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1 PURPOSE & SCOPE

The purpose of this document is to specify requirements for Qorvo suppliers to notify or obtain approval for changes affecting products supplied to Qorvo. This includes change management of products, processes, equipment, documents, external providers and software comprising the configuration and manufacture of Qorvo product.

This document applies to any Qorvo Foundry and Final Manufacturing supplier listed on a Bill of Materials and the Corporate Approved Supplier List. FEOL/Fab suppliers will follow PRO-000339. The document applies to supplier-initiated changes and Qorvo-initiated changes. The requirements apply to production and prototype (after process lockdown) processes and products. It is the responsibility of the supplier to ensure that their suppliers (Qorvo Sub-Tier Suppliers) have the required processes in place to be compliant to this specification.

2 DEFINITIONS & ACRONYMS


Term	Definition
Line Down PCR	A PCR that needs to be executed by Qorvo in order to mitigate any line down situation from occurring.
Form	The visual appearance of the product, including color, marking, and surface finish, as specified by the supplier and/or customer.
Fit	The external dimensions and associated tolerances of the product, as specified by the supplier and/or customer.
Function	The electrical, mechanical, thermal, and performance characteristics of the product, as specified by the supplier and/or customer.
Reliability	The ability of a product to perform a required function over time.
Qorvo Supplier	A supplier who is a direct supplier to a Qorvo facility and who also obtains purchase orders directly from Qorvo.
Qorvo Sub-Tier Supplier	A supplier who is a direct supplier to a Qorvo Supplier (receives purchase orders from a Qorvo Supplier).
SQ	Qorvo Corporate Supplier Quality
SQE	Supplier Quality Engineer
PPAP	An automotive part qualification process – Product Part Approval Process
PCR	Process Change Request – between Qorvo and supplier

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Term	Definition
PCN	Process Change Notification – between Qorvo and external Customer
TD Gate	Technology Development gate
Major Change	A change that may affect the form, fit or function of the product or adversely affect the quality or reliability of the product.
Minor Change	A change that does not affect the form, fit, function, quality or reliability of the product.
FMO	Final Manufacturing Operations, all processing done in die, wafer, package, or module form.
Foundry	External Wafer Fab Operations.
FEOL/Fab	Front End of Line; Internal Wafer Fab Operations, all processing done in wafer form.

3 ROLES, RESPONSIBILITIES & AUTHORITIES

Role	Responsibilities
Qorvo Supplier	<ul style="list-style-type: none"> Submits the change request by completing required information on Qorvo PCR website or on PCR form via email, and attaching required supporting documentation. Must have a system in place for the control and implementation of process changes. The system must incorporate Qorvo's requirements to ensure complete implementation of these requirements. Is responsible for implementing PCR and providing supporting documentation, in order to close the implementation loop by communicating the change results back to Qorvo. Must have a system in place to ensure sub-tier suppliers meet the requirements of Section 6.
Supplier Quality (SQ)	<ul style="list-style-type: none"> Manages the PCR process. May initiate a PCR to a supplier. Completes the Supplier Quality tab on Qorvo PCR website, or processes the emailed form.


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4 REFERENCES

Reference	Title	Location
COR.103	Supplier Quality Manual	QDC
MAN-000634	Qorvo Biotechnologies Supplier Quality Manual	QDC
QAL-21-1021	Supplier Process Change Request (PCR) Form	QDC
ITG-21-1008	How to Use the Qorvo Supplier Quality Connect Site	QDC
MAT-21-1002	Logistics Specifications for Assembly Contractors	QDC
MAT-21-1005	Logistics Specifications for Tape and Reel Contractors	QDC
MAT-21-1006	Logistics Specifications for Test Contractors	QDC
QAL-06-1017	PCR Internal Processing Instructions	QDC
WIS-001719	Process Changes for Purchased BOM Materials	QDC

5 EQUIPMENT

- 5.1 Must have a computer and internet connection to Qorvo account login for online PCR web site, or email capability to send QAL-21-1021 form to Qorvo SQE.
- 5.2 For access to the online PCR system:
- 5.2.1 Supplier: Determine the personnel who will be responsible for submitting a PCR, then request a Connect account by emailing the person's name and email to your Supplier Quality contact or PCRs@Qorvo.com. Refer to ITG-21-1008 for instructions to log into the Qorvo Connect site.
 - 5.2.2 Qorvo: Qorvo personnel in all worldwide locations will have the ability to submit a PCR directly into the PCR application without using Connect.

