



**Welcome to**

**Murrietta Circuits**  
**The Integrated Solution**

# Introduction

- Murrietta Circuits is a high reliability, turnkey supplier of Electronic Manufacturing Services.
- The company was founded in 1980 and specializes in the design, fabrication, assembly and testing of circuit boards, with today's most challenging technologies and applications.
- 27 years of experience & Financially Sound.
- The unique feature of our company is that we perform all these services under one roof, with one management team, one quality system, and one MIS system.
- 50,000 Sq. Ft. Mfg Facility
- AS9100 & ISO 9001:2000 Registered
- J-Std-001 Certified



# Mission Statement

**“We will consistently deliver Quality products, on time, with the highest Customer Service, while continually improving our processes.”**



# Murrietta Circuits Plant



Corporate Address:  
5000 East Landon Drive, Anaheim, California 92807  
Phone: 714-970-2430 Fax: 714-970-2406

# Murrietta Circuits Major Strengths

1

Complete Design, Manufacturing and Assembly Capabilities – All In House

2

Excellent DFM Knowledge

3

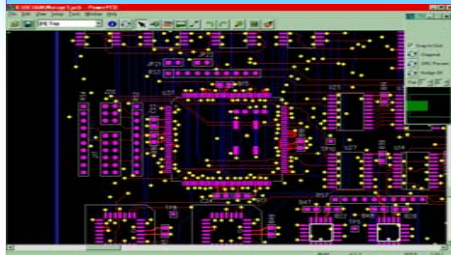
One Source – One Purchase Order – One Point of Responsibility

4

Excellent Quality, Customer Service & On-Time Deliveries

# Comprehensive Services Capabilities

## PCB Design Layout



- PCB Design to IPC 222X Standards
- Mentor Graphics Expedition PCB, Pads-Power PCB Design, Altium Summer 2009
- Mentor and OrCad Schematic Capture
- Fine Pitch SMT & Micro BGA
- Digital, Analog & RF
- High Speed & Impedance Control
- Mechanical Engineering
- Designed for:
  - Manufacturability
  - Testability

## PCB Fabrication



- Quick Turn, Prototype & Production
- SMT, Micro BGA, 4 to 30 Layers
- Line and Pad Spacing - .003
- Blind and Buried Vias
- Impedance Testing
- DFM Analysis
- Netlist Testing (Flying Probe & Fixtures)
- Materials: FR-4, Rogers, Polyimide, Stablcor
- UL Approved, IPC 6012 Class II & III

## PCB Assembly



- Quick-Turn
- Prototype & Production
- Assemble to IPC-A-610 Class II & III
- Fine Pitch SMT & micro-BGAs
- Automated Optical Inspection (AOI)
- Chassis Assembly
- Cable & Wire Harness Assembly
- BGA X-Ray & Rework
- Conformal Coating
- J-Std-001 Process Certified

## Test Engineering



- Functional Test Fixtures (custom designed)
- Boundary Scan Programming & Testing (Corelis Software)
- In-Circuit Testing
- DFT Analysis
- Environmental (HASS/HALT)



## **Markets we serve**

**Consumer  
Electronics**

**Engineering  
Services**

**Semi-  
conductors**

**Military/  
Aerospace**

**General  
Electronics**

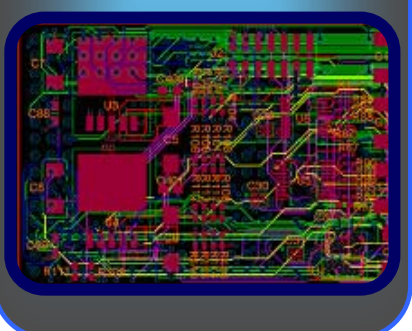
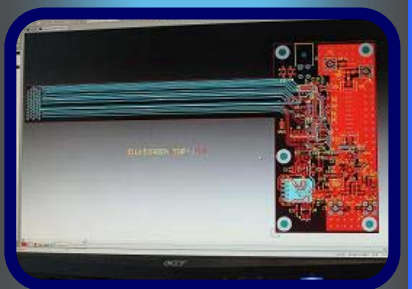
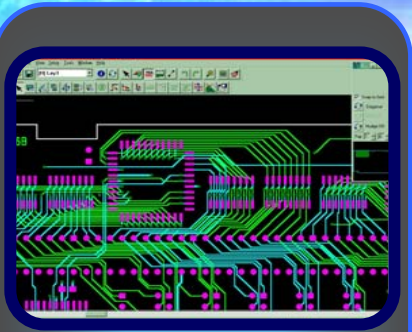
**Test &  
Measurements**

