



Pwr Blade+™

Customer Presentation

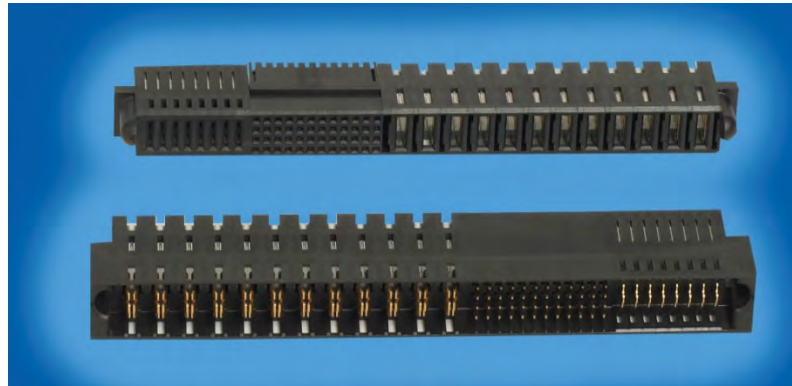
Daisy Liu

April 2014



High Performance PwrBlade® Connector – Overview

- Similar to PwrBlade® but with an enhanced power contact design for increased linear current density
 - Includes a 48 A/contact high power option (8 contacts energized; 30 ° C T-rise in still air); represents an increase versus existing PwrBlade® power contacts
 - Also includes a 27 A/contact lower power option (8 contacts energized; 30 ° C T-rise in still air); for multiple voltage applications with lower power but high density requirements
 - Both power contact options are hot-pluggable
- For next generation 1U and 2U pluggable power supplies with higher current density requirements
- Modular tooling design with capability for many combinations of high and low power contacts as well as signal contacts for power control
- High Power contacts of 5.08mm, 6.35mm, 7.62 and customised pitch is available upon request
- Half-bullet guide offers a smaller PCB needed size
- Licensed second-source agreement is already in place (see next slide)
- R/A header, R/A receptacle and vertical receptacle samples from production tooling are available at Q1 of 2012; vertical header samples are available in Q3 2012



Product Development Background

- Licensed from TE MBXLE
- TE and FCI target to be 2nd source to each other to secure the supply to worldwide end equipment manufacturers
- <http://www.te.com/aboutus/news/prodinnov.aspx?id=1675>



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Tyco Electronics and FCI Cross-License MULTI-BEAM XLE Product

05/15/2009

TE announces its MULTI-BEAM XLE power distribution connector family has been licensed with FCI Electronics. Building upon the existing cross-license for MULTI-BEAM XL and PwrBlade connectors, this new license will create a certified second source for the higher performance MULTI-BEAM XLE connectors.

Product Features

- Certified second source
- Up to 20 Amps per linear inch
- Configuration options for power & signal

