

NUMBER GS-20-0426	TYPE <b>Application Specification</b>	<b>Amphenol FCI</b>	
TITLE Application Guide for Pwrblade+™ cable Plug and Receptacle		PAGE 1 of 18	REVISION C
		AUTHORIZED BY Sunny Liu	DATE 2020-07-23
		CLASSIFICATION <b>UNRESTRICTED</b>	

## 1.0 OBJECTIVE

This specification provides information and requirements regarding customer application of PwrBlade+™ Connector System. This specification is intended to provide general guidance for application process development. It is recognized that no single application process will work under all customer scenarios and that customers will develop their own application processes to meet their needs. However, if these application processes differ greatly from the one recommended, FCI cannot guarantee results.

## 2.0 SCOPE

This specification provides information and requirements regarding customer application of PwrBlade+™ Connector System. The product possibilities for configuration including:

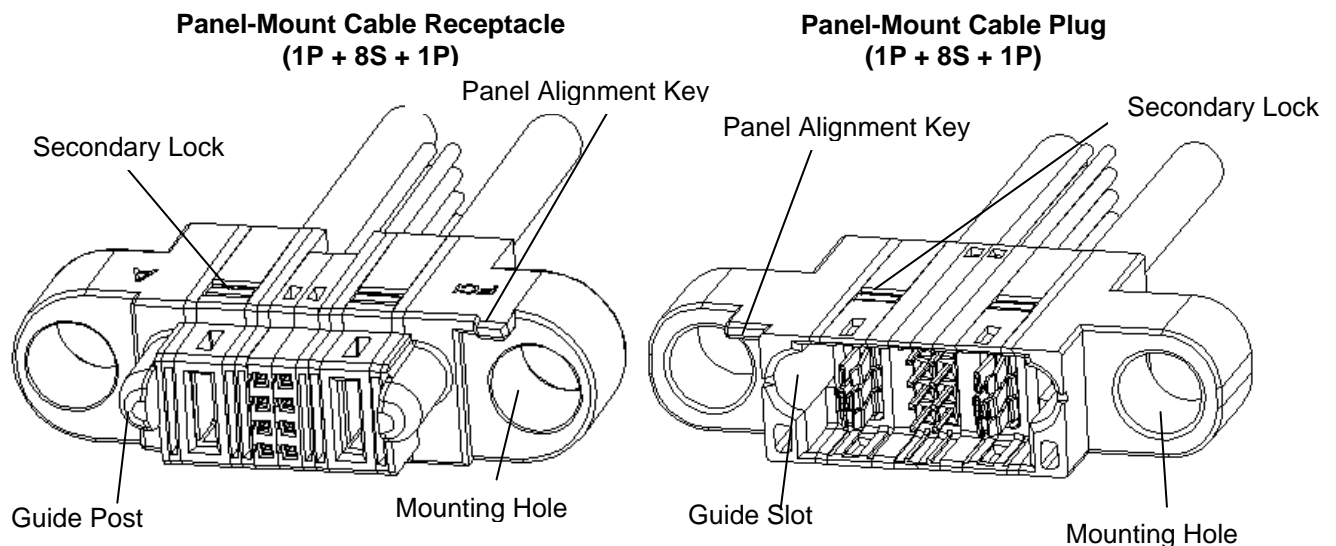
- Panel mount receptacle
- Panel mount plug
- Slide to lock receptacle
- Slide to lock plug
- Squeeze to release receptacle
- Squeeze to release plug

## 3.0 GENERAL

3.1. This document is meant to be an application guide. If there is a conflict between the product drawings and specifications, the drawings take precedence.

### 3.2. CONNECTOR CONFIGURATIONS

The cable are offered in panel-mount for panel-mount applications(refer to Figure 1), squeeze-to-release for free-hanging applications (refer to Figure 2) and slide-to-lock applications(refer to Figure 3)

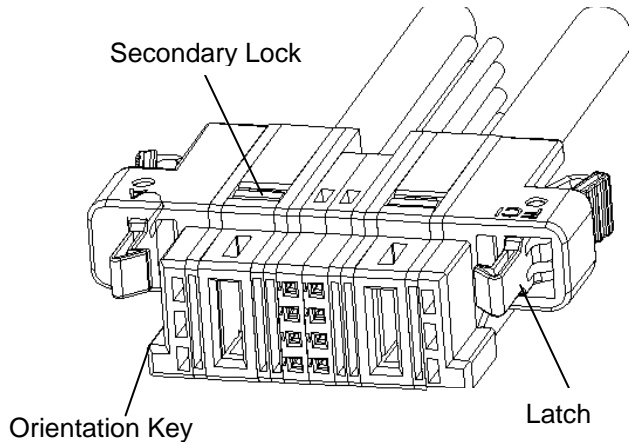


**Figure 1 Panel-Mount Cable**

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**Squeeze-To-Release Cable Receptacle  
(1P + 8S + 1P)**



**Squeeze-To-Release Cable Plug  
(1P + 8S + 1P)**

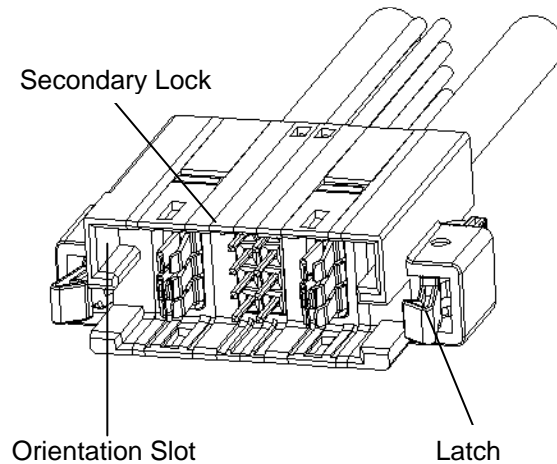
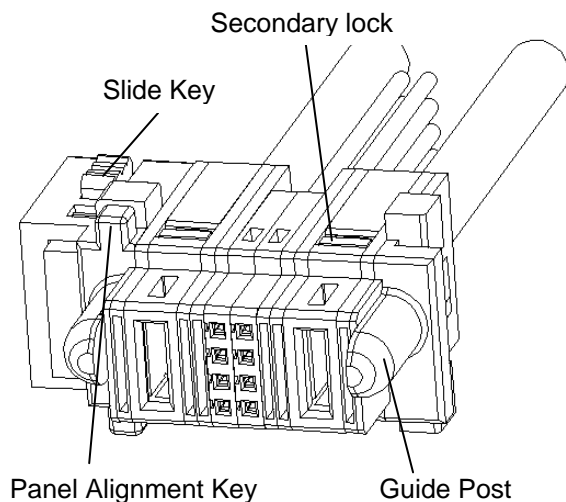


