REPORT No. : SZ19010260S01

Hearing Aid Compatibility (HAC) RF Emissions Test Report

APPLICANT	:	Shenzhen Link Win Technology Co., Ltd
PRODUCT NAME	:	Mobile phone
MODEL NAME	:	SSB504R
BRAND NAME	:	Maze Speed
FCC ID	:	2AQ4G-SSB504R
STANDARD(S)	:	47CFR 20.19 ANSI C63.19-2011
RECEIPT DATE	:	2019-01-25
TEST DATE	:	2019-02-22
ISSUE DATE	:	2019-02-25

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Annex D Plots of RF Test Results
Annex E DASY Calibration Certificate

Change History		
Version	**Date**	**Reason for change**
1.0	2019-02-25	First edition

1. Attestation of Testing Summary

Air Interface	Frequency Band	E-Field M Rating
GSM CMRS Voice	**GSM850**	M4
	GSM1900	M4

2. Technical Information

Note: Provide by manufacturer.

2.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Link Win Technology Co., Ltd
Applicant Address:	9F, Zhengqilong Industrial Building 1st Rd Gushu, Xixiang, Bao'an，Shenzhen，China
Manufacturer:	Shenzhen Link Win Technology Co., Ltd
Manufacturer Address:	9F, Zhengqilong Industrial Building 1st Rd Gushu, Xixiang, Bao'an，Shenzhen，China

2.2. Equipment under Test (EUT) Description

EUT Type:	Mobile phone
Hardware Version:	Q9-V2.3
Software Version:	LY-SSB504R_V1.3_20180821
Frequency Bands:	GSM 850: 824.2 MHz ~ 848.8 MHz GSM 1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WLAN 2.4GHz：2412 MHz ~ 2462 MHz Bluetooth：2402 MHz ~ 2480 MHz
Modulation Mode:	GSM/GPRS: GMSK WCDMA: QPSK 802.11b:DSSS 802.11g/n:OFDM Bluetooth：Bluetooth: GFSK, π/4-DQPSK, 8-DPSK
Antenna type:	PIFA Antenna
SIM cards description:	For dual SIM card version, SIM 1 and SIM 2 are the same chipset unit and tested as a single chipset, the SIM 1 is chosen for test.

2.3. Photographs of the EUT

Please refer to the External Photos for the Photos of the EUT

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§20.19**	Hearing aid-compatible mobile handsets.
2	**ANSI C63.19-2011**	American National Standard Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids
3	**KDB 285076 D01**	HAC Guidance v04
4	**KDB 285076 D02**	T Coil testing for CMRS IP v01r01

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3. RF Audio Interference Level

FCC wireless hearing aid compatibility rules ensure that consumers with hearing loss are able to access wireless communications services through a wide selection of handsets without experiencing disabling radio frequency (RF)interference or other technical obstacles. To define and measure the hearing aid compatibility of handsets, in CFR47 part 20.19 ANSI C63.19 is referenced.

A handset is considered hearing aid-compatible for acoustic coupling if it meets a rating of at least M3 under ANSI C63.19, and A handset is considered hearing aid compatible for inductive coupling if it meets a rating of at least T3. According to ANSI C63.19 2011 version, for acoustic coupling, the RF electric field emissions of wireless communication devices should be measured and rated according to the emission level as below.

Table 3.1 WD RF audio Interference level categories in logarithmic units

Emission Categories	E-field Emissions	
	＜960MHz	＞960MHz
M1	**50 to 55 dB (V/m)**	**45 to 50 dB (V/m)**
M2	**45 to 50 dB (V/m)**	**35 to 40 dB (V/m)**
M3	**40 to 45 dB (V/m)**	**30 to 35 dB (V/m)**
M4	**＜40 dB (V/m)**	**＜30 dB (V/m)**

Table 3.2 System performance classification table

System classification	Category sum hearing aid category + telephone category
Usable	Hearing aid category + telephone category = 4
Normal use	Hearing aid category + telephone category = 5
Excellent performance	Hearing aid category + telephone category = ≥6

4. Air Interface and Operating Mode

Air Interface	Band	Transport Type	Simultaneous Transmitter	Name of Voice Service	Power Reduction
GSM	GSM850	VO	WLAN&BT	CMRS Voice	No
	GSM1900				No
WCDMA (UMTS)	Band II	VO	WLAN&BT	CMRS Voice	No
	Band IV				No
	Band V				No
WiFi	2450	DT	BT and GSM, WCDMA or GSM	N/A	No
BT	2450	DT	N/A	Wi-Fi and BT GSM,WCDMA or GSM	No

Where:

VO=Voice Only

DT=Digital Transport only

VD=CMRS and IP Voice Service over Digital Transport

BT=Bluetooth

* Ref Lev in accordance with 7.4.2.1 of ANSI C63.19-2011 and the July 2012 VoLTE interpretation

** Ref Lev −20 dBm0

*** Ref Lev XYNet established by KDB Inquiry NNNNNN @ −16 dBm0

Note:

1) **Air Interface/Band MHz:** List of all air interfaces and bands supported by the handset.
2) **Type: For each air interface, indicate the type of voice transport mode:**
   i. VO = legacy Cellular Voice Service, from Table 7.1 in 7.4.2.1 of ANSI C63.19-2011;
   ii. DT = Digital Transport only (no voice); and
   iii. VD = IP Voice Service over Digital Transport.
3) **Simultaneous Transmitter:** Indicate any air interface/bands that operate in simultaneous or concurrent service transmission mode**.**
4) **Name of Voice Service:** See Q4 in 285076 D03 HAC FAQ for further clarification.
   a) Ref Lev in accordance with 7.4.2.1 of ANSI C63.19-2011 and the July 2012 VoLTE interpretation
   b) ** Ref Lev −20 dBm0
   c) *** Ref Lev XYNet established by KDB Inquiry NNNNNN @ −16 dBm0
5) **Power Reduction:** If the 1900 MHz band GSM air interface was tested using the option to reduce the power, state in the test report the maximum power in the 1900 MHz band, and the reduced power used for testing compliance to demonstrate compliance to the requirement that power be reduced by no more

than 2.5 dB.

