HAC TEST REPORT

Applicant	TCL Communication Ltd.
FCC ID	2ACCJH107
Product	LTE/UMTS/GSM mobile phone
Brand	alcatel
Model	5048A
Report No.	R1908A0473-H1
Issue Date	August 29, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ANSI C63.19-2011.** The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Yu Wang

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Table of Contents

1 Test Laboratory 3
1.1 Notes of the Test Report 3
1.2 Test facility 3
1.3 Testing Location 4
1.4 Laboratory Environment 4
2 Statement of Compliance 5
3 Description of Equipment under Test 6
4 Test Specification and Operational Conditions 9
4.1 Test Specification 9
5 Test Information 10
5.1 Operational Conditions during Test 10
5.1.1 General Description of Test Procedures 10
5.2 HAC RF Measurements System Configuration 10
5.2.1 HAC Measurement Set-up 10
5.2.2 Probe System 11
5.2.3 Test Arch Phantom & Phone Positioner 12
5.3 RF Test Procedures 13
5.4 System Check 15
5.5 Modulation Interference Factor 16
5.6 Justification of Held to Ear Modes Tested 17
5.6.1 Analysis of RF Air Interface Technologies 17
5.6.2 Average Antenna Input Power & Evaluation for Low-power Exemption 17
6 Test Results 18
6.1 ANSI C63.19-2011 Limits 18
6.2 Summary Test Results 19
7 Measurement Uncertainty 20
8 Main Test Instruments 21
ANNEX A: System Check Results 22
ANNEX B: Graph Results 24
ANNEX C: E-Probe Calibration Certificate 36
ANNEX D: CD835V3 Dipole Calibration Certificate 75
ANNEX E: CD1880V3 Dipole Calibration Certificate 80
ANNEX F: DAE4 Calibration Certificate 85
ANNEX G: The EUT Appearances and Test Configuration 90

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

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1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
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E-mail:	xukai@ta-shanghai.com

1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 28 °C
Relative humidity	Min. = 0%, Max. = 80%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

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2 Statement of Compliance

Table 2.1: The Total M-rating of each tested band

Mode	Rating
GSM 850	**M4**
GSM 1900	**M4**
WCDMA Band II	**M4**
WCDMA Band IV	**M4**
WCDMA Band V	**M4**
Date of Testing: August 4, 2019	
Note: Refer to section 7 Evaluation for Low-power Exemption. RF Emission testing for this device is required only for GSM voice modes.	

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3 Description of Equipment under Test

Client Information

Applicant	TCL Communication Ltd.
Applicant address	7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China
Manufacturer	TCL Communication Ltd.
Manufacturer address	7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China

General Technologies

Device Type:	Portable Device	
State of Sample:	Prototype Unit	
Model:	5048A	
IMEI:	358343100000068	
Hardware Version:	PIO	
Software Version:	v2B54	
Antenna Type:	Internal Antenna	
Power Class:	GSM 850: 4 GSM 1900: 1 WCDMA Band II/IV/V: 3 LTE FDD 2/4/5/7/12/13/17/28/66:3	
Power Level	GSM 850: level 5 GSM 1900: level 0 WCDMA Band II/IV/V: All up bits LTE FDD 2/4/5/7/12/13/17/28/66: max power	
Test Modulation:	(GSM)GMSK;(WCDMA) QPSK;(CDMA) QPSK; (LTE) QPSK, 16QAM;	
Operating Frequency Range(s):	**Mode**	**Tx (MHz)**
	GSM 850	824 ~ 849
	GSM 1900	1850 ~ 1910
	WCDMA Band II	1850 ~ 1910
	WCDMA Band IV	1710 ~ 1755
	WCDMA Band V	824 ~ 849
	LTE FDD 2	1850 ~ 1910
	LTE FDD 4	1710 ~ 1755
	LTE FDD 5	824 ~ 849
	LTE FDD 7	2500 ~ 2570
	LTE FDD 12	699 ~ 716

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	LTE FDD 13	777 ~ 787
	LTE FDD 17	704 ~ 716
	LTE FDD 28	703 ~ 748
	LTE FDD 66	1710 ~ 1780
	Wi-Fi 2.4G	2412 ~ 2462
	BT	2402 ~2480
Accessory Equipment		
Battery	Manufacturer: Ningbo Veken Battery Co., Ltd. Model: TLp038C7(CAC3860014C7)	

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Air-Interface	Band (MHz)	Type	ANSI C63.19 tested	Simultaneous Transmissions	Voice over Digital Transport OTT Capability	Name of Voice Service	Power Reduction
GSM	850	VO	Yes	Yes BT or Wi-Fi	N/A	#	No
	1900						
	GPRS/EGPRS	DT	No		No		
WCDMA	Band II	VO	Yes	Yes BT or Wi-Fi	N/A	#	No
	Band IV						
	Band V						
	HSPA	DT	No		No		
LTE	Band 2	DT	No	Yes BT or Wi-Fi	N/A	NA	No
	Band 4						
	Band 5						
	Band 7						
	Band 12						
	Band 13						
	Band 17						
	Band 28						
	Band 66						
Wi-Fi	2450	DT	No	Yes GSM, WCDMA, LTE,	N/A	NA	No
Bluetooth (BT)	2450	DT	No	Yes GSM, WCDMA, LTE,	N/A	NA	No

VO= legacy Cellular Voice Service from Table 7.1 in 7.4.2.1 of ANSI C63.19-2011
DT= Digital Transport only (no voice)
VD= IP voice service over digital transport.
#: Ref Lev in accordance with 7.4.2.1 of ANSI C63.19-2011
Remark:
1. It applies the low power exemption based on ANSI C63.19-2011
2. This device has NO VOIP function for LTE and WLAN.

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4 Test Specification and Operational Conditions

4.1 Test Specification

The tests documented in this report were performed in accordance with the following:

FCC CFR47 Part 20.19
ANSI C63.19-2011
285076 D01 HAC Guidance v05
285076 D02 T-Coil Testing v03

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5 Test Information

5.1 Operational Conditions during Test

5.1.1 General Description of Test Procedures

The phone was tested in all normal configurations for the ear use. The EUT is mounted in the device holder equivalent as for classic dosimeter measurements. The acoustic output of the EUT shall coincide with the center point of the area formed by the dielectric wire and the middle bar of the arch's top frame The EUT shall be moved vertically upwards until it touches the frame. The fine adjustment is possible by sliding the complete. The EUT holder is on the yellow base plate of the Test Arch phantom. These test configurations are tested at the high, middle and low frequency channels of each applicable operating mode.

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The EUT is commanded to operate at maximum transmitting power.

5.2 HAC RF Measurements System Configuration

5.2.1 HAC Measurement Set-up

These measurements are performed using the DASY5 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Stäubli), robot controller, Intel Core2 computer, near-field probe, probe alignment sensor. The robot is a six-axis industrial robot performing precise movements. Cell controller systems contain the power supply, robot controller, teach pendant (Joystick) and remote control, and are used to drive the robot motors. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification; signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

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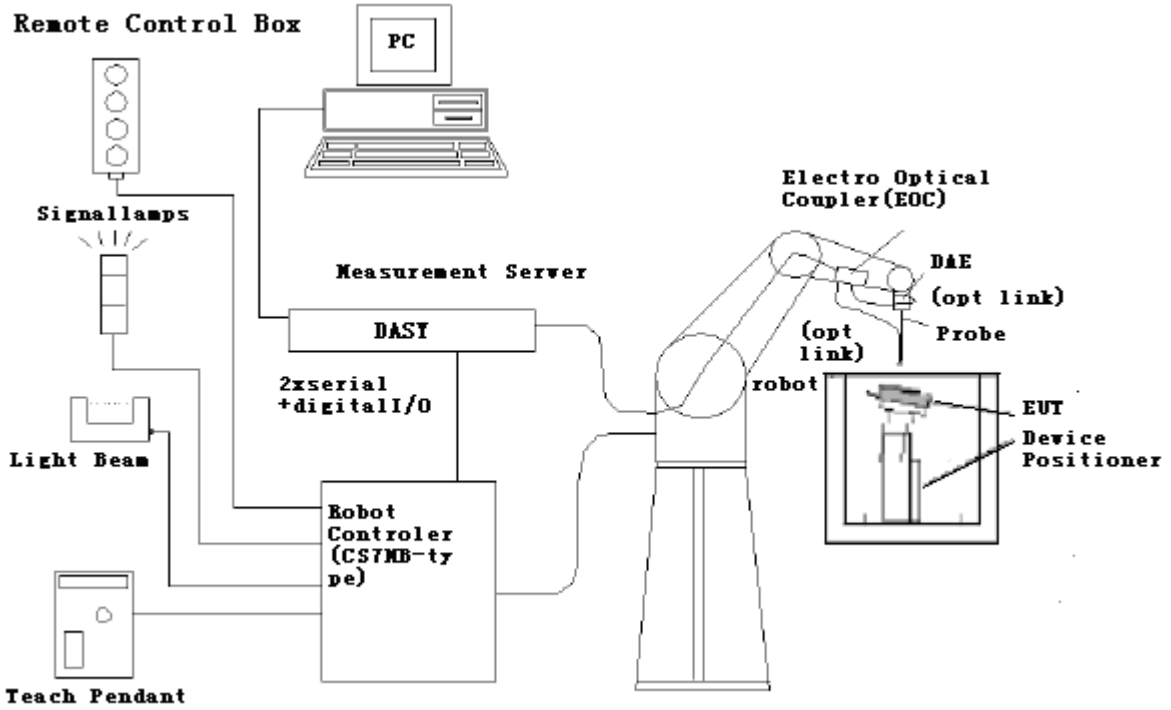

Figure 1 HAC Test Measurement Set-up

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

5.2.2 Probe System

The HAC measurements were conducted with the E-Field Probe ER3DV6 and the H-Field Probe H3DV6 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

E-Field Probe Description

Construction	One dipole parallel, two dipoles normal to probe axis Built-in shielding against static charges PEEK enclosure material
Calibration	In air from 100 MHz to 3.0 GHz (absolute accuracy ±6.0%, k=2)
Frequency	40 MHz to > 6 GHz (can be extended to < 20 MHz) Linearity: ± 0.2 dB (100 MHz to 3 GHz)

Figure 2 ER3DV6 E-field

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Directivity	± 0.2 dB in air (rotation around probe axis) ± 0.4 dB in air (rotation normal to probe axis)	**Probe**
Dynamic Range	2 V/m to > 1000 V/m; Linearity: ± 0.2 dB	
Dimensions	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.5 mm	
Application	General near-field measurements up to 6 GHz Field component measurements Fast automatic scanning in phantoms	

5.2.3 Test Arch Phantom & Phone Positioner

The Test Arch phantom should be positioned horizontally on a stable surface. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. It enables easy and well defined positioning of the phone and validation dipoles as well as simple teaching of the robot (Dimensions: 370 x 370 x 370 mm).
The Device reference point is set for the EUT at 6.3 mm, the Grid reference point is on the upper surface at the origin of the coordinates, and the “user point \Height Check 0.5 mm” is 0.5mm above the center, allowing verication of the gap of 0.5mm while the probe is positioned there.

The Phone Positioner supports accurate and reliable positioning of any phone with effect on near field <±0.5 dB.

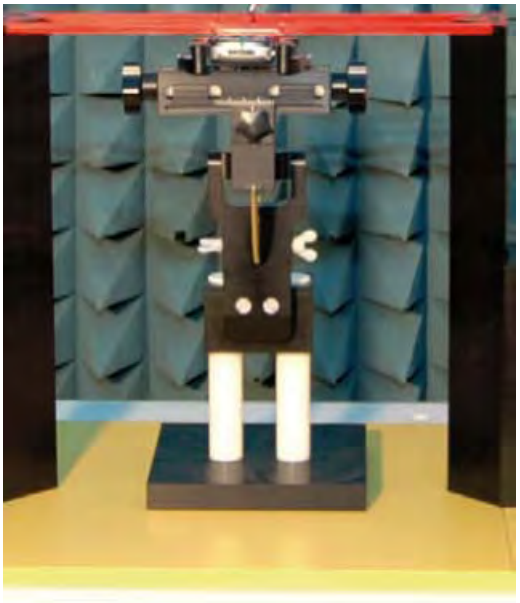

Figure 3 HAC Phantom & Device Holder

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5.3 RF Test Procedures

The evaluation was performed with the following procedure:

1. Confirm proper operation of the field probe, probe measurement system and other instrumentation and the positioning system.
2. Position the WD in its intended test position. The gauge block can simplify this positioning. Note that a separate E-field gauge block will be needed if the center of the probe sensor elements is at different distances from the tip of the probe.
3. Configure the WD normal operation for maximum rated RF output power, at the desired channel and other operating parameters (e.g., test mode), as intended for the test.
4. The center sub-grid shall center on the center of the axial measurement point or the acoustic output, as appropriate. Locate the field probe at the initial test position in the 50 mm by 50 mm grid, which is contained in the measurement plane. If the field alignment method is used, align the probe for maximum field reception.
5. Record the reading.
6. Scan the entire 50 mm by 50 mm region in equally spaced increments and record the reading at each measurement point. The grid is 5 cm by 5 cm area that is divided into 9 evenly sized blocks or sub-grids.The distance between measurement points shall be sufficient to assure the identification of the maximum reading.
7. Identify the five contiguous sub-grids around the center sub-grid with the lowest maximum field strength readings. Thus the six areas to be used to determine the WD's highest emissions are identified and outlined for the final manual scan. Please note that a maximum of five blocks can be excluded for both E-field measurements for the WD output being measured. Stated another way, the center sub-grid and three others must be common to both the E-field measurements.
8. Identify the maximum field reading within the non-excluded sub-grids identified in Step 7.
9. Convert the maximum field strength reading identified in Step 8 to V/m or A/m, as appropriate. For probes which require a probe modulation factor, this conversion shall be done using the appropriate probe modulation factor and the calibration.
10. Repeat Step 1 through Step 10 for both the E-field measurements.
11. Compare this reading to the categories in ANSI C63.19 Clause 8 and record the resulting category. The lowest category number listed in 8.2, Table 8.3 obtained in Step 10 for either E-field determines the M category for the audio coupling mode assessment. Record the WD category rating.

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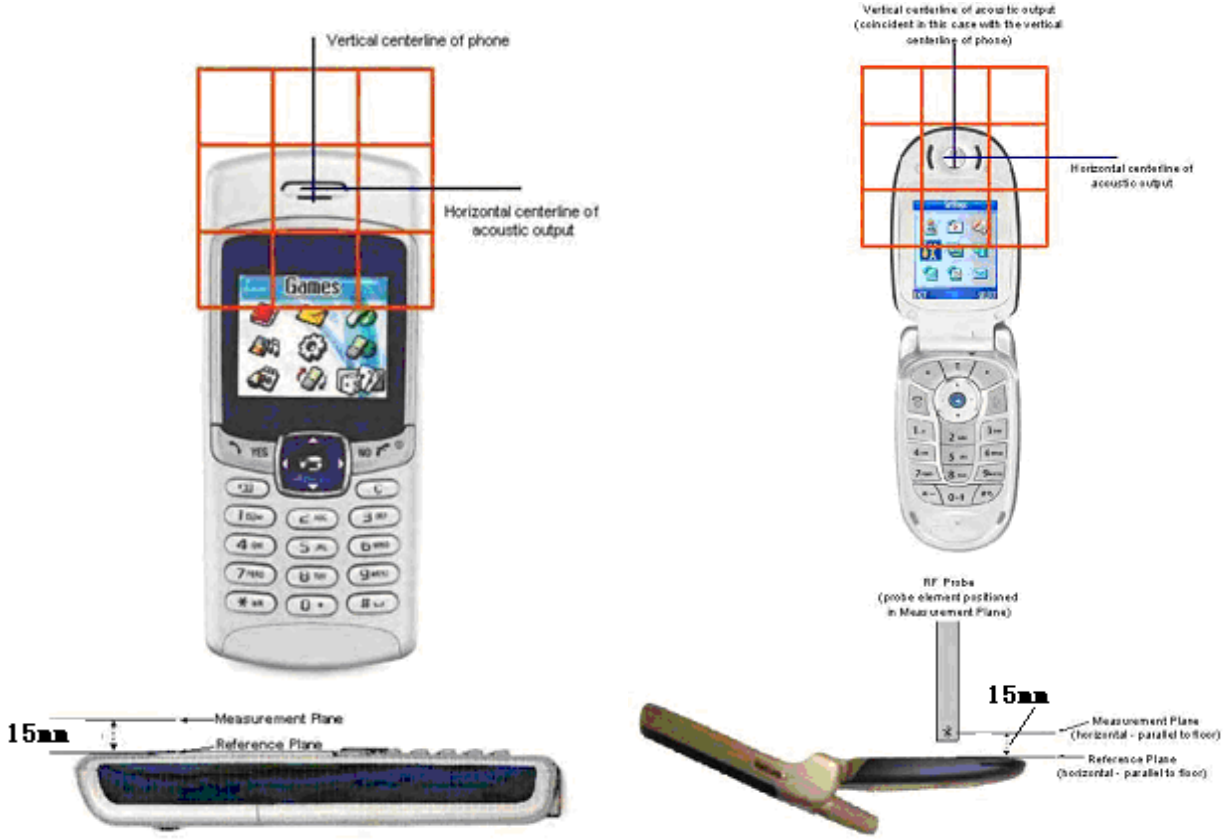

Figure 4 WD reference and plane for RF emission measurements

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5.4 System Check

Validation Procedure

Place a dipole antenna meeting the requirements given in ANSI C63.19 D.11 in the position normally occupied by the WD. The dipole antenna serves as a known source for an electrical output. Position the E-field probe so that:

The probes and their cables are parallel to the coaxial feed of the dipole antenna.
The probe cables and the coaxial feed of the dipole antenna approach the measurement area from opposite directions.
Position the E-field probe at a 15 mm distance from the center of the probe element to the top surface. Validation was performed to verify that measured E-field is within +/-18% from the target reference values provided by the manufacturer. ”Values within +/-18% are acceptable. Of which 12% is deviation and 13% is measurement uncertainty.”

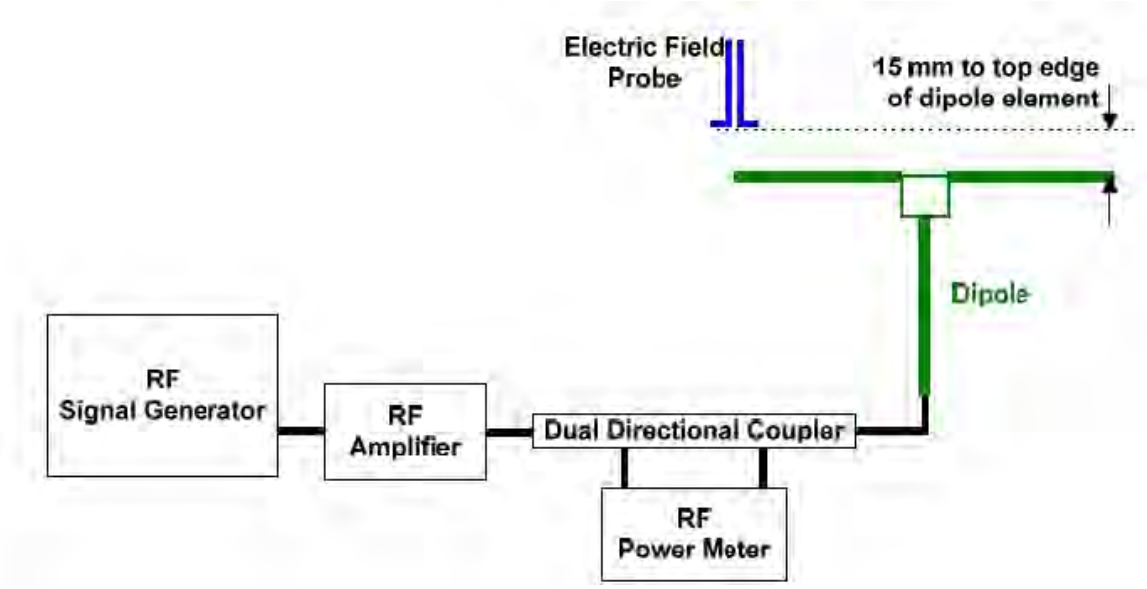

Figure 5 Dipole Validation Setup

Frequency (MHz)	Input Power (mW)	Target[1] Value (V/m)	Measured[2] Value (V/m)	Deviation [3] (%)	Test Date
835	100	106.6	107.3	-0.65	8/4/2019
1880	100	90.5	92.1	1.77	8/4/2019

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5.5 Modulation Interference Factor

For any specific fixed and repeatable modulated signal, a modulation interference factor (MIF, expressed in dB) may be developed that relates its interference potential to its steady-state rms signal level or average power level. This factor is a function only of the audio-frequency amplitude modulation characteristics of the signal and is the same for field-strength and conducted power measurements. It is important to emphasize that the MIF is valid only for a specific repeatable audio-frequency amplitude modulation characteristic. Any change in modulation characteristic requires determination and application of a new MIF

The MIF may be determined using a radiated RF field or a conducted RF signal,

b) Using RF illumination or conducted coupling, apply the specific modulated signal in question to the measurement system at a level within its confirmed operating dynamic range.

c) Measure the steady-state rms level at the output of the fast probe or sensor.

d) Measure the steady-state average level at the weighting output.

e) Without changing the square-law detector or weighting system, and using RF illumination or conducted coupling, substitute for the specific modulated signal a 1kHz, 80% amplitude modulated carrier at the same frequency and adjust its strength until the level at the weighting output equals the step d) measurement.

f) Without changing the carrier level from step e), remove the 1 kHz modulation and again measure the steady-state ms level indicated at the output of the fast probe or sensor.

g) The MIF for the specific modulation characteristic is provided by the ratio of the step f) measurement to the step c) measurement, expressed in dB (20 x log(step f)/step c)).