Figure 2 Squeeze-To-Release cable

**Slide-To-Lock Cable Receptacle  
(1P + 8S + 1P)**



**Slide-To-Lock Cable Plug  
(1P + 8S + 1P)**

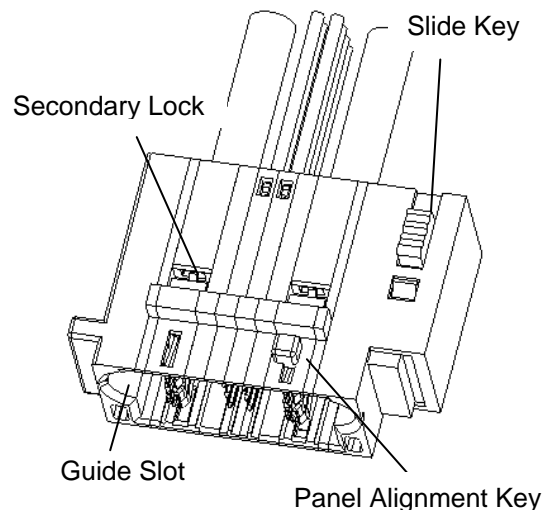


Figure 3 Slide-To-Lock Cable

The amount and location of power and signal contacts is customer determined. The cable receptacle are available with wire sizes 10 through 6 AWG for High power contacts, wire size 12 through 16 for low power contact and wire sizes 26 through 22 AWG for signal contacts, The cable plug are available with wire sizes 14 through 8 AWG for power contacts and wire sizes 26 through 22 AWG for signal contacts, the cable receptacle is capable of holding combinations of power contacts and/or signal contacts within a maximum length of 155 mm between guide posts or squeeze latches.

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For sequencing applications, the cable receptacles are available with standard mating for signal contacts and two mating lengths for power contacts: standard and make-first-break-last (MFBL). Signal contacts have a centerline spacing of 2.54mm. The cable plug are available with standard mating for High power contacts and two mating length signal contacts: standard and make-first-break-last(MFBL). Power contact centerlines spacing according to wire size is given in Table 1.

Wire		power contact pitch
AWG	Insulation Diameter (mm)	
6	8.86 - 7.41	8.89mm
8	5.46 - 6.91	7.62 mm
10	4.47 - 5.46	6.35 mm
12-14	3.96 - 4.47	5.08 mm
12-16	3.05 - 3.96	2.91 mm(receptacle)

**Table1: Power contact pitch offering with wire size**

The panel-mount cable feature have panel alignment key, mounting holes and guide posts. The panel alignment key ensures proper orientation of the cable to the panel. The mounting holes are used to secure the cable to the panel. The guide posts provide ease of mating and offset to prevent improper mating of connectors.

The squeeze-to-release cable feature have mating alignment keys to ensure proper orientation of connectors when mating, and squeeze latches to ensure that mating connectors do not be separated.

The slide-to-lock cable feature has slide key, panel alignment key, mounting holes and guide posts. The panel alignment key ensures proper orientation of the cable to the panel. The slide key is used to secure the cable to the panel. The guide posts provide ease of mating and offset to prevent improper mating of connectors.

#### 4.0 DRAWINGS AND APPLICABLE DOCUMENTS

- FCI PRODUCT SPECIFICATION GS-12-1267
- FCI PRODUCT DRAWINGS

Product drawings and FCI's **GS-12-1267** Product Specification are available at [www.fci.com](http://www.fci.com). In the event of a conflict between this application specification and the drawing, the drawing will take precedence. Customers are advised to refer to the latest revision level of FCI product drawings for appropriate details.


#### 5.0 REQUIREMENT FOR CUSTOMERS

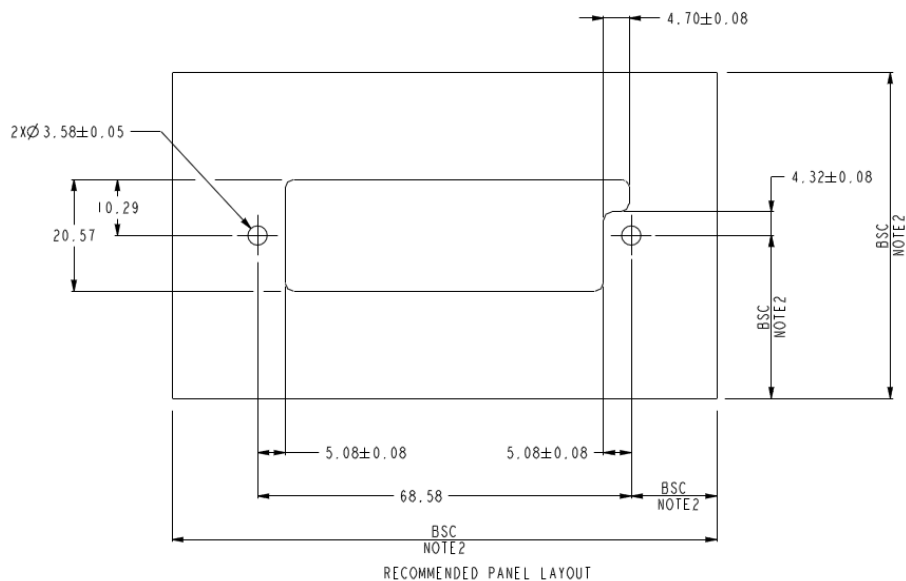
##### 5.1. Panel-Mount Cable

###### 5.1.1. Panel For Panel-Mount Cable

The panel thickness range for the panel-mount cable shall be 0.79mm through 2.54mm.

The cutout of the panel must refer the dimensions provided on the customer drawing for the specific cable (refer to Figure 4).

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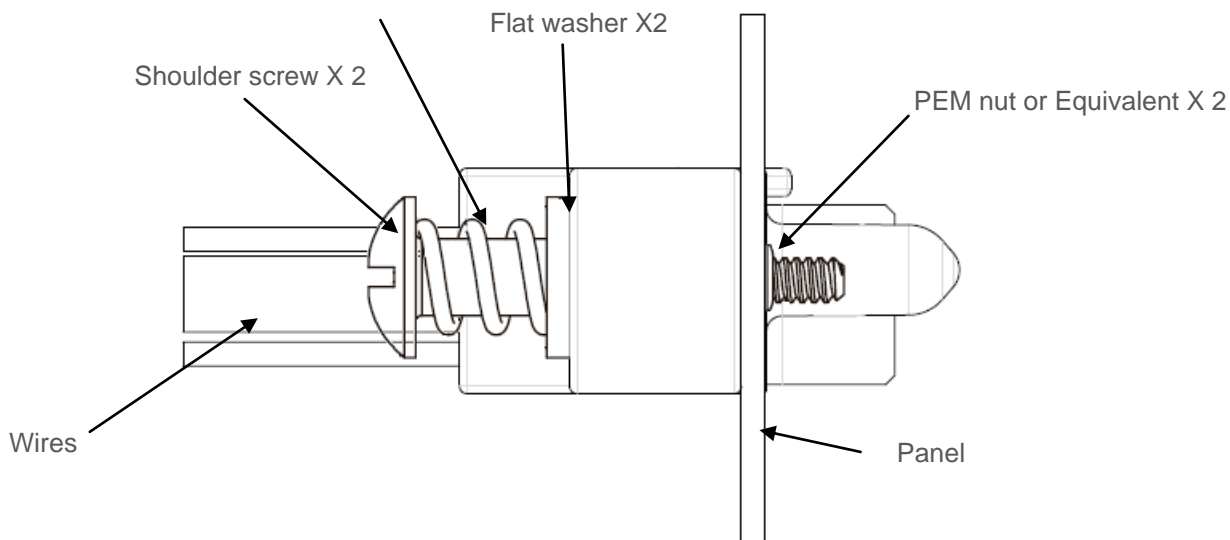
NOTES  
 1. PANEL THICKNESS: 0.79-2.54mm  
 2. DATUM AND BASIC DIMENSIONS WERE ESTABLISHED BY CUSTOMER.

