

**Series:** RFM 25 Cable Assembly, CCH Housing  
**Description:** Bull's Eye™ Test Point System



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## High Speed Characterization Report



### Bull's Eye™ Family High Density HF Connections

**Series:** RFM 25 Cable Assembly, CCH Housing  
**Description:** Bull's Eye™ Test Point System

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## ***Introduction***

This testing was performed to evaluate the electrical performance of the Compliant Coax series of high-data rate cable assemblies. Testing was performed in accordance to the High Performance Electrical Interconnect (HPEI) SFF-8410<sup>1</sup>, Level 1, testing standards when applicable.

Time domain and frequency domain measurements were made. In the time domain impedance was measured. Frequency domain measurements were performed using an Agilent N5230A 4 port Vector Network Analyzer. The measurements include insertion loss (IL) and return loss (RL). All measurements were made utilizing a custom SMA to Bull's Eye™ adapter.

## ***Product Description***

The samples consisted of 6 inch lengths of Tempflex 25 awg "PN 063-2501" coaxial cable. At one end the cable is terminated to a plated plastic pogo assembly and on the other it is terminated to a SMA male connector. The overall sample length is 6 inches.

The cable tested consisted of the following sample.

1. 6 inch Bull's Eye™ assembly

Refer to [Figure 1](#) for a picture of the sample.

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<sup>1</sup> HSS Copper Testing and Performance Requirements, Rev. 16.1 March 20, 2000

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**Figure 1 Bull's Eye™ Direct Connect to SMA for testing**

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## Results Summary

### Time Domain Data

#### Impedance

Impedance measurements were performed using a CSA8000 sampling scope equipped with two 80E04 sampling heads. The equivalent reflected rise time is approximately 20ps. Note that all measurements were performed with the cable assembly mated to the respective connector test adapter. (refer to [Figure 1](#)).

Assembly	Connector		Cable	
	SMA	CCH	SMA Side	CCH Side
Bull's Eye™	52	45	49	49

Table 1: Impedance Measurements (tr ~ 20psec)

#### Impedance Profile

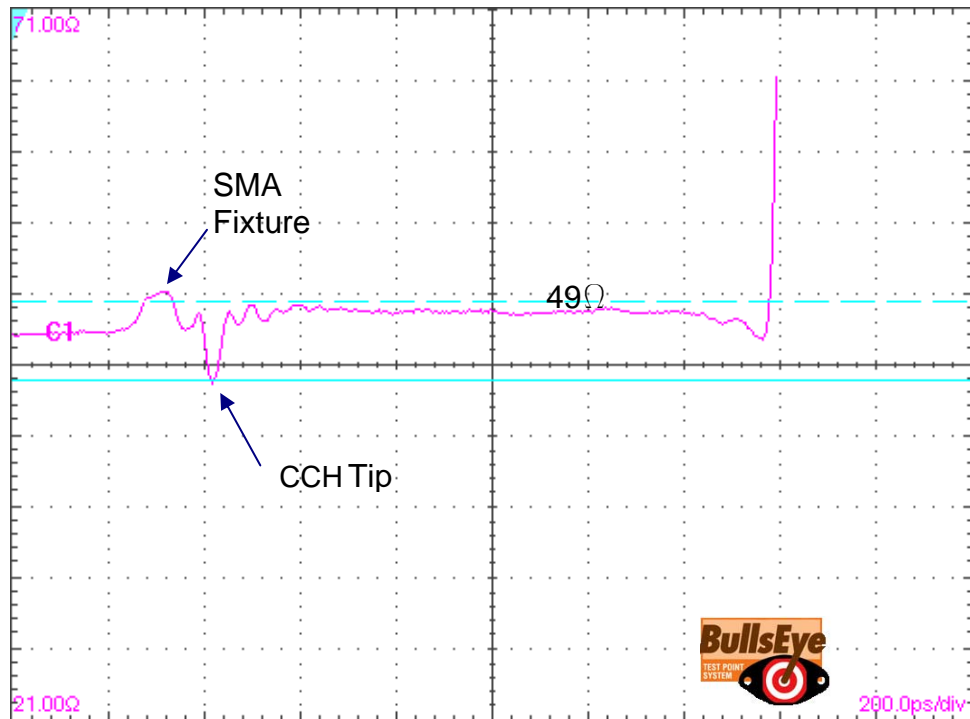


Figure 2 Bull's Eye™ Impedance Profile 5Ω /Division

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### Timing Measurements

Timing is cable length specific. Delay matching is available upon request.

