

# ET-DP-TPA-S

# DisplayPort™ v1.1/v2.0 SDR/DDR Test Adapter Test Set

## Features

- 17.5 GHz test adapter bandwidth exceeds the v1.1 specification and will exceed the v2.0 specification when approved in 2007
- Insertion loss <-3 dB at 17.5 GHz
- Return loss <-20dB @ 10 GHz  
<-24 dB @ 4.05 GHz (SDR)  
<-20.2 dB @ 8.10 GHz (DDR)
- Trace differential impedance 100 +/- 5 ohms
- Calibration fixtures to zero out test fixture attributes (SOLT with 2x thru)
- Characterization of impedance, reflections, jitter, insertion & return loss, crosstalk, eye patterns, S-parameters, and S4P parameters
- Supports both active and passive cables

## General Description

The ET-DP-TPA-S DisplayPort™ test adapter set provides a very high bandwidth, low noise evaluation vehicle that enables high-performance characterization of source and sink devices as well as cabling. Single Data Rate (SDR) DisplayPort v1.1 bandwidth requirements exceed 10.8Gbps, equivalent to a data transfer rate of 1080 Mbytes/second. This adapter test set will also support Double Data Rates (DDR) anticipated in the v2.0 specification.

DisplayPort enables a common interface for both external and internal display connections for high-definition digital audio and video data.

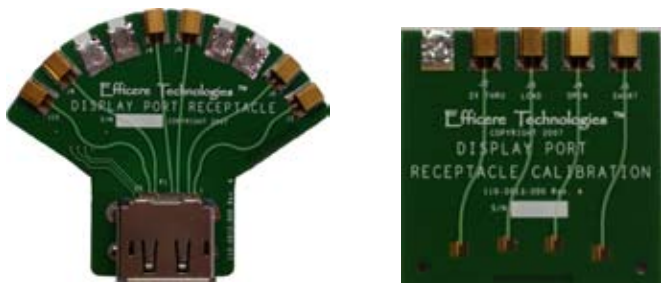
The plug and receptacle test adapter boards included in this set feature ultra-low insertion and return loss with near-perfect signal integrity to assure that electrical results reflect the device under test, not the fixture.

Efficere's advanced and patented signal integrity design and manufacturing techniques include proprietary electrically Invisible Via™ structures to eliminate the signal disruptions common on most other test adapters.

Efficere Technologies specializes in the design of high-speed products with superior signal integrity that enable our customers to design and characterize their next generation products.



DisplayPort Plug and Plug Calibration boards. Plug board shown with 2" GPPO->SMA cables attached. (not to scale)



DisplayPort receptacle and Receptacle Calibration boards. (not to scale)

## Standards & Compatibility

- DisplayPort v1.0 and v1.1
- Anticipated support for the Double Data Rate (DDR) specification v2.0 when approved in 2007

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**Product specifications and descriptions in Preliminary Information data sheets are subject to change at any time without notice.**

**August 2007a**

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## Specifications (preliminary information)

	Units/ Condition	Minimum	Typical	Maximum	SDR Requirement <sup>2</sup>	DDR Requirement <sup>2</sup>
<b>Insertion Loss</b> <sup>1</sup>	GHz at -3 dB	17.0	17.5		6.75	13.
<b>Return Loss</b> <sup>1</sup>	GHZ at -20 dB	9.5	10		4.05	8.1
<b>VSWR</b> <sup>1</sup>	10 GHz	1.3:1	1.2:1			
<b>Rise Time</b> <sup>1</sup>	pS 10/90%			55		
<b>Trace Differential Impedance</b> <sup>3</sup>	ohms	95	100	105		
<b>SOLT Trace Impedance</b> <sup>4</sup>	ohms	47.5	50	52.5		
<b>DP_Power Carrying</b> <sup>5</sup>	mA			500		

1. 2x\_thru signal path measured with Agilent E8364B 50 GHz 4-port with PLTS software, using 1 meter Gore ATN-6007 cables and 2" GPPO to SMA transition cable
2. Insertion loss requirements are stated at 5th harmonic, Return loss requirements are stated at 3rd harmonic
3. Clock and data paths measured with differential TDR using Agilent 86100 DCA-J with 54754 sampling head and 12" RG142 cables.
4. Short, Open, Load, and 2x\_Thru paths measured with TDR using Agilent 86100 DCA-J with 54754 sampling head and 12" RG142 cables.
5. Guaranteed by design