**Figure 4 10128858-004(6P+16S) layout**

### 5.1.2. Panel Mounting Of Panel-Mount Cable


The panel-mount cable is designed to be panel mounted by using two shoulder screws, compression springs and flat washers. Screw can refer 10091213-001; spring can refer 10091213-016; washer can refer 10091213-002, the assembly drawing refer figure 5.

Compression spring X2



**Figure 5 Panel-Mount Cable**

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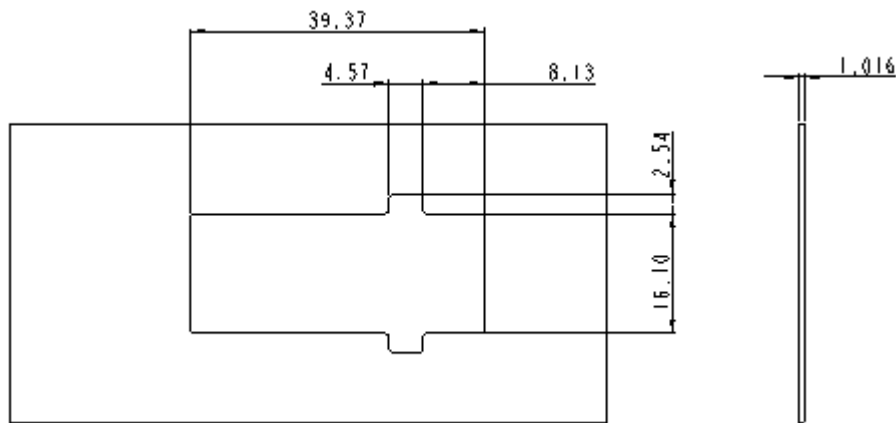
The PMT cable is mounted to the panel by matching the panel alignment keys with the vertical notch in the panel cutout. When secured to the panel, the panel-mount floats in the cutout with  $\pm 1.52$  mm in horizontal, vertical and back-and-forth directions.

## 5.2. Slide-To-Lock Cable

### 5.2.1. Panel For Slide-To-Lock Cable

The panel thickness range for the slide-to-lock panel mount cable shall be  $1.02 \pm 0.10$ mm.

The cutout of the panel must refer the dimensions provided on the customer drawing for the specific cable (refer to Figure 6 ).

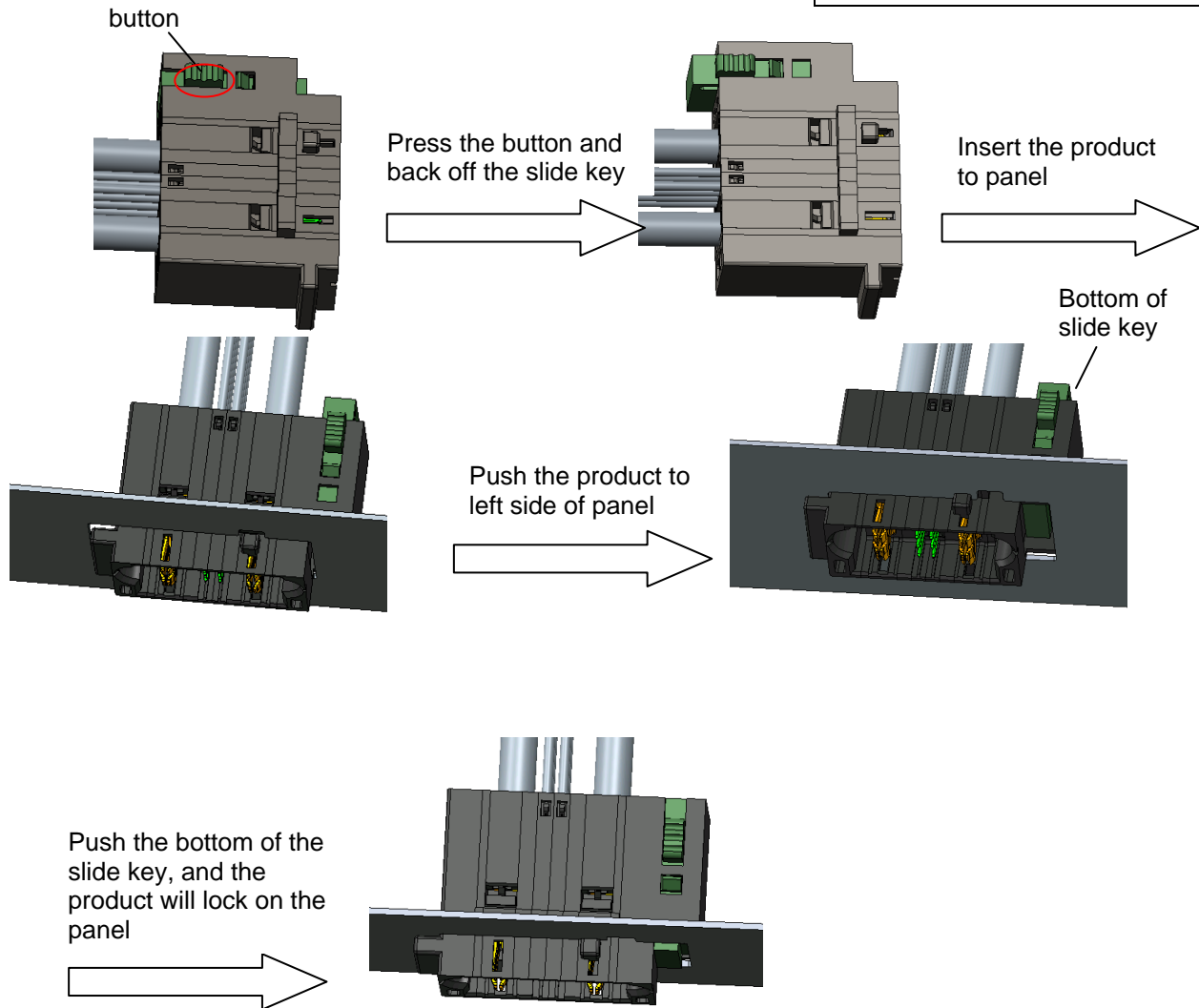


**Figure 6 Recommended Panel Cutout(10128882-002)**

### 5.2.2. Panel Mounting Of Slide-To-Lock Cable

The slide-to-lock cable is designed to be panel mounted by sliding slide key . When secured to the panel, the cable floats in the cutout with  $\pm 0.75$  mm in horizontal and vertical directions, and the Slide lock cable mounting panel as bellow flow chart

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## 6.0 Connector Mating

Connectors should be handled only by the housing to avoid deformation, contamination, or damage to the contacts.

### 6.1 Polarization

For connectors with guides, polarization is provided by matching the guides of mating connectors.

For connectors with latch receivers, polarization is provided by matching the mating alignment keys with the key slots of mating connectors.

