



ChipConnect Cable Assemblies

TABLE OF CONTENTS

Introduction	2
Description	2
Features and Benefits	2
Product Applications.....	2
Industry Protocols.....	2
Technical Documents	2
Part Numbers	3
Table 1. Part Number Selection Guide.....	3
Product Specifications	4
Table 2. Material Specifications	4
Table 3. Electrical/Mechanical Specifications	4
Table 4. Environmental Specifications	4
Table 5. Discrete Primary Pair Cable Specifications.....	5
Pin Configurations.....	6
IFPA 2-Port Configuration	6
IFPB 1-Port Configuration	7
ChipConnect Cable Assembly Mechanical Schematics	7
IFPB 1-Port Flat Right Exit	9
IFPB 1-Port Inverted Right Exit	10
IFPB 1-Port Flat Left Exit.....	10
IFPB 1-Port Inverted Left Exit.....	11
Signal Integrity Performance.....	12
TEPN 2821719-1.....	12
TEPN 2821720-1.....	12
TEPN 2821721-1.....	12
TEPN 2821722-1.....	13
LEC A – Differential Impedance	13
IFP A – Differential Impedance	13
LEC B – Differential Impedance	14
IFP B – Differential Impedance	14

ChipConnect Cable Assemblies

INTRODUCTION

Description

TE Connectivity's (TE) ChipConnect passive copper cable assembly is a robust and flexible cable assembly based on the Intel® Omni-Path Internal Faceplate-to-Processor (IFP) cable assembly with support of up to 2 ports, at 100Gbps per port. The IFP cable assembly is composed of discrete twinax pairs with a 54-position Linear Edge Connector (LEC) that mates with CPU substrate, and paddle card connectors that mate internally with Intel® Omni-Path Internal Faceplate Transition (IFT) connector and cage. Due to the lower loss characteristics of copper cable, ChipConnect internal cabling extends the reach for high data rate signals. TE's cabling solution helps lower overall costs by eliminating re-timers required to compensate for lossy PCB traces as well as costlier, lower loss PCB laminates.

ChipConnect assemblies are offered with 85 ohm impedance 30AWG twinax pairs. The cable design is available in a broad range of standard configurations. Standard cabling options include:

- IFPA - mates with 1.587mm thick microprocessor substrate
- IFPB - mates with 1.102mm thick microprocessor substrate
- Straight, right and left turn exit configurations
- 1-port (8 diff pair) and 2-port (16 diff pair) I/O paddle card connector configurations
- Inverted and non-inverted I/O paddle card connectors
- Various standard cable lengths through 439mm

In addition to these standard IFP cable configurations, TE can develop customized versions based on individual customer requirements.

Features and Benefits

- Internal copper cable solution for use with Intel® Xeon® Phi™ Processor 7200F Series with integrated Intel® Omni-Path Architecture
- Supports 25Gbps channel speeds utilizing Intel Omni-Path Architecture
- Enables less expensive PCB material and electronics, with higher channel performance
- Optimized construction to minimize insertion loss and cross talk
- High density 0.7 mm LEC contact pitch
- 30AWG 85 Ohm low loss 25GHz primary pairs
- Toolless connector insertion and extraction
- Molded plastic strain-relief isolates solder joints from external stresses
- Straight, left-turn or right-turn exit LEC termination support different system designs
- Active press to release stainless steel IFT latching
- Torsional spring latch LEC termination connects to retention features on socket bolster plate
- RoHS compliant

Product Applications

- High performance computing
- Servers and routers
- Data Center and Enterprise networks

Industry Protocols

- Intel Omni-Path Architecture (100Gbps)

Technical Documents

Product Specification
108-130015

ChipConnect Cable Assemblies

PART NUMBERS

Table 1. Part Number Selection Guide

IFP Style	Number of Ports	LEC Configuration	IFP Configuration	Assembly Length (mm)	Breakout Length (mm)	Part Number	Remark
A	2	Straight	Flat	142	75	2821719-3	
				208	104.5	2821719-1	
				405	104.5	2821719-2	
				460	104.5	2821719-4	*
			Inverted	208	104.5	2821720-1	
				405	104.5	2821720-2	
B	1	Straight	Flat	150	N/A	2821721-1	
			Inverted	160	N/A	2821722-1	
				205	N/A	2821722-2	
				242	N/A	2821722-3	
				465	N/A	2821722-4	*
		Left Angle	Flat	142	N/A	2821723-4	
				335	N/A	2821723-1	
				371	N/A	2821723-2	
				460	N/A	2821723-5	*
				515	N/A	2821723-3	*
			Inverted	178	N/A	2821724-1	
				235	N/A	2821724-2	
				318	N/A	2821724-3	
				419	N/A	2821724-4	
				439	N/A	2821724-5	
				500	N/A	2821724-6	*
		Right Angle	Flat	142	N/A	2821778-1	
				460	N/A	2821778-2	*
			Inverted	235	N/A	2821725-1	
				370	N/A	2821725-2	
				500	N/A	2821725-3	*

