



## MD 103 ESD PULSE CALIBRATION SET



Calibration procedures on ESD generators call for high class test equipment and a carefully configured test rig. All the elements incorporated within the measurement chain must be matched to one another before highly accurate measurements with minimal uncertainties can be contemplated.

Faster oscilloscopes enable more complete measurements and analyses of the fast ESD pulses but, of course, the rest of the components in the measurement chain must be up to the necessary standard and exhibit the appropriate frequency response. Therefore the MD 103 set offers a complete measuring path from the target to the attenuator up to the high quality coax cable. The whole path has to be left together and should not be disassembled into parts, as the whole coupling path is calibrated in one piece.

An important component in this chain is the measurement target. Through a collaborative effort with the Swiss Federal Institute of Technology, a new type of construction has been developed featuring a distortion-free, flat frequency characteristic up to at least 6 GHz.

Standardization committees work on the pulse definitions of ESD generators to be specified more accurately and hence to ensure greater reproducibility during test trials. Simultaneously the description of the calibration test rig configuration and the measurement conditions have been newly and more precisely specified.

The newest recommendations are written in the form of a draft standard that has been submitted to the ANSI as well as the IEC. Results from extensive round robin investigations confirm the feasibility and usefulness of tougher calibration requirements. The draft standard specifies the overall variation of the insertion loss of the whole measurement chain including cabling and any additional attenuators as follows:

- $\pm 0.3$  dB up to 1 GHz
- $\pm 1$  dB between 1 and 4 GHz

As a result, the S21 parameter (insertion loss) of a target becomes a decisive factor. The classical measurement shunt can no longer satisfy these increased demands. The MD 103 target fulfils these specifications comfortably. The MD 103 is manufactured with the highest mechanical and electrical precision and therefore very narrow tolerances are assured. All the important elements are gold plated. The target is supplied ready for mounting in a screening wall.

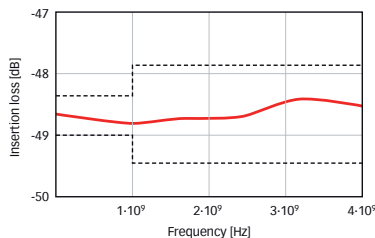
The MD 103 is a measurement device for calibration laboratories and specialists, who work right at the cutting edge of the latest technological know-how. The set will be delivered as a complete chain, consisting of target, attenuator, cable and a ISO 17025 calibration certificate including all relevant calibration data and graphs. A calibration adapter is also supplied with each target as standard. Thanks to the excellent frequency characteristic and the accurately determined parameters this target cannot negatively influence the uncertainty budget of the measurement chain as a whole.



- Target for precise ESD pulse measurements
- Very small insertion loss variation
- Precise gold plated construction
- Includes target, attenuator and cable
- ISO 17025 calibration certificate for the whole set



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## Technical specifications

Variation of insertion loss	<0.2 dB up to 1 GHz
(S21 parameter):	<0.3 dB up to 4 GHz <0.5 dB up to 6 GHz
Shunt resistance:	1.03 $\Omega$ (SMD design)
Calibration pulse amplitude:	1/2/4/8 kV
Max. pulse amplitude:	30 kV
Calibration adapter:	Reflection coefficient (placed face to face)
	<-40 dB up to 1 GHz
	<-25 dB up to 6 GHz
	Insertion loss (placed face to face)
	>-0.05 dB up to 6 GHz
	Characteristic impedance 50 $\Omega$ $\pm$ 1 $\Omega$ up to 6 GHz
Target parts:	Gold plated
Cable connectors:	Type N

## Ordering information

MD 103	MD 103 ESD target set including: ESD target, 20 dB attenuator, high precision coax cable, solid case with spare place for INA 103 and special screw tool, manual, calibration certificate conform to ISO 17025
Optional:	
INA 103	Calibration adapter including: measuring adapter with N-connector and special screw tool