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## 6.2 Mating Force

The maximum amount of mating force per contact is given in Table 2

CONTACT	MAXIMUM MATING FORCE PER CONTACT
High Power	5N [18 ounce]
Low power	2N [7.2 ounce]
Signal	1N [3.6 ounce]

Table 2

## 6.3 Mating Length

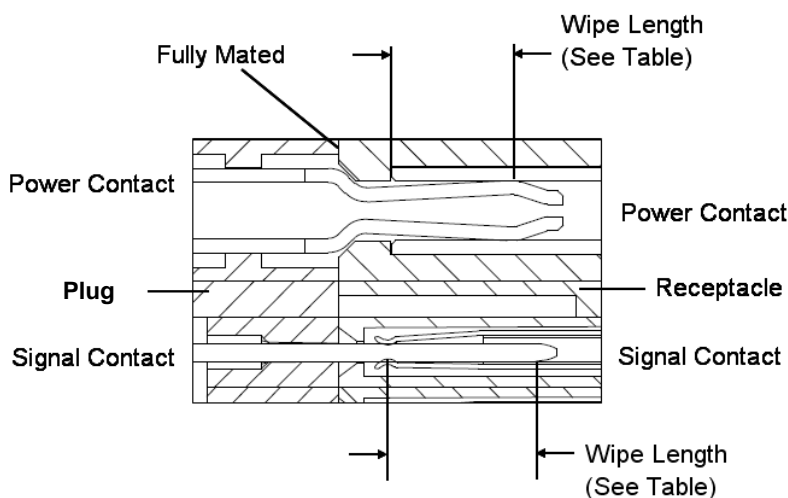
Contact mating lengths available for the connectors are listed in Figure 13.

CONNECTOR	CONTACT MATING LENGTH		
	High Power Contact	Low Power Contact	Signal Contact
Receptacle	Standard and MFBL(Pre-Mate)	Standard	Standard
Plug	Standard	Standard, MFBL, and MLBF(Post Mate)	Standard, MFBL, and MLBF

Table 3

### 6.3.1 Wipe Length

The wipe length at the level of mating for power and signal contacts is listed in Figure 7.



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Configuration of PwrBlade+ Cable Receptacle mated with PwrBlade+ Board Connector Plug

CONTACT	MATING LENGTH	MATING LEVEL	NOMINAL WIPE LENGTH
High Power	MFBL (Pre-Mate)	1	5.30[.209]
	Standard	2	4.35[.171]
Low Power	MFBL (Pre-Mate)	2	4.75[.187]
	Standard	3	3.60[.142]
	MLBF (Post Mate)	4	2.00[.079]
Signal	Standard	2	4.75[.187]
	MLBF (Post Mate)	3	3.60[.142]
	MLBF2 (Post Mate)	4	2.50[.098]

Figure 7A

Configuration of PwrBlade+ Cable Plug mated with PwrBlade+ Board Connector Receptacle

CONTACT	MATING LENGTH	MATING LEVEL	NOMINAL WIPE LENGTH
High Power	MFBL (Pre-Mate)	1	5.30[.209]
	Standard	2	4.35[.171]
Low Power	MFBL (Pre-Mate)	2	4.75[.187]
	Standard	3	3.60[.142]
	MLBF (Post Mate)	4	2.00[.079]
Signal	Standard	3	3.50[.138]
	MLBF (Post Mate)	4	2.23[.088]

Figure 7B

Configuration of PwrBlade+ Cable mated with PwrBlade+ Cable

CONTACT	MATING LENGTH	MATING LEVEL	NOMINAL WIPE LENGTH
High Power	MFBL (Pre-Mate)	1	5.30[.209]
	Standard	2	4.35[.171]
Low Power	MFBL (Pre-Mate)	2	4.75[.187]
	Standard	3	3.60[.142]
	MLBF (Post Mate)	4	2.00[.079]
Signal	Standard	3	3.50[.138]
	MLBF (Post Mate)	4	2.23[.088]

Figure 7C

### 6.3.2 Sequencing

The connectors provide sequencing among contacts with 4 mating levels. The offset distance, measured from the receptacle mating face to the plug mating face at the point of electrical engagement, depends on the contact (power or signal) and mating length (standard, MFBL, or MLBF) of the mating connectors. The offset distance at the level of mating for power and signal contacts is listed in Figure 8.



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Configuration of PwrBlade+ Cable Receptacle mated with PwrBlade+ Board Connector Plug

CONTACT	MATING LENGTH	MATING LEVEL	OFFSET DISTANCE	
			Dimension	Nominal
High Power	MFBL (Pre-Mate)	1	A	5.30 [.209]
	Standard	2	B	4.35 [.171]
Low Power	MFBL (Pre-Mate)	2	C	4.75 [.187]
	Standard	3	D	3.60 [.142]
	MLBF (Post Mate)	4	E	2.00 [.079]
Signal	Standard	2	C	4.75 [.187]
	MLBF (Post Mate)	3	D1	3.60 [.142]
	MLBF2 (Post Mate)	4	D2	2.50 [.098]

Configuration of PwrBlade+ Cable Plug mated with PwrBlade+ Board Connector Receptacle

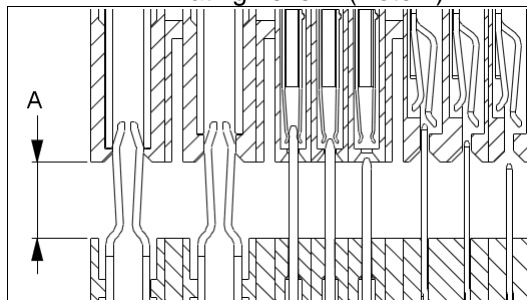
CONTACT	MATING LENGTH	MATING LEVEL	OFFSET DISTANCE	
			Dimension	Nominal
High Power	MFBL (Pre-Mate)	1	A	5.30 [.209]
	Standard	2	B	4.35 [.171]
Low Power	MFBL (Pre-Mate)	2	C	4.75 [.187]
	Standard	3	D	3.60 [.142]
	MLBF (Post Mate)	4	E	2.00 [.079]
Signal	Standard	2	C	3.50 [.138]
	MLBF (Post Mate)	3	D	2.23 [.088]

Configuration of PwrBlade+ Cable mated with PwrBlade+ Cable

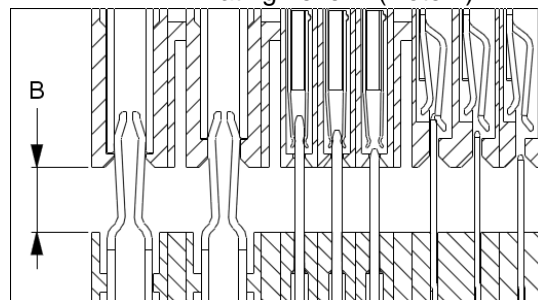
CONTACT	MATING LENGTH	MATING LEVEL	OFFSET DISTANCE	
			Dimension	Nominal
High Power	MFBL (Pre-Mate)	1	A	5.30 [.209]
	Standard	2	B	4.35 [.171]
Low Power	MFBL (Pre-Mate)	2	C	4.75 [.187]
	Standard	3	D	3.60 [.142]
	MLBF (Post Mate)	4	E	2.00 [.079]
Signal	Standard	2	C	3.50 [.138]
	MLBF (Post Mate)	3	D	2.23 [.088]

**High Power Contacts**

Mating Level 1 (Note 1)



