

NUMBER GS-20-0488	TYPE Application Specification	Amphenol FCI	
TITLE Application Guide for Enhanced High Power Card Edge (eHPCE®) Vertical Receptacle Connector		PAGE 1 of 8	REVISION A
		AUTHORIZED BY Andy Lu	DATE Jul 2, 2019
		CLASSIFICATION UNRESTRICTED	

1.0 OBJECTIVE

This specification provides information and requirements regarding customer application of eHPCE® Vertical Connector. 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, Amphenol cannot guarantee results.

2.0 SCOPE

This specification provides information and requirements regarding customer application of eHPCE® Vertical Connector to printed circuit boards (PCB).

3.0 GENERAL

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

Table 1

Enhanced High Power Card Edge	Vertical Receptacle, Solder Tail
	Vertical Receptacle, Press-fit Tail

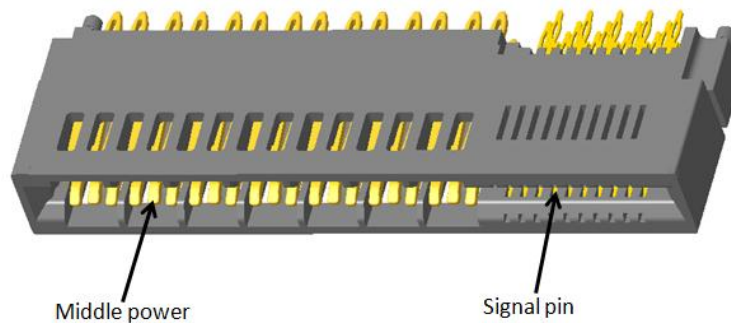


Figure 1

eHPCE® Connector Configuration **14 Middle power + 20 Signal** as shown
(One Middle power has three contact beams and two tails)

4.0 DRAWINGS AND APPLICABLE DOCUMENTS

- Product Specification: GS-12-1380
- Product Drawings: 10140903 10143917, 10139482, 10141274, 10142907, 10144129 etc.

Product drawings and GS-12-1380 Product Specification are available at www.amphenol-icc.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 product drawings for appropriate details.

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5.0 APPLICATION REQUIREMENTS

5.1 Product Application

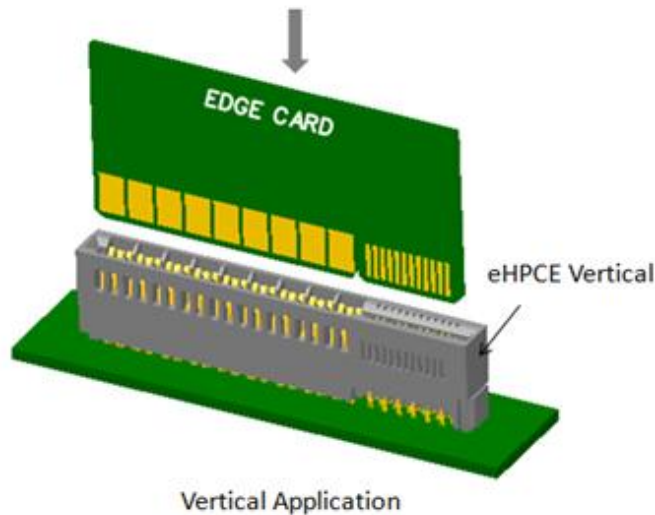


Figure 2

eHPCE® has two options for connection to Printed Circuit Boards -- Press Fit and Solder to Board, available as follows:

Table 2

Product Configuration	Solder Tail	Press fit Tail
eHPCE® Vertical Receptacle	YES	YES

eHPCE® Solder to Board power and signal contacts are compatible with wave soldering process. They are versatile with many configurations to fit the individual needs of the client; the maximum length of connector is 100mm.

5.2 Wipe Distance and Contact Sequencing

Recommended minimum wipe is 3.0mm for both signal contact and power contact, the nominal wipe distance of the signal contact is shorter than the power contact by 1.05mm.

