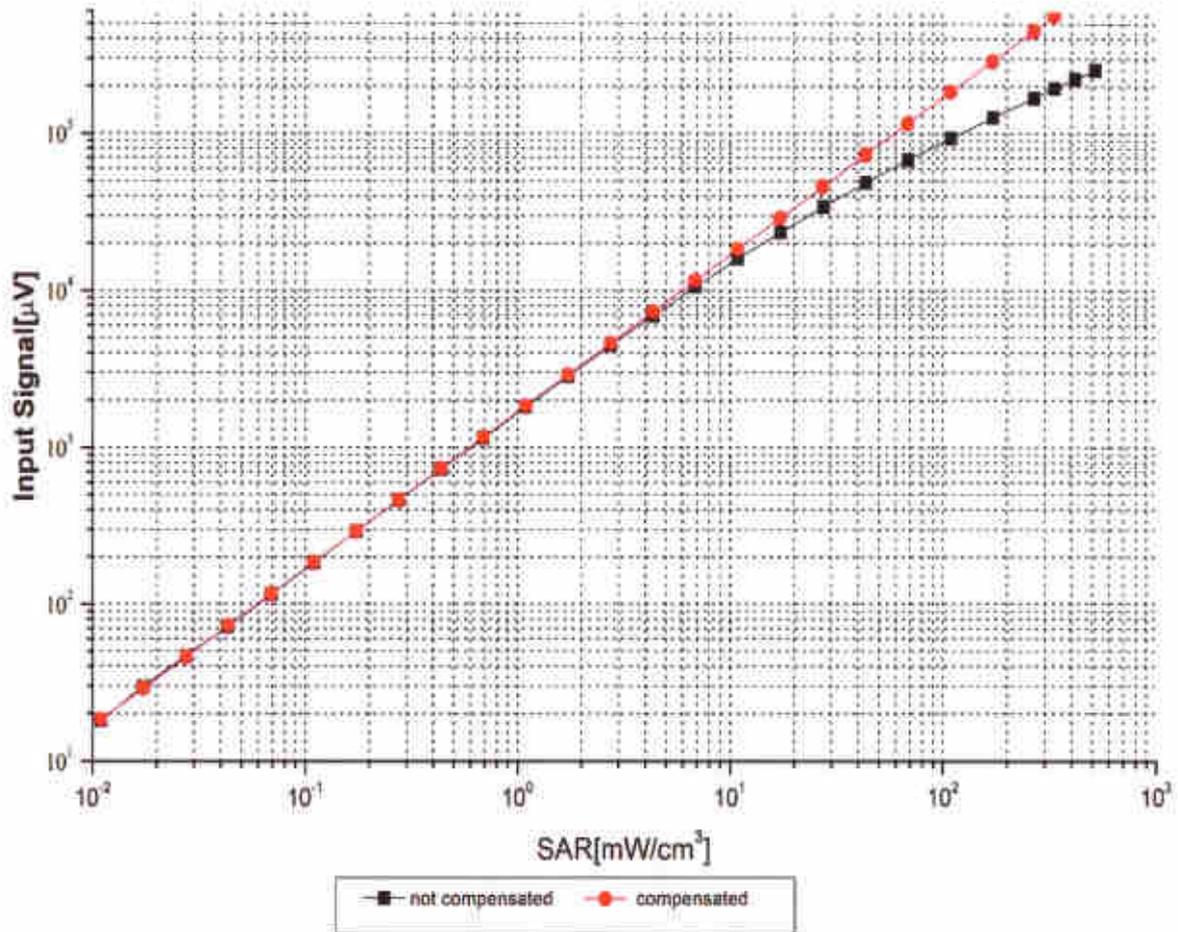
f=1800 MHz, R22



Uncertainty of Axial Isotropy Assessment: $\pm 1.2\%$ ($k=2$)



Dynamic Range f(SAR_{head}) (TEM cell, f = 900 MHz)



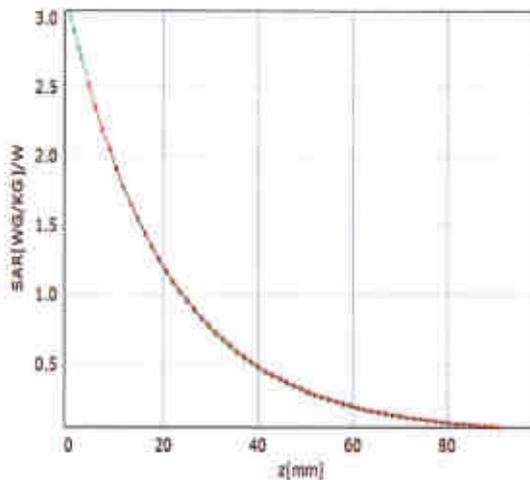
Uncertainty of Linearity Assessment: ±0.9% (k=2)



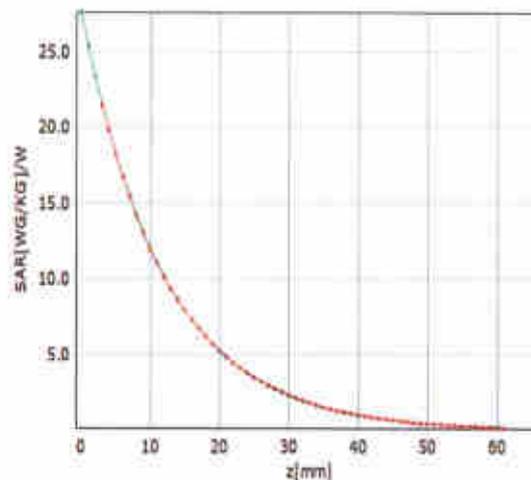
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)

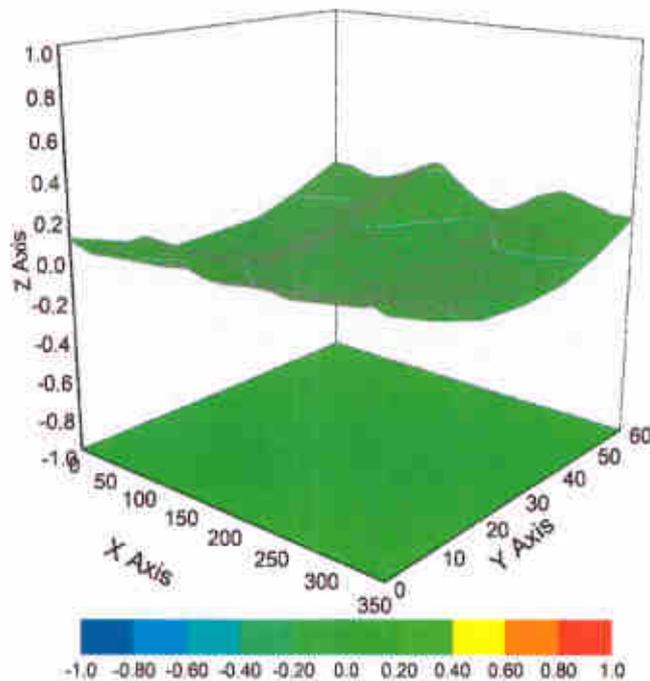


analytical measured



analytical measured

Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: $\pm 3.2\%$ ($k=2$)



DASY/EASY – Parameters of Probe: EX3DV4 – SN:3826

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	51.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	10mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm



Appendix E. Conducted RF Output Power Table

The detailed power table are shown as follows.



Full Power

GSM850 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame Average Power (dBm)			Tune-up Limit (dBm)
	128	188	251		128	188	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	32.16	32.29	32.32	33.50	23.16	23.29	23.32	24.50
GPRS 1 Tx slot	32.15	32.27	32.31	33.50	23.15	23.27	23.31	24.50
GPRS 2 Tx slots	30.32	30.40	30.02	31.50	24.32	24.40	24.02	25.50
GPRS 3 Tx slots	27.98	28.03	27.81	29.00	23.70	23.77	23.55	24.74
GPRS 4 Tx slots	25.72	25.73	25.55	26.50	22.72	22.73	22.55	23.50
EDGE 1 Tx slot	28.51	28.34	28.24	27.50	17.51	17.34	17.24	18.50
EDGE 2 Tx slots	24.38	24.31	24.22	25.50	18.38	18.31	18.22	19.50
EDGE 3 Tx slots	22.14	22.13	22.07	23.00	17.88	17.87	17.81	18.74
EDGE 4 Tx slots	20.03	20.09	19.94	21.00	17.03	17.09	16.94	18.00

GSM1900 TX Channel	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1552.2	1620	1622.8		1552.2	1620	1622.8	
GSM 1 Tx slot	29.75	29.77	29.53	30.50	20.75	20.77	20.53	21.50
GPRS 1 Tx slot	28.74	28.72	28.47	30.50	20.74	20.72	20.47	21.50
GPRS 2 Tx slots	27.75	27.82	27.71	29.00	21.75	21.82	21.71	23.00
GPRS 3 Tx slots	25.44	25.41	25.53	26.50	21.18	21.15	21.27	22.24
GPRS 4 Tx slots	23.44	23.47	23.42	24.50	20.44	20.47	20.42	21.50
EDGE 1 Tx slot	25.46	25.58	25.32	26.50	16.46	16.58	16.32	17.50
EDGE 2 Tx slots	23.29	23.52	23.38	24.50	17.29	17.52	17.38	18.50
EDGE 3 Tx slots	21.24	21.18	21.13	22.00	16.98	16.92	16.87	17.74
EDGE 4 Tx slots	19.81	19.71	19.68	21.00	16.81	16.71	16.68	18.00

Band TX Channel Rx Channel	WCDMA I			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
	900	960	958		1512	1413	1513		4132	4182	4233	
Frequency (MHz)	1852.4	1880	1907.6		1712.4	1732.6	1752.8		826.4	836.4	846.8	
3GPP Rel 99 AMR 12.2Kbps	23.00	23.04	22.98	24.00	22.84	22.96	22.73	24.00	23.01	23.00	23.22	24.00
3GPP Rel 99 AMR 12.2Kbps	23.01	23.05	22.99	24.00	22.75	22.58	22.70	24.00	23.02	23.03	23.29	24.00
3GPP Rel 6 HSDPA Subtest-1	22.08	22.04	21.97	23.00	22.02	21.90	22.10	23.00	22.09	22.07	22.26	23.00
3GPP Rel 6 HSDPA Subtest-2	22.06	22.06	22.02	23.00	22.05	22.06	22.18	23.00	22.08	22.12	22.29	23.00
3GPP Rel 6 HSDPA Subtest-3	21.21	21.55	21.47	22.50	21.57	21.52	21.78	22.50	21.60	21.58	21.82	22.50
3GPP Rel 6 HSDPA Subtest-4	21.54	21.57	21.52	22.50	21.48	21.56	21.21	22.50	21.56	21.61	21.38	22.50
3GPP Rel 6 DC-HSDPA Subtest-1	21.92	21.97	21.80	23.00	21.94	21.99	22.09	23.00	22.02	21.87	22.13	23.00
3GPP Rel 6 DC-HSDPA Subtest-2	21.99	21.87	21.99	23.00	21.99	22.03	22.08	23.00	21.99	21.93	22.26	23.00
3GPP Rel 6 DC-HSDPA Subtest-3	21.08	21.47	21.43	22.50	21.57	21.40	21.74	22.50	21.57	21.42	21.76	22.50
3GPP Rel 6 DC-HSDPA Subtest-4	21.53	21.53	21.42	22.50	21.26	21.51	21.20	22.50	21.36	21.47	21.20	22.50
3GPP Rel 6 HSUPA Subtest-1	22.08	22.07	22.02	23.00	21.99	22.03	21.84	23.00	22.03	22.03	22.17	23.00
3GPP Rel 6 HSUPA Subtest-2	20.05	20.06	20.05	21.00	19.87	19.86	19.89	21.00	19.87	20.02	20.13	21.00
3GPP Rel 6 HSUPA Subtest-3	21.07	21.04	20.99	22.00	20.96	20.99	20.99	22.00	21.01	21.01	21.20	23.00
3GPP Rel 6 HSUPA Subtest-4	20.08	20.03	19.98	21.00	19.98	20.00	19.89	21.00	19.99	20.00	20.18	21.00
3GPP Rel 6 HSUPA Subtest-5	22.10	22.10	22.00	23.00	22.00	22.00	22.10	23.00	22.00	22.00	22.20	23.00

Band TX Channel	CDMA BC0			Tune-up Limit (dBm)	CDMA BC1			Tune-up Limit (dBm)	CDMA BC10			Tune-up Limit (dBm)
	1013	384	777		25	800	1175		476	580	684	
Frequency (MHz)	824.7	836.52	848.31		1851.25	1860	1808.75		817.9	820.5	823.1	
RC1 S055	24.13	24.23	24.54	25.00	24.32	24.55	24.38	25.00	23.90	24.28	24.22	25.00
RC3 S055	24.10	24.19	24.50	25.00	24.23	24.44	24.26	25.00	23.85	24.11	24.02	25.00
RC3 S032 (F-SCH)	24.14	24.24	24.53	25.00	24.44	24.52	24.35	25.00	24.25	24.27	24.18	25.00
RC3 S032 (H-SCH)	24.08	24.15	24.47	25.00	24.42	24.39	24.22	25.00	24.01	24.24	24.11	25.00
RTAP 15.5Kbps	23.85	23.94	24.25	25.00	23.72	23.81	23.69	25.00	24.72	24.14	24.08	25.00
RTAP 40.5Kbps	23.79	23.86	24.11	25.00	23.74	23.74	23.62	25.00	24.01	24.11	24.07	25.00



Band 2 (1900MHz Band) Part 24E										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power Middle Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				1870	1880	1900				
Frequency (MHz)				1860	1880	1900				
20	QPSK	1	0	22.94	22.91	22.84	24	0		
20	QPSK	1	49	22.57	22.49	22.64				
20	QPSK	1	99	22.47	22.55	22.48				
20	QPSK	50	0	21.96	21.89	21.90	23	1		
20	QPSK	50	24	21.87	21.84	21.88				
20	QPSK	50	50	21.64	21.77	21.73				
20	QPSK	100	0	21.84	21.81	21.82				
20	16QAM	1	0	22.12	22.11	22.12	23	1		
20	16QAM	1	49	22.03	22.11	22.08				
20	16QAM	1	99	21.78	21.88	21.79				
20	16QAM	50	0	20.94	20.90	20.88	22	2		
20	16QAM	50	24	20.83	20.85	20.87				
20	16QAM	50	50	20.60	20.76	20.74				
20	16QAM	100	0	20.75	20.79	20.80				
20	84QAM	1	0	21.10	20.99	20.94	22	2		
20	84QAM	1	49	20.98	20.94	20.85				
20	84QAM	1	99	20.74	20.76	20.69				
20	84QAM	50	0	19.92	19.94	19.86	21	3		
20	84QAM	50	24	19.79	19.85	19.85				
20	84QAM	50	50	19.59	19.74	19.70				
20	84QAM	100	0	19.74	19.79	19.80				
Channel				1867.5	1890	1912.5	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1875	1890	1902.5				
15	QPSK	1	0	22.24	22.88	22.84	24	0		
15	QPSK	1	37	22.51	22.71	22.44				
15	QPSK	1	74	22.39	22.47	22.48				
15	QPSK	36	0	21.92	21.80	21.90	23	1		
15	QPSK	36	20	21.75	21.64	21.83				
15	QPSK	36	39	21.64	21.66	21.71				
15	QPSK	75	0	21.71	21.69	21.68	23	1		
15	16QAM	1	0	22.01	22.01	22.02				
15	16QAM	1	37	21.93	22.02	21.96				
15	16QAM	1	74	21.70	21.77	21.77				
15	16QAM	36	0	20.85	20.92	20.70	22	2		
15	16QAM	36	20	20.70	20.73	20.87				
15	16QAM	36	39	20.51	20.70	20.79				
15	16QAM	75	0	20.55	20.80	20.79	22	2		
15	84QAM	1	0	20.88	20.82	20.76				
15	84QAM	1	37	20.94	20.79	20.84	22	2		
15	84QAM	1	74	20.66	20.72	20.57				
15	84QAM	36	0	19.81	19.89	19.85	21	3		
15	84QAM	36	20	19.75	19.85	19.76				
15	84QAM	36	39	19.59	19.60	19.52				
15	84QAM	75	0	19.59	19.72	19.64				
Channel				1865	1880	19150	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1855	1880	1905				
10	QPSK	1	0	22.81	22.76	22.69	24	0		
10	QPSK	1	25	22.38	22.47	22.57				
10	QPSK	1	49	22.40	22.52	22.39				
10	QPSK	25	0	21.79	21.96	21.86	23	1		
10	QPSK	25	12	21.63	21.71	21.69				
10	QPSK	25	25	21.57	21.74	21.53				
10	QPSK	50	0	21.76	21.63	21.73	23	1		
10	16QAM	1	0	21.96	22.05	22.01				
10	16QAM	1	25	21.97	22.08	21.92				
10	16QAM	1	49	21.70	21.75	21.72				
10	16QAM	25	0	20.91	20.94	20.78	22	2		
10	16QAM	25	12	20.81	20.73	20.79				
10	16QAM	25	25	20.42	20.67	20.85				
10	16QAM	50	0	20.82	20.86	20.71	22	2		
10	84QAM	1	0	20.95	20.98	20.90				
10	84QAM	1	25	20.79	20.86	20.67	22	2		
10	84QAM	1	49	20.73	20.67	20.59				
10	84QAM	25	0	19.92	19.91	19.76	21	3		
10	84QAM	25	12	19.82	19.77	19.81				
10	84QAM	25	25	19.49	19.68	19.66				
10	84QAM	50	0	19.60	19.61	19.80				
Channel				1862.5	1890	1917.5	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1872.5	1890	1907.5				
5	QPSK	1	0	22.78	22.83	22.74	24	0		
5	QPSK	1	12	22.37	22.41	22.58				
5	QPSK	1	24	22.46	22.35	22.33				
5	QPSK	12	0	21.76	21.80	21.84	23	1		
5	QPSK	12	7	21.80	21.64	21.75				
5	QPSK	12	13	21.58	21.72	21.73				
5	QPSK	25	0	21.73	21.81	21.85	23	1		
5	16QAM	1	0	22.03	21.97	22.12				
5	16QAM	1	12	22.03	22.11	22.04				
5	16QAM	1	24	21.71	21.86	21.79	22	2		
5	16QAM	12	0	20.92	20.95	20.73				
5	16QAM	12	7	20.63	20.79	20.80				
5	16QAM	12	13	20.60	20.60	20.60				
5	16QAM	25	0	20.85	20.89	20.85	22	2		
5	84QAM	1	0	21.02	20.94	20.87				
5	84QAM	1	12	20.87	20.75	20.83	22	2		
5	84QAM	1	24	20.61	20.61	20.53				
5	84QAM	12	0	19.90	19.88	19.68	21	3		
5	84QAM	12	7	19.76	19.85	19.85				
5	84QAM	12	13	19.57	19.55	19.56				
5	84QAM	25	0	19.66	19.73	19.70				
Channel				1861.5	1890	1918.5	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1851.5	1880	1908.5				
3	QPSK	1	0	22.91	22.91	22.81	24	0		
3	QPSK	1	8	22.49	22.47	22.64				
3	QPSK	1	14	22.37	22.45	22.44				
3	QPSK	8	0	21.92	21.87	21.84	23	1		
3	QPSK	8	4	21.64	21.68	21.67				
3	QPSK	8	7	21.45	21.70	21.73				
3	QPSK	15	0	21.71	21.81	21.69	23	1		
3	16QAM	1	0	22.06	21.91	22.00				
3	16QAM	1	8	21.93	22.08	22.07				
3	16QAM	1	14	21.75	21.77	21.62	22	2		
3	16QAM	8	0	20.80	20.81	20.85				
3	16QAM	8	4	20.82	20.78	20.78				
3	16QAM	8	7	20.46	20.74	20.55				
3	16QAM	15	0	20.85	20.70	20.77	22	2		
3	84QAM	1	0	21.02	20.91	20.85				
3	84QAM	1	8	20.96	20.87	20.85				
3	84QAM	1	14	20.59	20.56	20.58	21	3		
3	84QAM	8	0	19.80	19.78	19.80				
3	84QAM	8	4	19.71	19.76	19.77				
3	84QAM	8	7	19.58	19.63	19.60				
3	84QAM	15	0	19.60	19.79	19.74				
Channel				1850	1890	1909.3	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1857	1890	1909.3				
1.4	QPSK	1	0	22.90	22.72	22.67	24	0		
1.4	QPSK	1	3	22.54	22.40	22.56				
1.4	QPSK	1	5	22.41	22.44	22.28				
1.4	QPSK	3	0	22.77	22.84	22.74	23	1		
1.4	QPSK	3	1	22.51	22.54	22.73				
1.4	QPSK	3	3	22.49	22.85	22.45				
1.4	QPSK	6	0	21.80	21.89	21.82	23	1		
1.4	16QAM	1	0	21.98	22.02	21.98				
1.4	16QAM	1	3	21.93	21.92	22.00	23	1		
1.4	16QAM	1	5	21.64	21.69	21.67				
1.4	16QAM	3	0	21.80	21.67	21.61				
1.4	16QAM	3	1	21.52	21.71	21.57	22	2		
1.4	16QAM	3	1	21.47	21.60	21.58				
1.4	16QAM	6	0	20.74	20.70	20.78				
1.4	84QAM	1	0	21.09	20.90	20.88	22	2		
1.4	84QAM	1	3	20.79	20.83	20.72				
1.4	84QAM	1	5	20.63	20.64	20.61				
1.4	84QAM	3	0	20.72	20.74	20.72	22	2		
1.4	84QAM	3	1	20.85	20.54	20.64				
1.4	84QAM	3	1	20.33	20.50	20.51				
1.4	84QAM	6	0	19.70	19.61	19.80	21	3		

Band 4 (AWS Band) Part 27L (Only on channel required)										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power Middle Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				1720	1732.5	1745				
Frequency (MHz)				1720	1732.5	1745				
20	QPSK	1	0	22.99	22.95	22.98	24	0		
20	QPSK	1	49	23.07	22.97	23.26				
20	QPSK	1	99	22.97	22.96	23.33				
20	QPSK	50	0	22.11	21.95	22.05	23	1		
20	QPSK	50	24	22.16	21.98	22.03				
20	QPSK	50	50	22.01	21.96	22.29				
20	QPSK	100	0	22.16	22.03	22.09				
20	16QAM	1	0	22.37	22.28	22.35	23	1		
20	16QAM	1	49	22.52	22.34	22.39				
20	16QAM	1	99	22.29	22.31	22.70				
20	16QAM	50	0							