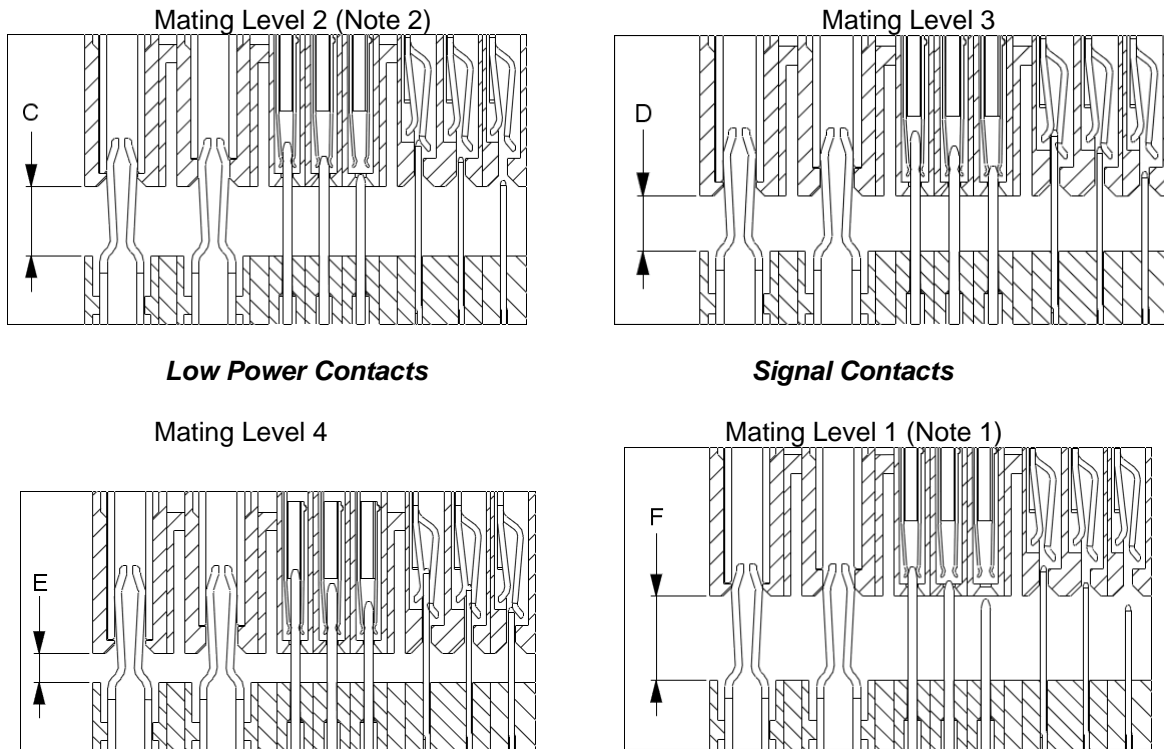
Mating Level 2 (Note 2)



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### **Low Power Contacts and Signal Contacts**



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.

Figure 8

### **6.3.3 Misalignment**

When mating connectors, side-to-side and up-and-down misalignment is allowed to the dimensions given in Figure 9. There is no misalignment for connectors with latch receivers.

(Connectors with guides should be used in applications requiring blind mating. Connectors with latch receivers and connectors without guides should not be used in applications requiring blind mating.)

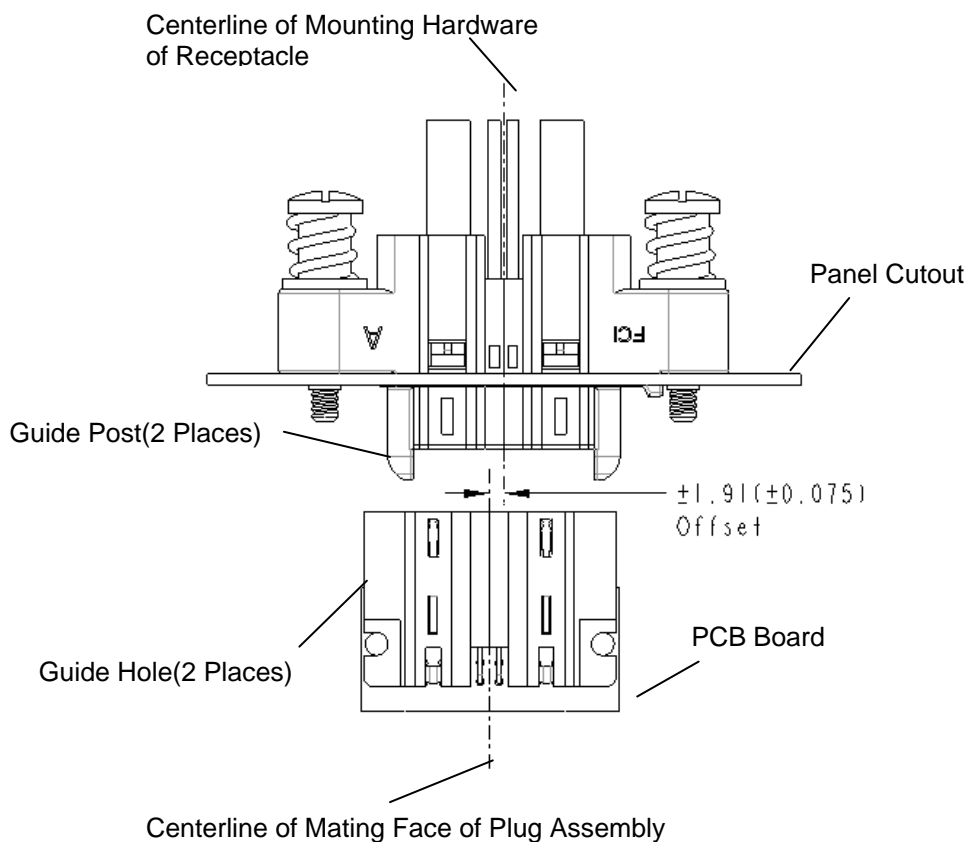
#### Misalignment for Connectors With Guides

The connectors can be misaligned nominally by  $\pm 1.91\text{mm}$  [ $\pm 0.075$ ”] in the X and Y direction.