Applications

- Power Distribution
- High-End Telecom
- Computer
- Industrial



Documentation & Additional Information

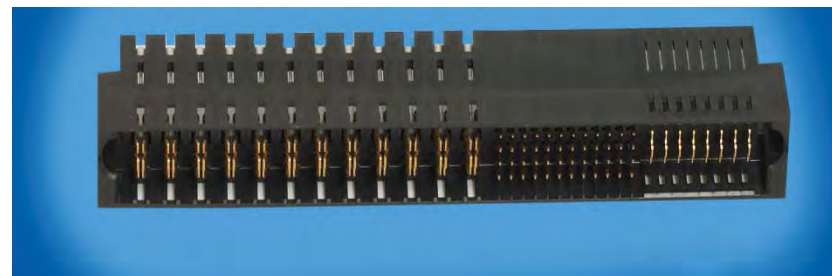
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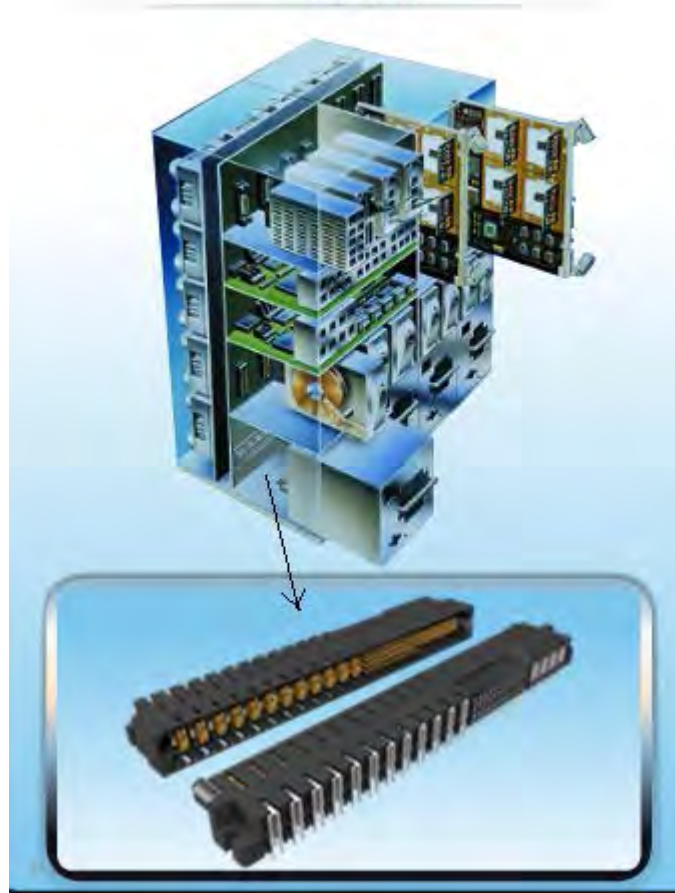
Tyco Electronics announces its MULTI-BEAM XLE power distribution connector family has been licensed with FCI Electronics. Building upon the existing cross-license for MULTI-BEAM XL and PwrBlade connectors in place since 2000, this new license will create a certified second source for the higher performance MULTI-BEAM XLE connectors.



Products PB+	Tail		Configurations
	STB	PF	
R/A HDR	Yes	Yes	P+S+P, S+P, P+S, Only P, Only S
R/A REC	Yes	Yes	P+S+P, S+P, P+S, Only P, Only S
Vtl HDR	Yes	Yes	P+S+P, S+P, P+S, Only P, Only S
Vtl Rec	Yes	Yes	P+S+P, S+P, P+S, Only P, Only S