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6 WHEN TO ISSUE PCR

6.1 A PCR can be initiated by Qorvo or a Qorvo supplier.

6.1.1 If Qorvo initiates a PCR to the supplier, then Qorvo will follow sections 7 and 8 to submit the PCR, and the supplier will follow section 9 to update the PCR system with Implementation information.

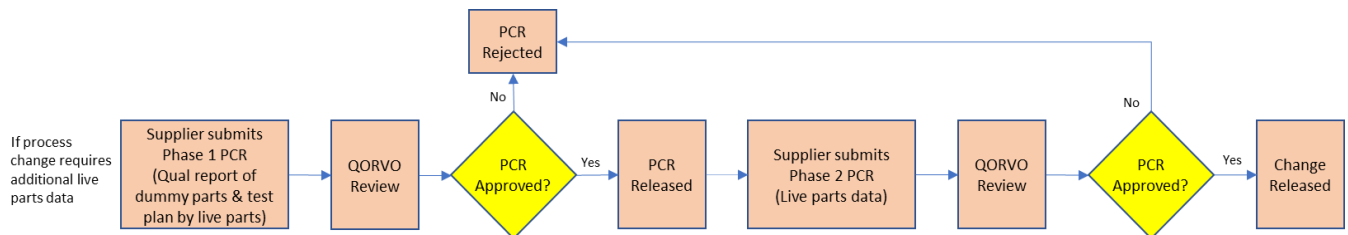
6.1.2 If the supplier initiates a PCR to Qorvo, then the supplier will follow sections 7, 8 and 9 to submit and implement.

6.2 The change can be temporary or permanent.

6.3 The supplier will issue one PCR per change. A maximum of two PCR numbers for a supplier change is allowed if the change requires additional live parts data from Qorvo.

6.3.1 Phase 1 PCR – supplier qualification report of dummy parts with test plan by live parts for Phase 2 PCR.

6.3.2 Phase 2 PCR – supplier provides additional live parts data. Change is release upon PCR approval.




6.4 The change may require Qorvo’s approval before the change can be made, or can be for notification purposes only. All Qorvo initiated PCRs are considered “Approval Required” since they have to be approved by a multi-functional team before submitting the PCR to the supplier. The difference between “Qorvo Approval Required” and “Notification Only” PCRs is explained below:


6.4.1 **Qorvo Approval Required** A major change to the product or process, or a new process that may impact form, fit, function, reliability or safety of the product. Changes to the supplier’s methods or materials are included. Approval is also required for any changes to the supplier’s control plan that are not associated with another change request and reduce the controls (loosening spec limits, removing inspection step, etc). Below are examples of changes requiring approval. (note: these are examples only and do not represent the scope of all possible changes)

6.4.1.1 **Prototype** Any process changes once process is locked during the qualification stage prior to limited production release. (ie, process changes post-TD2 gate)

6.4.1.2 **Design** New Layout, Die Size, Element Spacing.

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- 6.4.1.3 Wafer Fab** Wafer Diameter, Wafer Thickness, Epitaxial Layer, Diffusion Dopant, Gate Oxide Material, Gate Oxide Thickness, Dielectric Material, Substrate Dopant Type, Metallization Material, Metallization Thickness, Passivation Material, Passivation Thickness, Die Coating Material, Die Coating Thickness, Process Technique, Photo Resist.
- 6.4.1.4 Wafer Probing** Test Program Revision, Change in AC Spec, Change in DC Spec, Test Platform.
- 6.4.1.5 Assembly** Lead Frame Base Material, Wire Bond Method, Wire Bond Capillary, Wire Bond Layout, Mold Compound Material, Sealing Material, Die Attach Material, Marking Method/Marking Appearance (font type, size and legibility), Plating Material, Plating Technique, Heat Sink Material, Wire Composition, Package Dimension, Scribe/Break/Singulation Methods, ESD Protection.
- 6.4.1.6 Substrates** Addition of Substrate Process Lines, Change of Substrate Process Chemicals, Change of Substrate Materials, Change of Substrate Process Flow, Change of Substrate Suppliers.
- 6.4.1.7 Electric Test** Test Program Revision, Change in AC Spec, Change in DC Spec, Test Platform.
- 6.4.1.8 Mechanical** Change in Case/Package Outline, Loosening Tolerance, Change in Lead Configuration.
- 6.4.1.9 Packing, Shipping, and Labeling** Carrier Tray Dimension, Drypack Requirements, Maximum Storage Temp, Tape and Reel Supplier, Diameter of Reel, Deletion of Bar Codes, Changes to the Label, ESD Packaging.
- 6.4.1.10 Location Change** Changes in manufacturing location or major rearrangement of existing facilities, adding locations (ex: wafer Fab site, assembly site).
- 6.4.1.11 Equipment** Addition of new manufacturing lines in existing facilities. Additional qualified processing equipment that does not duplicate existing equipment.
- 6.4.1.12 Traceability** Assembly suppliers, test suppliers & tape and reel suppliers are required to submit PCRs for any deviations to the traceability requirements listed in the following procedures:
- MAT-21-1002 (Assembly)
 - MAT-21-1005 (Tape and Reel)
 - MAT-21-1006 (Test)
- 6.4.1.13 Software** Changes to software that is intended to be included as part of the finished, packaged and labeled product. For medical product applications, all software changes shall be validated before approval and issuance.