5. HAC (RF) Measurement System

5.1. RF Measurement Setup

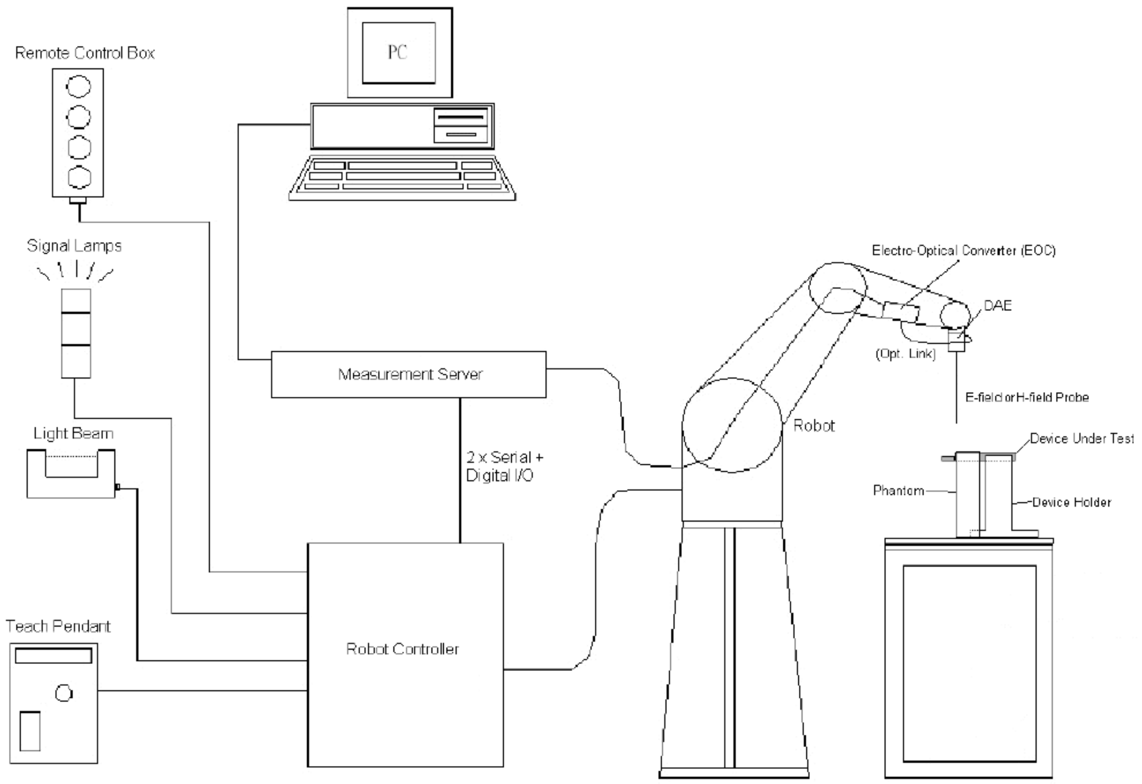


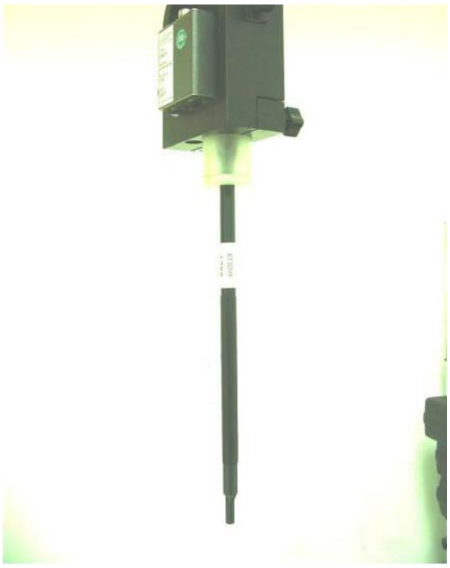
Fig 5.1 SPEAG RF System Configurations

5.2. E-Field Probe

The RF measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use with high permittivity. The dosimetric probe has special calibration at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

E-Field Probe Specification

<ER3DV6>

<table>
<tr><td>Construction</td><td>One dipole parallel, two dipoles normal to probe axis
Built-in shielding against static charges</td><td rowspan="7">
Fig 5.2 Photo of ES3DV6</td></tr>
<tr><td>Calibration</td><td>In air from 100 MHz to 3.0 GHz
(Absolute accuracy ±6.0%, k=2)</td></tr>
<tr><td>Frequency</td><td>10 MHz to 6 GHz;Linearity: ± 0.2 dB</td></tr>
<tr><td>Directivity</td><td>± 0.2 dB in HSL (rotation around probe axis)
± 0.4 dB in HSL (rotation normal to probe axis)</td></tr>
<tr><td>Dynamic Range</td><td>2 V/m to 1000 V/m
(M3 or better device readings fall well below diode compression point)</td></tr>
<tr><td>Linearity</td><td>± 0.2 dB</td></tr>
<tr><td>Dimensions</td><td>Overall length: 330 mm (Tip: 16 mm)
Tip diameter: 8 mm (Body: 12 mm)
Distance from probe tip to dipole centers: 2.5 mm</td></tr>
<tr><td colspan="3">Probe Tip Description:
HAC field measurements take place in the close near field with high gradients. Increasing the measuring distance from the source will generally decrease the measured field values (in case of the validation dipole approx. 10% per mm).</td></tr>
</table>

5.3. Data Acquisition Electronics (DAE)

The data acquisition electronics(DAE) 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. AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.3 Photo of DAE

6. RF Measurement Procedure

6.1. General Guidance

Referenced from ANSI C63.19 -2011 section 5.5.1:

1. Confirm the 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.
3. Set the WD to transmit a fixed and repeatable combination of signal power and modulation characteristic that is representative of the worst case (highest interference potential) encountered in normal use. Transiently occurring start-up, changeover, or termination conditions, or other operations likely to occur less than 1% of the time during normal operation, may be excluded from consideration. Transiently occurring start-up, changeover, or termination conditions, or other operations likely to occur less than 1% of the time during normal operation, may be excluded from consideration.
4. The center sub-grid shall be centered on the T-Coil mode perpendicular 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, refer to illustrated in Figure 8.2. If the field alignment method is used, align the probe for maximum field reception.
5. Record the reading at the output of the measurement system.
6. Scan the entire 50 mm by 50 mm region in equality spaced increments and record the reading at each measurement point, 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 whose maximum reading is the lowest of all available choices. This eliminates the three sub-grids with the maximum readings. Thus, the six areas to be used to determine the WD's highest emissions are identified.
8. Identify the maximum reading within the non-excluded sub-grids identified in step 7).
9. Convert the maximum reading identified in step 8) to RF audio interference level, in, V/m, by taking the square root of the reading and then dividing it by the measurement system transfer function, established in ANSI C63.19 -2011 section 5.5.1.1. Convert the result to dB(V/m) by taking the base-10 logarithm and multiplying it by 20. Expressed as a formula:

   RF audio interference level in dB(V/m) = $20 \times \log(R_{max}^{1/2}/TF)$, where R_{max} is the maximum reading.

10. The RF audio interference level in dB (V/m) is obtained by adding the MIF (in dB) to the maximum steady-state rms field-strength reading, in dB (V/m)
11. Compare this RF audio interference level with the categories in ANSI C63.19-2011 clause 8 and record the resulting WD category rating.