Product Application 1/3 : Servers

Servers



Product Application 2/3 : Storage

Storage



Front view



Back view



Product Application 3/3 : Switches, Routers, Base Station

Switches

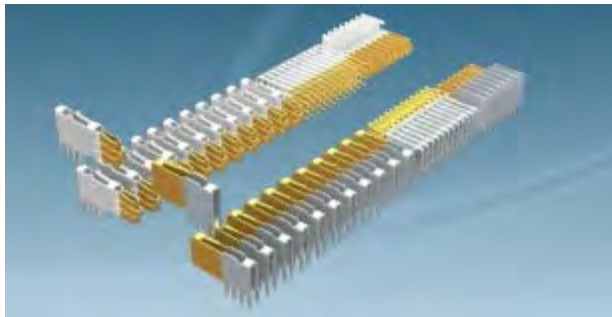


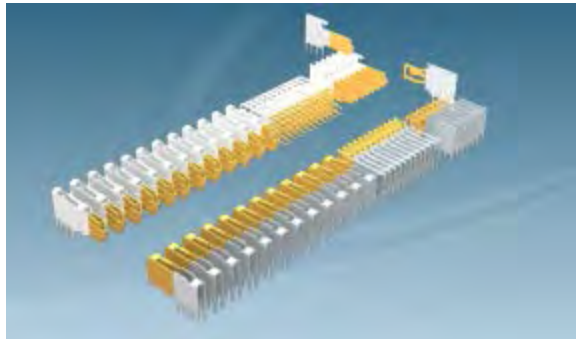
Routers

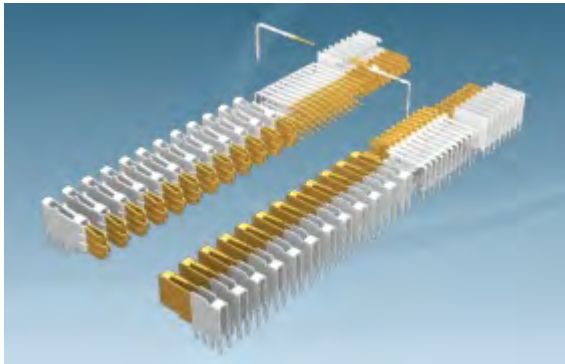


Base station





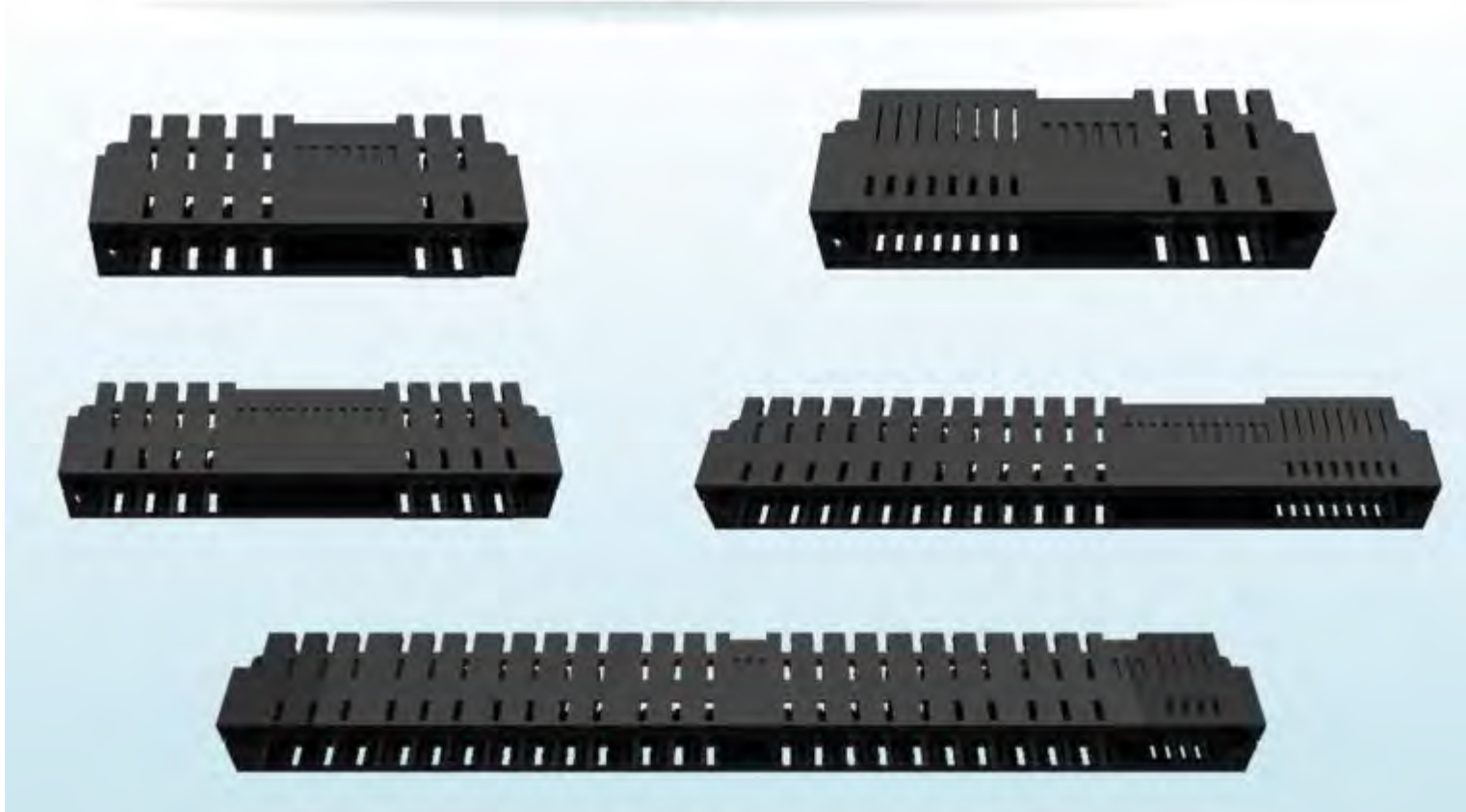