Based on the KDB285076 D01v05, the handset can also use the MIF values predetermined by the test equipment manufacturer, and the following table lists the MIF values evaluated by DASY manufacturer (SPEAG), and the test result will be calculated with the MIF parameter automatically.

SPEAG UID	UID version	Communication system	MIF(dB)
10021	DAC	GSM-FDD (TDMA, GMSK)	3.63

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5.6 Justification of Held to Ear Modes Tested

5.6.1 Analysis of RF Air Interface Technologies

a. According to the April 2013 TCB workshop slides, LTE and other OTT data services are outside the current definition of a managed CMRS service and are currently not required to be evaluated.
b. No associated T-coil measurements for VoIP over WIFI CMRS have been made in accordance with the guidance issued by OET in KDB publication 285076 D02 T-Coil testing for CMRS IP.
c. An analysis was performed, following the guidance of 4.3 and 4.4 of the ANSI standard, of the RF air interface technologies being evaluated. The factors that will affect the RF interference potential were evaluated, and the worst case operating modes were identified and used in the evaluation. A WD's interference potential is a function both of the WD's average near-field field strength and of the signal's audio-frequency amplitude modulation characteristics. Per 4.4, RF air interface technologies that have low power have been found to produce sufficiently low RF interference potential, So it is possible to exempt them from the product testing specified in Clause 5 of the ANSI standard. An RF air interface technology of a device is exempt from testing when its average antenna input power plus its MIF is <17dBm for all of its operating modes. RF air interface technologies exempted from testing in this manner are automatically assigned an M4 rating to be used in determining the overall rating for the WD.
The worst case MIF plus the worst case average antenna input power for all modes are investigated below to determine the testing requirements for this device.

5.6.2 Average Antenna Input Power & Evaluation for Low-power Exemption

An RF air interface technology of a device is exempt from testing when its average antenna input power plus its **MIF is ≤17 dBm** for any of its operating modes. If a device supports multiple RF air interfaces, each RF air interface shall be evaluated individually.

Band	Maximum Average Antenna Input Power (dBm)	Worst Case MIF (dB)	Maximum Average Antenna Input Power + MIF (dBm)	Low power exemption
GSM 850	32.81	3.63	36.44	No
GSM 1900	30.72	3.63	34.35	No
WCDMA Band II	23.82	-27.23	-3.41	Yes
WCDMA Band IV	23.72	-27.23	-3.51	Yes
WCDMA Band V	23.64	-27.23	-3.59	Yes
Note: 1. MIF values applied in this test report were provided by the HAC equipment provider, SPEAG.				

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6 Test Results

6.1 ANSI C63.19-2011 Limits

Category	Telephone RF parameters < 960 MHz	Telephone RF parameters > 960 MHz
Near field	**E-field emissions**	
Category M1	50 to 55 dB (V/m)	40 to 45 dB (V/m)
Category M2	45 to 50 dB (V/m)	35 to 40 dB (V/m)
Category M3	40 to 45 dB (V/m)	30 to 35 dB (V/m)
Category M4	< 40 dB (V/m)	< 30 dB (V/m)

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6.2 Summary Test Results

Band	Channel /Frenqucy (MHz)	MIF (dB)	E-field (dBV/m)	Power Drift (dB)	Category	Graph Results
GSM 850	128/824.2	3.63	34.00	-0.02	M4	1
	190/836.6	3.63	34.87	-0.02	M4	2
	251/848.8	3.63	35.25	-0.02	M4	3
GSM 1900	512/1850.2	3.63	26.86	0.17	M4	4
	661/1880	3.63	25.99	-0.08	M4	5
	810/1909.8	3.63	28.55	-1.96	M4	6

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7 Measurement Uncertainty

Measurement uncertainty evaluation template for DUT HAC RF test

Error source	Type	Uncertainty Value (± %)	Prob. Dist.	k	c_i/E	c_i\H	Standard Uncertainty ui (± %) E	Degree of freedom Veff or vi
Measurement system								
Probe Calibration	B	5.1	N	1	1	1	5.1	∞
Axial Isotropy	B	4.7	R	1.732	1	1	2.7	∞
Sensor Displacement	B	16.5	R	1.732	1	0.145	9.5	∞
Boundary Effects	B	2.4	R	1.732	1	1	1.4	∞
Test Arch	B	7.2	R	1.732	1	0	4.2	∞
Linearity	B	4.7	R	1.732	1	1	2.7	∞
Scaling to Peak Envelope Power	B	2.0	R	1.732	1	1	1.2	∞
System Detection Limit	B	1.0	R	1.732	1	1	0.6	∞
Readout Electronics	B	0.3	N	1	1	1	0.3	∞
Response Time	B	0.8	R	1.732	1	1	0.5	∞
Integration Time	B	2.6	R	1.732	1	1	1.5	∞
RF Ambient Conditions	B	3.0	R	1.732	1	1	1.7	∞
RF Reflections	B	12.0	R	1.732	1	1	6.9	∞
Probe Positioner	B	1.2	R	1.732	1	0.67	0.7	∞
Probe Positioning	A	4.7	R	1.732	1	0.67	2.7	∞
Extra. And Interpolation	B	1.0	R	1.732	1	1	0.6	∞
Test sample related								
Device Positioning Vertical	B	4.7	R	1.732	1	0.67	2.7	∞
Device Positioning Lateral	B	1.0	R	1.732	1	1	0.6	∞
Device Holder and Phantom	B	2.4	R	1.732	1	1	1.4	∞
Power Drift	B	5.0	R	1.732	1	1	2.9	∞
Phantom and Setup related								
Phantom Thickness	B	2.4	R	1.732	1	0.67	1.4	∞
Combined standard uncertainty (%)							15.3	
Expanded Std. uncertainty on power (K=2)							30.6	
Expanded Std. uncertainty on field (K=2)							15.3	

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8 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Time
Power meter	Agilent	E4417A	GB41291714	2019-05-19	2020-05-18
Power sensor	Agilent	N8481H	MY50350004	2019-05-19	2020-05-18
Signal Generator	Agilent	N5181A	MY50140143	2019-05-19	2020-05-18
Amplifier	INDEXSAR	IXA-020	0401	2019-05-19	2020-05-18
Wideband radio communication tester	R&S	CMW500	146734	2019-05-19	2020-05-18
E-Field Probe	SPEAG	EF3DV3	4048	2018-01-09	2021-01-08
DAE	SPEAG	DAE4	1291	2018-12-04	2019-12-03
Validation Kit 835MHz	SPEAG	CD835V3	1133	2017-11-22	2020-11-21
Validation Kit 1880MHz	SPEAG	CD1880V3	1115	2017-11-22	2020-11-21
Hygrothermograph	Anymetr	NT-311	20150731	2019-05-19	2020-05-18
HAC Phantom	SPEAG	SD HAC P01 BB	1117	2017-11-22	2020-11-21
Software for Test	Speag	DASY5	52.8.8.1222	/	/
Software for Tissue	Agilent	85070	E06.01.36	/	/

*******END OF REPORT *******

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ANNEX A: System Check Results

HAC_System Performance Check at 835MHz_E

DUT: Dipole 835 MHz; Type: CD835V3; SN:1023

Date: 8/4/2019

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

E Scan - measurement distance from the probe sensor center to CD835 Dipole = 15mm

2/Hearing Aid Compatibility Test (41x361x1): Measurement grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 91 V/m; Power Drift = 0.003 dB

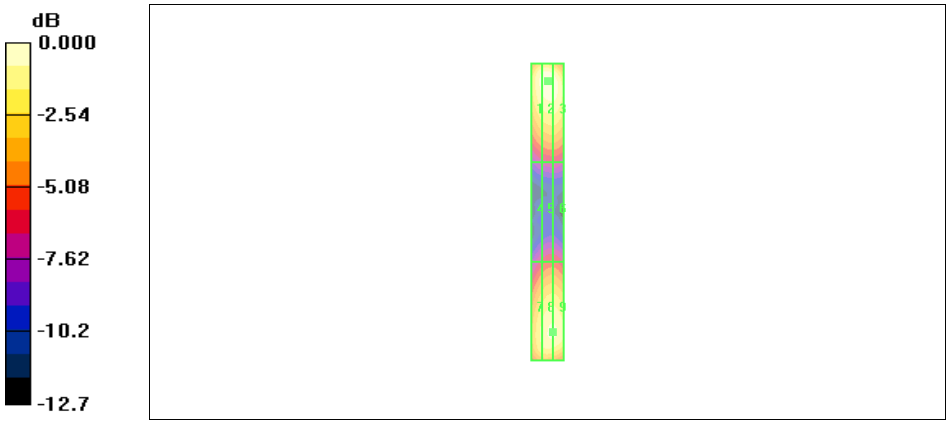
Applied MIF = 0.00 dB

Maximum value of peak Total field = 107.3 V/m

Hearing Aid Near-Field Category: M4 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **101.2 M4**	Grid 2 **104.3 M4**	Grid 3 **101.5 M4**
Grid 4 **61.2 M4**	Grid 5 **64.23 M4**	Grid 6 **62.39 M4**
Grid 7 **104.5 M4**	Grid 8 **107.3 M4**	Grid 9 **104.3 M4**



0 dB = 107.3V/m

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HAC_System Performance Check at 1880MHz_E

DUT: Dipole 1880 MHz; Type: CD1880V3; SN: 1018

Date: 8/4/2019

Communication System: CW; Frequency: 1880 MHz;Duty Cycle: 1:1

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

E Scan - measurement distance from the probe sensor center to CD1880 Dipole = 15mm/Hearing Aid Compatibility Test (41x181x1): Measurement grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 86V/m; Power Drift = 0.002 dB

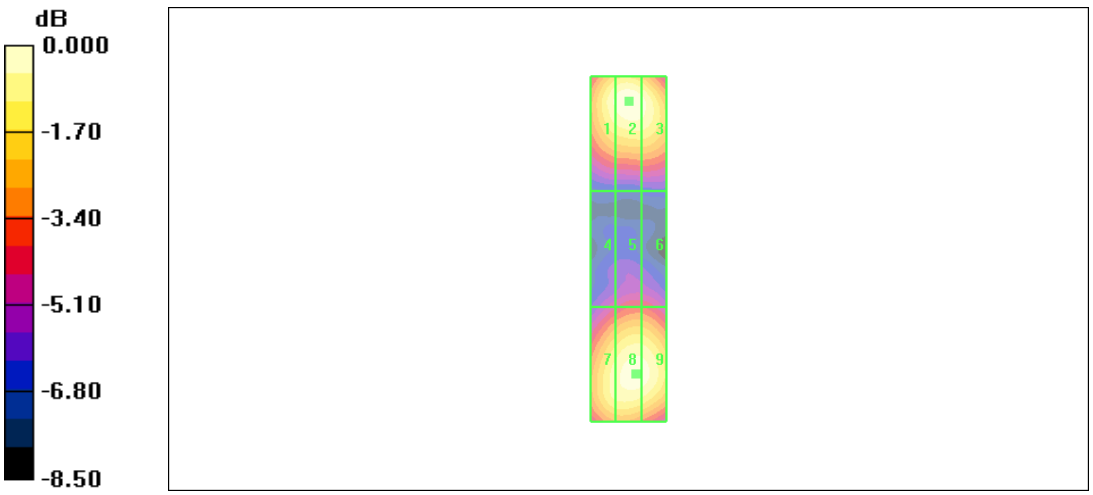
Applied MIF = 0.00 dB

Maximum value of peak Total field = 92.1 V/m

Hearing Aid Near-Field Category: M2 (AWF 0 dB)

Peak E-field in V/m

Grid 1 **91.78 M2**	Grid 2 **98.10 M2**	Grid 3 **93.42M2**
Grid 4 **71.76 M3**	Grid 5 **73.56 M3**	Grid 6 **71.17 M3**
Grid 7 **87.15 M2**	Grid 8 **89.46 M2**	Grid 9 **89.01 M2**



0 dB = 98.10V/m

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ANNEX B: Graph Results

Plot 1 HAC RF E-Field GSM 850 Low

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 824.2 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM850 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 44.10 V/m; Power Drift = -0.02 dB

Applied MIF = 3.63 dB

RF audio interference level = 34.00 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **33.41 dBV/m**	Grid 2 **M4** **33.96 dBV/m**	Grid 3 **M4** **33.38 dBV/m**
Grid 4 **M4** **33.59 dBV/m**	Grid 5 **M4** **34 dBV/m**	Grid 6 **M4** **33.33 dBV/m**
Grid 7 **M4** **33.61 dBV/m**	Grid 8 **M4** **33.81 dBV/m**	Grid 9 **M4** **33.05 dBV/m**

Cursor:

Total = 34.00 dBV/m

E Category: M4

Location: 1.5, -0.5, 7.7 mm

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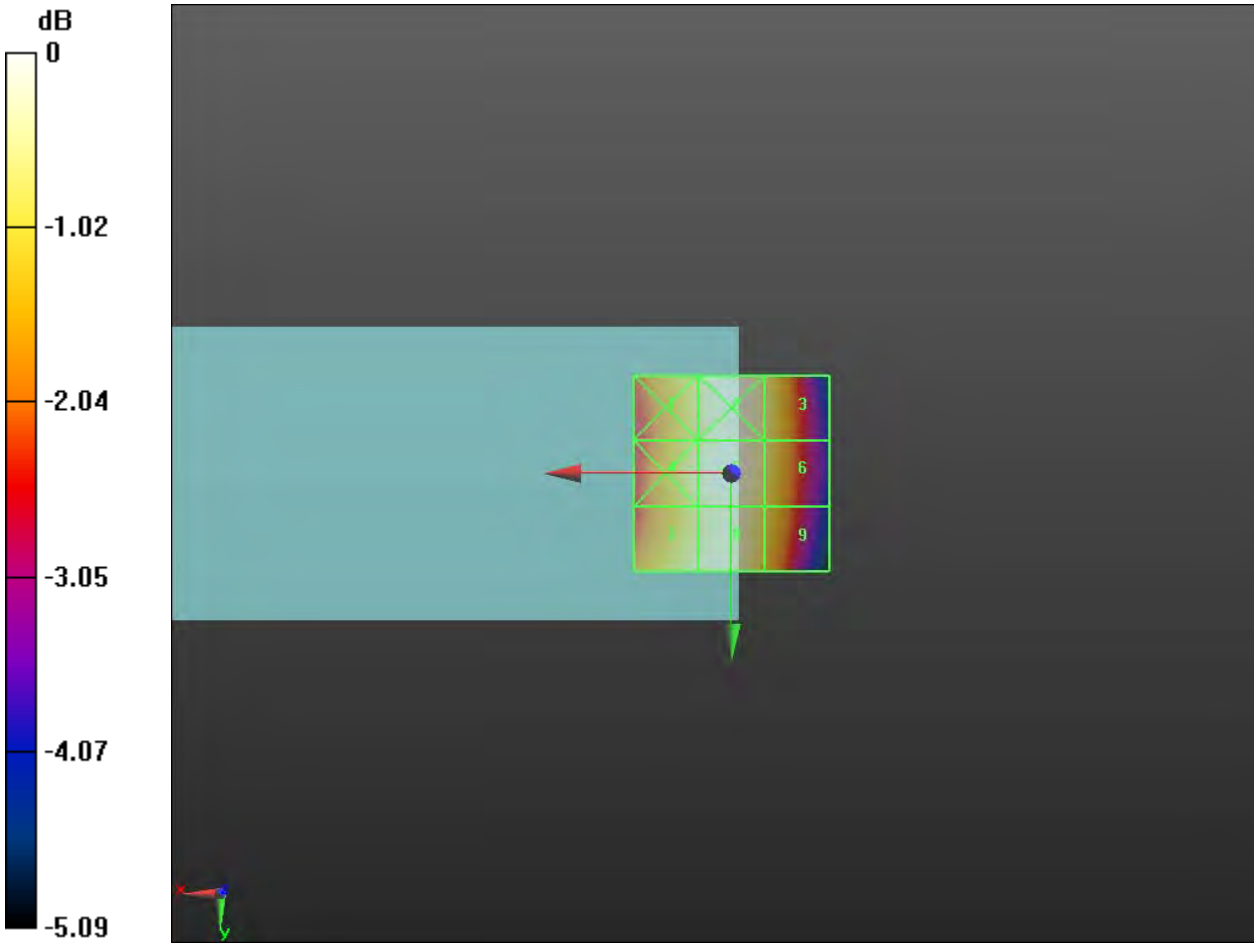

0 dB = 50.11 V/m = 34.00 dBV/m

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Plot 2 HAC RF E-Field GSM 850 Middle

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 836.6 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM850 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 49.14 V/m; Power Drift = -0.02 dB

Applied MIF = 3.63 dB

RF audio interference level = 34.87 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **34.39 dBV/m**	Grid 2 **M4** **34.99 dBV/m**	Grid 3 **M4** **34.46 dBV/m**
Grid 4 **M4** **34.34 dBV/m**	Grid 5 **M4** **34.87 dBV/m**	Grid 6 **M4** **34.37 dBV/m**
Grid 7 **M4** **34.1 dBV/m**	Grid 8 **M4** **34.54 dBV/m**	Grid 9 **M4** **34.04 dBV/m**

Cursor:

Total = 34.99 dBV/m

E Category: M4

Location: 0, -24, 7.7 mm

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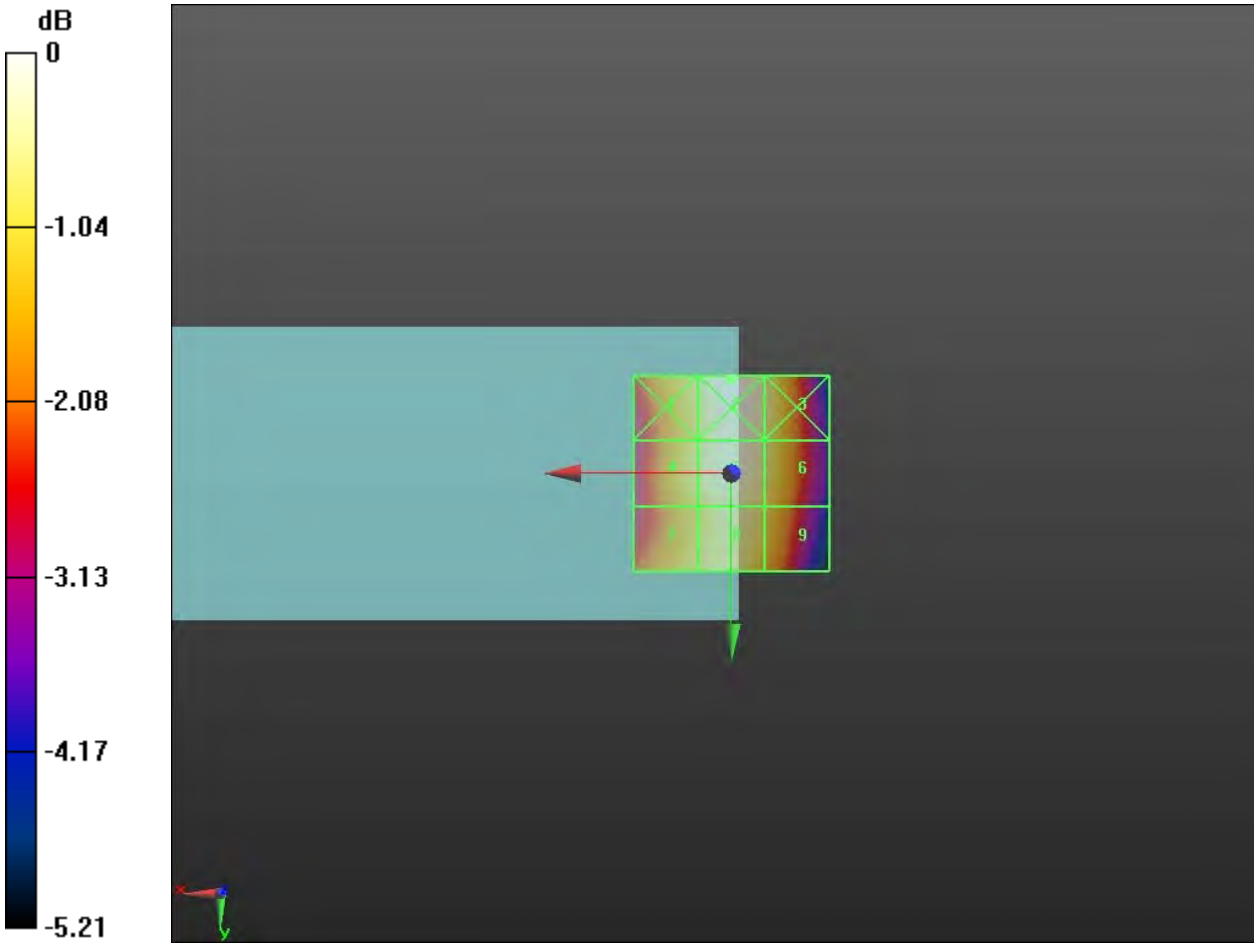

