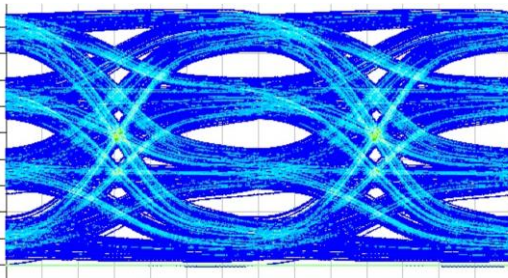


# ISI-112/224 – Advanced ISI Loss Modeling

Improves SERDES Testing – Test Pre-Silicon – EDA Kit Friendly

## FEATURES

- **Extreme Signal Integrity**
- **Stripline topology (not Microstrip)** – geometries mimic common application
- **92- and 100-ohm version available**
- Suited for
  - **PAM4 characterization and compliance testing**
    - **IEEE 802.3dj 200 Gb/s (per lane) Ethernet**
    - **OIF-CEI-224 Standard**
  - **Design-of-Experiments (DOE)**
- **100% NIST Traceable Tested**
- **Very low return-loss** out to 110 GHz
- **Industry best resolution –7dB to –25dB** at 56GHz Nyquist, in **~1dB loss increments**



## INCLUDES

- **Insertion Loss Platforms** – Provides IL ranging from 7db to 25db at 56 GHz, ~1dB resolution
- Hard shell case for transport
- **NIST traceable TDR impedance compliance report**
- Wild River Technology Test Plan assistance
- **Unconditional Guarantee – Lifetime Warranty**
- **Measured S-parameter library**, tested for causality, includes DC point for immediate EDA support

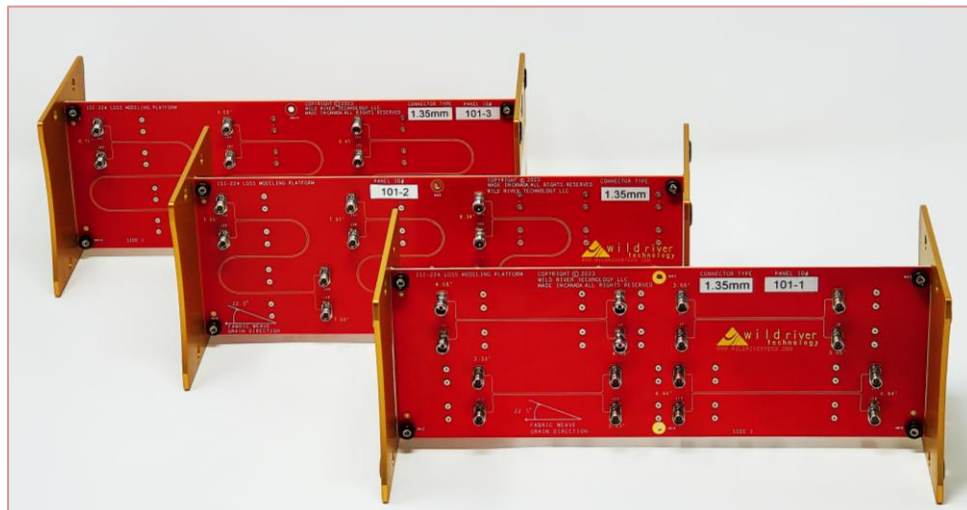


## 224 Gbaud Advanced SERDES Inter-symbol Interference Loss Platform Set

The ISI-224 is an advanced inter-symbol interference (ISI) platform specifically designed for the demanding signal integrity requirements of 112-224 Gbaud PAM-4. The laminate system is ultra-low weave, with similar copper roughness profile expected in practical backplanes. Group delay variation and Block resonance, an important loss consideration for data rates exceeding 25Gbps, has been eliminated with special layout techniques, homogenous laminate system, pristine connector launch design, and the use of controlled weave dielectric material.

The ISI-224 Loss Modeling Platforms are composed of 21 stripline differential pairs of various lengths with ~1dB insertion loss resolution.

Any issues or concerns after purchase simply contact WRT, create a repair number, send it back to Wild River Tech for a complete TDR impedance analysis, repaired, all at no charge: Lifetime warranty, Lifetime Unconditional Guarantee, Lifetime Extreme Signal Integrity performance.



For more information regarding WRT applications support, email us at [info@wildrivertech.com](mailto:info@wildrivertech.com).