Band 7 (2600MHz Band)										
Part 27										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				2080	2100	2120				
Frequency (MHz)				2510	2535	2550				
20	QPSK	1	0	22.97	23.21	23.25				
20	QPSK	1	49	22.89	23.24	23.30			24	0
20	QPSK	1	99	23.06	23.25	23.46				
20	QPSK	50	0	21.91	22.21	22.34				
20	QPSK	50	24	21.91	22.31	22.30				
20	QPSK	50	50	22.04	22.39	22.42			23	1
20	QPSK	100	0	22.01	22.22	22.32				
20	16QAM	1	0	22.40	22.58	22.18				
20	16QAM	1	49	22.31	22.62	22.59			23	1
20	16QAM	1	99	22.39	22.39	22.75				
20	16QAM	50	0	20.91	21.31	21.24				
20	16QAM	50	24	20.92	21.26	21.37				
20	16QAM	50	50	20.94	21.26	21.44			22	2
20	16QAM	100	0	20.99	21.29	21.32				
20	64QAM	1	0	21.31	21.67	21.58				
20	64QAM	1	49	21.12	21.40	21.55			22	2
20	64QAM	1	99	21.16	21.72	21.65				
20	64QAM	50	0	19.91	20.21	20.29				
20	64QAM	50	24	19.95	20.38	20.38				
20	64QAM	50	50	19.96	20.33	20.27			21	3
20	64QAM	100	0	20.00	20.24	20.34				
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				2507.5	2535	2562.5				
15	QPSK	1	0	22.71	22.85	22.87			24	0
15	QPSK	1	37	22.72	22.83	22.88				
15	QPSK	1	74	23.05	23.40	23.43				
15	QPSK	36	0	22.06	22.44	22.36				
15	QPSK	36	20	22.10	22.43	22.43				
15	QPSK	36	39	22.03	22.37	22.42			23	1
15	QPSK	75	0	22.07	22.42	22.43				
15	16QAM	1	0	22.38	22.79	22.89				
15	16QAM	1	37	22.37	22.79	22.80			23	1
15	16QAM	1	74	22.38	22.81	22.85				
15	16QAM	36	0	21.09	21.51	21.42				
15	16QAM	36	20	21.12	21.47	21.41				
15	16QAM	36	39	21.02	21.37	21.47			22	2
15	16QAM	75	0	21.05	21.42	21.43				
15	64QAM	1	0	21.30	21.60	21.78				
15	64QAM	1	37	21.18	21.61	21.49			22	2
15	64QAM	1	74	21.33	21.57	21.68				
15	64QAM	36	0	20.08	20.47	20.41				
15	64QAM	36	20	20.14	20.45	20.43				
15	64QAM	36	39	20.01	20.31	20.47			21	3
15	64QAM	75	0	20.02	20.44	20.41				
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				2505	2535	2565				
10	QPSK	1	0	22.86	22.97	22.84			24	0
10	QPSK	1	25	23.06	23.16	22.99				
10	QPSK	1	49	23.16	23.23	23.28				
10	QPSK	25	0	21.99	22.45	22.51				
10	QPSK	25	12	22.00	22.45	22.50			23	1
10	QPSK	25	25	22.02	22.44	22.49				
10	QPSK	50	0	22.04	22.47	22.55				
10	16QAM	1	0	22.58	22.88	22.99				
10	16QAM	1	25	22.31	22.73	22.87			23	1
10	16QAM	1	49	22.52	22.85	22.92				
10	16QAM	25	0	21.02	21.46	21.50				
10	16QAM	25	12	21.03	21.47	21.49				
10	16QAM	25	25	21.02	21.46	21.44			22	2
10	16QAM	50	0	21.08	21.49	21.49				
10	64QAM	1	0	21.51	21.75	21.88				
10	64QAM	1	25	21.15	21.63	21.59			22	2
10	64QAM	1	49	21.37	21.81	21.82				
10	64QAM	25	0	19.99	20.46	20.43				
10	64QAM	25	12	19.99	20.44	20.46			21	3
10	64QAM	25	25	20.06	20.46	20.52				
10	64QAM	50	0	20.06	20.48	20.52				
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				2502.5	2535	2567.5				
5	QPSK	1	0	22.80	22.86	22.86			24	0
5	QPSK	1	12	22.87	22.97	23.15				
5	QPSK	1	24	22.94	23.38	23.39				
5	QPSK	12	0	21.96	22.47	22.53				
5	QPSK	12	7	22.00	22.48	22.48			23	1
5	QPSK	12	13	21.93	22.37	22.46				
5	QPSK	25	0	21.91	22.44	22.51				
5	16QAM	1	0	22.34	22.74	22.87				
5	16QAM	1	12	22.22	22.71	22.73			23	1
5	16QAM	1	24	22.20	22.76	22.71				
5	16QAM	12	0	21.01	21.49	21.53				
5	16QAM	12	7	21.05	21.50	21.52			22	2
5	16QAM	12	13	20.95	21.46	21.49				
5	16QAM	25	0	20.94	21.51	21.49				
5	64QAM	1	0	21.22	21.65	21.67				
5	64QAM	1	12	21.20	21.58	21.68			22	2
5	64QAM	1	24	21.15	21.64	21.61				
5	64QAM	12	0	20.00	20.49	20.51				
5	64QAM	12	7	20.09	20.51	20.50			21	3
5	64QAM	12	13	19.95	20.43	20.47				
5	64QAM	25	0	19.90	20.49	20.49				

Band 12 (700MHz Low Band)										
Part 27F (only on channel required)										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				2090	2095	2105				
Frequency (MHz)				704	707.5	711				
10	QPSK	1	0	22.87	22.90	22.93				
10	QPSK	1	25	22.56	22.59	22.46			24	0
10	QPSK	1	49	22.86	22.82	22.89				
10	QPSK	25	0	21.77	21.89	21.80				
10	QPSK	25	12	21.75	21.87	21.56			23	1
10	QPSK	25	25	21.58	21.61	21.66				
10	QPSK	50	0	21.78	21.51	21.72				
10	16QAM	1	0	22.12	22.10	22.03				
10	16QAM	1	25	21.83	21.78	21.81			23	1
10	16QAM	1	49	22.02	22.05	22.04				
10	16QAM	25	0	20.79	20.54	20.59				
10	16QAM	25	12	20.70	20.64	20.59				
10	16QAM	25	25	20.58	20.64	20.66			22	2
10	16QAM	50	0	20.78	20.55	20.73				
10	64QAM	1	0	20.94	20.94	20.97				
10	64QAM	1	25	20.69	20.69	20.79			22	2
10	64QAM	1	49	20.96	20.99	20.99				
10	64QAM	25	0	19.77	19.55	19.56				
10	64QAM	25	12	19.71	19.62	19.56			21	3
10	64QAM	25	25	19.60	19.58	19.65				
10	64QAM	50	0	19.73	19.54	19.64				
Channel				20935	20995	21055	Tune-up limit (dBm)	MPR (dB)		
Frequency (MHz)				701.5	707.5	713.5				
5	QPSK	1	0	22.70	22.72	22.91			24	0
5	QPSK	1	12	22.08	22.51	22.37				
5	QPSK	1	24	22.71	22.75	22.77				
5	QPSK	12	0	21.62	21.47	21.48				
5	QPSK	12	7	21.58	21.58	21.37			23	1
5	QPSK	12	13	21.55	21.51	21.48				
5	QPSK	25	0	21.70	21.36	21.55				
5	16QAM	1	0	22.06	22.05	22.03				
5	16QAM	1	12	21.65	21.66	21.62			23	1
5	16QAM	1	24	21.95	21.93	21.87				
5	16QAM	12	0	20.64	20.39	20.46				
5	16QAM	12	7	20.66	20.53	20.50			22	2
5	16QAM	12	13	20.48	20.51	20.47				



Band 14 (700MHz Band)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)									
793									
10	QPSK	1	0	22.65					
10	QPSK	1	25	22.57			24	0	
10	QPSK	1	49	22.72					
10	QPSK	25	0	21.46					
10	QPSK	25	12	21.47			23	1	
10	QPSK	25	25	21.42					
10	QPSK	50	0	21.54					
10	16QAM	1	0	21.86					
10	16QAM	1	25	21.76			23	1	
10	16QAM	1	49	21.90					
10	16QAM	25	0	20.47					
10	16QAM	25	12	20.52			22	2	
10	16QAM	25	25	20.41					
10	16QAM	50	0	20.55					
10	16QAM	1	0	20.70					
10	64QAM	1	25	20.71			22	2	
10	64QAM	1	49	20.87					
10	64QAM	25	0	19.46					
10	64QAM	25	12	19.50			21	3	
10	64QAM	25	25	19.46					
10	64QAM	50	0	19.46					
Channel									
Frequency (MHz)									
2330									
5	QPSK	1	0	22.26	22.14	22.22	24	0	
5	QPSK	1	12	22.15	22.16	22.07			
5	QPSK	1	24	22.40	22.37	22.44			
5	QPSK	12	0	21.41	21.41	21.46			
5	QPSK	12	7	21.33	21.45	21.38	23	1	
5	QPSK	12	13	21.44	21.43	21.42			
5	QPSK	25	0	21.44	21.44	21.52			
5	16QAM	1	0	21.69	21.72	21.70	23	1	
5	16QAM	1	12	21.65	21.73	21.67			
5	16QAM	1	24	21.77	21.73	21.74			
5	16QAM	12	0	20.44	20.44	20.50			
5	16QAM	12	7	20.35	20.52	20.43	22	2	
5	16QAM	12	13	20.46	20.46	20.48			
5	16QAM	25	0	20.45	20.49	20.49			
5	64QAM	1	0	20.49	20.55	20.60			
5	64QAM	1	12	20.43	20.55	20.59	22	2	
5	64QAM	1	24	20.59	20.59	20.61			
5	64QAM	12	0	19.43	19.45	19.50			
5	64QAM	12	7	19.35	19.48	19.39	21	3	
5	64QAM	12	13	19.44	19.45	19.45			
5	64QAM	25	0	19.42	19.43	19.47			

Band 17 (700MHz Band) Part 27M(only on channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)									
709 710 711									
10	QPSK	1	0	22.85	22.93	22.88			
10	QPSK	1	25	22.84	22.77	22.74	24	0	
10	QPSK	1	49	22.81	22.76	22.79			
10	QPSK	25	0	21.70	21.74	21.86			
10	QPSK	25	12	21.57	21.63	21.59	23	1	
10	QPSK	25	25	21.64	21.54	21.64			
10	QPSK	50	0	21.65	21.66	21.65			
10	16QAM	1	0	22.13	22.07	22.06			
10	16QAM	1	25	21.80	21.84	21.87	23	1	
10	16QAM	1	49	22.05	22.08	22.05			
10	16QAM	25	0	20.66	20.63	20.63			
10	16QAM	25	12	20.59	20.65	20.58	22	2	
10	16QAM	25	25	20.62	20.57	20.62			
10	16QAM	50	0	20.61	20.60	20.59			
10	64QAM	1	0	20.98	20.97	20.96			
10	64QAM	1	25	20.71	20.70	20.82	22	2	
10	64QAM	1	49	20.99	20.91	20.86			
10	64QAM	25	0	19.66	19.63	19.63			
10	64QAM	25	12	19.59	19.66	19.61	21	3	
10	64QAM	25	25	19.64	19.57	19.49			
10	64QAM	50	0	19.62	19.57	19.56			
Channel									
Frequency (MHz)									
2376 2379 2383									
5	QPSK	1	0	22.75	22.82	22.78			
5	QPSK	1	12	22.55	22.47	22.42	24	0	
5	QPSK	1	24	22.57	22.46	22.48			
5	QPSK	12	0	21.53	21.54	21.53			
5	QPSK	12	7	21.65	21.53	21.51	23	1	
5	QPSK	12	13	21.58	21.58	21.53			
5	QPSK	25	0	21.65	21.62	21.51			
5	16QAM	1	0	21.88	21.83	21.87			
5	16QAM	1	12	21.85	21.77	21.80	23	1	
5	16QAM	1	24	21.92	21.84	21.77			
5	16QAM	12	0	20.55	20.58	20.54			
5	16QAM	12	7	20.63	20.52	20.49	22	2	
5	16QAM	12	13	20.59	20.57	20.55			
5	16QAM	25	0	20.64	20.59	20.50			
5	64QAM	1	0	20.75	20.69	20.71			
5	64QAM	1	12	20.69	20.59	20.66	22	2	
5	64QAM	1	24	20.69	20.71	20.63			
5	64QAM	12	0	19.57	19.56	19.48			
5	64QAM	12	7	19.62	19.55	19.51	21	3	
5	64QAM	12	13	19.62	19.58	19.53			
5	64QAM	25	0	19.63	19.59	19.46			

Band 25 (1900MHz Band) Part 24E									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)									
1890 1890 1905									
20	QPSK	1	0	22.90	22.76	22.93			
20	QPSK	1	49	22.60	22.74	22.74	24	0	
20	QPSK	1	99	22.51	22.61	22.65			
20	QPSK	50	0	21.93	21.77	21.96			
20	QPSK	50	24	20.92	21.75	21.79	23	1	
20	QPSK	50	50	21.74	21.69	21.69			
20	QPSK	100	0	21.79	21.79	21.88			
20	16QAM	1	0	22.10	22.03	22.05			
20	16QAM	1	49	21.95	22.06	21.98	23	1	
20	16QAM	1	99	21.52	21.77	21.48			
20	16QAM	50	0	20.92	20.74	20.76			
20	16QAM	50	24	20.77	20.75	20.81			
20	16QAM	50	50	20.74	20.69	20.73	22	2	
20	16QAM	100	0	20.77	20.70	20.76			
20	64QAM	1	0	20.98	20.94	21.05			
20	64QAM	1	49	20.89	20.93	20.90			
20	64QAM	1	99	20.57	20.87	20.54	22	2	
20	64QAM	50	0	19.80	19.87	19.86			
20	64QAM	50	24	19.89	19.83	19.85	21	3	
20	64QAM	50	50	19.84	19.76	19.83			
20	64QAM	100	0	19.87	19.82	19.87			
Channel									
Frequency (MHz)									
1837.5 1890 1907.5									
15	QPSK	1	0	22.76	22.74	22.63			
15	QPSK	1	37	22.55	22.65	22.68	24	0	
15	QPSK	1	74	22.44	22.42	22.49			
15	QPSK	36	0	21.71	21.71	21.67			
15	QPSK	36	20	21.69	21.58	21.81			
15	QPSK	36	39	21.73	21.66	21.60	23	1	
15	QPSK	75	0	21.61	21.66	21.71			
15	16QAM	1	0	21.95	22.00	21.96			
15	16QAM	1	37	21.93	21.87	21.90	23	1	
15	16QAM	1	74	21.35	21.58	21.42			
15	16QAM	36	0	20.80	20.63	20.76			
15	16QAM	36	20	20.66	20.56	20.74	22	2	
15	16QAM	36	39	20.71	20.50	20.73			
15	16QAM	75	0	20.62	20.66	20.65			
15	64QAM	1	0	20.92	20.76	21.00			
15	64QAM	1	37	20.79	20.78	20.72	22	2	
15	64QAM	1	74	20.55	20.62	20.47			
15	64QAM	36	0	19.73	19.74	19.73			
15	64QAM	36	20	19.88	19.84	19.89	21	3	
15	64QAM	36	39	19.75	19.74	19.82			
15	64QAM	75	0	19.84	19.75	19.82			
Channel									
Frequency (MHz)									
2690 26340 26640									
1855 1880 1910									
10	QPSK	1	0	22.66	22.58	22.68			
10	QPSK	1	25	22.45	22.71	22.58	24	0	
10	QPSK	1	49	22.46	22.45	22.58			
10	QPSK	25	0	21.65	21.63	21.69			



Band 26 for FCC (only on channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq	Power Middle Ch. / Freq	Power High Ch. / Freq	Tune-up limit (dBm)	MPR (dB)	
Channel				26765	26865	26965			
Frequency (MHz)				821.5	831.5	841.5			
15	QPSK	1	0	22.64	22.74	22.95			
15	QPSK	1	37	22.47	22.43	22.75	24	0	
15	QPSK	1	74	23.05	23.08	23.07			
15	QPSK	36	0	21.72	21.75	21.71			
15	QPSK	36	20	21.57	21.54	21.66			
15	QPSK	36	39	21.46	21.44	21.60	23	1	
15	QPSK	75	0	21.63	21.68	21.67			
15	16QAM	1	0	21.95	21.98	22.26			
15	16QAM	1	37	21.68	21.74	21.92	23	1	
15	16QAM	1	74	22.40	22.26	22.38			
15	16QAM	36	0	20.67	20.67	20.93			
15	16QAM	36	20	20.54	20.53	20.65			
15	16QAM	36	39	20.43	20.40	20.56	22	2	
15	16QAM	75	0	20.61	20.59	20.74			
15	64QAM	1	0	20.89	20.96	21.09			
15	64QAM	1	37	20.47	20.60	20.71	22	2	
15	64QAM	1	74	21.11	21.13	21.10			
15	64QAM	36	0	19.73	19.69	19.91			
15	64QAM	36	20	19.58	19.55	19.67			
15	64QAM	36	39	19.47	19.44	19.62	21	3	
15	64QAM	75	0	19.58	19.60	19.73			
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				819	831.5	844			
10	QPSK	1	0	22.46	22.60	22.85			
10	QPSK	1	25	22.47	22.37	22.67	24	0	
10	QPSK	1	49	22.86	22.96	23.00			
10	QPSK	25	0	21.53	21.60	21.85			
10	QPSK	25	12	21.44	21.50	21.62			
10	QPSK	25	25	21.27	21.25	21.57	23	1	
10	QPSK	50	0	21.52	21.49	21.61			
10	16QAM	1	0	21.85	21.91	22.17			
10	16QAM	1	25	21.59	21.67	21.86	23	1	
10	16QAM	1	49	22.29	22.10	22.30			
10	16QAM	25	0	20.52	20.65	20.82			
10	16QAM	25	12	20.43	20.46	20.46	22	2	
10	16QAM	25	25	20.26	20.40	20.39			
10	16QAM	50	0	20.48	20.57	20.63			
10	64QAM	1	0	20.70	20.81	20.89			
10	64QAM	1	25	20.41	20.60	20.66	22	2	
10	64QAM	1	49	20.91	21.09	21.02			
10	64QAM	25	0	19.66	19.66	19.79			
10	64QAM	25	12	19.52	19.47	19.48	21	3	
10	64QAM	25	25	19.37	19.26	19.52			
10	64QAM	50	0	19.40	19.54	19.57			
Channel				26716	26865	27016	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				816.5	831.5	846.5			
5	QPSK	1	0	22.60	22.66	22.94			
5	QPSK	1	12	22.43	22.42	22.56	24	0	
5	QPSK	1	24	22.95	23.06	23.03			
5	QPSK	12	0	21.61	21.53	21.78			
5	QPSK	12	7	21.43	21.41	21.65	23	1	
5	QPSK	12	13	21.32	21.24	21.46			
5	QPSK	25	0	21.56	21.58	21.68			
5	16QAM	1	0	21.88	21.91	22.07			
5	16QAM	1	12	21.56	21.60	21.76	23	1	
5	16QAM	1	24	22.25	22.25	22.26			
5	16QAM	12	0	20.65	20.58	20.74			
5	16QAM	12	7	20.39	20.48	20.55	22	2	
5	16QAM	12	13	20.25	20.33	20.47			
5	16QAM	25	0	20.44	20.59	20.56			
5	64QAM	1	0	20.82	20.88	21.05			
5	64QAM	1	12	20.40	20.60	20.61	22	2	
5	64QAM	1	24	20.94	21.03	21.03			
5	64QAM	12	0	19.68	19.58	19.80			
5	64QAM	12	7	19.44	19.48	19.50	21	3	
5	64QAM	12	13	19.41	19.31	19.50			
5	64QAM	25	0	19.47	19.50	19.57			
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				815.5	831.5	847.5			
3	QPSK	1	0	22.46	22.64	22.83			
3	QPSK	1	8	22.45	22.32	22.74	24	0	
3	QPSK	1	14	22.95	22.92	22.94			
3	QPSK	8	0	21.56	21.65	21.75			
3	QPSK	8	4	21.44	21.42	21.50	23	1	
3	QPSK	8	7	21.39	21.43	21.40			
3	QPSK	15	0	21.53	21.50	21.60			
3	16QAM	1	0	21.86	21.90	22.11			
3	16QAM	1	8	21.66	21.58	21.91	23	1	
3	16QAM	1	14	22.33	22.26	22.28			
3	16QAM	8	0	20.53	20.52	20.84			
3	16QAM	8	4	20.46	20.39	20.48	22	2	
3	16QAM	8	7	20.32	20.30	20.52			
3	16QAM	15	0	20.61	20.40	20.60			
3	64QAM	1	0	20.81	20.81	21.00			
3	64QAM	1	8	20.45	20.59	20.59	22	2	
3	64QAM	1	14	21.04	21.07	20.98			
3	64QAM	8	0	19.67	19.53	19.76			
3	64QAM	8	4	19.52	19.37	19.54	21	3	
3	64QAM	8	7	19.36	19.44	19.42			
3	64QAM	15	0	19.39	19.54	19.71			
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				814.7	831.5	848.3			
1.4	QPSK	1	0	22.49	22.61	22.80			
1.4	QPSK	1	3	22.32	22.32	22.75	24	0	
1.4	QPSK	1	5	23.05	23.07	22.88			
1.4	QPSK	3	0	22.42	22.43	22.74			
1.4	QPSK	3	1	22.29	22.34	22.47			
1.4	QPSK	3	3	22.35	22.26	22.49			
1.4	QPSK	6	0	21.63	21.42	21.67	23	1	
1.4	16QAM	1	0	21.82	21.81	22.22			
1.4	16QAM	1	3	21.60	21.60	21.92			
1.4	16QAM	1	5	22.35	22.11	22.22	23	1	
1.4	16QAM	3	0	21.53	21.36	21.70			
1.4	16QAM	3	1	21.24	21.39	21.38			
1.4	16QAM	3	3	21.13	21.23	21.36			
1.4	16QAM	6	0	20.50	20.45	20.62	22	2	
1.4	64QAM	1	0	20.69	20.94	20.97			
1.4	64QAM	1	3	20.36	20.64	20.62			
1.4	64QAM	1	5	20.94	21.10	20.95			
1.4	64QAM	3	0	20.49	20.47	20.66	22	2	
1.4	64QAM	3	1	20.42	20.34	20.37			
1.4	64QAM	3	3	20.27	20.29	20.34			
1.4	64QAM	6	0	19.45	19.55	19.69	21	3	

Band 30									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. / Freq	Power Middle Ch. / Freq	Power High Ch. / Freq	Tune-up limit (dBm)	MPR (dB)	
Channel				27710	27710	27710			
Frequency (MHz)				2310					
10	QPSK	1	0		22.92				
10	QPSK	1	25		22.61		24	0	
10	QPSK	1	49		22.86				
10	QPSK	25	0		21.75				
10	QPSK	25	12		21.66		23	1	
10	QPSK	25	25		21.79				
10	QPSK	50	0		21.72				
10	16QAM	1	0		22.23				
10	16QAM	1	25		22.01		23	1	
10	16QAM	1	49		22.31				
10	16QAM	25	0		20.76				
10	16QAM	25	12		20.63		22	2	
10	16QAM	25	25		20.74				
10	16QAM	50	0		20.69				
10	64QAM	1	0		21.14				
10	64QAM	1	25		20.76		22	2	
10	64QAM	1	49		21.21				
10	64QAM	25	0		19.67				
10	64QAM	25	12		19.61		21	3	
10	64QAM	25	25		19.73				
10	64QAM	50	0		19.69				
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				2307.5	2310	2312.5			
5	QPSK	1	0</						