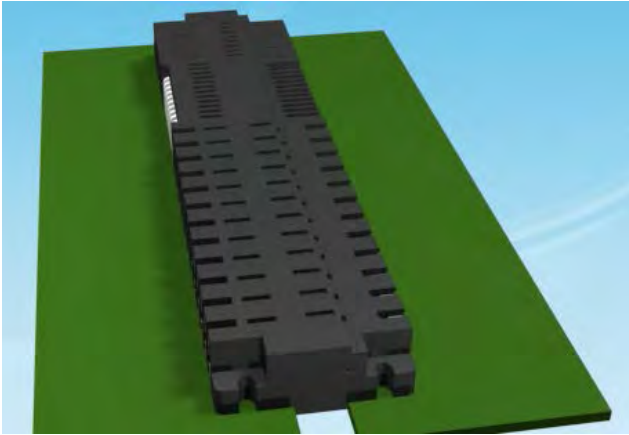
Plastic Housing

Full Modular design for Housing Tooling to meet various kinds of customer requirement for product configurations

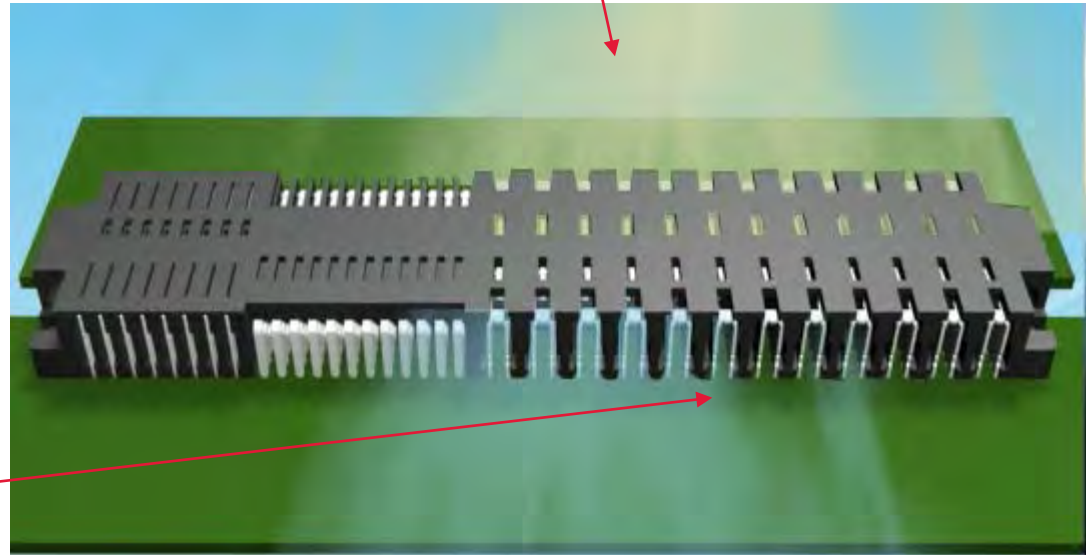
Housing



Special Vent-designed HSG for better heat distribution



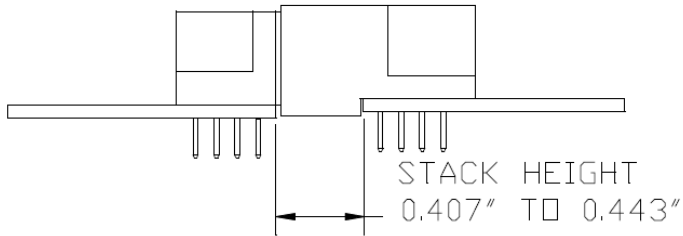
Heat distribution
through and over
the connectors