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## Competitive Comparison Table

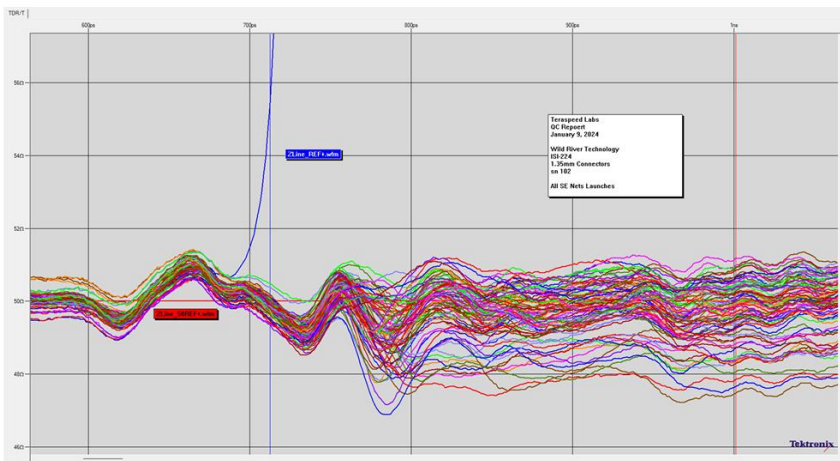
	WRT ISI-224	Competition
Extreme Signal Integrity (note 1)	Yes	No
Lifetime Warranty	Yes	No
Unconditional Guarantee of Extreme Signal Integrity Performance for life (note 2)	Yes	No
100% NIST traceable TDR impedance tested with included report	Yes	No
Mimics actual SERDES serial link channels (note 3)	Yes	No
1dB resolution	Yes	No
Assistance with test plan (note 4)	Yes	No
Core business of company, not an add-on	Yes	No

### Notes:

1. Extreme Signal Integrity is defined by IEEE P370, WRT was involved with this signal integrity compliance spec. Our 3D EM optimization focused on achieving lowest insertion loss to return loss margin through 2 X Nyquist frequency.
2. Anything goes wrong (you break a connector for example), you doubt your characterization results... send it back, we analyze, redo the 100% testing, fix it, send it back for lifetime of product at no cost.
3. Our stripline topology mimics backplanes, routers, and general daughtercard design topology. One competitor uses Microstrip, which is not used in applications.
4. Contact WRT at [info@wildrivertech.com](mailto:info@wildrivertech.com), we help with comprehensive test plan.

## ISI-224 platform set specifications

PC board material	Low loss
Insertion loss	Typical values see Tables 2 (excludes cable losses)
Return loss	27 dB typical at 56 GHz
Connectors	1.35mm or 1.00mm vertical launch female, compression mount, replaceable. All connector launches are NIST-traceable tested.
Trace Impedances	100Ω or 92Ω



This is an example of the WRT 100% NIST traceable TDR impedance report.

It confirms:

- Impedances
- RF launch integrity
- Issues with fabrication

Report is included with each platform set and can be redone if there any issues at a future date at no cost.