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### Side-to-Side



### Up-and-Down

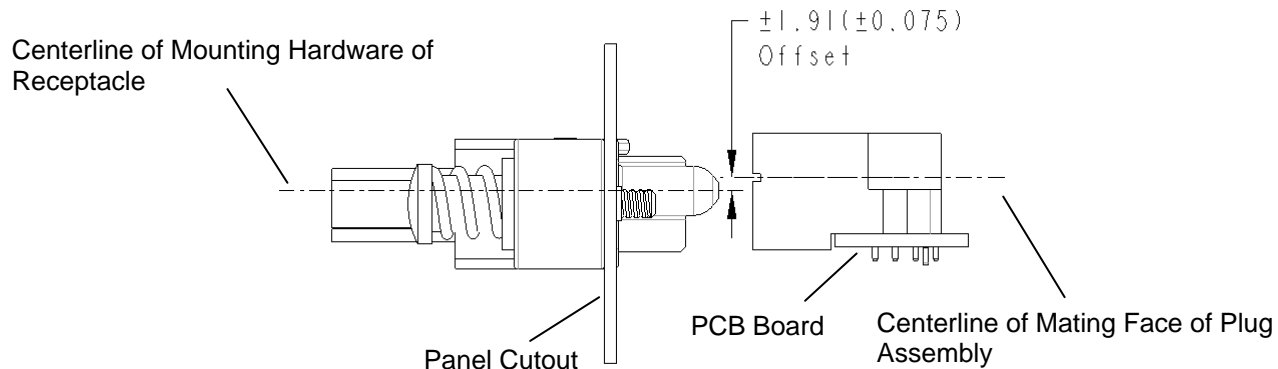


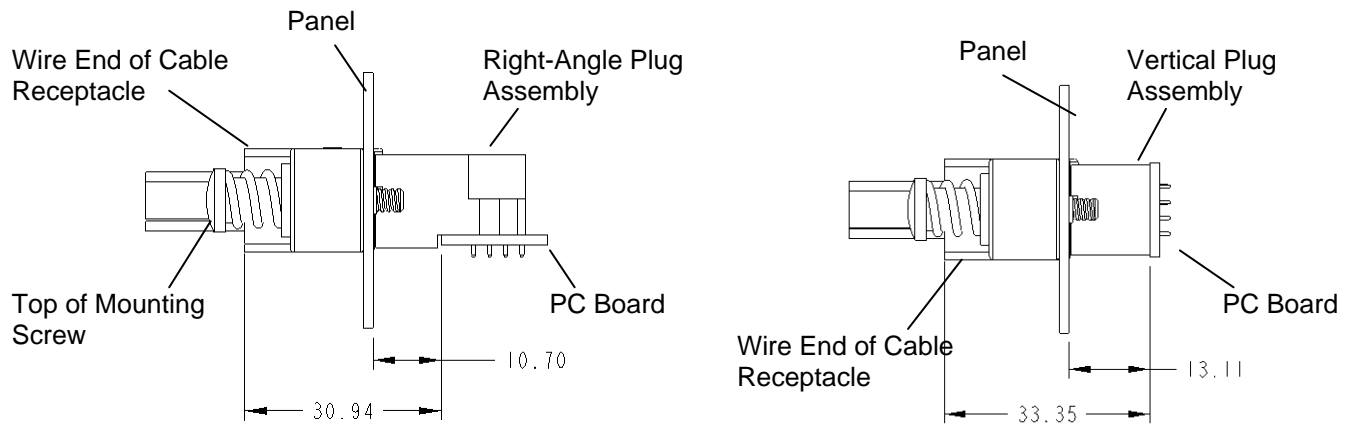
Figure 9

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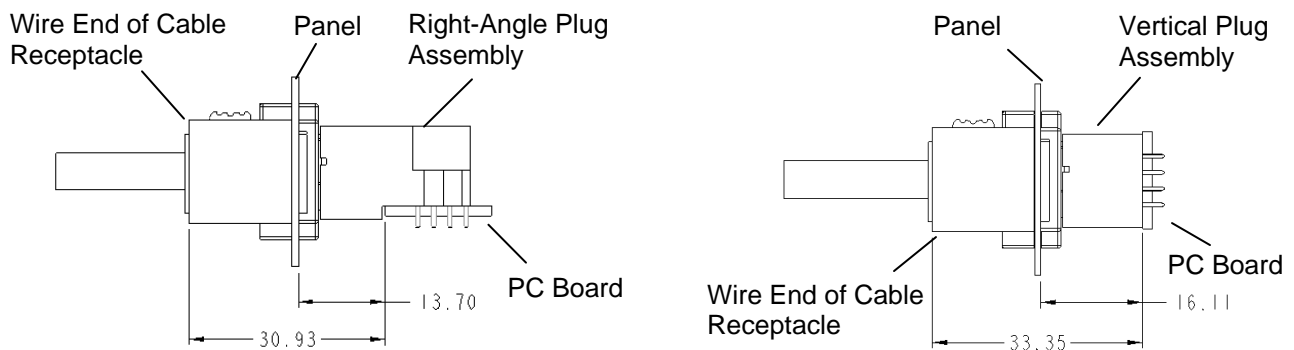
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## 6.4 Dimension

The required nominal mating dimension is provided in Figure10~16.



**Figure 10 Panel-Mount Cable Receptacle**

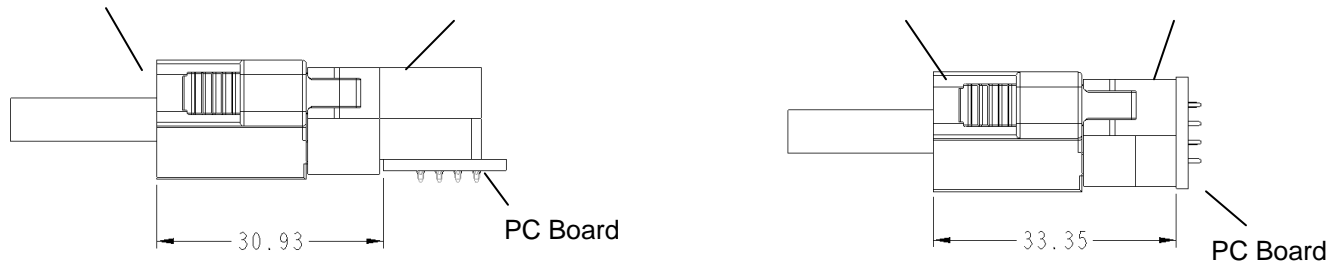


**Figure 11 Slide to lock Cable Receptacle**

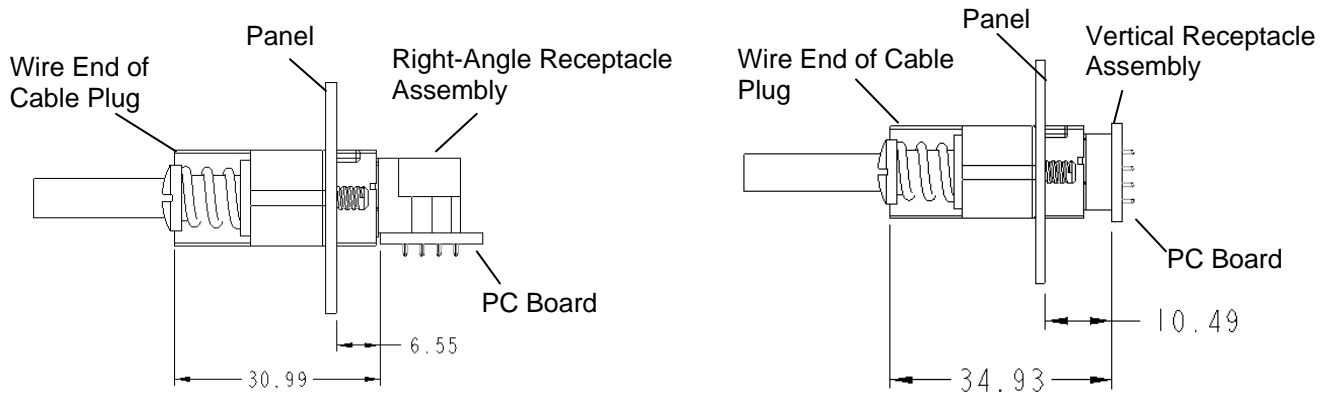
~~Wire End of Cable Receptacle~~      ~~Right-Angle Plug Assembly~~      ~~Wire End of Cable Receptacle~~      ~~Vertical Plug Assembly~~

