Amphenol
COMMUNICATIONS SOLUTIONS

**Rugged Connectors
Application Guideline**
USB, RJ Modular Jack, HDMI and D-Sub

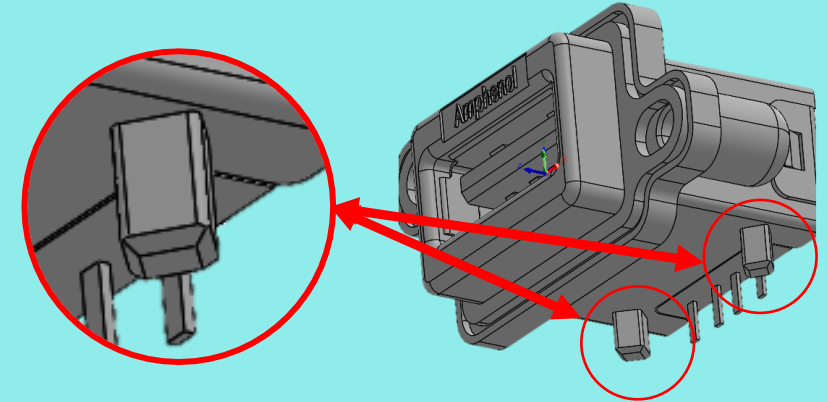October 2024

**Commercial
Industrial**

Through-Hole Rugged Connector Application Guideline

- This application guideline covers the family of IP67-rated, rugged connectors that are through-hole soldered to a PCB with subsequent panel mount capability. Amphenol's part number series MUSB, MUSBR, MRJ, MRJR, MHDR, MDB and MDBR are included. Interface types include USB, RJ, HDMI, and D-sub.

- Depending upon the connector design, features include the ability to provide a ground path from the shell to the PCB. The die-cast metal connector shell can also provide grounding to the panel and mating plug shields.

- Some designs provide the ability to have the connector secured to the PCB prior to soldering for stability during the soldering process.

- Recommended PCB soldering processes for Amphenol's Rugged connectors are manual and wave soldering. The solder profile is the responsibility of the board assembler and may vary depending on equipment, process, and connector design.

- The following pages summarize connector features related to grounding and secure attachment to the PCB. A suggested wave solder profile is also included.

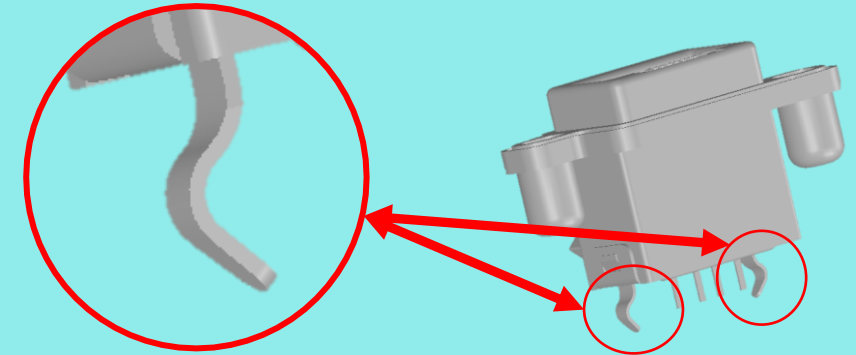# Types of PCB Ground and Security to PCB Features

Diamond Pegs

- Integrated feature of the metal die-cast shell.

- Can be soldered to the PCB for grounding.

- Friction fit into PCB hole can be used to secure connector during soldering. Part pressed down to PCB level manually or with an arbor press.
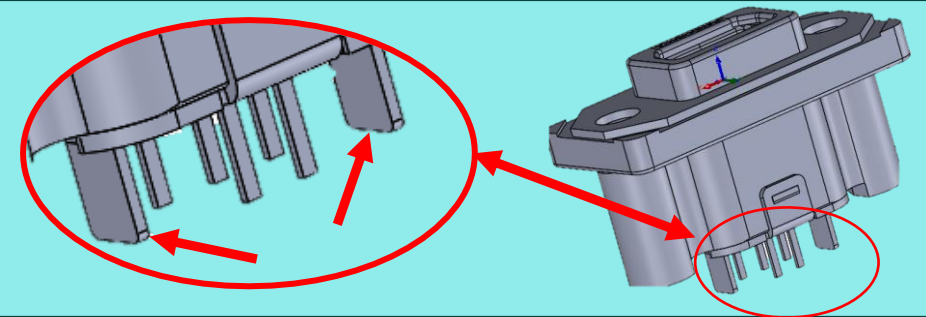

Deflected Solder Tails

- Integrated feature of rear or internal metal shield.

- Can be soldered to the PCB for grounding.