0 dB = 56.17 V/m = 34.99 dBV/m

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Plot 3 HAC RF E-Field GSM 850 High

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 848.6 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM850 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 51.40 V/m; Power Drift = -0.02 dB

Applied MIF = 3.63 dB

RF audio interference level = 35.25 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **34.47 dBV/m**	Grid 2 **M4** **35.25 dBV/m**	Grid 3 **M4** **34.85 dBV/m**
Grid 4 **M4** **34.58 dBV/m**	Grid 5 **M4** **35.25 dBV/m**	Grid 6 **M4** **34.86 dBV/m**
Grid 7 **M4** **34.53 dBV/m**	Grid 8 **M4** **34.97 dBV/m**	Grid 9 **M4** **34.63 dBV/m**

Cursor:

Total = 35.25 dBV/m

E Category: M4

Location: -1, -1, 7.7 mm

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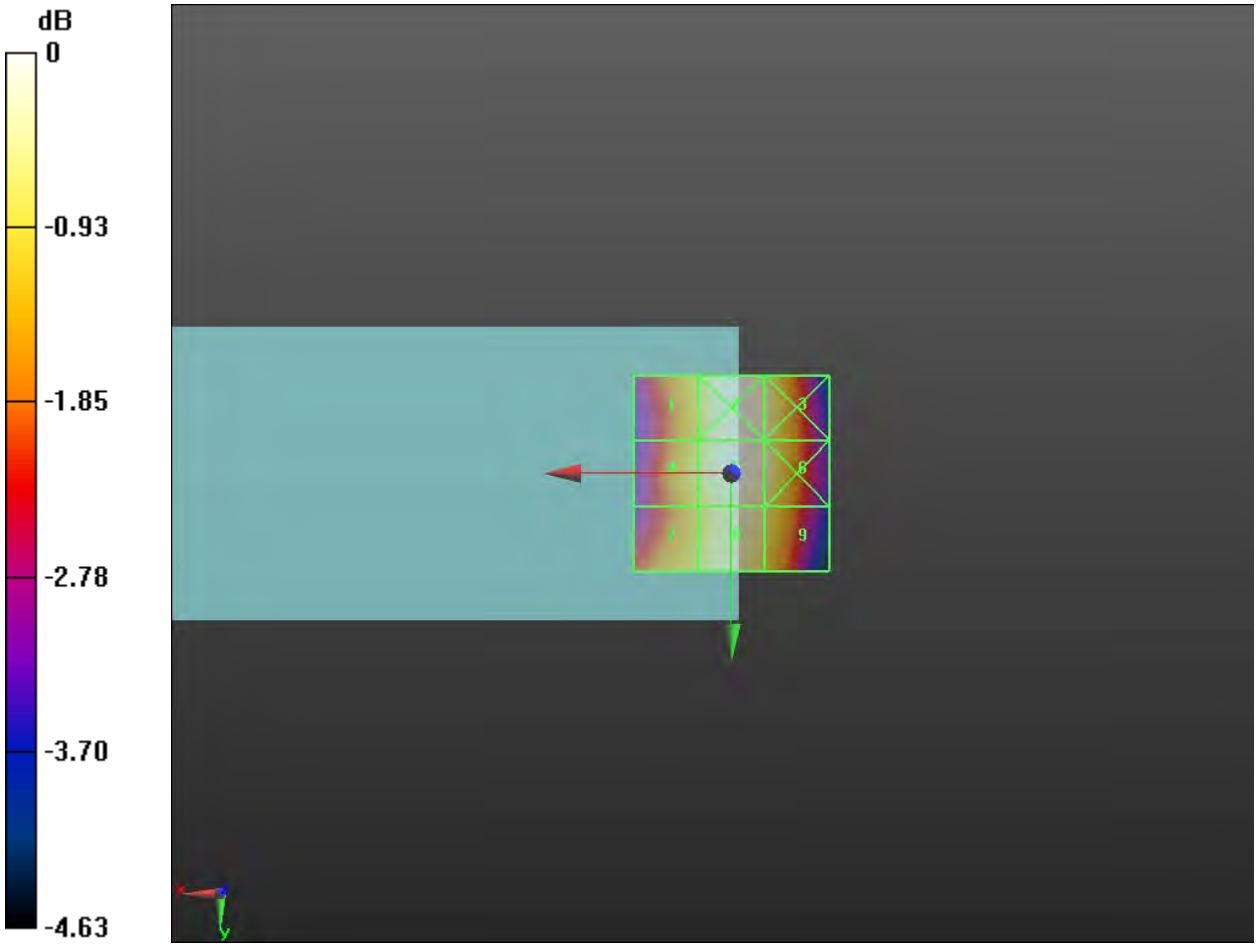

0 dB = 57.89 V/m = 35.25 dBV/m

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Plot 4 HAC RF E-Field GSM 1900 Low

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 1850.2 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM1900 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device Low/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 11.28 V/m; Power Drift = 0.17 dB

Applied MIF = 3.63 dB

RF audio interference level = 26.86 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **26.86 dBV/m**	Grid 2 **M4** **26.67 dBV/m**	Grid 3 **M4** **23.63 dBV/m**
Grid 4 **M4** **23.46 dBV/m**	Grid 5 **M4** **26.48 dBV/m**	Grid 6 **M4** **26.44 dBV/m**
Grid 7 **M4** **28.39 dBV/m**	Grid 8 **M3** **30.03 dBV/m**	Grid 9 **M4** **29.64 dBV/m**

Cursor:

Total = 30.03 dBV/m

E Category: M3

Location: -1.5, 25, 7.7 mm

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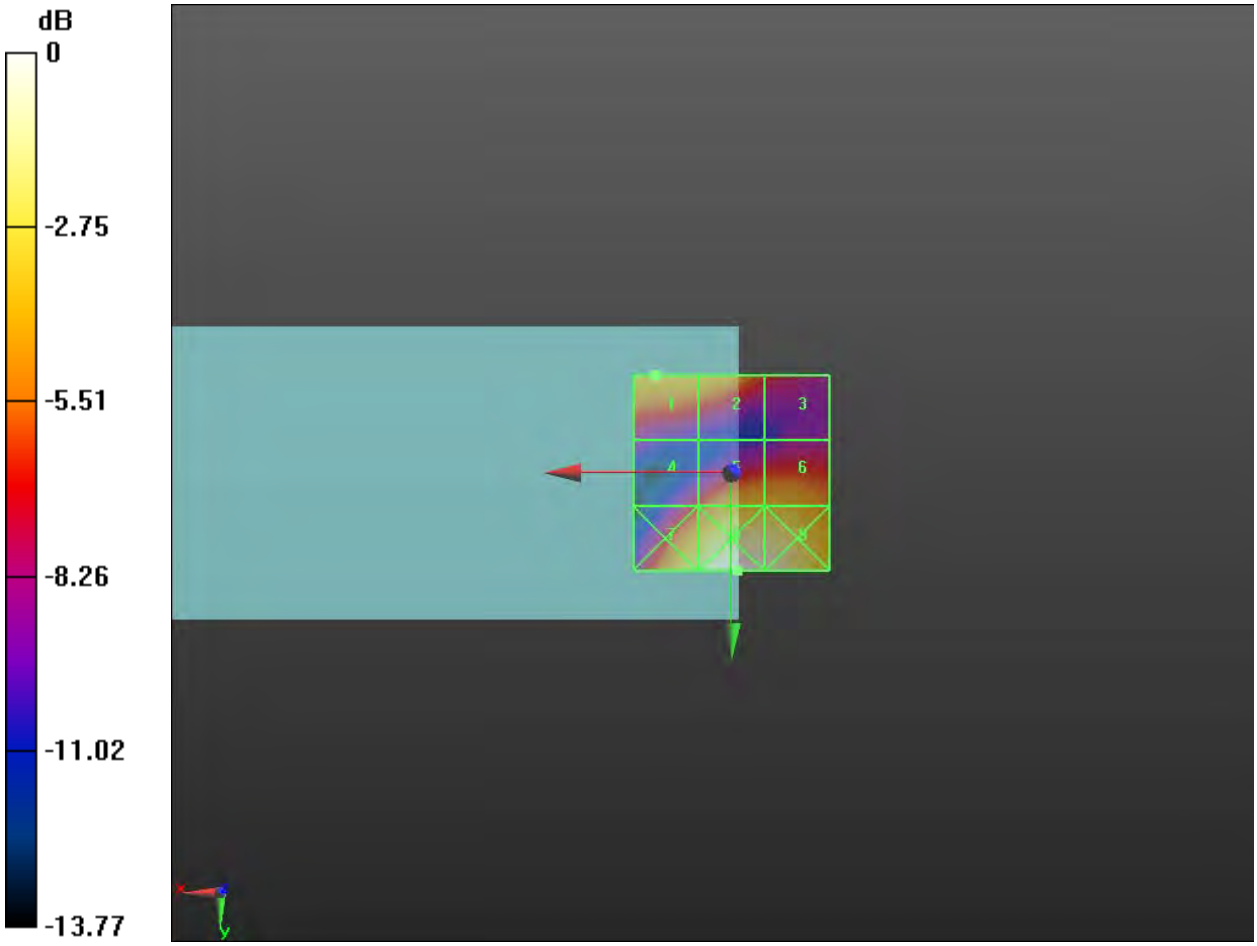

0 dB = 31.74 V/m = 30.03 dBV/m

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Plot 5 HAC RF E-Field GSM 1900 Middle

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 1880 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM1900 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device Middle/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 10.32 V/m; Power Drift = -0.08 dB

Applied MIF = 3.63 dB

RF audio interference level = 25.99 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **25.99 dBV/m**	Grid 2 **M4** **25.38 dBV/m**	Grid 3 **M4** **22.68 dBV/m**
Grid 4 **M4** **22.23 dBV/m**	Grid 5 **M4** **25.81 dBV/m**	Grid 6 **M4** **25.88 dBV/m**
Grid 7 **M4** **27.06 dBV/m**	Grid 8 **M4** **28.82 dBV/m**	Grid 9 **M4** **28.55 dBV/m**

Cursor:

Total = 28.82 dBV/m

E Category: M4

Location: -4.5, 25, 7.7 mm

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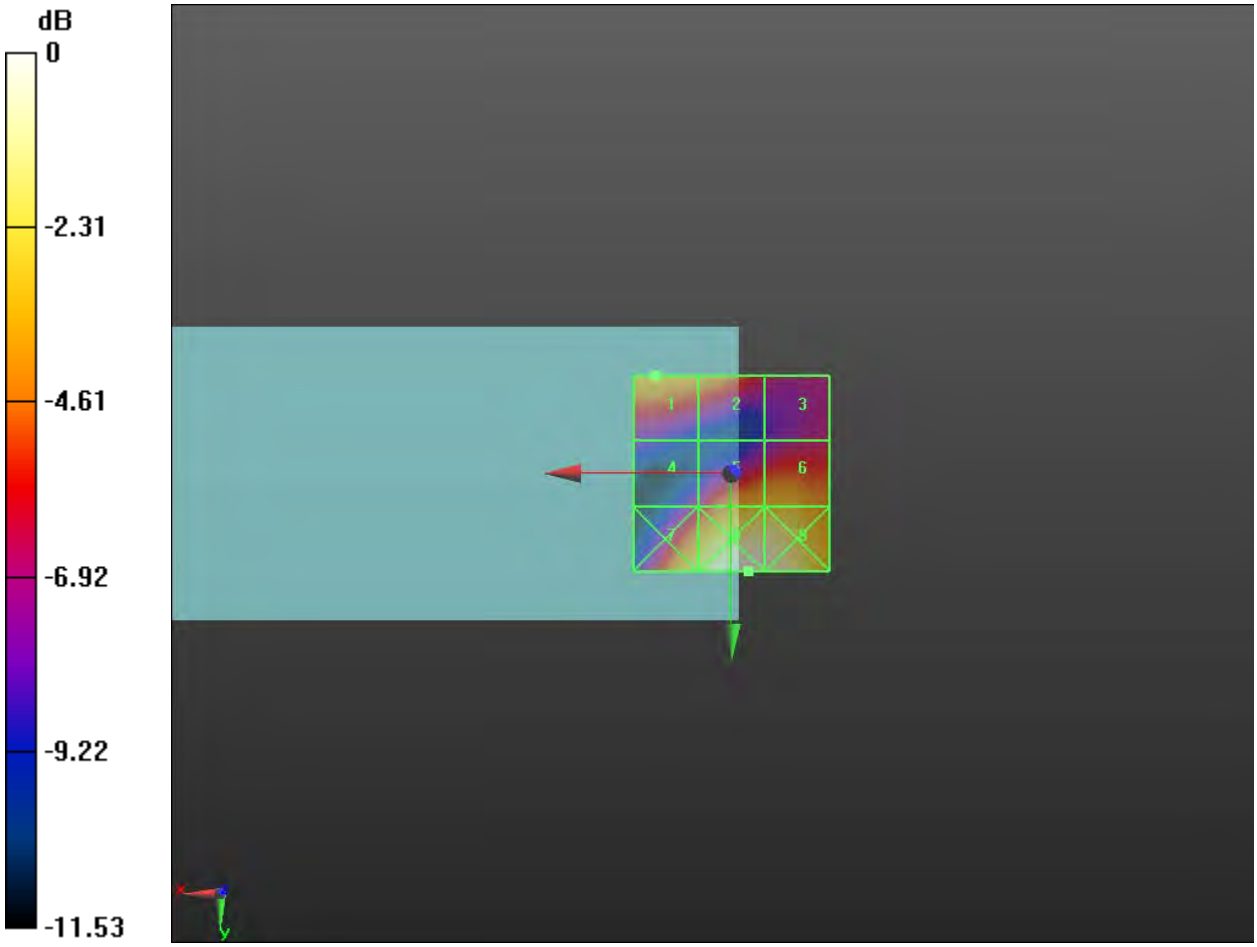

0 dB = 27.61 V/m = 28.82 dBV/m

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Plot 6 HAC RF E-Field GSM 1900 High

Date: 8/4/2019

Communication System: UID 10021 - DAC, GSM-FDD (TDMA, GMSK); Frequency: 1909.8 MHz;Duty Cycle: 1:8.6896

Ambient Temperature:22.3 ℃

Phantom section: RF Section

DASY5 Configuration:

Sensor-Surface: 0mm (Mechanical Surface Detection)

Probe: EF3DV3 – SN4048; ConvF(1, 1, 1); Calibrated: 1/9/2018

Electronics: DAE4 SN1291; Calibrated: 12/4/2018

Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA

Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

5048A GSM1900 HAC RF E-Field/E Scan - ER3D: 15 mm from Probe Center to the Device High/Hearing Aid Compatibility Test (101x101x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm

Device Reference Point: 0, 0, -6.3 mm

Reference Value = 12.76 V/m; Power Drift = -1.96 dB

Applied MIF = 3.63 dB

RF audio interference level = 28.55 dBV/m

Emission category: M4

MIF scaled E-field

Grid 1 **M4** **28.06 dBV/m**	Grid 2 **M4** **25.57 dBV/m**	Grid 3 **M4** **22.7 dBV/m**
Grid 4 **M4** **28.58 dBV/m**	Grid 5 **M4** **25.62 dBV/m**	Grid 6 **M4** **25.65 dBV/m**
Grid 7 **M4** **27.68 dBV/m**	Grid 8 **M4** **28.84 dBV/m**	Grid 9 **M4** **28.55 dBV/m**

Cursor:

Total = 28.84 dBV/m

E Category: M4

Location: -3.5, 25, 7.7 mm

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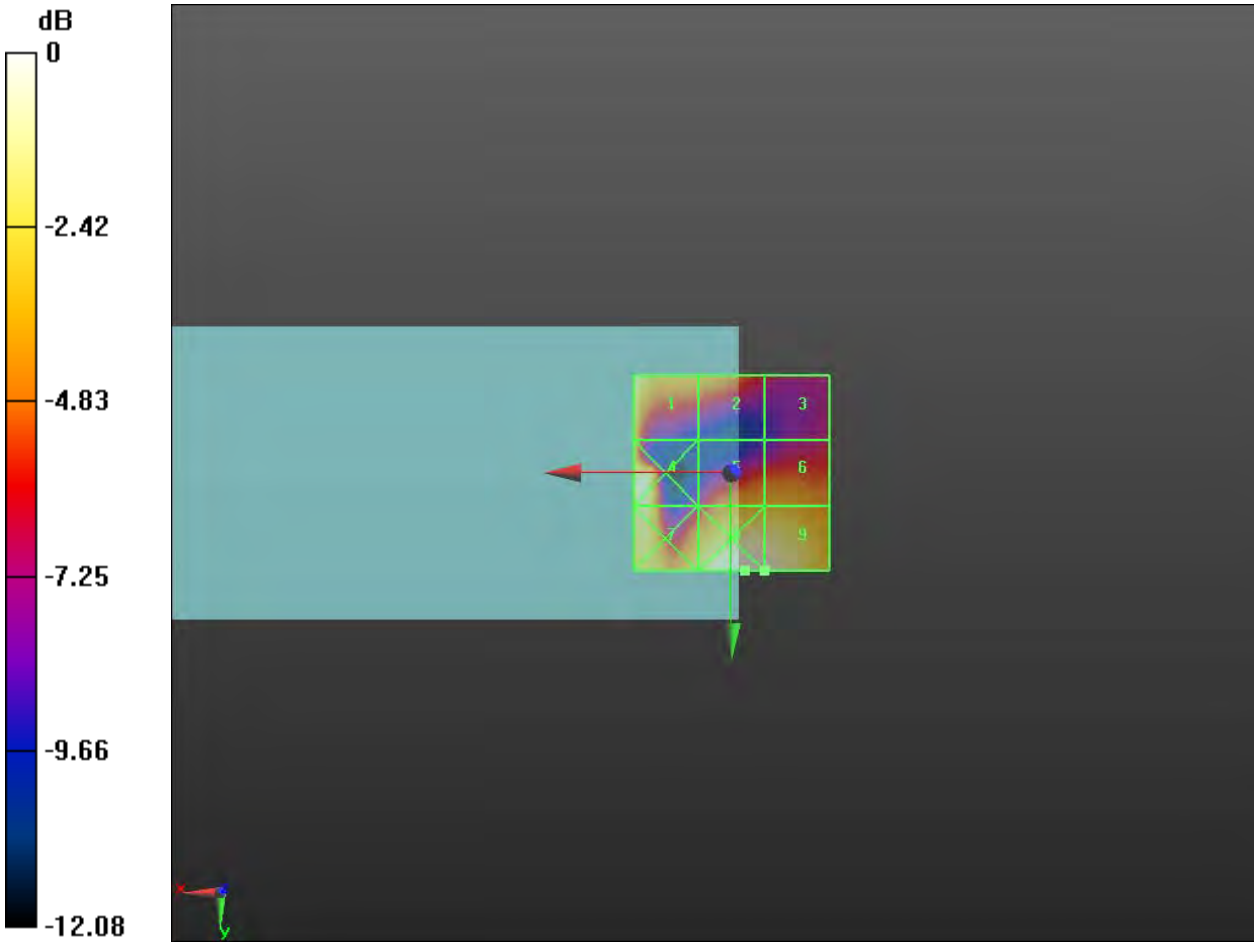

0 dB = 27.68 V/m = 28.84 dBV/m

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ANNEX C: E-Probe Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TA-SH (Auden)** Certificate No: **EF3-4048_Jan18**

CALIBRATION CERTIFICATE

Object	EF3DV3 - SN:4048
Calibration procedure(s)	QA CAL-02.v8, QA CAL-25.v6 Calibration procedure for E-field probes optimized for close near field evaluations in air
Calibration date:	January 9, 2018

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
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ER3DV6	SN: 2328	10-Oct-17 (No. ER3-2328_Oct17)	Oct-18
DAE4	SN: 789	2-Aug-17 (No. DAE4-789_Aug17)	Aug-18
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-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 9, 2018

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Certificate No: EF3-4048_Jan18 Page 1 of 39

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Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

NORMx,y,z	sensitivity in free space
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., ϑ = 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:

a) IEEE Std 1309-2005, " IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", December 2005
b) CTIA Test Plan for Hearing Aid Compatibility, Rev 3.0, November 2013

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 for XY sensors and ϑ = 90 for Z sensor (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart).
- *DCPx,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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,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.
- *Spherical isotropy (3D deviation from isotropy)*: in a locally homogeneous field realized using an open waveguide setup.
- *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 *NORMx* (no uncertainty required).