6.2. RF Test Instructions

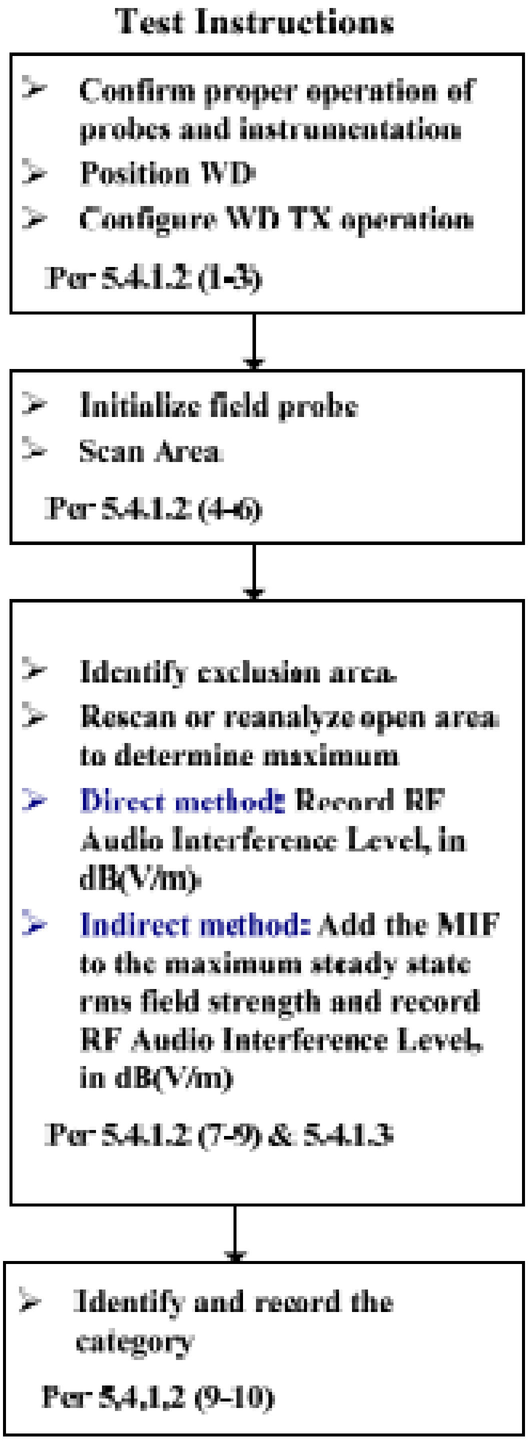


Fig 6.1 WD near-field emission scan flowchart

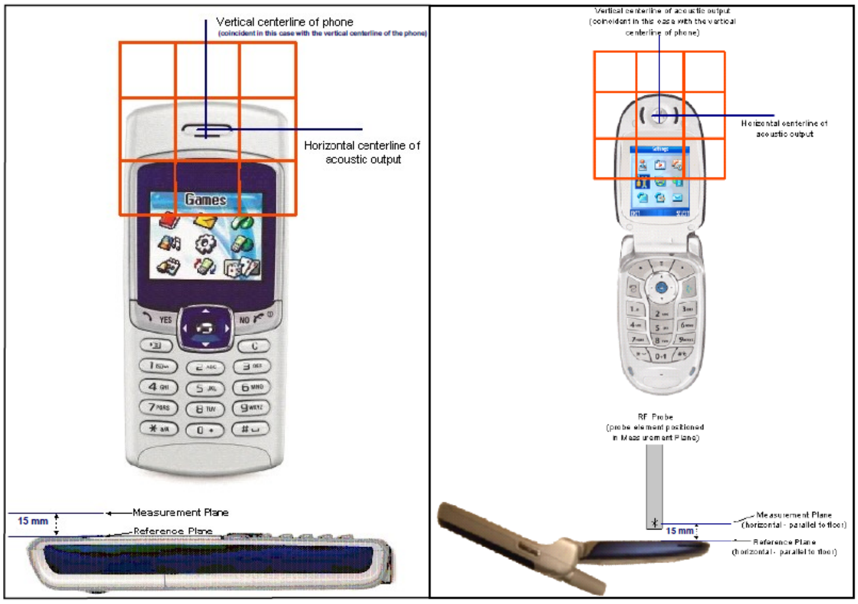


Fig 6.2 WD reference and plane for RF emission measurements

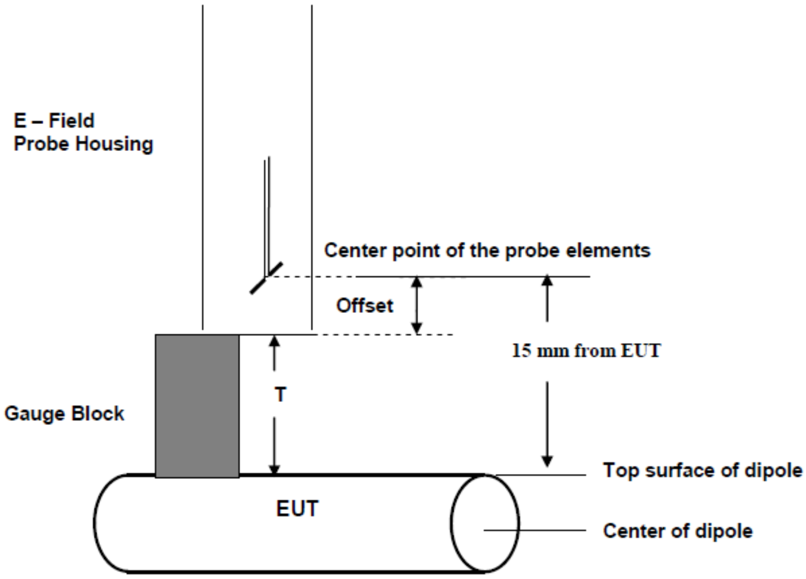


Fig 6.3 Gauge block with E-field probe

7. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Isotropic E-Field Probe	ER3DV6	2434	2018-11-24	2019-11-23
SPEAG	Audio Holder	N/A	1094	NCR	NCR
SPEAG	835MHz Calibration Dipole	CD835V3	1113	2018-11-23	2019-11-22
SPEAG	1880MHz Calibration Dipole	CD1880V3	1111	2018-11-23	2019-11-22
SPEAG	Data Acquisition Electronics	DAE4	480	2018-10-29	2019-10-28
R&S	Base Station	CMU200	N/A	2018-04-17	2019-04-16

8. System Validation

According to ANSI C63.19, before hearing aid testing commences, the experimental setup shall be validated. Subclauses 6.3.1through 6.3.5 include a set of pretest procedures designed to validate the experimental setup to ensure the accuracy of the results. To verify that the hearing aid performs per the manufacturer's specifications, 6.3.5 advises that the hearing aid be pretested per ANSI S3.22.

8.1. Test setup

1. In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator.
2. Position the E-field probe at a 15 mm distance from the top surface of the dipole, which is also fixed in an appropriate fixture.
3. Make sure that the desired measuring channel of the probe is aligned for maximum reception of the E-field generated by the dipole. This may be accomplished by rotating the probe until the maximum value is located. The E-field probe shall have been calibrated over the frequency range to be measured using standard calibration techniques.
4. Adjust the power level (20dBm→100mW) of the signal generator at the initial starting frequency such that the desired E-field strength at the 15 mm distance from the tip of the dipole is achieved. Setting the field strength to be in the range of category M2 is advised.
5. Step the frequency in increments of ≤1%, adjusting the power fed into the dipole such that the desired E-field strength is maintained.

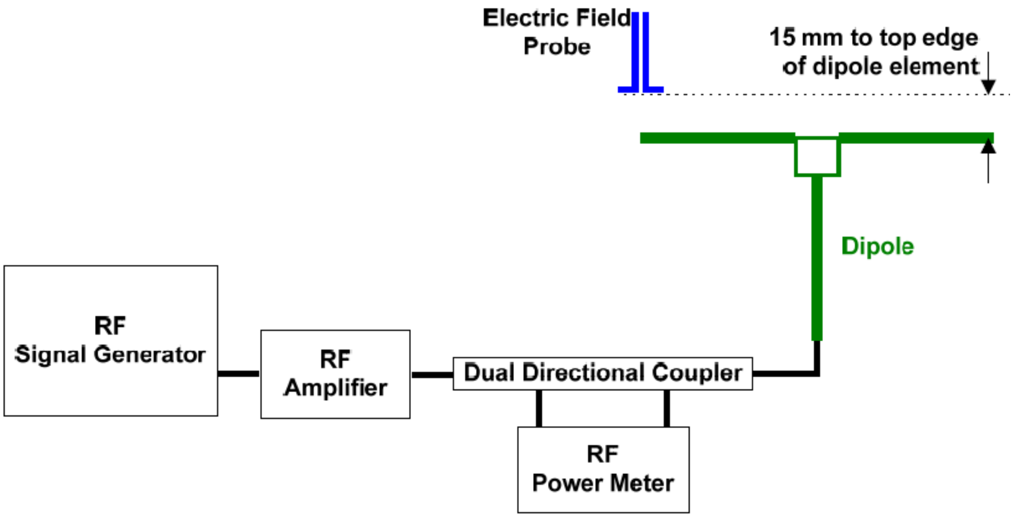


Fig 8.1 WD dipole calibration procedure

8.2. Validation Result

After testing, record the frequency and signal generator setting at each frequency for use during the actual immunity test. Comparing to the original E-field value provided by SPEAG, the verification data should be within its specification of 25 %. Table 6.1 shows the target value and measured value. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to appendix A of this report. Deviation = ((Average E-field Value) - (Target value)) / (Target value) * 100%

Frequency (MHz)	Input Power (dBm)	Target Value (V/m)	E-Field 1 (V/m)	E-Field 2 (V/m)	Average Value (V/m)	Deviation (%)
835	20	110.80	122.04	122.04	122.04	10.14
1880	20	89.50	95.94	97.50	96.72	8.07

9. Modulation Interference Factor

The HAC Standard ANSI C63.19-2011 defines a new scaling using the Modulation Interference Factor (MIF).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 Modulation Interference factor (MIF, in dB) is added to the measured average E-field (in dBV/m) and converts it to the RF Audio Interference level (in dBV/m). This level considers the audible amplitude modulation components in the RF E-field. CW fields without amplitude modulation are assumed to not interfere with the hearing aid electronics. Modulations without time slots and low fluctuations at low frequencies have low MIF values, TDMA modulations with narrow transmission and repetition rates of few 100 Hz have high MIF values and give similar classifications as ANSI C63.19-2011. ER3D, EF3D and EU2D E-field probes have a bandwidth <10 kHz and can therefore not evaluate the RF envelope in the full audio band. DASY52 is therefore using the indirect measurement method according to ANSI C63.19-2011 which is the primary method. These near field probes read the averaged E-field measurement. Especially for the new high peak-to-average (PAR) signal types, the probes shall be linearized by PMR calibration in order to not overestimate the field reading. Probe Modulation Response (PMR) calibration linearizes the probe response over its dynamic range for specific modulations which are characterized by their UID and result in an uncertainty specified in the probe calibration certificate. The MIF is characteristic for a given waveform envelope and can be used as a constant conversion factor if the probe has been PMR calibrated. The evaluation method for the MIF is defined in ANSI C63.19-2011 section D.7. An RMS demodulated RF signal is fed to a spectral filter (similar to an A weighting filter) and forwarded to a temporal filter acting as a quasi-peak detector. The averaged output of these filtering is scaled to a 1 kHz 80% AM signal as reference. MIF measurement requires additional instrumentation and is not well suited for evaluation by the end user with reasonable uncertainty. It may alliteratively be determined through analysis and simulation, because it is constant and characteristic for a communication signal. DASY52 uses well-defined signals for PMR calibration. The MIF of these signals has been determined by simulation and it is automatically applied. The MIF measurement uncertainty is estimated as follows, declared by HAC equipment provider SPEAG, for modulation frequencies from slotted waveforms with fundamental frequency and at least 2 harmonics within 10 kHz:

