



Die Differential-Sonden sind ein hochwertiges Zubehör, welches jedes Oszilloskop für die Messung von Parametern im Zusammenhang mit Leistungselektronik erweitert.

Folgende Messungen beispielsweise können mit einfachen Oszilloskopen nicht vorgenommen werden:

- Differential-Messung in Schaltungen und an Komponenten der Leistungselektronik
- Messungen bei hohem Spannungspegel

Mit den Differential-Tastköpfen können derartige Messungen mit wenig Aufwand realisiert werden

- SI-7000 Optisch Isolierter Vorverstärker
- SI-7001 Isolations-Vorverstärker
- FP-1000PW6 FET-Tastkopf 1GHz
- DP-800PW6 SMD-Differential-Tastkopf 800MHz
- HV-2500PW6 Differential-Tastkopf 2,5kV/100MHz
- HV-7000PW6 Differential-Tastkopf 7kV/70MHz

Abbildungen, von oben links nach oben rechts:
 SI-9001, FP-1000PW6, HV-2500PW6, SI-9000A

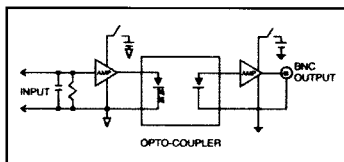
The differential probes are an important type of accessory which extends the measurement power of oscilloscopes to power semiconductor circuits. The engineers have always suffered from following two problems in waveform measurement of power circuits on general oscilloscopes: Most signals concerned in power circuits are not single-end type but differential type which the general oscilloscopes cannot accept. The input voltage rating of the general oscilloscope is not enough to measure power signals. Now, the universal scope differential probes can resolve it at economical cost.

- SI-7000 Opto-Isolator Preamplifier
- SI-7001 Isolator Preamplifier
- FP-1000PW6 FET Probe 1GHz
- DP-800PW6 SMD Differential Probe 800MHz
- HV-2500PW6 Differential Probe 2.5kV/100MHz
- HV-7000PW6 Differential Probe 7kV/70MHz

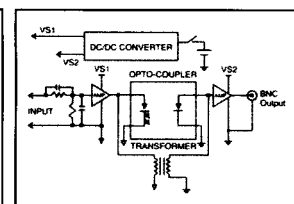
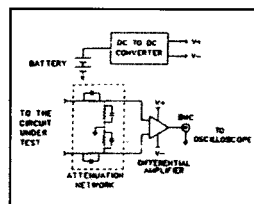
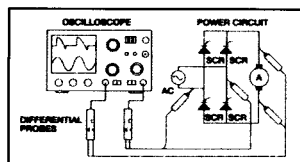
*Pictures from top left to top right, counterclockwise:
 SI-9001, FP-1000PW6, HV-2500PW6, SI-9000A*