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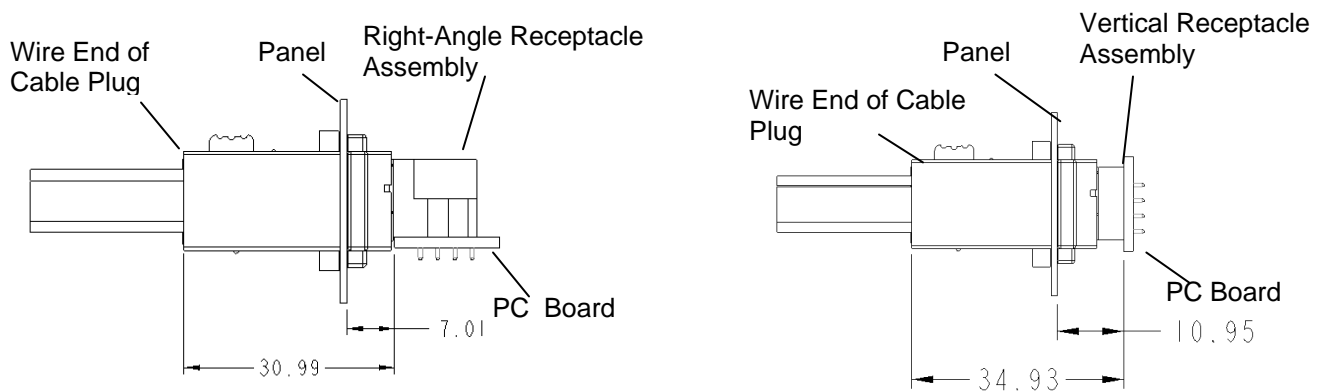
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**Figure 12 Squeeze-to-release Cable Receptacle**



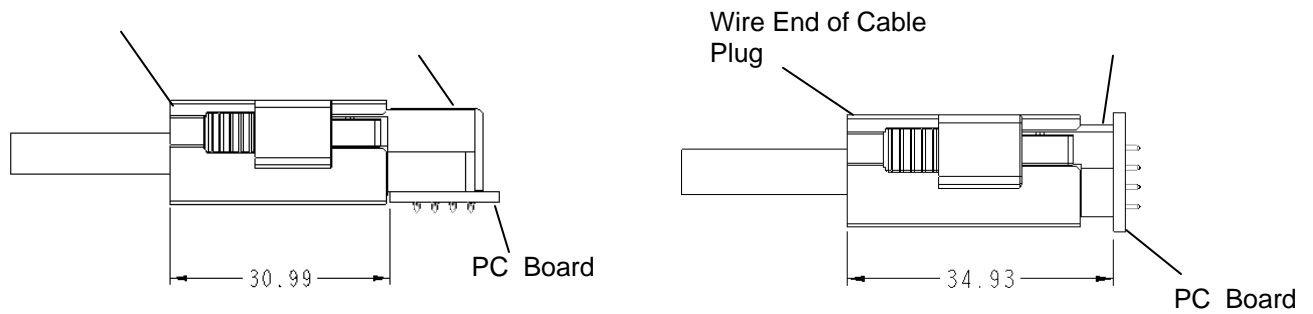
**Figure 13 Panel Mount Cable Plug**



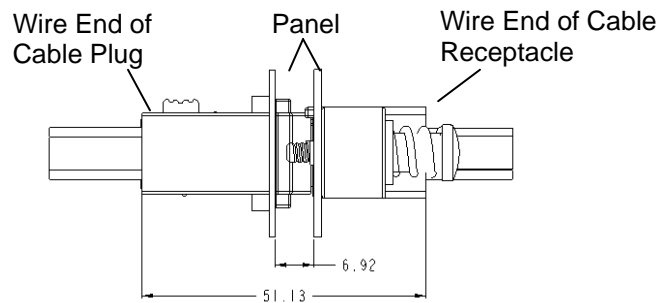
**Figure 14 Slide-To-Lock Cable Plug**

Wire End of Cable Plug Right-Angle Receptacle Assembly Vertical Receptacle Assembly  
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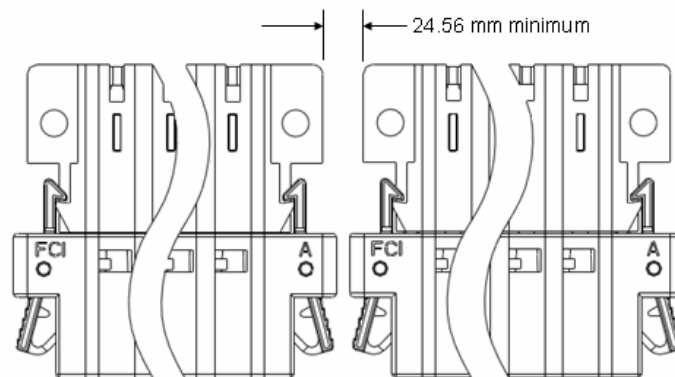
**Figure 15 Squeeze-To-Release Cable Plug**



**Figure 16 cable mate with cable**

### 6.5 Recommended spacing

Between adjacent board connectors which can receive cable connectors with latches. Refer to Figure 17.



**Figure 17**

### 6.6 Connector Unmating

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The minimum amount of unmating force per contact is given in Figure 18.

CONTACT	MINIMUM UNMATING FORCE PER CONTACT
High Power	2.2N [8 ounce]
Low Power	0.5N [1.8 ounce]
Signal	0.2N [0.64 ounce]

Figure 18.

## 7.0 Latch Strength

Retention to Housing - Individual latch shall withstand an axial load of 65 N minimum.

Latch strength after cable connector mating to board connector without contacts shall withstand an axial load of 85 N minimum.

## 8.0 Removal from Panel

Connector must be unmated before removal from panel.

### a. Floating Panel-Mount Cable Plug and Receptacle

The mounting hardware must be loosened from the panel before the cable plug or receptacle can be removed from the panel.

### b. Slide-to Lock Cable Plug and Receptacle

The slide key of the cable plug or receptacle must be disengaged from the panel, then the cable plug or receptacle slid sideways away from the single-notched edge of the panel cutout. The panel alignment keys must align with the vertical notches in the panel cutout before the cable plug or receptacle can be removed from the panel. Refer to Figure 19 as example.