- During installation to the PCB, the tail deflects and friction between the tail and the edge of the PCB hole secures the connector during soldering.
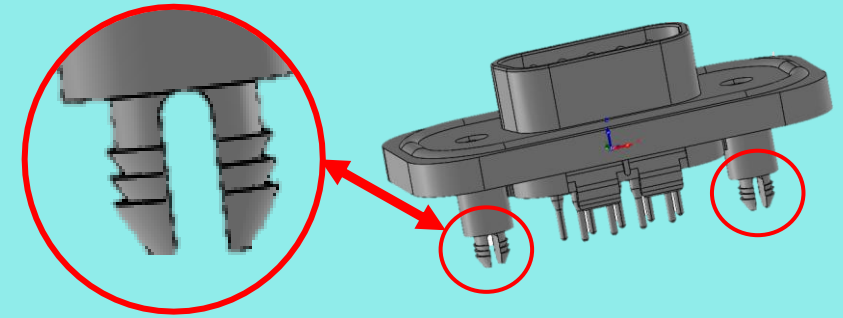

Solder Tails

- Integrated feature of rear metal cover or the die-cast shell.

- Can be soldered to the PCB for grounding but are not designed to secure the connector to the PCB due to the clearance between the tail and the PCB hole.

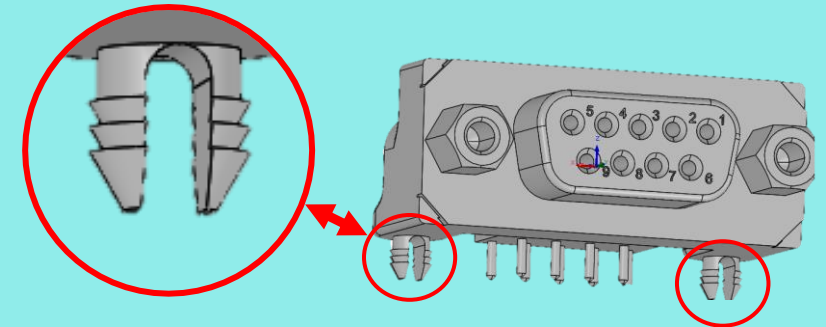# Types of PCB Ground and Security to PCB Features

Split Peg

- Integrated feature of the metal die-cast shell.

- Can be soldered to the PCB for grounding.

- Friction fit into pcb hole can be used to secure connector during soldering. Part pressed down to PCB level manually or with an arbor press.
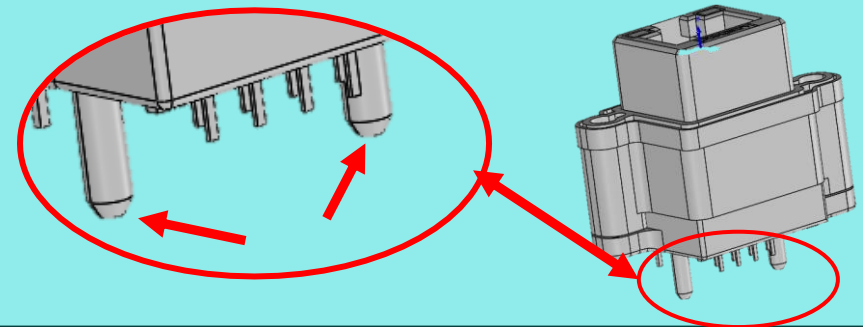
Plastic Split Peg

- Integrated feature of the plastic housing.

- Cannot be soldered to the PCB for grounding. Plastic housing will not provide grounding to the panel or mating plug.

- Friction fit into PCB hole can be used to secure connector during soldering of the contact tails. Part pressed down to PCB level manually or with an arbor press.

Plastic Alignment Peg

- Integrated feature of the plastic housing.

- Cannot be soldered to the PCB and does not provide any security to the PCB during soldering. For MRJR series, contact Amphenol for available ground connection options.

