



## HIGH-FREQUENCY TEST PROBES



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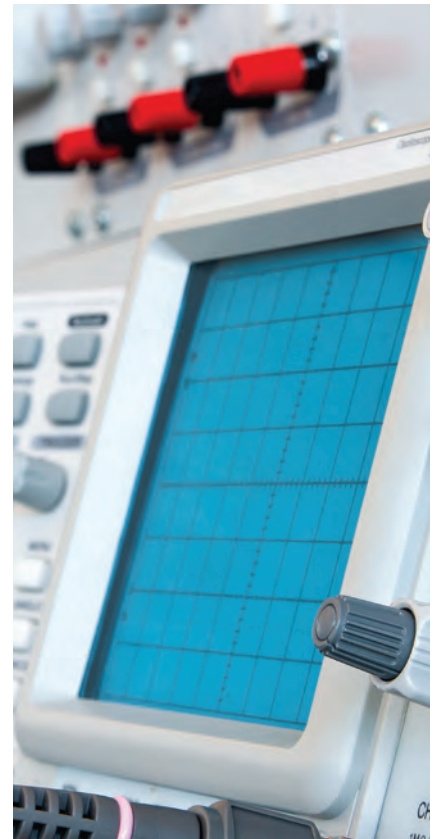
## FIELDS OF APPLICATION

- Automotive technology, especially car entertainment/infotainment
- Antenna technology
- Radio and telecommunications
- Medical technology
- Laboratory and measurement engineering

## CUSTOMER BENEFITS

- Time-saving through integration in the test adapter or assembly line production, compared to a manual assembly of the test jack
- Low loss because of spring-loaded contacting
- Large number of test cycles with high level of accuracy
- Replaceable inner conductor





High-frequency test probes (HF-TP) consist of sprung inner and outer conductors that are arranged coaxially to one another. This arrangement is optimal for the transmission of high-frequency signals because the electromagnetic field that is required to transport the energy is restricted to the area between the inner and outer conductors. The advantage is that electromagnetic emissions and parasitic induction are effectively suppressed. Specially matched geometric relationships and high precision in manufacture allow the transmission of high-frequency signals with low emissions and losses. For that reason the high-frequency test probes of the 7860/7840 series are matched to suit high-frequency systems with an impedance of 50 Ohms. In the same way the geometry and dimensions of the probe heads of the inner and outer conductors are also designed to suit the relevant test piece.






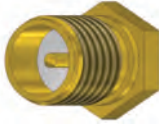



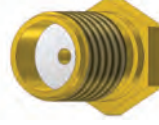


High-frequency test probes are compact, space-saving and solid. As a result they are ideally suited for economically carrying out sensitive measuring tasks involving high-frequencies. Furthermore, their modular construction allows the inner and outer conductors to be changed.










High-frequency test probes are available both in plug-in and screw-type form for use when subjected to disturbing forces that act axially (vibration, impacts and the like). For both types there are matching receptacles that allow fast and secure installation and can be changed easily.

The high-frequency test probes have a practical connecting bush for connection to a test system, permitting quick contact creation through standardised MCX miniature plugs, and without soldering or other complicated procedures. These MCX plugs are available ready assembled with a flexible high-frequency cable of the Multiflex type, at the end of which an SMA cable plug, for example, is connected.

# HIGH-FREQUENCY TEST PROBES




## SERIES 7860 UP TO 6 GHZ / SERIES 7840 UP TO 4 GHZ

 KK86MCX750SMA*      7860-Z1DL-xxN-Au-2,8/0,5C	 MS-156
 KK86MCX750SMA*      7860-Z2D-xxN-Au-2,8/0,5C	 MS-156
 KK86MCX750SMA*      7860-Z3A-xxN-Au-2,8/0,74C	 U.FL-m
 KK86MCX750SMA*      7860-Z4A-xxN-Au-8,0/1,5C	 R-SMA-m
 KK86MCX750SMA*      7860-Z5E-xxN-Au-3,2/0,9C	 MCX-f
 KK86MCX750SMA*      7860-Z6E-xxN-Au-8,0/1,8C	 SMA-f
 KK86MCX750SMA*      7860-Z7A-xxN-Au-5,0/1,5C	 SMB-m

 <p>KK86MCX750SMA*</p>	 <p>7860-Z8E-xxN-Au-3,2/0,8C</p>	 <p>SMB-f</p>
 <p>KK86MCX750SMA*</p>	 <p>7860-Z9A-xxN-Au-5,0/1,5C</p>	 <p>SMC-m</p>
 <p>KK86MCX750SMA*</p>	 <p>7860-Z25A-5.3Nau-6.1/1.5C</p>	 <p>Fakra</p>

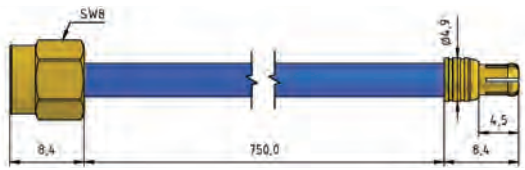
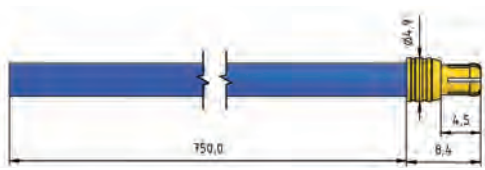
All test probes from the 7860 series are also available as threaded type.

## PCB TESTER

 <p>KK86MCX750SMA*</p>	 <p>7840-Z51B-5.6N-Au-6.0C/0.5</p>	
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All test probes from the 7840 series are also available as threaded type.

