MCHP: NPI Process

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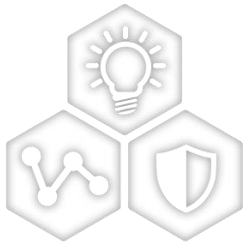
A Leading Provider of Smart, Connected and Secure Embedded Control Solutions

SMART | CONNECTED | SECURE

MPHL - TPE
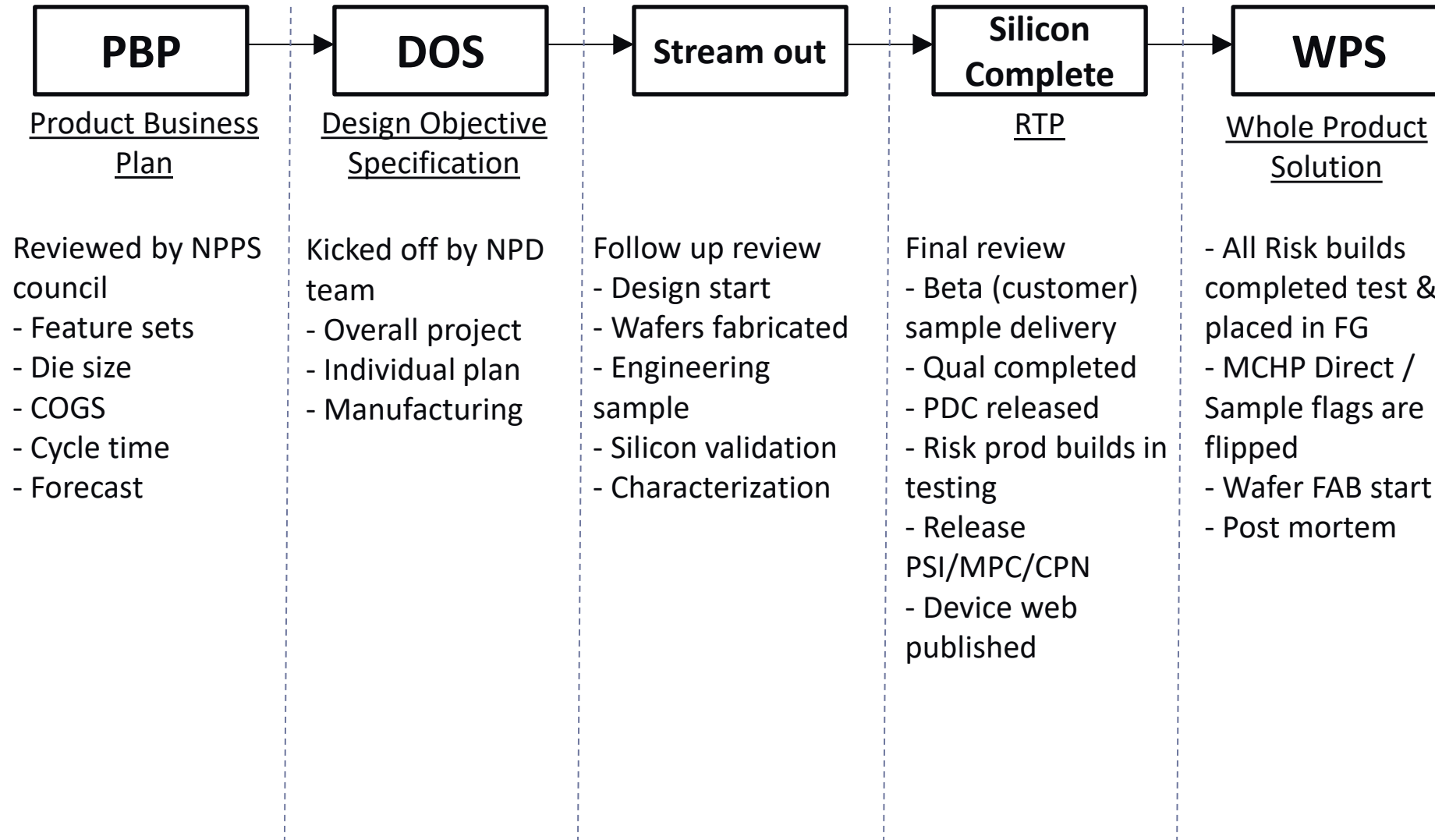
May 2024

NPI Process

MCHP

Scope

- **Present how Microchip introduces new product and releases to manufacturing.**
- **SPI-41036: New Product Development Review / Quality Planning and FRM-41036-xxx.**
  - **Team Composition**
  - **Key Milestones**
  - **Forms**
  - **Peer Review**
  - **Engineering Engagement**