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Probe EF3DV3

SN:4048

Manufactured: May 24, 2016
Calibrated: January 9, 2018

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

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EF3DV3 – SN:4048 January 9, 2018

DASY/EASY - Parameters of Probe: EF3DV3 - SN:4048

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)	0.59	0.69	1.22	± 10.1 %
DCP (mV)[B]	97.3	98.1	94.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	154.4	±3.3 %
		Y	0.0	0.0	1.0		124.9	
		Z	0.0	0.0	1.0		121.5	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	41.24	271.0	36.63	9.157	0.288	4.968	0.915	0.128	1.003
Y	64.32	421.9	36.55	15.84	1.083	4.999	1.244	0.387	1.006
Z	50.74	343.7	38.64	12.31	0.521	5.064	0.000	0.171	1.014

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%.

[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.

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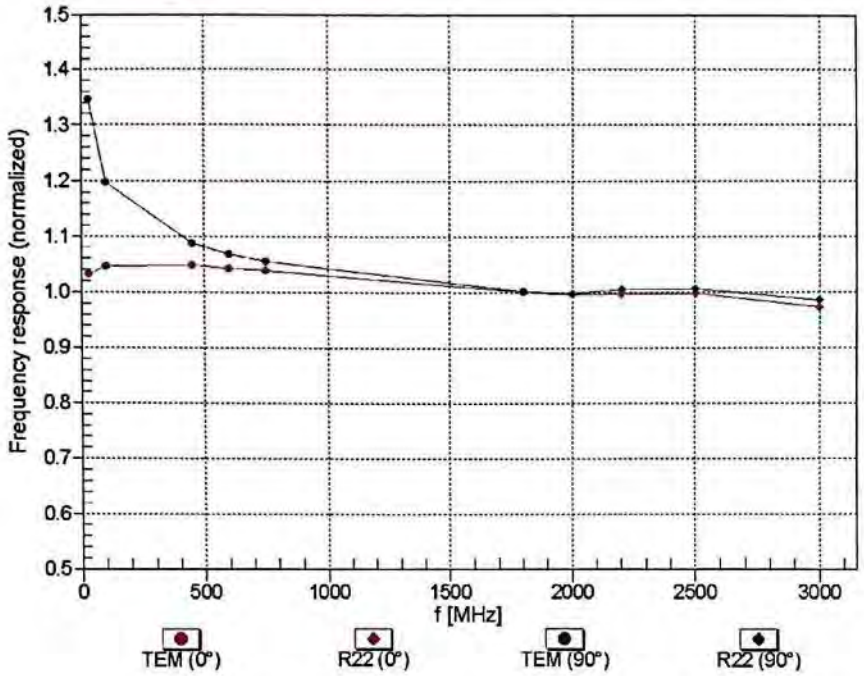
EF3DV3 – SN:4048 January 9, 2018

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Certificate No: EF3-4048_Jan18 Page 5 of 39

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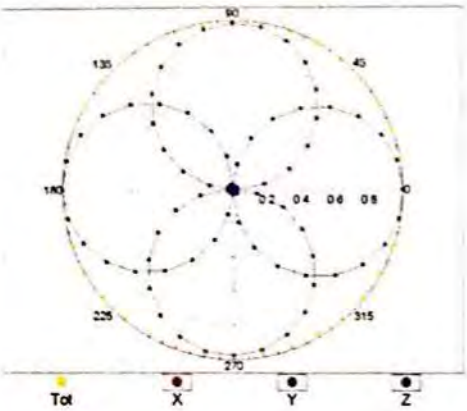
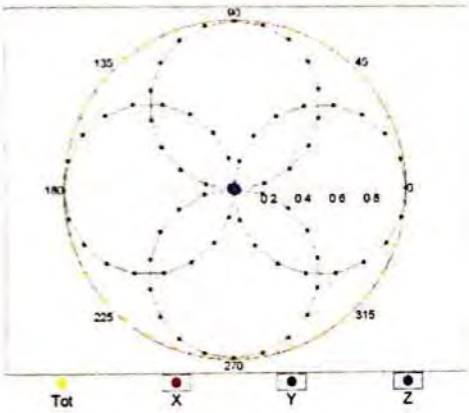
EF3DV3 – SN:4048 January 9, 2018

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM,0°

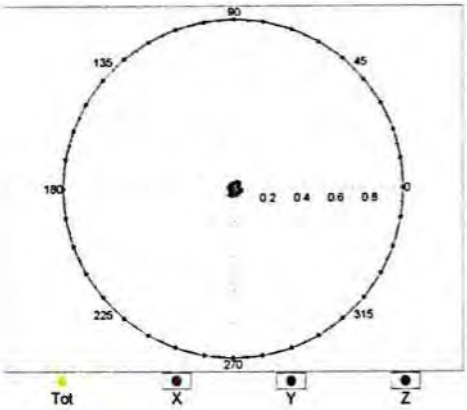


f=1800 MHz,R22,0°

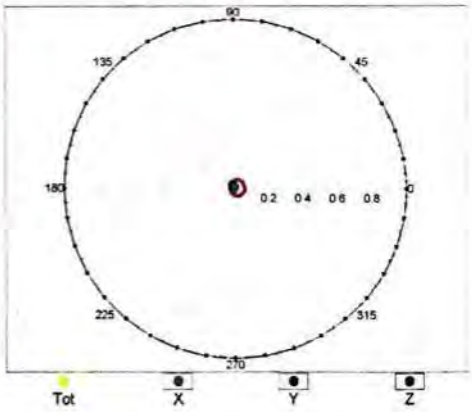


Receiving Pattern (ϕ), ϑ = 90°

f=600 MHz,TEM,90°



f=1800 MHz,R22,90°



Certificate No: EF3-4048_Jan18 Page 6 of 39

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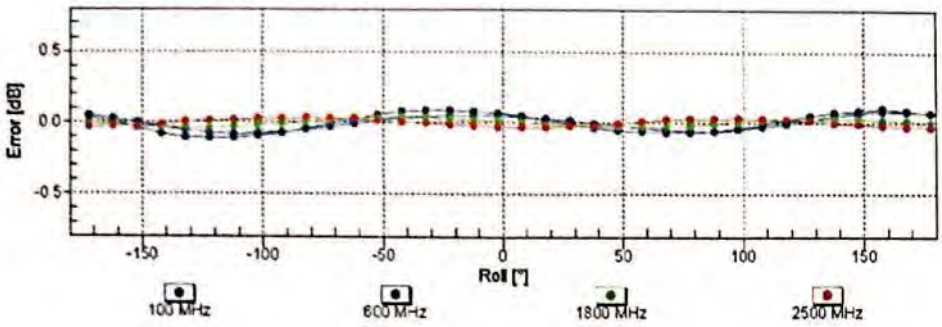
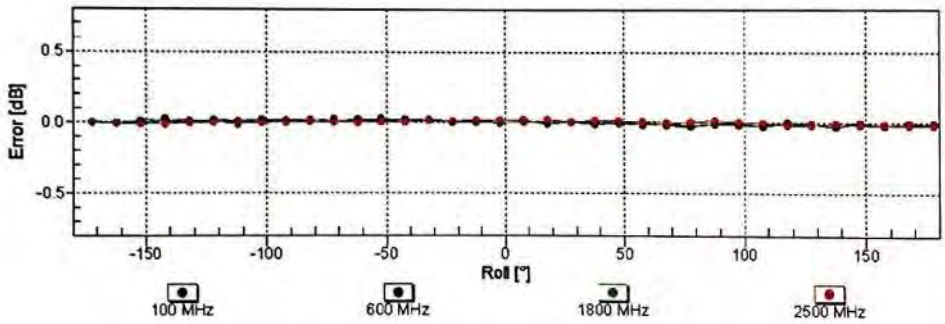
EF3DV3 – SN:4048 January 9, 2018

Receiving Pattern (ϕ), ϑ = 0°



Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Receiving Pattern (ϕ), ϑ = 90°



Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: EF3-4048_Jan18 Page 7 of 39

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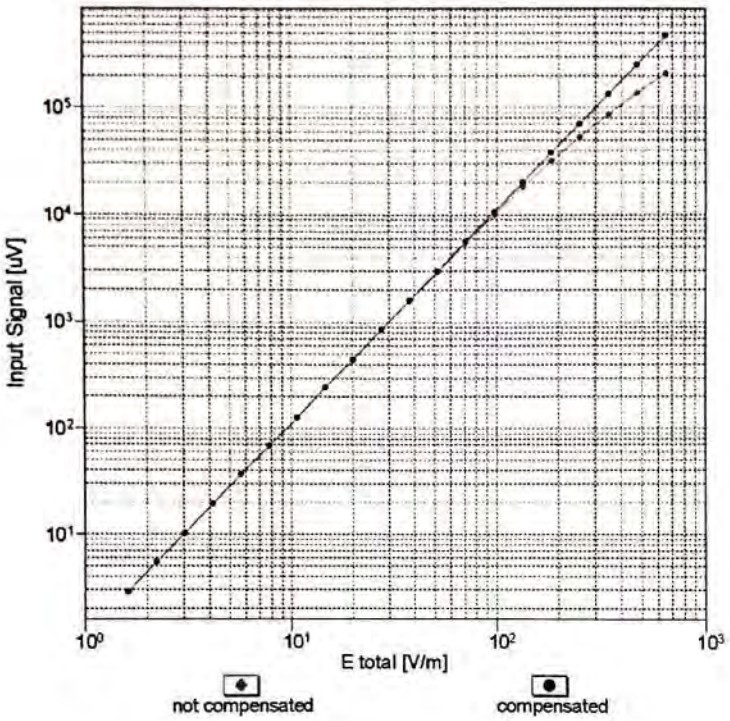
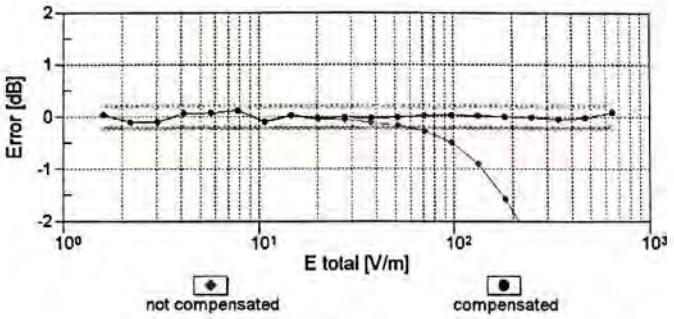
EF3DV3 – SN:4048 January 9, 2018

Dynamic Range f(E-field)
(TEM cell , f = 900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: EF3-4048_Jan18 Page 8 of 39

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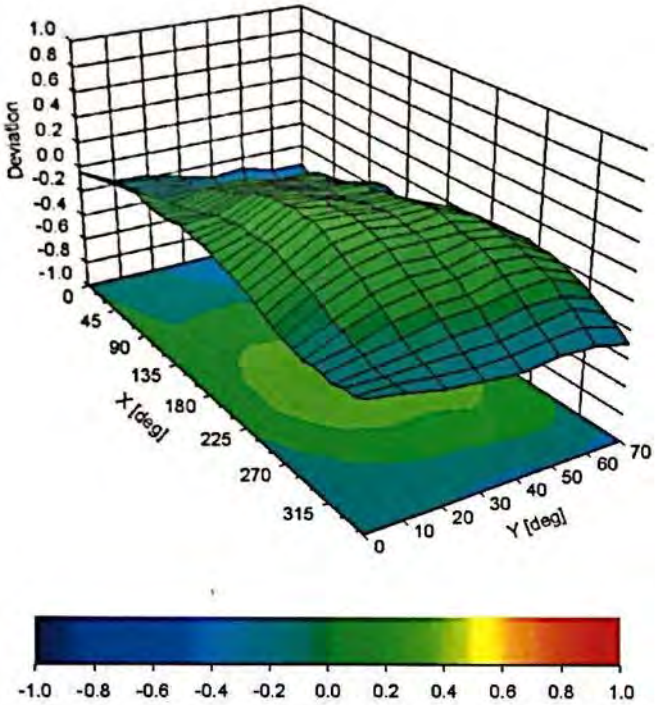
EF3DV3 – SN:4048 January 9, 2018

Deviation from Isotropy in Air

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Certificate No: EF3-4048_Jan18 Page 9 of 39

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DASY/EASY - Parameters of Probe: EF3DV3 - SN:4048

Other Probe Parameters

Sensor Arrangement	Rectangular
Connector Angle (°)	-22.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	12 mm
Tip Length	25 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	1.5 mm
Probe Tip to Sensor Y Calibration Point	1.5 mm
Probe Tip to Sensor Z Calibration Point	1.5 mm

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EF3DV3 – SN:4048 January 9, 2018

Appendix (Additional assessments outside the scope of SCS 0108)

Calibration Parameters for 3-4 GHz

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m)^2)^X	0.68	0.76	1.35	± 10.1 %
DCP (mV)^B	97.3	98.1	94.2	

Calibration Parameters for 5-6 GHz

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m)^2)^X	0.80	0.85	1.60	± 10.1 %
DCP (mV)^B	97.3	98.1	94.2	

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%.

^{B} Numerical linearization parameter: uncertainty not required.
^{X} Calibration procedure for frequencies above 3 GHz is pending accreditation.

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EF3DV3 – SN:4048 January 9, 2018

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	154.4	± 3.3 %
		Y	0.00	0.00	1.00		124.9	
		Z	0.00	0.00	1.00		121.5	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	1.95	63.63	7.91	10.00	20.0	± 9.6 %
		Y	3.38	68.47	11.78		20.0	
		Z	2.85	67.62	10.80		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	1.46	75.01	19.11	0.00	150.0	± 9.6 %
		Y	1.54	74.99	19.39		150.0	
		Z	1.56	76.02	19.66		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.21	65.78	16.65	0.41	150.0	± 9.6 %
		Y	1.28	66.30	17.06		150.0	
		Z	1.24	66.29	17.26		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.83	67.57	17.55	1.46	150.0	± 9.6 %
		Y	5.12	67.51	17.69		150.0	
		Z	5.01	67.69	17.95		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	3.64	69.75	11.65	9.39	50.0	± 9.6 %
		Y	12.25	85.40	19.64		50.0	
		Z	100.00	112.14	26.34		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	3.54	69.24	11.45	9.57	50.0	± 9.6 %
		Y	10.82	83.64	19.10		50.0	
		Z	100.00	111.91	26.29		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	2.25	67.72	9.88	6.56	60.0	± 9.6 %
		Y	42.99	100.11	22.39		60.0	
		Z	100.00	110.82	24.67		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	21.10	123.53	48.27	12.57	50.0	± 9.6 %
		Y	46.15	141.84	52.96		50.0	
		Z	100.00	176.82	64.98		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	14.06	105.86	37.81	9.56	60.0	± 9.6 %
		Y	25.09	114.90	39.86		60.0	
		Z	29.92	126.18	45.09		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	1.77	67.62	9.31	4.80	80.0	± 9.6 %
		Y	100.00	108.33	23.32		80.0	
		Z	100.00	110.81	23.90		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	1.82	69.37	9.56	3.55	100.0	± 9.6 %
		Y	100.00	108.05	22.55		100.0	
		Z	100.00	111.44	23.49		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	6.25	85.88	29.41	7.80	80.0	± 9.6 %
		Y	11.87	96.86	32.85		80.0	
		Z	9.75	96.52	34.16		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	1.59	65.71	8.54	5.30	70.0	± 9.6 %
		Y	71.57	104.46	22.66		70.0	
		Z	100.00	109.30	23.53		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	0.34	61.07	4.85	1.88	100.0	± 9.6 %
		Y	100.00	106.27	20.57		100.0	
		Z	100.00	105.38	19.64		100.0	

Certificate No: EF3-4048_Jan18 Page 12 of 39

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EF3DV3 – SN:4048 January 9, 2018

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	0.17	60.00	3.82	1.17	100.0	± 9.6 %
		Y	100.00	108.86	20.78		100.0	
		Z	100.00	101.01	17.04		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	5.85	81.94	19.13	5.30	70.0	± 9.6 %
		Y	16.24	97.75	26.14		70.0	
		Z	100.00	129.31	34.53		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	2.38	73.93	15.23	1.88	100.0	± 9.6 %
		Y	5.44	85.72	21.66		100.0	
		Z	13.97	100.19	25.59		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	1.96	72.92	14.78	1.17	100.0	± 9.6 %
		Y	3.61	81.48	20.20		100.0	
		Z	5.89	89.04	22.06		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	7.30	85.09	20.23	5.30	70.0	± 9.6 %
		Y	22.31	102.91	27.68		70.0	
		Z	100.00	129.58	34.66		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	2.22	73.19	14.92	1.88	100.0	± 9.6 %
		Y	5.30	85.39	21.50		100.0	
		Z	12.32	98.49	25.09		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	2.03	73.67	15.22	1.17	100.0	± 9.6 %
		Y	3.80	82.56	20.69		100.0	
		Z	6.55	90.97	22.81		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	3.06	79.88	17.54	0.00	150.0	± 9.6 %
		Y	3.38	81.43	20.33		150.0	
		Z	3.57	82.07	19.25		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	2.15	66.09	9.28	7.78	50.0	± 9.6 %
		Y	9.21	81.57	17.15		50.0	
		Z	100.00	108.47	23.88		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	10.42	145.24	6.85	0.00	150.0	± 9.6 %
		Y	0.08	125.46	16.45		150.0	
		Z	8.80	141.34	8.03		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	3.86	66.23	11.52	13.80	20.0	± 9.6 %
		Y	7.82	76.72	18.14		20.0	
		Z	17.17	87.22	20.88		20.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	3.77	68.59	11.37	10.79	40.0	± 9.6 %
		Y	8.13	79.06	17.80		40.0	
		Z	23.61	93.24	21.72		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	9.88	83.82	19.78	9.03	50.0	± 9.6 %
		Y	13.32	89.54	23.76		50.0	
		Z	84.94	120.93	32.50		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.47	78.61	25.67	6.55	100.0	± 9.6 %
		Y	7.80	87.87	28.89		100.0	
		Z	6.16	85.69	29.22		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.24	67.01	17.24	0.61	110.0	± 9.6 %
		Y	1.39	68.21	17.96		110.0	
		Z	1.32	68.22	18.29		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	139.25	35.66	1.30	110.0	± 9.6 %
		Y	100.00	135.73	34.78		110.0	
		Z	100.00	143.71	37.93		110.0	

Certificate No: EF3-4048_Jan18 Page 13 of 39

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EF3DV3 – SN:4048 January 9, 2018

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	3.54	85.96	24.06	2.04	110.0	± 9.6 %
		Y	8.58	98.04	27.87		110.0	
		Z	14.63	112.69	33.41		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.67	67.66	17.10	0.49	100.0	± 9.6 %
		Y	4.94	67.56	17.19		100.0	
		Z	4.82	67.66	17.36		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.67	67.72	17.16	0.72	100.0	± 9.6 %
		Y	4.96	67.66	17.28		100.0	
		Z	4.84	67.78	17.46		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.93	67.95	17.36	0.86	100.0	± 9.6 %
		Y	5.30	68.01	17.54		100.0	
		Z	5.14	68.08	17.72		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.78	67.77	17.40	1.21	100.0	± 9.6 %
		Y	5.15	67.90	17.62		100.0	
		Z	5.00	67.97	17.82		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.78	67.74	17.53	1.46	100.0	± 9.6 %
		Y	5.17	67.94	17.78		100.0	
		Z	5.01	68.02	18.01		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.06	67.98	17.97	2.04	100.0	± 9.6 %
		Y	5.45	68.01	18.17		100.0	
		Z	5.31	68.20	18.46		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.08	67.89	18.11	2.55	100.0	± 9.6 %
		Y	5.54	68.26	18.47		100.0	
		Z	5.36	68.31	18.73		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.16	67.95	18.32	2.67	100.0	± 9.6 %
		Y	5.62	68.19	18.64		100.0	
		Z	5.45	68.35	18.95		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.91	67.60	17.80	1.99	100.0	± 9.6 %
		Y	5.22	67.61	17.98		100.0	
		Z	5.11	67.79	18.27		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.86	67.85	17.97	2.30	100.0	± 9.6 %
		Y	5.23	68.03	18.22		100.0	
		Z	5.10	68.17	18.52		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.91	67.98	18.25	2.83	100.0	± 9.6 %
		Y	5.29	68.20	18.53		100.0	
		Z	5.16	68.35	18.87		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.89	67.85	18.36	3.30	100.0	± 9.6 %
		Y	5.26	68.11	18.68		100.0	
		Z	5.13	68.23	19.01		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.90	67.90	18.61	3.82	90.0	± 9.6 %
		Y	5.34	68.43	19.09		90.0	
		Z	5.18	68.40	19.37		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.93	67.73	18.75	4.15	90.0	± 9.6 %
		Y	5.31	68.10	19.14		90.0	
		Z	5.17	68.14	19.47		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.95	67.80	18.85	4.30	90.0	± 9.6 %
		Y	5.33	68.14	19.22		90.0	
		Z	5.20	68.21	19.57		90.0	

