



Version
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Current Probe R&S®EZ-17

Electromagnetic emission and susceptibility measurements in the range 5 Hz to 100 (200) MHz

- ◆ Wide frequency range
- ◆ High sensitivity
- ◆ High load capacity for DC and AC currents (300 A)
- ◆ Small dimensions in spite of large inner diameter (30 mm)
- ◆ Simple clamping thanks to spring-loaded mechanism
- ◆ Calibrated to CISPR 16-1/8.93



ROHDE & SCHWARZ

- ◆ Model 02 for emission measurements in the range 20 Hz to 100 (200) MHz
- ◆ Model 03 for emission and susceptibility measurements in the range 20 Hz to 100 (200) MHz
- ◆ Model 04 with balanced connector for emission measurements in the range 5 Hz to 2 MHz

Description

RF currents carried on supply and control lines of equipment and systems can be measured with the aid of current probes clamped on to the conductors. The current probe itself forms a transformer, the current-carrying conductor being its primary winding. A voltage proportional to the primary current is measured at the RF output of the current probe.

Fields of application

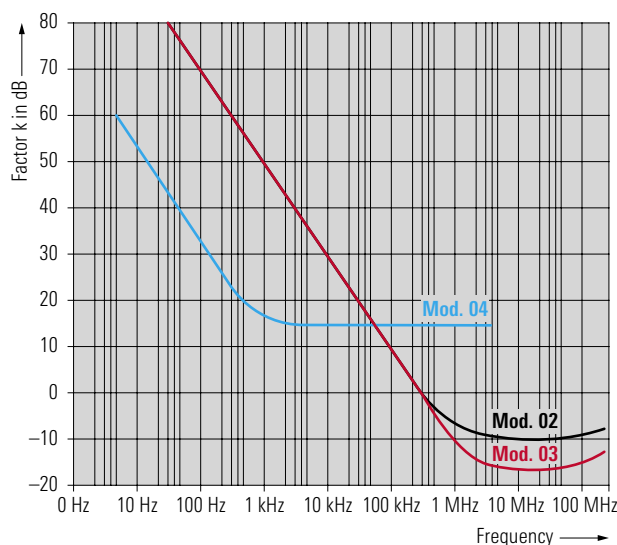
Current probes are used in particular where other coupling networks, such as line-impedance stabilization networks, are either not available or not suitable for practical reasons. Current probes are however also used to measure the electromagnetic susceptibility of equipment and systems. With the aid of the current probe, sinewave or pulse-shaped RF current is injected into lines or cable harnesses. The shielding effectiveness of RF cables can also very easily be measured with the aid of current probes. The Current Probes R&S®EZ-17 comply with the following standards:

- ◆ CISPR 16-1 and VDE 0876 Part 1/ Part 161 for standards stipulating maximum values for RFI current
- ◆ MIL-STD-461 A, B and C CE 01 and 03 as well as MIL-STD-461D CE 101
- ◆ VG 95373 Part 20 and VG 95377 Part 14
- ◆ DEF STAN 59-41 DCE 01 and 02
- ◆ GAM EG 13
- ◆ RTCA/DO 160 C and ED-14-C

Three models to suit different applications

The models 02 to 04 of the Current Probe R&S®EZ-17 are suitable for the following applications in the frequency range 5 Hz to 100 MHz:

- ◆ Model 02 with its flat frequency response above 1 MHz and output impedance of $50\ \Omega$ is ideal for emission measurements as well as for measuring the shielding effectiveness
- ◆ Due to its small transducer factor in the range from 1 MHz to 200 MHz, model 03 is particularly suitable for emission measurements with stringent requirements placed on sensitivity (e.g. VG 95 373 limit class 1) and, due to its high load capacity, also recommended for EMS measurements (bulk current injection tests)
- ◆ Model 04 has been especially optimized for high sensitivity at low frequencies and is therefore ideally suited for emission measurements to MIL-STD-461 A, B, C and D CE 01 and CE 101 as well as to comparable other military EMC standards; a balanced connector with shielded, balanced connecting cable prevents coupling of stray currents to the cable shield, as often occurs at low frequencies



Transducer factor k of the three models of the Current Probe R&S®EZ-17

Owing to their high magnetic overload capacity, the Current Probes R&S®EZ-17 can be used on three-phase power lines with currents up to 300 A without any adverse effect on the result of the RF current measurement. The small dimensions – despite the large inner diameter – and the simple clamping mechanism allow the current probes to be used even where space is at a premium.



