A consideration regarding with noise of high precision DC source.

Product marketing group

Marketing department

Measurement Business Headquarters

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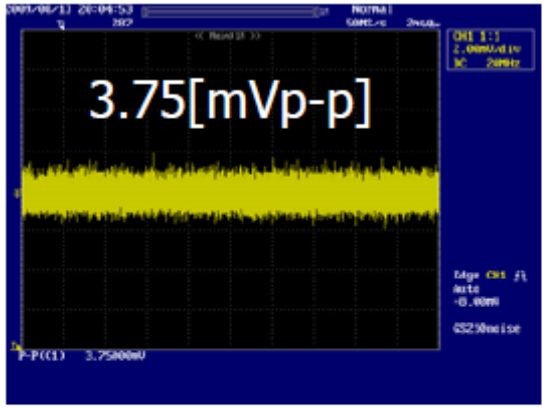
In a testing environment where a source (generator) connects to DUT (Device Under Test) or measuring instruments, the noise of instruments may affects to repeatability of measured values.

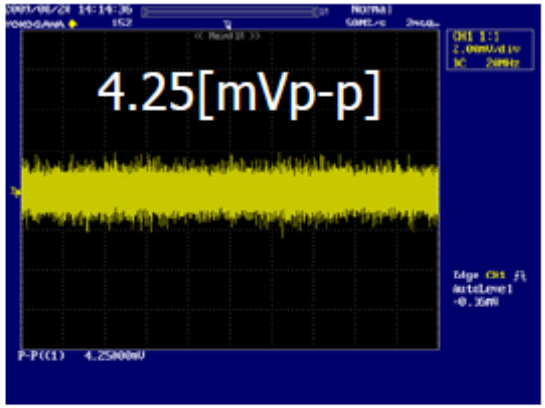
It is very important for consideration about repeatability of measured values that a source output is observed by non-insulated input or insulated input in order to understand an influence of normal mode noise or common mode noise.

The result of noise evaluation (observed from DC to 20 MHz with non-insulated input).

We show a typical value of noise level below when it is observed by non-insulated input and frequency bandwidth is from DC to 20 MHz. Both instruments have a little noise from 3 to 4 mVp-p and its influence to repeatability of measured values may be almost same.



GS200 30VRange

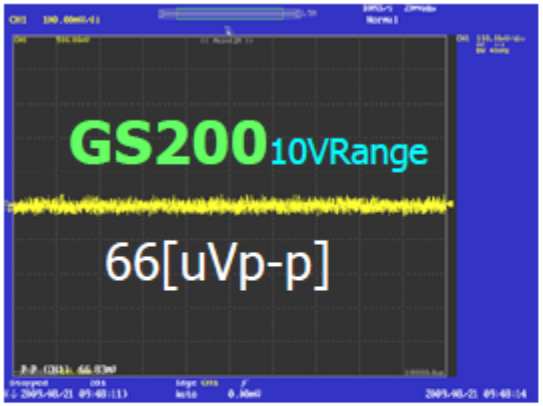


7651 30VRange

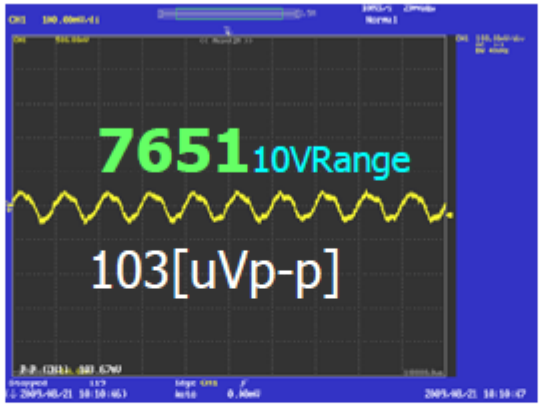
The above is a typical value. It does not show a specification.

The result of noise evaluation (observed from DC to 10 kHz with insulated input).

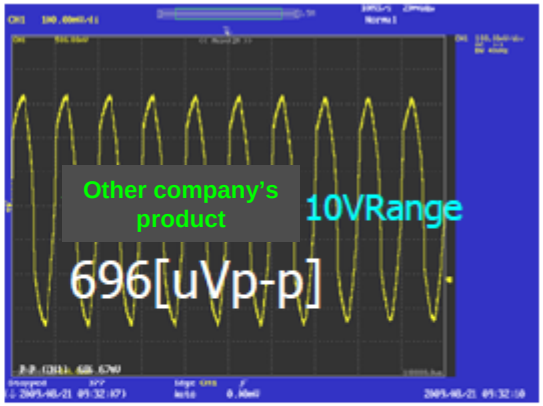
We show a typical value of noise level below when it is observed by insulated input (DL750 + 701251) and frequency bandwidth is from DC to 10 kHz. Like as below, noise level of 7651 is very little and GS200 realizes noise level less than 7651. This is because a difference of common mode rejection ratio of each source appears as a difference of noise level. (CMRR evaluation data is on next page.)