### NEXT

Not available: This is layout specific and will vary depending on pcb stackup and routing considerations.

### FEXT

Not available: This is layout specific and will vary depending on pcb stackup and routing considerations.

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### Frequency Domain Data

#### Insertion Loss

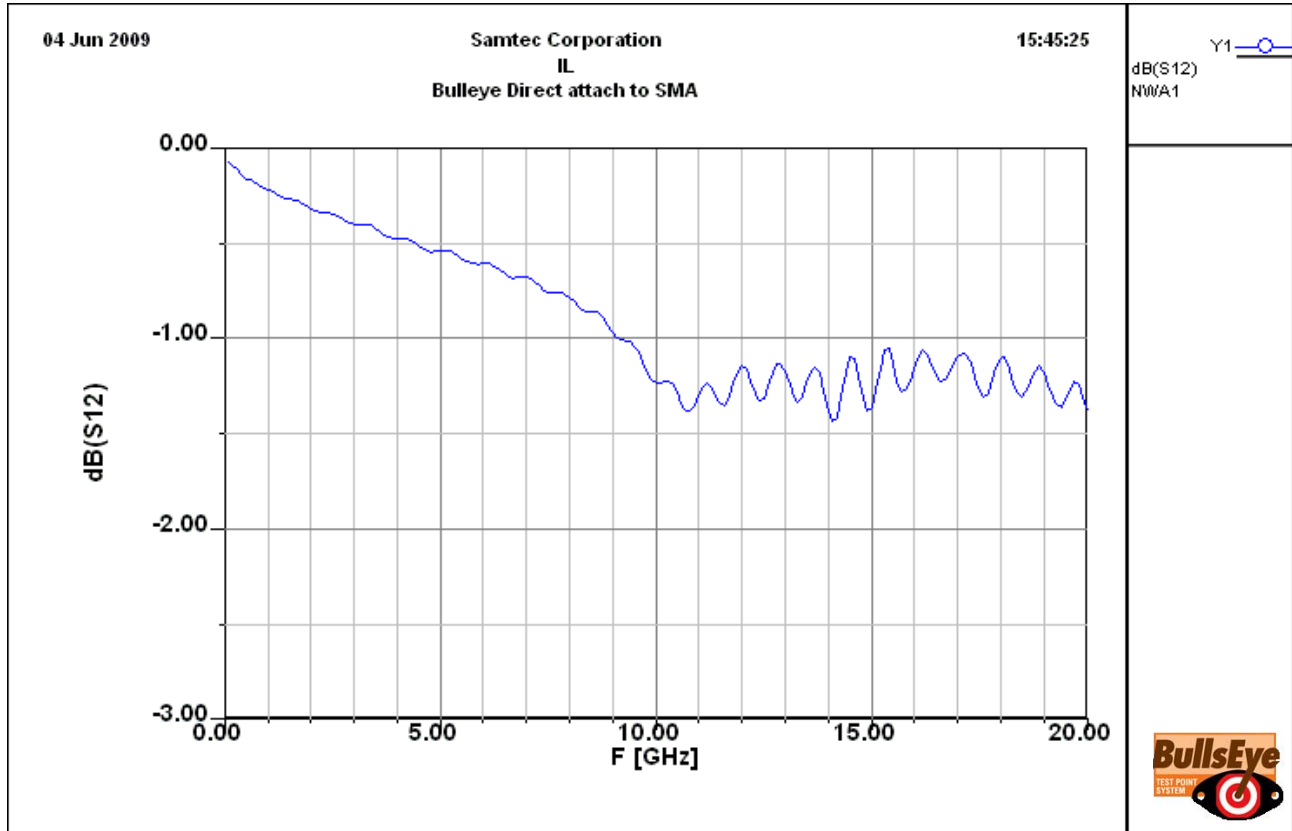


Figure 3 Bull's Eye™ Insertion Loss