Certificate No: EF3-4048_Jan18 Page 14 of 39

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EF3DV3 – SN:4048 January 9, 2018

10081-CAB	CDMA2000 (1xRTT, RC3)	X	1.05	70.34	13.37	0.00	150.0	± 9.6 %
		Y	1.51	74.81	17.49		150.0	
		Z	1.28	72.78	15.25		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	0.59	60.00	3.42	4.77	80.0	± 9.6 %
		Y	1.02	60.49	4.88		80.0	
		Z	0.74	60.00	4.08		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	2.26	67.72	9.89	6.56	60.0	± 9.6 %
		Y	40.86	99.57	22.28		60.0	
		Z	100.00	110.90	24.73		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	2.12	71.62	17.53	0.00	150.0	± 9.6 %
		Y	2.09	70.32	17.50		150.0	
		Z	2.09	70.96	17.56		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	2.09	71.66	17.56	0.00	150.0	± 9.6 %
		Y	2.06	70.37	17.51		150.0	
		Z	2.06	71.02	17.59		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	14.22	106.09	37.87	9.56	60.0	± 9.6 %
		Y	25.12	114.86	39.84		60.0	
		Z	30.33	126.49	45.17		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.33	72.41	18.01	0.00	150.0	± 9.6 %
		Y	3.62	72.83	18.06		150.0	
		Z	3.44	72.49	18.05		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.33	68.90	16.87	0.00	150.0	± 9.6 %
		Y	3.56	69.17	16.99		150.0	
		Z	3.42	68.93	16.98		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.42	68.81	16.93	0.00	150.0	± 9.6 %
		Y	3.65	69.00	17.02		150.0	
		Z	3.51	68.80	17.02		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	6.00	76.22	20.60	3.98	65.0	± 9.6 %
		Y	7.22	77.12	20.81		65.0	
		Z	6.95	78.44	22.02		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	6.12	74.74	20.85	3.98	65.0	± 9.6 %
		Y	7.62	76.82	21.69		65.0	
		Z	7.02	76.95	22.32		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	5.79	73.50	20.62	3.98	65.0	± 9.6 %
		Y	6.98	75.02	21.23		65.0	
		Z	6.35	74.73	21.65		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.93	72.17	18.08	0.00	150.0	± 9.6 %
		Y	3.22	72.33	18.05		150.0	
		Z	3.06	72.23	18.14		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.98	69.09	16.86	0.00	150.0	± 9.6 %
		Y	3.23	69.17	17.02		150.0	
		Z	3.08	69.05	16.99		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.44	72.08	17.92	0.00	150.0	± 9.6 %
		Y	2.70	71.86	17.99		150.0	
		Z	2.56	72.10	18.08		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.74	70.64	17.26	0.00	150.0	± 9.6 %
		Y	2.93	69.99	17.42		150.0	
		Z	2.80	70.22	17.36		150.0	

Certificate No: EF3-4048_Jan18 Page 15 of 39

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EF3DV3 – SN:4048 January 9, 2018

10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.10	69.03	16.87	0.00	150.0	± 9.6 %
		Y	3.33	68.98	16.99		150.0	
		Z	3.19	68.92	16.98		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.88	70.69	17.33	0.00	150.0	± 9.6 %
		Y	3.07	69.95	17.45		150.0	
		Z	2.94	70.23	17.42		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.27	68.50	17.33	0.00	150.0	± 9.6 %
		Y	5.45	68.30	17.22		150.0	
		Z	5.47	68.77	17.59		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.58	68.78	17.48	0.00	150.0	± 9.6 %
		Y	5.91	68.93	17.55		150.0	
		Z	5.71	68.71	17.57		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.38	68.76	17.39	0.00	150.0	± 9.6 %
		Y	5.64	68.77	17.38		150.0	
		Z	5.55	68.87	17.56		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.24	68.37	17.29	0.00	150.0	± 9.6 %
		Y	5.45	68.32	17.24		150.0	
		Z	5.33	68.25	17.35		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.83	69.55	17.88	0.00	150.0	± 9.6 %
		Y	5.90	68.81	17.48		150.0	
		Z	5.98	69.55	18.01		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.44	68.98	17.51	0.00	150.0	± 9.6 %
		Y	5.64	68.84	17.43		150.0	
		Z	5.62	69.14	17.72		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.45	68.84	16.84	0.00	150.0	± 9.6 %
		Y	3.69	68.99	16.93		150.0	
		Z	3.55	68.80	16.93		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.57	68.92	16.99	0.00	150.0	± 9.6 %
		Y	3.80	68.97	17.04		150.0	
		Z	3.66	68.83	17.06		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	2.27	72.74	17.57	0.00	150.0	± 9.6 %
		Y	2.50	72.26	17.96		150.0	
		Z	2.38	72.70	17.89		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.64	71.69	16.69	0.00	150.0	± 9.6 %
		Y	2.85	71.06	17.42		150.0	
		Z	2.71	71.33	17.06		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.25	68.32	14.51	0.00	150.0	± 9.6 %
		Y	2.63	68.90	15.90		150.0	
		Z	2.43	68.64	15.24		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.98	63.98	9.67	0.00	150.0	± 9.6 %
		Y	1.83	70.72	15.51		150.0	
		Z	1.30	66.67	12.12		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	1.20	62.39	7.69	0.00	150.0	± 9.6 %
		Y	3.23	72.43	15.23		150.0	
		Z	2.33	70.73	13.96		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	1.25	62.78	8.00	0.00	150.0	± 9.6 %
		Y	3.99	75.39	16.63		150.0	
		Z	3.45	75.89	16.27		150.0	

Certificate No: EF3-4048_Jan18 Page 16 of 39

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

EF3DV3 – SN:4048 January 9, 2018

10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.99	69.15	16.91	0.00	150.0	± 9.6 %
		Y	3.23	69.22	17.06		150.0	
		Z	3.09	69.11	17.04		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.10	69.09	16.92	0.00	150.0	± 9.6 %
		Y	3.34	69.03	17.03		150.0	
		Z	3.20	68.97	17.02		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	6.54	79.54	21.90	3.98	65.0	± 9.6 %
		Y	7.97	80.30	22.16		65.0	
		Z	8.13	83.17	23.96		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	5.65	74.76	20.37	3.98	65.0	± 9.6 %
		Y	7.24	77.06	21.53		65.0	
		Z	6.66	77.40	22.16		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	6.04	75.83	21.22	3.98	65.0	± 9.6 %
		Y	7.57	77.77	22.20		65.0	
		Z	7.02	78.26	22.89		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.49	72.52	18.18	0.00	150.0	± 9.6 %
		Y	2.76	72.36	18.28		150.0	
		Z	2.62	72.54	18.34		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.75	70.67	17.29	0.00	150.0	± 9.6 %
		Y	2.93	70.00	17.43		150.0	
		Z	2.80	70.24	17.38		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	2.13	73.09	17.25	0.00	150.0	± 9.6 %
		Y	2.41	73.02	18.13		150.0	
		Z	2.27	73.32	17.82		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.15	69.25	14.50	0.00	150.0	± 9.6 %
		Y	2.58	70.28	16.38		150.0	
		Z	2.40	70.09	15.57		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.89	70.77	17.39	0.00	150.0	± 9.6 %
		Y	3.08	70.00	17.49		150.0	
		Z	2.95	70.29	17.47		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.18	69.22	14.56	0.00	150.0	± 9.6 %
		Y	2.63	70.32	16.48		150.0	
		Z	2.39	69.85	15.54		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	3.25	72.87	18.44	0.00	150.0	± 9.6 %
		Y	3.43	72.33	18.29		150.0	
		Z	3.54	73.64	18.88		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	3.00	69.13	16.83	0.00	150.0	± 9.6 %
		Y	3.23	68.95	16.98		150.0	
		Z	3.09	68.97	16.96		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.11	69.31	16.95	0.00	150.0	± 9.6 %
		Y	3.33	68.97	17.03		150.0	
		Z	3.20	69.08	17.05		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.40	71.02	20.13	3.01	150.0	± 9.6 %
		Y	4.16	72.19	20.54		150.0	
		Z	3.50	70.96	20.76		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	4.24	74.95	20.93	3.01	150.0	± 9.6 %
		Y	5.69	76.63	21.50		150.0	
		Z	4.07	73.90	21.30		150.0	

Certificate No: EF3-4048_Jan18 Page 17 of 39

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EF3DV3 – SN:4048 January 9, 2018

10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	4.83	77.93	22.59	3.01	150.0	± 9.6 %
		Y	6.32	78.92	22.75		150.0	
		Z	4.49	76.24	22.69		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.67	69.45	19.55	3.01	150.0	± 9.6 %
		Y	3.98	74.79	21.68		150.0	
		Z	2.55	68.69	20.07		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.68	76.80	22.59	3.01	150.0	± 9.6 %
		Y	7.10	85.06	25.20		150.0	
		Z	3.01	73.79	22.44		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	2.99	72.24	19.50	3.01	150.0	± 9.6 %
		Y	5.35	78.80	21.82		150.0	
		Z	2.61	70.59	19.90		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	6.50	90.52	28.24	6.02	65.0	± 9.6 %
		Y	26.74	110.78	33.70		65.0	
		Z	13.98	109.40	36.62		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	14.41	100.42	28.77	6.02	65.0	± 9.6 %
		Y	42.14	111.90	31.64		65.0	
		Z	100.00	144.19	43.15		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	8.64	90.44	25.00	6.02	65.0	± 9.6 %
		Y	22.47	99.76	27.70		65.0	
		Z	57.04	130.14	38.90		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.65	69.24	19.34	3.01	150.0	± 9.6 %
		Y	3.93	74.42	21.41		150.0	
		Z	2.55	68.56	19.89		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.68	76.83	22.60	3.01	150.0	± 9.6 %
		Y	7.11	85.09	25.21		150.0	
		Z	3.02	73.82	22.46		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.66	69.31	19.39	3.01	150.0	± 9.6 %
		Y	3.96	74.56	21.50		150.0	
		Z	2.55	68.60	19.93		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.65	76.64	22.50	3.01	150.0	± 9.6 %
		Y	6.97	84.67	25.03		150.0	
		Z	3.00	73.64	22.35		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.31	74.45	20.92	3.01	150.0	± 9.6 %
		Y	6.11	81.63	23.31		150.0	
		Z	2.81	72.29	21.13		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	2.99	72.20	19.46	3.01	150.0	± 9.6 %
		Y	5.32	78.68	21.76		150.0	
		Z	2.61	70.55	19.86		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.66	69.30	19.39	3.01	150.0	± 9.6 %
		Y	3.95	74.55	21.49		150.0	
		Z	2.55	68.58	19.93		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.65	76.61	22.49	3.01	150.0	± 9.6 %
		Y	6.95	84.63	25.02		150.0	
		Z	2.99	73.61	22.34		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	2.98	72.17	19.45	3.01	150.0	± 9.6 %
		Y	5.31	78.65	21.74		150.0	
		Z	2.60	70.52	19.84		150.0	

Certificate No: EF3-4048_Jan18 Page 18 of 39

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EF3DV3 – SN:4048 January 9, 2018

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.67	69.33	19.40	3.01	150.0	± 9.6 %
		Y	3.97	74.59	21.51		150.0	
		Z	2.56	68.62	19.94		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.67	76.70	22.53	3.01	150.0	± 9.6 %
		Y	6.99	84.74	25.06		150.0	
		Z	3.01	73.69	22.38		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	3.00	72.25	19.49	3.01	150.0	± 9.6 %
		Y	5.34	78.74	21.78		150.0	
		Z	2.62	70.60	19.89		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.68	69.41	19.49	3.01	150.0	± 9.6 %
		Y	3.98	74.67	21.58		150.0	
		Z	2.57	68.68	20.02		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.78	77.39	22.93	3.01	150.0	± 9.6 %
		Y	7.36	85.81	25.55		150.0	
		Z	3.08	74.23	22.72		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	3.07	72.69	19.78	3.01	150.0	± 9.6 %
		Y	5.51	79.38	22.12		150.0	
		Z	2.67	70.97	20.15		150.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.56	67.78	16.85	0.00	150.0	± 9.6 %
		Y	4.79	67.55	16.89		150.0	
		Z	4.66	67.57	16.94		150.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.71	68.06	17.00	0.00	150.0	± 9.6 %
		Y	5.00	67.93	17.02		150.0	
		Z	4.84	67.90	17.08		150.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.75	68.09	17.02	0.00	150.0	± 9.6 %
		Y	5.04	67.94	17.03		150.0	
		Z	4.88	67.94	17.10		150.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.55	67.81	16.86	0.00	150.0	± 9.6 %
		Y	4.82	67.66	16.94		150.0	
		Z	4.66	67.65	16.97		150.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.73	68.07	17.01	0.00	150.0	± 9.6 %
		Y	5.02	67.95	17.03		150.0	
		Z	4.85	67.93	17.10		150.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.75	68.10	17.03	0.00	150.0	± 9.6 %
		Y	5.05	67.96	17.04		150.0	
		Z	4.88	67.96	17.12		150.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.50	67.85	16.83	0.00	150.0	± 9.6 %
		Y	4.77	67.69	16.91		150.0	
		Z	4.61	67.68	16.93		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.72	68.03	17.00	0.00	150.0	± 9.6 %
		Y	5.02	67.95	17.03		150.0	
		Z	4.85	67.90	17.09		150.0	
10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.76	68.03	17.01	0.00	150.0	± 9.6 %
		Y	5.05	67.89	17.03		150.0	
		Z	4.89	67.88	17.10		150.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.21	68.35	17.27	0.00	150.0	± 9.6 %
		Y	5.44	68.36	17.26		150.0	
		Z	5.31	68.27	17.35		150.0	

Certificate No: EF3-4048_Jan18 Page 19 of 39

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EF3DV3 – SN:4048 January 9, 2018

10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.58	68.87	17.55	0.00	150.0	± 9.6 %
		Y	5.94	69.16	17.69		150.0	
		Z	5.74	68.93	17.71		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.25	68.46	17.25	0.00	150.0	± 9.6 %
		Y	5.47	68.38	17.18		150.0	
		Z	5.37	68.43	17.35		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.83	67.70	15.94	0.00	150.0	± 9.6 %
		Y	3.05	67.44	16.43		150.0	
		Z	2.91	67.51	16.24		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	16.01	102.43	29.46	6.02	65.0	± 9.6 %
		Y	46.59	113.83	32.26		65.0	
		Z	100.00	144.45	43.32		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	13.91	97.92	27.27	6.02	65.0	± 9.6 %
		Y	29.38	104.14	29.00		65.0	
		Z	100.00	140.58	41.36		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	8.36	95.48	29.90	6.02	65.0	± 9.6 %
		Y	38.95	118.34	35.84		65.0	
		Z	30.22	126.68	41.56		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	14.47	100.47	28.79	6.02	65.0	± 9.6 %
		Y	42.07	111.87	31.64		65.0	
		Z	100.00	144.15	43.14		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	12.61	96.21	26.68	6.02	65.0	± 9.6 %
		Y	27.31	102.80	28.54		65.0	
		Z	100.00	140.43	41.25		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	7.88	94.21	29.40	6.02	65.0	± 9.6 %
		Y	35.72	116.50	35.26		65.0	
		Z	27.20	124.15	40.78		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	14.45	100.46	28.79	6.02	65.0	± 9.6 %
		Y	42.10	111.89	31.65		65.0	
		Z	100.00	144.18	43.15		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	12.58	96.20	26.68	6.02	65.0	± 9.6 %
		Y	27.35	102.84	28.55		65.0	
		Z	100.00	140.47	41.26		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	7.53	93.14	28.90	6.02	65.0	± 9.6 %
		Y	32.80	114.58	34.61		65.0	
		Z	25.36	122.26	40.12		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	14.56	100.61	28.83	6.02	65.0	± 9.6 %
		Y	42.49	112.05	31.69		65.0	
		Z	100.00	144.20	43.16		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	12.83	96.46	26.75	6.02	65.0	± 9.6 %
		Y	27.74	103.03	28.60		65.0	
		Z	100.00	140.35	41.21		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	7.93	94.37	29.46	6.02	65.0	± 9.6 %
		Y	36.43	116.90	35.37		65.0	
		Z	27.83	124.72	40.95		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	14.42	100.44	28.78	6.02	65.0	± 9.6 %
		Y	42.15	111.92	31.65		65.0	
		Z	100.00	144.21	43.16		65.0	

Certificate No: EF3-4048_Jan18 Page 20 of 39

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EF3DV3 – SN:4048 January 9, 2018

10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	12.55	96.18	26.67	6.02	65.0	± 9.6 %
		Y	27.39	102.88	28.56		65.0	
		Z	100.00	140.51	41.28		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	7.88	94.27	29.42	6.02	65.0	± 9.6 %
		Y	36.07	116.73	35.32		65.0	
		Z	27.45	124.44	40.87		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	7.95	84.17	26.42	6.98	65.0	± 9.6 %
		Y	11.20	86.91	27.48		65.0	
		Z	8.58	85.75	28.34		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	7.17	82.05	25.51	6.98	65.0	± 9.6 %
		Y	9.59	83.52	26.08		65.0	
		Z	7.61	82.93	27.09		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.73	78.07	24.92	6.98	65.0	± 9.6 %
		Y	7.54	80.11	25.72		65.0	
		Z	6.19	78.98	26.38		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	3.76	69.60	13.89	3.98	65.0	± 9.6 %
		Y	7.55	78.56	19.75		65.0	
		Z	7.54	81.51	21.11		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	3.71	69.19	13.65	3.98	65.0	± 9.6 %
		Y	7.47	78.13	19.54		65.0	
		Z	7.18	80.40	20.61		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	3.86	73.36	16.13	3.98	65.0	± 9.6 %
		Y	7.49	81.95	21.21		65.0	
		Z	8.11	85.27	22.26		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	4.21	71.89	16.44	3.98	65.0	± 9.6 %
		Y	6.40	77.02	20.09		65.0	
		Z	5.88	77.35	20.08		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	4.22	71.52	16.27	3.98	65.0	± 9.6 %
		Y	6.46	76.64	19.93		65.0	
		Z	5.82	76.67	19.79		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	5.83	80.10	20.21	3.98	65.0	± 9.6 %
		Y	8.70	84.65	22.97		65.0	
		Z	10.72	90.86	25.37		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	5.63	76.82	20.90	3.98	65.0	± 9.6 %
		Y	7.35	79.34	22.47		65.0	
		Z	6.95	80.49	23.30		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	5.34	74.65	19.59	3.98	65.0	± 9.6 %
		Y	7.03	77.28	21.33		65.0	
		Z	6.54	77.97	21.89		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	6.86	82.67	22.79	3.98	65.0	± 9.6 %
		Y	8.63	83.81	23.49		65.0	
		Z	9.69	88.90	25.95		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	5.53	74.24	20.05	3.98	65.0	± 9.6 %
		Y	6.99	76.32	21.27		65.0	
		Z	6.45	76.66	21.81		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	5.89	75.21	20.79	3.98	65.0	± 9.6 %
		Y	7.35	77.09	21.90		65.0	
		Z	6.81	77.53	22.49		65.0	

