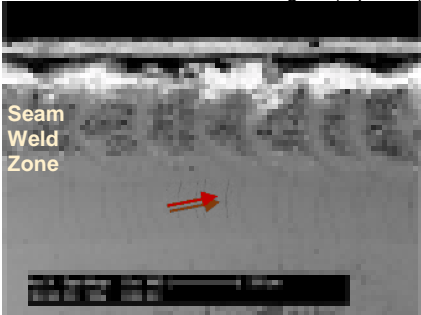
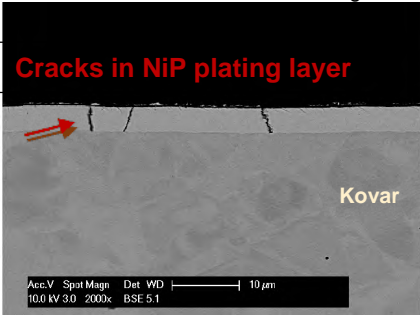
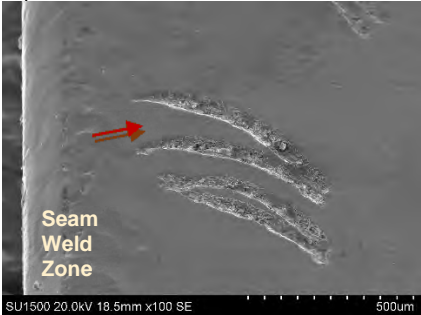



GOVERNMENT - INDUSTRY DATA EXCHANGE PROGRAM		
PROBLEM ADVISORY		
1. TITLE (Class, Function, Type, etc.) Nickel Plated Kovar Lids		2. DOCUMENT NUMBER FV5-P-18-0001
		3. DATE (DD-MMM-YY) 30-JAN-18
4. MANUFACTURER AND ADDRESS International Rectifier, HiRel Products 205 Crawford Street Leominster, MA 01453	5. PART NUMBER Various	6. NATIONAL STOCK NUMBER Not Applicable
	7. SPECIFICATION MIL-PRF-19500	8. GOVERNMENT PART NUMBER Various
	9. LOT DATE CODE START See detail in block 20	10. LOT DATE CODE END
11. MANUFACTURER'S POINT OF CONTACT Paul Hebert	12. CAGE 69210	13. MANUFACTURER'S FAX (978) 537-4246
14. MFR. POC PHONE (978) 514-6180	15. MANUFACTURER'S E-MAIL paul.hebert@irhirel.com	
16. SUPPLIER Not Applicable	17. SUPPLIER ADDRESS Not Applicable	18. SUPPLIER CAGE Not Applicable
19. PROBLEM DESCRIPTION / DISCUSSION / EFFECT International Rectifier has identified that semiconductor devices that are seam welded with electroless nickel (NiP) plated Kovar lids can leak after exposure to MIL-STD-750, TM1041, salt atmosphere. This discovery was made irrespective of the fact that hermetic seal testing is not required following Salt Atmosphere for semiconductor devices (reference MIL-PRF-19500, Table E-VII, group C4). Failure analysis revealed hermetic seal leaks in the seam weld region. High magnification examination revealed the formation of micro cracks in the NiP plating at the seam weld that allowed salts to deposit and corrode through the underlying Kovar metal. Refer to image 1, 2 and 3 below for exhibit cracks in NiP.		
Image 1 Cracks in NiP at seam weld region (top view)	Image 2 Cross sectional view of seam weld region	Image 3 Top view of salt corrosion in Kovar
		
20. ACTION TAKEN/PLANNED In order to improve the robustness of IR semiconductor devices against corrosive environments or substances, an interlayer of electrolytic nickel will be added between the lid's Kovar base metal and external electroless nickel. Electroless nickel that contains 10 +/-2% phosphorus is brittle and can crack during the seam weld process. Electrolytic (Ni) nickel is more ductile than electroless (NiP) nickel and will act as a barrier to the Kovar base metal; hence making the product more robust. Implementation of the new Kovar lid plating is planned beginning March 2018.		
This Problem Advisory has been coordinated with DSCC-VQE and NASA prior to its release.		
Continued on page 2		
21. DATE MFR. NOTIFIED/ SUPPLIER NOTIFIED	22. MFR./SUPPLIER RESPONSE	23. ORIGINATOR ADDRESS/POINT OF CONTACT
Not Applicable	REPLY ATTACHED	Paul Hebert, International Rectifier
	Not Applicable NO REPLY	205 Crawford Street Leominster, MA 01453 (978) 514-6180
24. GIDEP REPRESENTATIVE	25. SIGNATURE	26. DATE
Paul Hebert		Jan 30, 2018

Scope: IR believes the problem is industry wide, where NiP plated Kovar lids are used in conjunction with seam welding. The nickel can crack in the heat affected zone of the seam weld, and expose base metal.

Parts Affected (Date Code): This GIDEP applies to IR HiRel Products parts packaged (and seam sealed) in TO-254, TO-257, TO-258, TO-259, SMD-0.5, SMD-1 and SMD-2. The date code range for TO-254 packaged products starts from early 2001 through present. The date code range for the TO-257, TO-258, TO-259, SMD-0.5, SMD-1 and SMD-2 packaged products starts from June 2014 through present.

Containment: No stock action or part replacement is required, however if application involves exposing parts to corrosive type environment, then a review should be conducted to assure reliability. In order to obtain more information about the part's ability to withstand long term storage environments, IR HiRel Products tested retained samples from QCI Group C2 and confirmed the parts maintained hermetic seal. QCI group C2 includes exposure to Moisture Resistance IAW MIL-STD-750, TM1021. A total of 88 parts were tested with no leak failure. Also note that since 2001, IR HiRel has delivered approximately 1 million TO-254 packaged parts using the current nickel (NiP) plated Kovar lid configuration. IR HiRel has not received a field failure or complaint related to the lid plating or corrosion, as such we believe the risk of failure is remote based on normal application. Customers may contact the originator / point of contact for further review or information as needed.