1. 0.2 dB for MIF: -7 to +5 dB
2. 0.5 dB for MIF: -13 to +11 dB

3. 1 dB for MIF: > -20 dB

MIF values applied in this test report were provided by the HAC equipment provider of SPEAG, and the worst values for all air interface are listed below to be determine the Low-power Exemption.

UID	Communication System Name	MIF(dB)
10021	GSM-FDD(TDMA,GMSK)	3.63
10023	GPRS-FDD(TDMA,GMSK)	3.77
10025	EDGE-FDD (TDMA, 8PSK, TN 0)	3.75
10011	UMTS-FDD(WCDMA, AMR)	-25.43
10225	UMTS-FDD (HSPA+)	-20.39
10081	CDMA2000 (1xRTT, RC3)	-19.71
10295	CDMA2000 (1xRTT, RC1 SO3, 1/8th Rate 25 fr.)	3.26
10403	CDMA2000 (1xEV-DO, Rev. 0)	-17.67
10170	LTE-FDD(SC-FDMA,1RB,20MHz, 16-QAM)	-9.76
10182	LTE-FDD(SC-FDMA,1RB,15MHz, 16-QAM)	-9.78
10176	LTE-FDD(SC-FDMA,1RB,10MHz, 16-QAM)	-9.78
10177	LTE-FDD(SC-FDMA,1RB,5MHz, 16-QAM)	-9.78
10185	LTE-FDD(SC-FDMA,1RB,3MHz, 16-QAM)	-9.78
10188	LTE-FDD(SC-FDMA,1RB,1.4MHz, 16-QAM)	-9.78

10. Conducted Power

<GSM Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251	
Frequency (MHz)	824.2	836.4	848.8	
GSM 1 Tx slot	33.35	**33.43**	33.37	34.00

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810	
Frequency (MHz)	1850.2	1880	1909.8	
GSM 1 Tx slot	29.62	**29.65**	29.63	30.00

<WCDMA Mode>

Band	WCDMA II			Tune-up Limit (dBm)
TX Channel	9262	9400	9538	
Rx Channel	9662	9800	9938	
Frequency (MHz)	1852.4	1880	1907.6	
AMR 12.2Kbps	21.89	**21.98**	21.91	22.00
RMC 12.2Kbps	21.82	21.96	21.89	22.00

Band	WCDMA IV			Tune-up Limit (dBm)
TX Channel	1312	1413	1513	
Rx Channel	1537	1638	1738	
Frequency (MHz)	1712.4	1732.6	1752.6	
AMR 12.2Kbps	22.55	22.68	22.33	23.50
RMC 12.2Kbps	23.12	**23.25**	23.21	23.50

Band	WCDMA V			Tune-up Limit (dBm)
TX Channel	4132	4182	4233	
Rx Channel	4357	4407	4458	
Frequency (MHz)	826.4	836.4	846.6	
AMR 12.2Kbps	22.90	22.50	22.87	24.00
RMC 12.2Kbps	23.53	**23.67**	23.61	24.00

11. Low-power Exemption

Air Interface	Max Tune-up Limit (dBm)	Worst Case MIF (dB)	Power + MIF(dB)	C63.19 test required
GSM850	34.00	3.63	37.63	Yes
GSM1900	30.00	3.63	33.63	Yes
WCDMA Band II	22.00	-25.43	--3.43	No
WCDMA Band IV	23.50	-25.43	-1.93	No
WCDMA Band V	24.00	-25.43	-1.43	No

Note:

1. According to ANSI C63.19 2011-version, for the 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.
2. For all of bands, the worst case of max tune-up limit will be test RF, therefore WCDMA modes is not necessary for testing.
3. HAC RF rating is M4 for the air interface which meets the low power exemption.

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12. Summary Test Results

Plot No.	Air Interface	Modulation / Mode	Channel	Average Antenna Input Power (dBm)	MIF	E-Field (dBV/m)	Margin to FCC M3 limit (dB)	E-Field M Rating
1	GSM850	GSM Voice	128	33.35	3.63	27.63	17.37	M4
2	GSM850	GSM Voice	189	33.43	3.63	27.13	17.87	M4
3	GSM850	GSM Voice	251	33.37	3.63	27.25	17.75	M4
4	GSM1900	GSM Voice	512	29.62	3.63	26.97	8.03	M4
5	GSM1900	GSM Voice	661	29.65	3.63	27.38	7.62	M4
6	GSM1900	GSM Voice	810	29.63	3.63	27.41	7.59	M4

13. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances. Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed tolie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is showed in Table 12.1.

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Annex A General Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
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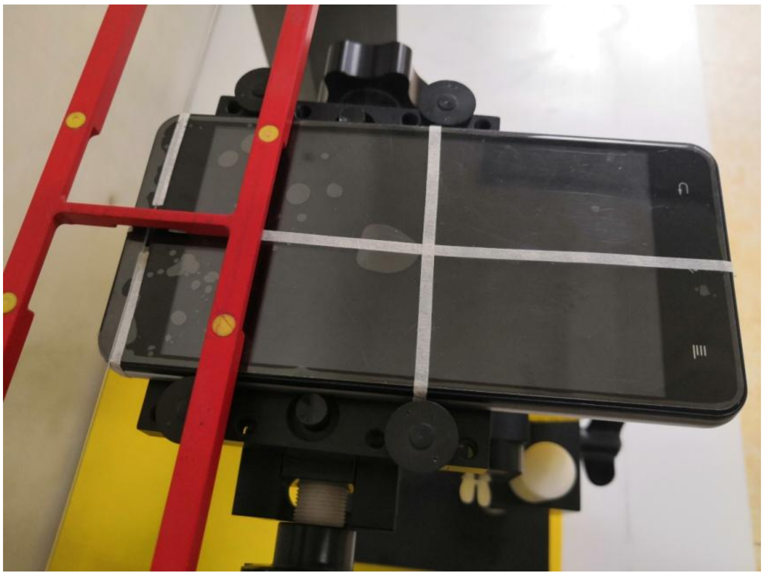
2. Identification of the Responsible Testing Location

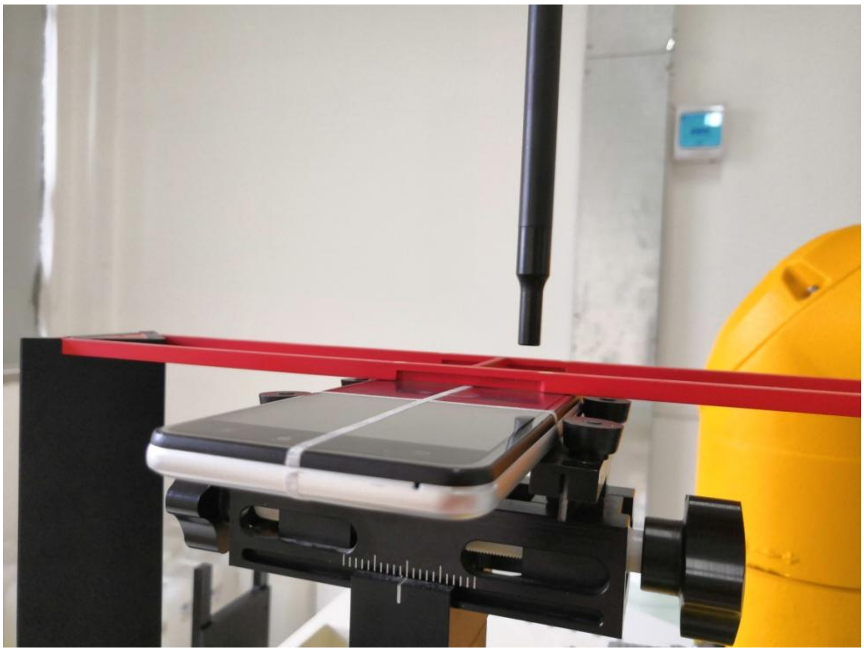
Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