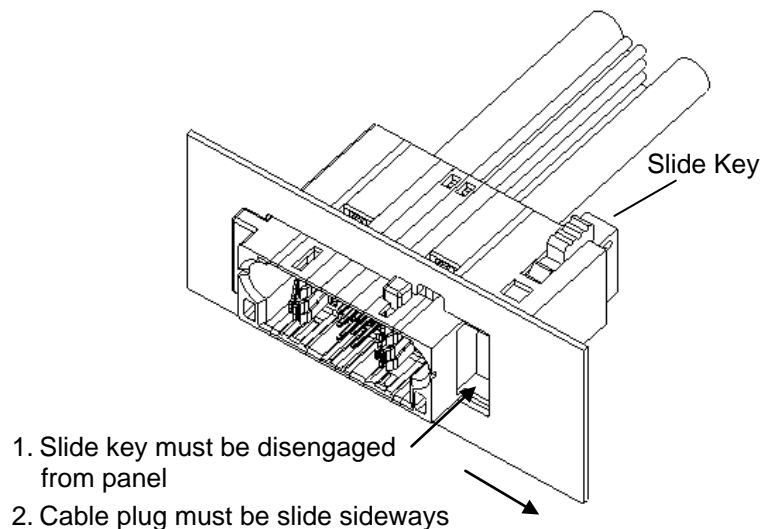


Figure 19

## 9.0 Repair

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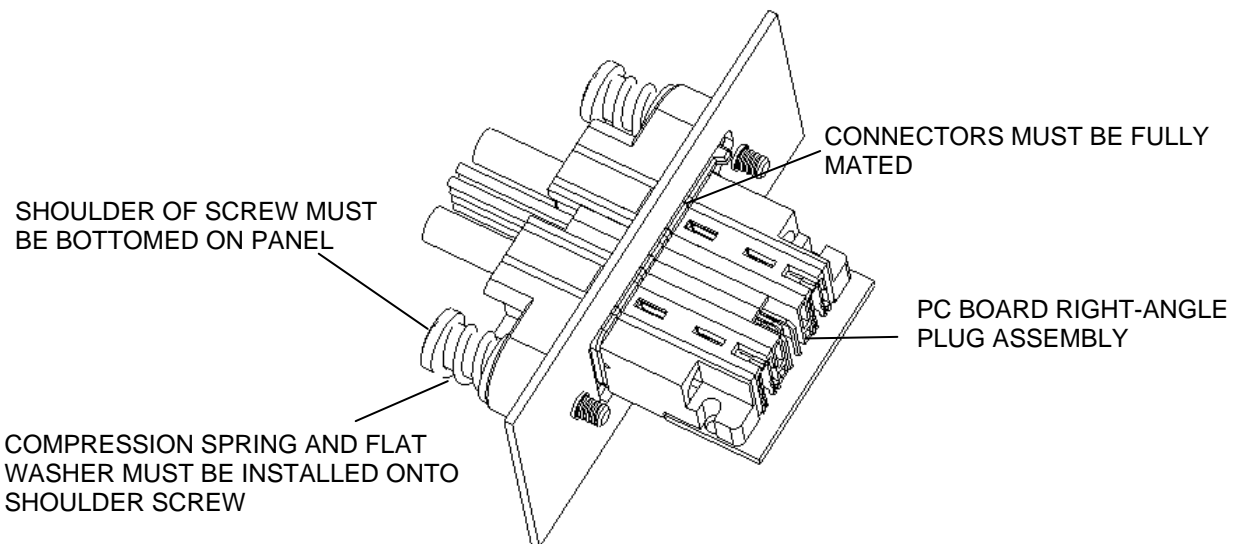
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Damaged or defective cable receptacles must not be used. Wires MUST NOT be removed from the connector.

## 10.0 Visual Aid

The illustration below shows a typical application of PwrBlade+ cable receptacle and plug assemblies. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

### FLOATING PANEL-MOUNT CABLE RECEPTACLE

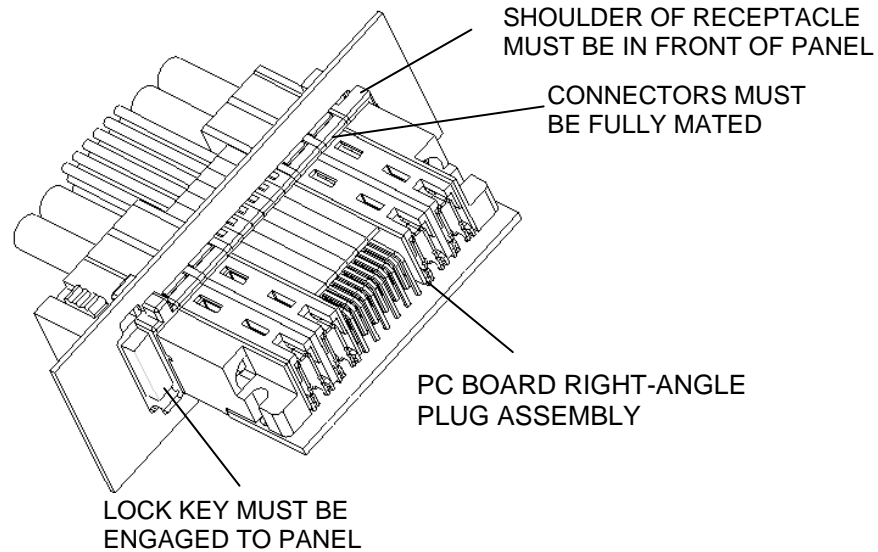


FLOATING PANEL-MOUNT CABLE PLUG IS THE SAME AS RECEPTACLE.

### SLIDE-TO LOCK CABLE RECEPTACLE

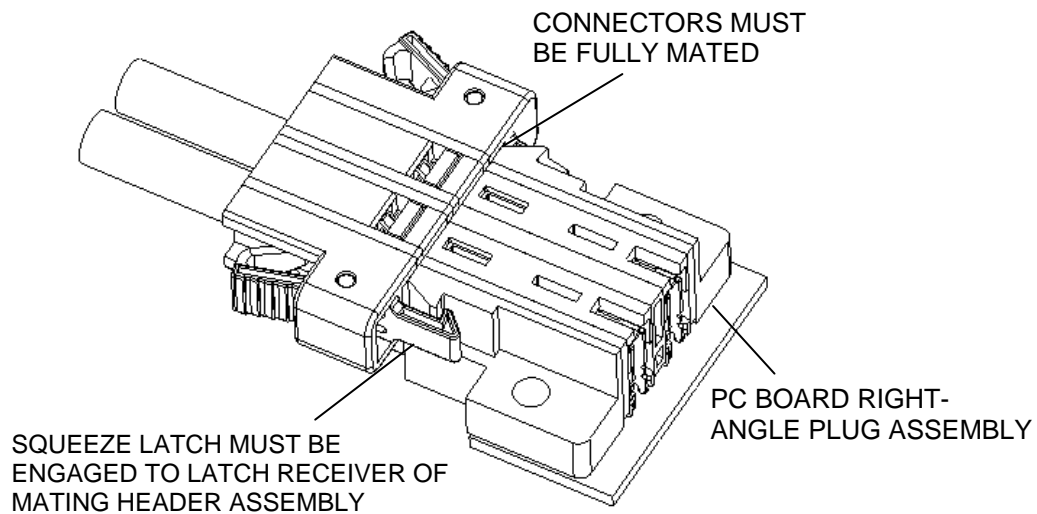


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		CLASSIFICATION <b>UNRESTRICTED</b>	



SLIDE-TO-LOCK CABLE PLUG IS THE SAME AS RECEPTACLE.

**SQUEEZE-TO-RELEASE CABLE RECEPTACLE**



SQUEEZE-TO-RELEASE CABLE PLUG IS THE SAME AS RECEPTACLE.

REV	PAGE	DESCRIPTION	EC #	DATE
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A	ALL	Initial release	-	2015-03-24
B	15,16	Add 8.0, 9.0 and 10.0	-	2016-02-26
C	8.9	Add “Cable plug mated with board connector receptacle/figure 7B&7C” and “Cable mated with cable/figure 7B&7C” in section 6.3.1 and 6.3.2	-	2020-07-23

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