Certificate No: EF3-4048_Jan18 Page 21 of 39

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

EF3DV3 – SN:4048 January 9, 2018

10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	6.29	79.09	21.90	3.98	65.0	± 9.6 %
		Y	7.69	79.97	22.31		65.0	
		Z	7.73	82.54	23.95		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	2.73	65.53	10.62	3.98	65.0	± 9.6 %
		Y	6.19	75.16	17.42		65.0	
		Z	5.40	75.62	17.51		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	2.72	65.21	10.37	3.98	65.0	± 9.6 %
		Y	6.11	74.61	17.12		65.0	
		Z	5.08	74.29	16.82		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	2.58	67.46	12.28	3.98	65.0	± 9.6 %
		Y	5.98	78.02	18.99		65.0	
		Z	5.09	77.14	18.16		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	4.78	73.88	18.13	3.98	65.0	± 9.6 %
		Y	6.79	77.89	20.95		65.0	
		Z	6.35	78.67	21.31		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	4.79	73.57	18.00	3.98	65.0	± 9.6 %
		Y	6.83	77.65	20.87		65.0	
		Z	6.31	78.18	21.11		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	5.99	80.47	21.00	3.98	65.0	± 9.6 %
		Y	8.33	83.69	23.01		65.0	
		Z	9.48	88.71	25.18		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	5.61	76.75	20.85	3.98	65.0	± 9.6 %
		Y	7.35	79.31	22.43		65.0	
		Z	6.94	80.44	23.26		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.33	74.62	19.58	3.98	65.0	± 9.6 %
		Y	7.02	77.27	21.33		65.0	
		Z	6.52	77.94	21.88		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	6.79	82.44	22.68	3.98	65.0	± 9.6 %
		Y	8.57	83.66	23.41		65.0	
		Z	9.58	88.65	25.84		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	5.65	74.76	20.37	3.98	65.0	± 9.6 %
		Y	7.23	77.06	21.53		65.0	
		Z	6.65	77.40	22.17		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	6.03	75.81	21.20	3.98	65.0	± 9.6 %
		Y	7.56	77.76	22.19		65.0	
		Z	7.01	78.24	22.88		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.53	79.49	21.88	3.98	65.0	± 9.6 %
		Y	7.96	80.26	22.14		65.0	
		Z	8.11	83.12	23.94		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	6.27	74.66	20.91	3.98	65.0	± 9.6 %
		Y	7.71	76.49	21.70		65.0	
		Z	7.11	76.60	22.28		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	6.26	74.26	20.78	3.98	65.0	± 9.6 %
		Y	7.64	76.03	21.59		65.0	
		Z	7.04	76.06	22.10		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	6.30	76.50	20.95	3.98	65.0	± 9.6 %
		Y	7.59	77.48	21.24		65.0	
		Z	7.30	78.77	22.41		65.0	

Certificate No: EF3-4048_Jan18 Page 22 of 39

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EF3DV3 – SN:4048 January 9, 2018

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.70	68.56	16.12	0.00	150.0	± 9.6 %
		Y	2.79	67.80	16.34		150.0	
		Z	2.74	68.13	16.29		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.93	72.54	17.86	0.00	150.0	± 9.6 %
		Y	2.02	72.02	17.97		150.0	
		Z	1.98	72.50	18.05		150.0	
10277-CAA	PHS (QPSK)	X	2.03	61.33	5.59	9.03	50.0	± 9.6 %
		Y	3.35	64.94	9.50		50.0	
		Z	2.60	63.28	7.72		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	3.14	66.17	10.50	9.03	50.0	± 9.6 %
		Y	6.32	75.59	17.16		50.0	
		Z	5.54	74.41	15.91		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	3.22	66.42	10.68	9.03	50.0	± 9.6 %
		Y	6.52	75.94	17.35		50.0	
		Z	5.73	74.82	16.15		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	1.62	71.70	14.06	0.00	150.0	± 9.6 %
		Y	2.42	76.19	18.04		150.0	
		Z	2.10	74.61	16.14		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	1.00	69.85	13.13	0.00	150.0	± 9.6 %
		Y	1.45	74.25	17.24		150.0	
		Z	1.22	72.20	14.99		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	5.32	91.53	21.20	0.00	150.0	± 9.6 %
		Y	2.87	85.95	22.18		150.0	
		Z	4.51	90.94	22.10		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	100.00	131.73	31.79	0.00	150.0	± 9.6 %
		Y	7.74	102.49	27.96		150.0	
		Z	100.00	136.11	34.04		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	57.59	108.40	27.97	9.03	50.0	± 9.6 %
		Y	15.14	92.65	26.41		50.0	
		Z	100.00	124.92	34.79		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.95	72.29	18.15	0.00	150.0	± 9.6 %
		Y	3.24	72.43	18.12		150.0	
		Z	3.07	72.34	18.21		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	1.58	69.58	14.03	0.00	150.0	± 9.6 %
		Y	2.21	72.84	17.26		150.0	
		Z	1.90	71.52	15.71		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	1.83	66.40	11.18	0.00	150.0	± 9.6 %
		Y	3.98	75.10	17.23		150.0	
		Z	3.86	77.80	18.26		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	1.46	63.37	8.88	0.00	150.0	± 9.6 %
		Y	2.89	69.52	14.08		150.0	
		Z	2.11	68.04	13.10		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.56	66.33	17.93	4.17	80.0	± 9.6 %
		Y	5.11	66.67	18.42		80.0	
		Z	4.97	66.95	18.46		80.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	4.99	66.70	18.53	4.96	80.0	± 9.6 %
		Y	5.61	67.45	19.24		80.0	
		Z	5.45	67.67	19.26		80.0	

Certificate No: EF3-4048_Jan18 Page 23 of 39

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EF3DV3 – SN:4048 January 9, 2018

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.72	66.27	18.30	4.96	80.0	± 9.6 %
		Y	5.38	67.24	19.18		80.0	
		Z	5.19	67.34	19.12		80.0	
10304-AAA	IEEE 802.16e WiMAX (29.18, 5ms, 10MHz, 64QAM, PUSC)	X	4.56	66.25	17.85	4.17	80.0	± 9.6 %
		Y	5.14	66.90	18.54		80.0	
		Z	4.99	67.11	18.53		80.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.00	67.07	18.92	6.02	50.0	± 9.6 %
		Y	4.95	69.48	21.03		50.0	
		Z	4.70	69.39	20.55		50.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.39	66.50	18.88	6.02	50.0	± 9.6 %
		Y	5.18	68.05	20.35		50.0	
		Z	4.97	68.15	20.11		50.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.27	66.52	18.78	6.02	50.0	± 9.6 %
		Y	5.12	68.41	20.40		50.0	
		Z	4.88	68.35	20.09		50.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	4.24	66.70	18.91	6.02	50.0	± 9.6 %
		Y	5.08	68.56	20.51		50.0	
		Z	4.86	68.57	20.23		50.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.43	66.67	19.02	6.02	50.0	± 9.6 %
		Y	5.28	68.41	20.56		50.0	
		Z	5.04	68.45	20.31		50.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	4.34	66.54	18.86	6.02	50.0	± 9.6 %
		Y	5.13	68.13	20.32		50.0	
		Z	4.92	68.22	20.09		50.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.29	71.02	17.55	0.00	150.0	± 9.6 %
		Y	3.58	71.30	17.55		150.0	
		Z	3.40	71.03	17.57		150.0	
10313-AAA	iDEN 1:3	X	3.19	72.57	15.07	6.99	70.0	± 9.6 %
		Y	4.88	75.47	16.63		70.0	
		Z	7.03	83.17	19.85		70.0	
10314-AAA	iDEN 1:6	X	5.31	81.53	21.24	10.00	30.0	± 9.6 %
		Y	6.78	82.49	21.87		30.0	
		Z	16.29	100.28	28.18		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.13	65.91	16.77	0.17	150.0	± 9.6 %
		Y	1.17	66.14	17.04		150.0	
		Z	1.14	66.19	17.22		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.58	67.71	16.91	0.17	150.0	± 9.6 %
		Y	4.85	67.60	16.99		150.0	
		Z	4.72	67.68	17.13		150.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.58	67.71	16.91	0.17	150.0	± 9.6 %
		Y	4.85	67.60	16.99		150.0	
		Z	4.72	67.68	17.13		150.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.70	68.16	17.03	0.00	150.0	± 9.6 %
		Y	5.02	68.05	17.05		150.0	
		Z	4.84	68.05	17.13		150.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.58	68.69	17.43	0.00	150.0	± 9.6 %
		Y	5.78	68.48	17.34		150.0	
		Z	5.71	68.65	17.55		150.0	

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EF3DV3 – SN:4048 January 9, 2018

10402-AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.75	68.52	17.20	0.00	150.0	± 9.6 %
		Y	6.00	68.61	17.22		150.0	
		Z	5.85	68.43	17.27		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	1.62	71.70	14.06	0.00	115.0	± 9.6 %
		Y	2.42	76.19	18.04		115.0	
		Z	2.10	74.61	16.14		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	1.62	71.70	14.06	0.00	115.0	± 9.6 %
		Y	2.42	76.19	18.04		115.0	
		Z	2.10	74.61	16.14		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	117.99	27.44	0.00	100.0	± 9.6 %
		Y	100.00	121.24	30.40		100.0	
		Z	100.00	144.44	39.35		100.0	
10410-AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	19.28	98.85	22.74	3.23	80.0	± 9.6 %
		Y	100.00	117.24	28.30		80.0	
		Z	100.00	136.44	36.26		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.06	65.24	16.38	0.00	150.0	± 9.6 %
		Y	1.07	65.00	16.42		150.0	
		Z	1.05	65.12	16.52		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.56	67.81	16.94	0.00	150.0	± 9.6 %
		Y	4.80	67.60	16.95		150.0	
		Z	4.67	67.63	17.03		150.0	
10417-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.56	67.81	16.94	0.00	150.0	± 9.6 %
		Y	4.80	67.60	16.95		150.0	
		Z	4.67	67.63	17.03		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.56	68.02	17.00	0.00	150.0	± 9.6 %
		Y	4.79	67.73	16.95		150.0	
		Z	4.66	67.80	17.05		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.57	67.95	16.98	0.00	150.0	± 9.6 %
		Y	4.81	67.69	16.96		150.0	
		Z	4.68	67.75	17.05		150.0	
10422-AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.68	67.92	16.99	0.00	150.0	± 9.6 %
		Y	4.94	67.70	16.98		150.0	
		Z	4.80	67.74	17.07		150.0	
10423-AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.82	68.21	17.09	0.00	150.0	± 9.6 %
		Y	5.15	68.11	17.13		150.0	
		Z	4.97	68.08	17.19		150.0	
10424-AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.75	68.16	17.07	0.00	150.0	± 9.6 %
		Y	5.06	68.03	17.09		150.0	
		Z	4.89	68.03	17.16		150.0	
10425-AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.52	68.81	17.49	0.00	150.0	± 9.6 %
		Y	5.82	68.94	17.56		150.0	
		Z	5.73	69.04	17.74		150.0	
10426-AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.70	69.45	17.81	0.00	150.0	± 9.6 %
		Y	5.87	69.10	17.63		150.0	
		Z	5.87	69.57	18.01		150.0	

Certificate No: EF3-4048_Jan18 Page 25 of 39

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EF3DV3 – SN:4048 January 9, 2018

10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.52	68.75	17.46	0.00	150.0	± 9.6 %
		Y	5.81	68.83	17.49		150.0	
		Z	5.81	69.28	17.86		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.32	72.89	18.89	0.00	150.0	± 9.6 %
		Y	4.46	71.28	18.79		150.0	
		Z	4.32	71.84	18.79		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.20	68.56	16.90	0.00	150.0	± 9.6 %
		Y	4.54	68.28	17.05		150.0	
		Z	4.35	68.37	17.05		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.51	68.30	17.01	0.00	150.0	± 9.6 %
		Y	4.83	68.11	17.07		150.0	
		Z	4.65	68.13	17.12		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.77	68.19	17.09	0.00	150.0	± 9.6 %
		Y	5.07	68.08	17.11		150.0	
		Z	4.90	68.05	17.18		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.43	73.79	18.70	0.00	150.0	± 9.6 %
		Y	4.56	72.04	18.76		150.0	
		Z	4.41	72.68	18.67		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.14	81.90	18.21	3.23	80.0	± 9.6 %
		Y	100.00	117.32	28.33		80.0	
		Z	100.00	143.13	39.08		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.46	68.62	15.88	0.00	150.0	± 9.6 %
		Y	3.85	68.50	16.60		150.0	
		Z	3.63	68.53	16.29		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.06	68.35	16.77	0.00	150.0	± 9.6 %
		Y	4.35	68.04	16.91		150.0	
		Z	4.18	68.13	16.91		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.34	68.12	16.91	0.00	150.0	± 9.6 %
		Y	4.61	67.91	16.96		150.0	
		Z	4.46	67.94	17.01		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.55	67.94	16.94	0.00	150.0	± 9.6 %
		Y	4.79	67.80	16.95		150.0	
		Z	4.66	67.79	17.02		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.30	68.56	15.21	0.00	150.0	± 9.6 %
		Y	3.79	68.84	16.34		150.0	
		Z	3.53	68.71	15.83		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.66	69.85	17.92	0.00	150.0	± 9.6 %
		Y	6.71	69.45	17.67		150.0	
		Z	6.84	70.06	18.14		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.85	66.45	16.66	0.00	150.0	± 9.6 %
		Y	3.96	66.18	16.69		150.0	
		Z	3.89	66.20	16.74		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.94	72.42	17.52	0.00	150.0	± 9.6 %
		Y	4.14	71.12	18.17		150.0	
		Z	4.05	71.94	17.97		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	4.97	69.66	18.34	0.00	150.0	± 9.6 %
		Y	5.21	68.22	18.41		150.0	
		Z	5.08	68.98	18.50		150.0	

Certificate No: EF3-4048_Jan18 Page 26 of 39

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EF3DV3 – SN:4048 January 9, 2018

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.48	78.99	21.39	0.00	150.0	± 9.6 %
		Y	1.45	77.90	21.28		150.0	
		Z	1.59	80.39	22.09		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.79	91.54	22.09	3.29	80.0	± 9.6 %
		Y	100.00	120.65	29.97		80.0	
		Z	100.00	146.64	40.89		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.67	60.00	6.21	3.23	80.0	± 9.6 %
		Y	2.70	68.44	11.89		80.0	
		Z	100.00	116.38	26.63		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.65	3.23	80.0	± 9.6 %
		Y	1.89	64.43	9.76		80.0	
		Z	100.00	108.57	23.12		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.71	81.04	18.02	3.23	80.0	± 9.6 %
		Y	100.00	117.86	28.53		80.0	
		Z	100.00	143.96	39.41		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.67	60.00	6.15	3.23	80.0	± 9.6 %
		Y	2.42	67.33	11.38		80.0	
		Z	100.00	115.28	26.13		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.62	3.23	80.0	± 9.6 %
		Y	1.79	63.92	9.48		80.0	
		Z	100.00	107.69	22.73		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.27	82.80	18.62	3.23	80.0	± 9.6 %
		Y	100.00	118.08	28.62		80.0	
		Z	100.00	144.42	39.61		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.16	3.23	80.0	± 9.6 %
		Y	2.47	67.58	11.50		80.0	
		Z	100.00	115.66	26.29		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.61	3.23	80.0	± 9.6 %
		Y	1.79	63.93	9.48		80.0	
		Z	100.00	107.73	22.74		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.29	82.84	18.62	3.23	80.0	± 9.6 %
		Y	100.00	118.09	28.62		80.0	
		Z	100.00	144.54	39.65		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.15	3.23	80.0	± 9.6 %
		Y	2.46	67.51	11.45		80.0	
		Z	100.00	115.53	26.23		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.59	3.23	80.0	± 9.6 %
		Y	1.78	63.87	9.45		80.0	
		Z	100.00	107.56	22.66		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.26	82.74	18.58	3.23	80.0	± 9.6 %
		Y	100.00	118.05	28.60		80.0	
		Z	100.00	144.48	39.62		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.14	3.23	80.0	± 9.6 %
		Y	2.45	67.47	11.44		80.0	
		Z	100.00	115.55	26.24		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.60	3.23	80.0	± 9.6 %
		Y	1.78	63.86	9.44		80.0	
		Z	100.00	107.61	22.68		80.0	

Certificate No: EF3-4048_Jan18 Page 27 of 39

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EF3DV3 – SN:4048 January 9, 2018

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.12	3.23	80.0	± 9.6 %
		Y	2.39	67.24	11.32		80.0	
		Z	100.00	115.18	26.07		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.58	3.23	80.0	± 9.6 %
		Y	1.77	63.82	9.41		80.0	
		Z	100.00	107.46	22.61		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.67	85.59	21.53	3.23	80.0	± 9.6 %
		Y	7.57	85.20	22.75		80.0	
		Z	100.00	134.96	37.67		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.55	68.74	13.04	3.23	80.0	± 9.6 %
		Y	7.10	79.46	19.05		80.0	
		Z	100.00	122.22	31.55		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.97	65.53	11.23	3.23	80.0	± 9.6 %
		Y	6.00	76.58	17.69		80.0	
		Z	100.00	119.54	30.23		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.92	67.27	13.28	2.23	80.0	± 9.6 %
		Y	4.18	76.13	18.67		80.0	
		Z	5.15	80.78	20.05		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.84	63.51	10.57	2.23	80.0	± 9.6 %
		Y	4.96	74.64	17.64		80.0	
		Z	12.06	90.00	23.06		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.83	63.19	10.41	2.23	80.0	± 9.6 %
		Y	4.81	73.95	17.39		80.0	
		Z	9.18	85.84	21.74		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.87	72.75	17.16	2.23	80.0	± 9.6 %
		Y	4.55	77.45	19.99		80.0	
		Z	5.58	82.88	22.13		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.49	67.19	13.98	2.23	80.0	± 9.6 %
		Y	3.85	71.60	17.36		80.0	
		Z	3.82	73.05	17.72		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.49	66.79	13.77	2.23	80.0	± 9.6 %
		Y	3.85	71.21	17.19		80.0	
		Z	3.74	72.30	17.39		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.35	73.28	18.73	2.23	80.0	± 9.6 %
		Y	4.67	76.04	20.03		80.0	
		Z	4.82	78.84	21.64		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.21	69.34	16.94	2.23	80.0	± 9.6 %
		Y	4.09	71.15	18.25		80.0	
		Z	3.93	72.12	18.91		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.30	69.19	16.87	2.23	80.0	± 9.6 %
		Y	4.18	70.90	18.17		80.0	
		Z	4.00	71.79	18.77		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.56	71.57	18.33	2.23	80.0	± 9.6 %
		Y	4.63	73.64	19.22		80.0	
		Z	4.53	75.06	20.33		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.60	68.77	17.23	2.23	80.0	± 9.6 %
		Y	4.41	70.23	18.14		80.0	
		Z	4.17	70.67	18.66		80.0	

Certificate No: EF3-4048_Jan18 Page 28 of 39

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EF3DV3 – SN:4048 January 9, 2018

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.66	68.65	17.18	2.23	80.0	± 9.6 %
		Y	4.48	70.07	18.09		80.0	
		Z	4.22	70.47	18.57		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.82	72.82	18.73	2.23	80.0	± 9.6 %
		Y	5.10	75.31	19.68		80.0	
		Z	5.05	77.01	20.93		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.62	69.06	17.46	2.23	80.0	± 9.6 %
		Y	4.47	70.76	18.36		80.0	
		Z	4.22	71.12	18.90		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.71	68.83	17.40	2.23	80.0	± 9.6 %
		Y	4.54	70.40	18.25		80.0	
		Z	4.27	70.70	18.75		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.13	61.32	8.92	2.23	80.0	± 9.6 %
		Y	3.06	71.77	16.13		80.0	
		Z	2.72	71.33	15.18		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.16	60.00	7.12	2.23	80.0	± 9.6 %
		Y	2.43	65.85	12.60		80.0	
		Z	1.66	62.55	9.94		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.17	60.00	6.98	2.23	80.0	± 9.6 %
		Y	2.39	65.36	12.23		80.0	
		Z	1.61	61.96	9.47		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.08	73.02	17.82	2.23	80.0	± 9.6 %
		Y	4.46	76.36	19.85		80.0	
		Z	5.03	80.54	21.72		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.85	68.44	15.30	2.23	80.0	± 9.6 %
		Y	3.96	71.38	17.69		80.0	
		Z	3.90	72.79	18.22		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.88	68.20	15.11	2.23	80.0	± 9.6 %
		Y	4.01	71.16	17.55		80.0	
		Z	3.93	72.44	18.00		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.31	73.08	18.63	2.23	80.0	± 9.6 %
		Y	4.61	75.84	19.94		80.0	
		Z	4.75	78.59	21.53		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.20	69.24	16.88	2.23	80.0	± 9.6 %
		Y	4.08	71.08	18.20		80.0	
		Z	3.92	72.03	18.85		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.28	69.10	16.82	2.23	80.0	± 9.6 %
		Y	4.16	70.82	18.12		80.0	
		Z	3.98	71.70	18.71		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.79	72.69	18.66	2.23	80.0	± 9.6 %
		Y	5.06	75.18	19.61		80.0	
		Z	5.00	76.85	20.85		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.61	69.01	17.42	2.23	80.0	± 9.6 %
		Y	4.46	70.70	18.32		80.0	
		Z	4.21	71.07	18.87		80.0	

Certificate No: EF3-4048_Jan18 Page 29 of 39

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EF3DV3 – SN:4048 January 9, 2018

