

A Promise To Deliver Value

Guiding our clients through our MEC Freeze Gate Product Design and Development Process, we've been able to deliver real value to our partners. Following a proven model, we've delivered hundreds of successful design projects that our clients have launched into their markets.

Many of our clients entrust us with full turn-key projects from idea to full product release. Others rely on us for ala carte services to supplement their own engineering capabilities and knowledge. Each project is managed through the stages of our process that you've selected to meet your needs for this job.

Goals

- On Time, On Budget, On Spec, On Cost Target
- Produce a Manufacturable, Testable Product
- Deliver a Market Winner
- Be Easy to Do Business With
- Provide Positive Control and Tracking of Project Goals and Deliverables

General Electronic Engineering and Design Capabilities

- Microprocessor
- FPGA
- Analog
- Digital signal processing
- Power management
- Motor drive
- Performance verification
 - Noise testing
 - Beta testing
 - CE evaluation
 - HAST and HALT testing
- Environmental testing
 - Temperature
 - Humidity
- Network communication
 - DeviceNet
 - AS-i
 - Seriplex
- Hardware and software integration
- IrDA and PDA support
- PCB Layout
- Circuit board design software capabilities
 - ORCAD
 - PADS
- Mechanical design software capabilities
 - 2 D AutoCAD
 - 3 D Inventor/CoCreate

MEC Services

- **Product Development**
- **Rapid Prototyping**
- **EMS Manufacturing Service**
- **PCB Assembly Service**



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MEC Innovation

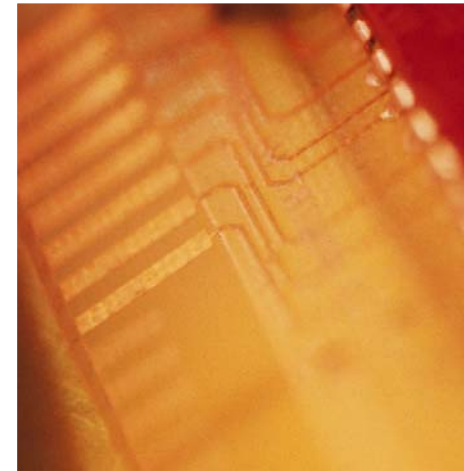
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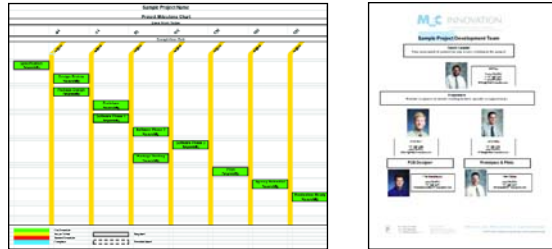


INNOVATION PROCESS

**Product Development
Electronic Design
Project Management**

Freeze Gate Development Process

Project Kickoff Meeting, Development Team and Project Timeline



We provide direct access to the engineers who will be working on your project at each stage and a color coded milestone chart for instant visual project progress.

MEC “Idea Capture” Session (MICS)

We provide guidance in the development of ideas and “what’s possible” sessions before we start determining specification details. A few hours or a full day, working through your thoughts, getting them filtered, prioritized, and down on paper. Our deliverable is your ideas in a clear plan for the future.

Specification Development

Once we have the product plan, we’ll delve into the operating conditions under which your product will live. Our written specification development step delivers a clear set of conditions, (physical, environmental or electronic).

Development Team Assigned
Timeline Established
 • MS Project
 • Contact Lists

Idea Capture Session
 • Block Diagrams
 • Key Functionality
 • Do Now, Plan for, Future unknowns

Spec Development

Proof of Concept
Design Components Selected

Design Review
 • Peer Review
 • DFT Audit
 • DFM Review

Software Development

FMEA

Board Layout

Hardware, Packaging Design

Build Protos

Prototype MAT’LS Procured

Software & Test Integration

Deliver Protos

Interactive Phased Release

Pilot Run

Agency Testing

Field Testing

Lab Testing

Pre-Production Audit DFM/DFT

Post Project Audit

Release

A Market Winner!

Design Review

Design Peer Review (DPR)

Here we utilize the full talent and experience of all our Project Managers, Designers and Layout Engineers to provide feedback on the initial design thoughts of the assigned Project Manager. Given the breadth of projects and products we’ve developed, this is an absolutely critical portion of the value we deliver, and one many of our clients can’t replicate within their own company.

Design For Test (DFT)

We recommend all PCB’s for In Circuit Testing (ICT) or Boundary Scan Testing (BST) and many for additional Functional Testing (TS). We study how the board will be tested and how we will provide for diagnosis of problems. Test points, optimal PCB coverage and suitability of ICT or FT fixtures are all reviewed.

Design For Manufacturability (DFM)

Our years of experience in building PCB assemblies provides us with a unique capability to provide feedback from the manufacturing floor. MEC Manufacturing Engineers offer their input toward producing a repeatable assembly at best cost.

Proof Of Concept

In some projects, we may jointly decide to take small steps to prove out some core level of functionality. Avoiding big mistakes now, that have broad impact later, can save hours and dollars later.

Parallel Processing

Initial Design & Layout

A base schematic and Bill of Materials are selected. Components are reviewed for life expectancy and suitability for application. Initial layout is completed.

Prototype BOM Procurement

Buying electronic components in very small prototype quantities requires special skills and supplier relationships. Our experience in this stage of development provides value client’s can’t match.

Build Prototypes

Prototypes will be built using production methods and equipment. Our use of highly qualified assembly personnel who generate manufacturability reports provide the timely address of manufacturing issues early in the process.

Software Integration and Test

Development is an emerging knowledge process; consequently we acknowledge that change is necessary. We will stage software

Revision Control
 Begins upon delivery of the prototype. We begin revision control on all documents so that we can track changes along the way.

Failure Mode & Effects Analysis (FMEA)

FMEA is methodology for analyzing potential reliability problems early in the development cycle where it is easier to take actions to overcome these issues, enhancing reliability through design. FMEA is used to identify potential failure modes, determine their effect on the operation of the product, and identify actions to mitigate the failures.

development into quick turn phases. Each phase will freeze functional requirements for that stage. Core functionality is delivered first. The early learning allows changes to be made in future stage requirements to optimize product performance. Traditional methodology of delivery in large blocks of code creates significant reworking of code and longer delays as the issue list grows to unmanageable size. Our approach provides the opportunity to release pilots earlier and accelerate the development process.

Pilot Run & Field Testing

This stage is strongly recommended. Product is built in a production intent process and a limited quantity of product is placed in a real world environment. Experience and insight into performance can be gained, which cannot be replicated in the lab.

Pre-Production Audit

This step again provides a full review of the product and it’s readiness to be released for full production in quantity. Our Manufacturing Engineers are involved to provide feedback and vote approval or non-approval of that readiness for manufacture and test.

Typical Timeline

2 WEEKS

12 WEEKS

7 WEEKS

12 WEEKS