Annex B Test Setup Photos

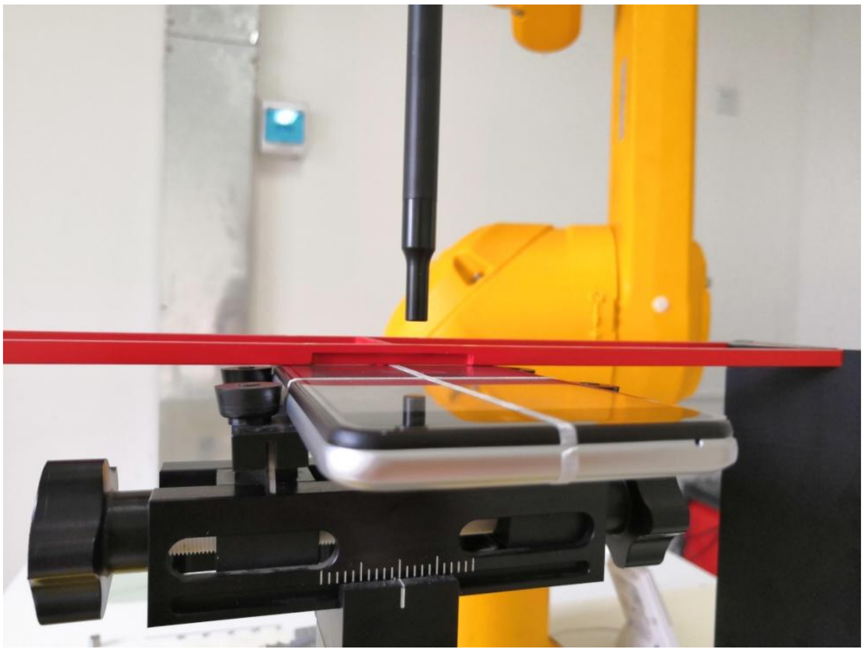
Test Setup Photos 1.



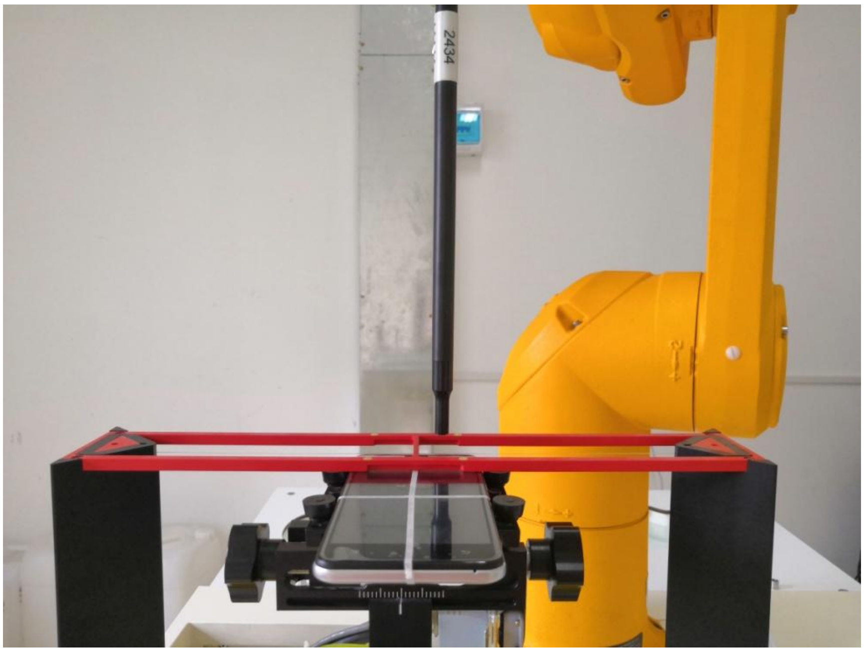
Test Setup Photos 2.



Test Setup Photos 3.



Test Setup Photos 4.



Annex C Plots of RF System Check

Test Laboratory: SAR Lab. of Shenzhen Morlab Communications Technology Co., Ltd. Date: 2019.02.22

System Check_835MHz_HAC_E

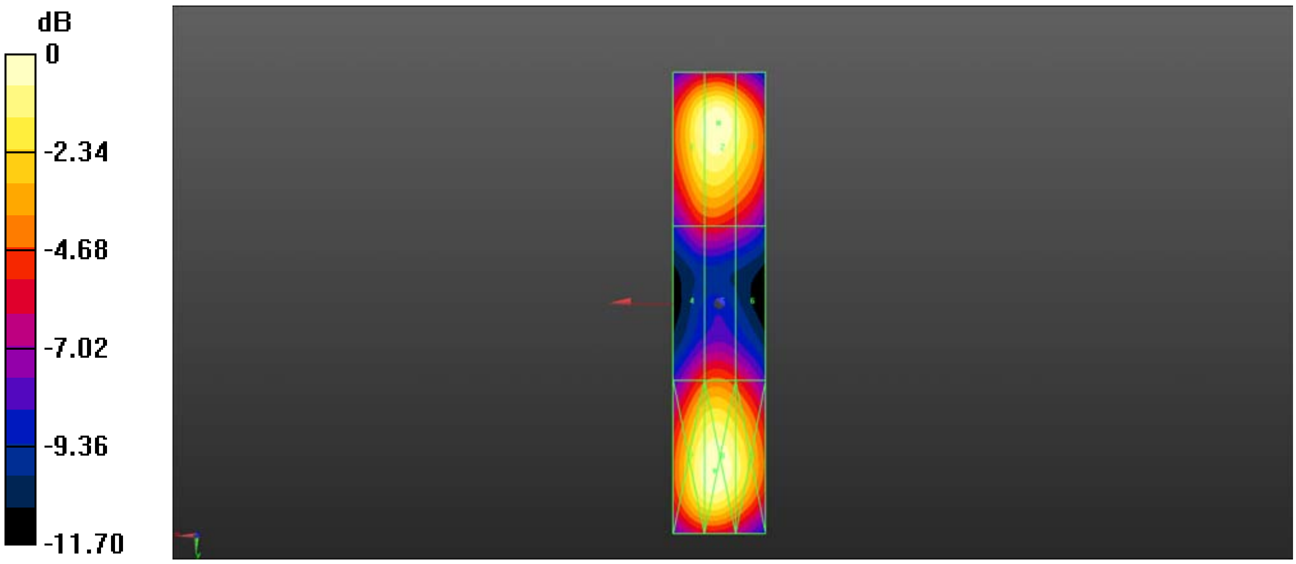
Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃

DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface), Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Hearing Aid Compatibility Test (81x401x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Maximum value of Total (interpolated) = 122.1 V/m
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 58.52 V/m; Power Drift = -0.00 dB
Applied MIF = 0.00 dB
RF audio interference level = 41.73 dBV/m
Emission category: M3

MIF scaled E-field

Grid 1 **M3** **41.18 dBV/m**	Grid 2 **M3** **41.73 dBV/m**	Grid 3 **M3** **40.65 dBV/m**
Grid 4 **M4** **36.91 dBV/m**	Grid 5 **M4** **37.32 dBV/m**	Grid 6 **M4** **36.48 dBV/m**
Grid 7 **M3** **41.32 dBV/m**	Grid 8 **M3** **41.73 dBV/m**	Grid 9 **M3** **40.64 dBV/m**



