SIGLENT SHS Handheld Oscilloscope Differences

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Siglent Technologies manufactures two families of handheld, battery-operated oscilloscopes; the SHS800 and SHS1000 families. Although the two families appear to be identical (except for the case color), they have several differences that may, or may not, affect your choice.

In fact, the difference between these two series of oscilloscopes can be found in the respective names: Isolation Handheld Oscilloscope SHS1000 series and Handheld Oscilloscope SHS800 series, the key lies in the word “isolated”. These are mentioned in details in the Isolation Handheld Oscilloscope SHS1000 series:

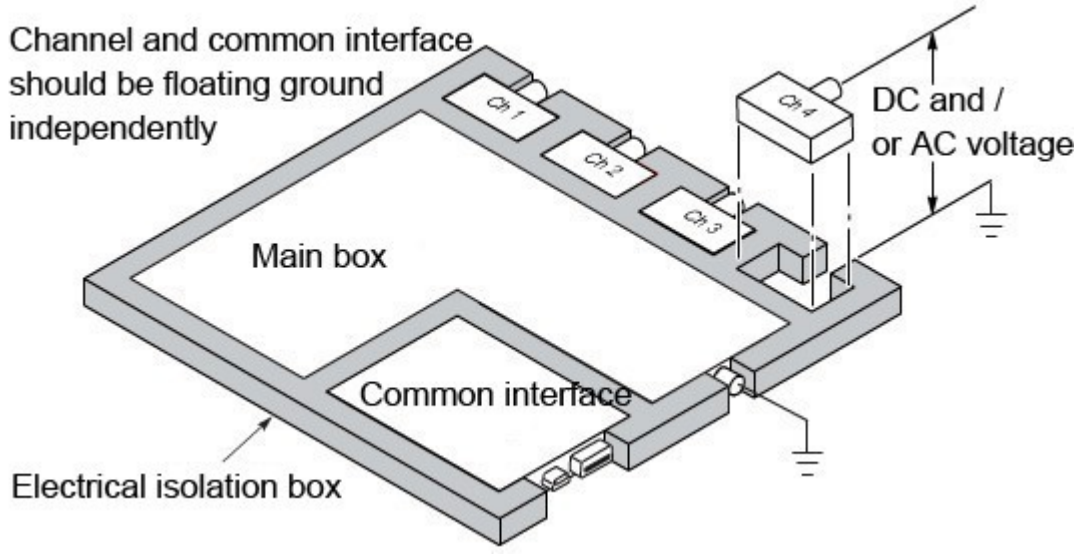
Isolation level between the oscilloscope channels: CATII 1000V, CATIII 600V

Isolation level between the oscilloscope channels and earth: CATII 1000V, CATIII 600V

From the description above we can see that SHS1000 employs both the “floating” and “isolation” concepts, but the SHS800 does not.

The traditional oscilloscopes are the structure shown in the right figure. In this structure, in multi-channel measurements, all the input signals must have the same voltage reference, and the shared default reference is the “earth”. If there is no differential preamplifier or external signal isolator, this traditional desktop oscilloscope is not suitable for floating measurements.

Comparing the isolation oscilloscope and the traditional oscilloscope, the isolation oscilloscope’s internal voltage references are not connected together, so that each reference point of the input channels must be connected to the reference voltage. As shown below:



There is no real ground reference level of a handheld oscilloscope. As shown above, the ground reference for the various modules belongs to virtual ground, and the reference voltage of the oscilloscope channel directly relies on the input voltage of the probe’s clip.

When it comes to isolation, let us introduce the definition of common Measurement Categories (CAT overvoltage category), as shown below:

Overvoltage category	Operating voltage (effective value of AC/DC to ground)	Peak instantaneous voltage (repeated 20 times)	Test resistor
CAT I	600 V	2500 V	30 Ω
CAT I	1000 V	4000 V	30 Ω
CAT II	600 V	4000 V	12 Ω
CAT II	1000 V	6000 V	12 Ω
CAT III	600 V	6000 V	2 Ω

CAT II 1000 V can withstand instantaneous high-voltage 6000 V. Although the SHS800 is lacking in channel isolation, it does have high overvoltage level CAT II 1000 V. This scope also features vertical sensitivity from 2 mv/div to 100 v/div.

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