

Integrated Solution for Evolving Market Challenges – *Higher Frequency Trend*

Application Note

11/28/2016

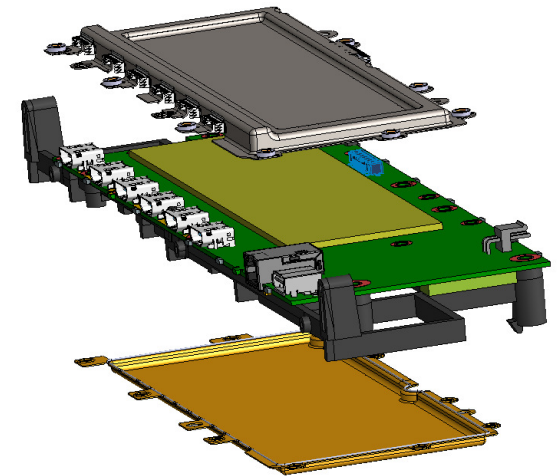
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Context

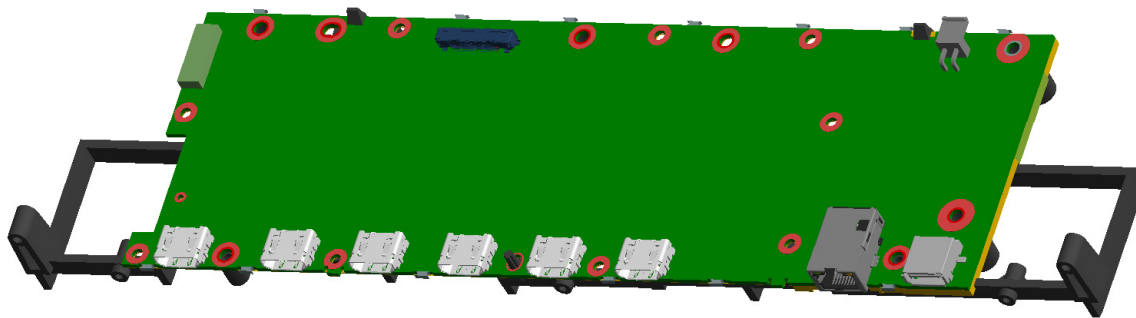
- Problem Statement
- Application Description
- Complex PMBU Assembly
 - Metals
 - Deep Drawn Metal Structure
 - Stamped Precision Fingers
 - Laser Welding
 - Press-Fitted Screw Fasteners
 - ECE (FIP)
 - Thermal Interface Materials



Problem Statement

- Design a shielding solution that enables the customer to pass EMI Testing in the first round – delivering faster time to market
- Solve EMI issues for higher frequency systems – Migration from HDMI 1.0 to HDMI 2.0 high end connected home entertainment system
- Meet System requirements include shielding 6GHz over multiple connections on a large PCBA
- Accommodate assembly without use of pick and place equipment due to manufacturing size and equipment limitations

Application Description

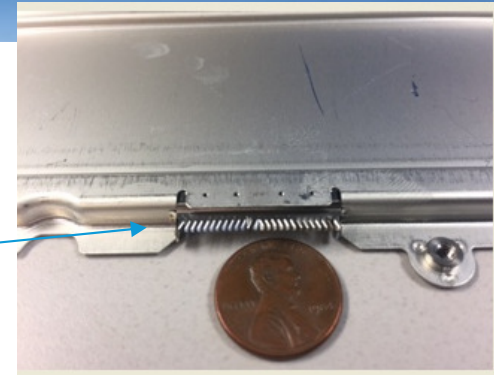


Primary HDMI PCBA:

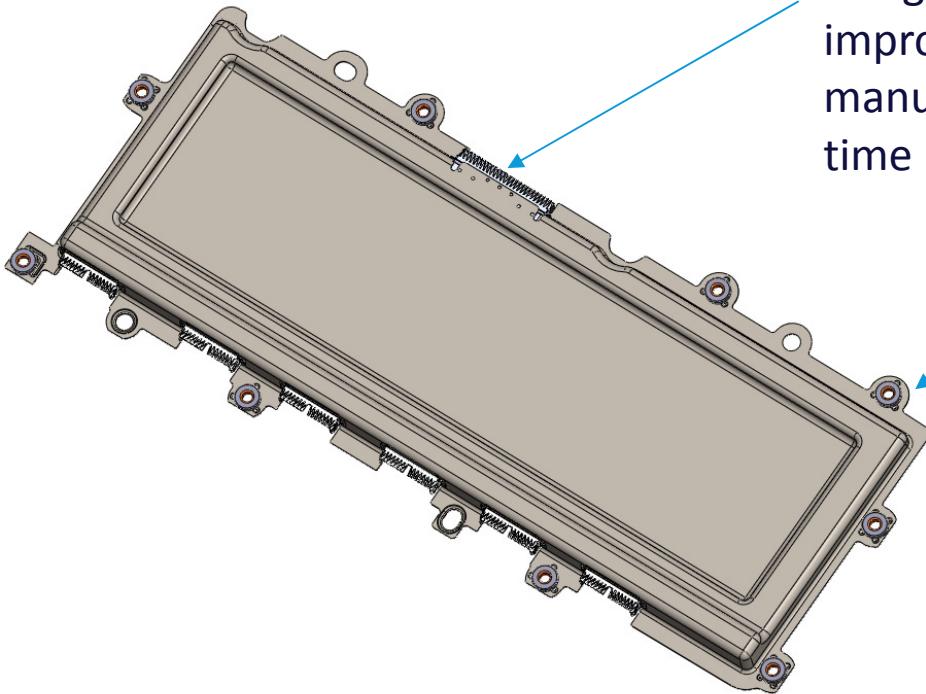
- Large area (~9X4")
- Need good contact along PCB Surface (6 GHz signals)
- Multiple heights as Heat Sink interfaces w/ Top of shield(s)
- 6X HDMI 2.0 connectors, need spring fingers to connect