| Model | SI-9000 | SI-9000B | SI-9000A | SI-9001 | SI-9002 | SI-9005 | SI-9105 |
|---|---|---|---|---|---|---|---|
| Bandbreite <i>Bandwidth</i> | 25MHz (-3dB) | 25MHz (-3dB) | 25MHz (-3dB) | 25MHz (-3dB) | 25MHz (-3dB) | 25MHz (-3dB) | 100MHz (-3dB) |
| Anstiegszeit <i>Rise Time</i> | 14ns | 14ns | 14ns | 14ns | 14ns | 14ns | 3,5ns |
| Genauigkeit <i>Accuracy</i> | +/- 2% | +/- 2% | +/- 2% | +/- 2% | +/- 2% | +/- 2% | +/- 2% |
| Eingang <i>Input</i> | Differential | Differential | Differential | Differential | Differential | Differential | Differential |
| Eingang R+C <i>In R+C</i> | 2x3M0hm 10pF | 2x3M0hm 10pF | 2x3M0hm 10pF | 2x4M0hm 10pF | 2x4M0hm +10pF | 2x10M0hm 5pF | 2x4M0hm 7pF |
| Abschwächung <i>Attenuation</i> | 20:1/200:1 | 10:1/100:1 | 50:1/500:1 | 10:1/100:1 | 20:1/200:1 | 50:1/500:1 | 1:50/1:500 |
| Max. Eingangsspannung <i>Max. Input Voltage</i> | +/-1400V | +/-1400V | +/-1400V | 1000Vrms | 1000Vrms | 2500Vrms | +/-700V |
| Messbereich <i>Input Range</i> | (20:1) +/-100V (200:1)+/-1000V | (10:1)+/-70V (100:1)+/-700V | (50:1)+/-140V (500:1)+/-1400V | (10:1)+/-70V 50Vrms (100:1)+/-700V 500Vrms | (20:1)+/-140V 100Vrms (200:1)+/-1400V 1000Vrms | (50:1)+/-350V/ 250Vrms (500:1)+/-3500V/ 2500Vrms | (50:1)+/-70V/ 50Vrms (500:1)+/-700V/ 500Vrms |
| Empfindlichkeit <i>Sensitivity</i> | | | | | | | |
| Gleichtaktunterdrückung <i>Common Mode Rejection</i> | 50Hz:-80dB 1kHz:-70dB 100kHz:59dB 1MHz:-47dB | 50Hz:-80dB 1kHz:-70dB 100kHz:59dB 1MHz:-47dB | 50Hz:-80dB 1kHz:-70dB 100kHz:59dB 1MHz:-47dB | 50Hz:-86dB 20kHz:-66dB 200kHz:-56dB | 50Hz:-86dB 20kHz:-60dB 200kHz:-50dB | 50Hz:-86dB 20kHz:-60dB 200kHz:-50dB | 60Hz:80dB 1MHz:50dB |
| Speisewiderstand <i>Source Impedance</i> | 10hm;1kHz 80hm;1MHz | 10hm;1kHz 80hm;1MHz | 10hm;1kHz 80hm;1MHz | 10hm;1kHz 80hm;1MHz | 10hm;1kHz 80hm;1MHz | 10hm;1kHz 80hm;1MHz | 50Ohm |
| Ausgang <i>Output</i> | +/-7V | +/-7V | +/-7V | +/-7V | +/-7V | +/-7V | +/-1,4V(50Ohm) |
| Rauschen <i>Noise</i> | 2mV | 2mV | 2mV | 1,5...2mV | 1,5...2mV | 1,5...2mV | 0,6mVrms |
| Offset | +/-5mV | +/-5mV | +/-5mV | +/-5mV | +/-5mV | +/-5mV | <+/-5mV,10°...40°C |
| Verstärkung <i>Gain</i> | | | | | | | |
| Betriebs-Temp. <i>Operat. Temp.</i> | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C |
| Speisung / Power | 6V/50mA | 6V/50mA | 6V/50mA | 6V/60mA | 6V/60mA | 6V/60mA | 6VDC/180mA |
| Abmessungen mm <i>Dimensions mm</i> | 168x62x20 | 168x62x20 | 168x62x20 | 168x62x20 | 168x62x20 | 202x77x36 | 207x83x38 |
| Gewicht <i>Weight</i> | 270g | 270g | 270g | 285g | 285g | 285g | 500g |
| Standard Compliance | CE | CE | CE | IEC-1010CATIII | IEC-1010CATIII | IEC-1010CATIII | IEC-1010 |

Applikations-Beispiele



↓ HV-7000PW6



↓ DP-800PW6



| SI-9110 | DP-9001 | DP-9010 | DP-9200 | SI-7000 | HV-2500PW6 | HV-7000PW6 | FP-1000PW6 | DP-800PW6 |
|---|--------------|--------------|--------------|---|---|--|---------------|------------------------------------|
| 100MHz (-3dB) | 40MHz | 80MHz | 40MHz | 300kHz | 100MHz (-3dB) | 70MHz (-3dB) | 1GHz | 800MHz (-3dB) |
| 3,5ns | | | | | | | | |
| +/- 2% | | | | | +/-2% | +/-2% | +/-2% | +/-2% |
| Differential | Differential | Differential | Differential | Isol. Preamp. | Differential | Differential | FET | Differential |
| 4Mohm 7pF | 2x1MOhm 15pF | 2x1MOhm 15pF | 2x1MOhm 15pF | 1MOhm 10pF | 4MOhm 7pF | 10MOhm 7pF | 1MOhm 2pF | 100kOhm 2pF |
| 100:1/1000:1 | 1:1 | 10:1 | 200:1 | | 100:1 / 1000:1 | 100:1 / 1000:1 | 10:1 | 10:1 |
| +/- 1400V | +/-1000Vp | +/-1000Vp | +/-1000Vp | 1000Vrms | 1000Vrms | +/-7000V | +/-40V | +/-40V |
| (100:1)+/-140V/ 100Vrms (1000:1)+/-1400V/ 1000Vrms | +/-3Vp | +/-30Vp | +/-600Vp | x1 +/-1V x10 +/-0,1V x100+/-0,01V | (100:1) +/-350V/ 250Vrms (1000:1) +/-2500V/ 1000Vrms | (100:1) +/-700V (1000:1) +/- 7000V | | +/-30V Common +/-15V Different. |
| | 20mV | 150mV | 150mV | | 60mVrms | | | |
| 60Hz:80dB 1MHz:50dB | ..70dB 1MHz | ..70dB 1MHz | ..70dB 1MHz | >1,000,000:1 DC to 10kHz | 60Hz:80dB 1MHz:50dB | 60Hz: 80dB 1MHz:50dB | | 1MHz: 60dB 400MHz: 20dB |
| 50Ohm | | | | | 50Ohm | | | |
| +/-1,4V(50Ohm) | +/-3Vp | +/-3Vp | +/-3Vp | | +/-1,4V(50Ohm) | +/-7V | | +/-1,5V (50Ohm) |
| 0,6mVrms | 6mVp | 5mVp | 5mVp | 200uV | 0,6mVrms | 0,6mVrms | | |
| <+/-5mV, 10°...40°C | | | | +/-10mV x1;x10;x100 | +/-5mV | < +/-5mV | < 5mV | < +/-5V |
| | | | | | | | | |
| -10°C...+40°C | 0°C...60°C | 0°C...60°C | 0°C...60°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C |
| 6VDC/180mA | 9VDC | 9VDC | 9VDC | 4xAA Cells | 6VDC/4xAA Cells | 6VDC/4xAA Cells | 12VDC/100mA | 12VDC/100mA |
| 207x83x38 | 116x70x25 | 116x70x25 | 116x70x25 | 202x77x36 | 207x83x38 | 202x83x38 | 104x21x14 | 104x21x14 |
| 500g | 140g | 140g | 140g | 600g | 800g | 800g | 200g | 200g |
| IEC-1010 | CE | CE | CE | IEC-1010CATI | IEC-1010CATII | IEC-1010CATII | CE/LVD | CE/LVD |

