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# Process for Product Returns for Failure Analysis (RFA)

# RFA Overview

## RFA: Return for Failure Analysis

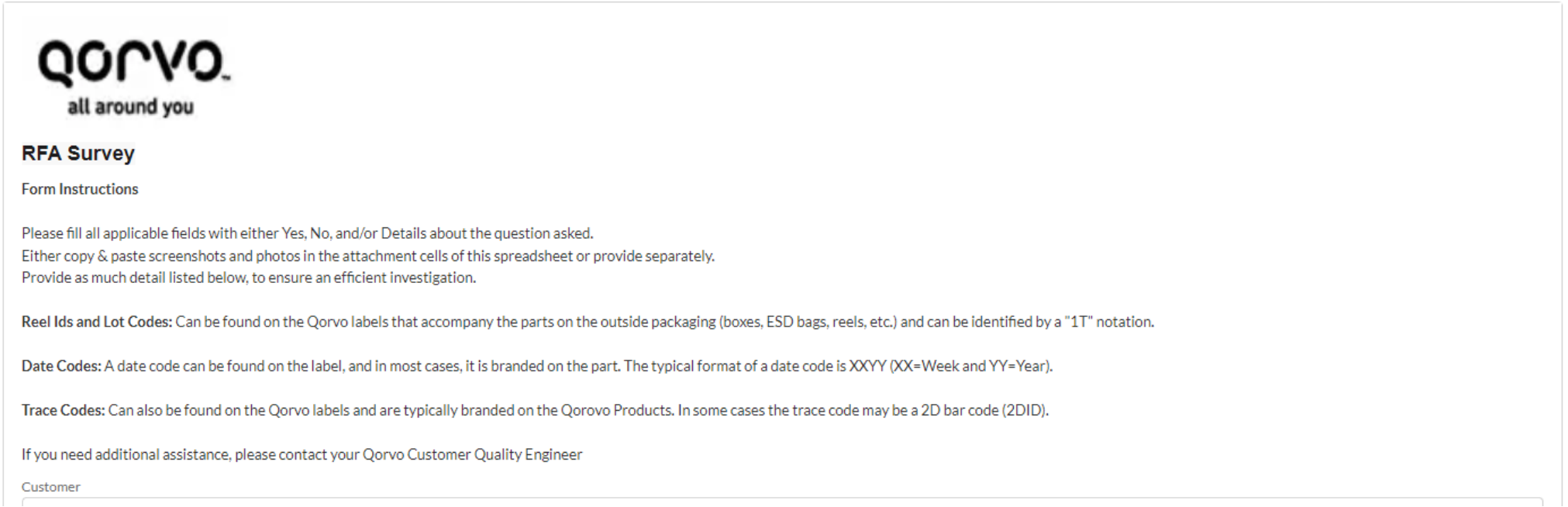
- RFA's are for returning products that have failed to meet the customer's requirements or expectations. These can be parametric or catastrophic failures from the customer's manufacturing location or from the field.
- Process for requesting an RFA is outlined in the following slides.
- Once the RFA is received at Qorvo, the returned parts will first go through an initial physical inspection, then go through an electrical verification (electrical analysis) and then go through a physical analysis to determine the failure mechanism at one of Qorvo's Failure Analysis Labs.
- Dependent on the urgency of the analysis and complexity of the part, the customer will typically receive an initial notice on verification of the failure in two to five business days after receipt of the part and a final failure analysis in ten to fifteen business days.

# Requesting an RFA

1. Customer should contact Qorvo Customer Service, Sales, or Customer Quality Engineer (CQE) for Return Request or Technical Assistance.
2. A web link to an electronic RFA questionnaire form is provided to customer to collect detailed information on the problem.
3. Customer completes and submits RFA questionnaire form.
4. Qorvo database is automatically updated with failure information.
5. Qorvo CQE reviews failure information and initiates one or more of the following actions
   - Applications engineering contacts customer to provide technical assistance.
   - Request is approved and RFA tracking number is assigned.
   - Request to customer for additional information.
6. Once the request is approved, the customer will be electronically notified and provided the RFA tracking number and shipping information for returning parts for analysis.