*Cable lengths exceeding 439 mm are not standard offer and have not been qualified by Intel

ChipConnect Cable Assemblies

PRODUCT SPECIFICATIONS

Table 2. Material Specifications

PCB	Halogen Free low loss laminate
	IPC Class 3
Contact	Gold plated contact pads
Connector housing	PBT thermoplastic
Active latches	Stainless steel wire bail lock (LEC)
	Stamped Stainless steel (I/O)
Discrete cable	Silver plated copper conductor
	Fluoropolymer dielectric
	Metallic tape pair shield
	Polyester tape jacket

Table 3. Electrical/Mechanical Specifications

Impedance	85Ω ±5 ohm (avg), ±10% (instantaneous)
Data Rate	25Gbps per channel
Within Pair Skew	5 ps max
Rated Voltage	30V
Connector Insertion	1.13 kgf
Connector Detraction	1.22 kgf
Latch Engagement	1.59 kgf
Connector Extraction	1.22 kgf
28-Pin Plug Insertion	4.1 kgf
28-Pin Plug Extraction	3.1 kgf
28-Pin Plug Retention	9.2 kgf
Durability	30 mating cycles
Residual Load Limit	0 kgf
Static Cable Strain Relief	5.0 kgf
Dynamic Cable Strain Relief	TBD
LEC54 from housing to back-shell retention	5.0 kgf
Minimum Cable Bend Radius	2-Port, 7.5 mm dia bundle: R=37.5 mm 1-Port, 5.5 mm dia bundle: R=25 mm

Table 4. Environmental Specifications

Non-Operating Condition	24°C
Operating Condition	-40C to 70C, 6%RH
Flammability Rating	VW-1
Safety Certificates	RoHS II compliant

ChipConnect Cable Assemblies**Table 5. Discrete Primary Pair Cable Specifications**

Bend Radius	7x minor diameter
Cable Dimensions	Minor Diameter = 0.89 mm
	Major Diameter = 1.55 mm
Attenuation	5 GHz = 3.8 dB/m
	12.89 GHz = 6.0 dB/m
	20 GHz = 8.0 dB/m
	25 GHz = 10.0 dB/m

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PIN CONFIGURATIONS

IFPA 2-Port Configuration

CABLE PINOUT				
PAIR	PIN NAME	P1	P2	P3
GROUND BUS	-	1	-	1
1	HF10_RX_DN(1)	2	-	2
	HF10_RX_DP(1)	3	-	3
GROUND BUS	-	4	-	4
2	HF10_RX_DN(3)	5	-	5
	HF10_RX_DP(3)	6	-	6
GROUND BUS	-	7	1	7
3	HF11_RX_DN(1)	-	2	8
	HF11_RX_DP(1)	-	3	9
GROUND BUS	-	-	4	10
4	HF11_RX_DN(3)	-	5	11
	HF11_RX_DP(3)	-	6	12
GROUND BUS	-	-	7	13
GROUND BUS	-	-	-	14
GROUND BUS	-	8	-	15
5	HF10_TX_DP(4)	9	-	16
	HF10_TX_DN(4)	10	-	17
GROUND BUS	-	11	-	18
6	HF10_TX_DP(2)	12	-	19
	HF10_TX_DN(2)	13	-	20
GROUND BUS	-	14	8	21
7	HF11_TX_DP(4)	-	9	22
	HF11_TX_DN(4)	-	10	23
GROUND BUS	-	-	11	24
8	HF11_TX_DP(2)	-	12	25
	HF11_TX_DN(2)	-	13	26
GROUND BUS	-	-	14	27
GROUND BUS	-	-	15	28
9	HF11_TX_DN(1)	-	16	29
	HF11_TX_DP(1)	-	17	30
GROUND BUS	-	-	18	31
10	HF11_TX_DN(3)	-	19	32
	HF11_TX_DP(3)	-	20	33
GROUND BUS	-	15	21	34
11	HF10_TX_DN(1)	16	-	35
	HF10_TX_DP(1)	17	-	36
GROUND BUS	-	18	-	37
12	HF10_TX_DN(3)	19	-	38
	HF10_TX_DP(3)	20	-	39
GROUND BUS	-	21	-	40
GROUND BUS	-	-	-	41
GROUND BUS	-	-	22	42
13	HF11_RX_DP(4)	-	23	43
	HF11_RX_DN(4)	-	24	44
GROUND BUS	-	-	25	45
14	HF11_RX_DP(2)	-	26	46
	HF11_RX_DN(2)	-	27	47
GROUND BUS	-	22	28	48
15	HF10_RX_DP(4)	23	-	49
	HF10_RX_DN(4)	24	-	50
GROUND BUS	-	25	-	51
16	HF10_RX_DP(2)	26	-	52
	HF10_RX_DN(2)	27	-	53
GROUND BUS	-	28	-	54

