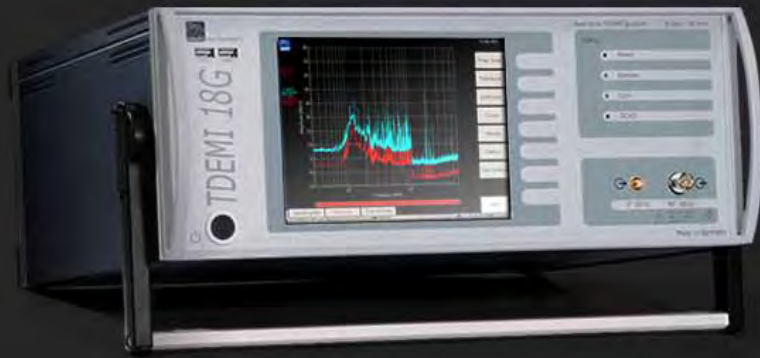


TDEMI 18G

- 4000x faster than conventional EMI receiver
- Measurement of ISM devices
- Analysis of harmonics of microwave ovens



The TDEMI 18G covers the frequency range 9 kHz - 18 GHz and enables the emission measurements according to CISPR/EN and FCC Standards. For measurements of household appliances, IT equipment and industrial scientific and medical (ISM) the TDEMI 18G provides all typical features as well as all known advantages of the technology of the TDEMI product line. With the TDEMI 18G completely unexpected possibilities are provided to the user in the range up to 18 GHz, e.g. during the measurement of the harmonics of microwave ovens. An automated measurement at all frequencies can be performed in less than 2 minutes.

For the measurement of pulse modulated signals with highest sensitivity the option LN-UG18G is recommended for the frequency range 6 GHz - 18 GHz. With this option a further improved noise floor below 15 dB μ V is achieved. The TDEMI uses an auto attenuation controller in order to set up the optimum attenuation. An indication of an overload occurring during the measurement comes with all the TDEMI Systems by the standard configuration. By the parallel measurement at several thousand frequencies an excellent ratio of dwell time and overall testing time is achieved. This enables fast scans with much longer dwell times. Due to the increasing complexity of the systems, as well as the number of operation modes and instationary behaviour fast and reliable measurement methods are mandatory during product development and product certification. Due to the measurement at all frequencies and a sufficient high

selection of the dwell time the measurement uncertainty is reduced significantly. Such scans with long dwell times as required by the EMC standards can be performed in reasonable times with the TDEMI. The automated evaluation and documentation according to CISPR 16-2-1 and 16-2-2 can be performed by the report generator.

By the weighted spectrogram mode with a gap-less real-time analysis bandwidth of 162.5 MHz the TDEMI is an excellent tool for preinvestigations in order to detect potential EMI sources and investigate methods to reduce the electromagnetic interference. Such methods can be applied to devices while the result can be shown in real-time.

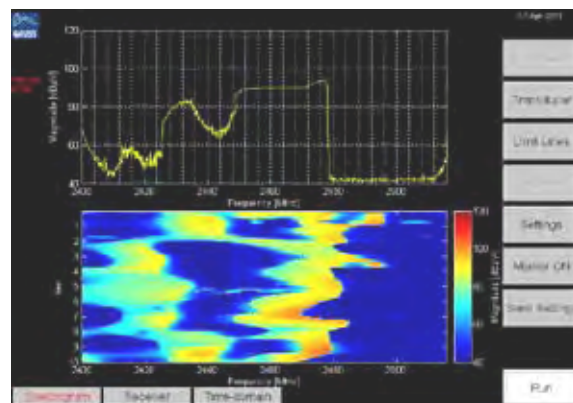


Fig. 29 – Measurement of the magnetron of a microwave oven. Lower graph shows the changes of the emission over time within an interval of 10 s.

TDEMI 18G Specifications

FREQUENCY RANGE

9 kHz - 18 GHz

REFERENCE (OCXO)

| | | |
|--|------------------------|-------------|
| Aging | < ± 3.5 ppm / 15 years | |
| Temperature Drift (0 .. 60° C) | ± 1 x 10e-8 | |
| SSB Phase Noise (1 Hz BW) (typ. @ 12.8 MHz) | 1 Hz | -95 dBc/Hz |
| | 10 Hz | -120 dBc/Hz |
| | 100 Hz | -140 dBc/Hz |
| | 1 kHz | -145 dBc/Hz |

RECEIVER MODE (CISPR Standard)

IF Bandwidth 200 Hz Band A

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 85 dBµV Sinus): < 0 dBµV (typ. -3 dBµV)
 Measurement at about 700 Frequencies in parallel
 Frequency Step < 100 Hz

IF Bandwidth 9 kHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < -15 dBµV (typ. -19 dBµV)
 Measurement at 4096 Frequencies in parallel
 Frequency Step < 400 Hz