# RFA Questionnaire Web Form

## Provided to customer as a web link. Each link is unique to a specific customer issue. Once the RFA is approved, the link is no longer available.



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**RFA Survey**

Form Instructions

Please fill all applicable fields with either Yes, No, and/or Details about the question asked.
Either copy & paste screenshots and photos in the attachment cells of this spreadsheet or provide separately.
Provide as much detail listed below, to ensure an efficient investigation.

**Reel Ids and Lot Codes:** Can be found on the Qorvo labels that accompany the parts on the outside packaging (boxes, ESD bags, reels, etc.) and can be identified by a "1T" notation.

**Date Codes:** A date code can be found on the label, and in most cases, it is branded on the part. The typical format of a date code is XXYY (XX=Week and YY=Year).

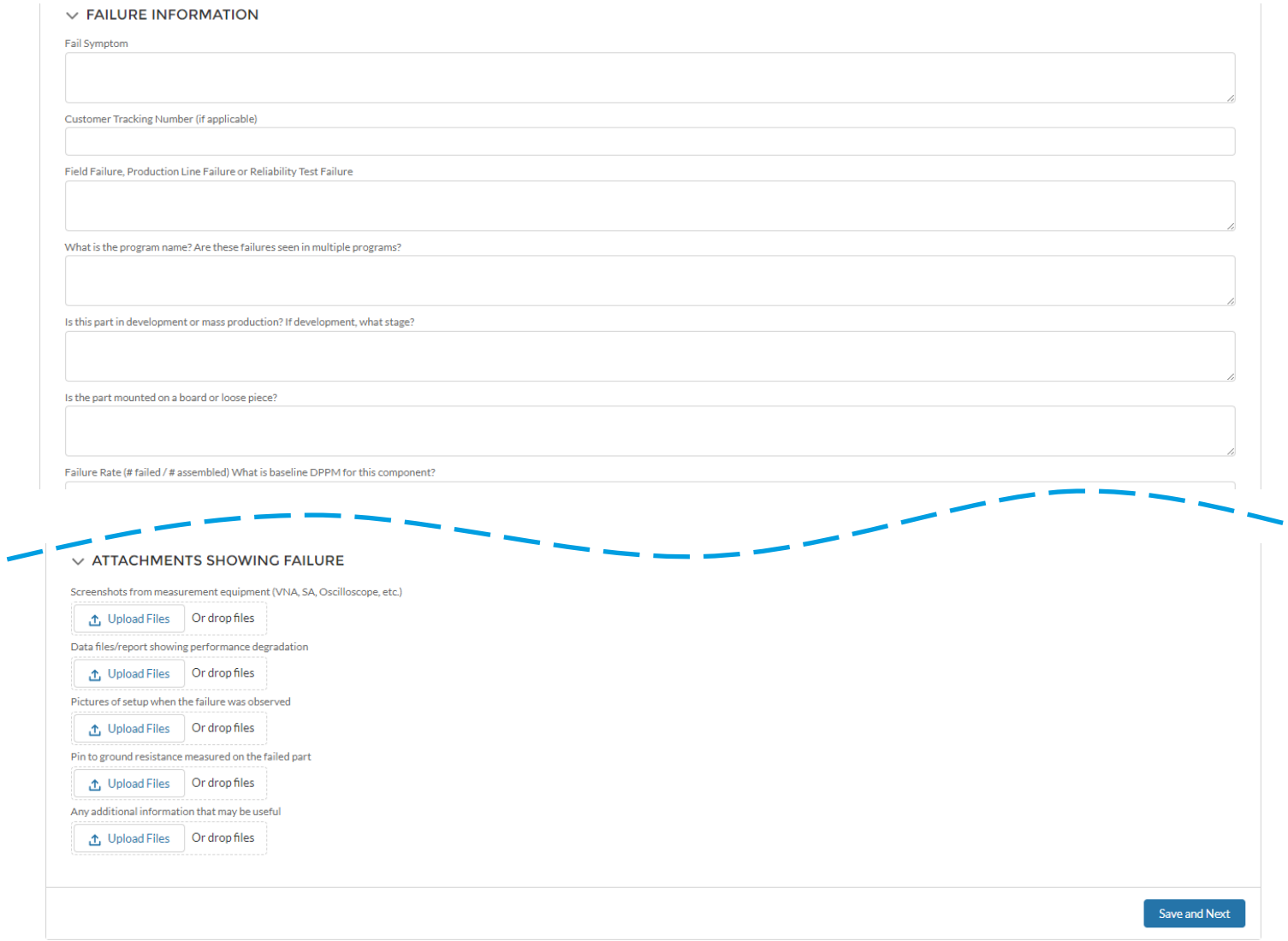
**Trace Codes:** Can also be found on the Qorvo labels and are typically branded on the Qorovo Products. In some cases the trace code may be a 2D bar code (2DID).