Band 66									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch / Freq	Power Middle Ch / Freq	Power High Ch / Freq	Tune-up limit (dBm)	MPR (dB)	
Channel				13322	13332	13372			
Frequency (MHz)				1720	1745	1770			
20	QPSK	1	0	22.61	22.67	22.89			
20	QPSK	1	49	22.58	22.65	22.88	24	0	
20	QPSK	1	99	22.73	23.08	23.30			
20	QPSK	50	0	21.57	21.64	21.70			
20	QPSK	50	24	21.61	21.70	21.74	23	1	
20	QPSK	50	50	21.58	21.90	22.08			
20	QPSK	100	0	21.67	21.79	21.97			
20	16QAM	1	0	21.90	21.84	21.71			
20	16QAM	1	49	21.97	22.12	22.03	23	1	
20	16QAM	1	99	22.07	22.08	22.10			
20	16QAM	50	0	20.56	20.81	20.61			
20	16QAM	50	24	20.61	21.00	20.78	22	2	
20	16QAM	50	50	20.58	21.11	20.90			
20	16QAM	100	0	20.60	20.97	20.73			
20	64QAM	1	0	20.78	20.78	20.61			
20	64QAM	1	49	20.66	20.99	20.87	22	2	
20	64QAM	1	99	20.95	21.08	21.10			
20	64QAM	50	0	19.56	19.79	19.62			
20	64QAM	50	24	19.60	19.97	19.76	21	3	
20	64QAM	50	50	19.56	20.12	19.88			
20	64QAM	100	0	19.58	19.93	19.74			
Channel				13202	13232	13257	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				17175	1745	17725			
15	QPSK	1	0	22.54	22.98	22.86	24	0	
15	QPSK	1	37	22.36	22.93	22.77			
15	QPSK	1	74	22.64	22.91	23.14			
15	QPSK	36	0	21.70	21.93	21.86			
15	QPSK	36	20	21.55	21.95	21.90	23	1	
15	QPSK	36	39	21.54	22.02	21.93			
15	QPSK	75	0	21.59	21.91	21.87			
15	16QAM	1	0	22.25	22.27	22.24			
15	16QAM	1	37	21.89	22.13	22.22	23	1	
15	16QAM	1	74	21.89	22.23	22.44			
15	16QAM	36	0	20.64	20.91	20.83			
15	16QAM	36	20	20.52	20.95	20.87	22	2	
15	16QAM	36	39	20.52	21.02	20.91			
15	16QAM	75	0	20.61	20.97	20.88			
15	64QAM	1	0	21.09	21.19	21.04			
15	64QAM	1	37	20.58	20.91	20.91	22	2	
15	64QAM	1	74	20.83	21.21	21.22			
15	64QAM	36	0	19.69	19.92	19.86			
15	64QAM	36	20	19.55	19.93	19.89	21	3	
15	64QAM	36	39	19.55	20.05	19.95			
15	64QAM	75	0	19.56	19.95	19.88			
Channel				13202	13232	13262	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				1715	1745	1775			
10	QPSK	1	0	22.62	22.94	23.06	24	0	
10	QPSK	1	25	22.67	23.10	22.96			
10	QPSK	1	49	23.02	23.02	23.17			
10	QPSK	25	0	21.75	22.00	21.97			
10	QPSK	25	12	21.78	22.10	22.08	23	1	
10	QPSK	25	25	21.77	22.30	22.20			
10	QPSK	50	0	21.77	22.10	22.04			
10	16QAM	1	0	21.69	21.62	21.61			
10	16QAM	1	25	21.98	22.31	22.33	23	1	
10	16QAM	1	49	22.31	22.16	22.31			
10	16QAM	25	0	20.76	21.08	20.87			
10	16QAM	25	12	20.75	21.17	21.07	22	2	
10	16QAM	25	25	20.72	21.32	21.14			
10	16QAM	50	0	20.76	21.15	21.01			
10	64QAM	1	0	20.33	20.58	20.49			
10	64QAM	1	25	20.75	21.19	21.12	22	2	
10	64QAM	1	49	21.21	21.11	21.05			
10	64QAM	25	0	19.75	20.05	19.98			
10	64QAM	25	12	19.78	20.16	20.07	21	3	
10	64QAM	25	25	19.75	20.34	20.22			
10	64QAM	50	0	19.74	20.13	20.01			
Channel				13197	13222	13267	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				17125	1745	17775			
5	QPSK	1	0	22.46	23.06	23.07	24	0	
5	QPSK	1	12	22.77	23.10	23.04			
5	QPSK	1	24	22.67	23.16	23.01			
5	QPSK	12	0	21.83	22.09	22.16			
5	QPSK	12	7	21.79	22.05	22.11	23	1	
5	QPSK	12	13	21.69	22.05	22.09			
5	QPSK	25	0	21.82	22.10	22.10			
5	16QAM	1	0	22.31	22.45	22.40			
5	16QAM	1	12	22.02	22.27	22.36	23	1	
5	16QAM	1	24	22.05	22.47	22.37			
5	16QAM	12	0	20.85	21.18	21.17			
5	16QAM	12	7	20.81	21.13	21.12	22	2	
5	16QAM	12	13	20.69	21.14	21.10			
5	16QAM	25	0	20.82	21.13	21.12			
5	64QAM	1	0	21.12	21.35	21.29			
5	64QAM	1	12	20.90	21.24	21.18	22	2	
5	64QAM	1	24	20.84	21.32	21.28			
5	64QAM	12	0	19.87	20.20	20.19			
5	64QAM	12	7	19.85	20.16	20.12	21	3	
5	64QAM	12	13	19.72	20.12	20.08			
5	64QAM	25	0	19.83	20.14	20.11			
Channel				13197	13222	13267	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				17115	1745	1778.5			
3	QPSK	1	0	22.75	23.12	23.11	24	0	
3	QPSK	1	8	22.76	23.10	23.06			
3	QPSK	1	14	22.70	23.07	23.04			
3	QPSK	8	0	21.82	22.10	22.11			
3	QPSK	8	4	21.81	22.11	22.12	23	1	
3	QPSK	8	7	21.76	22.07	22.09			
3	QPSK	15	0	21.77	22.05	22.06			
3	16QAM	1	0	22.16	22.42	22.45			
3	16QAM	1	8	22.16	22.40	22.43	23	1	
3	16QAM	1	14	22.11	22.38	22.43			
3	16QAM	8	0	20.83	21.13	21.14			
3	16QAM	8	4	20.87	21.16	21.17	22	2	
3	16QAM	8	7	20.81	21.10	21.13			
3	16QAM	15	0	20.80	21.12	21.11			
3	64QAM	1	0	20.95	21.29	21.31			
3	64QAM	1	8	20.95	21.24	21.26	22	2	
3	64QAM	1	14	20.89	21.25	21.20			
3	64QAM	8	0	19.86	20.17	20.13			
3	64QAM	8	4	19.85	20.16	20.18	21	3	
3	64QAM	8	7	19.80	20.14	20.13			
3	64QAM	15	0	19.79	20.11	20.10			
Channel				13197	13222	13267	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)				17107	1745	17723			
1.4	QPSK	1	0	22.59	23.05	23.04	24	0	
1.4	QPSK	1	3	22.74	23.09	23.11			
1.4	QPSK	1	5	22.75	23.08	23.04			
1.4	QPSK	3	0	22.79	23.09	23.07			
1.4	QPSK	3	1	22.79	23.12	23.17			
1.4	QPSK	3	3	22.74	23.11	23.12			
1.4	QPSK	6	0	21.69	21.97	22.02	23	1	
1.4	16QAM	1	0	22.08	22.35	22.38			
1.4	16QAM	1	3	22.14	22.37	22.45			
1.4	16QAM	1	5	22.05	22.33	22.39	23	1	
1.4	16QAM	3	0	21.75	22.02	22.11			
1.4	16QAM	3	1	21.82	22.04	22.17			
1.4	16QAM	3	3	21.75	22.01	22.06	22	2	
1.4	16QAM	6	0	20.79	21.21	21.12			
1.4	64QAM	1	0	20.89	21.21	21.24			
1.4	64QAM	1	3	20.89	21.20	21.23			
1.4	64QAM	1	5	20.87	21.22	21.23	22	2	
1.4	64QAM	3	0	20.84	21.19	21.18			
1.4	64QAM	3	1	20.92	21.22	21.25			
1.4	64QAM	3	3	20.83	21.18	21.16			
1.4	64QAM	6	0	19.74	20.05	20.09	21	3	

Band 71									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch / Freq	Power Middle Ch / Freq	Power High Ch / Freq	Tune-up limit (dBm)	MPR (dB)	
Channel				13322	13332	13372			
Frequency (MHz)				673	683	688			
20	QPSK	1	0	22.01	22.20	22.11			
20	QPSK	1	49	22.43	22.50	22.56	24	0	
20	QPSK	1	99	22.56	22.70	22.65			
20	QPSK	50	0	21.49	21.40	21.34			
20	QPSK	50	24	21.54	21.65	21.63	23	1	
20	QPSK	50	50	21.63	21.52	21.62			
20	QPSK	100	0	21.63	21.64	21.51			
20	16QAM	1	0	21.13	21.08	21.26			
20	16QAM	1	49	21.84	21.88	22.05	23	1	
20	16QAM	1	99	21.76	21.71	22.00			
20	16QAM	50	0	20.36	20.24	20.32			
20	16QAM	50	24	20.68	20.66	20.53	22	2	
20	16QAM	50	50	20.41	20.54	20.56			
20	16QAM	100	0	20.52	20.55	20.44			
20	64QAM	1	0	20.72	20.66	20.50			
20	64QAM	1	49	20.76	20.36	20.48	22	2	
20	64QAM	1	99	20.54	20.49	20.65			
20	64QAM	50	0	19.45	19.3				



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Band 38(only on channel required)

Table with columns: BW (MHz), Modulation, RB Size, RB Offset, Power Low Ch. (Freq), Power Middle Ch. (Freq), Power High Ch. (Freq), Tune-up limit (dBm), MPR (dB). Contains data for various modulation types (QPSK, 16QAM) and power levels (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100) across different channel frequencies.

Band 41 (2.6G Band)

Table with columns: BW (MHz), Modulation, RB Size, RB Offset, Power Low Ch. (Freq), Power Middle Ch. (Freq), Power High Ch. (Freq), Tune-up limit (dBm), MPR (dB). Contains data for various modulation types (QPSK, 16QAM) and power levels (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100) across different channel frequencies.

Band 41 (2.6G Band) HPUE (Limit 27)

Table with columns: BW (MHz), Modulation, RB Size, RB Offset, Power Low Ch. (Freq), Power Middle Ch. (Freq), Power High Ch. (Freq), Tune-up limit (dBm), MPR (dB). Contains data for various modulation types (QPSK, 16QAM) and power levels (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100) across different channel frequencies, with a specific MPR limit of 27 dB.



Reduced Power Mode for P-Sensor On

GSM1900 TX Channel	Baseband Average Power (dBm)			Tune-up Limit (dBm)	Carrier Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1852.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	22.89	23.00	22.76	24.00	13.99	14.00	13.76	15.00
GPRS 1 Tx slot	22.97	22.95	22.70	24.00	13.97	13.95	13.70	15.00
GPRS 3 Tx slots	20.08	21.05	20.84	22.50	14.98	15.05	14.84	16.50
GPRS 3 Tx slots	18.67	18.64	18.76	20.00	14.41	14.38	14.50	15.74
GPRS 4 Tx slots	16.67	16.70	16.85	18.00	13.67	13.70	13.85	15.00
EDGE 1 Tx slot	18.69	18.81	18.55	20.00	9.69	9.81	9.55	11.00
EDGE 3 Tx slots	18.52	18.75	18.61	18.00	10.52	10.75	10.61	12.00
EDGE 3 Tx slots	14.47	14.41	14.36	15.50	10.21	10.15	10.10	11.24
EDGE 4 Tx slots	13.54	13.44	13.41	14.50	10.54	10.44	10.41	11.50

Band TX Channel	WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)	
	5262	5400	5538		1312	1413	1513		4152	4182	4233		
RX Channel	5662	5600	5638	1537	1638	1738	4387	4407	4458				
Frequency (MHz)	1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6				
3GPP Rel 99	AMR 12.2Kbps	14.30	14.34	14.26	15.50	13.44	13.36	13.50	15.50	21.87	21.86	22.08	23.00
3GPP Rel 99	RMC 12.2Kbps	14.31	14.45	14.42	15.50	14.05	13.88	14.09	15.50	21.88	21.89	22.15	23.00
3GPP Rel 6	HSDPA Subtest-1	13.18	13.14	13.07	14.50	12.82	12.79	12.98	14.50	20.95	20.93	21.12	22.00
3GPP Rel 6	HSDPA Subtest-2	13.16	13.16	13.12	14.50	12.85	12.88	12.98	14.50	20.94	20.98	21.15	22.00
3GPP Rel 6	HSDPA Subtest-3	12.31	12.65	12.67	14.00	12.37	12.32	12.58	14.00	20.48	20.44	20.68	21.50
3GPP Rel 6	HSDPA Subtest-4	12.64	12.67	12.62	14.00	12.28	12.38	12.01	14.00	20.42	20.47	20.25	21.50
3GPP Rel 6	DC-HSDPA Subtest-1	13.02	13.07	12.90	14.50	12.74	12.79	12.89	14.50	20.98	20.79	20.99	22.00
3GPP Rel 6	DC-HSDPA Subtest-2	13.09	12.97	13.09	14.50	12.79	12.83	12.88	14.50	20.85	20.79	21.12	22.00
3GPP Rel 6	DC-HSDPA Subtest-3	12.18	12.57	12.53	14.00	12.37	12.20	12.54	14.00	20.43	20.28	20.62	21.50
3GPP Rel 6	DC-HSDPA Subtest-4	12.63	12.63	12.52	14.00	12.06	12.31	12.00	14.00	20.22	20.33	20.04	21.50
3GPP Rel 6	HSUPA Subtest-1	13.16	13.17	13.12	14.50	12.79	12.86	12.64	14.50	20.89	20.89	21.03	22.00
3GPP Rel 6	HSUPA Subtest-2	11.15	11.16	11.15	12.50	10.67	10.68	10.69	12.50	18.83	18.88	18.99	20.00
3GPP Rel 6	HSUPA Subtest-3	12.17	12.14	12.09	13.50	11.76	11.79	11.79	13.50	19.87	19.87	20.06	21.00
3GPP Rel 6	HSUPA Subtest-4	11.18	11.13	11.08	12.50	10.78	10.80	10.69	12.50	18.85	18.86	19.04	20.00
3GPP Rel 6	HSUPA Subtest-5	13.20	13.20	13.10	14.50	12.80	12.80	12.90	14.50	20.88	20.86	21.08	22.00

Band TX Channel	CDMA BC1			Tune-up Limit (dBm)
	26	300	1175	
Frequency (MHz)	1815.25	1880	1908.75	
RC1 S055	16.39	16.42	16.33	17.00
RC1 S065	18.21	18.31	18.17	17.00
RC1 S036 (FASCH)	16.31	16.39	16.22	17.00
RC1 S032 (FASCH)	16.29	16.28	16.19	17.00
RTAP 163.6Kbps	15.59	15.68	15.58	17.00
RETAP 4096Bps	15.61	15.61	15.58	17.00



Band 2 (1800MHz Band)									
Part 24E									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Middle Ch. Freq.	Power High Ch. Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel				1870	1880	1900			
20	QPSK	1	0	14.97	14.85	14.89			
20	QPSK	1	49	14.66	14.70	14.59			
20	QPSK	1	99	14.43	14.53	14.41			
20	QPSK	50	0	14.86	14.86	14.89			
20	QPSK	50	24	14.84	14.84	14.89			
20	QPSK	50	50	14.63	14.76	14.74			
20	QPSK	100	0	14.77	14.77	14.82			
20	16QAM	1	0	15.54	15.36	15.36			
20	16QAM	1	49	15.27	15.22	15.15			
20	16QAM	1	99	14.90	14.97	14.92			
20	16QAM	50	0	14.99	14.91	14.92			
20	16QAM	50	24	14.86	14.85	14.91			
20	16QAM	50	50	14.63	14.72	14.75			
20	16QAM	100	0	14.79	14.77	14.82			
20	64QAM	1	0	15.18	15.11	14.89			
20	64QAM	1	49	15.00	14.93	14.91			
20	64QAM	1	99	14.70	14.74	14.68			
20	64QAM	50	0	14.94	14.93	14.89			
20	64QAM	50	24	14.83	14.83	14.89			
20	64QAM	50	50	14.62	14.75	14.72			
20	64QAM	100	0	14.82	14.78	14.80			
Channel				1875	1890	1915	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
15	QPSK	1	0	15.04	15.10	15.03			
15	QPSK	1	37	14.42	14.51	14.49			
15	QPSK	1	74	14.96	14.97	15.02			
15	QPSK	36	0	14.90	14.87	14.87			
15	QPSK	36	20	14.81	14.84	14.88			
15	QPSK	36	39	14.78	14.83	14.87			
15	QPSK	75	0	14.81	14.76	14.87			
15	16QAM	1	0	15.54	15.51	15.55			
15	16QAM	1	37	15.40	15.34	15.32			
15	16QAM	1	74	15.37	15.40	15.35			
15	16QAM	36	0	14.91	14.89	14.88			
15	16QAM	36	20	14.86	14.81	14.88			
15	16QAM	36	39	14.77	14.82	14.84			
15	16QAM	75	0	14.80	14.79	14.87			
15	64QAM	1	0	15.28	15.26	15.29			
15	64QAM	1	37	14.98	14.96	14.89			
15	64QAM	1	74	15.05	15.27	15.05			
15	64QAM	36	0	14.92	14.87	14.89			
15	64QAM	36	20	14.84	14.80	14.87			
15	64QAM	36	39	14.79	14.81	14.80			
15	64QAM	75	0	14.79	14.79	14.89			
Channel				1885	1890	1915	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
10	QPSK	1	0	15.17	15.07	15.02			
10	QPSK	1	25	14.89	14.86	14.93			
10	QPSK	1	49	14.97	14.86	15.02			
10	QPSK	25	0	15.11	14.94	15.02			
10	QPSK	25	12	15.07	14.96	15.03			
10	QPSK	25	25	15.04	14.91	15.05			
10	QPSK	50	0	15.06	14.96	15.03			
10	16QAM	1	0	15.52	15.50	15.45			
10	16QAM	1	25	15.35	15.38	15.39			
10	16QAM	1	49	15.43	15.37	15.41			
10	16QAM	25	0	15.02	14.93	15.02			
10	16QAM	25	12	15.07	14.95	15.05			
10	16QAM	25	25	15.03	14.88	15.01			
10	16QAM	50	0	15.07	14.93	14.98			
10	64QAM	1	0	15.29	15.34	15.20			
10	64QAM	1	25	15.20	15.21	15.21			
10	64QAM	1	49	15.29	15.28	15.21			
10	64QAM	25	0	15.08	14.91	15.03			
10	64QAM	25	12	15.09	14.95	15.02			
10	64QAM	25	25	15.01	14.92	15.07			
10	64QAM	50	0	15.07	14.95	14.96			
Channel				1895	1890	1915	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
5	QPSK	1	0	15.15	15.06	15.14			
5	QPSK	1	12	14.87	14.89	14.84			
5	QPSK	1	24	14.97	14.89	14.96			
5	QPSK	12	0	15.07	15.06	15.06			
5	QPSK	12	7	15.11	15.02	15.05			
5	QPSK	12	13	15.07	14.93	15.03			
5	QPSK	25	0	15.08	15.00	15.08			
5	16QAM	1	0	15.45	15.42	15.41			
5	16QAM	1	12	15.35	15.38	15.40			
5	16QAM	1	24	15.33	15.22	15.31			
5	16QAM	12	0	15.08	15.10	15.09			
5	16QAM	12	7	15.16	14.99	15.07			
5	16QAM	12	13	15.06	14.99	15.02			
5	16QAM	25	0	15.07	14.98	15.01			
5	64QAM	1	0	15.33	15.26	15.32			
5	64QAM	1	12	15.20	15.11	15.15			
5	64QAM	1	24	15.27	15.15	15.13			
5	64QAM	12	0	15.09	15.03	15.08			
5	64QAM	12	7	15.10	14.99	15.05			
5	64QAM	12	13	15.05	14.96	15.04			
5	64QAM	25	0	15.06	14.96	15.07			
Channel				1895	1890	1915	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
3	QPSK	1	0	15.02	14.96	15.04			
3	QPSK	1	8	14.90	14.92	14.96			
3	QPSK	1	14	14.86	14.83	14.89			
3	QPSK	8	0	14.97	14.94	15.00			
3	QPSK	8	4	15.03	14.96	15.00			
3	QPSK	8	7	14.93	14.89	14.94			
3	QPSK	15	0	14.97	14.94	14.97			
3	16QAM	1	0	15.26	15.29	15.28			
3	16QAM	1	8	15.30	15.21	15.28			
3	16QAM	1	14	15.06	15.15	15.18			
3	16QAM	8	0	15.05	15.04	15.07			
3	16QAM	8	4	15.09	15.04	15.06			
3	16QAM	8	7	15.01	15.01	15.02			
3	16QAM	15	0	15.01	14.95	14.99			
3	64QAM	1	0	15.07	15.18	15.23			
3	64QAM	1	8	15.15	15.14	15.11			
3	64QAM	1	14	15.01	14.97	15.11			
3	64QAM	8	0	15.01	15.00	15.00			
3	64QAM	8	4	15.05	14.98	15.02			
3	64QAM	8	7	14.99	14.98	14.98			
3	64QAM	15	0	14.98	14.90	15.00			
Channel				1897	1890	1915	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
1.4	QPSK	1	0	14.94	14.92	14.95			
1.4	QPSK	1	3	14.99	14.97	15.02			
1.4	QPSK	1	5	14.95	14.85	14.93			
1.4	QPSK	3	0	14.95	14.89	14.92			
1.4	QPSK	3	1	15.00	15.01	15.00			
1.4	QPSK	3	3	14.93	14.87	14.93			
1.4	QPSK	3	5	14.90	14.88	14.95			
1.4	16QAM	1	0	15.37	15.29	15.22			
1.4	16QAM	1	3	15.23	15.24	15.26			
1.4	16QAM	1	5	15.22	15.21	15.23			
1.4	16QAM	3	0	14.98	14.98	15.01			
1.4	16QAM	3	1	15.04	15.04	15.05			
1.4	16QAM	3	3	15.00	14.90	14.96			
1.4	16QAM	6	0	14.94	14.89	14.90			
1.4	64QAM	1	0	15.03	14.99	15.17			
1.4	64QAM	1	3	15.02	15.05	15.27			
1.4	64QAM	1	5	15.08	15.10	15.09			
1.4	64QAM	3	0	15.01	15.05	15.08			
1.4	64QAM	3	1	15.08	15.12	15.11			
1.4	64QAM	3	3	15.05	15.00	15.02			
1.4	64QAM	6	0	14.96	14.97	14.96			

Band 4 (AWS Band)									
Part 27L (only one channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Middle Ch. Freq.	Power High Ch. Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel				2050	2075	2030			
20	QPSK	1	0	15.30	15.37	15.41			
20	QPSK	1	49	15.20	15.35				



