

Accessory for DLM series

Differential probe PBDH0400 series

702921 (1000 V DC+ACpeak, 400 MHz) / **702922** (2000 V DC+ACpeak, 400 MHz)

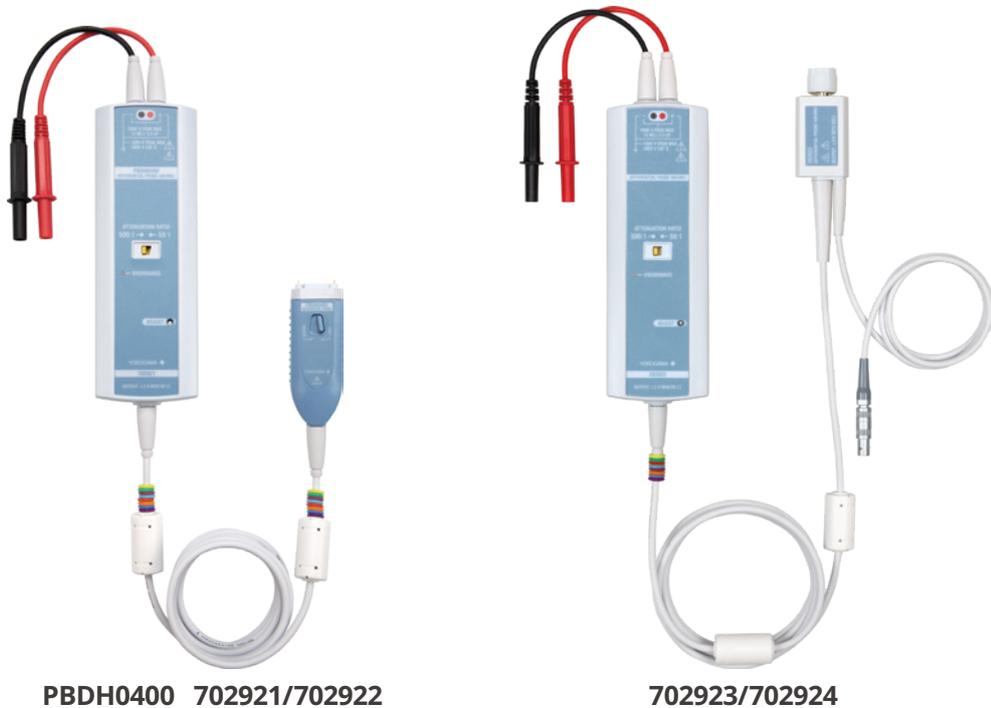
Differential probe

702923 (1000 V DC+ACpeak, 400 MHz) / **702924** (2000 V DC+ACpeak, 400 MHz)

High-Speed, High-Voltage Differential Probe

For Power Conversion Applications Using Next-Generation Power Semiconductors

This high-voltage differential probe offers a wide frequency range from DC to 400 MHz, excellent frequency response flatness, and superior Common Mode Rejection Ratio (CMRR) characteristics.



PBDH0400 702921/702922

702923/702924

Features

- The 702921/702922/702923/702924 probes are ideal for measuring non-grounded (floating) signals in power electronics applications such as inverters, motors, and power supplies — particularly in high-speed, high-voltage switching operations involving SiC and GaN devices.
- The 702921 and 702922 probes are equipped with the YOKOGAWA probe interface, enabling automatic configuration of settings such as attenuation ratio and input impedance simply by connecting them to the DLM series. This eliminates the need for manual adjustments and minimizes the risk of setup errors. The probes are powered directly by the DLM series main unit, so no external power source is required.
- The 702923 and 702924 probes feature a versatile BNC interface, allowing seamless use with a wide range of general-purpose oscilloscopes.
- In addition to the included pincher tip, users can choose the most suitable accessories for their measurement targets from the expanded lineup of optional accessories.

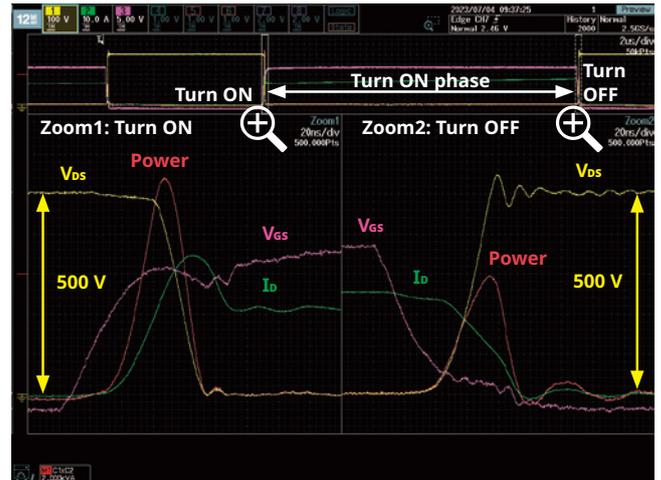
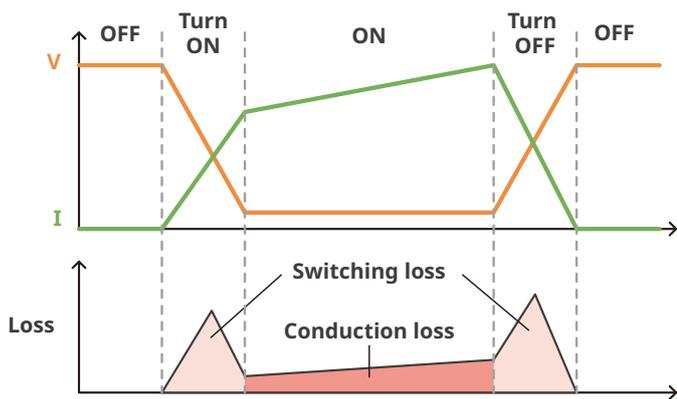