If you need additional assistance, please contact your Qorvo Customer Quality Engineer

Customer

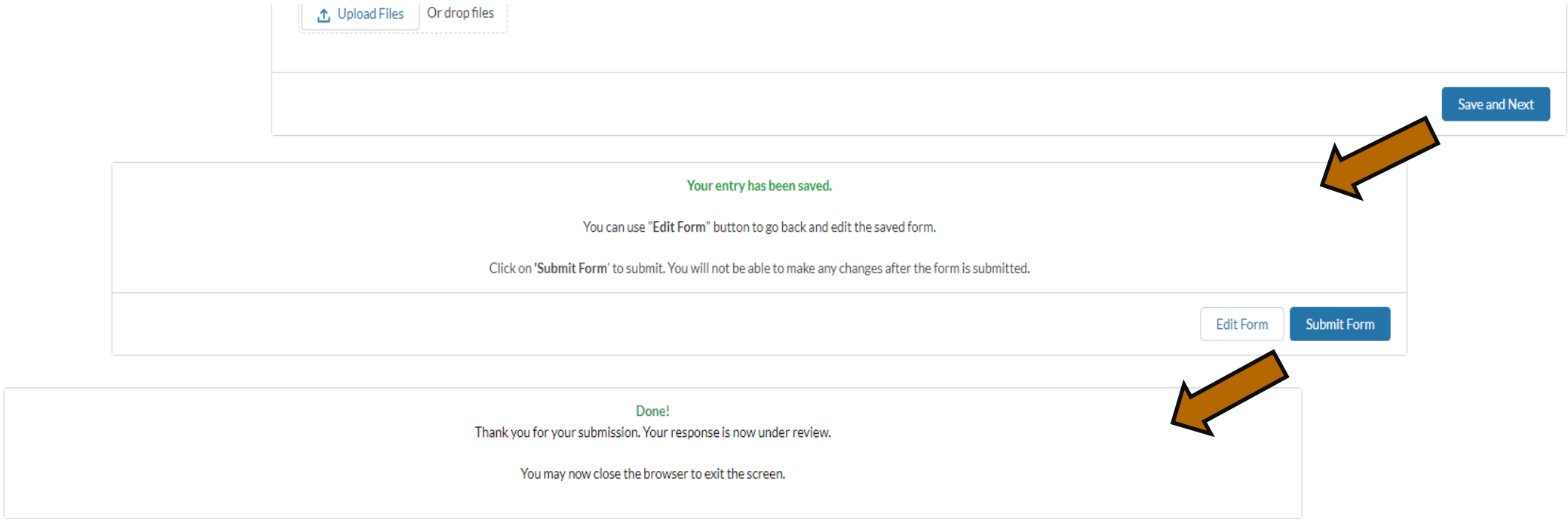
# RFA Questionnaire - Continued

## Customer provides details on the application and failure. Link also provides the customer a means to upload supporting files.



# Confirmation of Submission

After clicking Save and Next, Customer will receive confirmation of saved entry with an opportunity to go back to edit or submit to Qorvo for review. Once submitted, the link will no longer be available to the Customer.



# Approved RFA Confirmation

## Sent to Customer Contact via e-mail with shipping instructions…

From: **Qorvo CCDB No Reply**
To: mgibson@rfmd.com

9:10 AM | Today

Your request for failure analysis (RFA) has been approved. Please forward no more than 5 failed devices to the address shown below. Please be sure to always follow all appropriate ESD and MSL precautions when handling the failed devices.

If you have any questions, please let me know.