Band 26 (1900MHz Band) Part 2AE											
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Mode Ch. Freq.	Power High Ch. Freq.	Turn-up limit (dBm)	MPR (dB)			
Channel				20140	20340	20590					
Frequency (MHz)				1893	1880	1905					
20	QPSK	1	0	14.37	14.36	14.83					
20	QPSK	1	49	14.36	14.33	14.35	16	0			
20	QPSK	1	99	14.35	14.42	14.33					
20	QPSK	50	0	14.47	14.56	14.57					
20	QPSK	50	24	14.47	14.37	14.45	16	0			
20	QPSK	50	50	14.41	14.30	14.39					
20	QPSK	100	0	14.40	14.33	14.51					
20	16QAM	1	0	14.81	14.69	14.81					
20	16QAM	1	49	14.81	14.70	14.79	16	0			
20	16QAM	1	99	14.28	14.41	14.24					
20	16QAM	50	0	14.47	14.35	14.47					
20	16QAM	50	24	14.46	14.38	14.48	16	0			
20	16QAM	50	50	14.42	14.31	14.43					
20	16QAM	100	0	14.41	14.31	14.30					
20	64QAM	1	0	14.71	14.53	14.60					
20	64QAM	1	49	14.54	14.38	14.50	16	0			
20	64QAM	1	99	14.22	14.15	14.38					
20	64QAM	50	0	14.50	14.37	14.48					
20	64QAM	50	24	14.48	14.38	14.46	16	0			
20	64QAM	50	50	14.37	14.29	14.42					
20	64QAM	100	0	14.41	14.32	14.44					
Channel				20115	20340	20515					
Frequency (MHz)				19275	1903	19275					
15	QPSK	1	0	14.30	14.28	14.27					
15	QPSK	1	37	14.27	14.23	14.23	16	0			
15	QPSK	1	74	14.43	14.41	14.28					
15	QPSK	36	0	14.52	14.44	14.53					
15	QPSK	36	20	14.54	14.44	14.52	16	0			
15	QPSK	36	39	14.58	14.50	14.58					
15	QPSK	75	0	14.55	14.44	14.59					
15	16QAM	1	0	14.77	14.73	14.73					
15	16QAM	1	37	14.79	14.76	14.75	16	0			
15	16QAM	1	74	14.75	14.76	14.25					
15	16QAM	36	0	14.55	14.41	14.50					
15	16QAM	36	20	14.56	14.43	14.52	16	0			
15	16QAM	36	39	14.58	14.50	14.59					
15	16QAM	75	0	14.51	14.43	14.56					
15	64QAM	1	0	14.70	14.62	14.69					
15	64QAM	1	37	14.68	14.46	14.56	16	0			
15	64QAM	1	74	14.60	14.53	14.35					
15	64QAM	36	0	14.53	14.43	14.57					
15	64QAM	36	20	14.54	14.41	14.53	16	0			
15	64QAM	36	39	14.58	14.49	14.65					
15	64QAM	75	0	14.50	14.43	14.61					
Channel				20290	20340	20540					
Frequency (MHz)				1855	1880	1910					
10	QPSK	1	0	14.40	14.41	14.46					
10	QPSK	1	25	14.34	14.42	14.47	16	0			
10	QPSK	1	49	14.57	14.59	14.44					
10	QPSK	25	0	14.46	14.56	14.55					
10	QPSK	25	12	14.50	14.57	14.53	16	0			
10	QPSK	25	25	14.47	14.54	14.60					
10	QPSK	50	0	14.49	14.58	14.59					
10	16QAM	1	0	14.74	14.83	14.81					
10	16QAM	1	25	14.83	14.65	14.62	16	0			
10	16QAM	1	49	14.75	14.83	14.53					
10	16QAM	25	0	14.47	14.56	14.53					
10	16QAM	25	12	14.47	14.55	14.53	16	0			
10	16QAM	25	25	14.45	14.56	14.59					
10	16QAM	50	0	14.48	14.58	14.59					
10	64QAM	1	0	14.59	14.62	14.65					
10	64QAM	1	25	14.55	14.37	14.42	16	0			
10	64QAM	1	49	14.61	14.55	14.25					
10	64QAM	25	0	14.43	14.57	14.53					
10	64QAM	25	12	14.47	14.60	14.56	16	0			
10	64QAM	25	25	14.47	14.58	14.64					
10	64QAM	50	0	14.48	14.56	14.59					
Channel				20695	20340	20695					
Frequency (MHz)				1892.5	1880	1912.5					
5	QPSK	1	0	14.30	14.41	14.49					
5	QPSK	1	12	14.35	14.49	14.52	16	0			
5	QPSK	1	24	14.38	14.45	14.44					
5	QPSK	12	0	14.48	14.57	14.57					
5	QPSK	12	7	14.45	14.56	14.56	16	0			
5	QPSK	12	13	14.43	14.51	14.51					
5	QPSK	25	0	14.48	14.55	14.54					
5	16QAM	1	0	14.63	14.75	14.77					
5	16QAM	1	12	14.47	14.57	14.56	16	0			
5	16QAM	1	24	14.54	14.60	14.47					
5	16QAM	12	0	14.52	14.61	14.59					
5	16QAM	12	7	14.48	14.53	14.57	16	0			
5	16QAM	12	13	14.44	14.54	14.54					
5	16QAM	25	0	14.47	14.54	14.57					
5	16QAM	25	1	14.65	14.79	14.78					
5	64QAM	1	12	14.53	14.57	14.65	16	0			
5	64QAM	1	24	14.55	14.63	14.57					
5	64QAM	12	0	14.51	14.60	14.63					
5	64QAM	12	7	14.47	14.56	14.60	16	0			
5	64QAM	12	13	14.45	14.57	14.56					
5	64QAM	25	0	14.47	14.58	14.57					
Channel				20995	20340	20995					
Frequency (MHz)				1891.5	1880	1913.5					
3	QPSK	1	0	14.40	14.46	14.47					
3	QPSK	1	8	14.39	14.49	14.48	16	0			
3	QPSK	1	14	14.34	14.44	14.48					
3	QPSK	8	0	14.44	14.52	14.53					
3	QPSK	8	4	14.44	14.55	14.57	16	0			
3	QPSK	8	7	14.40	14.51	14.54					
3	QPSK	15	0	14.40	14.52	14.53					
3	16QAM	1	0	14.42	14.70	14.68	16	0			
3	16QAM	1	8	14.54	14.69	14.64					
3	16QAM	1	14	14.53	14.58	14.62					
3	16QAM	8	0	14.47	14.56	14.55					
3	16QAM	8	4	14.48	14.59	14.59	16	0			
3	16QAM	8	7	14.44	14.54	14.54					
3	16QAM	15	0	14.43	14.54	14.57					
3	64QAM	1	0	14.62	14.59	14.71					
3	64QAM	1	8	14.56	14.65	14.68	16	0			
3	64QAM	1	14	14.57	14.59	14.62					
3	64QAM	8	0	14.48	14.58	14.58					
3	64QAM	8	4	14.48	14.57	14.57	16	0			
3	64QAM	8	7	14.40	14.51	14.56					
3	64QAM	15	0	14.44	14.54	14.53					
Channel				20447	20340	20583					
Frequency (MHz)				1850.7	1880	1914.3					
1.4	QPSK	1	0	14.35	14.50	14.45					
1.4	QPSK	1	3	14.38	14.52	14.48	16	0			
1.4	QPSK	1	5	14.37	14.44	14.44					
1.4	QPSK	3	0	14.37	14.46	14.47					
1.4	QPSK	3	1	14.42	14.53	14.50	16	0			
1.4	QPSK	3	3	14.36	14.49	14.45					
1.4	QPSK	6	0	14.38	14.42	14.45	16	0			
1.4	16QAM	1	0	14.68	14.72	14.77					
1.4	16QAM	1	3	14.49	14.52	14.65					
1.4	16QAM	1	5	14.39	14.49	14.61	16	0			
1.4	16QAM	3	0	14.40	14.54	14.49					
1.4	16QAM	3	1	14.43	14.59	14.51					
1.4	16QAM	3	3	14.41	14.51	14.45					
1.4	16QAM	6	0	14.40	14.53	14.55	16	0			
1.4	64QAM	1	0	14.56	14.71	14.65					
1.4	64QAM	1	3								



Band 30									
EW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Middle Ch. Freq.	Power High Ch. Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel									
27710									
Frequency (MHz)									
2310									
10	QPSK	1	0	20.25					
10	QPSK	1	25	19.83					
10	QPSK	1	49	20.17					
10	QPSK	25	0	19.92					
10	QPSK	25	12	19.96					
10	QPSK	25	25	20.10					
10	QPSK	50	0	20.01					
10	16QAM	1	0	20.13					
10	16QAM	1	25	20.19					
10	16QAM	1	49	20.13					
10	16QAM	25	0	19.93					
10	16QAM	25	12	19.95					
10	16QAM	25	25	20.04					
10	16QAM	50	0	19.90					
10	64QAM	1	0	20.19					
10	64QAM	1	25	20.07					
10	64QAM	1	49	20.17					
10	64QAM	25	0	19.92					
10	64QAM	25	12	19.91					
10	64QAM	25	25	20.05					
10	64QAM	50	0	19.92					
Channel									
27685 27710 27735									
Frequency (MHz)									
2377.5 2310 2312.5									
5	QPSK	1	0	20.07	19.96	19.89			
5	QPSK	1	12	19.94	19.90	19.93			
5	QPSK	1	24	19.85	19.95	19.96			
5	QPSK	12	0	20.02	19.92	19.95			
5	QPSK	12	7	19.89	19.93	20.03			
5	QPSK	12	13	19.90	19.89	20.00			
5	QPSK	25	0	19.87	19.95	20.03			
5	16QAM	1	0	20.16	20.25	20.19			
5	16QAM	1	12	20.14	20.20	20.20			
5	16QAM	1	24	20.11	20.20	20.18			
5	16QAM	12	0	20.07	19.96	19.94			
5	16QAM	12	7	19.94	19.93	20.06			
5	16QAM	12	13	19.89	19.90	20.03			
5	16QAM	25	0	19.91	19.93	20.05			
5	64QAM	1	0	20.20	20.12	20.17			
5	64QAM	1	12	19.97	20.07	20.18			
5	64QAM	1	24	20.05	20.17	20.16			
5	64QAM	12	0	20.07	19.95	19.94			
5	64QAM	12	7	19.93	19.92	20.03			
5	64QAM	12	13	19.92	19.89	20.02			
5	64QAM	25	0	19.88	19.92	20.03			

Band 66									
EW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Middle Ch. Freq.	Power High Ch. Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel									
132072									
Frequency (MHz)									
1720 1745 1770									
20	QPSK	1	0	15.26	15.68	15.70			
20	QPSK	1	49	15.31	15.60	15.71			
20	QPSK	1	99	15.32	15.73	15.96			
20	QPSK	50	0	15.15	15.67	15.63			
20	QPSK	50	24	15.16	15.59	15.76			
20	QPSK	50	50	15.28	15.62	15.81			
20	QPSK	100	0	15.24	15.66	15.77			
20	16QAM	1	0	15.21	15.31	15.78			
20	16QAM	1	49	15.23	15.47	15.85			
20	16QAM	1	99	15.51	15.59	15.91			
20	16QAM	50	0	15.85	15.05	15.60			
20	16QAM	50	24	15.88	15.16	15.77			
20	16QAM	50	50	15.88	15.26	15.83			
20	16QAM	100	0	15.85	15.14	15.69			
20	64QAM	1	0	15.03	15.14	15.65			
20	64QAM	1	49	15.17	15.24	15.85			
20	64QAM	1	99	15.41	15.93	15.77			
20	64QAM	50	0	15.79	15.01	15.60			
20	64QAM	50	24	15.84	15.16	15.72			
20	64QAM	50	50	15.85	15.25	15.80			
20	64QAM	100	0	15.88	15.14	15.70			
Channel									
132047 132322 132597									
Frequency (MHz)									
1712.5 1745 1772.5									
15	QPSK	1	0	15.20	15.47	15.50			
15	QPSK	1	37	15.17	15.91	15.66			
15	QPSK	1	74	15.19	15.50	15.90			
15	QPSK	36	0	15.16	15.18	15.84			
15	QPSK	36	20	15.84	15.19	15.84			
15	QPSK	36	39	15.87	15.22	15.86			
15	QPSK	75	0	15.85	15.18	15.83			
15	16QAM	1	0	15.61	15.67	15.89			
15	16QAM	1	37	15.21	15.65	15.88			
15	16QAM	1	74	15.40	15.89	15.87			
15	16QAM	36	0	15.94	15.18	15.82			
15	16QAM	36	20	15.85	15.19	15.85			
15	16QAM	36	39	15.85	15.20	15.85			
15	16QAM	75	0	15.87	15.18	15.83			
15	64QAM	1	0	15.42	15.62	15.85			
15	64QAM	1	37	15.17	15.22	15.95			
15	64QAM	1	74	15.20	15.67	15.90			
15	64QAM	36	0	15.16	15.20	15.84			
15	64QAM	36	20	15.22	15.20	15.83			
15	64QAM	36	39	15.26	15.23	15.85			
15	64QAM	75	0	15.28	15.16	15.84			
Channel									
132022 132322 132622									
Frequency (MHz)									
1715 1745 1775									
10	QPSK	1	0	15.20	15.30	15.70			
10	QPSK	1	25	15.23	15.27	15.90			
10	QPSK	1	49	15.36	15.84	15.72			
10	QPSK	25	0	15.05	15.31	15.71			
10	QPSK	25	12	15.08	15.38	15.80			
10	QPSK	25	25	15.10	15.34	15.85			
10	QPSK	50	0	15.06	15.37	15.86			
10	16QAM	1	0	15.24	15.63	15.61			
10	16QAM	1	25	15.32	15.61	15.73			
10	16QAM	1	49	15.21	15.79	15.66			
10	16QAM	25	0	15.06	15.31	15.64			
10	16QAM	25	12	15.09	15.39	15.70			
10	16QAM	25	25	15.05	15.53	15.78			
10	16QAM	50	0	15.08	15.36	15.68			
10	64QAM	1	0	15.42	15.62	15.85			
10	64QAM	1	25	15.27	15.26	15.85			
10	64QAM	1	49	15.20	15.42	15.90			
10	64QAM	25	0	15.26	15.20	15.84			
10	64QAM	25	12	15.22	15.20	15.83			
10	64QAM	25	25	15.26	15.21	15.85			
10	64QAM	50	0	15.30	15.16	15.84			
Channel									
131997 132322 132647									
Frequency (MHz)									
1712.5 1745 1777.5									
5	QPSK	1	0	15.10	15.32	15.86			
5	QPSK	1	12	15.19	15.25	15.80			
5	QPSK	1	24	15.25	15.37	15.89			
5	QPSK	12	0	15.11	15.39	15.77			
5	QPSK	12	7	15.07	15.33	15.73			
5	QPSK	12	13	15.07	15.31	15.71			
5	QPSK	25	0	15.10	15.37	15.74			
5	16QAM	1	0	15.49	15.72	15.83			
5	16QAM	1	12	15.29	15.54	15.65			
5	16QAM	1	24	15.27	15.66	15.65			
5	16QAM	12	0	15.15	15.40	15.81			
5	16QAM	12	7	15.11	15.34	15.72			
5	16QAM	12	13	15.22	15.33	15.72			
5	16QAM	25	0	15.13	15.36	15.74			
5	64QAM	1	0	15.37	15.62	15.65			
5	64QAM	1	12	15.21	15.47	15.81			
5	64QAM	1	24	15.17	15.61	15.86			
5	64QAM	12	0	15.16	15.40	15.82			
5	64QAM	12	7	15.10	15.35	15.75			
5	64QAM	12	13	15.38	15.33	15.72			
5	64QAM	25	0	15.10	15.35	15.73			
Channel									
131997 132322 133007									
Frequency (MHz)									
1711.5 1745 1778.5									
3	QPSK	1	0	15.14	15.21	15.82			
3	QPSK	1	8	15.28	15.26	15.95			
3	QPSK	1	14	15.19	15.23	15.93			
3	QPSK	8	0	15.64	15.34	15.92			
3	QPSK	8	4	15.60	15.34	15.93			
3	QPSK	8	7	15.55	15.30	15.88			



Band 38(only on channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. (Freq)	Power Middle Ch. (Freq)	Power High Ch. (Freq)	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)				37850	38000	38150			
20	QPSK	1	0	19.03	18.79	18.83	20	0	
20	QPSK	1	49	19.26	19.06	19.09			
20	QPSK	1	99	19.09	19.08	19.20			
20	QPSK	50	0	19.09	18.93	19.01			
20	QPSK	50	24	19.29	19.04	19.04			
20	QPSK	50	50	19.29	19.06	19.18			
20	QPSK	100	0	19.04	19.03	19.12			
20	16QAM	1	0	18.92	18.90	19.06			
20	16QAM	1	49	19.11	19.18	19.01			
20	16QAM	1	99	19.22	19.10	18.92			
20	16QAM	50	0	18.96	18.99	18.96			
20	16QAM	50	24	19.07	19.05	18.96			
20	16QAM	50	50	19.10	19.00	19.26			
20	16QAM	100	0	19.22	19.05	19.16			
20	64QAM	1	0	18.63	18.39	18.67			
20	64QAM	1	49	18.79	18.97	18.75			
20	64QAM	1	99	18.74	18.53	18.28			
20	64QAM	50	0	19.03	18.80	19.11			
20	64QAM	50	24	19.26	18.94	19.14			
20	64QAM	50	50	19.24	18.93	18.89			
20	64QAM	100	0	19.20	18.86	18.93			
Channel									
Frequency (MHz)				37825	38000	38175			
15	QPSK	1	0	18.91	18.87	18.92	20	0	
15	QPSK	1	37	18.87	18.72	18.74			
15	QPSK	1	74	19.22	19.07	19.15			
15	QPSK	36	0	18.98	19.02	19.02			
15	QPSK	36	20	19.28	19.09	19.11			
15	QPSK	36	39	19.15	19.09	19.20			
15	QPSK	75	0	19.27	19.01	19.14			
15	16QAM	1	0	19.07	18.93	18.96			
15	16QAM	1	37	19.18	19.01	18.95			
15	16QAM	1	74	19.10	18.98	18.93			
15	16QAM	36	0	18.92	18.78	18.88			
15	16QAM	36	20	19.08	18.86	18.97			
15	16QAM	36	39	19.20	18.95	19.18			
15	16QAM	75	0	19.28	19.05	19.16			
15	64QAM	1	0	18.70	18.54	18.51			
15	64QAM	1	37	19.03	18.84	19.00			
15	64QAM	1	74	18.96	18.63	18.93			
15	64QAM	36	0	18.97	18.78	19.01			
15	64QAM	36	20	19.14	18.87	19.11			
15	64QAM	36	39	19.10	18.85	19.11			
15	64QAM	75	0	19.27	19.02	19.17			
Channel									
Frequency (MHz)				37800	38000	38200			
10	QPSK	1	0	19.23	19.03	19.26	20	0	
10	QPSK	1	25	19.19	18.99	18.97			
10	QPSK	1	49	19.40	19.12	19.20			
10	QPSK	25	0	19.15	19.16	19.11			
10	QPSK	25	12	19.30	19.02	19.09			
10	QPSK	25	25	19.41	19.17	19.32			
10	QPSK	50	0	19.18	19.09	19.27			
10	16QAM	1	0	19.31	19.16	19.32			
10	16QAM	1	25	19.29	19.01	19.08			
10	16QAM	1	49	19.28	19.23	19.26			
10	16QAM	25	0	19.27	19.19	19.08			
10	16QAM	25	12	19.12	18.94	19.22			
10	16QAM	25	25	19.36	19.09	19.26			
10	16QAM	50	0	19.30	18.94	19.20			
10	64QAM	1	0	19.07	18.68	18.95			
10	64QAM	1	25	18.71	18.94	18.71			
10	64QAM	1	49	18.98	18.76	18.79			
10	64QAM	25	0	19.09	18.91	19.31			
10	64QAM	25	12	19.24	19.18	19.24			
10	64QAM	25	25	19.03	19.03	19.21			
10	64QAM	50	0	19.07	18.91	19.08			
Channel									
Frequency (MHz)				37775	38000	38225			
5	QPSK	1	0	19.18	18.94	19.25	20	0	
5	QPSK	1	12	19.05	18.76	19.05			
5	QPSK	1	24	19.08	19.02	18.99			
5	QPSK	12	0	19.31	19.16	19.09			
5	QPSK	12	7	19.21	19.11	19.22			
5	QPSK	12	13	19.29	19.04	19.13			
5	QPSK	25	0	19.25	19.08	19.14			
5	16QAM	1	0	19.23	19.14	19.24			
5	16QAM	1	12	19.14	18.97	19.17			
5	16QAM	1	24	19.21	18.96	19.14			
5	16QAM	12	0	19.20	19.08	19.19			
5	16QAM	12	7	19.28	18.90	19.21			
5	16QAM	12	13	19.30	18.93	19.23			
5	16QAM	25	0	19.19	19.10	19.09			
5	64QAM	1	0	19.11	18.66	18.68			
5	64QAM	1	12	18.85	18.90	18.79			
5	64QAM	1	24	18.98	18.71	18.80			
5	64QAM	12	0	19.32	19.21	19.12			
5	64QAM	12	7	19.34	19.05	19.28			
5	64QAM	12	13	19.12	19.07	19.16			
5	64QAM	25	0	19.41	18.89	19.31			

Band 41 (2.6G Band)										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. (Freq)	Power Middle Ch. (Freq)	Power High Ch. (Freq)	Tune-up limit (dBm)	MPR (dB)		
Channel										
Frequency (MHz)				39750	40185	40620	41055	41490		
20	QPSK	1	0	19.39	19.68	19.31	19.25	19.52	21	0
20	QPSK	1	49	19.58	19.73	19.50	19.59	19.53		
20	QPSK	1	99	19.31	19.46	19.25	19.22	19.51		
20	QPSK	50	0	19.42	19.68	19.26	19.40	19.63		
20	QPSK	50	24	19.58	19.80	19.55	19.60	19.85	21	0
20	QPSK	50	50	19.37	19.53	19.34	19.39	19.56		
20	QPSK	100	0	19.26	19.54	19.33	19.40	19.59		
20	16QAM	1	0	19.16	19.39	19.33	19.52	19.45		
20	16QAM	1	49	19.32	19.33	19.36	19.34	19.65	21	0
20	16QAM	1	99	19.01	19.13	19.23	19.03	19.42		
20	16QAM	50	0	19.47	19.74	19.25	19.50	19.64		
20	16QAM	50	24	19.49	19.74	19.41	19.67	19.71	21	0
20	16QAM	50	50	19.35	19.60	19.37	19.46	19.60		
20	16QAM	100	0	19.29	19.55	19.30	19.32	19.61		
20	64QAM	1	0	19.43	19.15	19.59	19.68	19.16		
20	64QAM	1	49	19.16	19.33	19.04	19.09	19.36	21	0
20	64QAM	1	99	19.26	19.32	19.15	19.40	19.29		
20	64QAM	50	0	19.40	19.67	19.20	19.33	19.62		
20	64QAM	50	24	19.47	19.67	19.36	19.37	19.64	21	0
20	64QAM	50	50	19.28	19.46	19.30	19.35	19.56		
20	64QAM	100	0	19.33	19.59	19.37	19.37	19.62		
Channel										
Frequency (MHz)				39725	40173	40620	41068	41515		
15	QPSK	1	0	19.20	19.39	19.20	19.30	19.58	21	0
15	QPSK	1	37	19.35	19.14	19.50	19.62	19.38		
15	QPSK	1	74	19.28	19.07	19.54	19.38	19.59		
15	QPSK	36	0	19.48	19.76	19.32	19.32	19.63	21	0
15	QPSK	36	20	19.54	19.75	19.48	19.53	19.60		
15	QPSK	36	39	19.57	19.80	19.55	19.60	19.59		
15	QPSK	75	0	19.45	19.72	19.36	19.35	19.63		
15	16QAM	1	0	19.08	19.15	19.58	19.14	19.61	21	0
15	16QAM	1	37	19.04	19.26	19.47	19.07	19.44		
15	16QAM	1	74	19.30	19.39	19.18	19.25	19.50		
15	16QAM	36	0	19.44	19.69	19.20	19.28	19.55		
15	16QAM	36	20	19.53	19.69	19.39	19.48	19.64	21	0
15	16QAM	36	39	19.37	19.68	19.48	19.43	19.62		
15	16QAM	75	0	19.45	19.74	19.40	19.54	19.64		
15	64QAM	1	0	19.36	19.18	19.53	19.28	19.26	21	0
15	64QAM	1	37	19.42	19.16	19.12	19.33	19.01		
15	64QAM	1	74	19.04	19.20	19.08	19.07	19.21		
15	64QAM	36	0							



Reduced Power Mode for Hotspot On

GSM1900 TX Channel	Baseband Average Power (dBm)			Tune-up Limit (dBm)	Carrier Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	21.42	21.43	21.19	22.50	12.42	12.43	12.19	13.50
GPRS 1 Tx slot	21.40	21.38	21.13	22.50	12.40	12.38	12.13	13.50
GPRS 2 Tx slot	19.71	20.15	19.77	21.00	13.71	14.15	13.77	15.00
GPRS 3 Tx slot	17.40	17.31	17.49	18.50	13.14	13.05	13.23	14.24
GPRS 4 Tx slot	15.45	15.43	15.38	16.50	12.45	12.43	12.38	13.50
EDGE 1 Tx slot	17.12	17.24	16.98	18.50	9.12	9.24	7.98	9.50
EDGE 2 Tx slot	15.25	15.48	15.34	16.50	9.25	9.48	9.34	10.50
EDGE 3 Tx slot	13.20	13.11	13.09	14.00	8.94	8.85	8.83	9.74
EDGE 4 Tx slot	11.87	11.77	11.74	13.00	8.87	8.77	8.74	10.00