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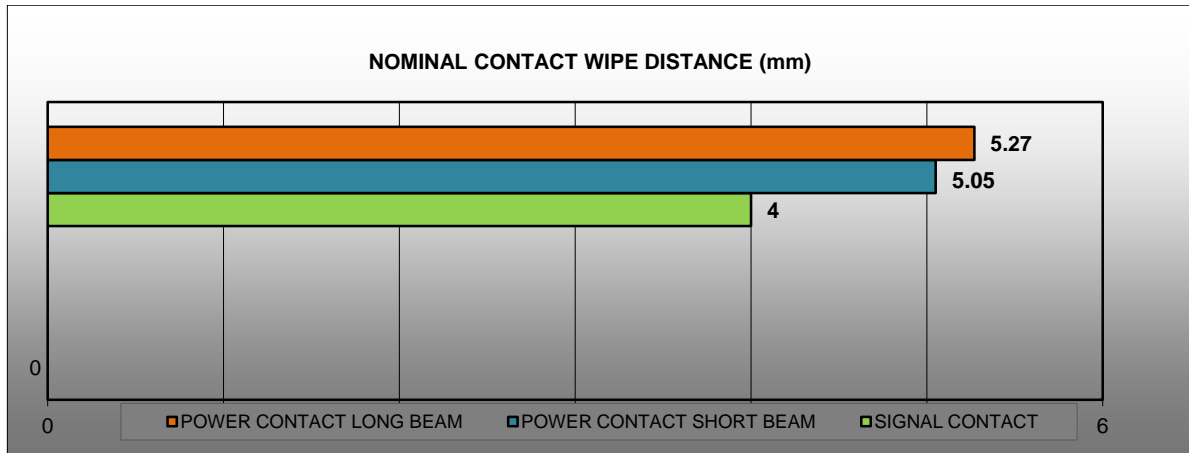


Figure 3

5.3 Mating Alignment

eHPCE® vertical connector design has not included a guide system therefore the design is not for a blind mate application. The mis-alignment allowance of the eHPCE® product is depended on the condition of the connector system and the chamfer of the edge card. Please see figure 4 and table 3 for explanation.

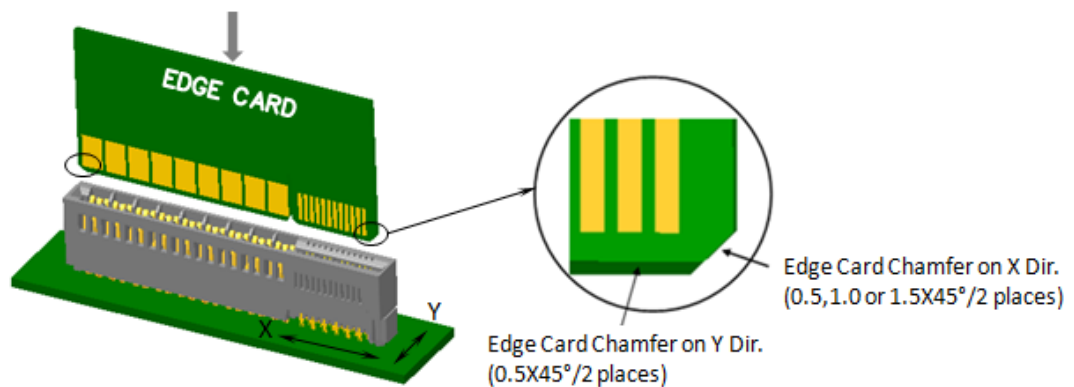


Figure 4

Connector Mating Condition	Edge Card Chamfer (mm)		Mis-Alignment Allowance (mm)		Insertion Angle Allowance (°)	
	X	Y	X	Y	X	Y
One Side is in Stationary condition, other side is in floating condition.	0.50	0.50	1.85 ± 0.125	1.60 ± 0.13	3	3
	1.00		2.35 ± 0.125			
	1.50		2.85 ± 0.125			
Both Side are in Stationary Condition			0.15 ± 0.056	0.115 ± 0.07		

Table 3

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5.4 Voltage Rating

The Maximum Working Voltage of the eHPCE® connector system is rated base on UL# E66906 Vol. 1 Sec. 124.

The Operating Voltage Rating: please refer to product specification GS-12-1380 section 3.1.

5.5 Current Rating

(Refer to Product Specification GS-12-1380 for additional information)

Following are the current rating values of the eHPCE® vertical connector system.