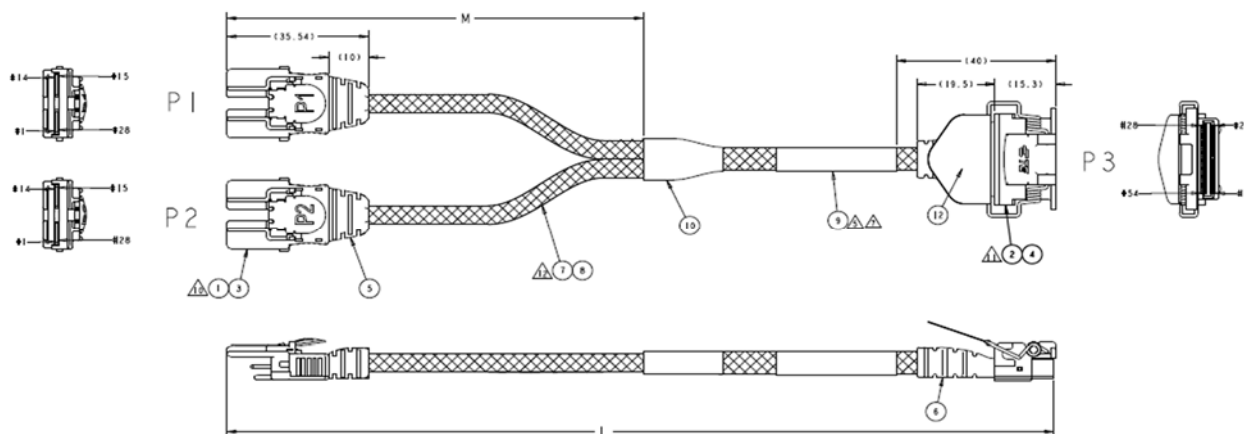
ChipConnect Cable Assemblies

IFPB 1-Port Configuration

CABLE PINOUT			
PAIR	PIN NAME	P1	P2
GROUND BUS	-	1	1
1	HF10_RX_DN(1)	2	2
	HF10_RX_DP(1)	3	3
GROUND BUS	-	4	4
GROUND BUS	-	28	4
2	HF10_RX_DN(2)	27	5
	HF10_RX_DP(2)	26	6
GROUND BUS	-	25	7
3	HF10_RX_DN(3)	5	8
	HF10_RX_DP(3)	6	9
GROUND BUS	-	25	10
4	HF10_RX_DN(4)	24	11
	HF10_RX_DP(4)	23	12
GROUND BUS	-	22	13
GROUND BUS	-	7	14
GROUND BUS	-	8	15
5	HF10_TX_DP(4)	9	16
	HF10_TX_DN(4)	10	17
GROUND BUS	-	21	18
6	HF10_TX_DP(3)	20	19
	HF10_TX_DN(3)	19	20
GROUND BUS	-	11	21
7	HF10_TX_DP(2)	12	22
	HF10_TX_DN(2)	13	23
GROUND BUS	-	14	24
GROUND BUS	-	18	24
8	HF10_TX_DP(1)	17	25
	HF10_TX_DN(1)	16	26
GROUND BUS	-	15	27