Band TX Channel	WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)	
	5262	5400	5538		1312	1413	1513		4152	4182	4233		
RX Channel	5662	5600	5638		1537	1638	1738		4387	4407	4458		
Frequency (MHz)	1852.4	1880	1907.6		1712.4	1732.6	1752.6		2264	2364	246.6		
3GPP Rel 99	AMR 12.2Kbps	12.65	12.69	12.81	14.00	12.48	12.40	12.57	14.00	21.87	21.86	22.08	23.00
3GPP Rel 99	RMC 12.2Kbps	12.66	12.70	12.64	14.00	12.59	12.42	12.63	14.00	21.88	21.89	22.15	23.00
3GPP Rel 6	HSDPA Subtest-1	11.73	11.69	11.62	13.00	11.86	11.83	12.00	13.00	20.95	20.93	21.12	22.00
3GPP Rel 6	HSDPA Subtest-2	11.71	11.71	11.67	13.00	11.89	11.90	12.02	13.00	20.94	20.98	21.15	22.00
3GPP Rel 6	HSDPA Subtest-3	10.86	11.20	11.12	12.50	11.41	11.36	11.62	12.50	20.46	20.44	20.68	21.50
3GPP Rel 6	HSDPA Subtest-4	11.19	11.22	11.17	12.50	11.30	11.49	11.05	12.50	20.42	20.47	20.25	21.50
3GPP Rel 6	DC-HSDPA Subtest-1	11.57	11.52	11.45	13.00	11.79	11.83	11.93	13.00	20.98	20.79	20.99	22.00
3GPP Rel 6	DC-HSDPA Subtest-2	11.64	11.52	11.64	13.00	11.83	11.87	11.92	13.00	20.85	20.79	21.12	22.00
3GPP Rel 6	DC-HSDPA Subtest-3	10.74	11.12	11.08	12.50	11.41	11.24	11.58	12.50	20.43	20.28	20.62	21.50
3GPP Rel 6	DC-HSDPA Subtest-4	11.18	11.16	11.07	12.50	11.10	11.35	11.04	12.50	20.22	20.33	20.04	21.50
3GPP Rel 6	HSUPA Subtest-1	11.71	11.72	11.67	13.00	11.83	11.90	11.68	13.00	20.89	20.89	21.03	22.00
3GPP Rel 6	HSUPA Subtest-2	9.70	9.71	9.70	11.00	9.71	9.70	9.73	11.00	18.83	18.88	18.99	20.00
3GPP Rel 6	HSUPA Subtest-3	10.72	10.89	10.64	12.00	10.80	10.83	10.83	12.00	19.87	19.87	20.06	21.00
3GPP Rel 6	HSUPA Subtest-4	9.73	9.68	9.63	11.00	9.82	9.84	9.73	11.00	18.85	18.86	19.04	20.00
3GPP Rel 6	HSUPA Subtest-5	11.75	11.75	11.65	13.00	11.84	11.84	11.94	13.00	20.88	20.86	21.08	22.00

Band TX Channel	CDMA BC1			Tune-up Limit (dBm)
	26	300	1175	
Frequency (MHz)	1815.25	1880	1908.75	
RC1 S055	14.55	14.78	14.59	15.50
RC1 S065	14.46	14.87	14.49	15.50
RC1 S084 (F+SCH)	14.67	14.75	14.58	15.50
RC1 S032 (F+SCH)	14.65	14.62	14.45	15.50
RTAP 16.3 kbps	13.95	14.04	13.92	15.50
RETAP 4096Bps	13.97	13.97	13.85	15.50



Band 2 (1900MHz Band) Part 24E									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq. 18700	Power High Ch./Freq. 18900	Power High Ch./Freq. 19100	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)									
20	QPSK	1	0	12.67	12.45	12.21			
20	QPSK	1	49	12.47	12.38	12.21			
20	QPSK	1	99	12.33	12.25	12.11	13.5	0	
20	QPSK	50	0	12.52	12.47	12.43			
20	QPSK	50	24	12.42	12.37	12.41	13.5	0	
20	QPSK	50	50	12.16	12.26	12.24			
20	QPSK	100	0	12.31	12.31	12.38			
20	16QAM	1	0	12.59	12.58	12.57			
20	16QAM	1	49	12.48	12.43	12.45	13.5	0	
20	16QAM	1	99	12.41	12.63	12.54			
20	16QAM	50	0	12.32	12.44	12.43			
20	16QAM	50	24	12.39	12.39	12.47	13.5	0	
20	16QAM	50	50	12.16	12.27	12.25			
20	16QAM	100	0	12.32	12.30	12.35			
20	64QAM	1	0	12.59	12.65	12.67	13.5	0	
20	64QAM	1	49	12.49	12.48	12.36			
20	64QAM	1	99	12.34	12.23	12.21			
20	64QAM	50	0	12.52	12.46	12.41			
20	64QAM	50	24	12.38	12.36	12.38	13.5	0	
20	64QAM	50	50	12.17	12.25	12.25			
20	64QAM	100	0	12.31	12.32	12.35			
Channel									
Frequency (MHz)									
15	QPSK	1	0	12.46	12.41	12.49			
15	QPSK	1	37	12.18	11.99	12.31	13.5	0	
15	QPSK	1	74	12.47	12.32	12.32			
15	QPSK	36	0	12.45	12.39	12.39			
15	QPSK	36	20	12.32	12.36	12.42	13.5	0	
15	QPSK	36	39	12.34	12.35	12.39			
15	16QAM	1	0	12.42	12.42	12.48			
15	16QAM	1	37	12.41	12.47	12.36	13.5	0	
15	16QAM	1	74	12.37	12.32	12.36			
15	16QAM	36	0	12.42	12.38	12.41			
15	16QAM	36	20	12.39	12.36	12.41	13.5	0	
15	16QAM	36	39	12.32	12.36	12.32			
15	16QAM	75	0	12.34	12.32	12.38			
15	64QAM	1	0	12.49	12.38	12.47			
15	64QAM	1	37	12.43	12.44	12.48	13.5	0	
15	64QAM	1	74	12.48	12.42	12.46			
15	64QAM	36	0	12.41	12.38	12.41			
15	64QAM	36	20	12.37	12.38	12.41	13.5	0	
15	64QAM	36	39	12.33	12.37	12.32			
15	64QAM	75	0	12.29	12.30	12.37			
Channel									
Frequency (MHz)									
10	QPSK	1	0	12.33	12.31	12.35			
10	QPSK	1	25	12.41	12.32	12.43	13.5	0	
10	QPSK	1	49	12.30	12.36	12.34			
10	QPSK	25	0	12.34	12.46	12.38			
10	QPSK	25	12	12.33	12.48	12.34	13.5	0	
10	QPSK	25	25	12.37	12.45	12.36			
10	QPSK	50	0	12.31	12.53	12.41			
10	16QAM	1	0	12.36	12.33	12.40			
10	16QAM	1	25	12.36	12.30	12.28	13.5	0	
10	16QAM	1	49	12.40	12.39	12.38			
10	16QAM	25	0	12.62	12.47	12.56			
10	16QAM	25	12	12.61	12.48	12.55	13.5	0	
10	16QAM	25	25	12.55	12.40	12.49			
10	16QAM	50	0	12.59	12.47	12.49			
10	64QAM	1	0	12.65	12.60	12.56			
10	64QAM	1	25	12.65	12.62	12.52	13.5	0	
10	64QAM	1	49	12.63	12.58	12.62			
10	64QAM	25	0	12.58	12.46	12.55			
10	64QAM	25	12	12.62	12.46	12.52	13.5	0	
10	64QAM	25	25	12.55	12.42	12.56			
10	64QAM	50	0	12.57	12.51	12.59			
Channel									
Frequency (MHz)									
5	QPSK	1	0	12.61	12.56	12.65			
5	QPSK	1	12	12.42	12.36	12.40	13.5	0	
5	QPSK	1	24	12.53	12.42	12.47			
5	QPSK	12	0	12.59	12.58	12.58			
5	QPSK	12	7	12.64	12.55	12.60	13.5	0	
5	QPSK	12	13	12.60	12.49	12.58			
5	QPSK	25	0	12.65	12.53	12.62			
5	16QAM	1	0	12.50	12.49	12.49			
5	16QAM	1	12	12.38	12.34	12.35	13.5	0	
5	16QAM	1	24	12.36	12.23	12.28			
5	16QAM	12	0	12.64	12.60	12.63			
5	16QAM	12	7	12.62	12.56	12.58	13.5	0	
5	16QAM	12	13	12.63	12.48	12.56			
5	16QAM	25	0	12.59	12.53	12.59			
5	64QAM	1	0	12.57	12.66	12.64			
5	64QAM	1	12	12.61	12.58	12.61	13.5	0	
5	64QAM	1	24	12.63	12.65	12.61			
5	64QAM	12	0	12.59	12.60	12.62			
5	64QAM	12	7	12.61	12.51	12.58	13.5	0	
5	64QAM	12	13	12.58	12.49	12.58			
5	64QAM	25	0	12.57	12.47	12.59			
Channel									
Frequency (MHz)									
3	QPSK	1	0	12.56	12.43	12.58			
3	QPSK	1	8	12.50	12.37	12.48	13.5	0	
3	QPSK	1	14	12.38	12.41	12.46			
3	QPSK	8	0	12.53	12.52	12.53			
3	QPSK	8	4	12.53	12.53	12.55	13.5	0	
3	QPSK	8	7	12.51	12.42	12.49			
3	QPSK	15	0	12.51	12.46	12.45			
3	16QAM	1	0	12.49	12.46	12.43			
3	16QAM	1	8	12.37	12.49	12.47	13.5	0	
3	16QAM	1	14	12.42	12.43	12.39			
3	16QAM	8	0	12.32	12.31	12.28			
3	16QAM	8	4	12.31	12.26	12.33	13.5	0	
3	16QAM	8	7	12.27	12.23	12.25			
3	64QAM	1	0	12.24	12.22	12.25			
3	64QAM	1	8	12.22	12.36	12.27	13.5	0	
3	64QAM	1	14	12.39	12.25	12.45			
3	64QAM	8	0	12.22	12.33	12.38			
3	64QAM	8	4	12.34	12.27	12.23	13.5	0	
3	64QAM	8	7	12.27	12.15	12.22			
3	64QAM	15	0	12.21	12.14	12.24			
Channel									
Frequency (MHz)									
1.4	QPSK	1	0	12.25	12.31	12.38			
1.4	QPSK	1	3	12.42	12.41	12.34	13.5	0	
1.4	QPSK	1	5	12.41	12.41	12.21			
1.4	QPSK	3	0	12.49	12.46	12.47			
1.4	QPSK	3	1	12.24	12.22	12.25	13.5	0	
1.4	QPSK	3	3	12.43	12.38	12.47			
1.4	QPSK	6	0	12.49	12.45	12.47	13.5	0	
1.4	16QAM	1	0	12.38	12.44	12.45			
1.4	16QAM	1	3	12.45	12.41	12.43			
1.4	16QAM	1	5	12.48	12.33	12.38	13.5	0	
1.4	16QAM	3	0	12.27	12.22	12.19			
1.4	16QAM	3	1	12.26	12.29	12.27	13.5	0	
1.4	16QAM	3	3	12.17	12.21	12.25			
1.4	16QAM	6	0	12.48	12.42	12.50	13.5	0	
1.4	64QAM	1	0	12.35	12.29	12.33			
1.4	64QAM	1	3	12.30	12.33	12.47			
1.4	64QAM	1	5	12.29	12.24	12.32	13.5	0	
1.4	64QAM	3	0	12.29	12.28	12.32			
1.4	64QAM	3	1	12.33	12.34	12.38			
1.4	64QAM	3	3	12.26	12.24	12.28	13.5	0	
1.4	64QAM	6	0	12.17	12.16	12.22			

Band 4 (AWS Band) Part 27L (only on power required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq. 20050	Power High Ch./Freq. 20175	Power High Ch./Freq. 20300	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)									
20	QPSK	1	0	13.16	13.24	13.61			
20	QPSK	1	49	13.17	13.28	13.69	14.5	0	
20	QPSK	1	99	13.18	13.32	13.98			
20	QPSK	50	0	13.17	13.33	13.54			
20	QPSK	50	24	13.20	13.37	13.68	14.5	0	
20	QPSK	50	50	13.12	13.36	13.81			
20	QPSK	100	0	13.29	13.27	13.70			
20	16QAM	1	0	13.51	13.46	13.64			
20	16QAM	1	49	13.50	13.79	13.91	14.5	0	
20	16QAM	1	99	13.50	13.66	13.96			
20	16QAM	50	0	13.20	13.11	13.21			
20	16QAM	50	24	13.02	13.11	13.45	14.5	0	
20	16QAM	50	50	12.93	13.15	13.61			
20	16QAM	100	0	12.99	13.11	13.45			
20	64QAM	1	0	13.30	13.21	13.48			
20	64QAM	1	49	13.19	13.47	13.65	14.5	0	
20	64QAM	1	99	13.34	13.47	13.98			
20	64QAM	50	0	12.94	13.08	13.31			
20	64QAM	50	24	12.99	13.09	13.45	14.5	0	
20	64QAM	50	50	12.87	13.09	13.61			
20	64QAM	100	0	13.01	13.09	13.47			
Channel									
Frequency (MHz)									
15	QPSK	1	0	12.59	12.60	13.07			
15	QPSK	1	37	12.85	12.63	13.18	14.5	0	
15	QPSK	1	74	12.93	13.19	13.28			
15	QPSK	36	0	13.06	13.17	13.45			
15	QPSK	36	20	13.00	13.18	13.63	14.5	0	



Band 25 (1900MHz band)									
Part 24E									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power High Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel				26140	26340	26590			
Frequency (MHz)									
20	QPSK	1	0	12.45	12.32	12.39			
20	QPSK	1	49	12.43	12.32	12.33	13.5	0	
20	QPSK	1	99	12.36	12.30	12.40			
20	QPSK	50	0	12.49	12.33	12.54			
20	QPSK	50	24	12.46	12.36	12.44			
20	QPSK	50	50	12.37	12.30	12.41	13.5	0	
20	QPSK	100	0	12.38	12.31	12.47			
20	16QAM	1	0	12.39	12.37	12.44			
20	16QAM	1	49	12.32	12.36	12.48	13.5	0	
20	16QAM	1	99	12.33	12.43	12.36			
20	16QAM	50	0	12.48	12.36	12.44			
20	16QAM	50	24	12.44	12.36	12.45			
20	16QAM	50	50	12.38	12.26	12.35	13.5	0	
20	16QAM	100	0	12.39	12.29	12.43			
20	64QAM	1	0	12.36	12.33	12.42			
20	64QAM	1	49	12.31	12.43	12.47	13.5	0	
20	64QAM	1	99	12.11	12.17	12.13			
20	64QAM	50	0	12.46	12.33	12.42			
20	64QAM	50	24	12.46	12.36	12.44			
20	64QAM	50	50	12.34	12.25	12.39	13.5	0	
20	64QAM	100	0	12.38	12.30	12.44			
Channel				26110	26340	26515	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
15	QPSK	1	0	12.43	12.41	12.49			
15	QPSK	1	37	11.94	11.94	11.86	13.5	0	
15	QPSK	1	74	11.98	11.92	11.95			
15	QPSK	36	0	12.08	11.99	12.01			
15	QPSK	36	20	12.08	12.00	12.03	13.5	0	
15	QPSK	36	39	12.08	12.05	12.07			
15	QPSK	75	0	12.10	12.02	12.03			
15	16QAM	1	0	12.44	12.32	12.36			
15	16QAM	1	37	12.38	12.30	12.33	13.5	0	
15	16QAM	1	74	12.37	12.40	12.29			
15	16QAM	36	0	12.08	11.98	12.03			
15	16QAM	36	20	12.08	12.00	12.01	13.5	0	
15	16QAM	36	39	12.09	12.04	12.05			
15	16QAM	75	0	12.06	12.03	12.07			
15	64QAM	1	0	12.26	12.18	12.20			
15	64QAM	1	37	12.18	12.18	12.05	13.5	0	
15	64QAM	1	74	12.16	12.16	12.01			
15	64QAM	36	0	12.08	12.01	12.03			
15	64QAM	36	20	12.08	12.01	12.01	13.5	0	
15	64QAM	36	39	12.11	12.08	12.06			
15	64QAM	75	0	12.05	12.01	12.06			
Channel				26590	26340	26640	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
10	QPSK	1	0	12.48	12.46	12.45			
10	QPSK	1	25	11.87	11.99	11.92	13.5	0	
10	QPSK	1	49	12.12	12.19	12.14			
10	QPSK	25	0	12.01	12.12	11.99			
10	QPSK	25	12	12.00	12.13	12.04	13.5	0	
10	QPSK	25	25	12.03	12.15	12.07			
10	QPSK	50	0	12.02	12.13	12.05			
10	16QAM	1	0	12.31	12.40	12.49			
10	16QAM	1	25	12.32	12.42	12.30	13.5	0	
10	16QAM	1	49	12.34	12.33	12.33			
10	16QAM	25	0	12.02	12.13	12.01			
10	16QAM	25	12	12.01	12.13	11.99	13.5	0	
10	16QAM	25	25	11.98	12.13	12.03			
10	16QAM	50	0	12.03	12.41	12.43			
10	64QAM	1	0	12.35	12.41	12.43	13.5	0	
10	64QAM	1	25	12.12	12.23	12.11			
10	64QAM	1	49	12.37	12.44	12.19			
10	64QAM	25	0	11.99	12.10	12.02			
10	64QAM	25	12	12.03	12.14	12.03	13.5	0	
10	64QAM	25	25	12.02	12.14	12.06			
10	64QAM	50	0	12.00	12.14	12.05			
Channel				26655	26340	26655	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
5	QPSK	1	0	12.09	12.46	12.45			
5	QPSK	1	12	11.89	11.96	11.86	13.5	0	
5	QPSK	1	24	11.96	12.02	11.92			
5	QPSK	12	0	12.02	12.13	12.03			
5	QPSK	12	7	12.01	12.11	11.98	13.5	0	
5	QPSK	12	13	11.98	12.07	11.98			
5	QPSK	25	0	12.01	12.12	12.02			
5	16QAM	1	0	12.38	12.41	12.38			
5	16QAM	1	12	12.27	12.34	12.22	13.5	0	
5	16QAM	1	24	12.20	12.40	12.29			
5	16QAM	12	0	12.06	12.17	12.05			
5	16QAM	12	7	12.02	12.11	12.01	13.5	0	
5	16QAM	12	13	11.98	12.12	11.97			
5	16QAM	25	0	12.00	12.12	12.01			
5	64QAM	1	0	12.26	12.40	12.28			
5	64QAM	1	12	12.15	12.20	12.08	13.5	0	
5	64QAM	1	24	12.12	12.23	12.10			
5	64QAM	12	0	12.05	12.18	12.05			
5	64QAM	12	7	12.01	12.11	12.01	13.5	0	
5	64QAM	12	13	11.98	12.08	12.00			
5	64QAM	25	0	11.99	12.11	12.04			
Channel				26655	26340	26675	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
3	QPSK	1	0	12.44	12.42	12.46			
3	QPSK	1	8	11.95	12.05	11.90	13.5	0	
3	QPSK	1	14	11.87	12.00	11.90			
3	QPSK	8	0	11.98	12.11	11.96			
3	QPSK	8	4	11.98	12.11	11.98	13.5	0	
3	QPSK	8	7	11.93	12.06	11.96			
3	QPSK	15	0	11.97	12.06	11.97			
3	16QAM	1	0	12.30	12.37	12.33			
3	16QAM	1	8	12.29	12.34	12.36	13.5	0	
3	16QAM	1	14	12.14	12.30	12.27			
3	16QAM	8	0	12.07	12.17	12.01			
3	16QAM	8	4	12.04	12.16	12.05	13.5	0	
3	16QAM	8	7	12.02	12.13	12.00			
3	16QAM	15	0	11.99	12.09	12.00			
3	64QAM	1	0	12.12	12.26	12.12			
3	64QAM	1	3	12.16	12.26	12.12	13.5	0	
3	64QAM	1	14	12.09	12.22	12.09			
3	64QAM	8	0	12.03	12.14	12.00			
3	64QAM	8	4	12.04	12.15	12.01	13.5	0	
3	64QAM	8	7	11.97	12.09	11.97			
3	64QAM	15	0	11.96	12.10	11.95			
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)	
Frequency (MHz)									
1.4	QPSK	1	0	12.44	12.46	12.47			
1.4	QPSK	1	3	11.98	12.01	11.88	13.5	0	
1.4	QPSK	1	5	11.87	11.97	11.86			
1.4	QPSK	3	0	11.89	12.00	11.89			
1.4	QPSK	3	1	11.97	12.05	11.91			
1.4	QPSK	3	3	11.89	12.00	11.87	13.5	0	
1.4	QPSK	6	0	11.89	12.01	11.86			
1.4	16QAM	1	0	12.14	12.23	12.17			
1.4	16QAM	1	3	12.22	12.33	12.22	13.5	0	
1.4	16QAM	1	5	12.14	12.22	12.17			
1.4	16QAM	3	0	11.96	12.06	11.93			
1.4	16QAM	3	1	12.02	12.12	11.97	13.5	0	
1.4	16QAM	3	3	11.96	12.08	11.92			
1.4	16QAM	6	0	11.95	12.01	11.94	13.5	0	
1.4	64QAM	1	0	12.12	12.20	12.07			
1.4	64QAM	1	3	12.11	12.18	12.06			
1.4	64QAM	1	5	12.07	12.14	12.07	13.5	0	
1.4	64QAM	3	0	11.98	12.14	12.03			
1.4	64QAM	3	1	12.09	12.19	12.05			
1.4	64QAM	3	3	12.01	12.11	12.01	13.5	0	
1.4	64QAM	6	0	11.92	12.04	11.89			

Band 26 for FOC									
(only on channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power High Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)	
Channel				26765	26865	26965			
Frequency (MHz)									
15	QPSK	1							



Band 30									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq	Power Middle Ch./Freq	Power High Ch./Freq	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)							2310		
10	QPSK	1	0	20.26			21	0	
10	QPSK	1	25	19.82					
10	QPSK	1	49	20.17					
10	QPSK	25	0	19.92			21	0	
10	QPSK	25	12	19.96					
10	QPSK	25	25	20.10					
10	QPSK	50	0	20.01			21	0	
10	16QAM	1	0	20.13					
10	16QAM	1	25	20.19					
10	16QAM	1	49	20.13			21	0	
10	16QAM	25	0	19.93					
10	16QAM	25	12	19.96					
10	16QAM	25	25	20.04			21	0	
10	16QAM	50	0	19.90					
10	64QAM	1	0	20.19					
10	64QAM	1	25	20.07			21	0	
10	64QAM	1	49	20.17					
10	64QAM	25	0	19.92					
10	64QAM	25	12	19.91			21	0	
10	64QAM	25	25	20.05					
10	64QAM	50	0	19.92					
Channel							2705		
Frequency (MHz)							2710	2775	
Channel							2307.5	2310	2312.5
5	QPSK	1	0	19.87	19.85	19.83	21	0	
5	QPSK	1	12	19.84	19.80	19.93			
5	QPSK	1	24	19.85	19.95	19.96			
5	QPSK	12	0	20.02	19.92	19.95	21	0	
5	QPSK	12	7	19.89	19.93	20.03			
5	QPSK	12	13	19.90	19.89	20.00			
5	QPSK	25	0	19.87	19.96	20.03	21	0	
5	16QAM	1	0	20.16	20.20	20.19			
5	16QAM	1	12	20.14	20.20	20.20			
5	16QAM	1	24	20.11	20.20	20.18	21	0	
5	16QAM	12	0	20.07	19.96	19.94			
5	16QAM	12	7	19.94	19.93	20.06			
5	16QAM	12	13	19.89	19.90	20.03	21	0	
5	16QAM	25	0	19.91	19.93	20.05			
5	64QAM	1	0	20.20	20.12	20.17			
5	64QAM	1	12	19.87	20.07	20.18	21	0	
5	64QAM	1	24	20.05	20.17	20.18			
5	64QAM	12	0	20.07	19.96	19.94			
5	64QAM	12	7	19.93	19.92	20.03	21	0	
5	64QAM	12	13	19.92	19.89	20.02			
5	64QAM	25	0	19.88	19.92	20.03			