0 dB = 122.1 V/m = 41.73 dBV/m

System Check_1880MHz_HAC_E

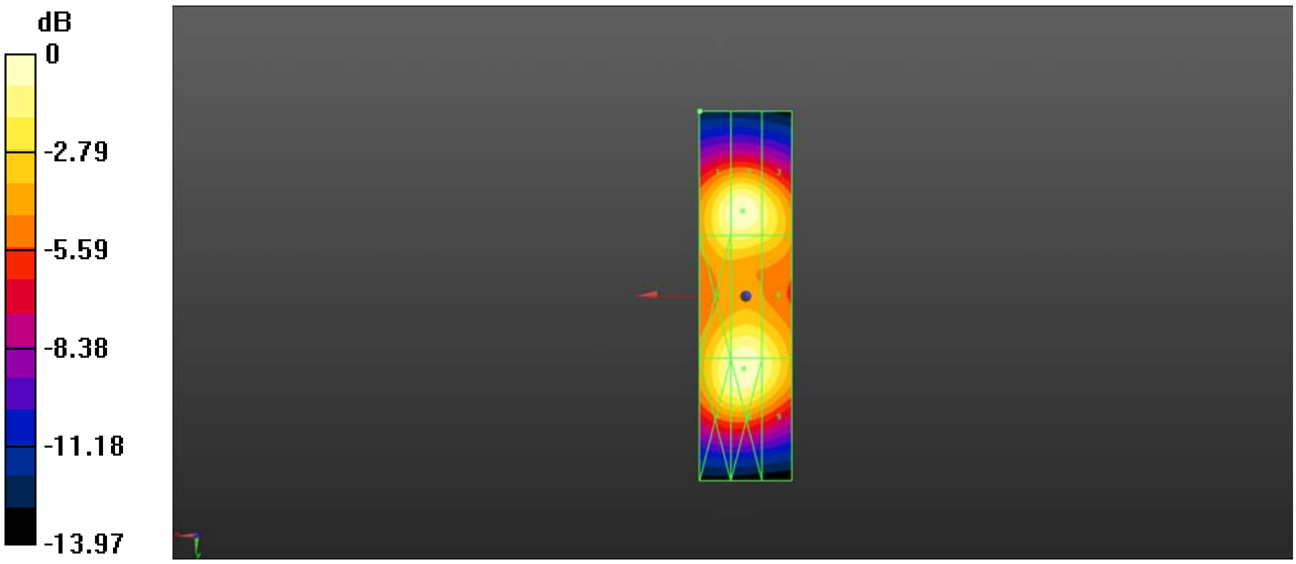
Communication System: UID 0, CW (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃

DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface), Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Hearing Aid Compatibility Test (81x321x1): Interpolated grid: dx=0.5000 mm, dy=0.5000 mm
Maximum value of Total (interpolated) = 97.46 V/m
Device Reference Point: 0, 0, -6.3 mm
Reference Value = 73.51 V/m; Power Drift = -0.01 dB
Applied MIF = 0.00 dB
RF audio interference level = 39.64 dBV/m
Emission category: M2

MIF scaled E-field

Grid 1 **M2** **39.23 dBV/m**	Grid 2 **M2** **39.64 dBV/m**	Grid 3 **M2** **38.54 dBV/m**
Grid 4 **M2** **39.05 dBV/m**	Grid 5 **M2** **39.56 dBV/m**	Grid 6 **M2** **38.72 dBV/m**
Grid 7 **M2** **39.31 dBV/m**	Grid 8 **M2** **39.78 dBV/m**	Grid 9 **M2** **38.84 dBV/m**



0 dB = 97.46 V/m = 39.78 dBV/m

Annex D Plots of RF Test Results

HAC RF_GSM850_GSM Voice_Ch128_E

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 836.6 MHz;Duty Cycle: 1:8.6896
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃;

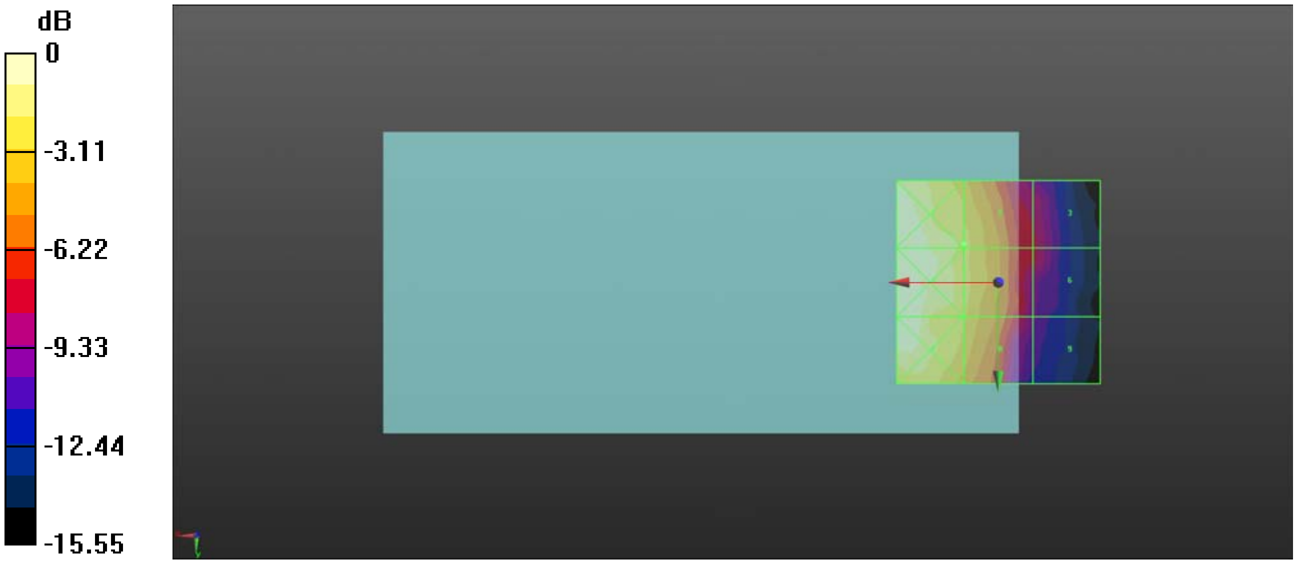
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch128/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 = 10.64 V/m; Power Drift = -0.56 dB
Applied MIF = 3.63 dB
RF audio interference level = 25.08 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **27.27 dBV/m**	Grid 2 **M4** **25.08 dBV/m**	Grid 3 **M4** **19.64 dBV/m**
Grid 4 **M4** **27.63 dBV/m**	Grid 5 **M4** **25.04 dBV/m**	Grid 6 **M4** **19.61 dBV/m**
Grid 7 **M4** **27.43 dBV/m**	Grid 8 **M4** **24.68 dBV/m**	Grid 9 **M4** **17.6 dBV/m**

Cursor:
Total = 27.63 dBV/m
E Category: M4
Location: 25, 0, 8.7 mm



0 dB = 24.07 V/m = 27.63 dBV/m

HAC RF_GSM850_GSM Voice_Ch189_E

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 836.4 MHz;Duty Cycle: 1:8.6896
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃;

