

APP_NOTE: ROSA Test with INSTELENT E5010 and T5003

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1 Summary

1.1 Preface

E5010, Pattern Generator and Checker, is developed by Instelent Technology and T5003 is an optical component test board for the application of E5010. PIN-TIA, APD-TIA could be tested with E5010 and T5003. This solution is fit for manufacturers which produce or need PIN/APD-TIA. Engineers could test the characteristics and debug components easily in this solution.

1.2 Reference

For engineers to understand and apply this solution better, these references are needed.

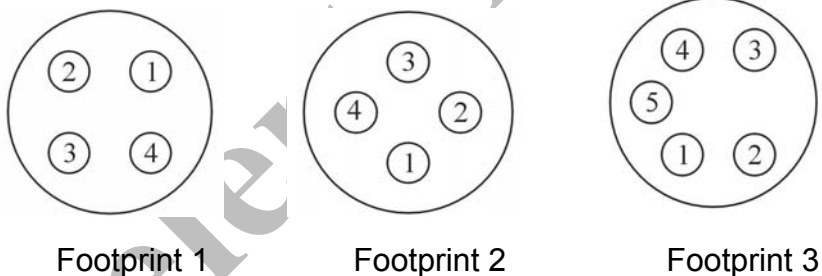
[1] INSTELMENT E5010 Operation Manual: E5010 Operation Manual.pdf

[2] INSTELMENT T5003 Operation Manual: T5003 Operation Manual.pdf

2 Test Components

T5003 test board supports 4-pin PIN-TIA, 5-pin PIN-TIA and 5-pin APD-TIA. Different footprints are shown in the following figures. **(Attention: TOP VIEW)**

PIN-TIA:



For 4-pin PIN-TIA and 5-pin PIN-TIA, the definition of pins:

Pin	Footprint 1	Footprint 2	Footprint 3
1	VCC	DOUT	DOUT
2	$\overline{\text{DOUT}}$	VCC	VCC
3	DOUT	$\overline{\text{DOUT}}$	V_{PIN}
4	GND	GND	$\overline{\text{DOUT}}$
5	NC	NC	GND

DUT is inserted in the socket on T5003, connecting to SFP Tx through fiber; SMA connectors on T5003 corresponding to the socket is connected to DIN of CH1 on the E5010 front panel with RF cable. (**Attention:** for differential signal, the connection should be “+” with “+”, “-” with “-”; and if single ended, the other interface should be terminated with 50Ω load.) About T5003, such as power, control, please refer T5003 Operation Manual.

After connection the cable, set rate and pattern on E5010, and run BER test, then the result is displayed on the LCD of E5010. Suggestion: During the BER test, please turn off Clock Output of SFP. About operation of E5010, and the choice of rate and pattern, please refer E5010 Operation Manual.

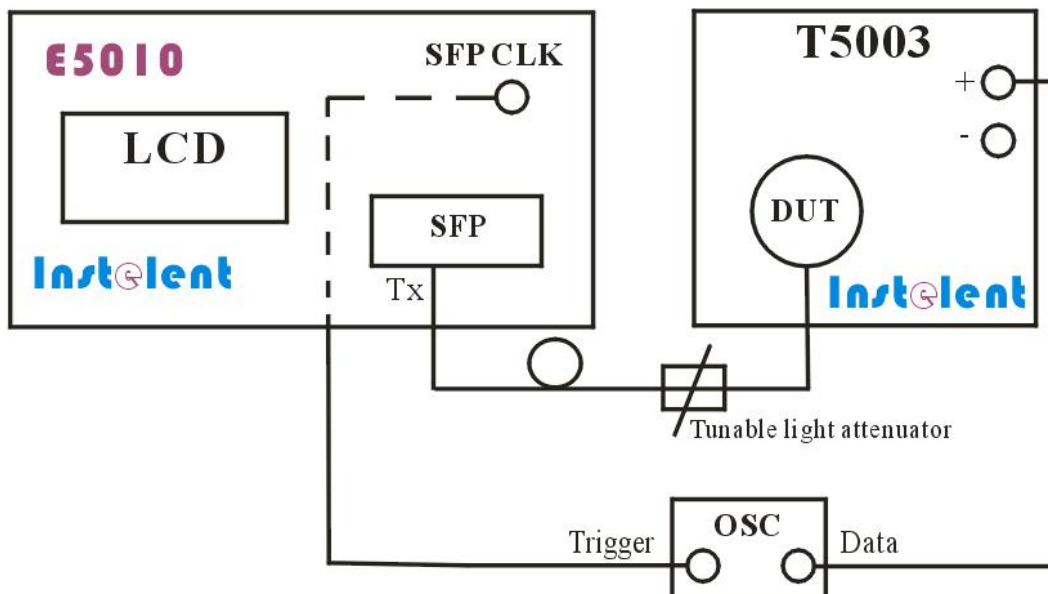
Besides BER test, this solution can be used for testing the sensitivity and saturated optical power of components with optical power meter.

