MITSTRONIC

DPS-20M Differential Probe

User Manual

1. 4mm Banana Jacks Input
2. BNC output 1MΩ Impedance
3. Range Selection Knob
4. Power Indicator LED
5. USB Power Input

PLEASE READ THIS MANUAL CAREFULLY BEFORE USE!

Differential Probe for Power Measurement & Small Floating Signals

Introduction

The DPS-20M is designed to safely analyse floating signals. The built in amplifier sales and converts the high voltage differential input to a low voltage single-ended BNC output. Due to its large selection of different attenuation values (5X-1000X), the DPS-20M is also good for small signals (like microcontroller pins, gate driver outputs, feedback signals), which makes the product more versatile than other similar products in the market. The probe is compatible with any 1MΩ input impedance oscilloscope.

Applications

-Switching Power Supply Design

-Motor Drive Design

-Thyristor controlled circuitry

-PWM outputs

Features

-Up to +2000V (DC +Peak AC) Differential and +1000V (DC +Peak AC) Common Mode

-Economical Cost

Price Includes

-Black Storage Box

-Differential probe

General Usage Summary

Connecting the probe: First, connect the probe's USB power input to a USB power source such as the oscilloscope's USB port and connect the probe's BNC connector to an oscilloscope input. Then, set the proper attenuation rate and connect the probe input to the device under test.

Disconnecting the probe: First, disconnect the probe inputs from the device under test, and then unplug the probe output and power input.

Use proper grounding: To avoid an electric shock, all devices that require grounding must be connected to earth ground. Before making connections to the input or output terminals of the probe, ensure that the test instrument is properly grounded if necessary.

Measurement safety: Always be aware of the voltage rating of the probe and the measurement accessories you are using and of the maximum amplitude of the signal you intend to measure. Never apply a potential that exceeds the voltage ratings of the probe and/or its accessories to avoid damaging the product and creating a hazardous situation.

Only qualified personnel should perform service on this product.

Do not touch exposed connections and components when power is present.

If an over-range condition occurs, please disconnect power and signal input from the probe immediately.

Do Not Operate in an Explosive Atmosphere. Do Not Operate in Wet/Damp Conditions. Keep Product Surfaces Clean and Dry.

Making Measurements

1) Powering the probe:
   Connect the USB input of the probe to the USB port of the oscilloscope or a suitable USB power source.
2) Connecting the probe to the oscilloscope:
   Connect the probe output BNC to the oscilloscope channel input.
   Note: make sure the oscilloscope is properly grounded if necessary.
3) Set the appropriate attenuation range according to the measured voltage.
4) Connecting the input to the device under test: Using the appropriate input accessory, connect the probe to the device under test to start the measurement. If the voltage exceeds the maximum voltage allowed on that particular range, please select a higher attenuation range. Exceeding the maximum allowed voltage of ±1000V will damage the probe

Specifications

Model	DPS-20M
Bandwidth	DC to 20MHz (-3dB)
Rise Time	10ns
Attenuation	5X, 10X, 50X, 100X, 500X, 1000X
Gain Accuracy	±2%
Maximum Differential Voltage (DC + Peak AC)	±10V (5X)
	±20V (10X)
	±100V (50X)
	±200V (100X)
	±1000V (500X)
	±2000V (1000X)
Maximum Input Common Mode Voltage (DC + Peak AC)	±10V (5X)
	±20V (10X)
	±100V (50X)
	±200V (100X)
	±1000V (500X)
	±1000V (1000X)
Input Referred Noise	≤10mVrms (5X)
	≤10mVrms (10X)
	≤10mVrms (50X)
	≤10mVrms (100X)
	≤10mVrms (500X)
	≤10mVrms (1000X)
Common Mode Rejection Ratio	>80dB (DC)
	>60dB (100kHz)
	>50dB (1MHz)
Input Impedance	2MΩ/2.5pF (Differential) 1MΩ/5pF (Single-Ended to Ground)
Output Voltage	≤3V
Power Supply	DC 5V, USB Supply Ground Isolated
Power	1W Max
Dimensions	11cm x 6.5cm x 4cm (Ignoring BNC Jack and Range Knob)
Operating Temperature	0^0C - 40^0C
Operating Humidity	10% - 85% RH
Storage Temperature	-30^0C - 70^0C
Storage Humidity	5% - 90% RH

Best Practices

1) Twisting the input leads together can help reduce noise and improve the probe's high frequency response when measuring signals.
2) Extending the input leads may introduce more noise during measurement. If extra extension lead is necessary, please ensure the extension leads are of equal length and the input signal frequency is under 10MHz. Otherwise, measurement errors may occur.
3) While measuring a high frequency signal, don't touch the end of the input lead with your hand or other objects. Otherwise, it may affect the accuracy of the measurement.
4) Ensure that you use an oscilloscope with an input impedance of at least 1MΩ and bandwidth of at least 100MHz.
5) Turn on the oscilloscope or externally powered instrument and let the probe and equipment warm up for 20 minutes.

Warranty

Mitstronic warrants that this probe will be free from defects in materials and workmanship for a period of two (2) years from the date of shipment. If any such product proves defective during this warranty period, Mitstronic, will provide a replacement in exchange for the defective product after a deposit is submitted. If product ends up not to be defective, the deposit submitted will not be refunded. Replacement products used by Mitstronic for warranty work may be new or reconditioned to like new performance. All replaced products will become the property of Mitstronic.

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