**Navigation  
Equipment**



# PCB Design Services

# PCB Design Capabilities & Tools



## CATEGORY

## CAPABILITY

### CAD Stations

- Mentor Graphics Expedition 2005 SP3
- PADS PowerPCB
- AutoCad for Drawing Packages
- Altium Summer 2009
- Solidworks 2010

### Schematic Capture

- Cadence OrCad Capture
- Mentor Graphics Design Capture
- Mentor Graphics DxDesigner

### Board Designs

- High Density/Complex Digital - Analog/Mixed Signal
- Digital/Analog
- Power Supplies
- Backplanes/Midplanes
- Blind/Buried Vias, Microvias & Via in Pad
- Rigid/Flex/Rigid-Flex

### High Speed Circuitry

- Single ended/Different Controlled Impedance
- Maximum Trace Length
- Matched Trace Length
- Delay Formulas
- Low to High Layer Count

### CAM Systems

- Valor Genesis - CAM350

### Features / Benefits

- Proven DFM Standards (Design For Manufacturability)
- Design For Testability (DFT)
- ICT Testability Analysis
- In-House PCB Fabrication
- In-House PCB Assembly
- BOM Analysis & Parts Procurement
- Full Electrical Engineering Services

### Pricing

- Fixed Price, Hourly Rates & On-Site Design Services

### Quality Standards

- IPC-2221 & IPC-2222
- IPC-275D



# PCB Manufacturing Services

# PCB Manufacturing Capabilities



Materials
FR-4, 170 Tg
FR-4, > 170 Tg
Polyimide, 260 Tg
Teflon
Rogers 4000
Lead-Free temp rated
Ceramic
Low Loss
Halogen Free
BT Epoxy
Cyanate Ester
<b>Buried Capacitance</b>
<b>*Pyralux Flexible Polyimide</b>
<b>*Copper (Rolled Annealed, E.D.)</b>

Multi-layer Construction
Max. Layers
<b>*Max. Layers</b>
<b>*Flex, Flex + Stiffener, Rigid-Flex</b>
Max. Thickness
Min. Thickness Tolerance
Blind & Buried via
Controlled Dielectrics Thickness
Layer to Layer Registration
Bow & Twist (inch per inch)
STABLCORE®

Inner Layers
Min. Core Dielectric
Min. Line ¼ copper
Min. Line ½ copper
Min. Space ½ copper
Min. Line 1 oz. copper
Min. Space 1 oz. copper
Min. Line 2 oz. copper
Min. Space 2 oz. copper
Min. Pad Size over drill (overall)
<b>*Min. Pad Size over drill (overall)</b>
Min. Plane Clearance diameter over drilled hole (overall)
<b>*Min. Plane Clearance diameter over drilled hole (overall)</b>

Drilling
Minimum Drill Size-mechanical
Controlled Depth Drilling
Drill Position (RTP)
Laser Drilling
<b>*Hole Edge To Rigid-Flex Interface</b>

Outer Layers
Min. Line 1 oz. copper
Min. Space 1 oz. copper
Min. Line 2 oz. copper
Min. Space 2 oz. copper
Min. Line 3 oz. copper
Min. Space 3 oz. copper
Base copper foil
Min. Pad over drill (overall)

Electrolytic Plating (Copper & Gold)
Max. Aspect Ratio, Copper (thru holes)
Max. Aspect Ratio, Copper (micro via)
Plasma Etch-back
Electrolytic Hard Gold, tips, selective
Electrolytic Soft Gold
Conductive Silver Via Fill (Via In Pad)
Edge Plating