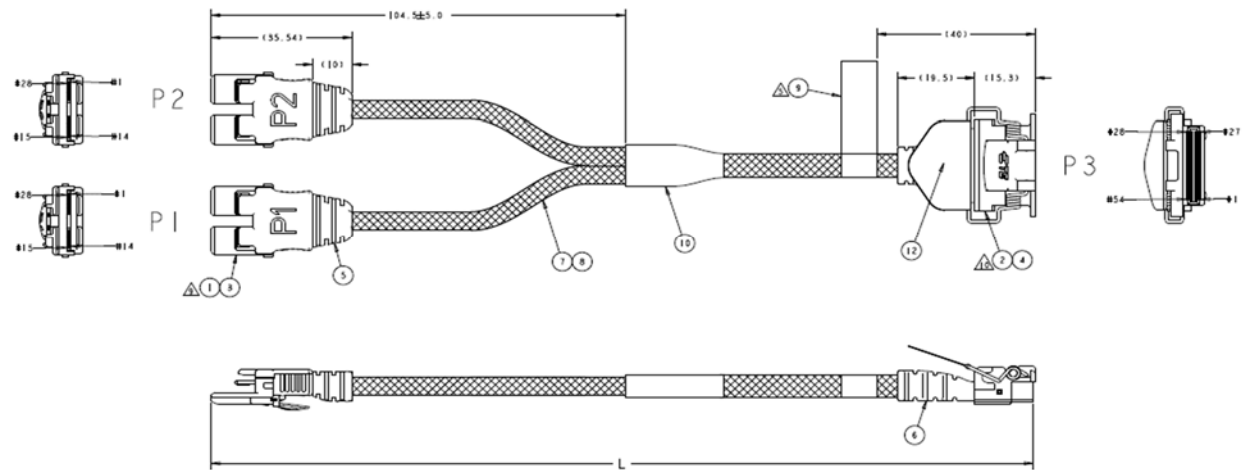
CHIPCONNECT CABLE ASSEMBLY MECHANICAL SCHEMATICS

IFPA 2-Port Flat Straight



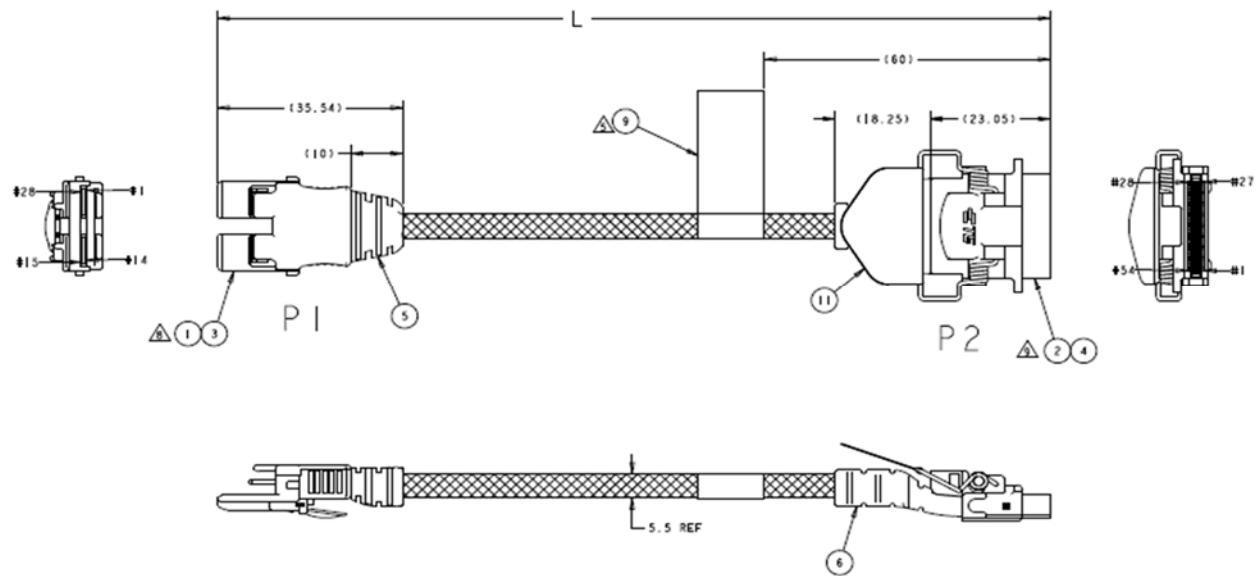
ChipConnect Cable Assemblies

IFPA 2-Port Inverted Straight

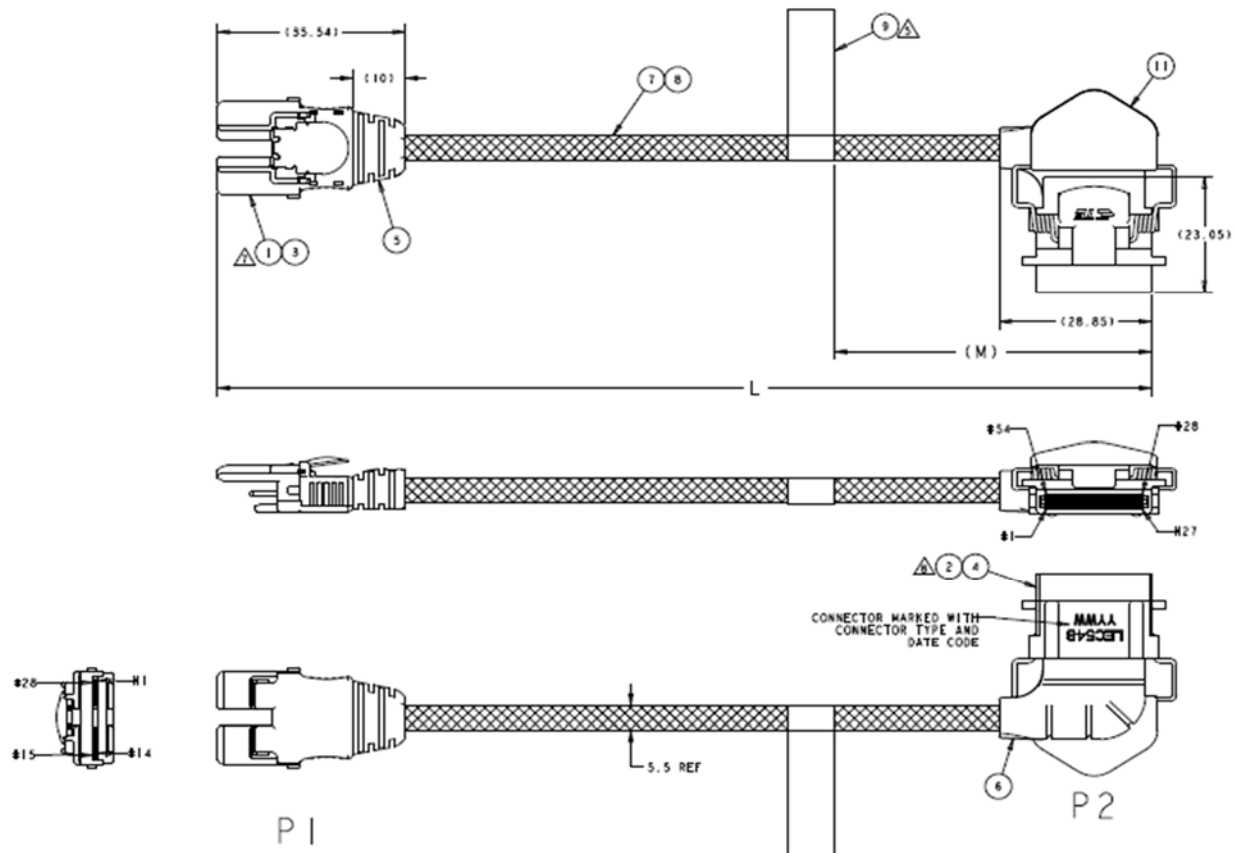