Application

Power semiconductor switching measurement with high-resolution oscilloscopes

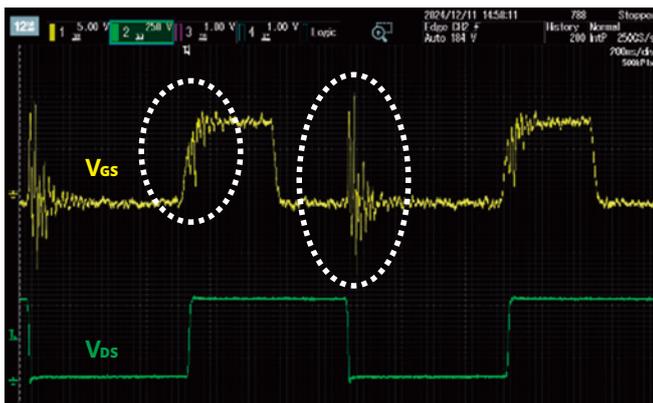
SiC Switching Loss Measurement

To precisely measure switching losses in SiC and GaN devices, measurement instruments must meet several critical requirements. These devices exhibit extremely fast switching rise times, necessitating the use of a wide-bandwidth oscilloscope. Additionally, their high operating voltages require probes that can handle high-voltage signals safely and reliably. To meet these conditions, we recommend the 702921, 702922, 702923, or 702924 differential probes, which are designed for both wide bandwidth and high-voltage applications.

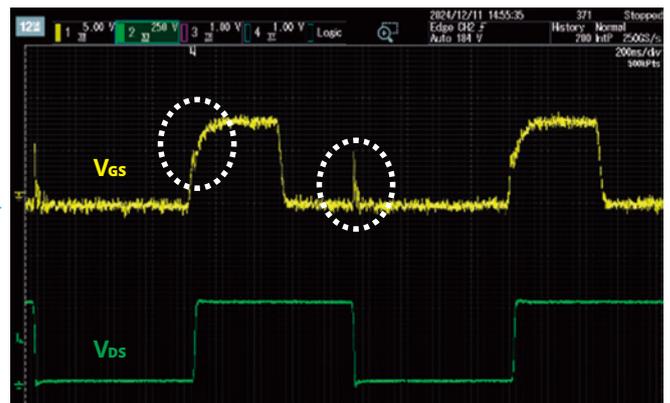


GaN Gate-Source Voltage Measurement

The 702921, 702922, 702923, and 702924 probes offer excellent common-mode rejection ratio (CMRR), making them highly resistant to common-mode noise and enabling more accurate waveform measurements. Compared to the earlier model 701927, these probes significantly reduce the impact of noise.



Previous model (701927)



702921

GaN Switching Waveform Measurement
(Comparison of high-side V_{GS} waveform measurements with large common-mode voltage fluctuations)

Specifications

	702921	702922	702923	702924
Frequency Bandwidth (-3 dB)	DC to 400 MHz	DC to 400 MHz	DC to 400 MHz	DC to 400 MHz
Attenuation ratio	50:1/500:1	100:1/1000:1	50:1/500:1	100:1/1000:1
DC gain accuracy	±0.7%			
Allowable differential voltage	±100 V (DC + ACpeak) ±1000 V (DC + ACpeak)	±200 V (DC + ACpeak) ±2000 V (DC + ACpeak)	±100 V (DC + ACpeak) ±1000 V (DC + ACpeak)	±200 V (DC + ACpeak) ±2000 V (DC + ACpeak)
Maximum input voltage	±1000 V (DC + ACpeak)	±2000 V (DC + ACpeak)	±1000 V (DC + ACpeak)	±2000 V (DC + ACpeak)
Maximum non-destructive input voltage	±1500 V (DC + ACpeak) < 5 s, Discontinuous	±3000 V (DC + ACpeak) < 5 s, Discontinuous	±1500 V (DC + ACpeak) < 5 s, Discontinuous	±3000 V (DC + ACpeak) < 5 s, Discontinuous
CMRR (typical)	-80 dB (60 Hz), -50 dB (10 MHz), -30 dB (100 MHz), -20 dB (400 MHz)			
Input conversion noise (typical)	250 mVrms	500 mVrms	250 mVrms	500 mVrms
Input resistance (typical)				
to ground	5 pF			
between +/-terminals	2.5 pF			
Input capacitance (typical)				
to ground	6 MΩ			
between +/-terminals	12 MΩ			
Measurement category	CATII 1000 V, CATIII 600 V			
Connector type	YOKOGAWA probe interface (Compatible with DLM3000, DLM3000HD, DLM5000 and DLM5000HD)		BNC	
Standard accessory	758928 Pincher tip set (Red and Black)			