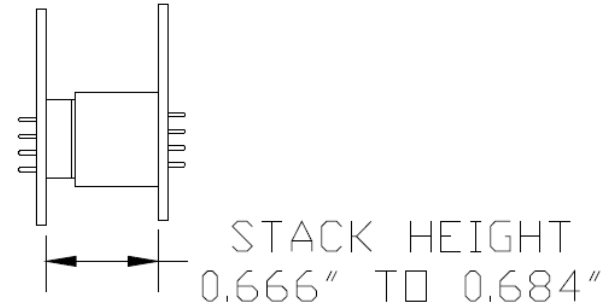
Heat distribution
through and over
the connectors

Mating distance between PCB

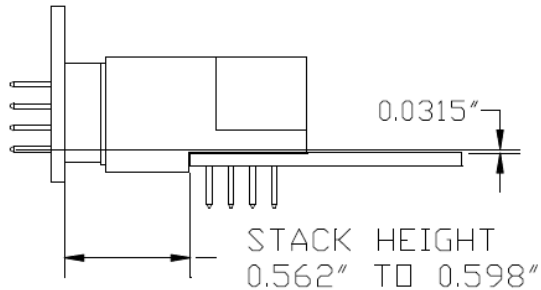
Right-Angle Receptacle to Right-Angle Header



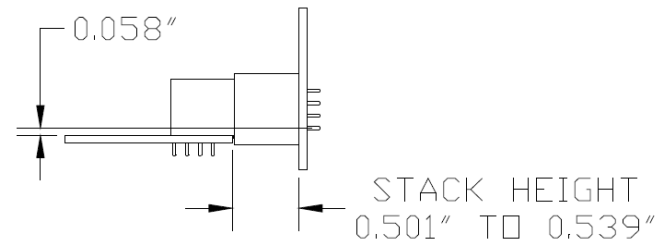
Vertical Receptacle to Vertical Header



Vertical Receptacle to Right-Angle Header



Right-Angle Receptacle to Vertical Header



User PCB thickness guide

FCI recommend connector users to follow the below table guide to choose PCB to have a good application and process.

PC BOARD THICKNESS			
CONNECTOR WITH PRESS-FIT CONTACTS	CONNECTOR WITH SOLDER TYPE CONTACTS		
	2.28 ± 0.40 TAIL LENGTH	3.43 ± 0.40 TAIL LENGTH	4.19±0.40 TAIL LENGTH
1.35 [.053] Min	1.40~1.75 [.055~.069]	2.11~2.62 [.083~.103]	2.92~3.43[.115~.135]

User PCB Soldering

FCI recommend connector users to follow the below table guide to soldering connector onto PCB, by using Tin or Tin-lead solder material, PIP Process requires for Pwrblade Plus Special Part Number.to meet application request

SOLDERING PROCESS	WAVE TEMPERATURE	TIME (At Maximum Temperature)
Wave	265 °C [509°F]	10 Seconds

Pwr Blade+™

Electrical Performance

Right comparison chart here showing how FCI's resistance is actually lower than TE's.

Low Level Contact Resistance (LLCR) – The low level contact resistance shall not exceed
 High Power contacts: 10 milliohm initially and 20milliohm final
 Low Power contacts: 15 milliohm initially and 20milliohm final
 Signal contacts: 20milliohm final
 after environmental exposure when measured in accordance with EIA-364-23 .The following details shall apply,

- Test Voltage – 20 millivolts DC max open circuit volatge.
- Test Current – Not to exceed 100 milliamps.

LLCR at 3rd party joint qualification report				mΩ MAX .
		Spec	FCI/FCI	TE/TE
Group 1	High Power	10	0.3	0.4
		10	0.3	0.9
		10	0.3	0.4
		10	0.3	0.9
Group 2	High Power	10	0.4	0.4
		10	0.4	0.5
Group 4	High Power	10	0.5	1.8
		10	0.8	1.8
Group 5	High Power	10	0.3	0.4
		10	0.3	0.6
		10	0.4	0.9
		10	2.6	2.0
		10	1.8	2.3

Current rating

Note: Connectors are applied to test boards with 10 layers X 2 ounce copper power plane