# PCB Manufacturing Capabilities

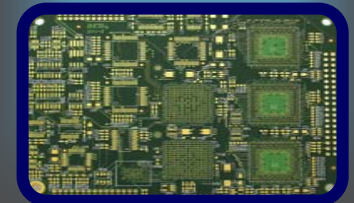
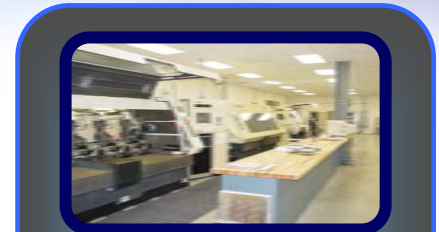
Solder mask & Legend	Surface Finishes	Fabrication
Solder mask type (LPISM)	Solder Leveling	Fabricated dimensions- routing
<b>*Solder mask type (Flexible)</b>		Fabrication radius
Colors-Green, blue, red, clear, black	Immersion Tin	Fabricated dimensions – scoring, x,y
Min. Solder mask dams		Fabricated dimensions - scoring, z (web thickness)
Min. Solder mask Clearance	Immersion Gold over electroless Nickel	Beveling
Legend Colors-white, yellow, black, red		Edge Milling
Via fill (Conductive, Non-Conductive)	Immersion Silver	Counter-sink/bore
Via tent (dry film)		<b>Precision Controlled Depth</b>
<b>Conductive Paste / Ink</b>	OSP	
Carbon Paste		
Dry film solder mask		

Testing-Electrical & Impedance
Double Sided Grid (.070/.080)
Flying Probe (fixture less)
Impedance-single ended, differential, broad-side coupled, edge coupled, co-planar
Impedance Tolerance

Panel Sizes
12" X 18", 16" X 18", 18" X 24"
<b>*Flex Min 12" X 18" – Max 18" X 24"</b>

Maximum Board Size
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Quality Standards
ISO-9000, 2000 Registered
AS-9100, Registered
IPC-6012/600 Class 2 & 3
UL Approved
Environmental - HALT, HASS, HATS
Ionic Cleanliness (bare & loaded board)



*\* Flex and Rigid-Flex design parameters only, all others apply to all product manufactured. Ask for Flex/Rigid Flex DFM demo.*

\*\*\*Stated manufacturing capabilities are intended to be general guidelines, deviations are possible and should be reviewed by Murrietta Circuits Engineering personnel\*\*\*



# PCB Assembly Services

# PCB Assembly Capabilities



## CATEGORY

## CAPABILITY

<b>Component Type's</b>	- SMT, BGA, Micro-BGA, Thru-Hole, Mixed, Double Sided			
<b>Max. Board Size (Automated)</b>	17 x 19			
<b>Max. Board Size (Manual)</b>	24 x 30			
<b>Min. Package Size</b>	0105 and up			
<b>Minimum Turn</b>	1 work day	<i>(Subject to job specific requirements)</i>		
<b>Turnkey Mfg /</b>				
<b>Parts Procurement</b>	Yes			
<b>Cable Assembly</b>	Yes			
<b>Box Builds</b>	Yes			
<b>Accepted Surface Finish:</b>	- Solder Level	- Immersion Gold	- White Immersion Tin	- Immersion Silver
<b>Conformal Coating Services:</b>	- Silicone (SR)	- Polyurethane (UR)	- Acrylic (AR)	- Epoxy (ER)
<b>X-Ray</b>	Yes			
<b>BGA Rework</b>	Yes			
<b>ESD Controls:</b>	- Floor Coatings	- Heel & Wrist Straps	- Grounded Equipment	- Daily Testing
<b>Test Services:</b>	- Functional Test Fixture Design & Mfg			
	- Boundary Scan Programming & Testing			
	- DFT Analysis			
<b>Quality Standards:</b>	- J-Standard 001 Process Certified		- IPC-610 Class II & III	
	- AS-9100 & ISO 9000 Registered (through UL)			



# Material Management

# Parts Procurement

We offer an experienced team of buyers, program managers, kitting specialist, BOM scrubbers and inventory managers, to provide you a full service turnkey solution.