# ISI-112/224 – Advanced ISI Loss Modeling

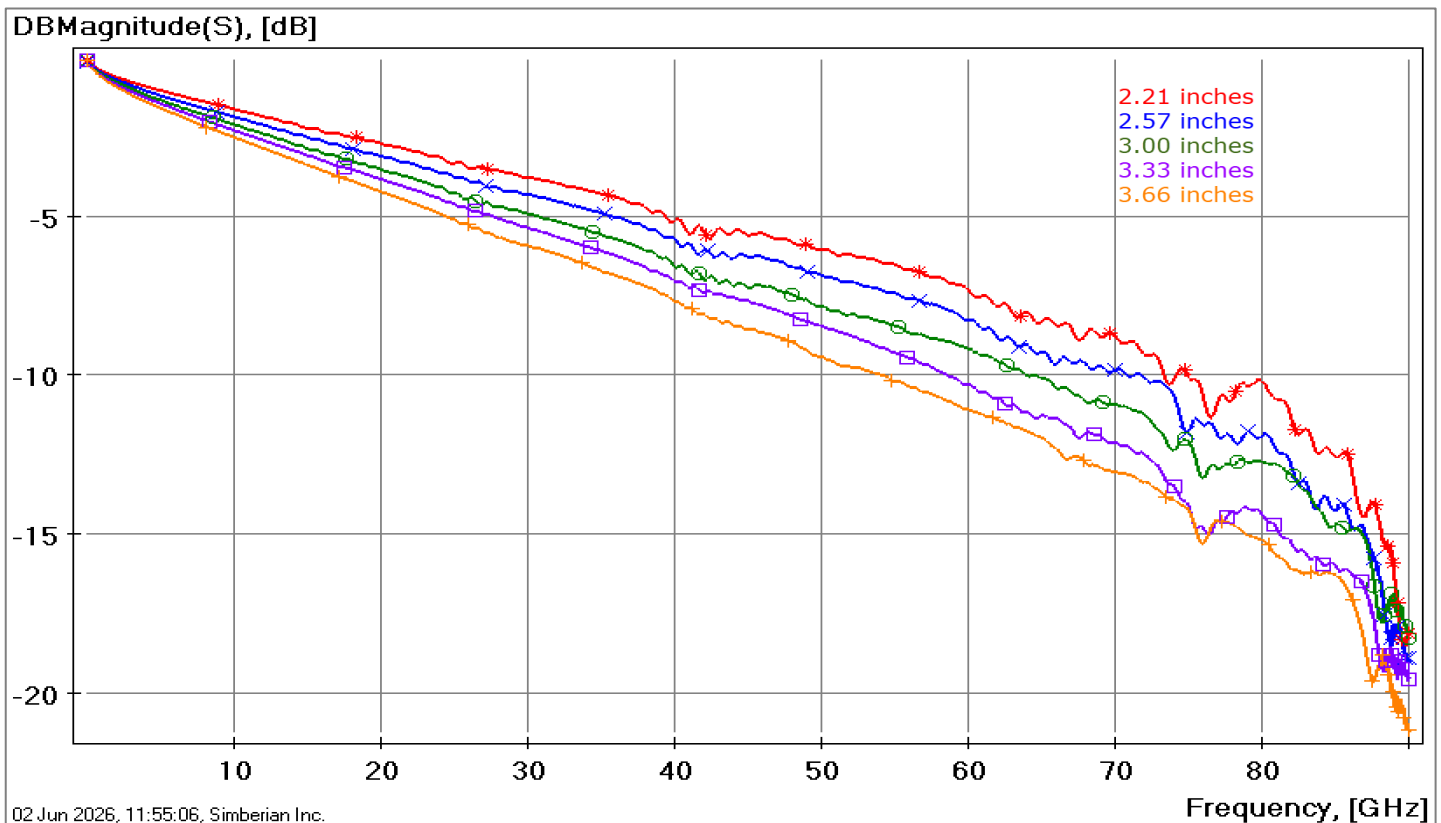
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ISI-224 Insertion Loss for each fixed variable trace length (100-Ohm trace impedances)

Trace Length		IL @	IL @
in.	mm	53.13 GHz	56 GHz
2.21	56.13	-6.3 dB	-6.7 dB
2.57	65.28	-7.3 dB	-7.6 dB
3.00	83.82	-8.2 dB	-8.7 dB
3.33	84.58	-8.9 dB	-9.5 dB
3.66	92.96	-9.8 dB	-10.3 dB
4.08	103.63	-11.0 dB	-11.7 dB
4.44	112.78	-11.8 dB	-12.5 dB
4.78	121.41	-12.7 dB	-13.3 dB
5.14	130.56	-13.5 dB	-14.3 dB
5.51	139.95	-14.3 dB	-15.0 dB
5.97	151.64	-15.7 dB	-16.4 dB