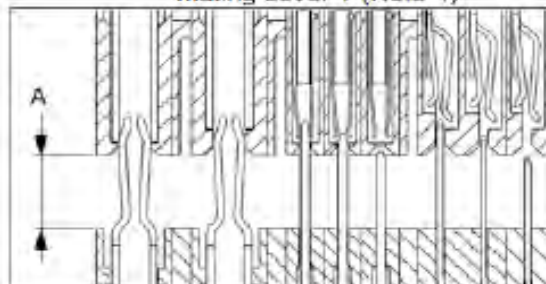
Types	Pitch (mm)	Single Contact	4 adjacent Contacts	8 adjacent Contacts	12 adjacent Contacts
High Power Contact	7.62	75	67	N.A.	N.A.
High Power Contact	6.35	75	63	48	45
High Power Contact	5.08	75	58	45	43
Low Power Contact	2.92	49	28	27	N.A.

Types	Pitch (mm)	Single Contact	24 adjacent Contacts	48 adjacent Contacts
Signal Contact	2.54	3	1.5	1

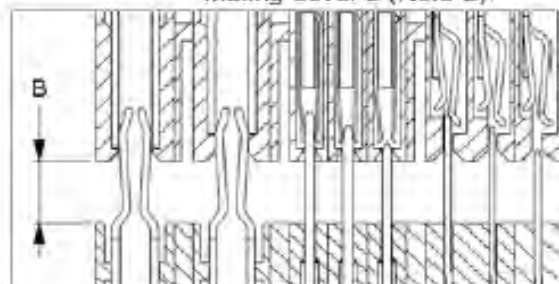
Mating Sequences

High Power Contacts

Mating Level 1 (Note 1)

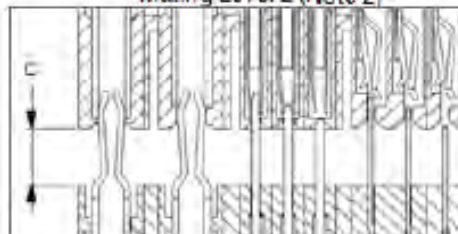


Mating Level 2 (Note 2)

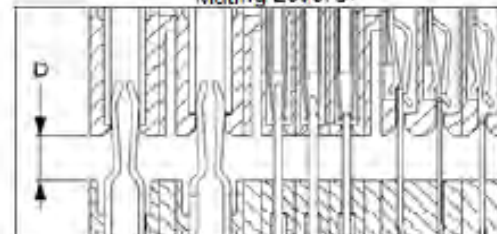


Low Power Contacts and Signal Contacts

Mating Level 2 (Note 2)



Mating Level 3



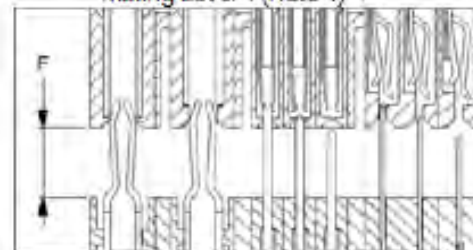
Low Power Contacts

Mating Level 4



Signal Contacts

Mating Level 1 (Note 1)



Note 1 The offset distance between "A" and "F" is not enough to consider these as separate levels

Note 2 The offset distance between "B" and "C" is not enough to consider these as separate levels

Mechanical Performance

- Operating temp : -40 degree C –125 degree C
- Durability : 500cycles
- MFG test : Class-IIA, 14Days Duration