ChipConnect Cable Assemblies

IFPB 1-Port Inverted Straight

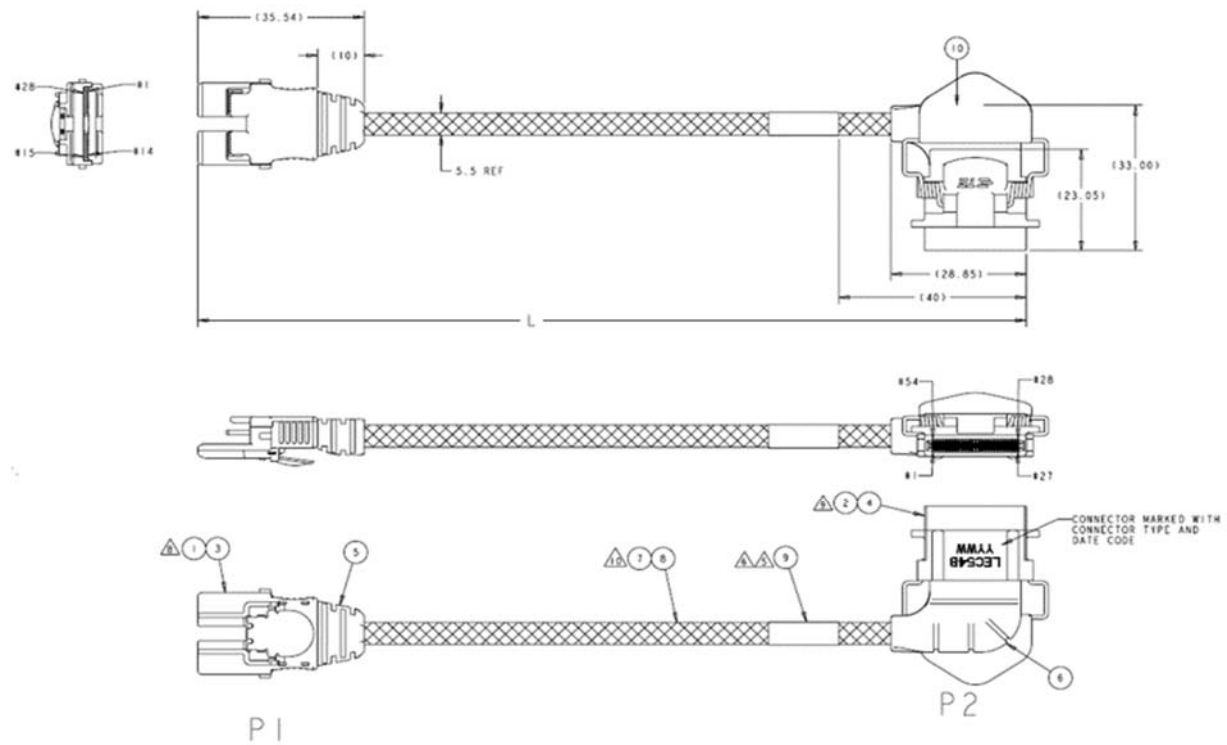


IFPB 1-Port Flat Right Exit

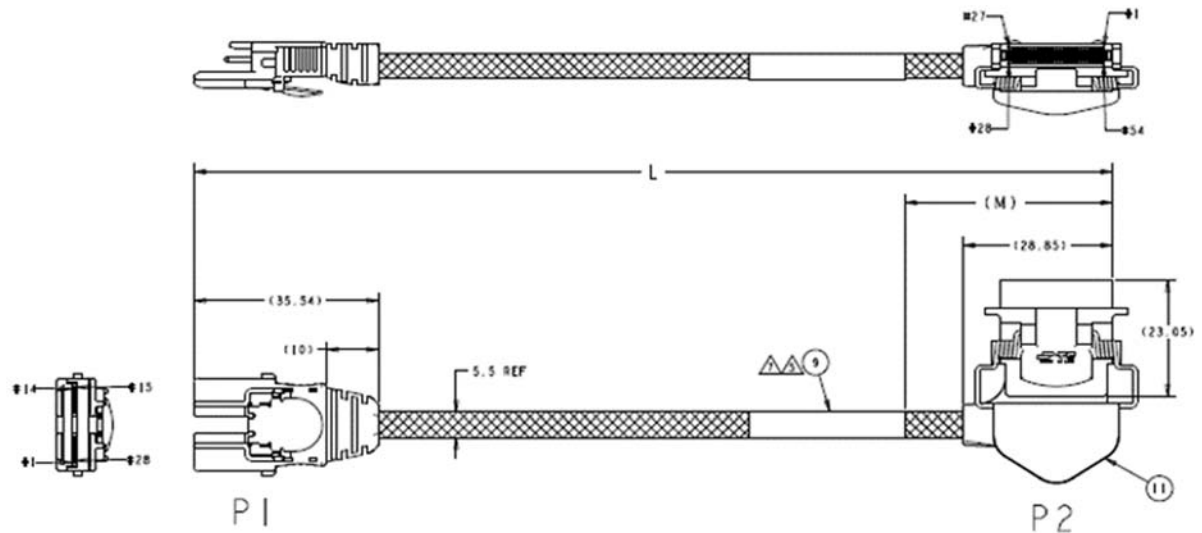


ChipConnect Cable Assemblies

IFPB 1-Port Inverted Right Exit

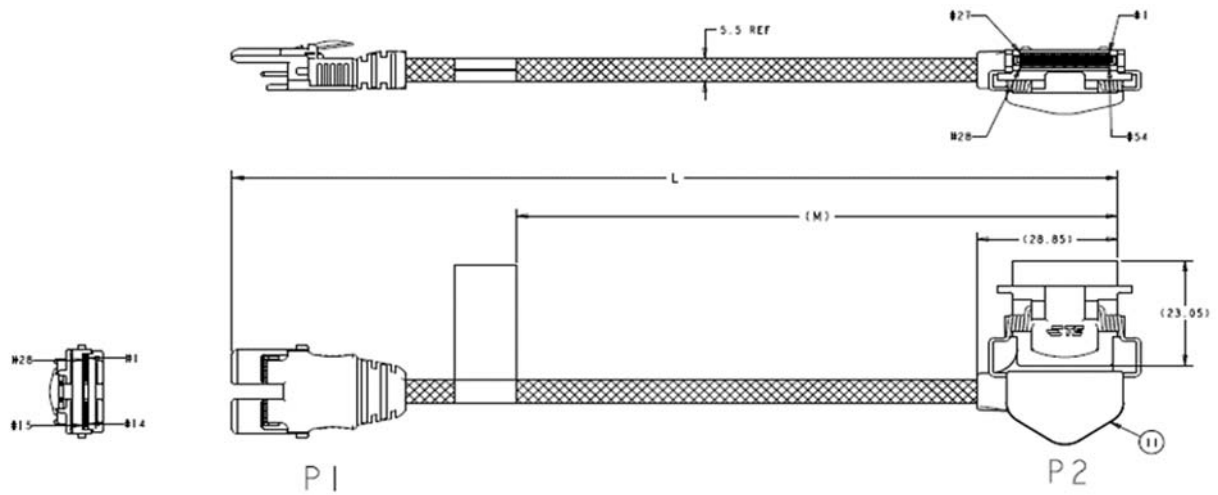