**Note: DisplayPort plug and receptacle, and the SMA and GPPO connectors are not rated for repetitive make/break connections. Use of this fixture for volume manufacturing should utilize an appropriately rated intermediate contact fixture.**

## Components of ET-DP-TPA-S Test Set

ET-DP-TPA-S Test Adapter Set includes the following

- 1 ET-DP-TPA-P Plug board with 2" GPPO to female SMA cables
- 2 ET-DP-TPA-R Receptacle boards with 2" GPPO to female SMA cables
- 1 ET-DP-TPA-PC Plug Calibration board with 2" GPPO to female SMA cables
- 1 ET-DP-TPA-RC Receptacle Calibration board with 2" GPPO to female SMA cables
- 40 2" GPPO to female SMA cables

Optional 6" and 24" 2" GPPO to female SMA cables

## Resources & References

VESA <http://www.VESA.org>

## Other Efficere Products

Ask us about our other interconnect test products for HDMI v1.3 A-type & C-type, SATA, SAS, InfiniBand, SFP+/+++, DDR2, FB-DIMM, PCI-Express, HSSDC/DC-2, etc..

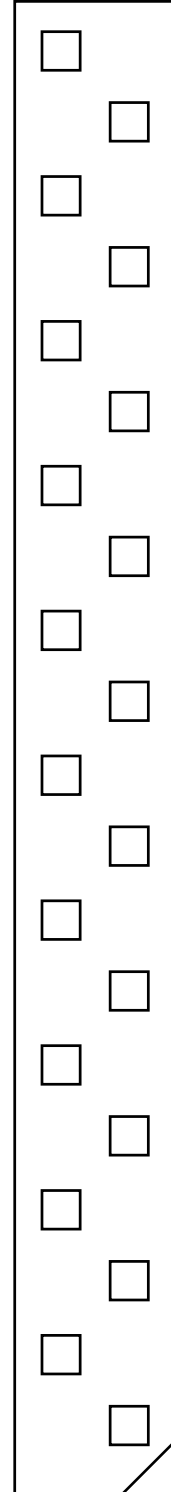
# ET-DP-TPA-S

## Connector Pin Assignments

Display Port Plug & Receptacle Pin Assignments		
Pin Description	Connector Pin Number	Destination Number
ML_Lane 0 (p) - Source ML_Lane 3 (n) - Sink	1	J1
Ground	2	Ground
ML_Lane 0 (n) - Source ML_Lane 3 (p) - Sink	3	J2
ML_Lane 1 (p) - Source ML_Lane 2 (n) - Sink	4	J3
Ground	5	Ground
ML_Lane 1 (n) - Source ML_Lane 2 (p) - Sink	6	J4
ML_Lane 2 (p) - Source ML_Lane 1 (n) - Sink	7	J5
Ground	8	Ground
ML_Lane 2 (n) - Source ML_Lane 1 (p) - Sink	9	J6
ML_Lane 3 (p) - Source ML_Lane 0 (n) - Sink	10	J7
Ground	11	Ground
ML_Lane 3 (n) - Source ML_Lane 0 (p) - Sink	12	J8
Ground	13	Ground
Ground	14	Ground
AUX_CH (p) - Source AUX_CH (p) - Sink	15	J9
Ground	16	Ground
AUX_CH (n) - Source AUX_CH (n) - Sink	17	J10
Hot Plug Detect	18	P2 Pin 1
Return DP_PWR	19	P2 Pin 3
DP_PWR	20	P2 Pin 2
Ground	2, 5, 8, 11, 13, 14, 16	P2 Pin 4