## Parts Procurement services offered

- Worldwide Supply Contacts
- Supply Chain Management
  - Experienced Procurement Team
  - Bonding programs to ensure continuity of supply
- Long Term Supply Relationships with all major Franchised Distributors
- Design Review Teams
- BOM Analysis and Feedback
- Commercial, Mil-Spec, Rohs Compliance
- Custom ERP / MRP Solutions
- Vendor Managed Inventory Solutions





# Quality System

# Quality Policy & Quality Standards

## QUALITY ASSURANCE STANDARDS

- ISO 9001:2000 → Registered through UL
- AS9100 Certified → Registered through UL
- IPC 2221 & 2222 → PCB Layouts
- IPC-6012 & IPC 600 → PCB Fabrication
- IPC 610 Class II and III → PCB Assembly
- J-Standard 001 Certified → PCB Assembly
- UL Approved → PCB Fabrication
- ITAR Certified → Companywide
- Comsec Clearance → Companywide

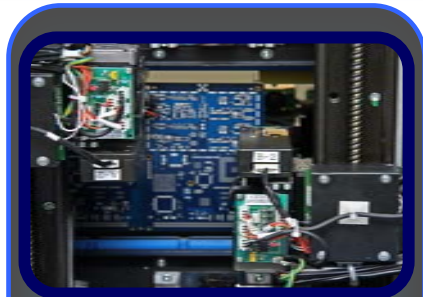


# Testing System

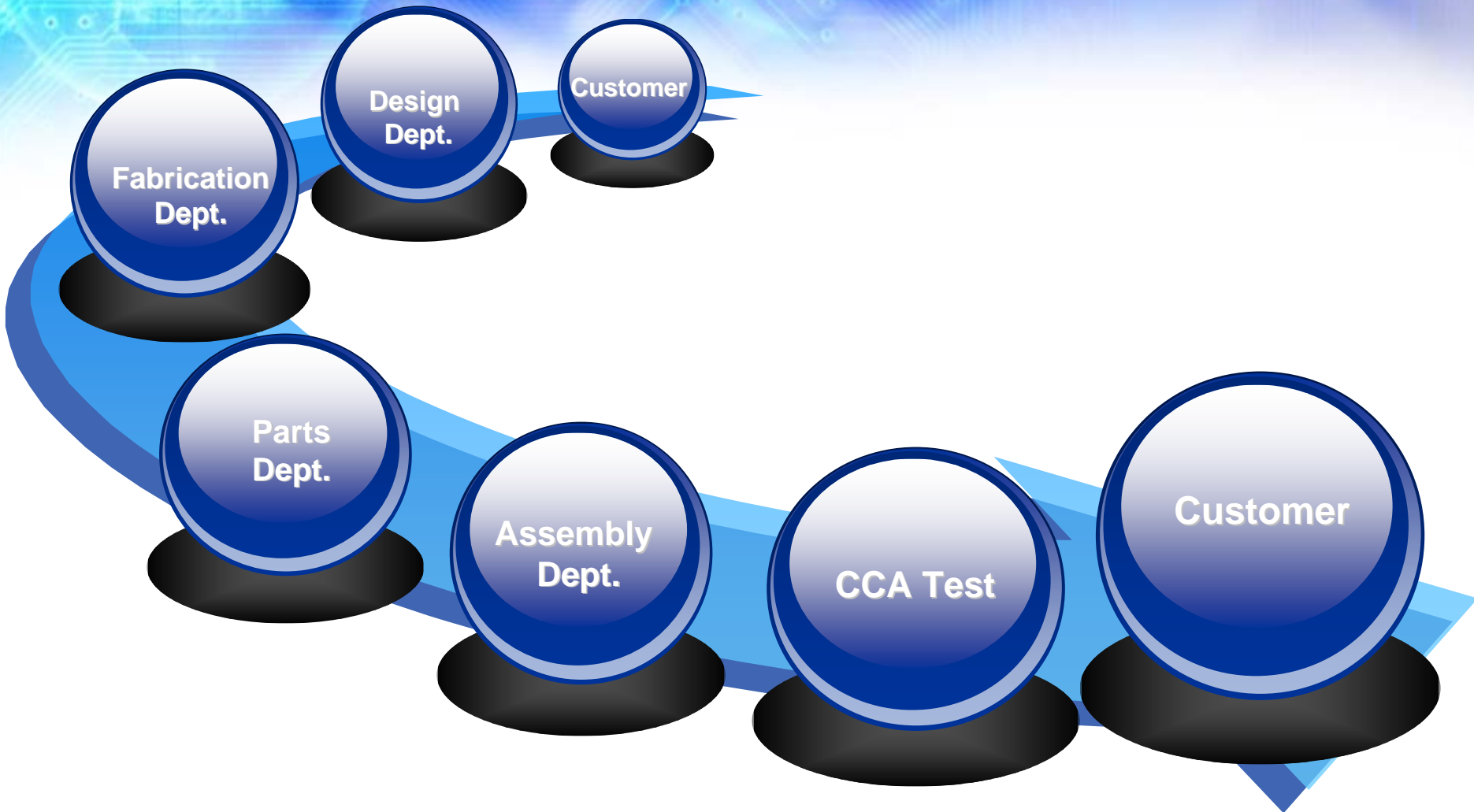
Murrietta Circuits offers a full range of testing services, from board level functional testing to full environmental screening.