Through-Hole Rugged Connector Styles & Features

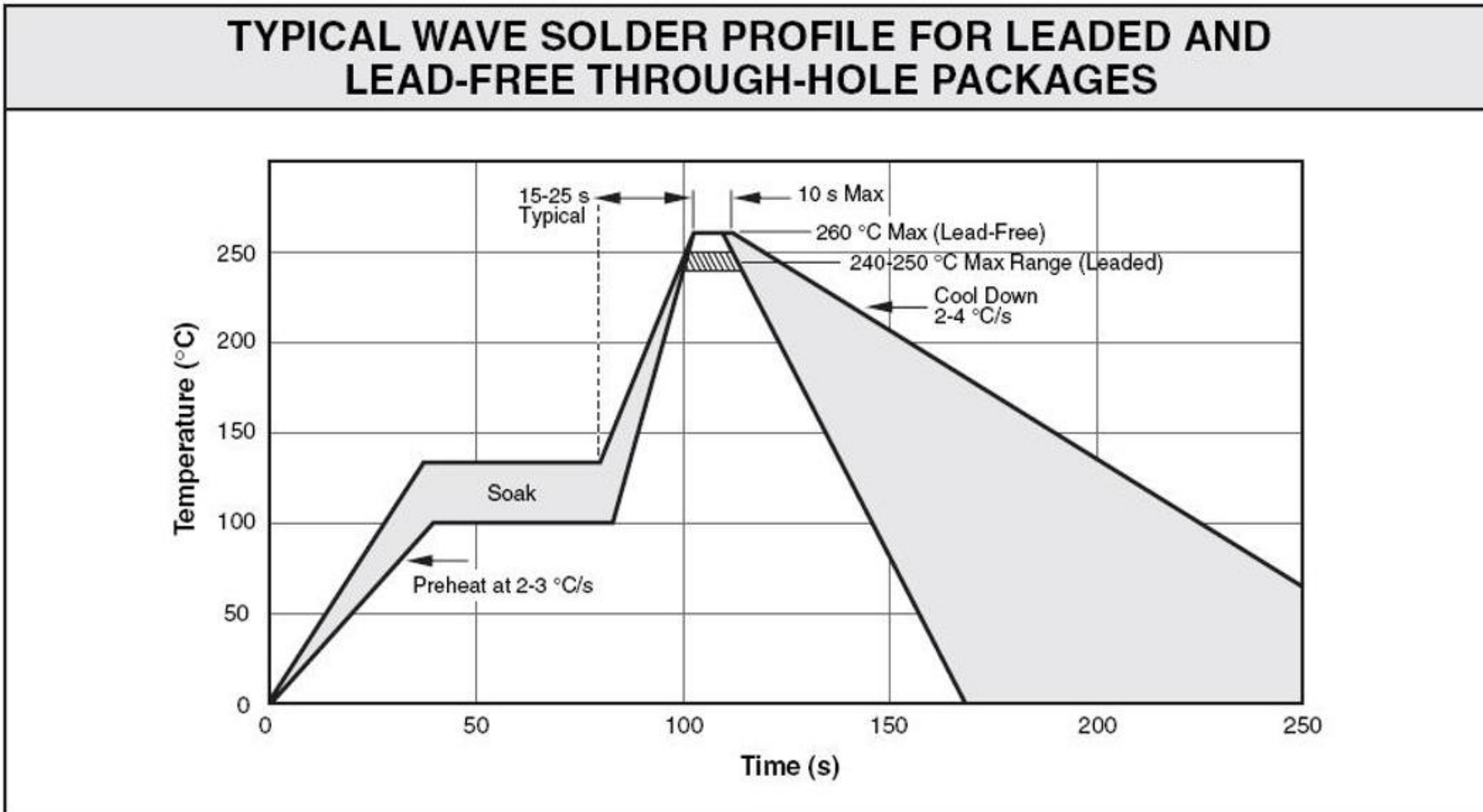## USB

Product Series	Sub-Group of Part Numbers	Interface	Configuration	Shell Ground to PCB Style	Connector Retained on PCB During Soldering
MUSB MUSBR	MUSB-A MUSBR-A	USB Type A	Right Angle	Diamond Peg	Yes
			Vertical	Deflected Solder Tail	Yes
	MUSB-B MUSBR-B	USB Mini A	Right Angle & Vertical	Solder Tail	No
	MUSB-C	USB Type A Stacked	Right Angle	Diamond Peg	Yes
			Vertical	Solder Tail	No
	MUSB-D	USB Type B	Right Angle	Diamond Peg	Yes
			Vertical	Deflected Solder Tail	Yes
	MUSB-E MUSBR-E	USB Mini AB	Right Angle & Vertical	Solder Tail	No
	MUSB-K	USB Micro	Right Angle & Vertical	Solder Tail	No
	MUSBR-M	UST Type C	Right Angle & Vertical	Solder Tail	No
	MUSBR-3 MUSBR-4	USB 3.0 Type A	Right Angle	Diamond Peg	Yes
			Vertical	Solder Tail	No

Through-Hole Rugged Connector Styles & Features

RJ, HDMI, D-Sub

Product Series	Sub-Group of Part Numbers	Interface	Configuration	Shell Ground to PCB Style	Connector Retained on PCB During Soldering
MRJ MRJR	MRJ-x3 MRJR-x3	RJ Modular Jack	Right Angle	Diamond Peg	Yes
	MRJ-x4 MRJR-x4		Vertical	Plastic Alignment Peg, No Grounding, Consult with Amphenol	No
MHDR	MHDR-A	HDMI Type A	Right Angle	Diamond Peg	Yes
			Vertical	Solder Tail	No
MDB MDBR	MDB-E09SA	D-Sub	Right Angle	Plastic Split Peg, No Grounding	Yes
	MDBR-E09 MDBR-E15 MDBR-A25	D-Sub	Vertical	Split Peg	Yes
	MDBR-A3W3	D-Sub Combo	Right Angle & Vertical	Diamond Peg	Yes

Suggested Wave Solder Profile

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Thank you