

Design Review Gating Requirements					
Responsibility	Category	Concept	Prototype	Pilot	Production
Engineer	Application Review	Preliminary	Finalized	Review	Review
Engineer / Marketing	Review of competitive landscape and is it favorable?	Finalized			
Engineer	Product History (new product, derivative, cost reduction, change)	Finalized			
Eng / Sales / Marketing / Purchasing	Design to Cost Goals	Preliminary	Finalized	Adjust / Revise	Adjust / Revise
Sales / PM / Marketing	General Business Case - volumes, cash flow, return on investment	Preliminary	Finalized	Adjust / Revise	Adjust / Revise
Engineer	Intellectual Property / Patent Review	Finalized	Review	Review	Review
Engineer / Patent Attorney	Intellectual Property Creation, Patent Disclosure Submitted	Review	Finalized	Review	Review
Sales / PM / Engineer	Customer Schedule / Milestones Defined	Preliminary	Finalized	Review	Review
Engineer	Detailed Review of Product Design and Function	Preliminary	Finalized	Review	Review
Engineer	- Review Critical Characteristics (details of each component, how they function, physics on why it works)	Preliminary	Finalized	Review	
Engineer	- System Approach (system on chip, system in package, discrete chips (sensor / signal conditioning), CMOS processes / compatible, wafer size, etc.)	Preliminary	Finalized	Review	
Engineer	- Material Selections (silicon, graphene, etc.)	Preliminary	Finalized	Review	
Engineer	- Wafer Approach (SOI, monocrystalline, polycrystalline, etc)	Preliminary	Finalized	Review	
Engineer	- Orientation of Silicon	Preliminary	Finalized	Review	
Engineer	- Doping Strategy (type, quantity, ion implantation, diffusion, etc.)	Preliminary	Finalized	Review	
Engineer	- Sensing / Actuation Technology (piezoresistive, capacitive, etc.)	Preliminary	Finalized	Review	
Engineer	- Micromachining Technology (bulk, surface, wet or dry etch, etc.)	Preliminary	Finalized	Review	
Engineer	- MEMS Features (undercuts, membranes, channels, etc.)	Preliminary	Finalized	Review	
Engineer	- CMOS Features (if required)	Preliminary	Finalized	Review	
Engineer	- Nanofabrication Feature Integration (if required)	Preliminary	Finalized	Review	
Engineer	- Metalizations (traces, wirebond pads, etc.)	Preliminary	Finalized	Review	
Engineer	- Oxide layers	Preliminary	Finalized	Review	
Engineer	- Through Silicon Vias	Preliminary	Finalized	Review	
Engineer	- Does the design require energy harvesting? If so, what approach?	Preliminary	Finalized	Review	
Engineer	- Process Steps and Order	Preliminary	Finalized	Review	Review
Engineer	- Explain features resulting from concurrent development of design, process, tooling and equipment for high yield and cost optimization. Does the design require new processes not currently deployed? If so, how is risk mitigated?	Preliminary	Finalized	Review	Review
Engineer	- Concurrent Design of MEMS Integration Strategy with Subsystem (i.e. solder bumps, hermiticity, packaging, sensor) and End System (final product - brake system, IED detection system, etc.)	Preliminary	Finalized	Review	Review
Engineer	- Completion of Models and Detailed Drawings	Preliminary	Finalized	Review	Review
Engineer	- Design feedback from foundry, equipment vendors and customer (MEMS integrator)	Preliminary	Finalized	Review	Review
Engineer	Review of analysis completed to validate design (Pspice simulations, tolerance stacks, doping simulations, FEA, matlab simulations, etc.)	Preliminary	Finalized	Review	
Engineer	Review for compliance to existing engineering specifications (JEDEC, ASTM, SAE, JIS, etc.)	Preliminary	Finalized	Review	Review
Engineer	DFMEA Completion and Review	Preliminary	Finalized	Review	Review
Sales / PM / Engineer	Customer Specification Review	Preliminary	Finalized	Review / Adjust	Review
Sales / PM / Engineer	- Gaps to specification that cannot be met, reasoning and mitigation plan	Preliminary	Finalized	Review / Adjust	Review
Sales / PM / Engineer	- Documentation of verbal communications of critical information not contained in spec.	Preliminary	Finalized	Review / Adjust	Review
Engineer	- Review of System FMEA	Preliminary	Finalized	Review / Adjust	Review
Sales / PM / Engineer	- Changes in Specifications During Development	Preliminary	Finalized	Review / Adjust	Review
Sales / PM / Engineer	- New Area of Concern Based on New Information from Development	Preliminary	Finalized	Review / Adjust	Review
Engineer	Design and Production Validation Test Plans	Preliminary	Finalized	Review	
Engineer	Review of Design and Production Validations Completed	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Measurement system analysis (Gage R&R, accuracy analysis, etc.)	Preliminary	Finalized		
Engineer	- Controls used	Preliminary	Finalized	Review	
Engineer	- Design of experiments review	Preliminary	Finalized	Review / adjust	
Engineer	- Highlights from Critical Tests	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- History of design issues, root causes and resolutions	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Comparison of results from concept, prototype, pilot and production samples when meaningful trends present	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Results from competitive benchmarking	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Review of results from testing at customer facility	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Visual inspection and tear down analysis of parts processed through validation showing robustness or potential issues	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	Strategic Testing to Failure (or 3 - 5X specification)	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Review of design weaknesses	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineer	- Design robustness (margin compared to spec)	Preliminary	Design Finalized	Pilot Finalized	Prod. Finalized
Engineers (design, process, equip)	Prototype and Production Tooling / Equipment Strategies	Preliminary	Design Finalized	Prod. Finalized	
Purchasing / Engineer	Supplier Reviews	Preliminary	Finalized	Review	Review
Purchasing / Engineer	- New or existing supplier	Preliminary	Finalized		
Purchasing / Engineer	- Supplier audit - knowledge, capability, quality and financial stability	Preliminary	Finalized	Review	
Purchasing / Engineer	- Component specifications accurate and complete	Preliminary	Finalized	Review	Review
Purchasing / Engineer	- Compliance and resolution to meet defined component specifications	Preliminary	Finalized	Review	Review
PM / Engineer	Risk Assessment	Preliminary	Finalized	Review	Review
PM / Engineer	Lessons Learned	Prev. Products	Review	Review	Finalized

PM - Program Manager

*Note all of this information cannot be displayed in one review. This document highlights critical areas and its up to the engineers/managers to decide the most meaningful information to include. However, all of this information should be completed and available to address potential concerns.