Calibration Jig R&S® EZ-18 with Current Probe R&S® EZ-17 inserted and cover removed

Specifications

	Model 02	Model 03	Model 04
Frequency range	20 Hz to 100 (200) ¹⁾ MHz	20 Hz to 100 (200) ¹⁾ MHz	5 Hz to 2 MHz
Range with constant transducer factor (–3 dB)	1 MHz to 100 MHz	2 MHz to 100 MHz	1 kHz to 2 MHz
Transducer factor reduced by 20 dB/decade in range	20 Hz to 1 MHz	20 Hz to 2 MHz	5 Hz to 1 kHz
RF connector	N female	N female	Twinax female
Output impedance	50 Ω ($f \geq 10$ MHz)	reactive	reactive
VSWR	<2 ($f > 10$ MHz)	—	—
Insertion impedance	$\leq 0.8 \Omega$	$\leq 1 \Omega$	$\leq 0.1 \Omega$
Transfer impedance Z_T			
In range with constant transducer factor	3.16 Ω	7.1 Ω	0.17 Ω
Transducer factor k ¹⁾ in range with flat frequency response	–10 dB	–17 dB	+15 dB
Effect by external magnetic fields			
Suppression of indication from current-carrying conductors next to probe	>40 dB	>40 dB	>30 dB (<9 kHz) >40 dB (9 kHz to 1 MHz) >30 dB (>1 MHz)
Load capacity (RF current measurement)			
Max. DC current or peak AC current	300 A ($f < 1$ kHz)	300 A ($f < 1$ kHz)	300 A ($f < 100$ Hz)
RMS value of RF current	2 A ($f > 1$ MHz)	1 A ($f > 1$ MHz)	20 A ($f > 1$ kHz)
Load capacity (EMS measurement)			
AC (RMS value)	6 A ($f < 1$ kHz)	6 A ($f < 1$ kHz)	1 A ($f < 10$ kHz)
Dropping to	0.2 A (up to 1 MHz) 2 W ($f > 1$ MHz)	0.45 A (up to 1 MHz) 10 W ($f > 1$ MHz) (50 W for max. 15 min)	10 W ($f > 10$ kHz)
General data (all models)			
Operating temperature range	–10 °C to +55 °C		
Storage temperature range	–25 °C to 70 °C		
Permissible core temperature	80 °C		
Mechanical stress	shock-tested to MIL-STD-810D (shock spectrum, 40 g), vibration-tested to MIL-T-28800D, class 5; EN 60068-2-6		
Dimensions			
L × W × H	95 mm × 84 mm × 26 mm		
Inner diameter	30 mm		
Weight	0.6 kg		

¹⁾ The manual contains a table specifying the transducer factor from 20 Hz to 200 MHz (models 02 and 03) and from 5 Hz to 2 MHz (model 04). The transducer factor k is calculated as $k = 20 \log (1/Z_T)$.

Ordering information

Current Probe		
Model 02: 20 Hz to 100 MHz	R&S®EZ-17	0816.2063.02
Model 03: 20 Hz to 100 MHz	R&S®EZ-17	0816.2063.03
Model 04: 5 Hz to 2 MHz	R&S®EZ-17	0816.2063.04
Accessories supplied		
Model 02	RF connecting cable with N connectors (1 m), coding connector	
Model 03	RF connecting cable with N connectors (1 m)	
Model 04	RF connecting cable with Twinax connectors (R&S®EZ-15; 1.5 m)	
All models	operating manual with information on relevant transducer factor	
Recommended extras		
Calibration Jig	R&S®EZ-18	1026.6490.02
Connecting Cable with BNC/Twinax connector (adapter)	R&S®EZ-19	1052.2630.02

More information at
www.rohde-schwarz.com
 (search term: EZ-17)



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