Contact current rating	
Contact type	Current(ampere)
AMPS per MP(total MPs ≤ 28MPs)	28A
AMPS per Signal(total Signal ≤ 24S)	1.0A (2.5A/pin if it is applied for standby power)
NOTES:	
1. The applicable maximum configuration: 28MP+24S.	
2. "MP" stands for Middle Power with 2 tails.	
3. Temperature rise: 30 °C Max.	
4. Test board has 8 layers and 2oz copper for each layer; top layer and bottom layer are for both signal and power, all 8 layers including (top and bottom layers) for current carrying of power.	
5. The maximum quantity of signal pin used for standby power is 4 pieces among total 24 pcs signal pins when signal pins are used as standby power pin with 2.5 Amp Max.	

Table 4

5.6 Safety

Prevention of operator access to energized parts

Reference UL60950 & IEC 60950-1 Section 2.1.1.1

UL and IEC specifications define three different probe designs to test for prevention of operator access to energized conductors (such as powered electrical contacts within an unmated connector). The two probes are referred to as follows:

- **Test Finger** (Figure 5)
- **Test Probe** (Figure 5)

The following sections show each of these test probes positioned as closely as possible to the mating side contacts of the Vertical eHPCE®, which will be located on the PCB and may be powered in an unmated state.

Although the Vertical eHPCE® connector system meets these probe requirements as noted, it is not recommended that the customer "hot plug" the edge card to the vertical receptacle.

5.6.1 Test Finger

The test finger may not make contact with energized parts while the access doors and covers of the system enclosure are open. Separable connectors must be disconnected for this test. The figures

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show the tip of the test finger inserted into a Vertical eHPCE® capture window, showing that it is impossible for the probe (shown at the smallest size per specified tolerances) to touch the receptacle contacts.

5.6.2 Test Probe

The requirements for the test probe conditions are not as clearly specified by UL and IEC. However assuming the worst-case scenario where the eHPCE® connector is accessible, the following 3D model was created. This model shows that the test probe is very large compared to the test finger and will never come close to touching a powered contact within the representative receptacle.

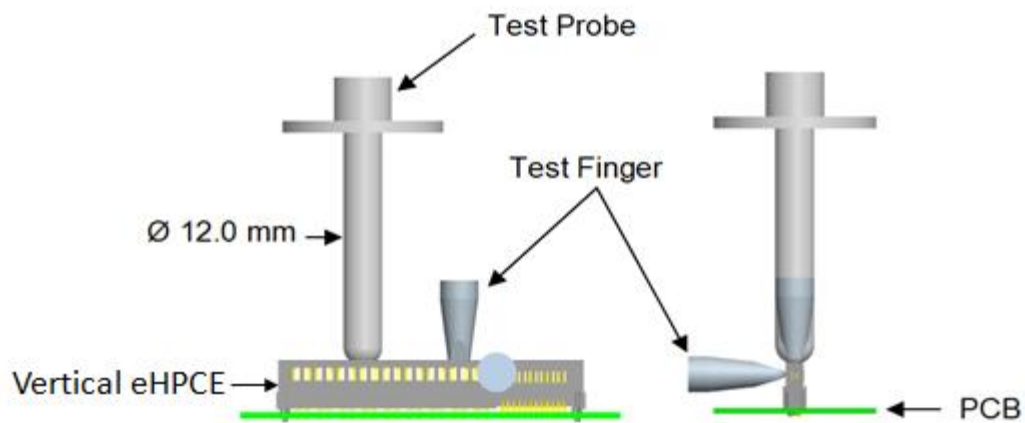
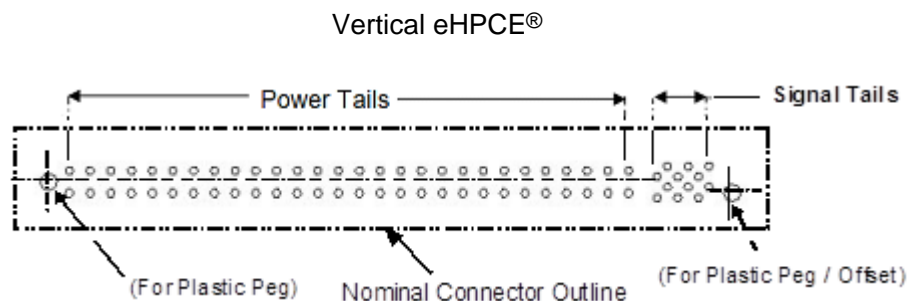


Figure 5

5.7 Requirement for Customers PCB

For specifics of the PCB layout, refer to the customer drawing of the part number being applied.