To test the sensitivity of components, a tunable light attenuator is needed on the fiber connecting SFP on E5010 and DUT. During BER test, under a certain BER, tune the attenuator and make the light received by DUT minimum. Then use the optical power meter, the sensitivity of the component is gotten.

To test the saturated optical power of components, a special SFP module is needed for output stronger optical signal. With tunable light attenuator, under a certain BER, tune the attenuator and make light received by DUT maximum. Then use the optical power meter, the saturated optical power of the component is gotten. If you doubt about special SFP module, please ask INSTELENT for help.

3.2 Eye Pattern Test

Eye pattern analyzer or high performance oscilloscope is needed for testing eye pattern of components with E5010 and T5003. The solution is shown in the following figure.



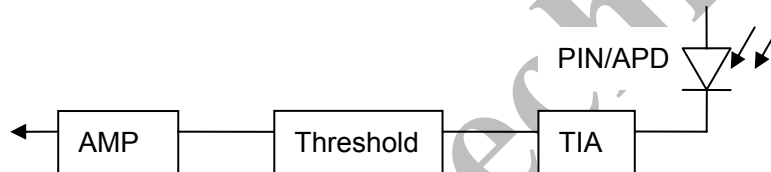
OSC is eye pattern analyzer or high performance oscilloscope. DUT is inserted in the socket on T5003, connecting to SFP Tx through fiber; SFP Clock Output is on the rear panel of E5010, connecting to OSC's Trigger Channel with RF cable; SMA connector on T5003 corresponding to the socket is connected to OSC's Data Channel with RF cable. (**Attention:** either "+" or "-" is ok, but the non connected one should be terminated with 50Ω load.) About T5003, such as power, control, please refer T5003 Operation Manual.

After connection the cable, set rate and pattern on E5010, run, eye pattern of DUT is displayed on OSC. About operation of E5010, and the choice of rate and pattern, please refer E5010 Operation Manual.

3.3 Other Test Function on T5003

Besides BER and eye pattern test with E5010, other basic characteristics could be tested on T5003.

3.3.1 Set Output Threshold of TIA



Shown in the figure, the voltage amplitude threshold of output signal from TIA could be set with tunable resistor on T5003. For detailed operation please refer T5003 Operation Manual.

3.3.2 Set reverse high voltage of APD

Reverse high voltage of APD could be set with tunable resistor on T5003. For detailed operation please refer T5003 Operation Manual.

3.3.3 Monitor current of PIN/APD

During the test, the current of PIN/APD could be monitored on T5003. For detailed operation please refer T5003 Operation Manual.

3.3.4 Monitor current of PIN/APD and TIA and digital tunable reverse high voltage of APD (Option)

T5003 could be controlled by PC through RS232 interface. Connecting PC and T5003, the current of PIN/APD and TIA could be monitored on PC, and the reverse high voltage of APD could be tuned in digital way. For detailed operation please refer T5003 Operation Manual. The driver software is needed for this function, if you need, please contact INSTELENT.

Note: If you have any question, please contact INSTELENT.

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