IFPB 1-Port Flat Left Exit



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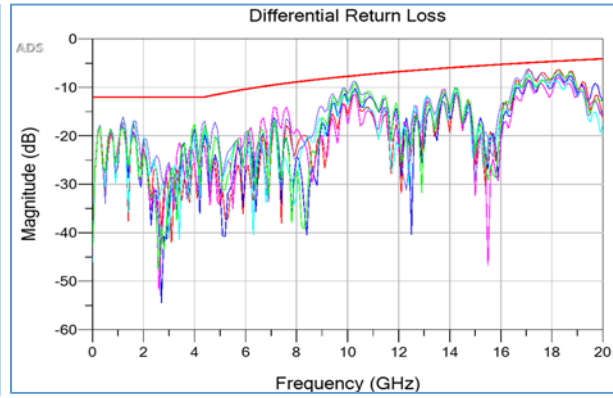
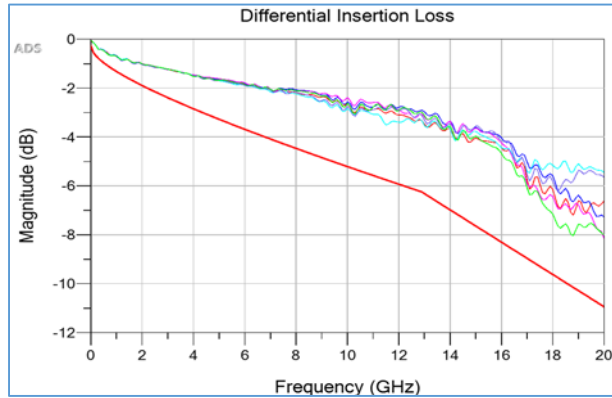
IFPB 1-Port Inverted Left Exit



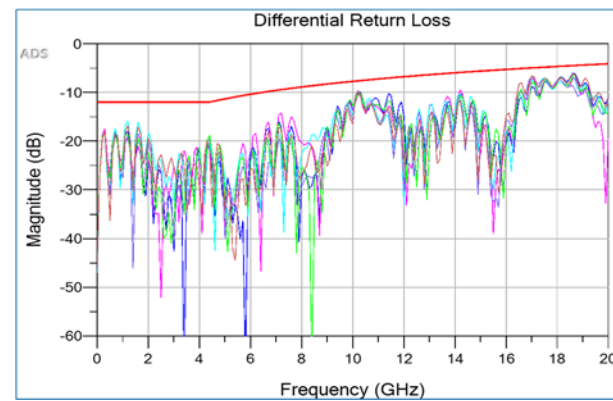