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Team Composition

- **Product Engineer (Team Leader)**
- **Design Leader**
- **Product Marketing**
- **Applications**
- **Test Engineer**
- **Software and Development Systems - BU**
- **Assembly Engineer**
- **Quality/Reliability**
- **Manufacturing (Probe/FT)**
- **Foundry Interface**
- **Test Hardware Group**

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Key Milestones

PBP	DOS	Stream out	Silicon Complete	WPS
Product Business Plan	Design Objective Specification		RTP	Whole Product Solution

PBP — Product Business Plan

Reviewed by NPPS council
- Feature sets
- Die size
- COGS
- Cycle time
- Forecast

DOS — Design Objective Specification

Kicked off by NPD team
- Overall project
- Individual plan
- Manufacturing

Stream out

Follow up review
- Design start
- Wafers fabricated
- Engineering sample
- Silicon validation
- Characterization

Silicon Complete — RTP

Final review
- Beta (customer) sample delivery
- Qual completed
- PDC released
- Risk prod builds in testing
- Release PSI/MPC/CPN
- Device web published

WPS — Whole Product Solution

- All Risk builds completed test & placed in FG
- MCHP Direct / Sample flags are flipped
- Wafer FAB start
- Post mortem

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Forms: DOS

FRM-41036-001 New Product Review @ DOS	
Primary	**Supporting Docs**
FRM-41036-005 - Attendance Summary	FRM-41036-016 - Special Requests Checklist
FRM-41036-006 - Actions/Notes Summary	FRM-41036-105 – Reliability Hardware Design Checklist
FRM-41036-007 - Wafer Start Summary	FRM-41036-121 - APID Automotive Manufacturing Checklist
FRM-41036-009 - Test Summary	
FRM-41036-011 - Assembly Summary	
FRM-41036-013 - Qualification Summary	
FRM-41036-017 - Hardware Summary	
FRM-41036-019 - Key Deliverables Summary	
FRM-41036-025 - Summary of DOS Requirements for Release	
IP Status Checklist – SharePoint e-Sign Application (IP Review Form)	

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Forms: Stream-out

FRM-41036-002 New Product Review@ Stream-out	
Primary	Supporting Docs
Front End PSI CN – SharePoint Application	FRM-41036-016 - Special Requests Checklist
Part Data Change Notice SharePoint Application - MPC/CPN/BOM CN	FRM-41036-035 – APID/MSLD Break-the Part (DFMEA) Checklist
FAB Work Order SharePoint Application – Wafer Start CN (Internal FABs only)	FRM-41036-125 - Mark & Pack (SCAN) New Package/Cd Readiness Requirements
FRM-41036-005 - Attendance Summary	
FRM-41036-006 - Actions/Notes Summary	
FRM-41036-007 - Wafer Start Summary	
FRM-41036-009 - Test Summary	
FRM-41036-011 - Assembly Summary	
FRM-41036-013 - Qualification Summary	
FRM-41036-017 - Hardware Summary	
FRM-41036-019 - Key Deliverables Summary	
FRM-41036-025 – Summary of DOS Requirements for Release or WPIP (Whole Product Introduction Plan)	
FRM-41036-026 - Production Ramp Plan	
FRM-41036-105 – Reliability Hardware Design Checklist	
FRM-00034 – Customs requirements	
IP Status Checklist – SharePoint e-Sign Application (IP Review Form)	

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Forms: RTP

FRM-41036-003 New Product Review @ RTP	
Primary	**Supporting Docs**
Front End PSI CN – SharePoint Application	FRM-41036-016 - Special Requests Checklist
Part Data Change Notice SharePoint Application - MPC/CPN/BOM CN	FRM-41036-042 - Reliability Monitor Program Addition Checklist
FRM-41036-005 - Attendance Summary	FRM-41036-036 - Whole Product Review Checklist
FRM-41036-006 - Actions/Notes Summary	FRM-41036-037 - Whole Product Solution Checklist
FRM-41036-021 - Summary Qual Test Results	FRM-41036-125 - Mark & Pack (SCAN) New Package/Cd Readiness Requirements
FRM-41036-022 - Production Readiness Summary	
FRM-41036-023 - Summary of Potential Problems	
FRM-41036-024 - Summary of Planned Changes	
FRM-41036-025 - Whole Product Collateral Summary Or WPIP (Whole Product Introduction Plan)	
FRM-41036-043 – Summary of Probe Readiness	