↓ SI-7000



↓ DP-9010



Sonden in kleiner Bauform
Probes with small dimensions

| DP-50PW6 | DP-50B-PW6 | HV-100A-PW6 | DP-150PW6 |
|-------------------|-------------------|--------------------|-------------------|
| 50MHz | 50MHz | 100MHz | 150MHz |
| | | | |
| Differential | Differential | Differential | Differential |
| 4M Ω m 7pF | 4M Ω m 7pF | 4M Ω m 7pF | 4M Ω m 7pF |
| 10:1 / 100:1 | 1:1 / 10:1 | 100:1 / 1000:1 | 10:1 / 100:1 |
| +/-1000V | +/-1000V | +/-10000V | +/-1000V |
| (10:1) +/-100V | (1:1) +/-10V | (100:1) +/-1000V | (10:1) +/-100V |
| (100:1) +/-1000V | (10:1) +/-100V | (1000:1) +/-10000V | (1000:1) +/-1000V |
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| -10°C...+40°C | -10°C...+40°C | -10°C...+40°C | -10°C...+40°C |
| 12VDC/100mA | 12VDC/100mA | 12VDC/100mA | 12VDC/100mA |
| 104x21x14 | 104x21x14 | 104x21x14 | 104x21x14 |
| 200g | 200g | 200g | 200g |
| IEC-1010CATV | IEC-1010CATV | IEC-1010CATV | IEC-1010 CATV |

Differential-Tastköpfe 100 MHz
*High Frequency Differential Probes
 Serie SI-9105 & SI 9110*

Diese 100 MHz Aktiv-Differential-Tastköpfe wurden speziell für die Messung sehr schnell ändernder Signale in galvanisch getrennten Schaltungen entwickelt. Die Geräte finden Einsatz in Umrichtern, Antriebssystemen, Netzgeräten etc.

These 100 MHz Active-Differential-Probes are specifically designed to measure fast changing signals in floating circuits such as power converters, drive systems, power supplies etc.



Spezifikationen / Specifications

| | SI-9105 | SI-9110 |
|---------------------------------|--------------------------------------|----------------|
| Differential Voltage | 700 V | 1400 V |
| Bandwidth (-3dB) | 100 MHz | 100 MHz |
| Common Mode Voltage DC + pk AC | 850 V | 1400 V |
| Common Mode Voltage RMS CAT III | 600 V | 1000 V |
| Attenuation (switchable) | 50 x / 500 x | 100 x / 1000 x |
| CMRR 60Hz / 1 Mhz | 80 dB / 50 dB | |
| Input R (each input) | 40 M | |
| Input C (each input) | 7pF | |
| Power Source | 4 AA size cells or 6 V mains adaptor | |
| Compliance | IEC 1010 | |

Das Sortiment wird laufend erweitert.
 Sonder-Ausführungen, Spezial-Stecker und repräsentabler Holz-Koffer auf Anfrage lieferbar.

The product range is continuously expanded. Special versions, special connectors and wooden case are available on demand.

Aenderungen und Irrtum vorbehalten.

Specifications may change without notice.