### Connector End View

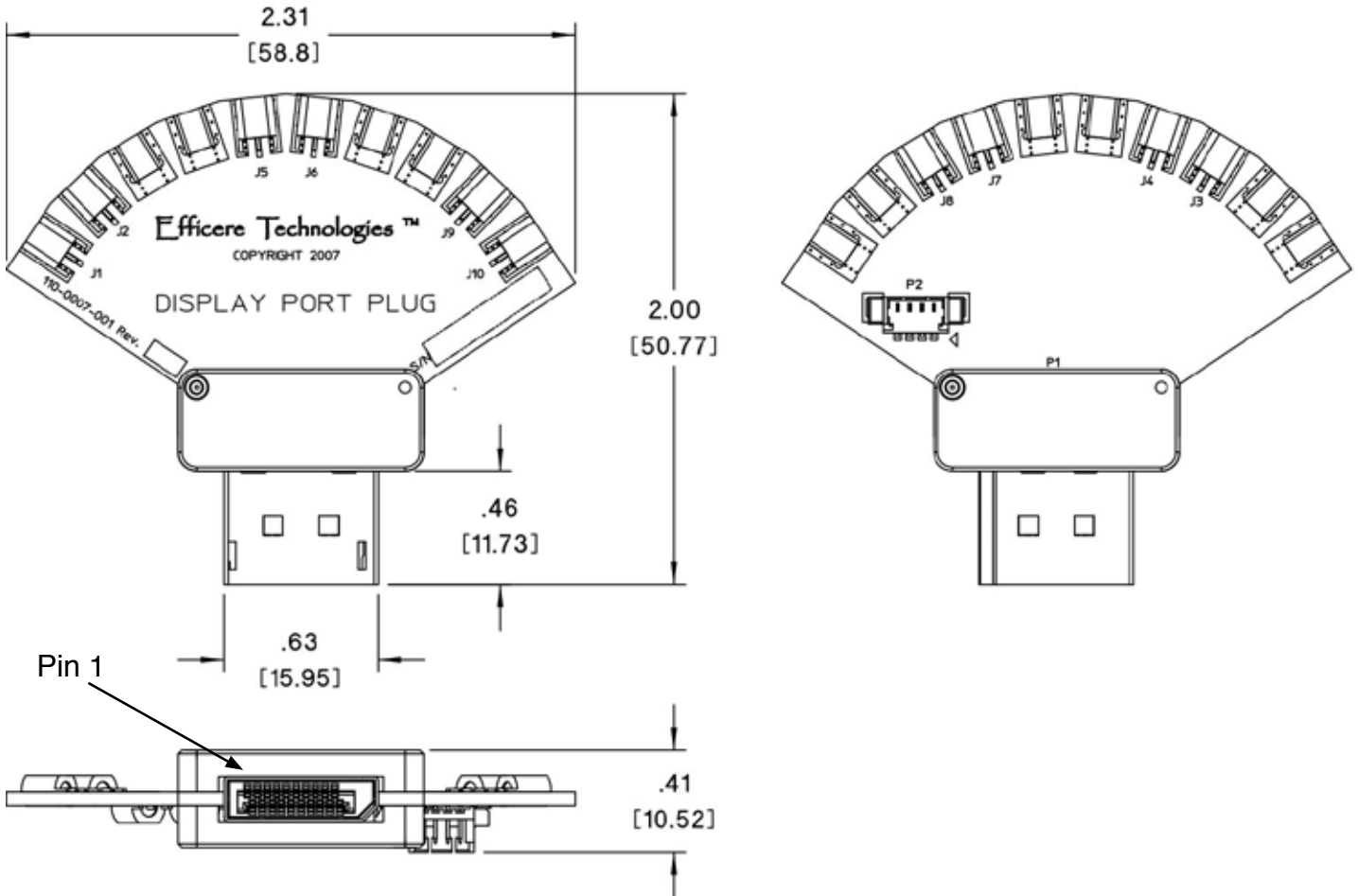
*Looking into connector*



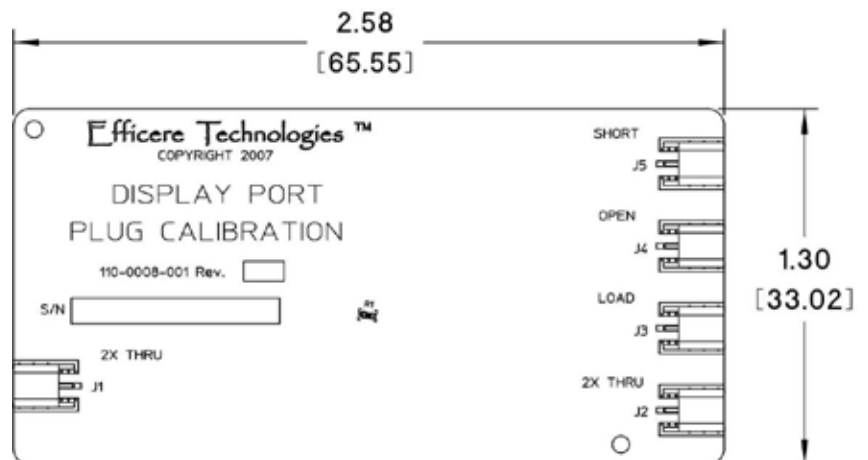
# ET-DP-TPA-S

## Physical