Precision Metals: Final HDMI Shield

Fingerstock is all single piece design to improve manufacturing time

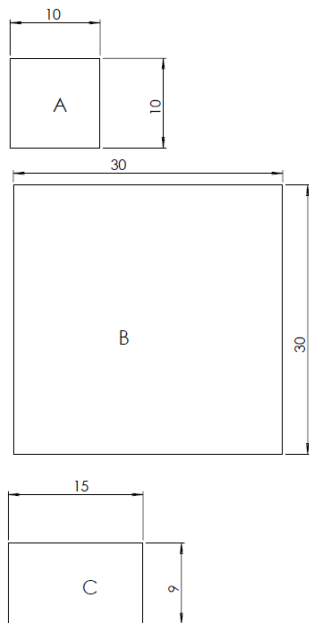


Compression Limiting Dimples added for FIP Gasket



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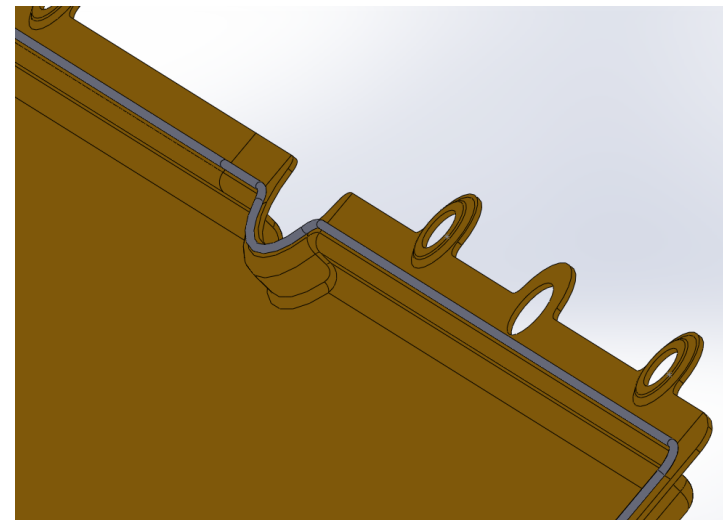
Performance Materials EMI/Thermal: FIP Gasket + TIM



TFLEX HD400 MATERIAL			
TIM SIZE	LOCATION	MATERIAL	QUANTITY PER SYS
A	APP PROC	TFLEX HD440	1
B	MUCS	TFLEX HD460	2
C	MEMORY	TFLEX HD4100	4

TFLEX HR600 MATERIAL			
TIM SIZE	LOCATION	MATERIAL	QUANTITY PER SYS
A	APP PROC	TFLEX HR640	1
B	MUCS	TFLEX HR670	2
C	MEMORY	TFLEX HR690	4