Band 66									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq	Power Middle Ch./Freq	Power High Ch./Freq	Tune-up limit (dBm)	MPR (dB)	
Channel									
Frequency (MHz)							1720	1745	1770
20	QPSK	1	0	13.16	13.26	13.54	14.5	0	
20	QPSK	1	49	13.24	13.31	13.56			
20	QPSK	1	99	13.61	14.06	14.09			
20	QPSK	50	0	12.79	12.83	13.52	14.5	0	
20	QPSK	50	24	12.87	12.98	13.64			
20	QPSK	50	50	12.88	13.55	13.68			
20	QPSK	100	0	12.97	13.65	13.82	14.5	0	
20	16QAM	1	0	13.16	13.13	13.73			
20	16QAM	1	49	13.25	13.34	13.92			
20	16QAM	1	99	13.62	13.85	13.97	14.5	0	
20	16QAM	50	0	12.77	12.83	13.52			
20	16QAM	50	24	12.87	13.02	13.66			
20	16QAM	50	50	12.90	13.13	13.68	14.5	0	
20	16QAM	100	0	12.85	12.98	13.69			
20	64QAM	1	0	13.05	13.11	13.57			
20	64QAM	1	49	13.09	13.11	13.80	14.5	0	
20	64QAM	1	99	13.47	13.80	13.92			
20	64QAM	50	0	12.79	12.82	13.49			
20	64QAM	50	24	12.84	12.99	13.62	14.5	0	
20	64QAM	50	50	12.88	13.15	13.67			
20	64QAM	100	0	12.86	12.96	13.60			
Channel							1320.72	1323.22	1325.97
Frequency (MHz)							1717.5	1745	1772.5
15	QPSK	1	0	12.71	12.75	13.41	14.5	0	
15	QPSK	1	37	12.81	12.81	13.48			
15	QPSK	1	74	12.97	13.34	13.91			
15	QPSK	36	0	12.89	12.96	13.67	14.5	0	
15	QPSK	36	20	12.78	13.00	13.67			
15	QPSK	36	39	12.82	13.05	13.66			
15	QPSK	75	0	12.85	12.96	13.88	14.5	0	
15	16QAM	1	0	13.55	13.45	13.96			
15	16QAM	1	37	13.14	13.32	13.91			
15	16QAM	1	74	13.36	13.76	13.98	14.5	0	
15	16QAM	36	0	12.87	12.93	13.70			
15	16QAM	36	20	12.79	12.87	13.68			
15	16QAM	36	39	12.80	13.04	13.63	14.5	0	
15	16QAM	75	0	12.84	13.01	13.67			
15	64QAM	1	0	13.35	13.21	13.94			
15	64QAM	1	37	13.02	13.08	13.84	14.5	0	
15	64QAM	1	74	13.16	13.64	13.93			
15	64QAM	36	0	12.88	12.96	13.71			
15	64QAM	36	20	12.78	13.00	13.70	14.5	0	
15	64QAM	36	39	12.81	13.05	13.70			
15	64QAM	75	0	12.81	12.98	13.68			
Channel							1320.22	1323.22	1326.22
Frequency (MHz)							1715	1745	1775
10	QPSK	1	0	13.11	13.01	13.61	14.5	0	
10	QPSK	1	25	13.16	13.07	13.70			
10	QPSK	1	49	13.30	13.66	13.98			
10	QPSK	25	0	12.95	13.08	13.78	14.5	0	
10	QPSK	25	12	13.00	13.17	13.88			
10	QPSK	25	25	13.01	13.38	13.94			
10	QPSK	50	0	12.99	13.18	13.82	14.5	0	
10	16QAM	1	0	13.18	13.23	13.56			
10	16QAM	1	25	13.24	13.47	13.97			
10	16QAM	1	49	13.64	13.86	13.95	14.5	0	
10	16QAM	25	0	12.98	13.06	13.79			
10	16QAM	25	12	12.99	13.20	13.85			
10	16QAM	25	25	13.00	13.26	13.92	14.5	0	
10	16QAM	50	0	12.98	13.17	13.80			
10	64QAM	1	0	13.05	13.04	13.32			
10	64QAM	1	25	13.12	13.29	13.87	14.5	0	
10	64QAM	1	49	13.50	13.90	13.97			
10	64QAM	25	0	12.96	13.06	13.79			
10	64QAM	25	12	13.02	13.20	13.87	14.5	0	
10	64QAM	25	25	13.02	13.37	13.95			
10	64QAM	50	0	12.93	13.16	13.79			
Channel							1319.97	1323.22	1326.07
Frequency (MHz)							1719.25	1745	1772.5
5	QPSK	1	0	12.91	13.01	13.54	14.5	0	
5	QPSK	1	12	12.90	13.09	13.74			
5	QPSK	1	24	12.90	13.20	13.76			
5	QPSK	12	0	13.05	13.19	13.91	14.5	0	
5	QPSK	12	7	13.03	13.16	13.84			
5	QPSK	12	13	13.10	13.14	13.80			
5	QPSK	25	0	13.05	13.19	13.86	14.5	0	
5	16QAM	1	0	13.41	13.54	13.80			
5	16QAM	1	12	13.24	13.39	13.86			
5	16QAM	1	24	13.22	13.52	13.91	14.5	0	
5	16QAM	12	0	13.06	13.10	13.94			
5	16QAM	12	7	13.05	13.18	13.85			
5	16QAM	12	13	13.13	13.16	13.83	14.5	0	
5	16QAM	25	0	13.04	13.17	13.84			
5	64QAM	1	0	13.34	13.43	13.88			
5	64QAM	1	12	13.10	13.23	13.94	14.5	0	
5	64QAM	1	24	13.14	13.39	13.88			
5	64QAM	12	0	13.06	13.21	13.75			
5	64QAM	12	7	13.06	13.18	13.86	14.5	0	
5	64QAM	12	13	13.12	13.16	13.82			
5	64QAM	25	0	13.01	13.16	13.85			
Channel							1319.97	1323.22	1326.07
Frequency (MHz)							1711.5	1745	1777.5
3	QPSK	1	0	12.95	12.87	13.75	14.5	0	
3	QPSK	1	8	12.95	13.07	13.74			
3	QPSK	1	14	12.90	13.07	13.73			
3	QPSK	8	0	12.99	13.15	13.83	14.5	0	
3	QPSK	8	4	12.99	13.16	13.81			
3	QPSK	8	7	12.97	13.13	13.80			
3	QPSK	15	0	12.96	13.12	13.79	14.5	0	
3	16QAM	1	0	13.26	13.43	13.88			
3	16QAM	1	8	13.30	13.46	13.95			
3	16QAM	1	14	13.24	13.38	13.96	14.5	0	
3	16QAM	8	0	13.05	13.18	13.90			
3	16QAM	8	4	13.06	13.21	13.88			
3	16QAM	8	7	13.03	13.17	13.87	14.5	0	
3	16QAM	15	0	13.01	13.14	13.82			
3	64QAM	1	0	13.15	13.26	13.96			
3	64QAM	1	8	13.16	13.31				



Band 38(only on channel required)											
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch./Freq	Power Mid Ch./Freq	Power High Ch./Freq	Tune-up limit (dBm)	MPR (dB)			
Channel											
Frequency (MHz)				37850	38000	38150					
20	QPSK	1	0	19.03	18.79	18.83	20	0			
20	QPSK	1	49	19.26	19.06	19.09					
20	QPSK	1	99	19.09	19.08	19.20					
20	QPSK	50	0	19.09	18.53	19.01					
20	QPSK	50	24	19.23	19.04	19.04	20	0			
20	QPSK	50	50	19.23	19.26	19.18					
20	QPSK	100	0	19.04	19.03	19.12					
20	15QAM	1	0	18.92	18.90	19.06					
20	15QAM	1	49	19.11	19.18	19.01					
20	15QAM	1	99	19.22	19.10	18.92					
20	15QAM	50	0	18.98	18.99	18.96					
20	15QAM	50	24	19.07	19.05	18.96					
20	15QAM	50	50	19.10	19.00	19.26					
20	15QAM	100	0	19.22	19.05	19.16					
20	15QAM	100	24	19.03	18.99	19.07					
20	15QAM	100	49	18.79	18.98	18.82					
20	64QAM	1	0	19.18	18.53	18.98	20	0			
20	64QAM	50	0	19.03	18.80	19.11					
20	64QAM	50	24	19.26	18.94	19.14					
20	64QAM	50	50	19.24	18.93	18.83					
20	64QAM	100	0	19.20	18.86	18.99					
Channel											
Frequency (MHz)				37825	38000	38175					
15	QPSK	1	0	18.91	18.87	18.92	20	0			
15	QPSK	1	37	19.07	18.72	18.74					
15	QPSK	1	74	19.22	18.97	19.15					
15	QPSK	36	0	18.98	19.02	19.02					
15	QPSK	36	20	19.28	19.09	19.11	20	0			
15	QPSK	36	39	19.15	19.09	19.20					
15	QPSK	75	0	19.27	19.01	19.14					
15	15QAM	1	0	19.07	18.93	18.96					
15	15QAM	1	37	19.18	19.01	18.95	20	0			
15	15QAM	1	74	19.10	18.98	18.93					
15	15QAM	36	0	18.92	18.78	18.88					
15	15QAM	36	20	19.08	18.85	18.97	20	0			
15	15QAM	36	39	19.40	18.85	19.10					
15	15QAM	75	0	19.28	19.05	19.16					
15	64QAM	1	0	18.70	18.54	18.51					
15	64QAM	1	37	19.03	18.84	19.00	20	0			
15	64QAM	1	74	18.96	18.63	18.93					
15	64QAM	36	0	18.97	18.78	19.01					
15	64QAM	36	20	19.14	18.87	19.11	20	0			
15	64QAM	36	39	19.10	18.85	19.11					
15	64QAM	75	0	19.27	19.02	19.17					
Channel											
Frequency (MHz)				37800	38000	38200					
10	QPSK	1	0	19.23	19.03	19.26	20	0			
10	QPSK	1	25	19.19	18.99	18.97					
10	QPSK	1	49	19.40	19.12	19.20					
10	QPSK	25	0	19.15	19.16	19.11					
10	QPSK	25	12	19.30	19.02	19.09	20	0			
10	QPSK	25	25	19.41	19.17	19.32					
10	QPSK	50	0	19.18	19.09	19.27					
10	15QAM	1	0	19.21	19.16	19.22	20	0			
10	15QAM	1	25	19.29	19.01	19.08					
10	15QAM	1	49	19.36	19.23	19.26					
10	15QAM	25	0	19.27	19.19	19.06					
10	15QAM	25	12	19.12	18.94	19.22					
10	15QAM	25	25	19.36	19.09	19.26	20	0			
10	15QAM	50	0	19.30	18.94	19.20					
10	64QAM	1	0	19.07	18.58	18.95					
10	64QAM	1	25	18.71	18.94	18.71	20	0			
10	64QAM	1	49	18.88	18.76	18.79					
10	64QAM	25	0	19.09	18.91	19.21					
10	64QAM	25	12	19.24	19.19	19.04	20	0			
10	64QAM	25	25	19.43	19.03	19.21					
10	64QAM	50	0	19.07	18.91	19.08					
Channel											
Frequency (MHz)				37775	38000	38225					
5	QPSK	1	0	19.18	18.94	19.26	20	0			
5	QPSK	1	12	19.05	18.76	19.05					
5	QPSK	1	24	19.08	19.02	19.28					
5	QPSK	12	0	19.31	19.16	19.09					
5	QPSK	12	7	19.21	19.11	19.22	20	0			
5	QPSK	12	13	19.29	19.04	19.13					
5	QPSK	25	0	19.35	19.06	19.14					
5	15QAM	1	0	19.23	19.14	19.24					
5	15QAM	1	12	19.14	18.97	19.17	20	0			
5	15QAM	1	24	19.21	18.96	19.14					
5	15QAM	12	0	19.20	19.08	19.19					
5	15QAM	12	7	19.28	18.90	19.21	20	0			
5	15QAM	12	13	19.30	18.93	19.23					
5	15QAM	25	0	19.19	19.10	19.09					
5	64QAM	1	0	19.11	18.98	18.98					
5	64QAM	1	12	18.85	18.80	18.79	20	0			
5	64QAM	1	24	18.96	18.71	18.89					
5	64QAM	12	0	19.32	19.21	19.12					
5	64QAM	12	7	19.34	19.05	19.26	20	0			
5	64QAM	12	13	19.12	19.07	19.16					
5	64QAM	25	0	19.41	18.89	19.31					

Band 41 (2.6G Band)										
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch./Freq	Power Mid Ch./Freq	Power High Ch./Freq	Tune-up limit (dBm)	MPR (dB)		
Channel										
Frequency (MHz)				39750	40185	40620				
20	QPSK	1	0	19.39	19.68	19.31	19.25	19.52	21	0
20	QPSK	1	49	19.58	19.73	19.50	19.49	19.53		
20	QPSK	1	99	19.31	19.46	19.25	19.22	19.51	20	0
20	QPSK	50	0	19.42	19.68	19.26	19.40	19.63		
20	QPSK	50	24	19.59	19.80	19.56	19.60	19.65	21	0
20	QPSK	50	50	19.37	19.53	19.34	19.39	19.55		
20	QPSK	100	0	19.36	19.54	19.33	19.40	19.20		
20	15QAM	1	0	19.16	19.38	19.06	19.02	19.45		
20	15QAM	1	49	19.32	19.33	19.36	19.34	19.65	21	0
20	15QAM	1	99	19.01	19.13	19.23	19.03	19.42		
20	15QAM	50	0	19.47	19.74	19.25	19.50	19.64		
20	15QAM	50	24	19.49	19.74	19.41	19.57	19.71	21	0
20	15QAM	50	50	19.35	19.60	19.37	19.46	19.61		
20	15QAM	100	0	19.29	19.55	19.30	19.32	19.60		
20	64QAM	1	0	19.43	19.15	19.59	19.68	19.16		
20	64QAM	1	49	19.16	19.33	19.04	19.09	19.36	21	0
20	64QAM	1	99	19.35	19.32	19.15	19.40	19.29		
20	64QAM	50	0	19.40	19.67	19.20	19.33	19.62		
20	64QAM	50	24	19.47	19.67	19.36	19.37	19.64	21	0
20	64QAM	50	50	19.28	19.46	19.30	19.35	19.56		
20	64QAM	100	0	19.33	19.59	19.37	19.37	19.62		
Channel										
Frequency (MHz)				39725	40173	40620				
15	QPSK	1	0	19.20	19.39	19.20	19.30	19.58	21	0
15	QPSK	1	37	19.35	19.14	19.50	19.52	19.38		
15	QPSK	1	74	19.28	19.07	19.54	19.38	19.59		
15	QPSK	36	0	19.48	19.70	19.32	19.32	19.63	21	0
15	QPSK	36	20	19.54	19.75	19.48	19.53	19.60		
15	QPSK	36	39	19.57	19.80	19.55	19.60	19.59		
15	QPSK	75	0	19.45	19.72	19.36	19.35	19.53	20	0
15	15QAM	1	0	19.08	19.15	19.58	19.14	19.61		
15	15QAM	1	37	19.04	19.26	19.47	19.07	19.44	21	0
15	15QAM	1	74	19.30	19.39	19.18	19.25	19.50		
15	15QAM	36	0	19.44	19.69	19.20	19.28	19.55		
15	15QAM	36	20	19.53	19.69	19.38	19.48	19.54	21	0
15	15QAM	36								



Reduced Power Mode for Handheld On

GSM1900	Frame-Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	26.39	26.35	26.23	27.00	17.39	17.35	17.23	18.50
GPRS 1 Tx slot	26.33	26.28	26.71	27.00	17.33	17.28	17.71	18.50
GPRS 2 Tx slots	24.33	24.41	24.35	26.00	16.33	16.41	16.39	20.00
GPRS 3 Tx slots	22.11	22.04	22.01	23.00	17.85	17.78	17.75	18.24
GPRS 4 Tx slots	19.86	19.87	19.79	21.00	16.96	16.87	16.79	18.50
EDGE 1 Tx slot	22.02	22.10	22.03	23.00	13.02	13.10	13.03	14.50
EDGE 2 Tx slots	19.85	19.92	19.89	21.00	13.85	13.92	13.89	15.50
EDGE 3 Tx slots	17.57	17.64	17.61	19.00	13.31	13.38	13.35	14.74
EDGE 4 Tx slots	16.01	16.11	16.05	18.00	13.01	13.11	13.05	15.00

Band	WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)
	9262	9400	9538		1312	1413	1513	
TX Channel	9262	9400	9538		1312	1413	1513	
Rx Channel	9692	9830	9968		1537	1638	1738	
Frequency (MHz)	1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	AMR 12.2Kbps	17.44	17.45	17.46	18.50	18.08	18.08	16.01
3GPP Rel 99	RM12 12Kbps	17.46	17.47	17.51	18.50	16.12	16.01	17.50
3GPP Rel 6	HSDPA Subtest-1	16.80	16.56	16.49	17.50	15.30	15.27	15.44
3GPP Rel 6	HSDPA Subtest-2	16.58	16.58	16.54	17.50	15.33	15.34	15.46
3GPP Rel 6	HSDPA Subtest-3	15.73	16.07	15.99	17.00	14.85	14.80	15.06
3GPP Rel 6	HSDPA Subtest-4	16.06	16.09	16.04	17.00	14.74	14.84	14.49
3GPP Rel 8	DCHSDPA Subtest-1	16.44	16.49	16.32	17.50	15.22	15.27	15.59
3GPP Rel 8	DCHSDPA Subtest-2	16.51	16.39	16.51	17.50	15.27	15.31	15.36
3GPP Rel 8	DCHSDPA Subtest-3	15.61	15.99	15.95	17.00	14.85	14.68	15.02
3GPP Rel 8	DCHSDPA Subtest-4	16.05	16.05	15.94	17.00	14.54	14.79	14.48
3GPP Rel 6	HSPA Subtest-1	16.58	16.59	16.54	17.50	15.27	15.34	15.12
3GPP Rel 6	HSPA Subtest-2	14.57	14.58	14.57	15.50	13.15	13.14	13.17
3GPP Rel 6	HSPA Subtest-3	15.59	15.56	15.51	16.50	14.24	14.27	14.27
3GPP Rel 6	HSPA Subtest-4	14.60	14.55	14.50	15.50	13.26	13.28	13.17
3GPP Rel 6	HSPA Subtest-5	16.62	16.62	16.52	17.50	15.28	15.28	15.38

Band	CDMA BIC1			Tune-up Limit (dBm)
	75	800	1175	
TX Channel	75	800	1175	
Frequency (MHz)	1851.25	1880	1908.75	
RC1 SO65	19.13	19.36	19.17	20.00
RC3 SO65	19.04	19.25	19.07	20.00
RC3 SO32 (F-SCH)	19.25	19.33	19.16	20.00
RC3 SO32 (H-SCH)	19.23	19.20	19.03	20.00
RTAP 153.6Kbps	19.04	19.07	18.97	20.00
RETAP 4956Kbps	18.75	18.75	18.63	20.00



Band 2 (1800MHz Band)										
Part 24E										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Middle Ch. Freq.	Power High Ch. Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel										
Frequency (MHz)										
20	QPSK	1	0	15.61	15.37	15.33				
20	QPSK	1	49	19.90	19.39	19.33	20.5	0		
20	QPSK	1	99	19.12	19.15	19.16				
20	QPSK	50	0	19.28	19.34	19.37				
20	QPSK	50	24	19.32	19.32	19.32	20.5	0		
20	QPSK	50	50	19.14	19.26	19.18				
20	QPSK	100	0	19.29	19.27	19.33				
20	16QAM	1	0	19.30	19.30	19.31				
20	16QAM	1	49	19.12	19.24	19.17	20.5	0		
20	16QAM	1	99	19.27	19.39	19.31				
20	16QAM	50	0	19.44	19.43	19.37				
20	16QAM	50	24	19.29	19.31	19.32	20.5	0		
20	16QAM	50	50	19.11	19.23	19.22				
20	16QAM	100	0	19.25	19.26	19.30				
20	64QAM	1	0	19.22	19.13	19.21	20.5	0		
20	64QAM	1	49	19.39	19.46	19.48	20.5	0		
20	64QAM	1	99	19.14	19.15	19.17				
20	64QAM	50	0	19.44	19.42	19.37				
20	64QAM	50	24	19.33	19.30	19.35	20.5	0		
20	64QAM	50	50	19.12	19.18	19.20				
20	64QAM	100	0	19.28	19.23	19.31				
Channel										
Frequency (MHz)										
15	QPSK	1	0	19.60	19.55	19.53				
15	QPSK	1	37	19.23	19.06	19.14	20.5	0		
15	QPSK	1	74	19.34	19.46	19.40				
15	QPSK	36	0	19.42	19.37	19.36				
15	QPSK	36	20	19.29	19.30	19.36	20.5	0		
15	QPSK	36	39	19.30	19.32	19.32				
15	QPSK	75	0	19.29	19.24	19.32				
15	16QAM	1	0	19.41	19.32	19.41				
15	16QAM	1	37	19.30	19.26	19.20	20.5	0		
15	16QAM	1	74	19.28	19.55	19.33				
15	16QAM	36	0	19.39	19.37	19.33				
15	16QAM	36	20	19.32	19.29	19.34	20.5	0		
15	16QAM	36	39	19.28	19.30	19.30				
15	16QAM	75	0	19.25	19.26	19.32				
15	64QAM	1	0	19.40	19.35	19.28				
15	64QAM	1	37	19.44	19.40	19.38	20.5	0		
15	64QAM	1	74	19.14	19.23	19.13				
15	64QAM	36	0	19.41	19.39	19.36				
15	64QAM	36	20	19.29	19.31	19.35	20.5	0		
15	64QAM	36	39	19.29	19.29	19.28				
15	64QAM	75	0	19.23	19.28	19.34				
Channel										
Frequency (MHz)										
10	QPSK	1	0	19.59	19.60	19.55				
10	QPSK	1	25	19.42	19.40	19.42	20.5	0		
10	QPSK	1	49	19.45	19.45	19.51				
10	QPSK	25	0	19.56	19.43	19.49				
10	QPSK	25	12	19.51	19.42	19.50	20.5	0		
10	QPSK	25	25	19.48	19.41	19.50				
10	QPSK	50	0	19.52	19.41	19.47				
10	16QAM	1	0	19.46	19.47	19.49				
10	16QAM	1	25	19.41	19.31	19.41	20.5	0		
10	16QAM	1	49	19.44	19.36	19.41				
10	16QAM	25	0	19.54	19.40	19.49				
10	16QAM	25	12	19.56	19.41	19.48	20.5	0		
10	16QAM	25	25	19.48	19.35	19.48				
10	16QAM	50	0	19.50	19.44	19.43				
10	64QAM	1	0	19.50	19.42	19.45				
10	64QAM	1	25	19.19	19.16	19.20	20.5	0		
10	64QAM	1	49	19.34	19.27	19.29				
10	64QAM	25	0	19.56	19.37	19.47				
10	64QAM	25	12	19.55	19.43	19.51	20.5	0		
10	64QAM	25	25	19.52	19.39	19.51				
10	64QAM	50	0	19.51	19.45	19.46				
Channel										
Frequency (MHz)										
5	QPSK	1	0	19.59	19.53	19.58				
5	QPSK	1	12	19.47	19.38	19.45	20.5	0		
5	QPSK	1	24	19.46	19.37	19.42				
5	QPSK	12	0	19.52	19.52	19.56				
5	QPSK	12	7	19.56	19.42	19.52	20.5	0		
5	QPSK	12	13	19.53	19.43	19.48				
5	QPSK	25	0	19.53	19.47	19.52				
5	16QAM	1	0	19.49	19.42	19.46				
5	16QAM	1	12	19.35	19.26	19.29	20.5	0		
5	16QAM	1	24	19.37	19.37	19.36				
5	16QAM	12	0	19.16	19.16	19.18				
5	16QAM	12	7	19.60	19.49	19.53	20.5	0		
5	16QAM	12	13	19.56	19.42	19.48				
5	16QAM	25	0	19.55	19.46	19.53				
5	64QAM	1	0	19.39	19.28	19.36				
5	64QAM	1	12	19.27	19.17	19.20	20.5	0		
5	64QAM	1	24	19.25	19.26	19.27				
5	64QAM	12	0	19.19	19.16	19.22				
5	64QAM	12	7	19.59	19.50	19.54	20.5	0		
5	64QAM	12	13	19.56	19.41	19.51				
5	64QAM	25	0	19.58	19.47	19.55				
Channel										
Frequency (MHz)										
3	QPSK	1	0	19.45	19.47	19.52				
3	QPSK	1	8	19.47	19.42	19.49	20.5	0		
3	QPSK	1	14	19.37	19.35	19.44				
3	QPSK	8	0	19.52	19.51	19.51				
3	QPSK	8	4	19.51	19.49	19.51	20.5	0		
3	QPSK	8	7	19.48	19.43	19.50				
3	QPSK	15	0	19.45	19.43	19.52				
3	16QAM	1	0	19.47	19.41	19.50				
3	16QAM	1	8	19.36	19.34	19.37	20.5	0		
3	16QAM	1	14	19.29	19.24	19.36				
3	16QAM	8	0	19.53	19.52	19.54				
3	16QAM	8	4	19.56	19.53	19.57	20.5	0		
3	16QAM	8	7	19.52	19.49	19.51				
3	16QAM	15	0	19.48	19.52	19.53				
3	64QAM	1	0	19.27	19.27	19.25				
3	64QAM	1	8	19.25	19.21	19.25	20.5	0		
3	64QAM	1	14	19.19	19.17	19.23				
3	64QAM	8	0	19.25	19.53	19.36				
3	64QAM	8	4	19.56	19.55	19.56	20.5	0		
3	64QAM	8	7	19.53	19.45	19.53				
3	64QAM	15	0	19.47	19.50	19.50				
Channel										
Frequency (MHz)										
1.4	QPSK	1	0	18.44	18.38	18.45				
1.4	QPSK	1	3	19.45	19.45	19.47	20.5	0		
1.4	QPSK	1	5	19.39	19.38	19.42				
1.4	QPSK	3	0	19.43	19.40	19.44				
1.4	QPSK	3	1	19.50	19.49	19.45	19.5	0		
1.4	QPSK	3	3	19.45	19.40	19.41				
1.4	QPSK	6	0	19.41	19.40	19.44	20.5	0		
1.4	16QAM	1	0	19.36	19.31	19.34				
1.4	16QAM	1	3	19.32	19.43	19.41				
1.4	16QAM	1	5	19.39	19.29	19.27				
1.4	16QAM	3	0	19.49	19.45	19.47	20.5	0		
1.4	16QAM	3	1	19.31	19.49	19.34				
1.4	16QAM	3	3	19.49	19.37	19.42				
1.4	16QAM	6	0	19.53	19.46	19.53	20.5	0		
1.4	64QAM	1	0	19.25	19.26	19.21				
1.4	64QAM	1	3	19.12	19.14	19.22				
1.4	64QAM	1	5	19.18	19.16	19.18	20.5	0		
1.4	64QAM	3	0	19.53	19.50	19.54				
1.4	64QAM	3	1	19.59	19.57	19.59				
1.4	64QAM	3	1	19.26	19.49	19.54	20.5	0		
1.4	64QAM	6	0	19.49	19.44	19.42				