Dimensions

### Plug



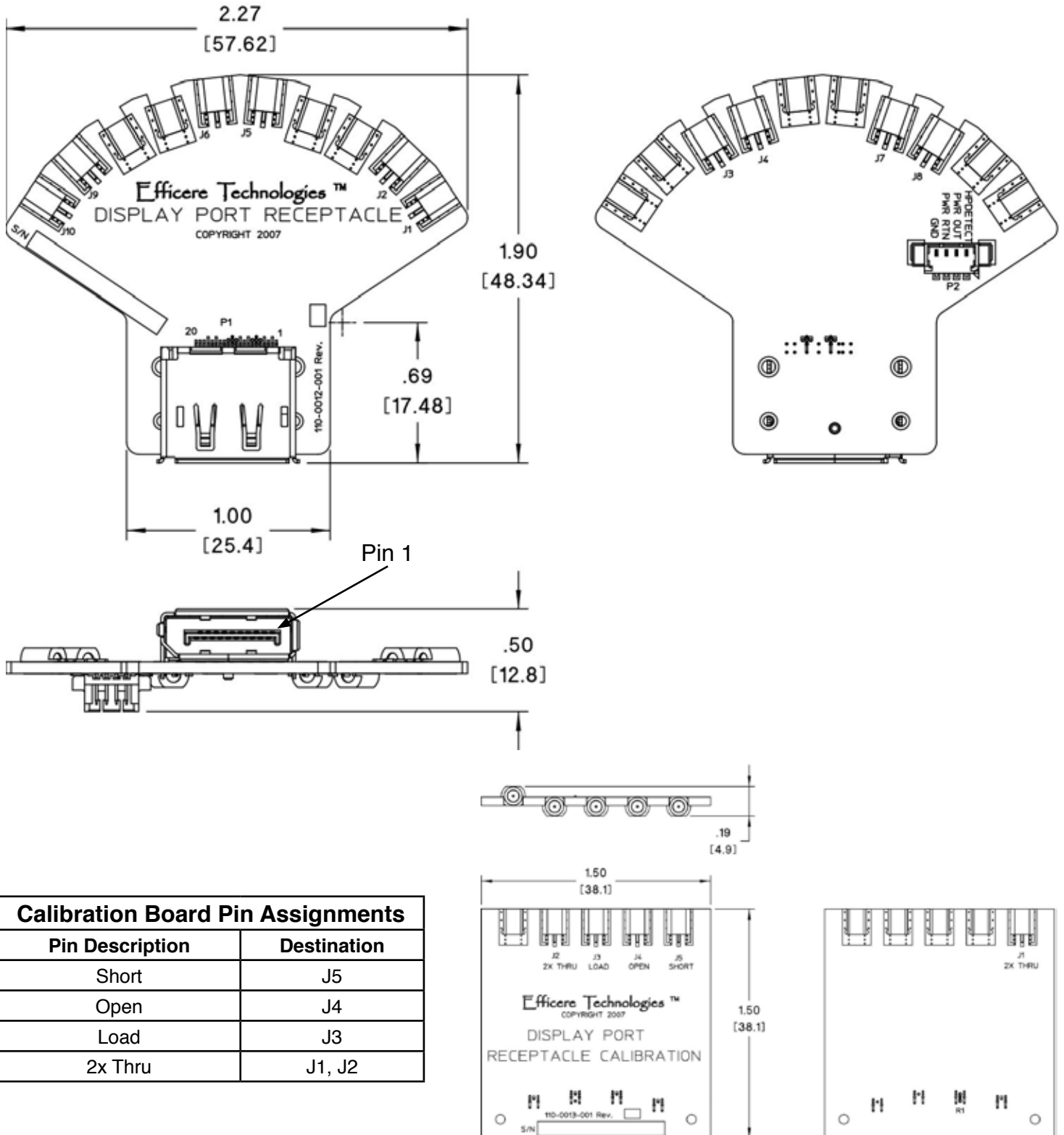
Calibration Board Pin Assignments	
Pin Description	Destination
Short	J5
Open	J4
Load	J3
2x Thru	J1, J2