PwrBlade® vs Pwr Blade+™

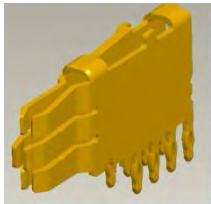
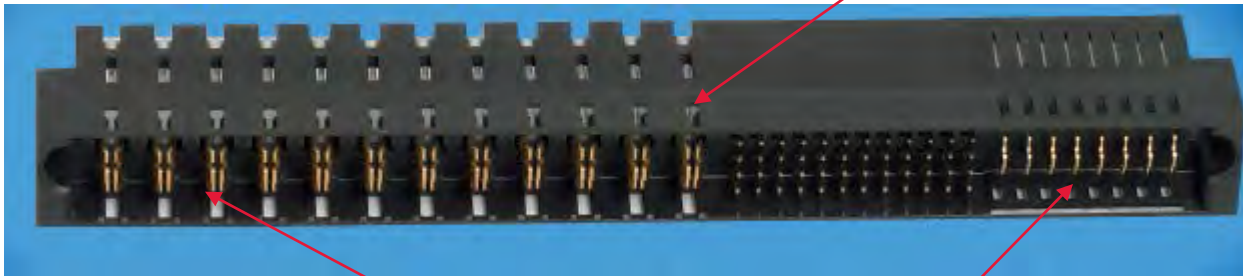
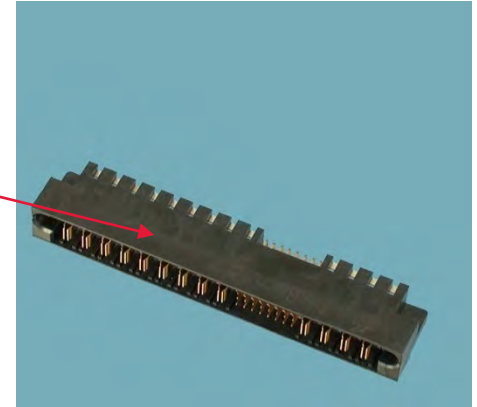


- Pwr blade = TE MBXL Pwr blade Plus=TE MBXLE



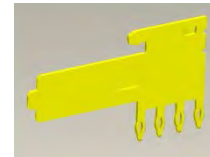
PB=Full Guide pin/post, PB+ is Half

Additional vent
holes on PB+



High Power Pins, 3 beams

Low Power pins



PwrBlade® vs Pwr Blade+™



- Pwr blade = TE MBXL Pwr blade Plus=TE MBXLE

Difference of PB and PB+

Items	PB+	PB
Mating cycles	500	200
Current Performance (30Degree C, still air, 8Ppins at 6.35mm)	48A	30A
End Module	Half	Full
Terminal thickness	PB+ TML thickness 40% more than PB	

Similarities of PB and PB+

Operating temperature: -40 to 125Degree C

Height above PCB

Stack Height

HSG width

Signal pin

Contact pitch same options

LLCR

Contact Resistance

PCB hole size

Material

- The HSG made with glass filled high temp. nylon, UL94V-0
- The Terminal: High Conductivity Copper Alloy
- Hold Down: Copper Alloy
- Platg: Performance based platg for functional area, and SnPb or Sn over Ni for PCB interface