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6.4.2 Notification to Qorvo Only (no approval required) A minor change that does not impact form, fit, function, or reliability of the product. Below are examples of these situations (note: these are examples only and do not represent the scope of all possible changes).

6.4.2.1 Addition of an inspection step.


6.4.2.2 Tightening physical dimension tolerances.

6.4.2.3 Additional qualified processing equipment that duplicates existing equipment. Must include the equipment buyoff or qualification plan/data. (Qualification data must be based on similar package type).

6.4.2.4 Moving qualified existing equipment and/or new qualified equipment of the same manufacture model and revision within the same facility. Qorvo will audit this process as part of the supplier performance program. However, prior to the move, the supplier must have a plan or documented procedure that includes the following (that does NOT have to be submitted to Qorvo):

- Document Changes – review of the control plan, flow charts, etc, to see if changes will be required.
- Detailed Steps – the steps required prior, during and after the move.
- Qualification – the qualifications that will be required once the move has been completed.
- Traceability – how the supplier is going to document the machine serial numbers and other traceability information, as the change is made, to satisfy possible product containment issues.

6.4.2.5 Changes to senior management with executive responsibility or authority to make changes to the supplier's quality policy or quality system.

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7 INITIATE A PCR

7.1 Refer to ITG-21-1008 on how to log into the Qorvo Supplier Quality Connect site: <https://connect.rfmd.com/sites/SQ/default.aspx>. Alternatively, the Supplier can log directly onto the PCR website <https://pcr.rfmd.com>.

7.1.1 If the Supplier does not have a Connect account, submit the PCR by completing PCR form QAL-21-1021 and then emailing the form and supporting documentation to PCRs@qorvo.com. The form can also be emailed directly to the responsible SQE, if known.

7.2 Click on the "PCRs (Process Change Request)" link and click on "Create New PCR". See Figure 1.

Figure 1



7.2.1 The PCR form will open.

Figure 2

PCR Number

Title*

Approval Type* Approval Required Notification Only

PCN Required (Qorvo Internal Use Only) Yes No

Supplier* Choose...

Supplier Operation* Choose...

Line Down* Yes - (1 Day) No - (5 Days)

Part Number


Change Affects* Fit Form Function Reliability Other Other: _____

Duration* Permanent Temporary Expiration Date: _____

Affected Qorvo and Supplier Documents

Reason for Change*

Description of Change*

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8 COMPLETING THE PCR INITIATION FORM (see Figure 2)