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## Physical Dimensions

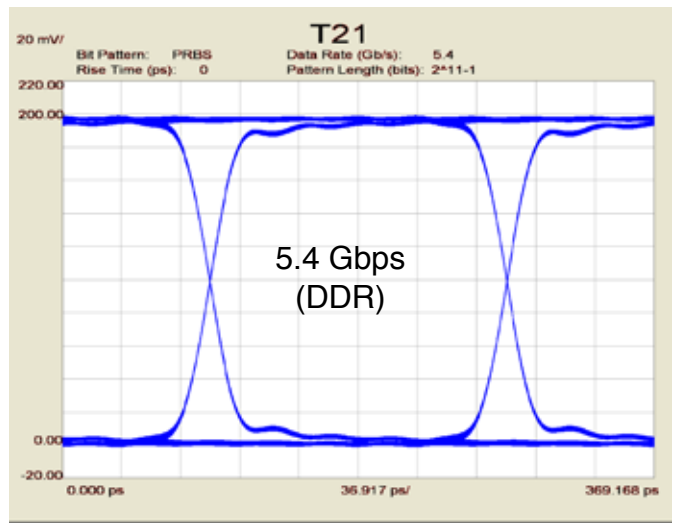
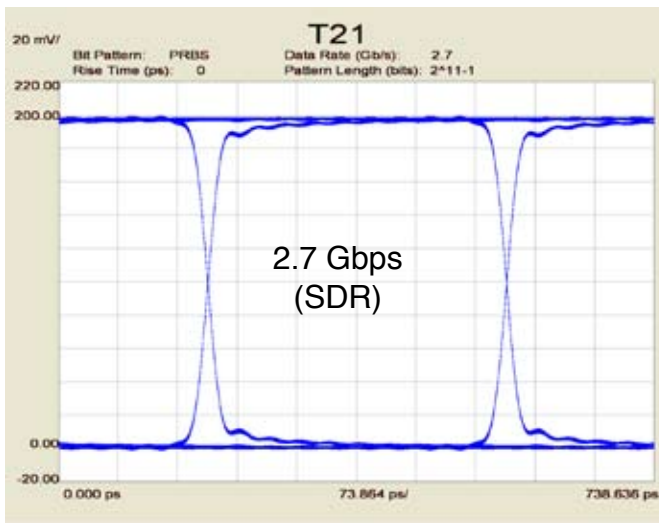
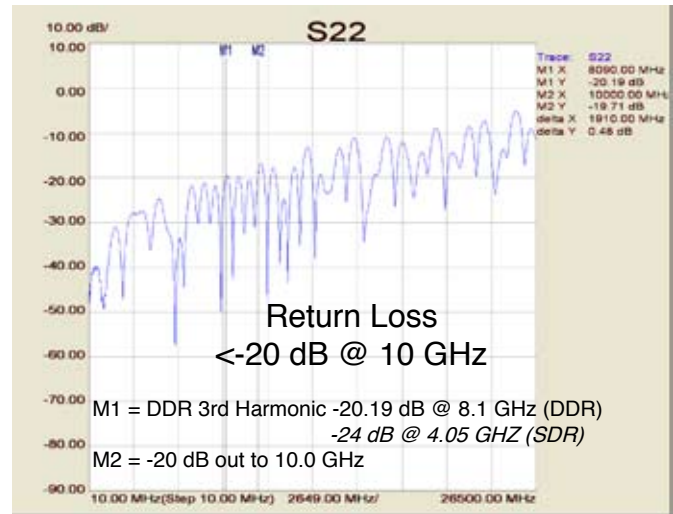
### Receptacle