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Forms: WPS

FRM-41036-036 PIC Whole Product Review	
Primary	Supporting Docs
FRM-41036-005 – Attendance Summary	FRM-41036-037 - Whole Product Solution Checklist
	FRM-41037-003 – WSG WPS Kick-off

FRM-41036-004 Post-Mortem

Peer Review

Review At…	Required Participants[†]	Recommended Participants (Representing)
DOS (New Products only)	• Product Engr (Team Leader) • Design Leader • Product Marketing** • Applications • Test Engineer • Software (Business Unit dependent) • Development Systems (Business Unit dependent)	• Assembly Engr/CPTD • Quality/Reliability* • Manufacturing (Probe)* • Manufacturing (FT)* • Team leaders of similar projects • Foundry Interface Group****
Stream-out	• Product Engr (Team Leader) • Design Leader • Product Marketing** • Quality/Reliability* • Applications • Test Engineer • Software (Business Unit dependent) • Foundry Interface Group****	• Team leaders of similar projects • Manufacturing (Probe)* • Manufacturing (FT)* • Test Hardware Group*
Silicon RTP	• Product Engr (Team Leader) • Design Leader • Product Marketing** • Test Engineer • Production Control • Production Planning • Quality/Reliability • APG Product Engineer*****	• Manufacturing (Probe)* • Manufacturing (FT)* • Yield Enhancement* • Applications*** • Foundry Interface Group****
Fab Transfer RTP******	• Product Engr (Team Leader) • Test Engineer • Product Marketing • Production Control • Production Planning • Quality/Reliability • APG Product Engineer*****	• Manufacturing (Probe)* • Manufacturing (FT)* • Yield Enhancement* • Applications*** • Foundry Interface Group****
Whole Product	• Product Engineer (Team Leader) • Product Marketing** • Development Systems (Business Unit dependent) • Applications • Software (Business Unit dependent)	• Sales • FAE's
Post-mortem	Presented to the Product Team	N/A

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Peer Review cont..

Review At…	Required Participants[‡]	Recommended Participants (Representing)
EOL>REL or PHAS>REL	• **Requesting Product Engineer or Product Marketing**** • **APG******	• **Invite experts for input as needed to answer questions in the checklist**

*   Must receive a copy of the review if not in attendance. **   Must invite APG marketing if automotive focused ***   It is strongly suggested that Applications be invited for firmware- based products. **** For products to be manufactured in a foundry. (Required for APID & MSLD foundry products) ***** Required only for Automotive qualified products. ****** Fab Transfer CCB approval is required.
[‡] NOTE: Although best if all required participants attend the new product review meetings, in the event that a required participant cannot attend, the following action satisfies the participation requirement. Documentation must be included in the product review record indicating that the required participant reviewed and approved the product review presentation. Some example documentation methods are listed below: -   Attach an email from the required participant indicating that they reviewed and approved the product review presentation. -   Add an entry on the attendance sheet for this required participant with a note indicating that they did review and approve the product review presentation. -   Waterfall attendance feature captures the list of attendees present at the review. For participants absent during the review, a copy of the review will be sent via an automated email. Approvals can be provided by following the link in the email. Waterfall captures these approvals.

Engineering Engagement

PBP DOS   SO   ES   Qual   RTP   Manufacturing

Kickoff		Wafer Fab	ES / Qual / Risk Builds

ES Delivery

Qual plan | **Qual report**

PSI, MPC, CPN

Device publish

Cost Improvement
- Yield
- LRR
- Site count
- TTR
- H/CTE
- Strip

DOS review

Test plan
- Coverage
- Production
- Qual
- Char

TP development - ES, Qual, Char, Prod

Char collection

HW plan | **HW development**

Manufacturability
- Assembly
- Test
- Scan

TP / HW Full checkout

Test support

PDC release

BU TE, BU PE and Manufacturing TPE

Time

Waterfall CCT

Waterfall Comprehensive Checklist Tracker (CCT) is an online system used for tracking the new product development (NPD). The online system can be used as an alternative to the paper-based checklists associated with each milestone of the NPD process. This applies to all business units of Microchip Technology Inc.