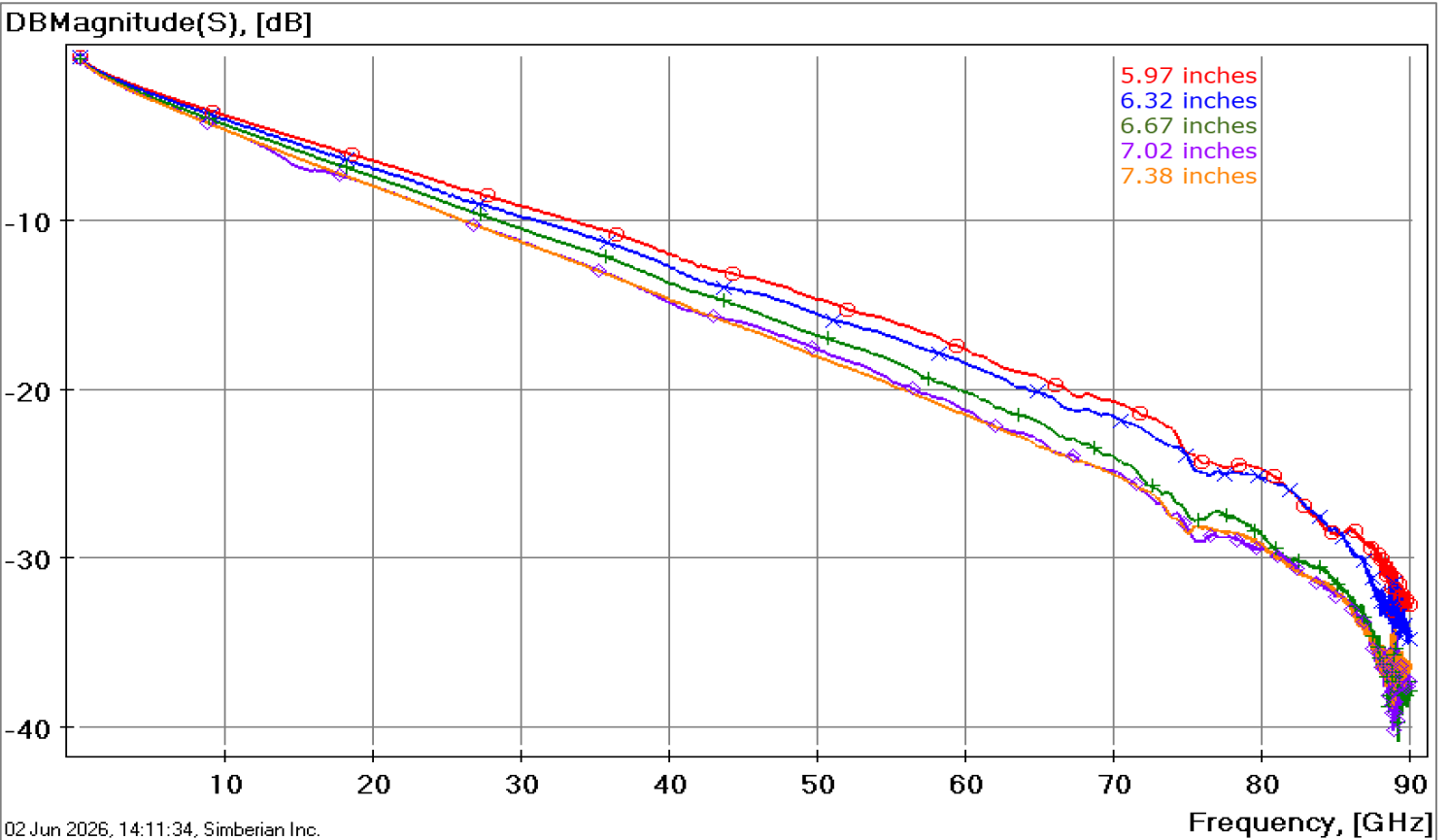
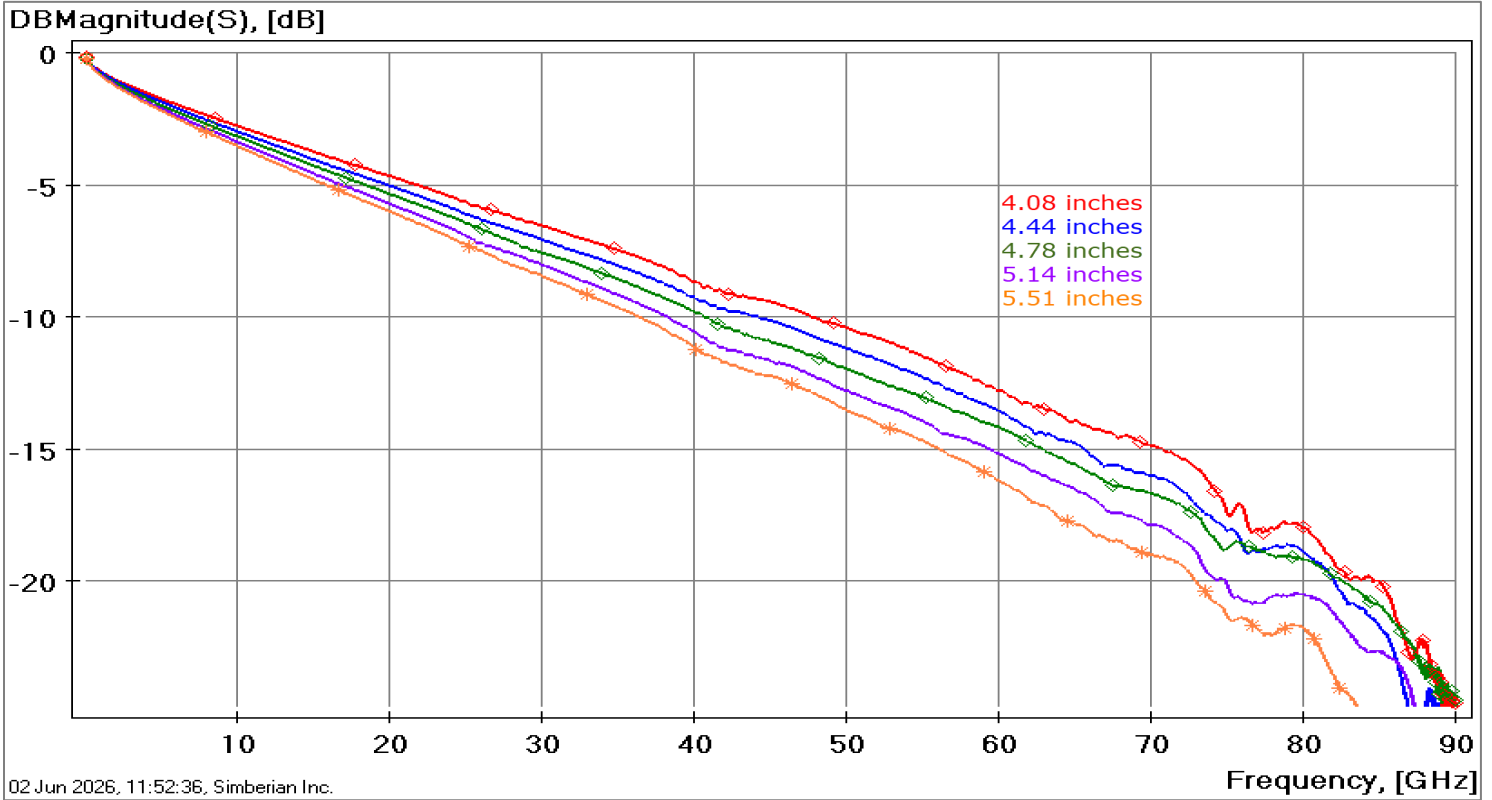
Trace Length		IL @	IL @
in.	mm	53.13 GHz	56 GHz
6.32	160.53	-16.4 dB	-17.2 dB
6.67	169.42	-17.6 dB	-18.6 dB
7.02	178.31	-18.5 dB	-19.6 dB
7.38	187.45	-19.1 dB	-20.1 dB
7.60	193.04	-19.4 dB	-20.4 dB
7.97	202.44	-20.2 dB	-21.3 dB
8.34	211.84	-21.2 dB	-22.3 dB
8.71	221.23	-22.6 dB	-23.8 dB
9.08	230.63	-23.2 dB	-24.4 dB
9.45	240.03	-23.9 dB	-25.1 dB