5.7.1 PCB Layout (See customer drawing for more details)



Power and signal traces inside the connector zone need to be coated or under solder mask to protect against oxidation and minimize wear or damage during assembly and handling

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PLATED THROUGH HOLE REQUIREMENTS

CONTACT TYPE	TOP LAYER DESCRIPTION	TABLE 1 (eHPCE / PRESS-FIT TAILS) PLATED THROUGH-HOLE REQUIREMENTS				
		DRILLED HOLE DIAMETER	COPPER THICKNESS	TIN-LEAD THICKNESS	TIN THICKNESS	FINISHED HOLE DIAMETER
SIGNAL	IMMERSION TIN	0.81-0.86 (0.85 DRILL)	0.025 - 0.050	--	0.9 - 1.5um	0.70 - 0.80
	COPPER	0.81-0.86 (0.85 DRILL)	0.025 - 0.050	--	--	0.70 - 0.80
POWER	IMMERSION TIN	1.21-1.26 (1.25 DRILL)	0.025 - 0.050	--	0.9 - 1.5um	1.10 - 1.20
	COPPER	1.21-1.26 (1.25 DRILL)	0.025 - 0.050	--	--	1.10 - 1.20

CONTACT TYPE	TOP LAYER DESCRIPTION	TABLE 2 (eHPCE / SOLDER TAILS) PLATED THROUGH-HOLE REQUIREMENTS				
		DRILLED HOLE DIAMETER	COPPER THICKNESS	TIN-LEAD THICKNESS	TIN THICKNESS	FINISHED HOLE DIAMETER
SIGNAL	IMMERSION TIN	0.96-1.01 (1.00 DRILL)	0.025 - 0.050	--	0.9 - 1.5um	0.85 - 0.95
	COPPER	0.96-1.01 (1.00 DRILL)	0.025 - 0.050	--	--	0.85 - 0.95
POWER	IMMERSION TIN	1.21-1.26 (1.25 DRILL)	0.025 - 0.050	--	0.9 - 1.5um	1.10 - 1.20
	COPPER	1.21-1.26 (1.25 DRILL)	0.025 - 0.050	--	--	1.10 - 1.20