Pin Description	Destination
Short	J5
Open	J4
Load	J3
2x Thru	J1, J2

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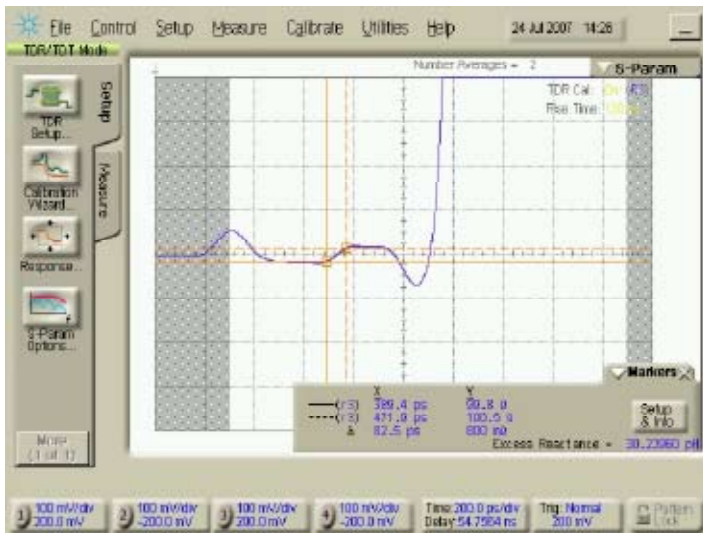
## Typical Results - 2" SMA cable on 2x thru calibration trace



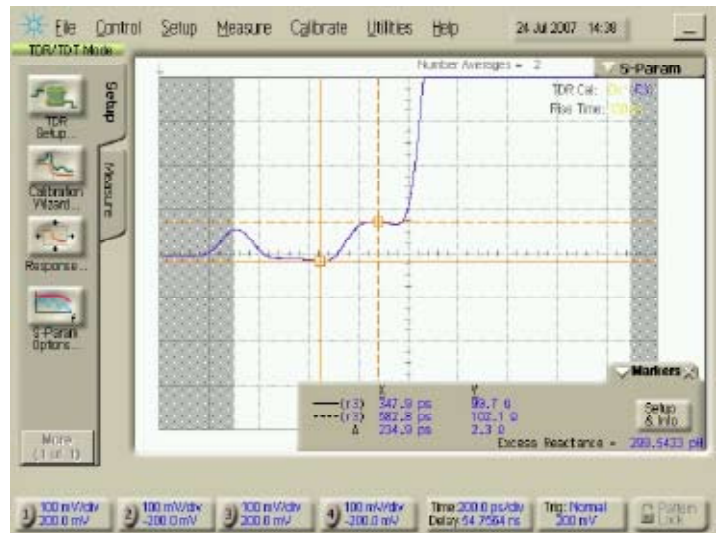
\* 2x calibration path includes the two GPPO-SMA cables, circuit board traces equivalent to that on two TPA-P or TPA-R boards, and pads for two DisplayPort connectors. It does not include the DisplayPort connector and there is no compensation.

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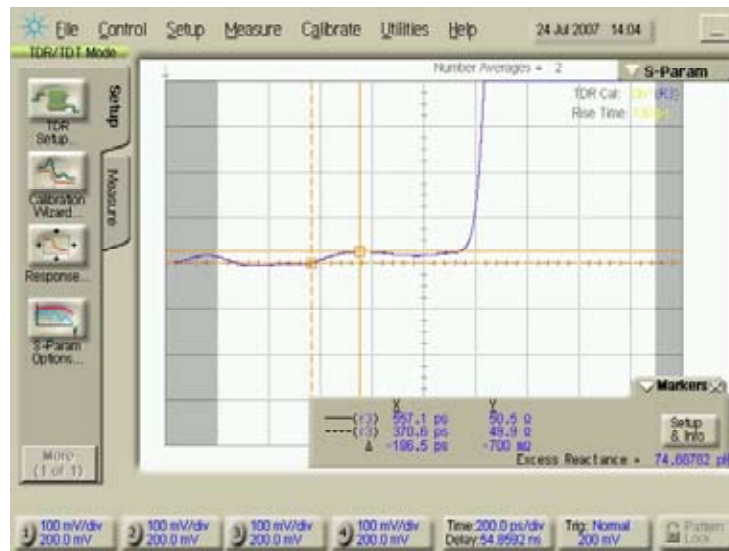
## Typical Results - 2" SMA cable on 2x thru calibration trace



130 ps Differential TDR of J1 and J2 on Plug board



130 ps Differential TDR of J1 and J2 on Receptacle board



130 ps Single-ended TDR of 2x Thru trace

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