All checklists pertaining to this procedure **SPI-41036** are supported by Waterfall release (starting Jan 2018) except for SharePoint Applications (ex: MPC/CPN/BOM, IP Form etc.).

Access Waterfall through: waterfall.microchip.com

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Waterfall: STS01

WSG Checklist Tracker

ATA5351 CaRA mark II - C1	Project Checklist Completion - 100% ⌃

Project Details

Project : ATA5351 CaRA mark II
Rev : C1
Mask ID : STS01
Proj Mgr / Chip Lead : Klaus Gratzke - M43615 ✉
Product Engineer : Maurizio Fagiolo - C50554 ✉

Checklist Completion

[Answered Completion] [Reviewed Completion]

100%
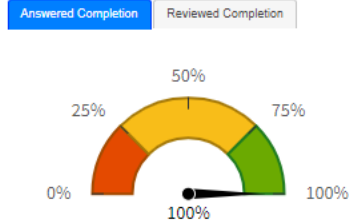
Project Links

Project Checklist Completion : 100 % (Completed)
Project Creation Date : Feb 14 2020

Project Home   Project Team
Project Summary   Project IP Info
Project Release Info   Parent Project

Project Complete

Approved By: Klaus Gratzke - M43615
Approval Date: Jul 14 2023 09:16

Checklist Navigation Options ⌃

Milestone	Discipline	Review Event			
----- Select ----- [Go]	----- Select ----- [Go]	----- Select ----- [Go]	Project Snapshots	All Questions	AI & Notes

Project Milestone ⌃

Milestone Name	Answered(%)	Reviewed(%)	Pending Action Item(s)?	Status	Latest Completed Task	By
PBP	100.0	100.0	0	Completed	2020-02-14 09:44	Klaus G
DOS	100.0	100.0	0	Completed	2020-02-14 09:55	Klaus G
Feasibility	100.0	100.0	0	Completed	2020-02-14 09:45	Klaus G
Floorplan	100.0	100.0	0	Completed	2020-02-14 09:55	Klaus G
RTL Freeze	100.0	100.0	0	Completed	2020-02-14 09:55	Klaus G
Streamout	100.0	100.0	0	Completed	2020-02-21 11:37	Klaus G
Post Mortem at Streamout	100.0	100.0	0	Completed	2023-07-14 09:14	Klaus G
Engineering Samples	100.0	100.0	0	Completed	2020-04-08 07:20	Klaus G
Silicon Validation	100.0	100.0	0	Completed	2023-07-14 09:15	Klaus G
Silicon Characterization	100.0	100.0	0	Completed	2023-07-14 09:16	Klaus G
EA Samples	100.0	100.0	0	Completed	2023-07-14 08:46	Klaus G
RTP	100.0	100.0	0	Completed	2023-07-14 09:02	Klaus G
WPS	100.0	100.0	0	Completed	2023-07-14 09:07	Klaus G
Post Mortem	100.0	100.0	0	Completed	2023-07-14 09:11	Klaus G

Current Milestone is highlighted with green(■) color background

Waterfall: STS01

WSG Checklist Tracker

ATA5351_CaRA_markII - C1   Project Checklist Completion - 98.8% ⋀

Project Details

Project	: ATA5351_CaRA_markII
Rev	: C1
Mask ID	: STS01
Proj Mgr / Chip Lead	: Alexander Schaller - M43758 ✉
Product Engineer	: Klaus Gratzke - M43615 ✉

Checklist Completion

[Answered Completion] [Reviewed Completion]

50%
25%   75%
0%   100%
98.8%
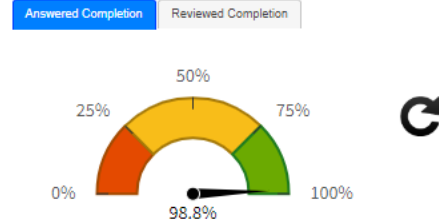
Project Links

Project Checklist Completion : 98.8 % (In Progress)
Project Creation Date : Feb 14 2020

Project Home   Project Team
Project Summary   FRM Version
Linked to **ATA5351-7MQW-VAO** Product   PE Flow Diagram

Checklist Navigation Options ⋀

Milestone	Discipline	FRMs			
----- Select ----- [Go]	----- Select ----- [Go]	----- Select ----- [Go]	Project Snapshots	All Questions	AI & Notes