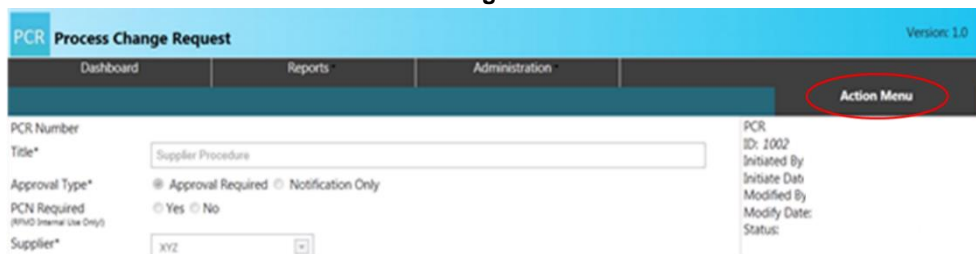
8.1 Supplier Enters Information


- 8.1.1 **PCR Title** Brief statement that summarizes the change requested. This will also be used as the title on the info card in Doc Center.
- 8.1.2 **Approval Required or Notification Only** The initiator must determine whether Qorvo approval is required for the change or whether the PCR will be submitted as notification only. See Section 6.3.
- 8.1.3 **PCN Required** Do not check, this is for Qorvo internal to complete.
- 8.1.4 **Supplier** Will automatically populate based on Log In credentials.
- 8.1.5 **Supplier Operation** Will automatically populate based on Log In credentials.
- 8.1.6 **Line Down** Select Yes-(1 Day) or No-(5 Days)
- 8.1.7 **Part Number** Enter all part numbers affected by this change request.
- 8.1.8 **Change Affects** Select as appropriate. If "none" of "Safety", then select OTHER and enter "None" or "Safety" in space provided.
- 8.1.9 **Duration** Select as appropriate. If "Temporary" then enter Expiration Date in space provided.
- 8.1.10 **Affected Documents** Enter document numbers as appropriate.
- 8.1.11 **Reason for Change** Enter why the PCR is being submitted. (i.e., quality improvement, material change, process change, new equipment). Clearly state the reason(s) for change and summarize the current situation prior to the change request.
- 8.1.12 **Description of Change** Enter detailed information to adequately describe the plan, evaluations and conclusions. All information must be clearly documented. Itemize the differences between the proposed changes to the current qualified part(s). Describe the benefits these changes will bring to Qorvo. Include all supporting data (example: qualification data, photos of before and after).

8.2 Supplier Submits PCR (see Figure 3)

- 8.2.1 Click [Action Menu] pull down menu
- 8.2.2 Click [Save]

Figure 3



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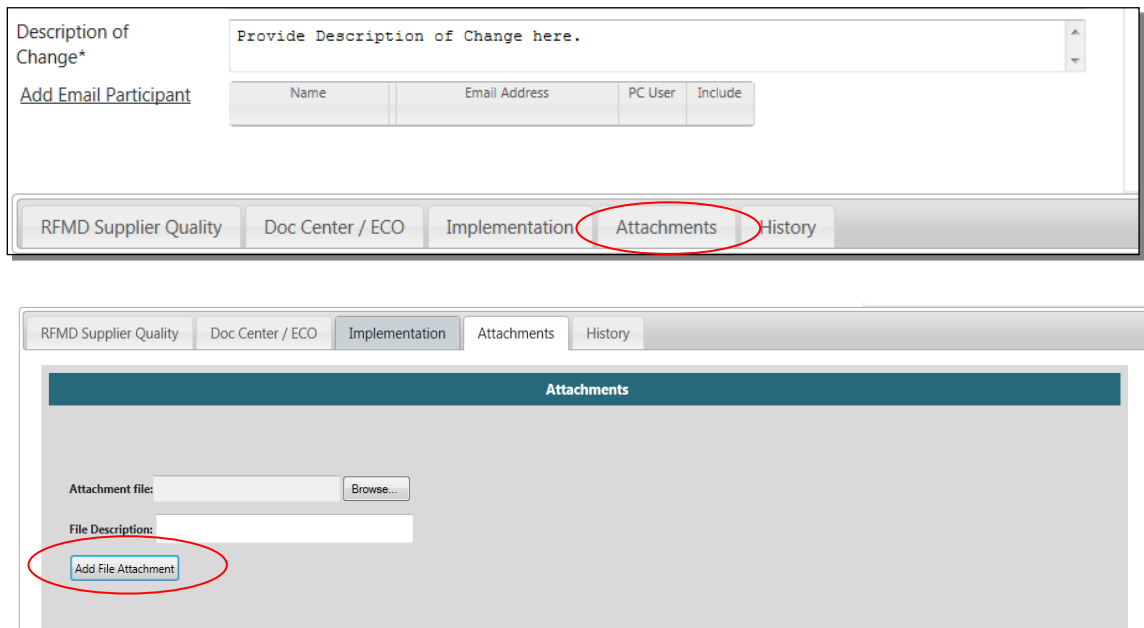
8.3 Adding attachments (see Figure 4)

8.3.1 Click [Attachments] Tab at the bottom of the window. Note that it may take some time to add attachments, as the system will automatically run a virus scan on all attachments before appending them to the PCR.

