Engineering Report

HHD High-Density
75 Ohm BNC Series

P/N HHD361A714-TL

P/N HHD364HDE704

Change History

REV	Reason	Date	Author
01	Electrical Report	MAY 2015	WKC ENG

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1 ABSTRACT

This report summarizes the validation procedure of the 75-Ohm HHD-BNC Right-angle Bulkhead and Straight Receptacles for PCB high-speed video applications. Simulation analysis was first used to predict the electrical performance of the connectors on a customized board and layout with the recommended footprint.

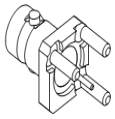
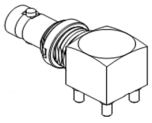
Measurements on various prototypes mounted on the test boards were then evaluated using the Agilent 50 Ohm PNA E8364B and appropriate 75 Ohm calibration kit and adapters.

KEYWORDS: HHD-BNC PCB 12Gbps

2 SUMMARY

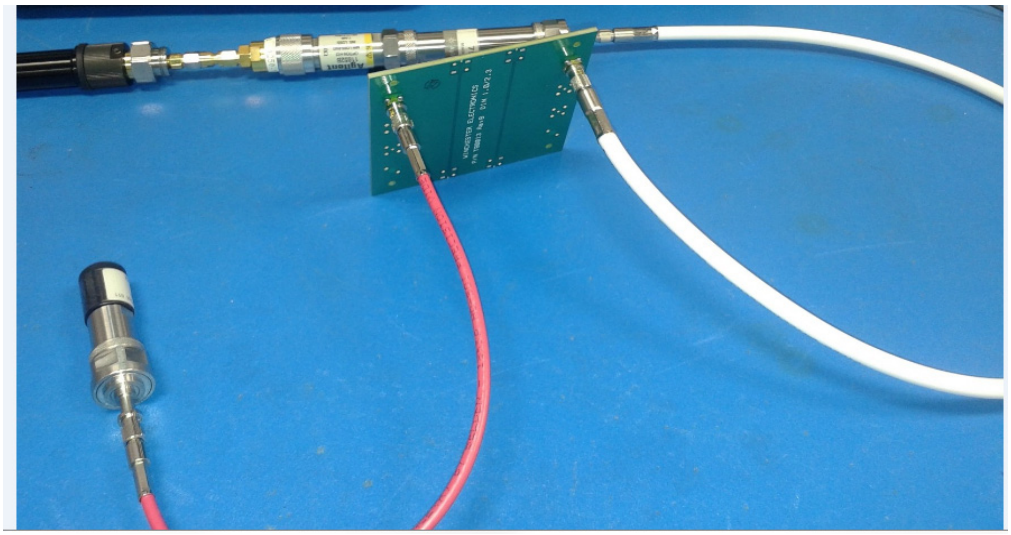
The main objective was to meet or exceed the SMPTE 424M Return Loss specification for 1080p/60 Hz and 1080p/5 Hz HD-SDI (and 3G-SDI) video signals. However, with the future transition to 4K and 8K UHD signals, the performance is evaluated to 6, 12 and 18 GHz as indicated on the SMPTE 2081-1 (6Gbps) and 2082-1 (12Gbps) standards.

Two main versions of the HHD-BNC connector have been validated. The table, below, summarizes these two versions and displays the maximum return loss for the connector alone from DC to 18 GHz.

HHD-BNC PCB MOUNT	P/N	RETURN LOSS (dB)				
		1.5 GHz	3.0 GHz	6.0 GHz	12 GHz	18 GHz
STR JACK 	HHD361A714-TL	-30	-25	-20	-15	-10
R/A BKHD JACK 	HHD364HDE704	-30	-22	-17	-10	-7

3 TESTING/VALIDATION

One-port frequency domain measurements were conducted on various samples of the connectors as those are mounted on the test boards. One 50/75 Ohm minimum loss pad and two N-HDBNC (M) adapters were also used in the testing setup, one on each side of the DUT. The end side of the one N-DIN adapter is terminated to a 75 Ohm load.



3.1 Measurement Setup

- 50 Ohm PNA E8364.
- 50 Ohm – 75 Ohm Minimum Loss Pad
- N-HDBNC Adapters
- FR4 Evaluation Board
- One-port calibration using 75 Ohm N-Type Cal Kit 85036B (Option H12)
- Frequency: 10 MHz to 12 GHz
- Points: 1601

3.2 Measured Results

Below are screenshots from measured results on samples of the DUT. **The measurement also includes the PCB via launch and a length of the 75 Ohm transmission line.**