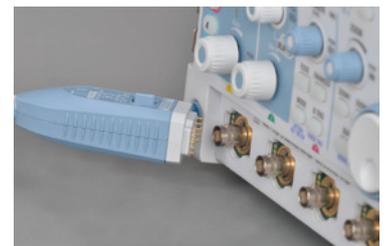
Probe power supply

702921/702922

Power is supplied to the probe from the DLM series main unit via the YOKOGAWA probe interface.

702923/702924

Either a DLM series probe power supply option (/P2, /P4, or /P8) or the separately sold probe power supply (701934) is required.

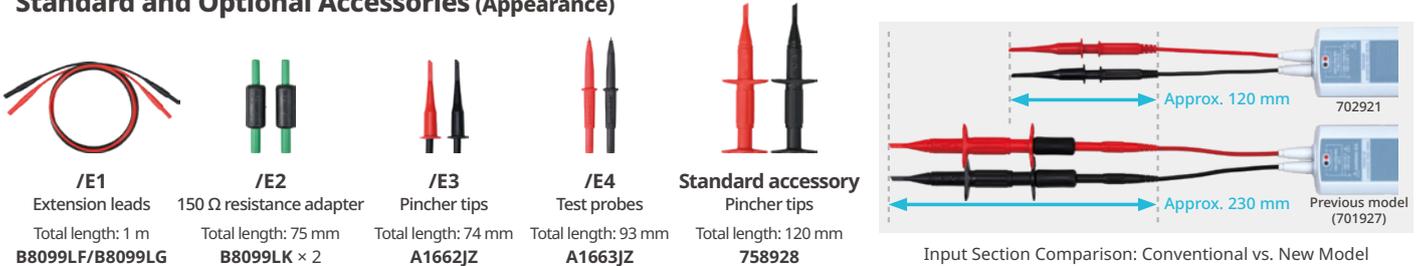


Model	DLM3000 /P2, /P4	DLM3000HD /P4	DLM5000 /P4, /P8	DLM5000HD /P4, /P8	701934
Output Voltage	±12 V	±12 V	±12 V	±12 V	± (12 ±0.5)V
Rated Output Current	±1.2 A	±1.2 A	±2.0 A	±2.0 A	±2.5 A
Number of power supply connectors	/P2:2 /P4:4	4	/P4:4 /P8:8	/P4:4 /P8:8	4

Comprehensive Accessory Lineup

The 702921, 702922, 702923, and 702924 probes feature newly designed input leads that deliver the same performance as using 100 Ω resistance adapters with conventional models. In addition to the accessory lineup for conventional models, compact pincher tips (/E3 option) and test probes (/E4 option) are also available. With the compact pincher tips (/E3), the overall tip length is reduced by approximately 100 mm compared to the standard accessories included with conventional models.

Standard and Optional Accessories (Appearance)



Accessories sold separately



Model and Suffix Code

Model	Suffix Code	Description
702921		PBDH0400 High-voltage type (1 kV) Differential probe with YOKOGAWA probe interface
702922		PBDH0400 High-voltage type (2 kV) Differential probe with YOKOGAWA probe interface
702923		High-voltage type (1 kV) differential probe with BNC
702924		High-voltage type (2 kV) differential probe with BNC
	-02	Cable length: 2 m
	/NA	No standard accessories
	/E1	Extension leads, cable length: 1 m, a set of red and black
	/E2	150 Ω resistance adapter × 2 pieces
	/E3	Pincher tips, a set of red and black
	/E4	Test probes, a set of red and black

NOTICE

- Before operating the product, read the user's manual thoroughly for proper and safe operation.

Related products

Combining the PBDH0400 with an oscilloscope with high vertical resolution provides an environment for more accurate waveform measurement.

Lightweight, Multi-Channel

DLM5000HD High-Definition Oscilloscope

- 8 Channels/500 MHz
- 12-bit/2.5 G Sample Rate
- 1 G Points, Supports Dual Synchronized Operation "DLMsync"



Compact, Lightweight, Portrait style

DLM3000HD High-Definition Oscilloscope

- 4 Channels/500 MHz
- 12-bit/2.5 G Sample Rate
- 1 G Points, Supports Dual Synchronized Operation "DLMsync"



Power Supply

Probe power supply 701934

- Four power supply connectors
- Provides power to current, FET, and differential probes
- Supports both AC100 V and 200 V power supply requirements



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