## CABLE-MULTIFLEX 86\* TWO VERSIONS AVAILABLE

 <p>KK86MCX750SMA</p>	 <p>KK86MCX750</p>
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## TECHNICAL DATA EXAMPLE 7860-Z5E

### Mechanical data | inner conductor

Full travel	3.70 mm
Working travel	2.00 mm
Pre-loaded spring force	0.65 / 0.95 N
Spring force at working travel	1.30 / 2.00 N

### Mechanical data | outer conductor

Full travel	5.00 mm
Working travel	4.00 mm
Pre-loaded spring force	1.50 / 3.00 / 4.00 N
Spring force at working travel	4.00 / 6.00 / 8.00 N

### Total spring force

Total spring force by working travel	5.30 / 6.00 / 7.30 / 8.00 / 9.30 / 10.00 N
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### Materials

Barrel	Bronze, gold plated
Spring	Steel, gold plated
Plunger	CuBe, gold plated
Receptacle	Brass, gold plated

	max. Current DC	Electrical resistance
Inner conductor	3 A	$\leq 15 \text{ m}\Omega$
Outer conductor	10 A	$\leq 2 \text{ m}\Omega$

### Typical data

S11 – high return losses	$\geq 20 \text{ dB}$
S21 – low insertion losses	$< 1 \text{ dB}$

### Electrical data

Impedance	50 $\Omega$
Frequency range	up to 6 GHz

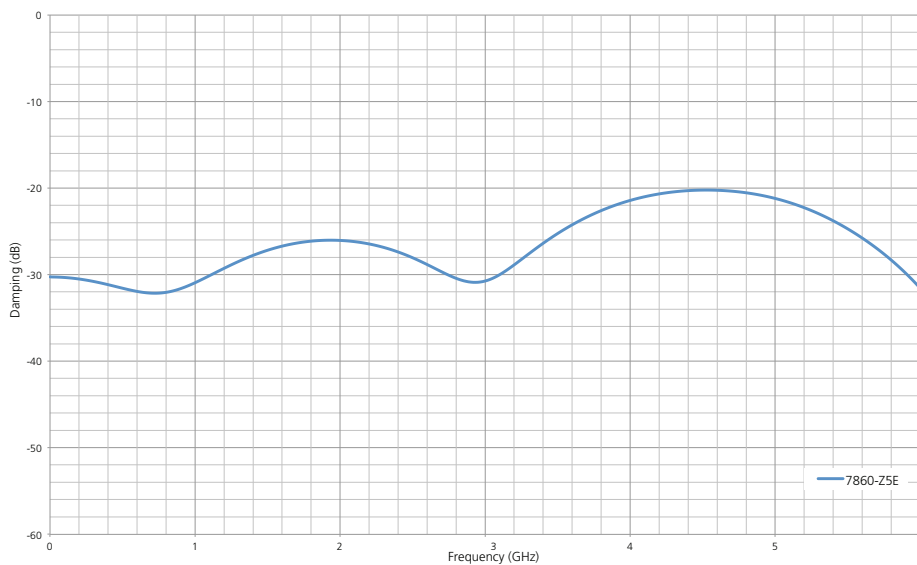


# TYPICAL DAMPING CHARACTERISTICS

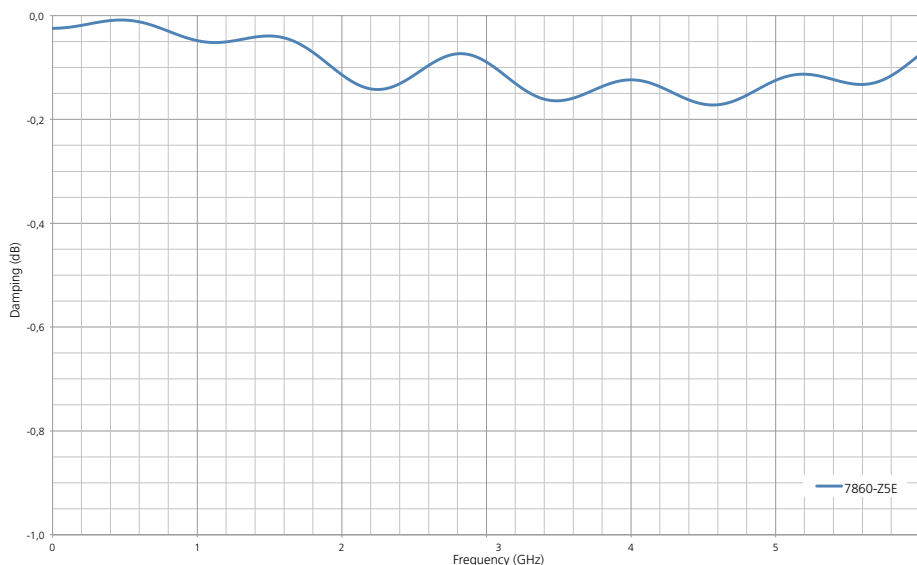
The effect of a high-frequency test probe on a section of measurements is determined by the scattering parameters (S-parameters). In this case, the S11 and S21 parameters which define the so-called return loss and insertion loss are especially important. The return loss (S11) describes that proportion of the signal which is reflected by the test probe; the insertion loss (S21) describes that proportion of the signal which remains in force after passing through the test probe.

In order to avoid loading upstream modules unnecessarily, the aim is to attain as high a value as possible for the return loss. The value for the insertion loss should be close to zero so that the proportion of the usable signal is maximised. The typical damping characteristics – using the PTR HF-FK 7860-Z5E as an example – confirm that the requirements with regard to high return losses and low insertion losses were met.

## TYPICAL HIGH RETURN LOSSES – REFLEXION (S11)



## TYPICAL LOW INSERTION LOSSES – TRANSMISSION (S21)





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