Band 25 (1500MHz Band)										
Part 24E										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Mid Ch. Freq.	Power High Ch. Freq.	Turn-up limit (dBm)	MPR (dB)		
Channel				26140	26340	26550				
Frequency (MHz)				1690	1690	1905				
20	QPSK	1	0	18.10	18.06	18.12			19	0
20	QPSK	1	49	18.08	17.94	18.07				
20	QPSK	1	99	17.82	17.67	17.70				
20	QPSK	50	0	17.76	17.68	17.86				
20	QPSK	50	24	17.74	17.67	17.70				
20	QPSK	50	50	17.68	17.59	17.64				
20	QPSK	100	0	17.71	17.67	17.81				
20	16QAM	1	0	17.97	17.91	17.95			19	0
20	16QAM	1	49	17.91	17.87	17.85				
20	16QAM	1	99	17.51	17.65	17.49				
20	16QAM	50	0	17.76	17.66	17.72				
20	16QAM	50	24	17.73	17.68	17.74			19	0
20	16QAM	50	50	17.68	17.61	17.67				
20	16QAM	100	0	17.70	17.63	17.71				
20	64QAM	1	0	17.95	17.86	17.91				
20	64QAM	1	49	17.88	17.84	17.86			19	0
20	64QAM	1	99	17.43	17.54	17.32				
20	64QAM	50	0	17.73	17.66	17.69				
20	64QAM	50	24	17.73	17.68	17.71			19	0
20	64QAM	50	50	17.66	17.56	17.66				
20	64QAM	100	0	17.68	17.64	17.66				
Channel				26115	26340	26515	Turn-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1697.5	1690	1697.5				
15	QPSK	1	0	17.81	17.58	17.56			19	0
15	QPSK	1	37	17.75	17.49	17.47				
15	QPSK	1	74	17.74	17.67	17.54				
15	QPSK	36	0	17.81	17.73	17.77				
15	QPSK	36	20	17.82	17.76	17.75			19	0
15	QPSK	36	39	17.85	17.79	17.84				
15	QPSK	75	0	17.90	17.73	17.76				
15	16QAM	1	0	17.93	17.94	17.96				
15	16QAM	1	37	17.88	17.91	17.85			19	0
15	16QAM	1	74	17.91	18.01	17.74				
15	16QAM	36	0	17.78	17.73	17.72				
15	16QAM	36	20	17.80	17.74	17.71			19	0
15	16QAM	36	39	17.81	17.77	17.78				
15	16QAM	75	0	17.86	17.71	17.83				
15	64QAM	1	0	17.93	17.85	17.89				
15	64QAM	1	37	17.83	17.71	17.72			19	0
15	64QAM	1	74	17.92	17.80	17.68				
15	64QAM	36	0	17.82	17.75	17.73				
15	64QAM	36	20	17.79	17.76	17.74			19	0
15	64QAM	36	39	17.85	17.78	17.81				
15	64QAM	75	0	17.81	17.75	17.81				
Channel				26500	26340	26500	Turn-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1695	1690	1695				
10	QPSK	1	0	17.82	17.85	17.83			19	0
10	QPSK	1	25	17.72	17.78	17.73				
10	QPSK	1	49	17.91	18.01	17.76				
10	QPSK	25	0	17.74	17.85	17.74				
10	QPSK	25	12	17.73	17.85	17.75			19	0
10	QPSK	25	25	17.75	17.88	17.81				
10	QPSK	50	0	17.73	17.67	17.77				
10	16QAM	1	0	17.84	17.91	17.87			19	0
10	16QAM	1	25	17.94	17.79	17.63				
10	16QAM	1	49	17.86	17.98	17.70				
10	16QAM	25	0	17.76	17.86	17.75				
10	16QAM	25	12	17.75	17.85	17.76			19	0
10	16QAM	25	25	17.75	17.84	17.78				
10	16QAM	50	0	17.78	17.88	17.77				
10	64QAM	1	0	17.70	17.83	17.71			19	0
10	64QAM	1	25	17.80	17.84	17.79				
10	64QAM	1	49	17.74	17.85	17.47				
10	64QAM	25	0	17.74	17.84	17.72				
10	64QAM	25	12	17.72	17.86	17.75			19	0
10	64QAM	25	25	17.77	17.88	17.80				
10	64QAM	50	0	17.74	17.87	17.78				
Channel				26555	26340	26555	Turn-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1692.5	1690	1692.5				
5	QPSK	1	0	17.68	17.75	17.61			19	0
5	QPSK	1	12	17.69	17.79	17.65				
5	QPSK	1	24	17.62	17.79	17.68				
5	QPSK	12	0	17.71	17.85	17.77				
5	QPSK	12	7	17.70	17.80	17.69			19	0
5	QPSK	12	13	17.66	17.77	17.69				
5	QPSK	25	0	17.71	17.83	17.71				
5	16QAM	1	0	17.72	17.88	17.76			19	0
5	16QAM	1	12	17.85	17.79	17.64				
5	16QAM	1	24	17.65	17.75	17.63				
5	16QAM	12	0	17.76	17.91	17.77				
5	16QAM	12	7	17.73	17.85	17.73			19	0
5	16QAM	12	13	17.69	17.79	17.73				
5	16QAM	25	0	17.73	17.84	17.72				
5	64QAM	1	0	17.67	17.76	17.63				
5	64QAM	1	12	17.77	17.91	17.83			19	0
5	64QAM	1	24	17.66	17.83	17.66				
5	64QAM	12	0	17.82	17.91	17.79				
5	64QAM	12	7	17.77	17.86	17.76			19	0
5	64QAM	12	13	17.73	17.83	17.73				
5	64QAM	25	0	17.73	17.83	17.75				
Channel				26555	26340	26575	Turn-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1651.5	1690	1693.5				
3	QPSK	1	0	17.75	17.83	17.72			19	0
3	QPSK	1	8	17.67	17.77	17.66				
3	QPSK	1	14	17.62	17.68	17.62				
3	QPSK	8	0	17.67	17.79	17.66				
3	QPSK	8	4	17.67	17.79	17.68			19	0
3	QPSK	8	7	17.64	17.75	17.65				
3	QPSK	15	0	17.63	17.76	17.68				
3	16QAM	1	0	17.66	17.78	17.71				
3	16QAM	1	8	17.71	17.82	17.71			19	0
3	16QAM	1	14	17.57	17.76	17.66				
3	16QAM	8	0	17.68	17.80	17.70				
3	16QAM	8	4	17.68	17.81	17.71			19	0
3	16QAM	8	7	17.65	17.79	17.67				
3	16QAM	15	0	17.67	17.80	17.68				
3	64QAM	1	0	17.82	17.98	17.88				
3	64QAM	1	8	17.82	17.94	17.82			19	0
3	64QAM	1	14	17.77	17.84	17.77				
3	64QAM	8	0	17.74	17.85	17.75				
3	64QAM	8	4	17.71	17.83	17.73			19	0
3	64QAM	8	7	17.67	17.82	17.68				
3	64QAM	15	0	17.65	17.77	17.67				
Channel				26947	26340	26953	Turn-up limit (dBm)	MPR (dB)		
Frequency (MHz)				1690.7	1690	1694.3				
1.4	QPSK	1	0	17.64	17.72	17.61			19	0
1.4	QPSK	1	3	17.60	17.71	17.64				
1.4	QPSK	1	5	17.55	17.67	17.57				
1.4	QPSK	3	0	17.63	17.71	17.66			19	0
1.4	QPSK	3	1	17.69	17.77	17.62				
1.4	QPSK	3	3	17.64	17.74	17.61				
1.4	QPSK	6	0	17.58	17.71	17.67			19	0
1.4	16QAM	1	0	17.64	17.75	17.63				
1.4	16QAM	1	3	17.65	17.78	17.67				
1.4	16QAM	1	5	17.63	17.71	17.67			19	0
1.4	16QAM	3	0	17.63	17.75	17.60				
1.4	16QAM	3	1	17.63	17.75	17.65				
1.4	16QAM	3	3	17.60	17.70	17.62			19	0
1.4	16QAM	6	0	17.74	17.82	17.72				
1.4	64QAM	1	0	17.80	17.85	17.77				
1.4	64QAM	1	3	17.82	17.92	17.79			19	0
1.4	64QAM	1	5	17.75	17.90	17.77				
1.4	64QAM	3	0	17.73	17.87	17.73				
1.4	64QAM	3	1	17.74	17.87	17.76			19	0
1.4	64QAM	3	3	17.74	17.81	17.74				
1.4	64QAM	6	0	17.69	17.71	17.67			20.5	0

Band 30										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch. Freq.	Power Mid Ch. Freq.	Power High Ch. Freq.	Turn-up limit (dBm)	MPR (dB)		
Channel				27140	27340	27550				
Frequency (MHz)				2310						
10	QPSK	1	0		19.07				20.5	0
10	QPSK	1	25		19.32					
10	QPSK	1	49		19.49					
10	QPSK	25	0		19.11					
10	QPSK	25	12		19.17				20.5	0
10	QPSK	25	25		19.35					
10	QPSK	50	0		19.32					
10	16QAM	1	0		19.42				20.5	0
10	16QAM	1	25		19.21					
10	16QAM	1	49		19.48					
10	16QAM	25	0		19.10					
10	16QAM	25								



Band 38(only on channel required)										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power Middle Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				3750	3850	3950				
Frequency (MHz)				2575	2595	2610				
20	QPSK	1	0	20.17	19.91	19.93	21	0		
20	QPSK	1	49	20.70	20.41	20.57				
20	QPSK	1	99	20.96	20.27	20.37				
20	QPSK	50	0	20.43	20.43	20.42				
20	QPSK	50	24	20.67	20.23	20.25				
20	QPSK	50	50	20.39	20.45	20.54				
20	QPSK	100	0	20.57	20.17	20.18				
20	16QAM	1	0	20.20	19.95	20.23				
20	16QAM	1	49	20.38	20.26	20.30				
20	16QAM	1	99	20.37	20.13	20.20				
20	16QAM	50	0	19.33	19.48	19.47				
20	16QAM	50	24	19.67	19.18	19.18				
20	16QAM	50	50	19.92	19.51	19.59				
20	16QAM	100	0	19.39	19.11	19.22				
20	64QAM	1	0	19.90	19.57	19.62				
20	64QAM	1	49	19.73	19.43	19.46				
20	64QAM	1	99	19.63	19.40	19.48				
20	64QAM	50	0	19.46	19.00	19.39				
20	64QAM	50	24	19.36	19.21	19.12				
20	64QAM	50	50	19.68	19.44	19.49				
20	64QAM	100	0	19.33	19.16	19.18				
Channel				3725	3820	3875				
Frequency (MHz)				2575	2595	2612.5				
15	QPSK	1	0	20.54	20.33	20.40	21	0		
15	QPSK	1	37	20.32	20.10	20.12				
15	QPSK	1	74	20.59	20.33	20.36				
15	QPSK	36	0	20.29	20.16	20.21				
15	QPSK	36	20	20.38	20.24	20.52				
15	QPSK	36	39	20.42	20.45	20.54				
15	QPSK	75	0	20.44	20.15	20.41				
15	16QAM	1	0	20.31	20.28	20.28				
15	16QAM	1	37	20.33	19.93	20.20				
15	16QAM	1	74	20.41	20.26	20.29				
15	16QAM	36	0	19.86	19.24	19.21				
15	16QAM	36	20	19.53	19.33	19.38				
15	16QAM	36	39	19.58	19.20	19.43				
15	16QAM	75	0	19.58	19.42	19.47				
15	64QAM	1	0	19.48	19.22	19.24				
15	64QAM	1	37	19.30	19.52	19.07				
15	64QAM	1	74	19.98	19.32	19.59				
15	64QAM	36	0	19.43	19.31	19.37				
15	64QAM	36	20	19.61	19.30	19.51				
15	64QAM	36	39	19.46	19.22	19.31				
15	64QAM	75	0	19.32	19.25	19.44				
Channel				3700	3800	3820				
Frequency (MHz)				2575	2595	2615				
10	QPSK	1	0	20.69	20.29	20.33	21	0		
10	QPSK	1	25	20.38	20.34	20.56				
10	QPSK	1	49	20.64	20.27	20.39				
10	QPSK	25	0	20.85	20.41	20.49				
10	QPSK	25	12	20.80	20.13	20.58				
10	QPSK	25	25	20.44	20.28	20.62				
10	QPSK	50	0	20.63	20.22	20.64				
10	16QAM	1	0	20.86	20.57	20.54				
10	16QAM	1	25	20.51	20.21	20.59				
10	16QAM	1	49	20.51	20.51	20.65				
10	16QAM	25	0	19.74	19.35	19.22				
10	16QAM	25	12	19.38	19.31	19.21				
10	16QAM	25	25	19.40	19.45	19.44				
10	16QAM	50	0	19.48	19.50	19.38				
10	64QAM	1	0	19.84	19.38	19.71				
10	64QAM	1	25	19.76	19.56	19.70				
10	64QAM	1	49	19.77	19.60	19.74				
10	64QAM	25	0	19.41	19.42	19.50				
10	64QAM	25	12	19.59	19.15	19.59				
10	64QAM	25	25	19.75	19.44	19.55				
10	64QAM	50	0	19.41	19.24	19.53				
Channel				3775	3800	3825				
Frequency (MHz)				2575	2595	2617.5				
5	QPSK	1	0	20.48	20.39	20.55	21	0		
5	QPSK	1	12	20.23	20.29	20.31				
5	QPSK	1	24	20.33	20.13	20.41				
5	QPSK	12	0	20.66	20.18	20.56				
5	QPSK	12	7	20.33	20.33	20.50				
5	QPSK	12	13	20.69	20.24	20.32				
5	QPSK	25	0	20.53	20.16	20.34				
5	16QAM	1	0	20.64	20.42	20.59				
5	16QAM	1	12	20.58	20.54	20.59				
5	16QAM	1	24	20.52	20.34	20.53				
5	16QAM	12	0	19.85	19.21	19.38				
5	16QAM	12	7	19.66	19.26	19.51				
5	16QAM	12	13	19.67	19.16	19.53				
5	16QAM	25	0	19.78	19.21	19.60				
5	64QAM	1	0	19.79	19.36	19.65				
5	64QAM	1	12	19.72	19.89	19.78				
5	64QAM	1	24	19.80	19.53	19.37				
5	64QAM	12	0	19.54	19.28	19.62				
5	64QAM	12	13	19.67	19.29	19.55				
5	64QAM	25	0	19.53	19.54	19.62				

Band 41 (2.6G Band)										
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch./Freq.	Power Middle Ch./Freq.	Power High Ch./Freq.	Tune-up limit (dBm)	MPR (dB)		
Channel				3970	4060	4150				
Frequency (MHz)				2595	2593	2620				
20	QPSK	1	0	20.75	20.90	20.91	22	0		
20	QPSK	1	49	20.63	20.68	20.75				
20	QPSK	1	99	20.30	20.24	20.25				
20	QPSK	50	0	20.27	20.39	20.18				
20	QPSK	50	24	20.59	20.40	20.90				
20	QPSK	50	50	20.10	20.21	20.09				
20	QPSK	100	0	20.35	20.49	20.20				
20	16QAM	1	0	20.81	20.63	20.74				
20	16QAM	1	49	20.14	20.15	20.24				
20	16QAM	1	99	20.71	20.61	20.66				
20	16QAM	50	0	20.50	20.71	20.29				
20	16QAM	50	24	20.54	20.75	20.91				
20	16QAM	50	50	20.39	20.62	20.37				
20	16QAM	100	0	20.84	20.84	20.76				
20	64QAM	1	0	20.73	20.86	20.52				
20	64QAM	1	49	20.95	20.99	20.90				
20	64QAM	1	99	20.40	20.56	20.61				
20	64QAM	50	0	20.83	20.99	20.52				
20	64QAM	50	24	20.91	20.95	20.33				
20	64QAM	50	50	20.77	20.76	20.82				
20	64QAM	100	0	20.78	20.74	20.86				
Channel				3975	4073	4160				
Frequency (MHz)				2593.5	2593	2625.5				
15	QPSK	1	0	20.81	20.63	20.16	22	0		
15	QPSK	1	37	20.50	20.65	20.49				
15	QPSK	1	74	20.39	20.43	20.40				
15	QPSK	36	0	20.92	20.97	20.69				
15	QPSK	36	20	20.97	21.04	20.92				
15	QPSK	36	39	21.01	21.06	21.00				
15	QPSK	75	0	20.94	20.99	20.80				
15	16QAM	1	0	20.50	20.37	20.34				
15	16QAM	1	37	20.58	20.77	20.63				
15	16QAM	1	74	20.21	20.44	20.50				
15	16QAM	36	0	20.82	20.85	20.88				
15	16QAM	36	20	20.90	20.94	20.83				
15	16QAM	36	39	20.98	20.94	20.95				
15	16QAM	75	0	20.89	20.94	20.82				
15	64QAM	1	0	20.19	20.98	20.30				
15	64QAM	1	37	21.07	20.29	20.21				
15										



UL CA

Full Power Head SAR										Tune up Power (dBm)
CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	49	0	0	1	0	23.73	25.00
40185	39987	QPSK	1	49	0	0	1	0	23.31	25.00
40620	40422	QPSK	1	49	0	0	1	0	23.21	25.00
41055	40857	QPSK	1	49	0	0	1	0	23.18	25.00
41490	41292	QPSK	1	49	0	0	1	0	23.25	25.00
Hotspot on Sensor On										Tune up Power (dBm)
CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	100	0	0	0	1	0	19.83	21.00
40185	39987	QPSK	100	0	0	0	1	0	19.69	21.00
40620	40422	QPSK	100	0	0	0	1	0	19.42	21.00
41055	40857	QPSK	100	0	0	0	1	0	19.5	21.00
41490	41292	QPSK	100	0	0	0	1	0	19.56	21.00
Handheld										
CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	50	24	0	0	1	0	20.54	22
40185	39987	QPSK	50	24	0	0	1	0	20.21	22
40620	40422	QPSK	50	24	0	0	1	0	20.57	22
41055	40857	QPSK	50	24	0	0	1	0	20.23	22
41490	41292	QPSK	50	24	0	0	1	0	20.46	22