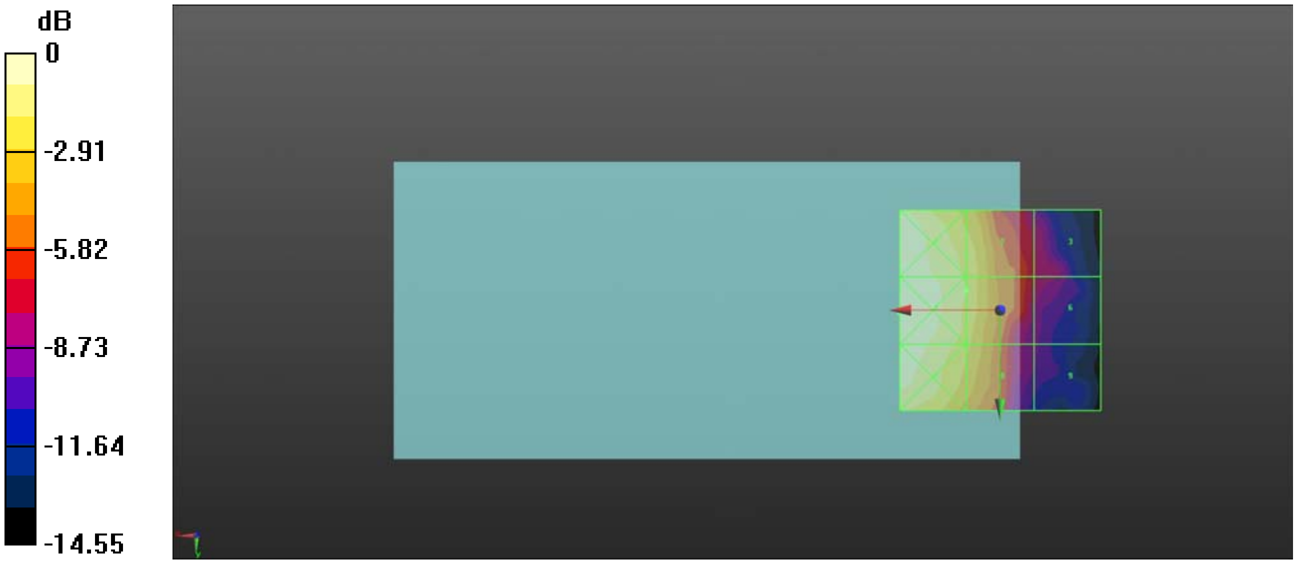
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch189/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 = 10.31 V/m; Power Drift = 0.19 dB
Applied MIF = 3.63 dB
RF audio interference level = 25.16 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **26.94 dBV/m**	Grid 2 **M4** **25.01 dBV/m**	Grid 3 **M4** **19.59 dBV/m**
Grid 4 **M4** **27.13 dBV/m**	Grid 5 **M4** **25.16 dBV/m**	Grid 6 **M4** **19.55 dBV/m**
Grid 7 **M4** **26.99 dBV/m**	Grid 8 **M4** **24.51 dBV/m**	Grid 9 **M4** **17.74 dBV/m**

Cursor:
Total = 27.13 dBV/m
E Category: M4
Location: 25, 0.5, 8.7 mm



0 dB = 22.71 V/m = 27.12 dBV/m

HAC RF_GSM850_GSM Voice_Ch251_E

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 848.6 MHz;Duty Cycle: 1:8.6896
Medium: Air Medium parameters used: σ = 0 S/m, ε_r = 1; ρ = 0 kg/m^3
Ambient Temperature：23.4 ℃;

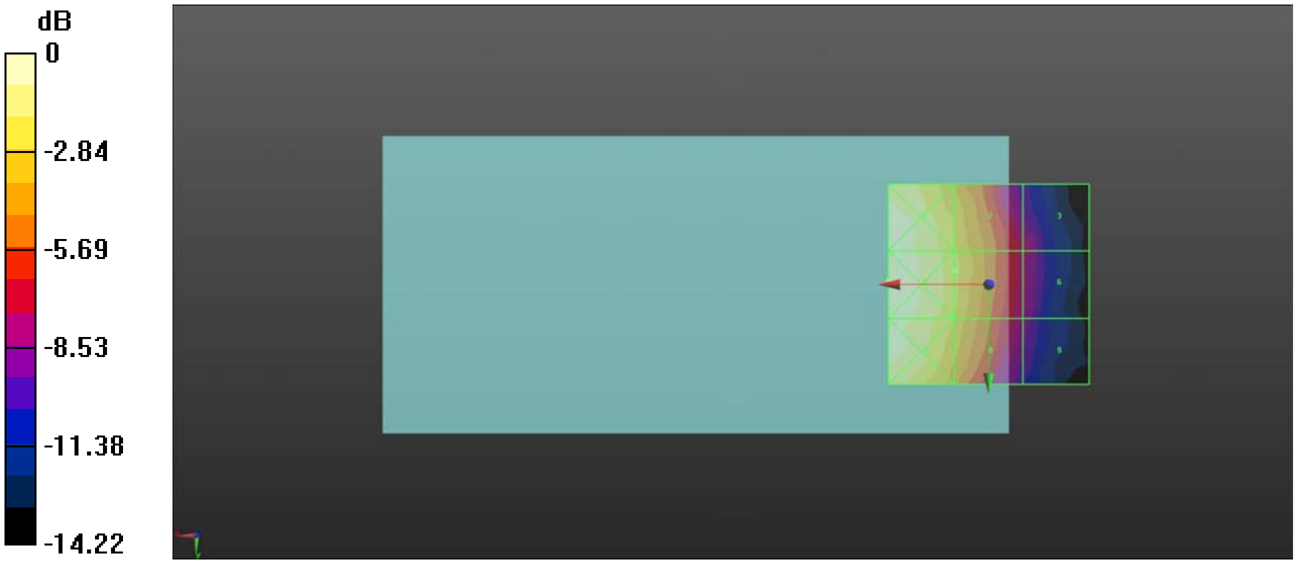
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch251/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 = 9.941 V/m; Power Drift = 0.35 dB
Applied MIF = 3.63 dB
RF audio interference level = 24.73 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **26.94 dBV/m**	Grid 2 **M4** **24.53 dBV/m**	Grid 3 **M4** **19.6 dBV/m**
Grid 4 **M4** **27.25 dBV/m**	Grid 5 **M4** **24.73 dBV/m**	Grid 6 **M4** **19.53 dBV/m**
Grid 7 **M4** **26.99 dBV/m**	Grid 8 **M4** **24.31 dBV/m**	Grid 9 **M4** **18.55 dBV/m**

Cursor:
Total = 27.25 dBV/m
E Category: M4
Location: 25, -1, 8.7 mm



0 dB = 23.05 V/m = 27.25 dBV/m

HAC RF_GSM1900_GSM Voice_Ch512

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 1850.2 MHz;Duty Cycle: 1:8.33
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃

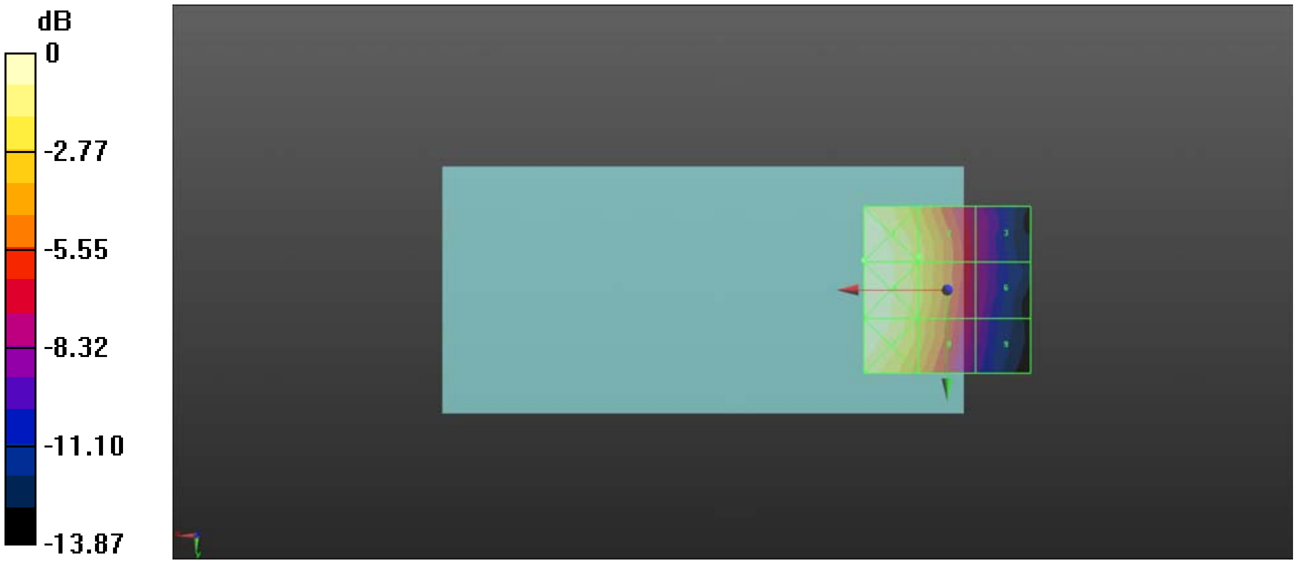
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch512/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 = 10.01 V/m; Power Drift = 0.03 dB
Applied MIF = 3.63 dB
RF audio interference level = 24.67 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **26.97 dBV/m**	Grid 2 **M4** **24.67 dBV/m**	Grid 3 **M4** **19.07 dBV/m**
Grid 4 **M4** **26.97 dBV/m**	Grid 5 **M4** **24.65 dBV/m**	Grid 6 **M4** **19.05 dBV/m**
Grid 7 **M4** **26.89 dBV/m**	Grid 8 **M4** **24.04 dBV/m**	Grid 9 **M4** **18.43 dBV/m**