## Testing services offered

- Sieca Pilot Flying Probe In-Circuit Test Machine with Viva Programming Software
- Functional Testing
- Boundary Scan Testing (BGA & fixtureless solutions)
- Boundary Scan Programming
- Custom Functional Test Box Design / Consulting
- Environmental Testing
  - HALT / HASS
  - Vibration
  - Temperature Cycling
  - Monitored / Un-Monitored
- In-Circuit Fixturing & Testing

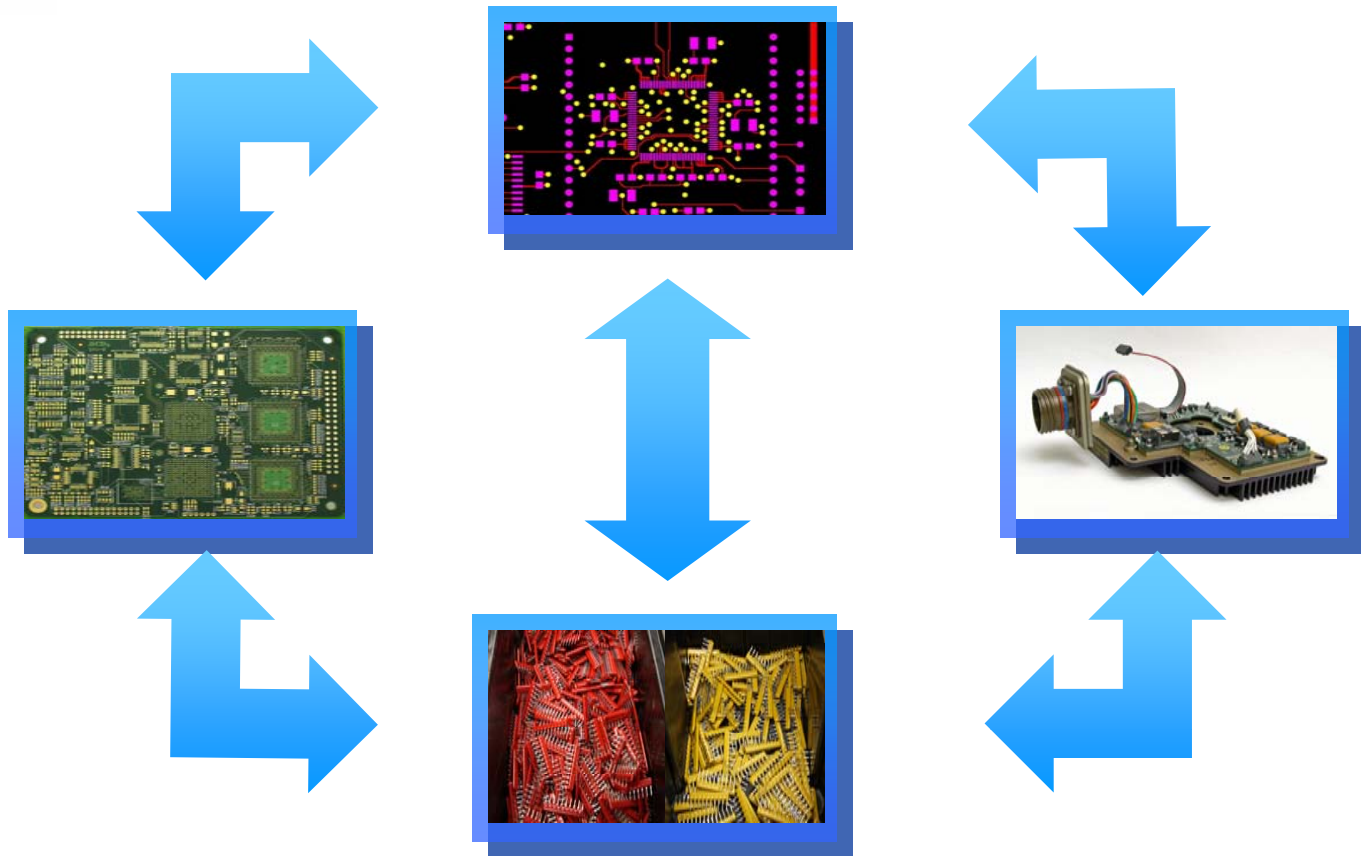


# Process Flow Chart

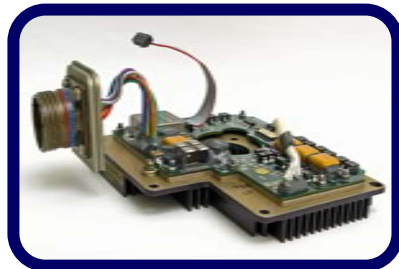
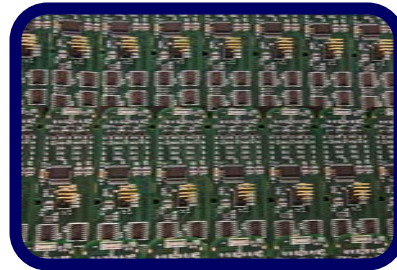
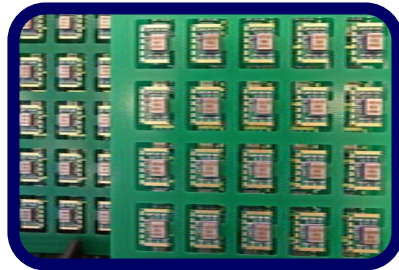
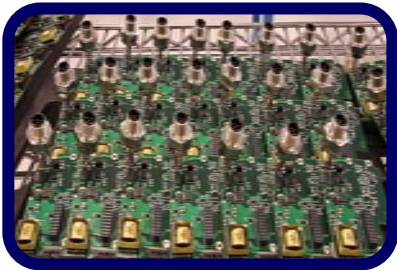