DL CA Full Power

2CC		DL CA Full Power													
Configure	CA Configuration (BCS)	PCC							SCC				Power		
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)	
Inter-Band	CA_2A-4A	2	20	1860	18700	QPSK	1	0	4	20	2132.5	2175	22.90	22.94	
	CA_2A-5A	2	20	1860	18700	QPSK	1	0	5	10	881.5	2525	22.87	22.94	
	CA_2A-7A	2	20	1860	18700	QPSK	1	0	7	20	2655	3100	22.89	22.94	
	CA_2A-12A	2	20	1860	18700	QPSK	1	0	12	10	737.5	5095	22.91	22.94	
	CA_2A-13A	2	20	1860	18700	QPSK	1	0	13	10	751	5230	22.88	22.94	
	CA_2A-14A	2	20	1860	18700	QPSK	1	0	14	10	763	5330	22.83	22.94	
	CA_2A-17A	2	10	1855	18650	QPSK	1	0	17	10	740	5790	22.72	22.81	
	CA_2A-29A	2	20	1860	18700	QPSK	1	0	29	10	722.5	9715	22.84	22.94	
	CA_2A-30A	2	20	1860	18700	QPSK	1	0	30	10	2355	9820	22.78	22.94	
	CA_2A-66A	2	20	1860	18700	QPSK	1	0	66	20	2155	66886	22.90	22.94	
	CA_2A-71A	2	20	1860	18700	QPSK	1	0	71	20	637	68786	22.69	22.94	
	CA_4A-5A	4	20	1732.5	20175	QPSK	1	99	5	10	881.5	2525	22.67	22.98	
	CA_4A-7A	4	20	1732.5	20175	QPSK	1	99	7	20	2655	3100	22.67	22.98	
	CA_4A-12A	4	20	1732.5	20175	QPSK	1	99	12	10	737.5	5095	22.74	22.98	
	CA_4A-13A	4	20	1732.5	20175	QPSK	1	99	13	10	751	5230	22.69	22.98	
	CA_4A-17A	4	10	1732.5	20175	QPSK	1	0	17	10	740	5790	22.40	22.98	
	CA_4A-30A	4	20	1732.5	20175	QPSK	1	99	29	10	722.5	9715	22.74	22.98	
	CA_4A-30A	4	20	1732.5	20175	QPSK	1	99	30	10	2355	9820	22.91	22.98	
	CA_4A-71A	4	20	1732.5	20175	QPSK	1	99	71	20	637	68786	22.58	22.98	
	CA_5A-7A	5	10	836.5	20525	QPSK	1	49	7	20	2655	3100	22.77	23.01	
	CA_5A-30A	5	10	836.5	20525	QPSK	1	49	30	10	2355	9820	22.98	23.01	
	CA_5A-66A	5	10	836.5	20525	QPSK	1	49	66	20	2155	66886	22.93	23.01	
	CA_7A-12A	7	20	2560	21350	QPSK	1	99	12	10	737.5	5095	23.04	23.46	
	CA_7A-66A	7	20	2560	21350	QPSK	1	99	66	20	2155	66886	23.05	23.46	
	CA_12A-30A	12	10	707.5	23095	QPSK	1	0	30	10	2355	9820	22.86	22.90	
	CA_12A-66A	12	10	707.5	23095	QPSK	1	0	66	20	2155	66886	22.75	22.90	
	CA_13A-66A	13	10	782	23230	QPSK	1	0	66	20	2155	66886	22.56	22.63	
	CA_14A-30A	14	10	793	23330	QPSK	1	49	30	10	2355	9820	22.65	22.72	
	CA_14A-66A	14	10	793	23330	QPSK	1	49	66	20	2155	66886	22.68	22.72	
	CA_25A-26A	25	20	1905	26590	QPSK	1	0	26	15	876.5	8865	22.78	22.93	
CA_25A-41A	25	20	1905	26590	QPSK	1	0	41	20	2593	40620	22.82	22.93		
CA_26A-41A	26	15	831.5	26865	QPSK	1	74	41	20	2593	40620	22.50	23.08		
CA_29A-30A	30	10	2310	27710	QPSK	1	0	29	10	722.5	9715	22.71	22.92		
CA_29A-66A	66	20	1770	132572	QPSK	1	99	29	10	722.5	9715	23.15	23.36		
CA_30A-66A	30	10	2310	27710	QPSK	1	0	66	20	2155	66886	22.87	22.92		
CA_66A-71A	66	20	1770	132572	QPSK	1	99	71	20	637	68786	23.23	23.36		
Inter-Band	Non-Contiguous	CA_2A-2A	2	20	1860	18700	QPSK	1	0	2	5	1987.5	1175	22.87	22.94
		CA_4A-4A	4	20	1732.5	20175	QPSK	1	99	4	5	2152.5	2375	22.53	22.98
		CA_7A-7A	7	20	2560	21350	QPSK	1	99	7	5	2622.5	2775	23.01	23.46
		CA_25A-25A	25	20	1905	26590	QPSK	1	0	25	5	1932.5	8065	22.77	22.93
		CA_41A-41A	41	20	2680	39750	QPSK	1	49	41	5	2498.5	41565	23.91	24.02
	CA_66A-66A	66	20	1770	132572	QPSK	1	99	66	5	2112.5	66461	23.19	23.36	
	Contiguous	CA_2C	2	20	1860	18700	QPSK	1	0	2	20	1959.80	898	22.82	22.94
		CA_5B	5	10	836.5	20501	QPSK	1	49	5	10	891.40	20600	22.75	23.01
		CA_7C	7	20	2560	21350	QPSK	1	99	7	20	2660.20	3152	22.97	23.46
		CA_12B	12	5	707.5	23058	QPSK	1	0	12	10	744.70	23130	22.78	22.90
		CA_38C	38	20	2580	37850	QPSK	1	99	38	20	2599.80	38048	23.17	23.29
		CA_41C	41	20	2680	39750	QPSK	1	49	41	20	2660.20	39948	23.78	24.02
CA_66B		66	15	1772.5	132597	QPSK	1	74	66	5	2188.20	67218	23.08	23.14	
CA_66C	66	20	1770	132072	QPSK	1	99	66	20	2170.20	132270	23.25	23.36		



Bluetooth BR/EDR

Mode	Channel	Frequency (MHz)	Average power (dBm)									Tune-up Limit
			Packet Type									
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5	
Bluetooth	CH 0	2402	8.20	8.24	8.32	6.27	5.69	5.22	6.25	5.51	5.34	10
	CH 39	2441	8.92	8.94	9.31	6.71	6.51	5.86	6.66	6.10	5.91	
	CH 78	2480	8.47	8.77	9.19	7.32	6.82	6.55	6.86	6.57	6.24	

Bluetooth LE

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	2.45
	CH 19	2440	3.49
	CH 39	2480	4.56
Tune-up Limit			5

Bluetooth LE v5.0

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402		2.82
	CH 19	2440		3.57
	CH 39	2480		4.70
Tune-up Limit				5



Full Power

2.4GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11b 1Mbps	1	2412	21.07	22.50	100.00	
	6	2437	20.94	22.50		
	11	2462	21.11	22.50		
802.11g 6Mbps	1	2412	19.03	20.50	98.28	
	6	2437	18.90	20.50		
	11	2462	19.19	20.50		
802.11n-HT20 MCS0	1	2412	18.87	20.50	98.15	
	6	2437	18.77	20.50		
	11	2462	19.10	20.50		

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	36	5180	17.22	19.00	98.28	
	40	5200	17.97	19.50		
	44	5220	17.90	19.50		
	48	5240	17.87	19.50		
802.11n-HT20 MCS0	36	5180	16.30	18.00	98.16	
	40	5200	16.75	18.50		
	44	5220	16.67	18.50		
	48	5240	16.81	18.50		
802.11n-HT40 MCS0	38	5190	10.85	12.50	96.76	
	46	5230	16.23	18.00		
802.11ac-VHT20 MCS0	36	5180	16.34	18.00	98.01	
	40	5200	16.98	18.50		
	44	5220	16.88	18.50		
802.11ac-VHT40 MCS0	38	5190	10.80	12.50	96.47	
	46	5230	15.75	17.50		
802.11ac-VHT80 MCS0	42	5210	10.42	12.00	93.08	

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	52	5260	17.80	19.50	98.28	
	56	5280	17.84	19.50		
	60	5300	17.91	19.50		
	64	5320	17.88	19.50		
802.11n-HT20 MCS0	52	5260	16.81	18.50	98.16	
	56	5280	16.92	18.50		
	60	5300	17.00	18.50		
	64	5320	16.95	18.50		
802.11n-HT40 MCS0	54	5270	16.43	18.00	96.76	
	62	5310	15.26	17.00		
	52	5260	16.85	18.50		
802.11ac-VHT20 MCS0	56	5280	16.95	18.50	98.01	
	60	5300	16.92	18.50		
	64	5320	16.98	18.50		
	54	5270	15.72	17.50		
802.11ac-VHT40 MCS0	62	5310	15.89	17.50	96.47	
	58	5290	14.54	16.50		

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	100	5500	17.91	19.50	98.28	
	116	5580	17.94	19.50		
	132	5660	18.17	19.50		
	140	5700	18.10	19.50		
802.11n-HT20 MCS0	100	5500	16.72	18.50	98.16	
	116	5580	16.96	18.50		
	132	5660	16.92	18.50		
	140	5700	16.86	18.50		
802.11n-HT40 MCS0	102	5510	16.37	18.00	96.76	
	110	5550	16.35	18.00		
	134	5670	15.75	17.50		
802.11ac-VHT20 MCS0	100	5500	16.90	18.50	98.01	
	116	5580	16.98	18.50		
	132	5660	17.04	18.50		
	140	5700	16.91	18.50		
802.11ac-VHT40 MCS0	102	5510	15.67	17.50	96.47	
	110	5550	15.62	17.50		
	134	5670	15.85	17.50		
802.11ac-VHT80 MCS0	106	5530	14.00	15.00	93.08	

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	149	5745	15.87	17.50	98.28	
	157	5785	15.44	16.50		
	165	5825	15.24	16.50		
802.11n-HT20 MCS0	149	5745	15.70	17.50	98.16	
	157	5785	15.29	16.50		
	165	5825	15.07	16.50		
802.11n-HT40 MCS0	151	5755	14.57	16.50	96.76	
	159	5795	14.13	15.50		
802.11ac-VHT20 MCS0	149	5745	15.70	17.50	98.01	
	157	5785	15.30	16.50		
	165	5825	15.11	16.50		
802.11ac-VHT40 MCS0	151	5755	14.64	16.50	96.47	
	159	5795	14.18	15.50		
802.11ac-VHT80 MCS0	155	5775	14.79	16.50	93.08	



Reduced Power Mode for Head

2.4GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.26	20.00	100.00
		6	2437	18.21	20.00	
		11	2462	18.31	20.00	
	802.11g 6Mbps	1	2412	18.60	20.00	98.28
		6	2437	18.70	20.00	
		11	2462	18.91	20.00	
	802.11n-HT20 MCS0	1	2412	18.46	20.00	98.15
		6	2437	18.48	20.00	
		11	2462	18.70	20.00	



Reduced Power Mode for Hotspot On

2.4GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11b 1Mbps	1	2412	19.49	21.00	100.00	
	6	2437	19.28	21.00		
	11	2462	19.64	21.00		
802.11g 6Mbps	1	2412	19.03	20.50	98.28	
	6	2437	18.90	20.50		
	11	2462	19.19	20.50		
802.11n-HT20 MCS0	1	2412	18.87	20.50	98.15	
	6	2437	18.77	20.50		
	11	2462	19.10	20.50		

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	36	5180	9.69	11.00	98.28	
	40	5200	9.56	11.00		
	44	5220	9.66	11.00		
	48	5240	9.53	11.00		
802.11n-HT20 MCS0	36	5180	8.44	10.00	98.16	
	40	5200	8.40	10.00		
	44	5220	8.37	10.00		
802.11n-HT40 MCS0	38	5190	7.88	9.50	96.76	
	46	5230	8.06	9.50		
802.11ac-VHT20 MCS0	36	5180	8.54	10.00	98.01	
	40	5200	8.40	10.00		
	44	5220	8.33	10.00		
802.11ac-VHT40 MCS0	38	5190	7.44	9.00	96.47	
	46	5230	7.70	9.00		
802.11ac-VHT80 MCS0	42	5210	7.80	9.50	93.08	

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	149	5745	9.69	11.00	98.28	
	157	5785	8.73	10.00		
	165	5825	8.89	10.00		
802.11n-HT20 MCS0	149	5745	9.27	11.00	98.16	
	157	5785	8.91	10.00		
	165	5825	8.72	10.00		
802.11n-HT40 MCS0	151	5755	8.19	9.50	96.76	
	159	5795	7.56	8.50		
802.11ac-VHT20 MCS0	149	5745	9.37	11.00	98.01	
	157	5785	8.75	10.00		
	165	5825	8.61	10.00		
802.11ac-VHT40 MCS0	151	5755	8.31	9.50	96.47	
	159	5795	7.57	8.50		
802.11ac-VHT80 MCS0	155	5775	8.23	9.50	93.08	



Reduced Power Mode for P-Sensor On

2.4GHz WLAN		Ant 1				
Mode	Channel	Frequency (Mhz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11b 1Mbps	1	2412	20.09	21.50	100.00	
	6	2437	20.05	21.50		
	11	2462	20.12	21.50		
802.11g 6Mbps	1	2412	19.03	20.50	98.28	
	6	2437	18.90	20.50		
	11	2462	19.19	20.50		
802.11n-HT20 MCS0	1	2412	18.87	20.50	98.15	
	6	2437	18.77	20.50		
	11	2462	19.10	20.50		

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (Mhz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	36	5180	9.69	11.00	98.28	
	40	5200	9.56	11.00		
	44	5220	9.66	11.00		
	48	5240	9.53	11.00		
802.11n-HT20 MCS0	36	5180	8.44	10.00	98.16	
	40	5200	8.40	10.00		
	44	5220	8.37	10.00		
	48	5240	8.56	10.00		
802.11n-HT40 MCS0	38	5190	7.88	9.50	96.76	
	46	5230	8.06	9.50		
802.11ac-VHT20 MCS0	36	5180	8.54	10.00	98.01	
	40	5200	8.40	10.00		
	44	5220	8.33	10.00		
802.11ac-VHT40 MCS0	48	5240	8.38	10.00	96.47	
	38	5190	7.44	9.00		
802.11ac-VHT80 MCS0	46	5230	7.57	9.00	93.08	
	42	5210	7.80	9.50		

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (Mhz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	52	5260	9.17	11.00	98.28	
	56	5280	9.22	11.00		
	60	5300	9.55	11.00		
	64	5320	9.41	11.00		
802.11n-HT20 MCS0	52	5260	8.11	10.00	98.16	
	56	5280	8.37	10.00		
	60	5300	8.40	10.00		
	64	5320	8.62	10.00		
802.11n-HT40 MCS0	54	5270	8.10	9.50	96.76	
	62	5310	8.38	9.50		
802.11ac-VHT20 MCS0	52	5260	8.44	10.00	98.01	
	56	5280	8.45	10.00		
	60	5300	8.56	10.00		
	64	5320	8.67	10.00		
802.11ac-VHT40 MCS0	54	5270	7.33	9.00	96.47	
	62	5310	7.59	9.00		
802.11ac-VHT80 MCS0	58	5290	8.65	9.50	93.08	

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (Mhz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	100	5500	9.99	11.50	98.28	
	116	5580	10.06	11.50		
	132	5660	10.09	11.50		
	140	5700	10.11	11.50		
802.11n-HT20 MCS0	100	5500	9.24	10.50	98.16	
	116	5580	9.55	10.50		
	132	5660	9.36	10.50		
	140	5700	9.30	10.50		
802.11n-HT40 MCS0	102	5510	8.89	10.00	96.76	
	110	5550	8.83	10.00		
	134	5670	8.55	9.50		
802.11ac-VHT20 MCS0	100	5500	9.50	10.50	98.01	
	116	5580	9.60	10.50		
	132	5660	9.60	10.50		
	140	5700	9.58	10.50		
802.11ac-VHT40 MCS0	102	5510	8.22	9.50	96.47	
	110	5550	8.20	9.50		
	134	5670	8.30	9.50		
802.11ac-VHT80 MCS0	106	5530	6.70	7.00	93.08	

5GHz WLAN		Ant 1				
Mode	Channel	Frequency (Mhz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	
802.11a 6Mbps	149	5745	9.69	11.00	98.28	
	157	5785	8.73	10.00		
	165	5825	8.89	10.00		
802.11n-HT20 MCS0	149	5745	9.27	11.00	98.16	
	157	5785	8.91	10.00		
	165	5825	8.72	10.00		
802.11n-HT40 MCS0	151	5755	8.19	9.50	96.76	
	159	5795	7.56	8.50		
802.11ac-VHT20 MCS0	149	5745	9.37	11.00	98.01	
	157	5785	8.75	10.00		
	165	5825	8.61	10.00		
802.11ac-VHT40 MCS0	151	5755	8.31	9.50	96.47	
	159	5795	7.57	8.50		
802.11ac-VHT80 MCS0	155	5775	8.23	9.50	93.08	



Appendix F. Supplemental Tuner Head & Body SAR Results

The results are shown as follows.



RF exposure position											Aperture 00											
											Average Value of Time Sweep (W/kg)											
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	0	14	28	42	56	70	84	98	112	126	140	
WCDMA V	RMC 12.2Hpa	Full Power	4233	841.6	NA	NA	Right Cheek	0mm	0.323	Auto-Tune	0.460	0	0.217	0.126	0.185	0.061	0.171	0.07	0.204	0.048	0	0.084
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	1	15	29	43	57	71	85	99	113	127	141	
WCDMA IV	RMC 12.2Hpa	Full Power	1412	1732.6	NA	NA	Left Cheek	0mm	0.113	Auto-Tune	0.166	0.046	0.052	0	0	0	0	0	0	0	0	0
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	2	16	30	44	58	72	86	100	114	128	142	
WCDMA II	RMC 12.2Hpa	Full Power	9538	1907.6	NA	NA	Left Cheek	0mm	0.136	Auto-Tune	0.211	0	0	0.059	0	0.055	0	0.069	0	0.056	0	0
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	3	17	31	45	59	73	87	101	115	129	143	
CDMA2000 BC0	RC3 S055	Full Power	1013	824.7	NA	NA	Right Cheek	0mm	0.297	Auto-Tune	0.381	0.088	0.233	0.228	0	0.134	0	0.107	0.134	0.083	0	0.042
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	4	18	32	46	60	74	88	102	116	130		
CDMA2000 BC10	RC3 S055	Full Power	580	820.5	NA	NA	Right Cheek	0mm	0.377	Auto-Tune	0.478	0.134	0.077	0.227	0.047	0.139	0	0.116	0.159	0.12	0.063	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	5	19	33	47	61	75	89	103	117	131		
CDMA2000 BC1	RC3 S055	Full Power	1175	1053.75	NA	NA	Left Cheek	0mm	0.093	Auto-Tune	0.143	0	0	0.048	0.052	0.042	0.051	0.063	0.046	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	6	20	34	48	62	76	90	104	118	132		
LTE Band 71	20M-QPSK	Full Power	19332	853	1	99	Right Cheek	0mm	0.297	Auto-Tune	0.375	0.088	0	0	0.097	0	0.013	0	0.041	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	7	21	35	49	63	77	91	105	119	133		
LTE Band 12	10M-QPSK	Full Power	23005	707.5	1	0	Right Cheek	0mm	0.292	Auto-Tune	0.354	0.083	0.07	0	0.058	0	0	0	0	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	8	22	36	50	64	78	92	106	120	134		
LTE Band 13	10M-QPSK	Full Power	23230	782	1	0	Right Cheek	0mm	0.325	Auto-Tune	0.406	0.122	0.169	0	0.088	0	0.062	0.167	0.059	0.049	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	9	23	37	51	65	79	93	107	121	135		
LTE Band 14	10M-QPSK	Full Power	23330	790	1	49	Right Cheek	0mm	0.202	Auto-Tune	0.252	0.088	0.155	0	0.07	0.109	0.066	0.059	0	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	10	24	38	52	66	80	94	108	122	136		
LTE Band 5	10M-QPSK	Full Power	20525	836.5	1	49	Right Cheek	0mm	0.315	Auto-Tune	0.402	0	0.183	0	0.107	0.093	0.168	0.061	0	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	11	25	39	53	67	81	95	109	123	137		
LTE Band 26	15M-QPSK	Full Power	20915	838.5	1	74	Right Cheek	0mm	0.408	Auto-Tune	0.526	0.08	0.273	0.076	0.235	0.161	0	0.115	0	0.071	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	12	26	40	54	68	82	96	110	124	138		
LTE Band 25	20M-QPSK	Full Power	26590	1905	1	0	Left Cheek	0mm	0.0982	Auto-Tune	0.149	0	0	0	0	0.051	0	0.06	0	0	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	13	27	41	55	69	83	97	111	125	139		
LTE Band 86	20M-QPSK	Full Power	13232	1746	1	99	Left Cheek	0mm	0.105	Auto-Tune	0.154	0.052	0.047	0	0	0	0	0	0	0	0	

Head



RF exposure position											Aperture 00											
											Average Value of Time Sweep (W/kg)											
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	0	14	28	42	56	70	84	98	112	126	140	
WCDMA V	RMC 12.2Kbps	sensor	4233	182.5	NA	NA	Back	5mm	1.11	Auto-Tune	2.31	0.163	0.573	0	0.509	0.55	0.538	0.165	0.61	0.13	0	0.243
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	1	15	29	43	57	71	85	99	113	127	141	
WCDMA IV	RMC 12.2Kbps	sensor	1519	1752.6	NA	NA	Front	5mm	1.10	Auto-Tune	2.07	0.746	0.684	0.404	0.539	0.527	0.13	0.185	0.255	0.131	0.087	0.067
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	2	16	30	44	58	72	86	100	114	128	142	
WCDMA II	RMC 12.2Kbps	sensor	9538	1907.6	NA	NA	Front	5mm	1.11	Auto-Tune	3.34	0.593	1.01	0.838	0.556	0.35	1.01	0.458	0.804	0.271	0.273	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	3	17	31	45	59	73	87	101	115	129	143	
CDMA2000 8Q	RC3 SOSI(F+SC)H	Full power	1013	824.7	NA	NA	Back	5mm	1.13	Auto-Tune	2.21	0.331	0.668	0.853	0.674	0.672	0	0.451	0.331	0.3	0.187	0.249
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	4	18	32	46	60	74	88	102	116	130		
CDMA2000 8C10	RC3 SOSI(F+SC)H	Full power	580	820.5	NA	NA	Back	5mm	1.01	Auto-Tune	2.17	0.451	0.171	0.85	0.127	0.125	0.082	0.454	0.5	0.449	0.241	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	5	19	33	47	61	75	89	103	117	131		
CDMA2000 8C1	RC3 SOSI(F+SC)H	sensor	800	1085	NA	NA	Front	5mm	1.14	Auto-Tune	2.42	0.476	0.745	1.1	0.883	0.863	0.87	0.841	0.411	0.108	0.324	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	6	20	34	48	62	76	90	104	118	132		
LTE Band 71	20M-QPSK	Full power	13322	883	1	99	Back	5mm	0.741	Auto-Tune	1.63	0.521	0.596	0.139	0.385	0.287	0.886	0	0.183	0	0.042	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	7	21	35	49	63	77	91	105	119	133		
LTE Band 12	10M-QPSK	Full power	23955	707.5	1	0	Back	5mm	0.707	Auto-Tune	1.44	0.363	0.342	0.337	0.238	0.234	0.14	0	0.122	0.103	0.064	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	8	22	36	50	64	78	92	106	120	134		
LTE Band 13	10M-QPSK	Full power	23220	782	1	0	Back	5mm	0.904	Auto-Tune	1.94	0.57	0.569	0.061	0.327	0.331	0.242	0.388	0.244	0.166	0.134	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	9	23	37	51	65	79	93	107	121	135		
LTE Band 14	10M-QPSK	Full power	23330	793	1	49	Back	5mm	0.718	Auto-Tune	1.5	0.212	0.49	0.548	0.274	0.274	0.241	0.156	0.134	0.092	0	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	10	24	38	52	66	80	94	108	122	136		
LTE Band 5	10M-QPSK	Full power	25525	636.5	1	49	Back	5mm	1.17	Auto-Tune	2.29	0.165	0.734	0.658	0.498	0.565	0.758	0.229	0	0.153	0.041	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	11	25	39	53	67	81	95	109	123	137		
LTE Band 26	15M-QPSK	sensor	26915	826.5	1	74	Front	5mm	1.55	Auto-Tune	2.23	0.193	0.731	0.2	0.761	0.788	0	0.326	0	0.268	0.079	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	12	26	40	54	68	82	96	110	124	138		
LTE Band 25	20M-QPSK	sensor	26340	1890	50	0	Front	5mm	0.914	Auto-Tune	1.95	0.836	0.757	0.869	0.945	0.55	0.966	0.750	0.202	0.301	0.16	
Band	Mode	Power Reduction	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Auto-Tune	13	27	41	55	69	83	97	111	125	139		
LTE Band 66	20M-QPSK	hotspot	13232	1745	1	99	bottom side	5mm	1.3	Auto-Tune	2.55	0.964	0.758	0.734	0.405	0.415	0.118	0.291	0.177	0.148	0.107	

Body