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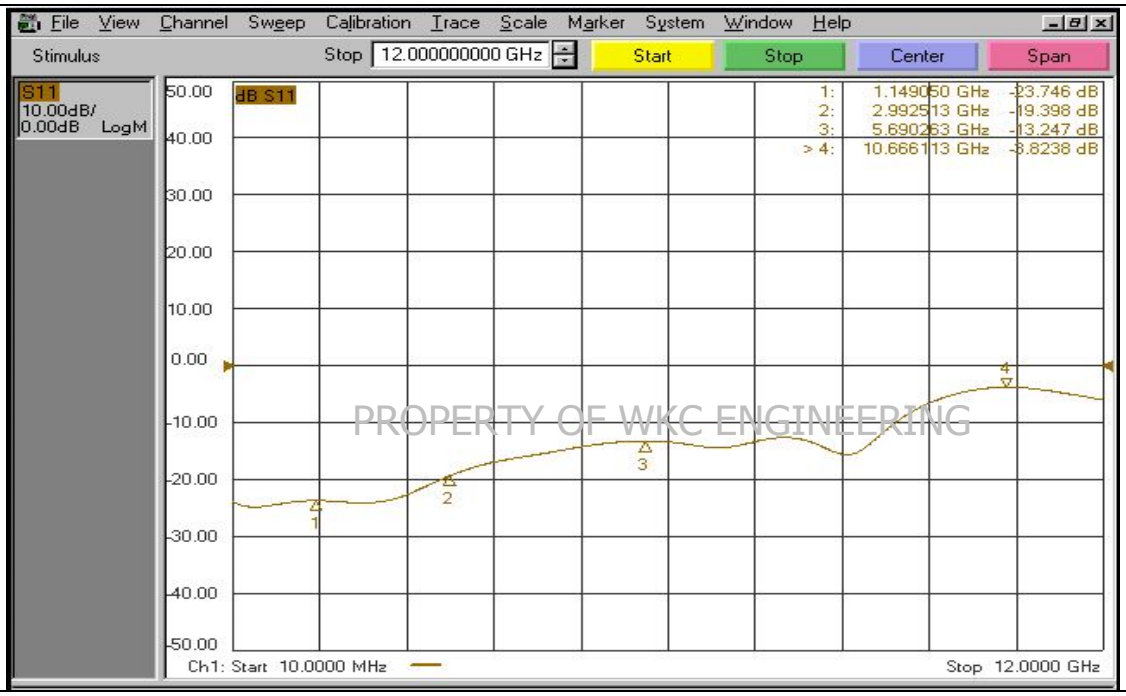

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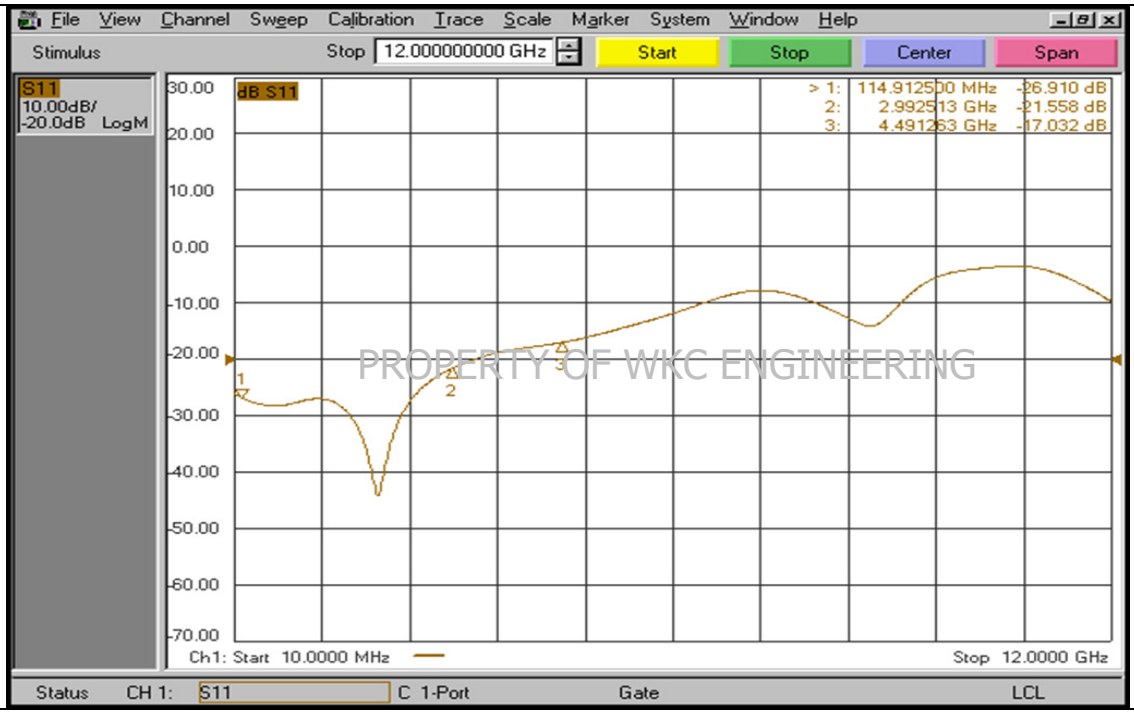

4 CONCLUSION

Both measurement and simulation results give excellent RF performance from DC to 12 GHz, exceeding compliance to SMPTE specifications.

The Winchester solution provides an optimum and superior performance as opposed to other available connectors, and guarantees sufficient headroom for a reliable 75 Ohm passive channel to the maximum 3rd harmonic frequency (18 GHz).