Project Milestone ⋀

Milestone Name	Answered(%)	Reviewed(%)	Pending Action Item(s)?	Status	Latest Completed Task	By
DOS	100.0	100.0	0	Completed	2020-02-20 13:24	Maurizio F
Streamout	100.0	100.0	0	Completed	2020-02-21 11:20	Klaus G
RTP	100.0	100.0	0	Completed	2020-09-03 06:24	Michelle P
WPS	100.0	100.0	0	Completed	2023-09-21 08:19	Alexander S
Post Mortem	93.8	87.5	0	Active	2023-07-19 03:08	Alexander S

Current Milestone is highlighted with green(■) color background

Note :
- To choose next step in the PE Checklist flow, please contact Alexander Schaller - M43758 ✉ / Klaus Gratzke - M43615 ✉

Microchip

Waterfall: STS01

List of FRMs that contains Data entry / Table(s)

↓ Back to Top

FRM #	FRM Name	Answer Completion (%)	Answer Completion Status	Review Completion Status	Last Answered	Last Answered By	Reviewed By
FRM-41036-003_T	NEW PRODUCT REVIEW AT RTP CHECKLIST	100.0	Completed	Reviewed	2020-09-22 11:15	Klaus G	Klaus G/2020-09-22 11:16
FRM-41036-005_E	NEW PRODUCT REVIEW ATTENDANCE SHEET	100.0	Completed	Reviewed	2020-09-29 01:27	Wolfgang E	Alexander S/2020-11-12 09:05
FRM-41036-016_E	NEW PRODUCT REVIEW CHECKLIST FOR SPECIAL CUSTOMER REQUESTS	100.0	Completed	Reviewed	2020-09-08 05:16	Alexander S	Klaus G/2020-09-17 08:54
FRM-41036-021_E	SUMMARY OF QUALIFICATION TEST RESULTS	100.0	Completed	Reviewed	2020-09-08 05:36	Alexander S	Klaus G/2020-09-14 03:40
FRM-41036-022_Q	SUMMARY OF PRODUCTION READINESS	100.0	Completed	Reviewed	2020-09-08 10:27	Rely R	Klaus G/2020-09-14 03:42
FRM-41036-023_E	SUMMARY OF POTENTIAL PROBLEMS	100.0	Completed	Reviewed	2020-09-08 05:43	Alexander S	Klaus G/2020-09-14 03:43
FRM-41036-024_C	SUMMARY OF PLANNED CHANGES AND ENHANCEMENTS	100.0	Completed	Reviewed	2020-09-08 05:46	Alexander S	Klaus G/2020-09-14 03:44
FRM-41036-025_G	SUMMARY OF WHOLE PRODUCT COLLATERAL	100.0	Completed	Reviewed	2020-09-21 03:50	Alexander S	Klaus G/2020-09-21 04:17
FRM-41036-042_D	RELIABILITY MONITOR PROGRAM ADDITION CHECKLIST	100.0	Completed	Reviewed	2020-10-26 09:55	Alexander S	Alexander S/2021-02-08 09:56
FRM-41036-043_A	SUMMARY OF PROBE READINESS	100.0	Completed	Reviewed	2021-02-16 02:27	Michelle P	Alexander S/2021-02-16 02:31
FRM-41036-125_Rev-A	MARK & PACK (SCAN) NEW PACKAGE/CD READINESS REQUIREMENTS	100.0	Completed	Reviewed	2020-09-11 08:32	Alexander S	Klaus G/2020-11-12 09:09
FRM-41037-003_B	WSG WPS KICKOFF SCHEDULE AND SCHEDULE UPDATE FORM	100.0	Completed	Reviewed	2020-11-12 08:55	Alexander S	Klaus G/2020-11-12 09:09

Links on the actual records:

SUMMARY OF PROBE READINESS

SUMMARY OF PRODUCTION READINESS

Waterfall: STZ06

MPU32 Checklist Tracker

Gallardo STZ06 - A0   Project Checklist Completion - 100% ^

Project Details

Project	: Gallardo STZ06
Rev	: A0
Mask ID	: STZ06
Proj Mgr / Chip Lead	: Thierry Rivier - M43440 ✉
Product Engineer	: Thierry Rivier - M43440 ✉

Checklist Completion

Answered Completion	Reviewed Completion

50%
25% 75%
0% 100%
100%

↻
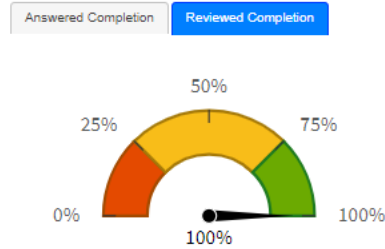
Project Links

Project Checklist Completion : 100 % (Pending Approval)
Project Creation Date : Jun 11 2021