Table 5

5.7.2 Edge Card Layout (See customer drawing for more details)

RECOMMENDED EDGE CARD FOOT PRINT

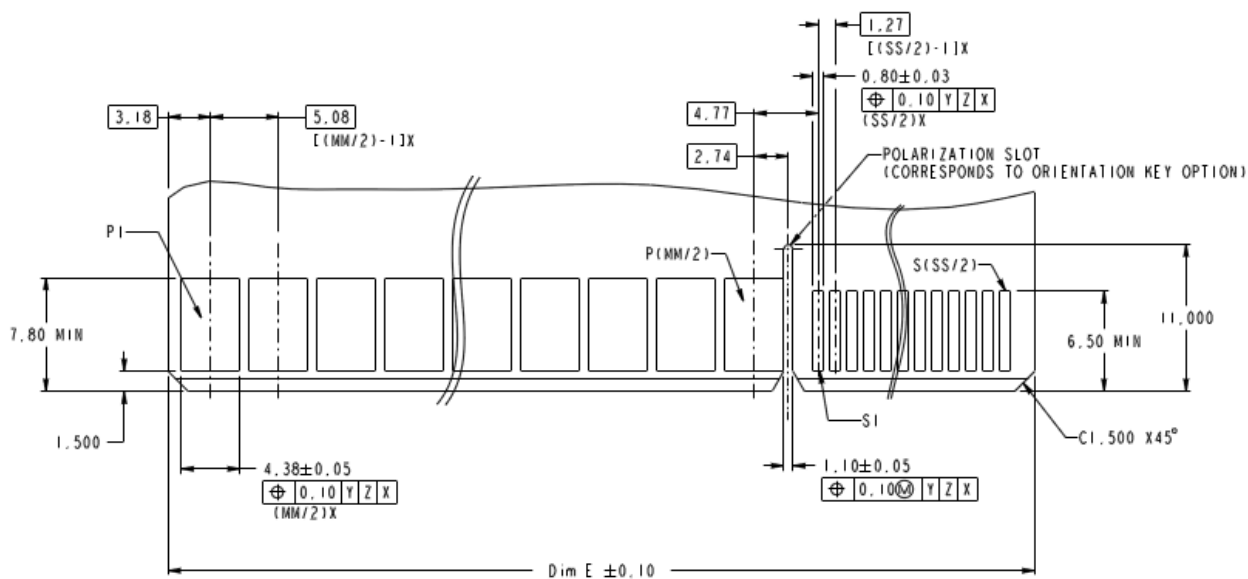


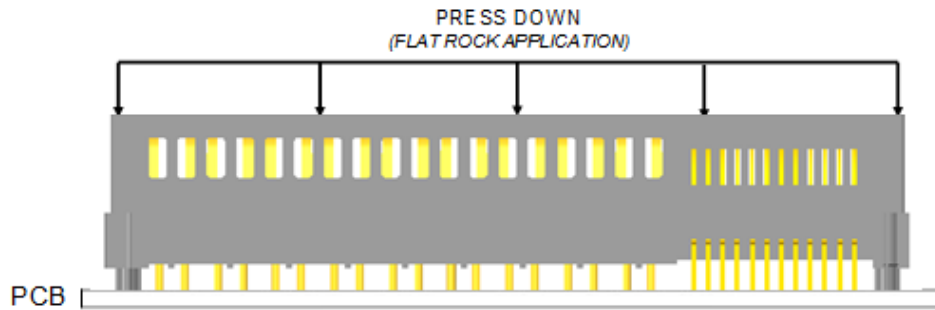
Figure 6

6.0 APPLICATION PROCEDURE

6.1 Vertical Receptacle (Solder Tails)

A flat rock tooling is required for solder tail type; the total insertion force of two plastic pegs should not exceed 100N.

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Vertical eHPCE® (Solder Tails)

Figure 7

6.2 Vertical Receptacle (Press-fit)

Press-fit application tooling is required for the vertical press fit type. Tooling drawing number is 10141462. The pressing rate should not exceed 5.08mm/minute, and the gap should not exceed 0.25mm from PCB surface to standoff of housing.

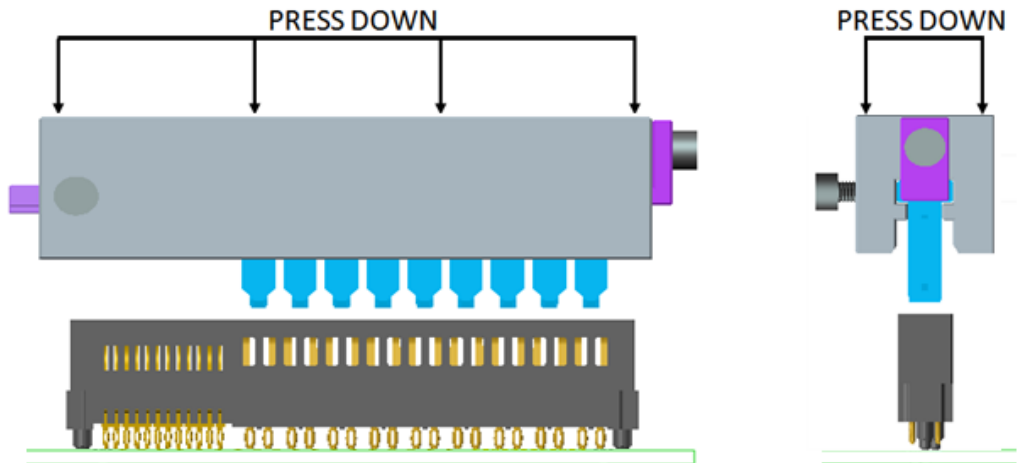


Figure 8

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7.0 RECORD RETENTION

<u>REV</u>	<u>PAGE</u>	<u>DESCRIPTION</u>	<u>EC#</u>	<u>DATE</u>
A	All	Initial release	N/A	2019/July/02