Cursor:
Total = 26.97 dBV/m
E Category: M4
Location: 25, -9, 8.7 mm



0 dB = 22.31 V/m = 26.97 dBV/m

HAC RF_GSM1900_GSM Voice_Ch661_E

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 1880 MHz;Duty Cycle: 1:8.6896
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃

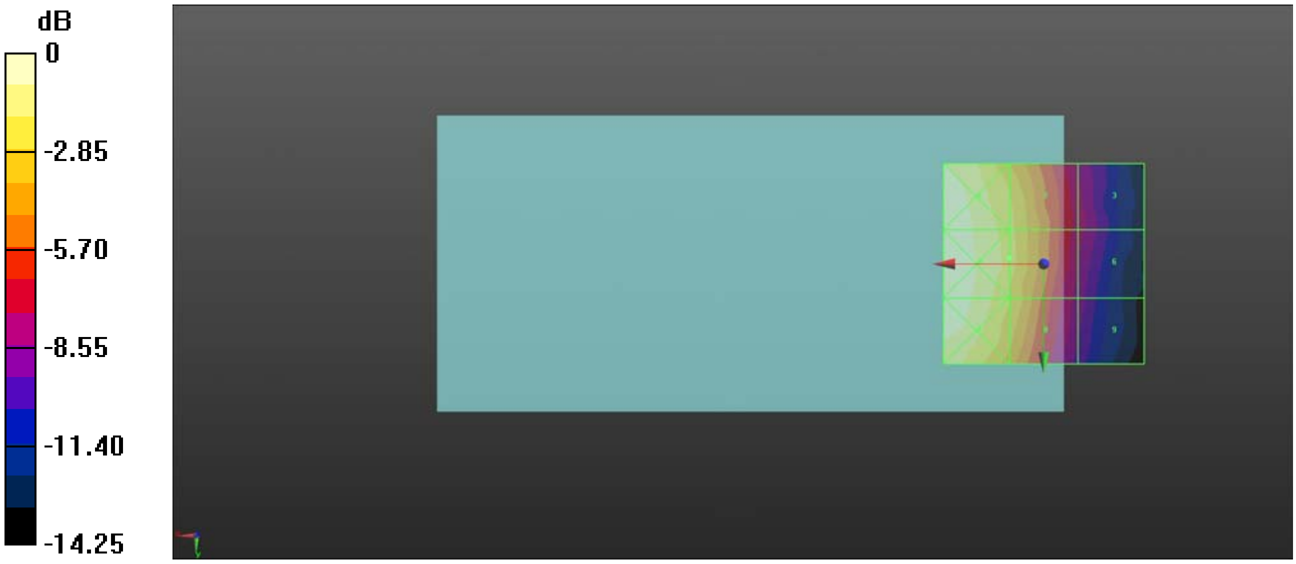
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch661/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 = 16.26 V/m; Power Drift = -0.06 dB
Applied MIF = 3.63 dB
RF audio interference level = 25.00 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **27.25 dBV/m**	Grid 2 **M4** **24.83 dBV/m**	Grid 3 **M4** **19.48 dBV/m**
Grid 4 **M4** **27.38 dBV/m**	Grid 5 **M4** **25 dBV/m**	Grid 6 **M4** **19.42 dBV/m**
Grid 7 **M4** **27.24 dBV/m**	Grid 8 **M4** **24.53 dBV/m**	Grid 9 **M4** **18.5 dBV/m**

Cursor:
Total = 27.38 dBV/m
E Category: M4
Location: 25, 0, 8.7 mm



0 dB = 23.39 V/m = 27.38 dBV/m

HAC RF_GSM1900_GSM Voice_Ch810_E

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 1909.8 MHz;Duty Cycle: 1:8.33
Medium: Air Medium parameters used: $\sigma = 0$ S/m, $\varepsilon_r = 1$; $\rho = 0$ kg/m^3
Ambient Temperature：23.4 ℃

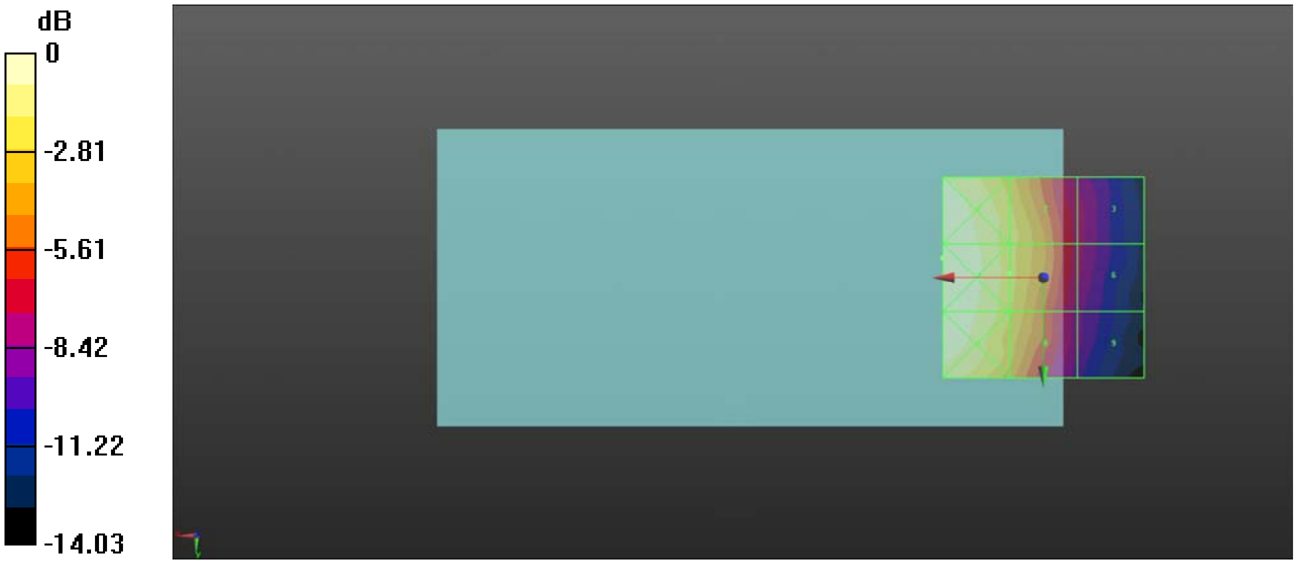
DASY5 Configuration:
- Probe: ER3DV6 - SN2434; ConvF(1, 1, 1); Calibrated: 2018.10.18;
- Sensor-Surface: (Fix Surface)
- Electronics: DAE4 Sn480; Calibrated: 2018.10.29
- Phantom: HAC Test Arch with AMCC; Type: SD HAC P01 BA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch810/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 = 10.93 V/m; Power Drift = -0.12 dB
Applied MIF = 3.63 dB
RF audio interference level = 25.05 dBV/m
Emission category: M4

MIF scaled E-field

Grid 1 **M4** **27.33 dBV/m**	Grid 2 **M4** **25.02 dBV/m**	Grid 3 **M4** **19.56 dBV/m**
Grid 4 **M4** **27.41 dBV/m**	Grid 5 **M4** **25.05 dBV/m**	Grid 6 **M4** **19.52 dBV/m**
Grid 7 **M4** **27.12 dBV/m**	Grid 8 **M4** **24.76 dBV/m**	Grid 9 **M4** **18.57 dBV/m**

Cursor:
Total = 27.41 dBV/m
E Category: M4
Location: 25, -5, 8.7 mm



0 dB = 23.46 V/m = 27.41 dBV/m