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	68.77	17.35	2.23	80.0	± 9.6 %
		Y	4.53	70.34	18.22		80.0	
		Z	4.26	70.64	18.71		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.10	71.17	18.11	2.23	80.0	± 9.6 %
		Y	5.13	73.07	18.80		80.0	
		Z	4.94	73.85	19.66		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.09	68.66	17.48	2.23	80.0	± 9.6 %
		Y	4.93	70.22	18.21		80.0	
		Z	4.62	70.25	18.62		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.16	68.45	17.43	2.23	80.0	± 9.6 %
		Y	4.96	69.90	18.12		80.0	
		Z	4.66	69.89	18.51		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.21	72.40	18.45	2.23	80.0	± 9.6 %
		Y	5.47	74.86	19.33		80.0	
		Z	5.33	75.95	20.33		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.98	68.82	17.56	2.23	80.0	± 9.6 %
		Y	4.84	70.66	18.36		80.0	
		Z	4.53	70.63	18.79		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.02	68.46	17.46	2.23	80.0	± 9.6 %
		Y	4.82	70.14	18.22		80.0	
		Z	4.53	70.08	18.61		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	1.03	65.64	16.57	0.00	150.0	± 9.6 %
		Y	1.04	65.40	16.62		150.0	
		Z	1.02	65.55	16.73		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	6.80	117.18	34.20	0.00	150.0	± 9.6 %
		Y	6.88	117.54	34.51		150.0	
		Z	100.00	165.60	44.98		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.97	70.02	18.51	0.00	150.0	± 9.6 %
		Y	1.00	69.97	18.62		150.0	
		Z	0.98	70.59	18.94		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.55	67.92	16.93	0.00	150.0	± 9.6 %
		Y	4.80	67.68	16.94		150.0	
		Z	4.66	67.72	17.01		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.71	68.12	17.04	0.00	150.0	± 9.6 %
		Y	5.03	68.00	17.09		150.0	
		Z	4.85	67.98	17.14		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.57	68.07	16.96	0.00	150.0	± 9.6 %
		Y	4.87	67.99	17.02		150.0	
		Z	4.70	67.95	17.07		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.50	68.03	16.94	0.00	150.0	± 9.6 %
		Y	4.80	67.99	17.00		150.0	
		Z	4.63	67.93	17.05		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.56	68.21	17.07	0.00	150.0	± 9.6 %
		Y	4.85	67.97	17.04		150.0	
		Z	4.70	68.06	17.16		150.0	

Certificate No: EF3-4048_Jan18 Page 30 of 39

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EF3DV3 – SN:4048 January 9, 2018

10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.47	68.11	16.93	0.00	150.0	± 9.6 %
		Y	4.71	67.84	16.89		150.0	
		Z	4.57	67.88	16.98		150.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.50	68.14	17.05	0.00	150.0	± 9.6 %
		Y	4.80	67.94	17.04		150.0	
		Z	4.64	67.99	17.13		150.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.53	67.16	16.62	0.00	150.0	± 9.6 %
		Y	4.76	66.91	16.59		150.0	
		Z	4.63	66.95	16.67		150.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.67	67.49	16.75	0.00	150.0	± 9.6 %
		Y	4.97	67.34	16.74		150.0	
		Z	4.80	67.35	16.83		150.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.60	67.46	16.69	0.00	150.0	± 9.6 %
		Y	4.88	67.31	16.69		150.0	
		Z	4.72	67.30	16.77		150.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.61	67.47	16.72	0.00	150.0	± 9.6 %
		Y	4.90	67.34	16.73		150.0	
		Z	4.74	67.32	16.80		150.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.61	67.47	16.72	0.00	150.0	± 9.6 %
		Y	4.90	67.34	16.73		150.0	
		Z	4.74	67.32	16.80		150.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.59	67.54	16.72	0.00	150.0	± 9.6 %
		Y	4.92	67.51	16.77		150.0	
		Z	4.73	67.45	16.83		150.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.46	67.39	16.65	0.00	150.0	± 9.6 %
		Y	4.76	67.37	16.71		150.0	
		Z	4.59	67.28	16.75		150.0	
10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.62	67.56	16.73	0.00	150.0	± 9.6 %
		Y	4.91	67.36	16.71		150.0	
		Z	4.75	67.38	16.79		150.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.23	67.58	16.84	0.00	150.0	± 9.6 %
		Y	5.47	67.57	16.83		150.0	
		Z	5.36	67.55	16.95		150.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.33	67.93	17.02	0.00	150.0	± 9.6 %
		Y	5.55	67.74	16.90		150.0	
		Z	5.53	68.11	17.23		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.19	67.81	16.93	0.00	150.0	± 9.6 %
		Y	5.42	67.73	16.88		150.0	
		Z	5.33	67.81	17.05		150.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.27	67.86	16.97	0.00	150.0	± 9.6 %
		Y	5.49	67.71	16.87		150.0	
		Z	5.39	67.79	17.04		150.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.34	67.83	16.99	0.00	150.0	± 9.6 %
		Y	5.60	67.80	16.96		150.0	
		Z	5.47	67.75	17.07		150.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.22	67.62	16.90	0.00	150.0	± 9.6 %
		Y	5.52	67.79	16.97		150.0	
		Z	5.43	67.88	17.15		150.0	

Certificate No: EF3-4048_Jan18 Page 31 of 39

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EF3DV3 – SN:4048 January 9, 2018

10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.17	67.41	16.78	0.00	150.0	± 9.6 %
		Y	5.45	67.52	16.82		150.0	
		Z	5.36	67.60	17.00		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.37	67.64	16.91	0.00	150.0	± 9.6 %
		Y	5.65	67.72	16.94		150.0	
		Z	5.53	67.71	17.07		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.46	67.79	17.01	0.00	150.0	± 9.6 %
		Y	5.75	67.79	16.99		150.0	
		Z	5.64	67.86	17.17		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.56	67.54	16.77	0.00	150.0	± 9.6 %
		Y	5.74	67.54	16.74		150.0	
		Z	5.68	67.54	16.88		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.92	68.56	17.25	0.00	150.0	± 9.6 %
		Y	6.10	68.43	17.13		150.0	
		Z	6.09	68.70	17.42		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.62	67.75	16.85	0.00	150.0	± 9.6 %
		Y	5.88	67.97	16.91		150.0	
		Z	5.79	67.91	17.04		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.81	68.20	17.07	0.00	150.0	± 9.6 %
		Y	5.97	68.06	16.95		150.0	
		Z	5.90	68.08	17.12		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	6.38	70.11	17.98	0.00	150.0	± 9.6 %
		Y	7.05	71.33	18.52		150.0	
		Z	6.92	71.26	18.64		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.87	68.56	17.27	0.00	150.0	± 9.6 %
		Y	5.93	68.04	16.96		150.0	
		Z	5.98	68.49	17.35		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.63	67.75	16.83	0.00	150.0	± 9.6 %
		Y	5.91	68.00	16.90		150.0	
		Z	5.73	67.69	16.89		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.55	67.58	16.73	0.00	150.0	± 9.6 %
		Y	5.76	67.58	16.70		150.0	
		Z	5.66	67.50	16.80		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.61	67.53	16.74	0.00	150.0	± 9.6 %
		Y	5.85	67.63	16.75		150.0	
		Z	5.72	67.49	16.83		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	6.04	67.97	16.90	0.00	150.0	± 9.6 %
		Y	6.20	68.05	16.90		150.0	
		Z	6.16	68.03	17.03		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.23	68.52	17.15	0.00	150.0	± 9.6 %
		Y	6.42	68.60	17.14		150.0	
		Z	6.43	68.79	17.40		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.27	68.61	17.19	0.00	150.0	± 9.6 %
		Y	6.44	68.63	17.16		150.0	
		Z	6.43	68.76	17.37		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.14	68.21	17.01	0.00	150.0	± 9.6 %
		Y	6.37	68.41	17.06		150.0	
		Z	6.28	68.30	17.16		150.0	

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EF3DV3 – SN:4048 January 9, 2018

10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.17	68.34	17.09	0.00	150.0	± 9.6 %
		Y	6.48	68.78	17.26		150.0	
		Z	6.34	68.51	17.28		150.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.18	68.22	17.07	0.00	150.0	± 9.6 %
		Y	6.39	68.36	17.09		150.0	
		Z	6.33	68.35	17.24		150.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	6.13	68.30	17.14	0.00	150.0	± 9.6 %
		Y	6.33	68.40	17.15		150.0	
		Z	6.29	68.45	17.33		150.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.17	68.40	17.19	0.00	150.0	± 9.6 %
		Y	6.65	69.34	17.63		150.0	
		Z	6.40	68.79	17.49		150.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	7.10	70.79	18.35	0.00	150.0	± 9.6 %
		Y	7.19	70.42	18.11		150.0	
		Z	6.90	69.90	18.03		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.87	67.92	17.05	0.46	150.0	± 9.6 %
		Y	5.14	67.78	17.09		150.0	
		Z	5.00	67.79	17.17		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.08	68.33	17.36	0.46	150.0	± 9.6 %
		Y	5.40	68.27	17.42		150.0	
		Z	5.23	68.24	17.49		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.92	68.17	17.18	0.46	150.0	± 9.6 %
		Y	5.23	68.14	17.25		150.0	
		Z	5.06	68.10	17.32		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.93	68.51	17.52	0.46	150.0	± 9.6 %
		Y	5.25	68.48	17.56		150.0	
		Z	5.08	68.42	17.63		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.83	67.98	16.96	0.46	150.0	± 9.6 %
		Y	5.14	67.90	17.01		150.0	
		Z	4.99	67.95	17.13		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.91	68.68	17.61	0.46	150.0	± 9.6 %
		Y	5.17	68.45	17.55		150.0	
		Z	5.03	68.49	17.68		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.93	68.56	17.56	0.46	150.0	± 9.6 %
		Y	5.23	68.37	17.54		150.0	
		Z	5.07	68.42	17.66		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.19	66.27	16.86	0.46	130.0	± 9.6 %
		Y	1.29	67.09	17.42		130.0	
		Z	1.24	67.09	17.68		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.21	66.99	17.30	0.46	130.0	± 9.6 %
		Y	1.32	67.88	17.87		130.0	
		Z	1.26	67.93	18.17		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	155.53	41.87	0.46	130.0	± 9.6 %
		Y	100.00	152.55	41.01		130.0	
		Z	100.00	157.67	42.87		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.50	75.85	21.66	0.46	130.0	± 9.6 %
		Y	1.79	77.89	22.51		130.0	
		Z	1.76	79.14	23.42		130.0	

Certificate No: EF3-4048_Jan18 Page 33 of 39

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EF3DV3 – SN:4048 January 9, 2018

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.62	67.61	17.00	0.46	130.0	± 9.6 %
		Y	4.90	67.51	17.09		130.0	
		Z	4.77	67.59	17.23		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.65	67.80	17.07	0.46	130.0	± 9.6 %
		Y	4.92	67.66	17.14		130.0	
		Z	4.79	67.75	17.28		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.83	68.06	17.23	0.46	130.0	± 9.6 %
		Y	5.17	68.03	17.34		130.0	
		Z	5.00	68.06	17.47		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.73	68.19	17.33	0.46	130.0	± 9.6 %
		Y	5.05	68.17	17.43		130.0	
		Z	4.89	68.19	17.55		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.49	67.46	16.63	0.46	130.0	± 9.6 %
		Y	4.84	67.59	16.82		130.0	
		Z	4.67	67.56	16.92		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.54	67.57	16.68	0.46	130.0	± 9.6 %
		Y	4.89	67.60	16.84		130.0	
		Z	4.73	67.67	16.97		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.63	68.26	17.29	0.46	130.0	± 9.6 %
		Y	4.95	68.23	17.37		130.0	
		Z	4.79	68.24	17.50		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.43	67.30	16.45	0.46	130.0	± 9.6 %
		Y	4.80	67.41	16.66		130.0	
		Z	4.62	67.42	16.76		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.62	67.61	17.00	0.46	130.0	± 9.6 %
		Y	4.90	67.51	17.09		130.0	
		Z	4.77	67.59	17.23		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.65	67.80	17.07	0.46	130.0	± 9.6 %
		Y	4.92	67.66	17.14		130.0	
		Z	4.79	67.75	17.28		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.83	68.06	17.23	0.46	130.0	± 9.6 %
		Y	5.17	68.03	17.34		130.0	
		Z	5.00	68.06	17.47		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.73	68.19	17.33	0.46	130.0	± 9.6 %
		Y	5.05	68.17	17.43		130.0	
		Z	4.89	68.19	17.55		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.49	67.46	16.63	0.46	130.0	± 9.6 %
		Y	4.84	67.59	16.82		130.0	
		Z	4.67	67.56	16.92		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.54	67.57	16.68	0.46	130.0	± 9.6 %
		Y	4.89	67.60	16.84		130.0	
		Z	4.73	67.67	16.97		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.63	68.26	17.29	0.46	130.0	± 9.6 %
		Y	4.95	68.23	17.37		130.0	
		Z	4.79	68.24	17.50		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.43	67.30	16.45	0.46	130.0	± 9.6 %
		Y	4.80	67.41	16.66		130.0	
		Z	4.62	67.42	16.76		130.0	

Certificate No: EF3-4048_Jan18 Page 34 of 39

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EF3DV3 – SN:4048 January 9, 2018

10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.78	67.66	17.10	0.46	130.0	± 9.6 %
		Y	5.05	67.55	17.18		130.0	
		Z	4.92	67.61	17.31		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.91	67.98	17.24	0.46	130.0	± 9.6 %
		Y	5.23	67.91	17.30		130.0	
		Z	5.07	67.97	17.45		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.83	67.87	17.10	0.46	130.0	± 9.6 %
		Y	5.16	67.88	17.22		130.0	
		Z	5.00	67.89	17.34		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.88	68.03	17.26	0.46	130.0	± 9.6 %
		Y	5.21	68.00	17.35		130.0	
		Z	5.05	68.04	17.48		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.85	68.02	17.17	0.46	130.0	± 9.6 %
		Y	5.19	68.00	17.26		130.0	
		Z	5.02	68.02	17.39		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.78	68.01	17.18	0.46	130.0	± 9.6 %
		Y	5.12	67.99	17.27		130.0	
		Z	4.96	68.04	17.41		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.73	67.88	17.03	0.46	130.0	± 9.6 %
		Y	5.07	67.94	17.17		130.0	
		Z	4.91	67.93	17.29		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.71	68.07	17.28	0.46	130.0	± 9.6 %
		Y	5.05	68.15	17.42		130.0	
		Z	4.88	68.11	17.52		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.71	68.97	17.81	0.46	130.0	± 9.6 %
		Y	5.84	68.51	17.57		130.0	
		Z	5.81	68.83	17.91		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	6.12	70.36	18.47	0.46	130.0	± 9.6 %
		Y	6.49	70.59	18.61		130.0	
		Z	6.57	71.34	19.15		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.70	69.05	17.83	0.46	130.0	± 9.6 %
		Y	6.06	69.32	17.98		130.0	
		Z	5.98	69.54	18.27		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.87	69.32	17.89	0.46	130.0	± 9.6 %
		Y	6.11	69.18	17.83		130.0	
		Z	6.12	69.69	18.26		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	6.00	69.82	18.27	0.46	130.0	± 9.6 %
		Y	6.16	69.32	18.01		130.0	
		Z	6.12	69.71	18.39		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.81	69.25	17.97	0.46	130.0	± 9.6 %
		Y	5.88	68.60	17.65		130.0	
		Z	5.78	68.63	17.83		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.95	69.72	18.21	0.46	130.0	± 9.6 %
		Y	6.12	69.34	18.03		130.0	
		Z	6.28	70.35	18.72		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.59	68.67	17.53	0.46	130.0	± 9.6 %
		Y	5.70	68.15	17.28		130.0	
		Z	5.60	68.23	17.49		130.0	

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EF3DV3 – SN:4048 January 9, 2018

10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.63	67.00	16.74	0.46	130.0	± 9.6 %
		Y	4.89	66.84	16.77		130.0	
		Z	4.77	66.94	16.93		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.79	67.38	16.90	0.46	130.0	± 9.6 %
		Y	5.11	67.29	16.94		130.0	
		Z	4.96	67.37	17.11		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.68	67.22	16.73	0.46	130.0	± 9.6 %
		Y	5.00	67.17	16.81		130.0	
		Z	4.85	67.23	16.95		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.73	67.37	16.89	0.46	130.0	± 9.6 %
		Y	5.05	67.32	16.96		130.0	
		Z	4.89	67.37	17.10		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.64	67.18	16.74	0.46	130.0	± 9.6 %
		Y	4.97	67.18	16.83		130.0	
		Z	4.81	67.20	16.97		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.65	67.36	16.80	0.46	130.0	± 9.6 %
		Y	4.99	67.35	16.88		130.0	
		Z	4.83	67.41	17.04		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.64	67.19	16.65	0.46	130.0	± 9.6 %
		Y	5.01	67.27	16.79		130.0	
		Z	4.83	67.28	16.92		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.59	67.35	16.87	0.46	130.0	± 9.6 %
		Y	4.92	67.40	16.99		130.0	
		Z	4.76	67.39	17.11		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.64	67.05	16.52	0.46	130.0	± 9.6 %
		Y	4.98	67.01	16.62		130.0	
		Z	4.82	67.07	16.76		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.37	67.60	17.07	0.46	130.0	± 9.6 %
		Y	5.63	67.63	17.10		130.0	
		Z	5.54	67.70	17.30		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.53	68.12	17.31	0.46	130.0	± 9.6 %
		Y	5.71	67.81	17.16		130.0	
		Z	5.77	68.45	17.66		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.37	67.94	17.23	0.46	130.0	± 9.6 %
		Y	5.59	67.83	17.18		130.0	
		Z	5.54	68.05	17.46		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.42	67.89	17.15	0.46	130.0	± 9.6 %
		Y	5.63	67.70	17.06		130.0	
		Z	5.57	67.91	17.33		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.47	67.80	17.15	0.46	130.0	± 9.6 %
		Y	5.74	67.77	17.14		130.0	
		Z	5.63	67.87	17.36		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.43	67.73	17.23	0.46	130.0	± 9.6 %
		Y	5.66	67.66	17.19		130.0	
		Z	5.58	67.77	17.42		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.40	67.76	17.24	0.46	130.0	± 9.6 %
		Y	5.72	67.99	17.35		130.0	
		Z	5.68	68.28	17.67		130.0	

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EF3DV3 – SN:4048 January 9, 2018

10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.27	67.25	16.85	0.46	130.0	± 9.6 %
		Y	5.56	67.41	16.95		130.0	
		Z	5.51	67.65	17.24		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.52	67.67	17.13	0.46	130.0	± 9.6 %
		Y	5.82	67.82	17.22		130.0	
		Z	5.71	67.85	17.40		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.65	67.98	17.35	0.46	130.0	± 9.6 %
		Y	6.70	70.31	18.51		130.0	
		Z	6.41	69.92	18.49		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.69	67.50	16.96	0.46	130.0	± 9.6 %
		Y	5.86	67.47	16.93		130.0	
		Z	5.83	67.61	17.18		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	6.19	68.98	17.68	0.46	130.0	± 9.6 %
		Y	6.32	68.68	17.50		130.0	
		Z	6.43	69.33	18.02		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.74	67.66	16.95	0.46	130.0	± 9.6 %
		Y	5.99	67.87	17.03		130.0	
		Z	5.92	67.90	17.23		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.94	68.16	17.20	0.46	130.0	± 9.6 %
		Y	6.09	67.97	17.08		130.0	
		Z	6.11	68.31	17.44		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.77	70.81	18.49	0.46	130.0	± 9.6 %
		Y	8.04	73.47	19.72		130.0	
		Z	7.75	73.08	19.73		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.18	69.15	17.87	0.46	130.0	± 9.6 %
		Y	6.78	70.26	18.39		130.0	
		Z	6.44	69.57	18.23		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	6.23	69.30	17.98	0.46	130.0	± 9.6 %
		Y	6.24	68.58	17.58		130.0	
		Z	6.37	69.33	18.15		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.76	67.72	17.01	0.46	130.0	± 9.6 %
		Y	6.09	68.11	17.17		130.0	
		Z	5.89	67.73	17.16		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.72	67.68	17.04	0.46	130.0	± 9.6 %
		Y	5.99	67.85	17.10		130.0	
		Z	5.88	67.80	17.25		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.59	66.99	16.43	0.46	130.0	± 9.6 %
		Y	5.89	67.28	16.57		130.0	
		Z	5.76	67.16	16.69		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.19	68.00	17.13	0.46	130.0	± 9.6 %
		Y	6.36	68.10	17.15		130.0	
		Z	6.35	68.20	17.38		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.46	68.76	17.50	0.46	130.0	± 9.6 %
		Y	6.63	68.78	17.47		130.0	
		Z	6.72	69.23	17.89		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.50	68.87	17.53	0.46	130.0	± 9.6 %
		Y	6.63	68.75	17.44		130.0	
		Z	6.72	69.20	17.85		130.0	

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EF3DV3 – SN:4048 January 9, 2018

