



## EMC Test System for Hearing Aids

Immunity of hearing aids to high-frequency radiated electromagnetic fields

- Complies with new draft version of IEC/EN60118-13
- GSM and DECT mobile radio bands covered
- Extended system version up to 3 GHz available
- Automatic measurement and documentation of IRIL
- Automatic generation of qualification test reports
- Equipment control via standard Windows PC and IEEE bus and reliable Rohde&Schwarz EMC software
- Flexible test routines for design phase
- Automatic calibration routines for system and components



**ROHDE & SCHWARZ**

# "Is your hearing aid ready for mobile communication?"

## Technical Fundamentals

High-frequency electromagnetic fields generated by modern radiocommunication equipment may considerably impair the functionality of hearing aids.

Hearing aids are particularly susceptible to signals emitted by GSM mobiles, for example. Units of this type do not emit a continuous signal but carriers which have undergone low-frequency pulse modulation. If a hearing aid is in the immediate vicinity of a mobile, the low-frequency pulse modulation (217 Hz) may, in conjunction with internal rectifying effects, produce an acoustic signal that is so intrusive that the performance of the hearing aid is considerably degraded.

Checking RFI immunity, therefore, plays an important role in the quality assessment of hearing aids.

EN60118-13 (1998) defines suitable test methods as well as minimum requirements for the immunity of hearing aids. The defined test field strengths are very low however, since a relatively restricted performance criterion is used for immunity evaluation.

With the increasing spread of mobile phones, hearing aid users will also want to communicate extensively via this medium. This means that an increasing number of hearing aids with enhanced RFI immunity will be needed in the future. Therefore the new version of EN60118-13 specifies markedly higher test field strengths (up to 75 V/m). This version is already available as Committee Draft August 2000 and is expected to be published as a standard in 2001.

## Rohde & Schwarz EMC Test System for Hearing Aids

Rohde & Schwarz has accumulated many years of experience in EMC system engineering, from bench top systems to complex test halls. Based on the standard test

system TS9981 a special application using a GTEM cell was developed for hearing aids. This means that immunity measurements on hearing aids in the GSM and DECT frequency bands can be performed using the test field strength that will be required by future standards. The system can be designed for frequencies up to 3 GHz to cover future applications, for example UMTS. Immunity measurements are carried out in a homogeneous, calibrated field. This makes it possible to perform reproducible qualification tests. Standardized test routines and reports guarantee straightforward operation for routine applications. Moreover, flexible automatic and semi-automatic software routines support more in-depth immunity analyses, for example during the design phase.



## Specifications

Test standard	IEC/EN60118-13 (Draft 08/2000)	System calibration	automatic routines for system components
Frequency range	0.8 GHz to 2 (3) GHz	Field calibration	factory calibration or semi-automatic on-site calibration with optional field sensor
Field strength	max. 75 V/m + 80% AM (135 V/m CW), higher field strength on request	Audio analysis	multi-purpose Audio Analyzer UPL integrated
EUT <sup>1)</sup> monitoring	automatic measurement of IRIL <sup>2)</sup> to IEC/EN60118-13	Operating system	Windows 95, 98, NT
Test routines	fully and semi-automatic standard routines for qualification testing and immunity analysis during design	GTEM dimensions (L x W x H)	1.25 m x 0.65 m x 0.45 m (typ.)
System control	fully automatic control via IEEE bus, using specific test software	System components	GTEM cell, Signal Generator SML, amplifier, Power Reflection Meter NRT, Audio Analyzer UPL, audio coupler, standard PC or notebook, field sensor (option)

<sup>1)</sup> EUT = Equipment Under Test

<sup>2)</sup> IRIL = Input Related Interference Level



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