8.3.2 Click [Browse...] to locate file.

8.3.3 Add brief File Description and click [Add File Attachment].

Figure 4



The figure consists of two screenshots of a web application interface. The top screenshot shows a form with a text area for 'Description of Change*' containing the placeholder text 'Provide Description of Change here.'. Below this is a table with columns 'Name', 'Email Address', 'PC User', and 'Include'. At the bottom of the form are several tabs: 'RFMD Supplier Quality', 'Doc Center / ECO', 'Implementation', 'Attachments', and 'History'. The 'Attachments' tab is highlighted with a red circle. The bottom screenshot shows the 'Attachments' tab selected, displaying a form with an 'Attachment file:' field and a 'Browse...' button. Below that is a 'File Description:' field, and at the bottom, the 'Add File Attachment' button is highlighted with a red circle.


8.4 Submit for Qorvo Approval

8.4.1 Under [Action Menu] drop-down menu, select [Submit for Approval]. After selecting this command, "Submitted" will appear at the top of the screen.

8.4.2 This completes the PCR Generation and Submission Process.

8.4.3 **Note:** Once submitted, do not make any further changes.

8.5 Supplier Quality Processes the PCR Once the PCR is submitted, SQE will complete the Supplier Quality Tab and the Doc Center/ECO Tab. SQE will process the PCR per procedure QAL-06-1017. This procedure is for internal use only, and does not require any action by the supplier.

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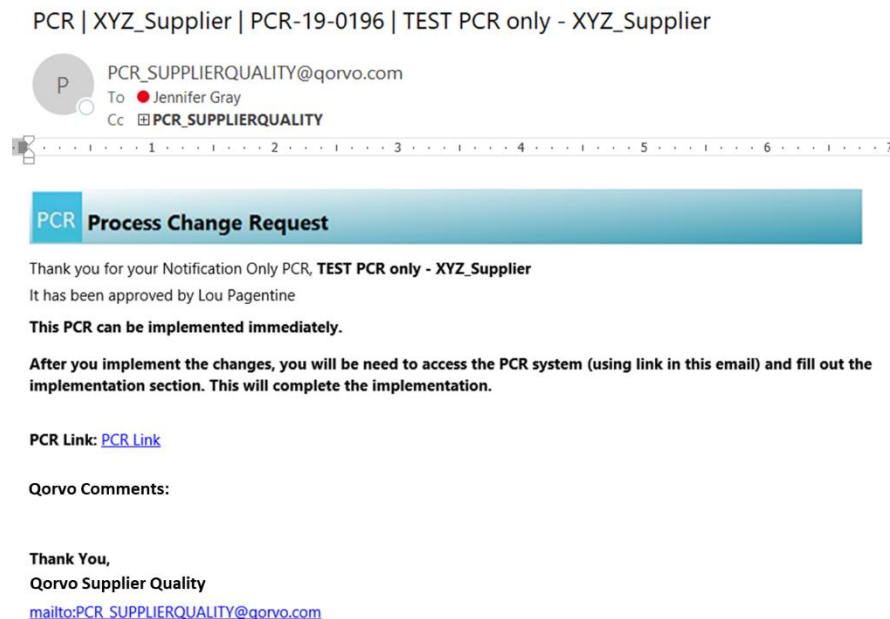
8.6 Sub-Tier Supplier Changes

- 8.6.1 All Qorvo suppliers shall have a process change procedure that is communicated to their suppliers (Qorvo Sub-Tier supplier).
- 8.6.2 All Qorvo suppliers will be responsible for managing their suppliers (Qorvo Sub-Tier Supplier) process change requests. Wherever applicable, Qorvo Suppliers shall communicate Sub-Tier Supplier changes to Qorvo using this PCR procedure.
- 8.6.3 Qorvo will not accept and approve a PCR from a supplier who does not receive a PO directly from Qorvo.


9 SUPPLIER IMPLEMENTATION

- 9.1 The PCR system will automatically send an email notification of Acceptance or Rejection to the Supplier (see Figure 5).