10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.31	68.28	17.27	0.46	130.0	± 9.6 %
		Y	6.54	68.48	17.34		130.0	
		Z	6.47	68.46	17.51		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.30	68.28	17.21	0.46	130.0	± 9.6 %
		Y	6.65	68.83	17.46		130.0	
		Z	6.50	68.54	17.50		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.50	68.67	17.44	0.46	130.0	± 9.6 %
		Y	6.58	68.36	17.24		130.0	
		Z	6.63	68.71	17.61		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.41	68.51	17.52	0.46	130.0	± 9.6 %
		Y	6.62	68.60	17.52		130.0	
		Z	6.61	68.77	17.80		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.29	68.35	17.34	0.46	130.0	± 9.6 %
		Y	6.48	68.41	17.34		130.0	
		Z	6.46	68.53	17.59		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.32	68.42	17.38	0.46	130.0	± 9.6 %
		Y	6.90	69.63	17.97		130.0	
		Z	6.59	68.92	17.79		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	7.64	71.83	19.05	0.46	130.0	± 9.6 %
		Y	7.39	70.52	18.36		130.0	
		Z	7.46	71.07	18.85		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	25.63	121.16	40.60	9.30	60.0	± 9.6 %
		Y	48.23	126.94	41.13		60.0	
		Z	100.00	158.36	52.52		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	19.37	115.59	39.19	9.30	60.0	± 9.6 %
		Y	44.84	126.23	41.10		60.0	
		Z	100.00	159.92	53.21		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.66	64.86	10.10	0.00	150.0	± 9.6 %
		Y	1.05	69.33	14.44		150.0	
		Z	0.80	66.62	11.78		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.49	67.66	16.60	2.23	80.0	± 9.6 %
		Y	4.04	68.34	17.41		80.0	
		Z	3.85	68.69	17.66		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.05	66.97	16.95	2.23	80.0	± 9.6 %
		Y	4.56	67.69	17.52		80.0	
		Z	4.34	67.66	17.70		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.05	66.55	16.99	2.23	80.0	± 9.6 %
		Y	4.50	67.32	17.51		80.0	
		Z	4.31	67.19	17.68		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.13	66.48	17.04	2.23	80.0	± 9.6 %
		Y	4.56	67.37	17.57		80.0	
		Z	4.38	67.16	17.72		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	3.25	67.22	10.58	10.00	50.0	± 9.6 %
		Y	6.71	76.21	16.38		50.0	
		Z	13.06	85.50	19.12		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	1.94	65.17	8.65	6.99	60.0	± 9.6 %
		Y	8.04	79.80	16.42		60.0	
		Z	100.00	108.13	23.68		60.0	

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EF3DV3 – SN:4048 January 9, 2018

10660-AAA	Pulse Waveform (200Hz, 40%)	X	0.98	63.30	6.81	3.98	80.0	± 9.6 %
		Y	100.00	105.15	21.55		80.0	
		Z	100.00	105.96	21.42		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	0.56	62.24	5.43	2.22	100.0	± 9.6 %
		Y	100.00	103.68	19.83		100.0	
		Z	100.00	100.21	17.94		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	0.16	60.00	3.38	0.97	120.0	± 9.6 %
		Y	100.00	102.95	18.13		120.0	
		Z	99.98	90.06	12.54		120.0	

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

Certificate No: EF3-4048_Jan18 Page 39 of 39

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ANNEX D: CD835V3 Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client TA-SH (Auden)

Certificate No: CD835V3-1133_Nov17

CALIBRATION CERTIFICATE

Object	CD835V3 - SN: 1133
Calibration procedure(s)	QA CAL-20.v6 Calibration procedure for dipoles in air
Calibration date:	November 22, 2017

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
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Probe ER3DV6	SN: 2336	30-Dec-16 (No. ER3-2336_Dec16)	Dec-17
DAE4	SN: 781	13-Jul-17 (No. DAE4-781_Jul17)	Jul-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
Power sensor HP E4412A	SN: US38485102	05-Jan-10 (in house check Oct-17)	In house check: Oct-20
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
RF generator R&S SMT-06	SN: 832283/011	27-Aug-12 (in house check Oct-17)	In house check: Oct-20
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: November 23, 2017

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Certificate No: CD835V3-1133_Nov17 Page 1 of 5

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Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

References

[1] ANSI-C63.19-2011
American National Standard, Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

Methods Applied and Interpretation of Parameters:

- *Coordinate System:* y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 15 mm above the top metal edge of the dipole arms.
- *Measurement Conditions:* Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- *Antenna Positioning:* The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections.
  It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- *Feed Point Impedance and Return Loss:* These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- *E-field distribution:* E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 15 mm (in z) above the metal top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, in the plane above the dipole surface.

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%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Phantom	HAC Test Arch	
Distance Dipole Top - Probe Center	15 mm	
Scan resolution	dx, dy = 5 mm	
Frequency	835 MHz ± 1 MHz	
Input power drift	< 0.05 dB	

Maximum Field values at 835 MHz

E-field 15 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end	100 mW input power	106.6 V/m = 40.56 dBV/m
Maximum measured above low end	100 mW input power	104.9 V/m = 40.42 dBV/m
Averaged maximum above arm	100 mW input power	**105.8 V/m ± 12.8 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters

Frequency	**Return Loss**	**Impedance**
800 MHz	16.1 dB	40.1 Ω - 10.1 jΩ
835 MHz	28.4 dB	52.7 Ω + 2.8 jΩ
900 MHz	17.0 dB	48.5 Ω - 14.0 jΩ
950 MHz	20.0 dB	49.4 Ω + 10.0 jΩ
960 MHz	15.0 dB	61.5 Ω + 16.3 jΩ

3.2 Antenna Design and Handling

The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.
The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.
Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

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

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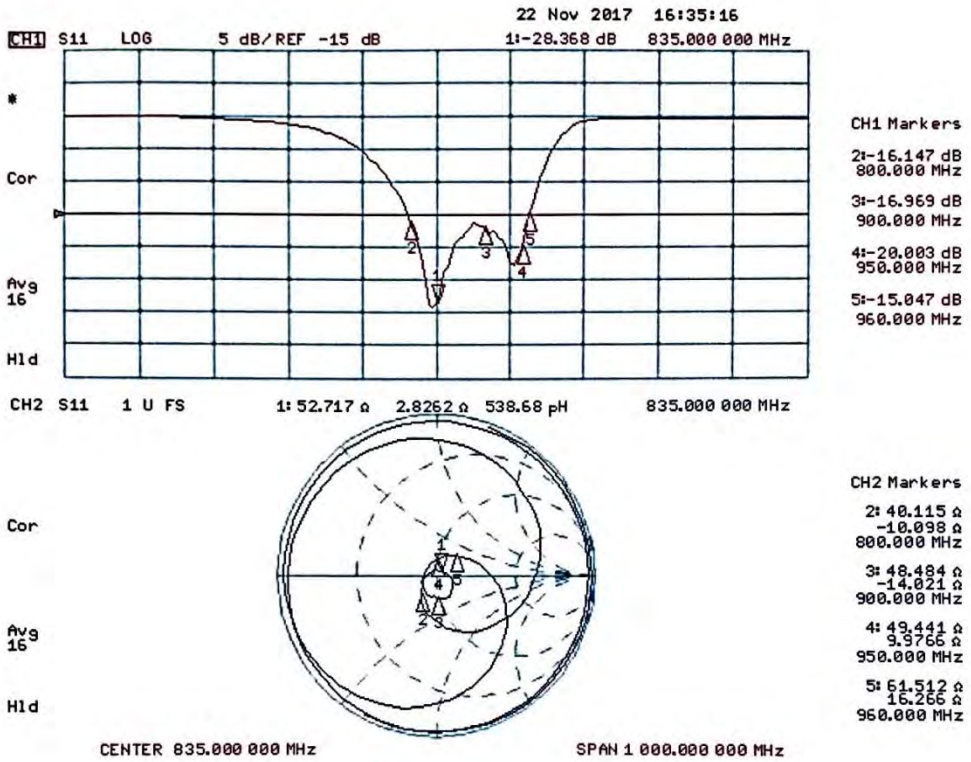
Impedance Measurement Plot



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DASY5 E-field Result

Date: 22.11.2017

Test Laboratory: SPEAG Lab2

DUT: HAC-Dipole 835 MHz; Type: CD835V3; Serial: CD835V3 - SN: 1133

Communication System: UID 0 - CW ; Frequency: 835 MHz
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

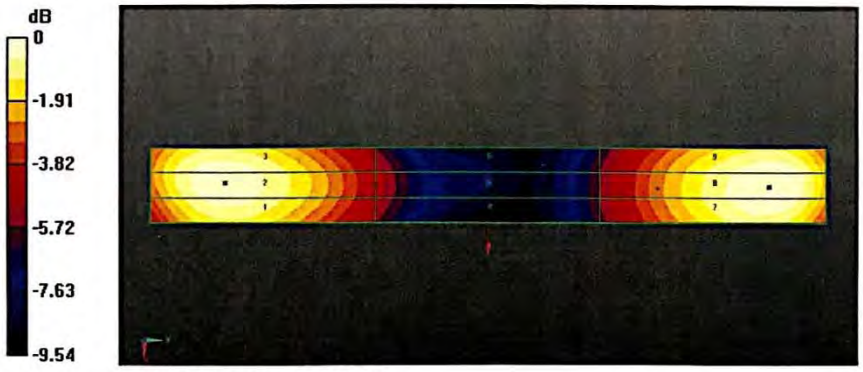
DASY52 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 30.12.2016;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 13.07.2017
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole E-Field measurement @ 835MHz/E-Scan - 835MHz d=15mm/Hearing Aid Compatibility Test (41x361x1):
Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 109.1 V/m; Power Drift = -0.00 dB
Applied MIF = 0.00 dB
RF audio interference level = 40.56 dBV/m
Emission category: M3

MIF scaled E-field

Grid 1 M3 40.18 dBV/m	Grid 2 M3 40.42 dBV/m	Grid 3 M3 40.33 dBV/m
Grid 4 M4 35.75 dBV/m	Grid 5 M4 35.91 dBV/m	Grid 6 M4 35.79 dBV/m
Grid 7 M3 40.44 dBV/m	Grid 8 M3 40.56 dBV/m	Grid 9 M3 40.39 dBV/m



0 dB = 106.6 V/m = 40.56 dBV/m

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ANNEX E: CD1880V3 Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client TA-SH (Auden)

Certificate No: CD1880V3-1115_Nov17

CALIBRATION CERTIFICATE

Object	CD1880V3 - SN: 1115
Calibration procedure(s)	QA CAL-20.v6 Calibration procedure for dipoles in air
Calibration date:	November 22, 2017

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
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Probe ER3DV6	SN: 2336	30-Dec-16 (No. ER3-2336_Dec16)	Dec-17
DAE4	SN: 781	13-Jul-17 (No. DAE4-781_Jul17)	Jul-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
Power sensor HP E4412A	SN: US38485102	05-Jan-10 (in house check Oct-17)	In house check: Oct-20
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
RF generator R&S SMT-06	SN: 832283/011	27-Aug-12 (in house check Oct-17)	In house check: Oct-20
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: November 23, 2017

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Certificate No: CD1880V3-1115_Nov17 Page 1 of 5

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

References

[1] ANSI-C63.19-2011
American National Standard, Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids.

Methods Applied and Interpretation of Parameters:

- *Coordinate System:* y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 15 mm above the top metal edge of the dipole arms.
- *Measurement Conditions:* Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- *Antenna Positioning:* The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections.
  It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- *Feed Point Impedance and Return Loss:* These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- *E-field distribution:* E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 15 mm (in z) above the metal top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, in the plane above the dipole surface.

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%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Phantom	HAC Test Arch	
Distance Dipole Top - Probe Center	15 mm	
Scan resolution	dx, dy = 5 mm	
Frequency	1880 MHz ± 1 MHz	
Input power drift	< 0.05 dB	

Maximum Field values at 1880 MHz

E-field 15 mm above dipole surface	condition	**Interpolated maximum**
Maximum measured above high end	100 mW input power	90.5 V/m = 39.13 dBV/m
Maximum measured above low end	100 mW input power	87.8 V/m = 38.87 dBV/m
Averaged maximum above arm	100 mW input power	**89.2 V/m ± 12.8 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters

Frequency	**Return Loss**	**Impedance**
1730 MHz	31.0 dB	52.8 Ω - 0.7 jΩ
1880 MHz	21.1 dB	51.9 Ω + 8.8 jΩ
1900 MHz	21.6 dB	54.2 Ω + 7.6 jΩ
1950 MHz	29.7 dB	52.3 Ω + 2.4 jΩ
2000 MHz	18.9 dB	46.8 Ω + 10.6 jΩ

3.2 Antenna Design and Handling

The calibration dipole has a symmetric geometry with a built-in two stub matching network, which leads to the enhanced bandwidth.
The dipole is built of standard semirigid coaxial cable. The internal matching line is open ended. The antenna is therefore open for DC signals.
Do not apply force to dipole arms, as they are liable to bend. The soldered connections near the feedpoint may be damaged. After excessive mechanical stress or overheating, check the impedance characteristics to ensure that the internal matching network is not affected.

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

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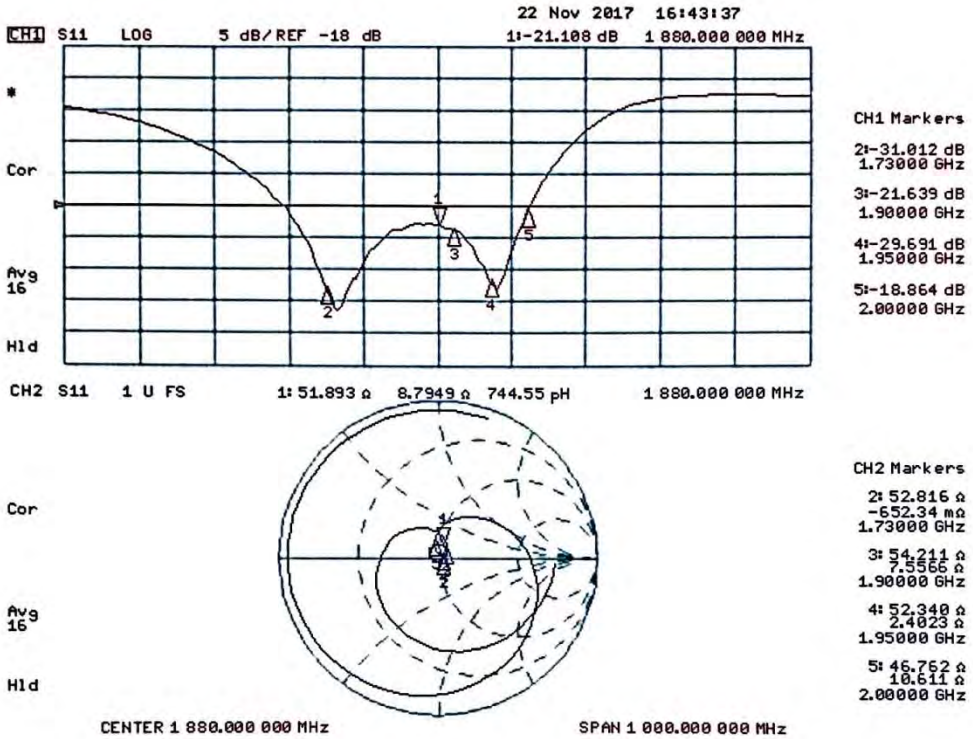
Impedance Measurement Plot



Certificate No: CD1880V3-1115_Nov17 Page 4 of 5

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DASY5 E-field Result

Date: 22.11.2017

Test Laboratory: SPEAG Lab2

DUT: HAC Dipole 1880 MHz; Type: CD1880V3; Serial: CD1880V3 - SN: 1115

Communication System: UID 0 - CW ; Frequency: 1880 MHz
Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 1000$ kg/m^3
Phantom section: RF Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

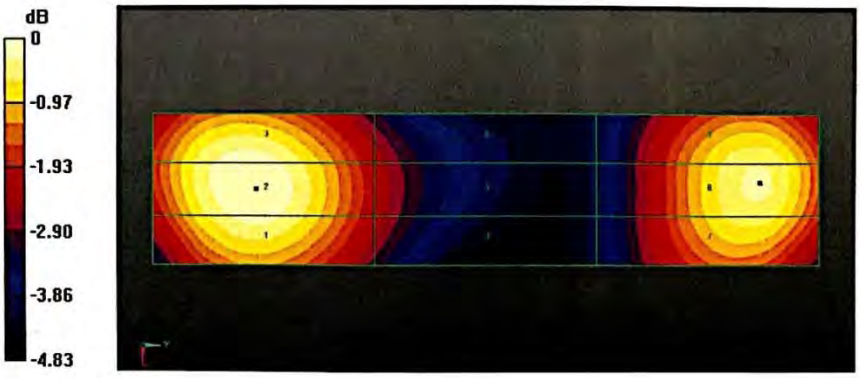
DASY52 Configuration:

- Probe: ER3DV6 - SN2336; ConvF(1, 1, 1); Calibrated: 30.12.2016;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn781; Calibrated: 13.07.2017
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA; Serial: 1070
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole E-Field measurement @ 1880MHz/E-Scan - 1880MHz d=15mm/Hearing Aid Compatibility Test (41x181x1):
Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 155.7 V/m; Power Drift = -0.01 dB
Applied MIF = 0.00 dB
RF audio interference level = 39.13 dBV/m
Emission category: M2

MIF scaled E-field

Grid 1 **M2** **38.94 dBV/m**	Grid 2 **M2** **39.13 dBV/m**	Grid 3 **M2** **39.02 dBV/m**
Grid 4 **M2** **36.82 dBV/m**	Grid 5 **M2** **36.95 dBV/m**	Grid 6 **M2** **36.82 dBV/m**
Grid 7 **M2** **38.67 dBV/m**	Grid 8 **M2** **38.87 dBV/m**	Grid 9 **M2** **38.79 dBV/m**



0 dB = 90.50 V/m = 39.13 dBV/m

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ANNEX F: DAE4 Calibration Certificate

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Servizio svizzero di taratura
S Swiss Calibration Service

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Accreditation No.: SCS 0108

Client TA-SH (Auden)

Certificate No: DAE4-1291_Dec18

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BM - SN: 1291
Calibration procedure(s)	QA CAL-06.v29 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	December 04, 2018

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-18 (No:23488)	Sep-19
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	04-Jan-18 (in house check)	In house check: Jan-19
Calibrator Box V2.1	SE UMS 006 AA 1002	04-Jan-18 (in house check)	In house check: Jan-19

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Laboratory Technician	
Approved by:	Sven Kühn	Deputy Manager	i.V.

Issued: December 4, 2018

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Certificate No: DAE4-1291_Dec18 Page 1 of 5

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S Swiss Calibration Service

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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.

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DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , 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	402.580 ± 0.02% (k=2)	403.249 ± 0.02% (k=2)	403.163 ± 0.02% (k=2)
Low Range	3.97560 ± 1.50% (k=2)	3.97886 ± 1.50% (k=2)	3.97558 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	164.5 ° ± 1 °

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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	200038.51	1.95	0.00
Channel X	+ Input	20006.61	1.29	0.01
Channel X	- Input	-20003.34	2.94	-0.01
Channel Y	+ Input	200036.77	0.05	0.00
Channel Y	+ Input	20003.65	-1.54	-0.01
Channel Y	- Input	-20006.11	0.22	-0.00
Channel Z	+ Input	200035.08	-1.41	-0.00
Channel Z	+ Input	20002.62	-2.58	-0.01
Channel Z	- Input	-20006.40	-0.06	0.00

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	2001.29	0.31	0.02
Channel X	+ Input	201.13	0.32	0.16
Channel X	- Input	-198.59	0.30	-0.15
Channel Y	+ Input	2000.40	-0.49	-0.02
Channel Y	+ Input	200.21	-0.66	-0.33
Channel Y	- Input	-199.89	-0.99	0.50
Channel Z	+ Input	2000.44	-0.41	-0.02
Channel Z	+ Input	199.70	-1.05	-0.52
Channel Z	- Input	-200.88	-1.78	0.89

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	10.02	7.91
	- 200	-6.52	-8.20
Channel Y	200	14.18	13.58
	- 200	-15.10	-15.62
Channel Z	200	-17.07	-17.23
	- 200	14.74	14.83

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	-	-0.01	-4.47
Channel Y	200	7.58	-	0.48
Channel Z	200	11.17	4.87	-

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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	16117	16241
Channel Y	15930	16718
Channel Z	16177	17128

5. Input Offset Measurement

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

Input 10MΩ

	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	-0.59	-1.81	0.89	0.47
Channel Y	1.17	-0.04	2.05	0.45
Channel Z	-1.12	-2.70	0.51	0.57

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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ANNEX G: The EUT Appearances and Test Configuration

EUT

Picture 1: Constituents of EUT

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