# Full Turnkey From design to assembly

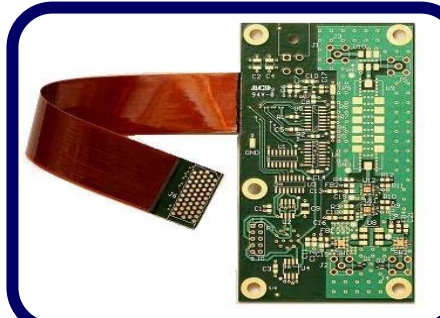
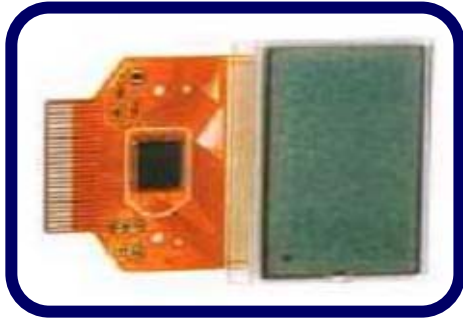
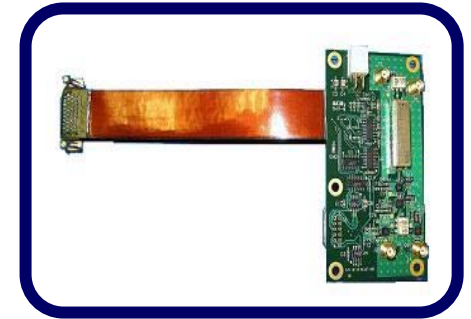
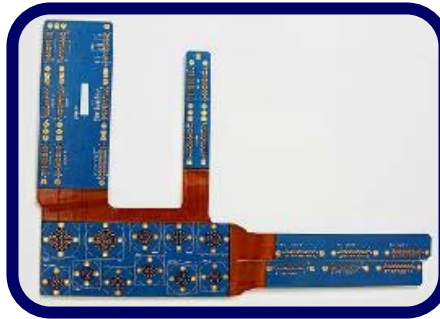
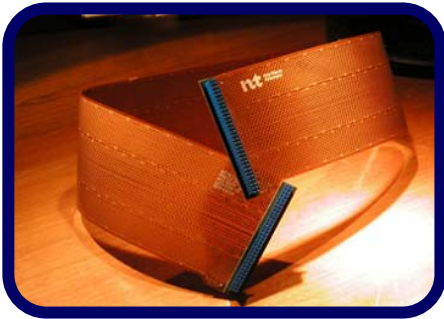
“All under one roof”