ISI-224 platform Insertion Loss Graphs (100 Ohm Traces) - Measurements do not employ de-embedding, reference planes are at RF connector



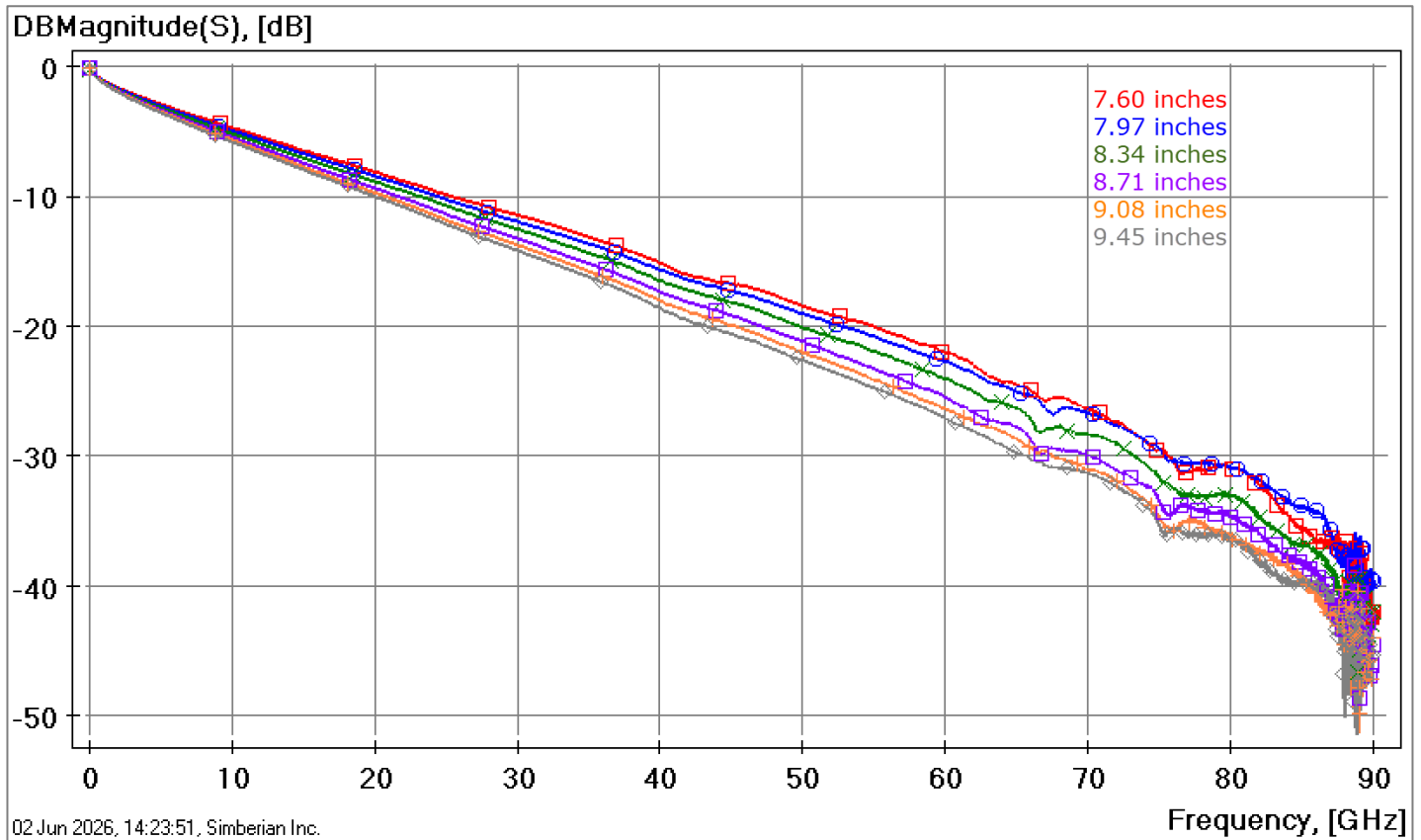
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## Ordering Instructions

Part Number	Model	Description
P/N 917-0001-00	Model ISI-224-1.85mm 100 Ohms	56-112 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.85mm connectors
P/N 917-0002-00	Model ISI-224-1.35mm 100 Ohms	56-112 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.35mm connectors
P/N 917-0003-00	Model ISI-224-1.00mm 100 Ohms	56-224 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.00mm connectors
P/N 917-0004-00	Model ISI-224-1.85mm 92 Ohms	56-224 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.85mm connectors
P/N 917-0005-00	Model ISI-224-1.35mm 92 Ohms	56-224 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.35mm connectors
P/N 917-0006-00	Model ISI-224-1.00mm 92 Ohms	56-224 Gbpsec Advanced SERDES Intersymbol Interference Loss Platform Set, assembled with 1.00mm connectors

## Option: Skew Matched Cables

*Figure 3 – Suggested Skew matched Cable Pairs. Cables are custom designed per customer length requirements.*



### **Ultra-low Skew Cable Assembly Pair**

*1.85mm, 1.35mm or 1.00mm male connector on both ends, customer configurable lengths of 1206 type cable, no-modes thru 56GHz, 16dB return loss or better through 65 GHz, 5 degrees (0.35ps) skew, red/green heat shrink for cable determination, additional heat shrink at 220mm (8.66") from end of cable pair for mechanical separation, label in center of cable for replacement part number.*

*Compliant with RoHS Directive 2011/65/EU in its entirety, inclusive of any further amendments or modifications of said Directive. 3-year replacement guarantee.*

*Each matched cable pair comes with graphs of insertion loss and return-loss for each cable, plus a thumb drive containing the measured s-parameter files.*