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### Return Loss

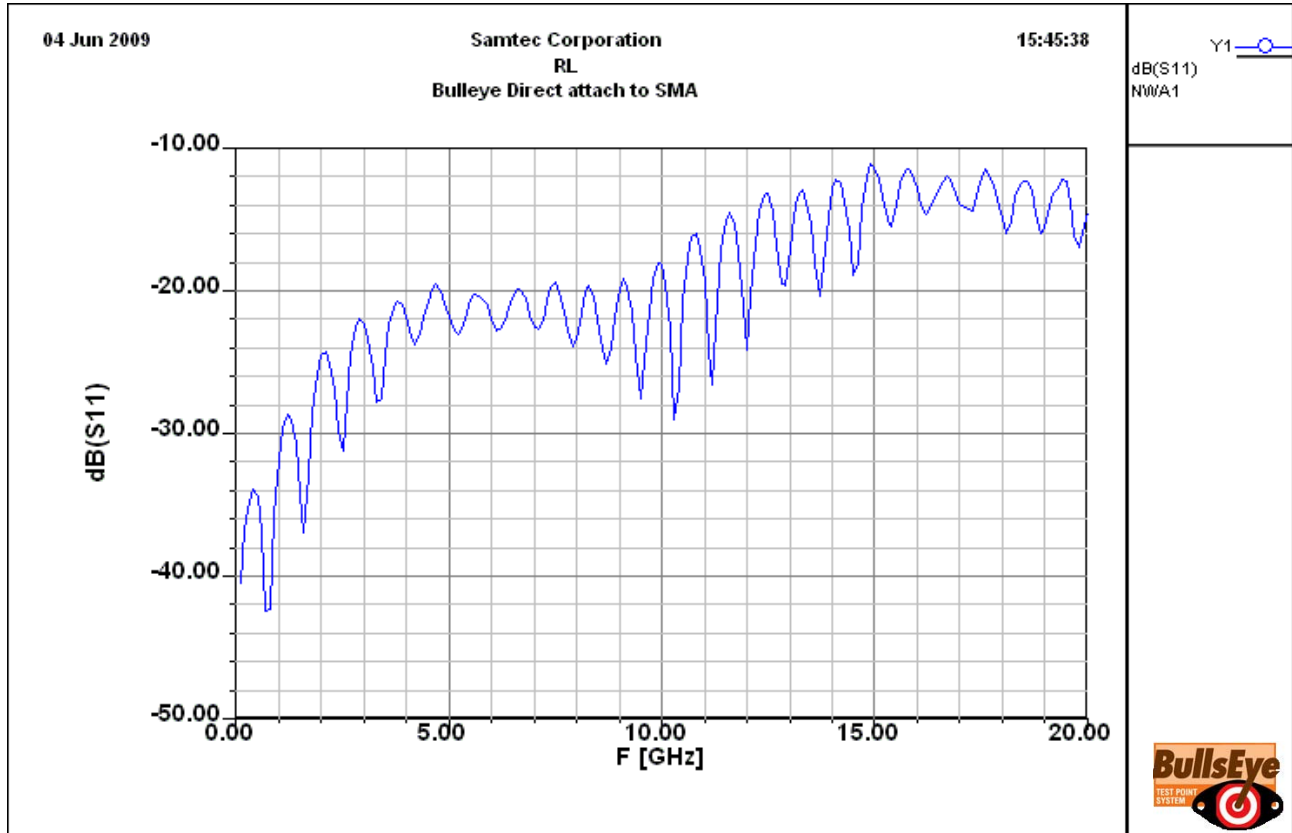


Figure 4 Bull's Eye™ Return Loss

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### VSWR

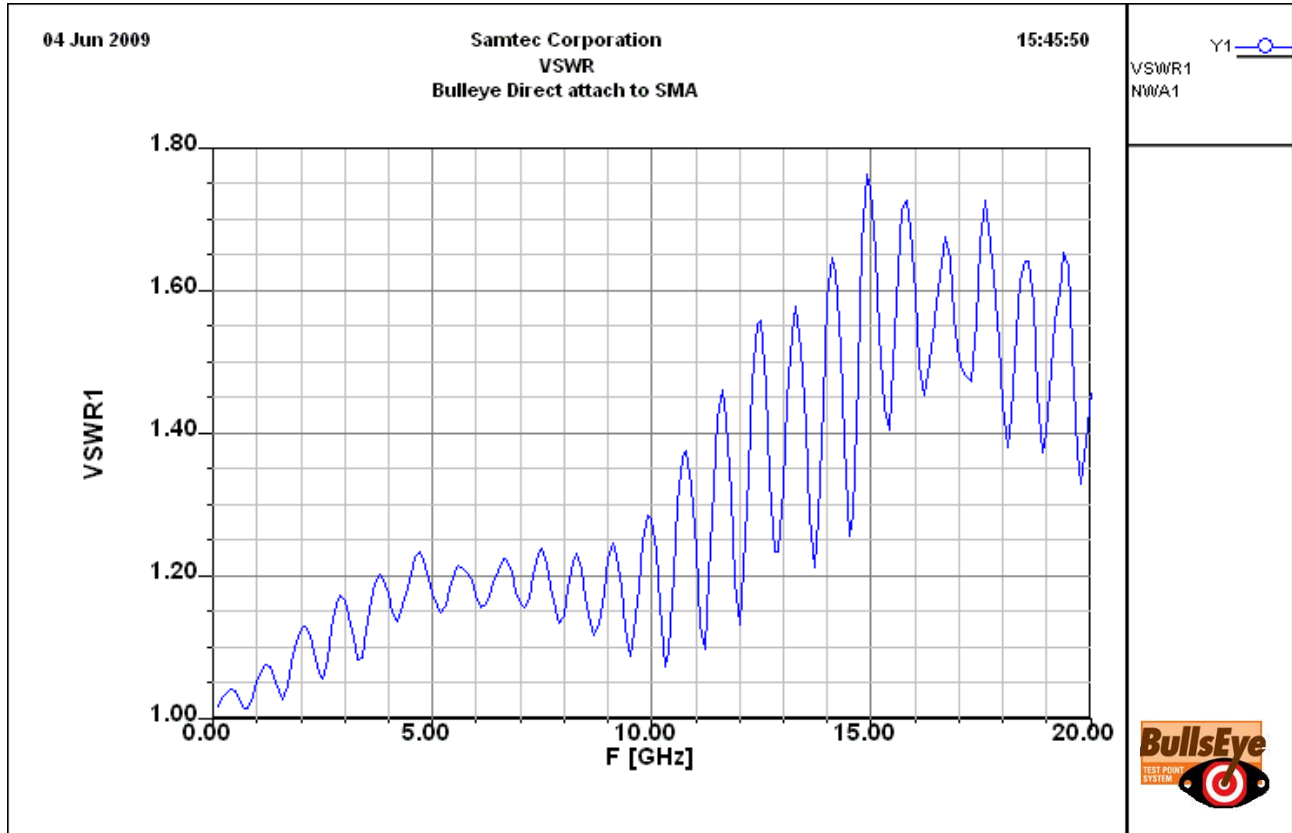


Figure 5 Bull's Eye™ VSWR

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## Test Procedures

### Test Apparatus:

All measurements were performed using a custom test adapter specifically modified for the product under test. For measurements that required reference measurements (insertion loss, return loss, NEXT, FEXT and propagation delay) a 85052D coaxial calibration was utilized as shown in Figure 19. The reference board was used to compensate for the losses due to the coaxial test cables, SMA launches and the test PCB traces during the measurement process.