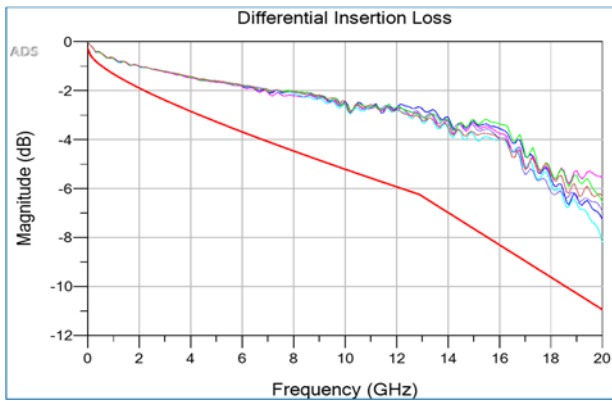
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SIGNAL INTEGRITY PERFORMANCE

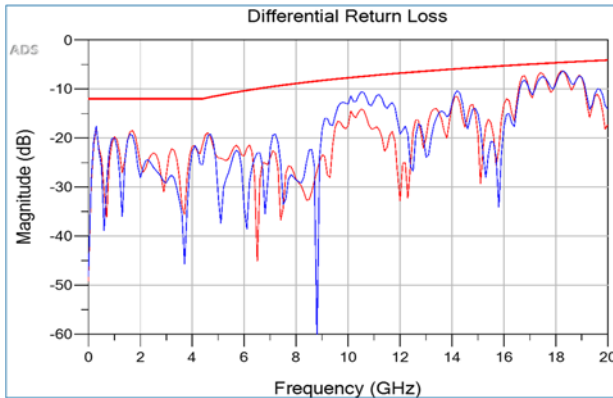
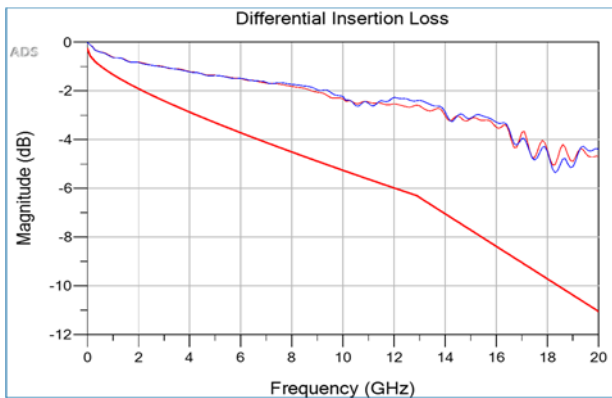
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TEPN 2821720-1