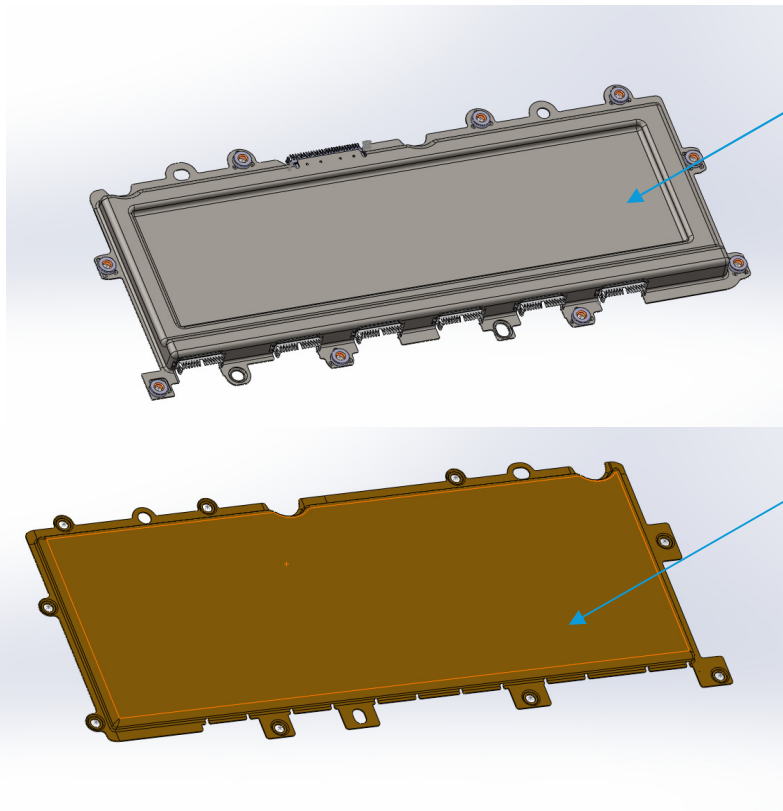
Thermal Interface Proposal, variety of materials/thicknesses to maximize cost/performance.



Form in Place Gasket (SNC70-RXP) along perimeters on both Top and Bottom HDMI Shields



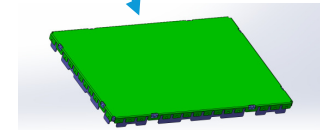
Program: Final Content



Top HDMI Shield
1 per

Wireless Shield
1-3 per

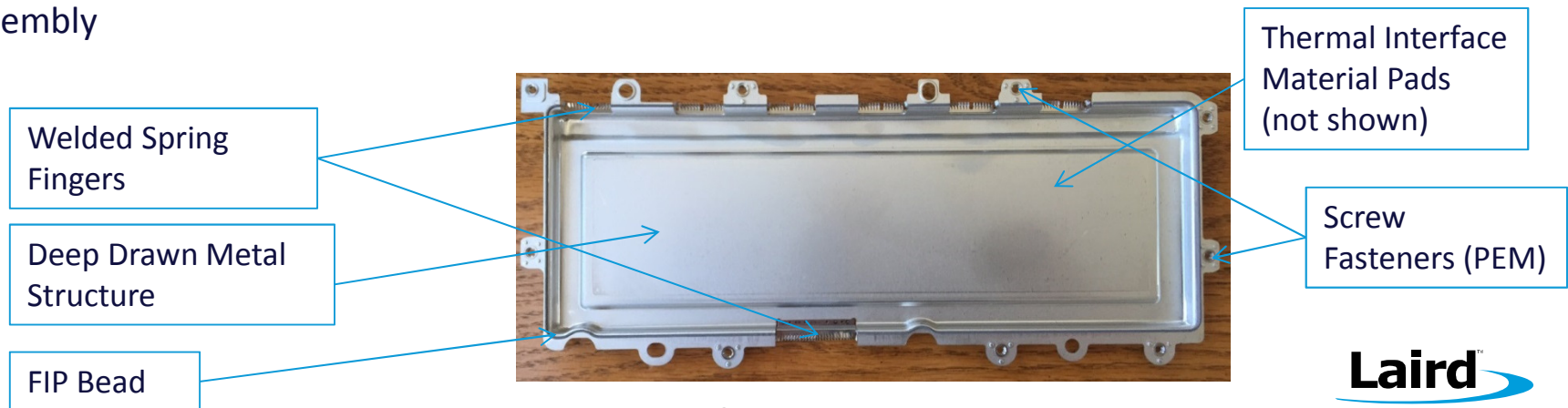
Bottom HDMI
Shield 1 per



Value Proposition – Integrated Solution

This product exemplifies the strategic importance of bringing a value added integrated solution through combining Performance Materials products of Precision Metals, EMI materials, Thermal materials, and capabilities such as joining technologies to provide solutions to market's evolving challenges thus delivering exceptional value to customers:

- Faster Time to Market – Robust EMI design to pass regulatory tests, global team work through field application engineers, program management, engineering, and operations
- Higher Performance – High frequency shielding, reliable contact point using FIP
- Reduce Total cost of Ownership – Consolidated supply chain, integrated features for ease of assembly



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Market

- The product win was for a high-end home theater system with high frequency and higher bandwidth interface (HDMI 2.0)
- Other Potential Applications in Connected Home Entertainment Devices, 4K TV, and other consumer electronics devices
- Besides the Consumer market, Automotive Electronics, Telecom are other attractive markets for selling these type of “complex”, thicker gauge combination products

Competitive Differentiation

- Other than Laird, only Chomerics can possibly provide an integrated “complex” solution for solving emerging needs in EMI, Thermal, Grounding, and Structural. There is no evidence of Chomerics or any other supplier providing these type of “complex” combination solutions in the market.





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