Figure 5



- 9.2 Upon Acceptance, the Supplier is authorized to implement the requested change, and then update the PCR system with Implementation information.
- 9.2.1 Supplier will log into the PCR System, and click [Implementation] tab (see Figure 6).
- 9.2.1.1 Supplier will complete all sections.
- 9.2.1.2 Attach any supporting documentation for implementation using the Action Menu dropdown [Add Attachments].

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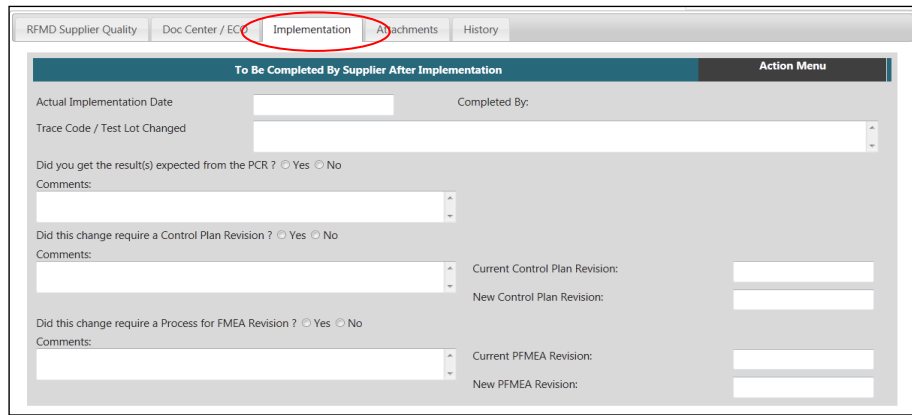
9.2.1.2.1 The supplier is expected to submit any additional data and results gathered during and after the implementation process, in accordance with instructions included in the PCR or as part of the supplier’s standard procedures.

9.2.1.3 Click on [Action Menu] dropdown, and click [Implementation Complete].

9.2.2 The PCR system will automatically send an email notification that the implementation is complete.

Note: As a reminder, the Supplier will receive a weekly email notification to implement the approved PCR. Once an implementation date has been entered by the Supplier, the email notification will be discontinued.

Figure 6




9.2.3 If the PCR form was submitted via email, the Supplier will record the Implementation Date and supporting information, and resubmit the updated form to Qorvo SQ.

10 METRICS

Status of change requests will be available in the online PCR system or in Doc Center ECO process.

11 QUALITY RECORDS

Change Requests will be maintained per QAL-16-1001.

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12 REVISION HISTORY

Revision	Create Date (mm/dd/yyyy)	Description of Change	Initiator of Change
previous		Subdocument in QDC	
N	11/21/2013	<ul style="list-style-type: none"> Changed owner to Frank Immacolato. Revised in preparation to move to new PCR web site. 	Frank Immacolato
O	3/22/2016	<ul style="list-style-type: none"> Changed logo and removed references to RFMD. 	Jerry Gedaly
P	8/25/2017	<ul style="list-style-type: none"> Added PCR and PCN definitions (4.11, 4.12). Added Reference to WIS-001719, and section 11.5.3 for determining if a PCN is required. 	Frank Immacolato
Q	10/27/2020	<ul style="list-style-type: none"> Added 6.3.1.1 re: Prototype process changes once process is locked during the qualification stage. Transferred document to Qorvo standard template and restructured section numbering. Updated purpose and scope. Updated definitions and acronyms. Modified roles and responsibilities section Added references. Corrected references in 6.3.1.12. Removed Figure 1 process flow; updated references to remaining figures. Added Section 7.1.1 for suppliers without Connect accounts. Other minor changes to sentence structure and format. 	Jennifer Gray
R	3/8/2021	<ul style="list-style-type: none"> Section 3 Roles and Responsibilities: Added statement that SQ may initiate a PCR. Added sections 6.1.1 and 6.1.2 to clarify sections that initiator must follow. Added sections 6.3, 6.3.1 and 6.3.2 for multi-phase PCRs. Modified section 6.4.1 to clarify control plan changes and add safety impact. Removed Process Control Plan changes from individual lists in 6.4.1.3, 6.4.1.4, 6.4.1.5, 6.4.1.7 and 6.4.1.9 as this is included in 6.4.1. Added section 6.4.1.13 for software changes. Added section 6.4.2.5 to include notification of changes to supplier management with authority to change quality policy and system. Update 8.1.8 to add Safety. Minor formatting/sentence changes. 	Jennifer Gray

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