Pwr Blade+™ and TE MBXLE 3rd party testing



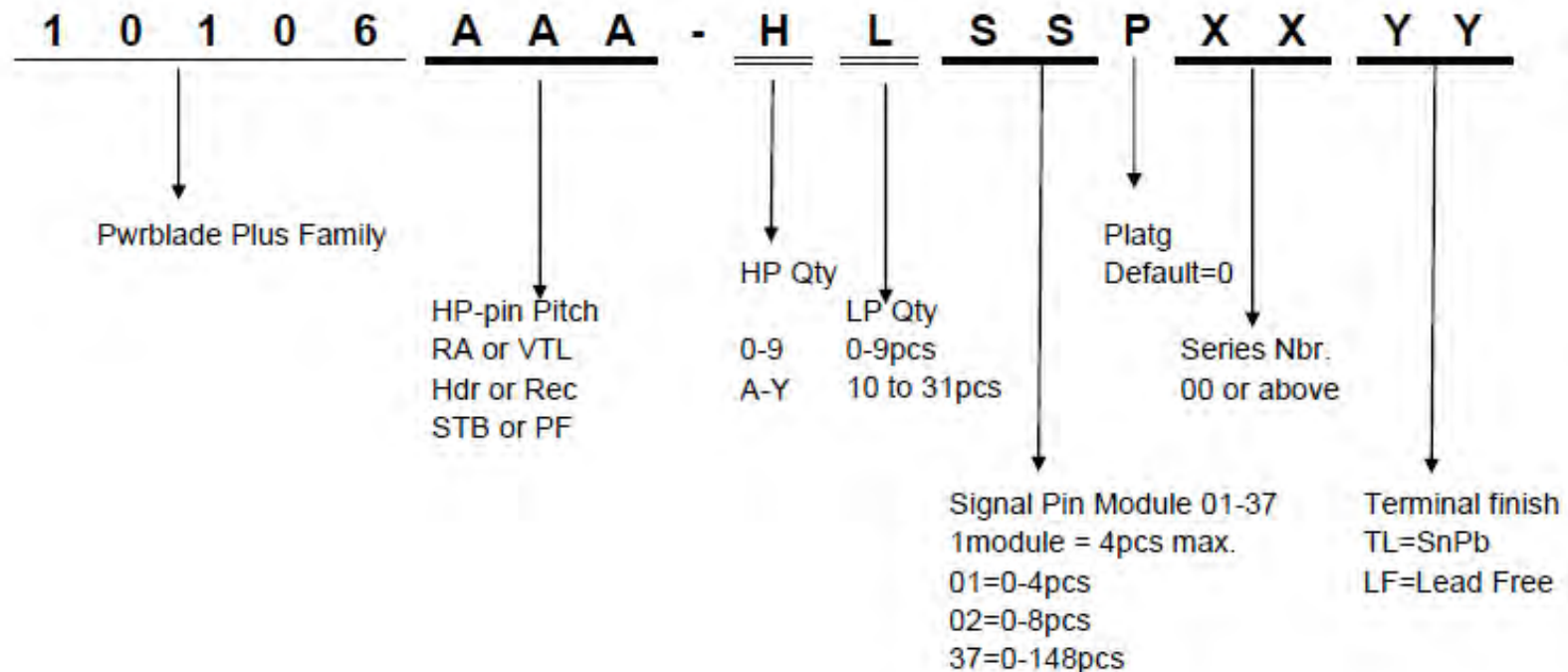
Test and Certificate

- FCI Internal test: done and test report available upon request
- UL: E66906
- Joint test with TE MBXLE: Done, report available upon request
- RoHS compliance: Done, report available upon request
- Industry Standard: EIA-364

Product Key Documents

- Prod Spec. : GS-12-658
- Prod. Application : BUS-20-141

Part Numbers



Up to May, 2013

- 1) We have created PNs total 325
- 2) 160 out of 325 are already been approved by customer and becomes active in GPS for PO in
- 3) FCI is already been in first Inquiry-to position for about 40% inquiries from customers

Part Numbers

Base PN	AAA	High Power Contact Pitch	Right Angle/ Vertical	Header / Receptacle	Solder to Board/ Press Fit
101 06	116	7.62 mm	Right Angle	Header	Solder To Board
	117				Press Fit
	118			Receptacle	Solder To Board
	119				Press Fit
	120		Vertical	Header	Solder To Board
	121				Press Fit
	122			Receptacle	Solder To Board
	123				Press Fit
	124	6.35 mm	Right Angle	Header	Solder To Board
	125				Press Fit
	126			Receptacle	Solder To Board
	127				Press Fit
	128		Vertical	Header	Solder To Board
	129				Press Fit
	130			Receptacle	Solder To Board
	131				Press Fit
	132	5.08 mm	Right Angle	Header	Solder To Board
	133				Press Fit
	134			Receptacle	Solder To Board
	135				Press Fit
	136		Vertical	Header	Solder To Board
	137				Press Fit
	138			Receptacle	Solder To Board
	139				Press Fit
	262	Hybrid design or other customized pitch	Right Angle	Header	Solder To Board
	263				Press Fit
	264			Receptacle	Solder To Board
	265				Press Fit
	266		Vertical	Header	Solder To Board
	267				Press Fit
	268			Receptacle	Solder To Board
	269				Press Fit

Power Blade + @ HPL 552	P/N and Drawing LT	Sample plant LT	Plant mass PO PELT	Quotation
PB RA HDR @ S&OP 5EEF PB RA Rec @ S&OP 5EFF PB Vertical HDR @ S&OP 5EGF PB Vertical Rec @ S&OP 5EHF	3 work days	4~5 wks, and target to meet 2~3wks in the future	5 wks	2 work days

Key contact name	
Technical Inquiry	AP - DON Pwrbld Plus Team
Prod Manager	Daisy Liu
Guardian Engineer	Fancy Zhang
SCM Planner	Qin Liu



THANK YOU