GS200 10VRange



7651 10VRange

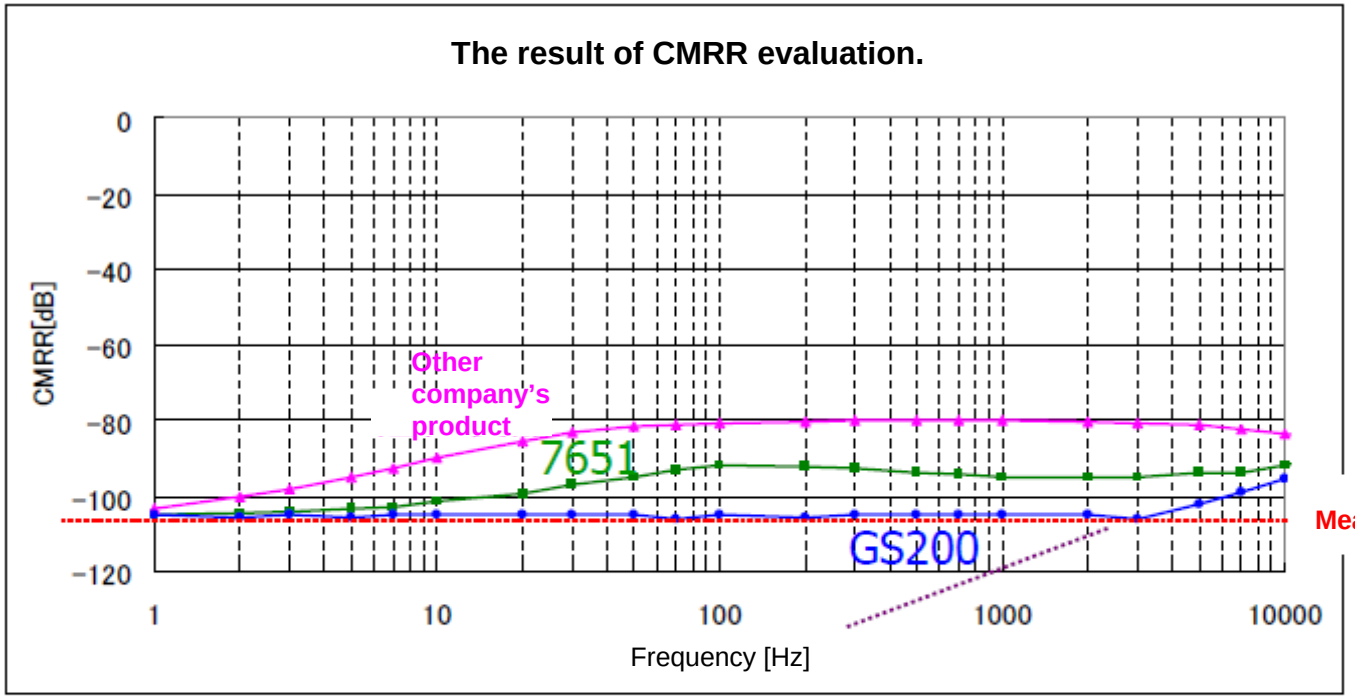


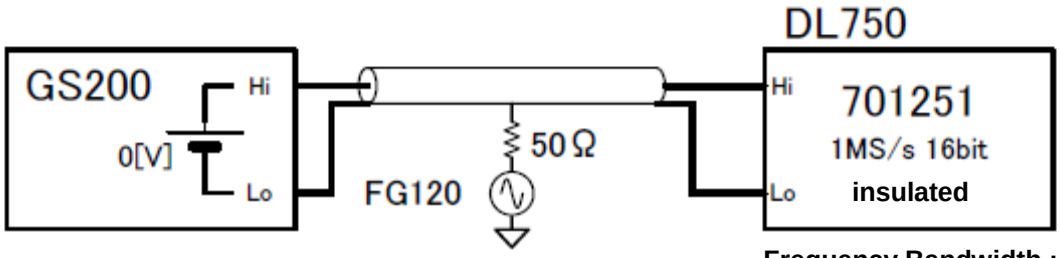
Other company's product 10VRange

The above is a typical value. It does not show a specification.

The result of common mode rejection ratio (CMRR) evaluation.

The CMRR of each instrument is shown below. It affects to measurement repeatability in floating connection.





MEASURE

Using Vp-p measurement

Frequency Bandwidth : from DC to 10k Hz

The above is a typical value. It does not show a specification.

Summary

The noise level is almost same when it is observed by non-insulated input. However, there is a difference of noise level when it is observed by insulated input because of a difference of CMRR.

In case of that a source is connected to DUT which is grounding to the earth, it is affected mainly by normal mode noise. On the other hand, in case of floating connection where DUT is not grounding to the earth, it tends to be affected by common mode noise.

As a result, it is necessary to confirm repeatability of measured value in both cases.