

Production Test

Combination test
Expanded test method for optocouplers

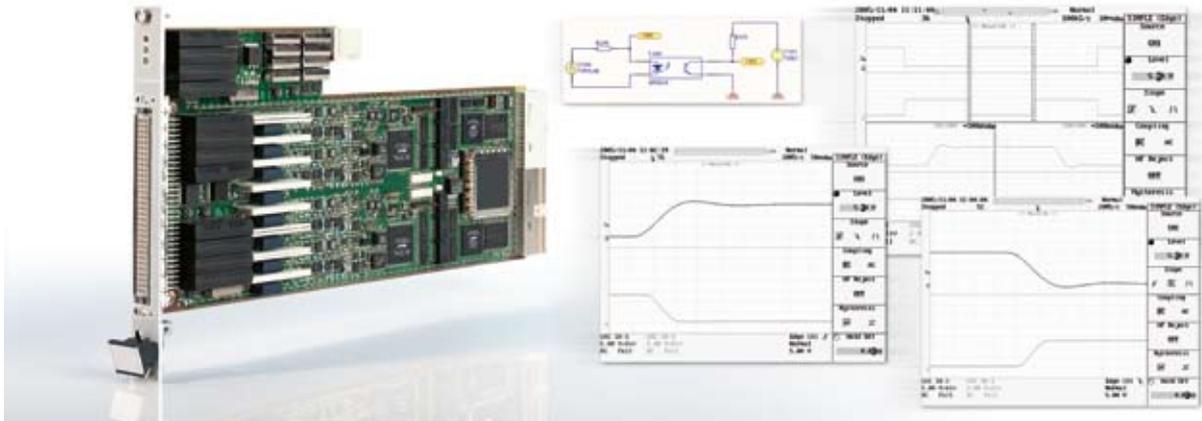
TEST & MEASUREMENT

Optocouplers must be tested for compliance with specified parameter values by means of function as well as in-circuit tests.

A basic characteristic of an optocoupler is DC isolation between its input and output. Determining the current transfer ratio (CRT) is therefore important in many cases. The device's coupling factor deteriorates due to semiconductor aging and the glass fibers becoming cloudy as a result of aging, which poses the risk of switching functions

becoming inoperative. Measuring the coupling factor is useful, for example, if the input power to the optocoupler is low, or a high driving current is required at the input. The optocoupler's timing characteristics are also important, especially at the points where the DUT (device under test) is electrically isolated from digital bus lines. Differences in delay between the individual optocouplers may lead to misinterpretation of the signals on the bus and thus elicit an erroneous response from the DUT.

T & M solution



The Open Test Platform R&S® CompactTSVP provides the ideal solution. Based on industrial standards, the R&S® CompactTSVP can be expanded by measurement, stimulus and switching modules from Rohde & Schwarz or by other standard modules, depending on the application. To determine the coupling factor, the Arbitrary Waveform and Function Generator Module R&S® TS-PFG and the Analog Source and Measurement Module R&S® TS-PSAM are required. The optocoupler's switching characteristic can

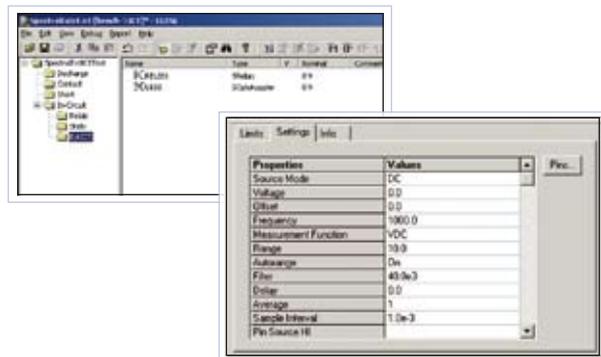
be determined through parallel recording and analysis of its control and switching signals by means of a CompactPCI/PXI digital oscilloscope.

By expanding the Enhanced Generic Test Software Library R&S® EGTSL as required, most commercially available optocouplers can be tested. The software enables highly convenient test parameterization and debugging while offering high test speed.

Application

The first step is to determine whether the optocoupler is installed. In the simplest case, this is done by measuring the diode on the input side and a resistor on the output side, both at high and low impedance. To obtain more detailed information about the optocoupler's functionality, the following additional analysis steps have to be performed. The measuring instruments and sources are wired to the DUT via the Switching Matrix Module R&S®TS-PMB. One of the two floating channels of the Arbitrary Waveform and Function Generator Module R&S®TS-PFG is used as a voltage

source for driving the optocoupler, the other for simulating the load connected to its output. To determine the coupling factor k or the current transfer ratio, the Analog Source and Measurement Module R&S®TS-PSAM measures the currents on the primary and the secondary side. The ratio of output current to input current yields the coupling factor. All parameter values for this test method are entered into an easy-to-operate screen and checked for plausibility by the software.



Technical information

Product designation	R&S® CompactTSVP
System components (basic configuration)	<ul style="list-style-type: none"> • Test and Measurement Chassis R&S®TS-PCA3 based on CompactPCI/PXI with embedded PC or external standard PC • Arbitrary Waveform and Function Generator Module R&S®TS-PFG • Analog Source and Measurement Module R&S®TS-PSAM • Switching Matrix Module R&S®TS-PMB • In-Circuit Test (ICT) Extension Module R&S®TS-PICT (optional) • Power Supply/Load Module R&S®TS-PSU (optional)
Operating system	Microsoft Windows XP/2000, Linux 2.4.x/2.6.x
Software	R&S® EGTSL (Enhanced Generic Test Software Library) External test method for R&S® EGTSL: Spectral Optocoupler Test Model



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