# Murrietta Circuits Product Samples



# Murrietta Circuits Product Samples

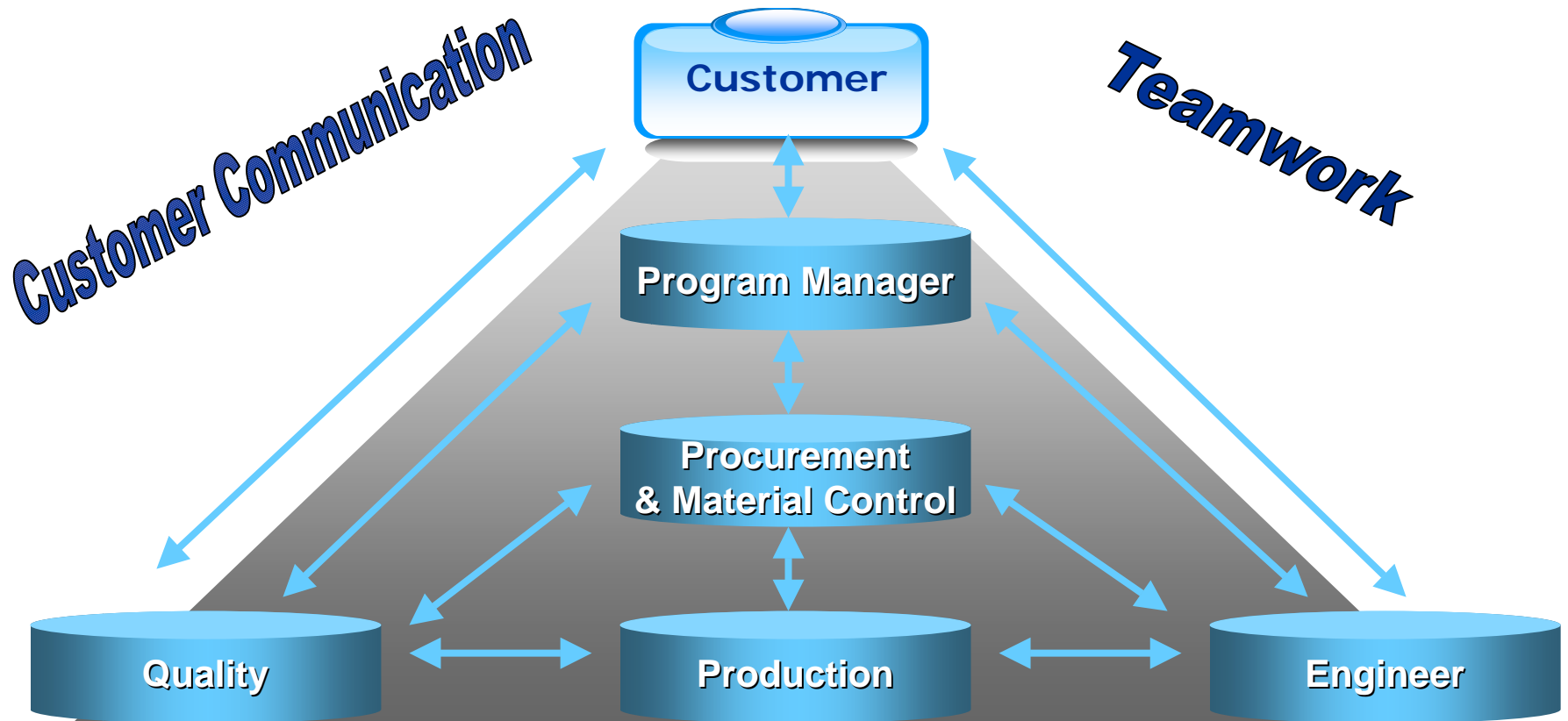




# Customer Service

# Customer Management System

“We strongly believe that our customers are the lifeblood of our Company and within the bounds of prudent management, all available resources are use to ensure their satisfaction. The customer service and support we offer is unique in our industry. The