Click here for additional information on the RFA process: RFA Customer Guidelines

Thank You,
Mark Gibson
Qorvo Customer Quality Engineering

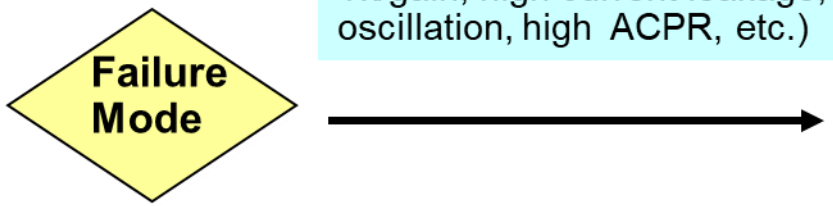
Ship parts to the following address:

Qorvo Hillsboro
Attn: Vivek Dixit RFA COM-0000000053
2300 NE Brookwood Parkway
Hillsboro, OR 97124, United States

Phone : 503-615-9692

# RFA Sample Recommendations

## Sent to Customer Contact via e-mail…




**Parametric** failure (Low Tx/gain, high current leakage, oscillation, high ACPR, etc.)

**Recommendation to send Qorvo:**
- **Failed boards** (1 to 3)
- Schematic of the board (related area)
- Failed units (at least 3)
- RFA Confirmation Form with failure information

**Catastrophic** failures (No or extremely low Tx/gain(more than 10dB)), shorts (extremely high current between pins)

**Recommendation to send Qorvo:**
- **Failed units** (at least 3)
- RFA Confirmation Form with failure information
- Failing phone boards (if possible)

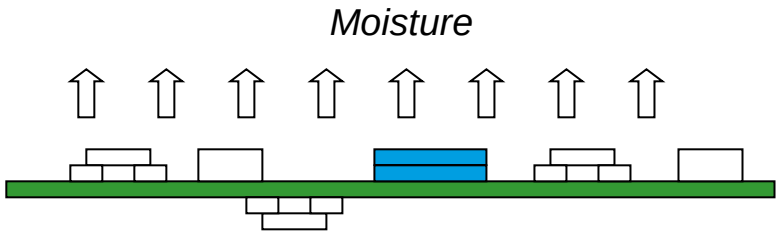
**Then Qorvo will perform:**

**Electrical Analysis**
- Impedance Measurements or Curve Tracing to check for catastrophic damage
- Electrical evaluations against production test plans and/or specific tests to replicate customer reported issue

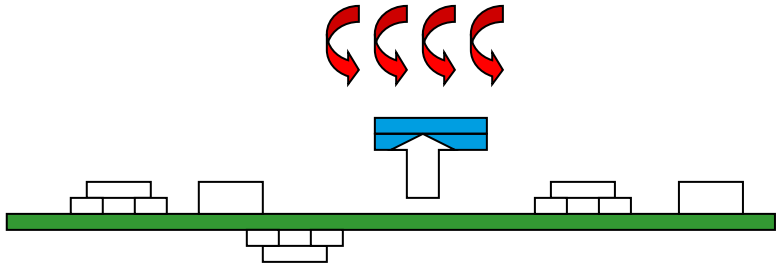
**Failure Analysis Group** (with phone boards)
- X-ray board to check device soldering, etc. (with loose parts)
- Curve tracing, X-ray, Decap, and Inspect
- Other FA as required

# Sample Preparation

1. **If parts are rated as MSL-2 or higher, bake the boards in accordance with IPC/JEDEC J-STD-033A prior to part removal.**




2. **Desolder** parts from the boards **with controlled heat**



**or**

**Send failing boards to Qorvo**
Qorvo will desolder failing parts from the boards and, if requested, send boards back to you

# Failure Sample Packing


Do not use tape or other static-generating materials on or around devices.

Use ESD safe handling procedures, equipment, workstation, and approved ESD safe packaging materials.

# Failure Sample Packing

## *Why use precautions on previously identified failed devices???*

**As with all high-performance integrated circuits, precautions must be taken when handling Qorvo products. Most Qorvo products are susceptible to damage from ESD. If parts are being returned to Qorvo for Failure Analysis, they must be handled with the same precautions as any known good device to avoid further damage from ESD or improper removal from a board. If not, the true original failure mechanism may be masked by further damage.**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