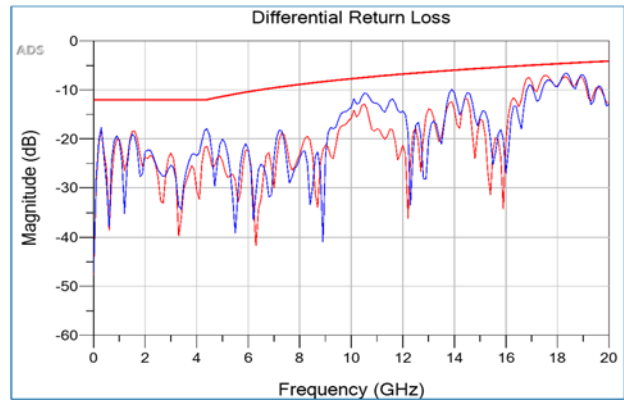
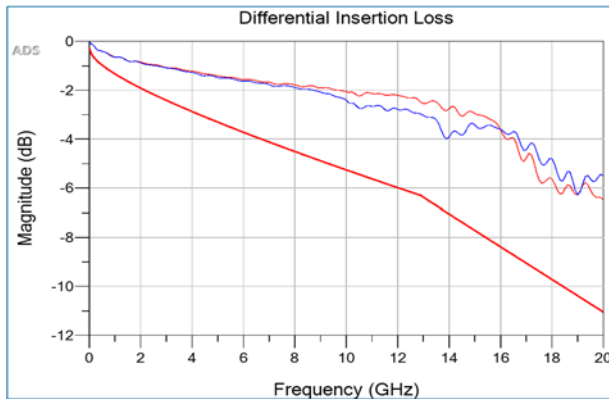


TEPN 2821721-1

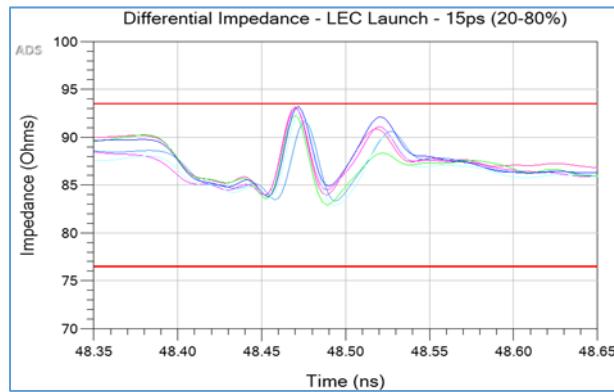


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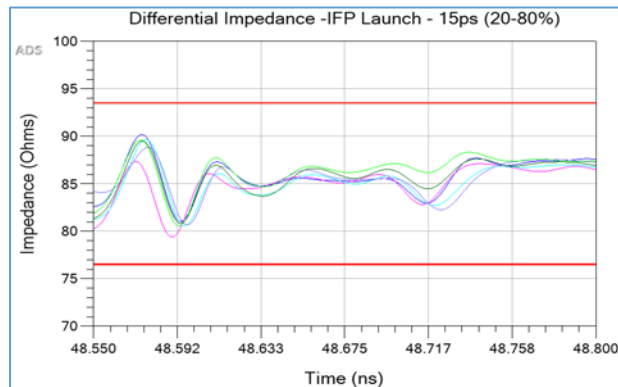
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LEC A – Differential Impedance

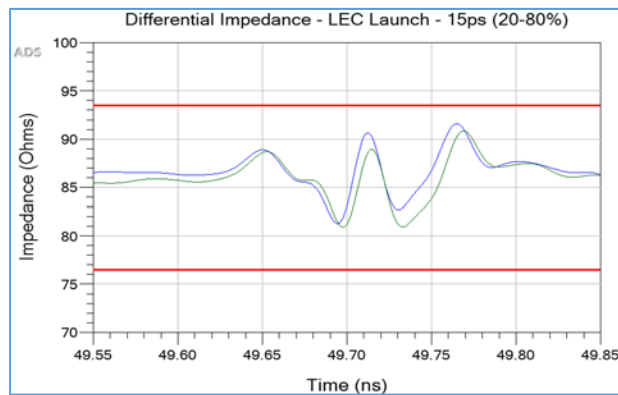


IFP A – Differential Impedance

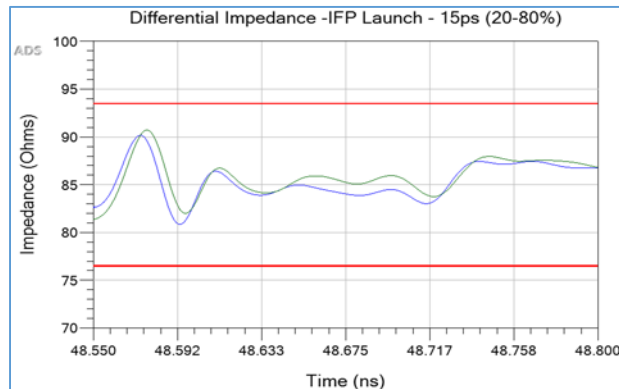


ChipConnect Cable Assemblies

LEC B – Differential Impedance



IFP B – Differential Impedance



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