responsibility for quality and excellent customer service and on-time delivery rests with our Company.”



# Murrietta Circuits Satisfied Customers

**Raytheon**



**Honeywell**

**BROOKS**<sup>®</sup>  
INSTRUMENT

**JPL**

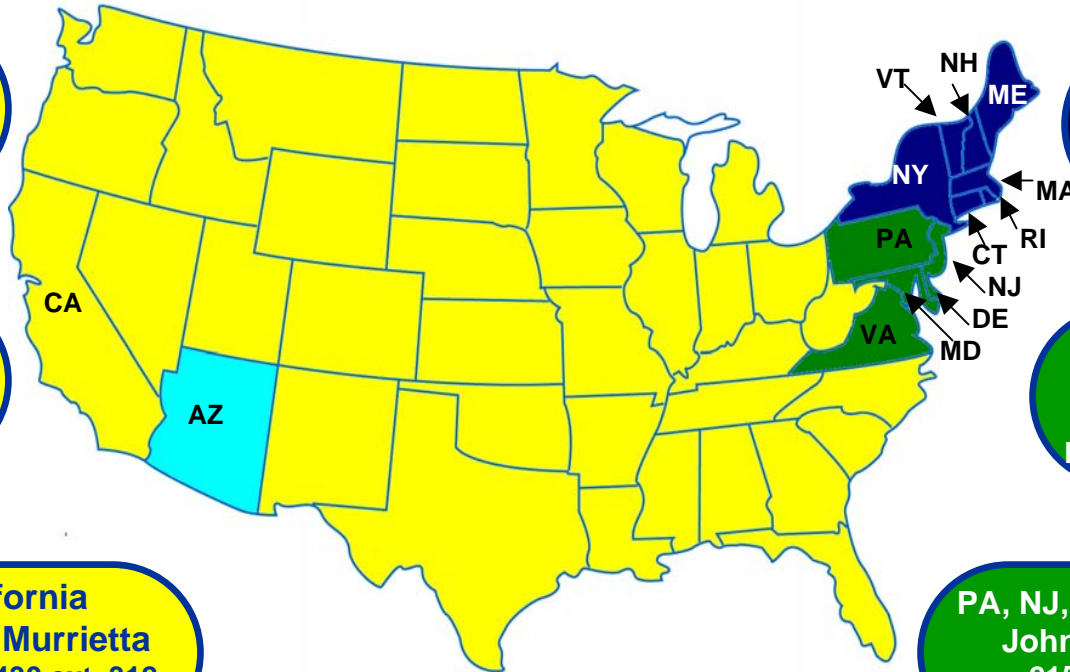


***NORTHROP GRUMMAN***





# Sales Contact



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# Thank You!

[www.murrietta.com](http://www.murrietta.com)