IF Bandwidth 120 kHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < -3 dBµV (typ. -6 dBµV)
 Measurement at 1024 Frequencies in parallel
 Frequency Step < 800 Hz

IF Bandwidth 1 MHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < 6 dBµV 1 MHz - 1 GHz
 < 8 dBµV 1 GHz - 1.15 GHz
 < 3 dBµV 1.15 GHz - 6 GHz
 < 15 dBµV 6 GHz - 18 GHz (with LN - UG18G)
 Measurement at 128 Frequencies in parallel
 Frequency Step < 800 Hz

WEIGHTED REAL-TIME SPECTROGRAM

| | |
|------------------------------|--|
| Weighted Spectrogram Mode | Peak, Average, RMS |
| Time-domain | Fully gapless |
| Frequency Step | 158 kHz for 120 kHz 1.2 MHz for 1 MHz |
| Frequency Step Interpolation | 40 kHz for 120 kHz 300 kHz for 1 MHz |
| Frequency Span | > 150 MHz |
| IF Bandwidths CISPR | 200 Hz, 9 kHz, 120 kHz, 1 MHz |
| Minimum Time Step | 50 ms |

TIME-DOMAIN ANALYSIS (RF)

| | |
|--------------------|---------------|
| Bandwidth | 1 GHz |
| Sampling Rate | 2.6 GS/s |
| Acquisition Memory | 32000 Samples |

ABSOLUTE MAXIMUM RATINGS (ATTENUATION 0 dB)

| | |
|-------------------------------|----------|
| Maximum DC Input Level, Pulse | 6 V |
| RF-CW Signal | 120 dBµV |

INDICATION (ATTENUATION 0 dB)

| | |
|-------------------------------|---------|
| Maximum DC Input Level, Pulse | 5 V |
| RF-CW Signal | 65 dBµV |

ATTENUATOR

0 - 75 dB, 5 dB Steps, Auto Attenuation
 max. Input Power for Attenuation > 15 dB: 1 W CW

INTERMODULATION, NONLINEARITIES

| | |
|--|-------------------------|
| CW Signals: Two Tone | < -40 dB (typ. -53 dB) |
| Harmonics (> 40 dBµV, > 1 MHz) | < -40 dB (typ. <-50 dB) |
| Inherent Reception Points | < -40 dB (typ. <-50 dB) |
| Total Dynamic Range (120 kHz IF Bandwidth) | > 140 dB |

INHERENT RECEPTION POINTS (ATTENUATION 0 dB)

Inherent Reception Point 1/4 ADC Sampling Rate:
 << 25 dBµV (using Multi-sampling < -15 dBµV)
 Further Inherent Reception Points
 << 5 dBµV (using Multi-sampling < -15 dBµV)

MEASUREMENT TIME

1 ms - 60 s (Average, RMS)
 1 ms - infinite (Peak, Quasi-Peak)

MEASUREMENT ACCURACY

Sinusoidal Signals (9 kHz - 1 GHz) ± 1 dB
 Sinusoidal Signals (1 GHz - 18 GHz) ± 2 dB
 Pulses according to CISPR 16-1-1

RF INPUT

50 Ohm
 VSWR < 3.0 typ., 1 GHz - 18 GHz
 VSWR < 1.2 typ., 9 kHz - 1 GHz, with 10 dB Attenuation

REMOTE CONTROL

Ethernet (LAN), Commands according to SCPI Standard

DISPLAY

XGA 8,4" 800 x 600 True Color
 Touchscreen

PC

Intel Celeron M 1.86 GHz, 1 GB RAM, 160 GB Hard Disk
 Interface: USB, Ethernet, VGA, serial, IEEE 1394, Audio
 Windows XP

POWER SUPPLY

230 V, 50 Hz or 110 V, 60 Hz

WEIGHT

ca. 30 kg

MAIN OPTIONS

| | |
|----------------|---|
| LN - UG18G | Low-noise Preamplifier (6 GHz - 18 GHz) |
| PRE - UG | Preselection Band A |
| SW - UG | Preselection Band B |
| MIL/DO - UG | Frequency Extension down to 10 Hz, IF Bandwidths 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz |
| LISN - UG | Controller for Measuring Accessories (TTL, 5V) |
| LISNCable - UG | Customized Control Cable for Accessories, e.g. LISN |
| TG - UG | Carrying Handle |
| PC - UG | Intel Core 2 Duo, 2.16 GHz, 2 GB RAM, 320 GB Hard Disk |
| KB - UG | Compact Keyboard incl. Touchpad |
| RG - UG | Report Generator |
| CAL - UG | Manufacturer Calibration with Certificate |
| CALD - UG | DKD Calibration with Certificate |
| CLICK - UG | Click Rate Analyzer, fully integrated |
| SLIDE - UG | Software for Disturbance Power Measurements |