Project Home   Project Team
Action list document FRM41036-006   Project Summary
FRM Version   Linked to **Gallardo** Product
Parent Project   PE Flow Diagram

Checklist Navigation Options ^

Milestone	Discipline	FRMs			
RTP ▾ Go	----- Select ----- ▾ Go	----- Select ----- ▾ Go	Project Snapshots	All Questions	AI & Notes

Project Milestone ^

Milestone Name	Answered(%)	Reviewed(%)	Pending Action Item(s)?	Status	Latest Completed Task	By
DOS	100.0	100.0	0	Completed	2021-06-14 11:44	Thierry R
Streamout	100.0	100.0	0	Completed	2022-02-16 10:35	Thierry R
RTP	100.0	100.0	0	Completed	2022-03-11 11:35	Sheryll C
WPS	100.0	100.0	0	Completed	2022-06-23 10:50	Thierry R
Post Mortem	100.0	100.0	0	Completed	2022-06-28 05:38	Thierry R

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Waterfall: STZ06

List of FRMs that contains Data entry / Table(s)

FRM #	FRM Name	Answer Completion (%)	Answer Completion Status	Review Completion Status	Last Answered	Last Answered By	Reviewed By
FRM-41036-003_T	NEW PRODUCT REVIEW AT RTP CHECKLIST	100.0	Completed	Reviewed	2022-02-16 11:35	Thierry R	Thierry R/2022-03-24 07:47
FRM-41036-005_E	NEW PRODUCT REVIEW ATTENDANCE SHEET	100.0	Completed	Reviewed	2022-03-27 05:00	Sheryll C	Thierry R/2022-06-13 07:48
FRM-41036-016_E	NEW PRODUCT REVIEW CHECKLIST FOR SPECIAL CUSTOMER REQUESTS	100.0	Completed	Reviewed	2022-02-23 09:06	Thierry R	Thierry R/2022-03-24 08:03
FRM-41036-021_E	SUMMARY OF QUALIFICATION TEST RESULTS	100.0	Completed	Reviewed	2022-03-10 05:43	Marta G	Thierry R/2022-03-24 08:00
FRM-41036-022_Q	SUMMARY OF PRODUCTION READINESS	100.0	Completed	Reviewed	2022-03-15 06:30	Thierry R	Thierry R/2022-03-24 08:01
FRM-41036-023_E	SUMMARY OF POTENTIAL PROBLEMS	100.0	Completed	Reviewed	2022-03-18 03:28	Thierry R	Thierry R/2022-03-24 08:01
FRM-41036-024_C	SUMMARY OF PLANNED CHANGES AND ENHANCEMENTS	100.0	Completed	Reviewed	2022-02-16 11:53	Thierry R	Thierry R/2022-03-24 08:01
FRM-41036-025_G	SUMMARY OF WHOLE PRODUCT COLLATERAL	100.0	Completed	Reviewed	2022-03-24 06:36	Thierry R	Thierry R/2022-03-24 08:02
FRM-41036-042_D	RELIABILITY MONITOR PROGRAM ADDITION CHECKLIST	100.0	Completed	Reviewed	2022-03-04 01:39	Thierry R	Thierry R/2022-03-24 08:08
FRM-41036-043_A	SUMMARY OF PROBE READINESS	100.0	Completed	Reviewed	2022-03-11 11:13	Thierry R	Thierry R/2022-03-24 07:41
FRM-41036-125_A	MARK & PACK (SCAN) NEW PACKAGE/CD READINESS REQUIREMENTS	100.0	Completed	Reviewed	2022-03-17 23:55	Nescelle Marie E	Thierry R/2022-03-24 08:10

Links on the actual records:

SUMMARY OF PROBE READINESS

SUMMARY OF PRODUCTION READINESS

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Waterfall: STZ06

Links on the actual records:

ACTION ITEMS

TP Release

MCHP

Test Program Release Overview

```
        ┌─────────────┐
        │    Start    │
        └──────┬──────┘
               │
     ┌─────────▼─────────┐
     │  Get TP Source code │            Originator
     │   from TPServer    │
     └─────────┬─────────┘
               │
     ┌─────────▼─────────┐
     │    TP Revision    │
     └─────────┬─────────┘
               │
     ┌─────────▼─────────┐
     │    TP Checkout    │
     └─────────┬─────────┘
               │
          ◇ Peer ◇
    Reject │ Review │
          ◇───────◇
         Approve │
               │
     ┌─────────▼─────────┐
     │   CN Submission   │
     └─────────┬─────────┘
               │
          ◇  CN  ◇
          │ Approval │  Reject
          ◇───────◇
         Approve │
               │
     ┌─────────▼─────────┐
     │Release To Production│
     └─────────┬─────────┘
               │
        ┌──────▼──────┐
        │     End     │
        └─────────────┘
```
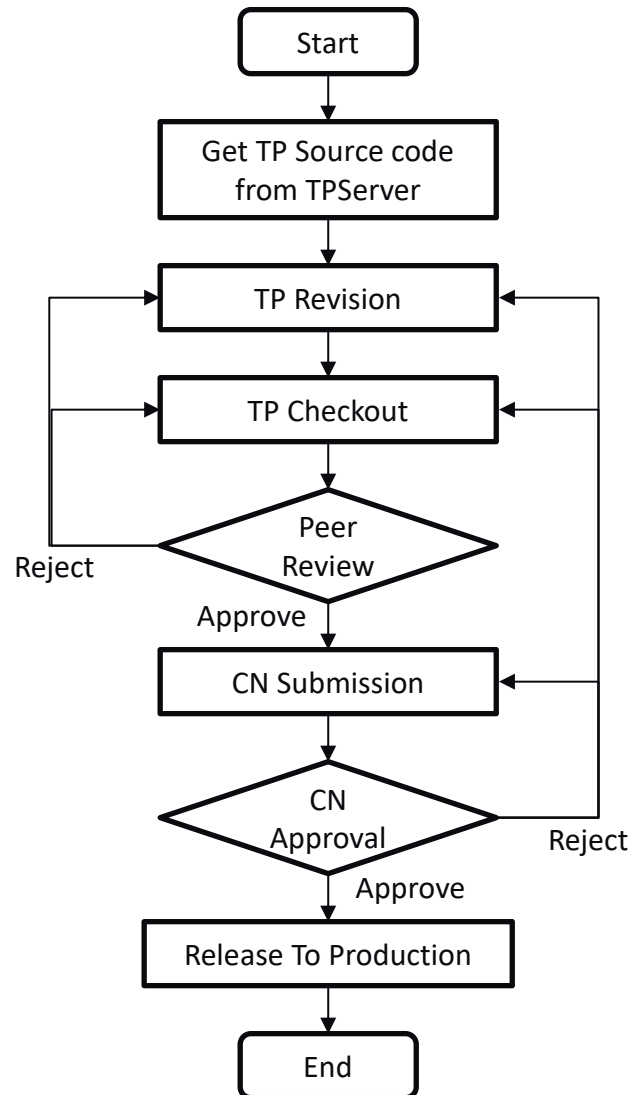
Originator

Originator fill "Corporate Program Verification Tasks" in checklist
Originator perform checkout as answered in checklist
Additions from MFG can be requested as needed
(Some BUs have had Peer reviewer agreement before request)

TE fill "Corporate Peer Review Tasks" in checklist
Peer reviewer cannot be an originator
MFG (Optional)

Originator submits CN

TE to guarantee quality of test program
PE to guarantee impact to product
MFG to guarantee suitability in production environment

DMS commits TP in TPServer and activates TP in system
Release Memo will be sent by Originator to Production

PI-70010 PDC Test Programs

MICROCHIP

Test Program CN (Wafer Test)

http://mchpweb-apps/dms/ecn/Generic%20Grid%20Configuration/CN%20Search.aspx?

Test Program CN (Final Test)

https://esign.microchip.com/Search

Reference Specs

SPI-41043 Test Specification System

SPI-41043-001 Test Hardware Development Procedure

SPI-41043-002 Test Development Procedure

SPI-41043-003 Test Verification, Review, and Release Procedure

SPI-41043-004 Test Program Release Criteria/Procedures

SPI-41043-005 Test Quality Screens Criteria/Procedures

SPI-41043-006 Guard banding for Tester Variances

FRM-41043-001 Test Program Verification and Peer Review Checksheet

http://mchpweb/dms/specindex/MCHPSearch.aspx?Spec%20Status=Current&Spec%20Type=SPI

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Thank you

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