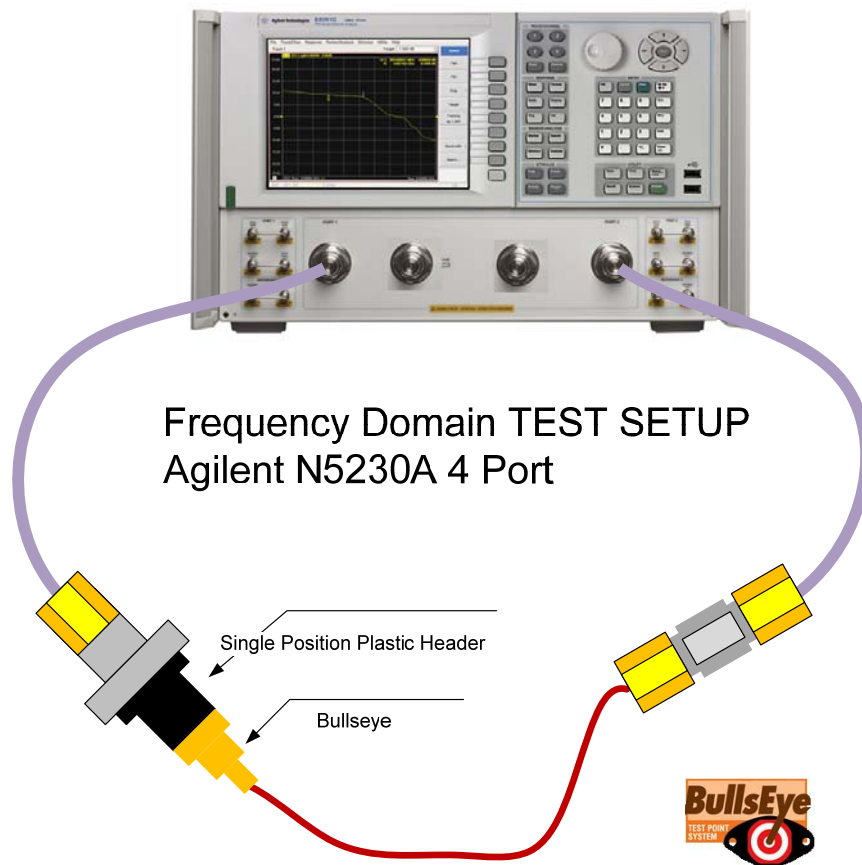
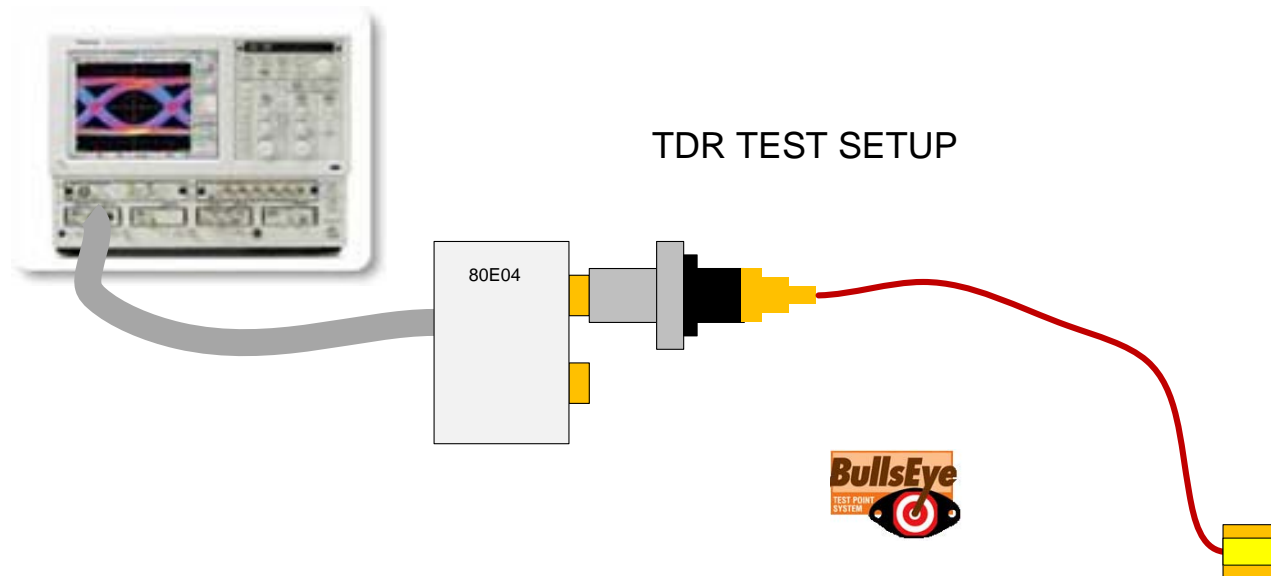


Figure 6: IL, & RL Measurement Configuration Bull's Eye™

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**Figure 7:** Test setup for measuring Impedance Profile

### ***Time Domain Testing***

#### **Impedance:**

Traces were measured using a CSA 8000 equipped with 80E04 TDR sampling heads.

#### **Propagation Delay:**

The propagation delay was measured using the CSA 8000 in conjunction with the 80E04 sampling heads.

#### **Skew:**

Not applicable for this application.

#### **NEXT and FEXT:**

Omitted from this test sequence.

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## ***Frequency Domain Testing***

### **Attenuation / Return Loss:**

Insertion loss and return Loss measurements were made using the Agilent N5230A 4 port Vector Network Analyzer. The horizontal scale was set to 300KHz to 20GHz, the record length was set to 1601 points with averaging turned off and the IF bandwidth set to 1kHz.

The VNA was calibrated using the 8052D coaxial calibration standard kit.

The test fixture effects were not removed from the measurement.

### **Near and Far End Crosstalk:**

Not evaluated at this time.

## **Equipment**

### ***Frequency Domain Testing***

Agilent 5230A 4 port VNA "300kHz to 20GHz"  
Agilent 85052D Economy Coaxial calibration kit

### ***Time Domain Testing***

Tektronix CSA 8000 Oscilloscope  
Tektronix 80E04 TDR/Sampling Head

## **Conclusion**

The Bull's Eye™ coax provides a good alternative to the vertical mount SMA "SMA 50." Since the connection is direct to the board via the cable Bull's Eye™ interface the return losses are decreased by eliminating one connection "SMA to cable". Cost and performance are improved as well as re-usability. The cable can be easily moved between test locations leaving behind just the header. The headers are less expensive than the vertical SMA which results in cost saving to the end user.