

# Quality System Introduction

## Table of Contents

- ◆ Quality System Profile
- ◆ Quality Assurance
- ◆ Production
- ◆ Design & Engineering
- ◆ Logistic
- ◆ Marketing and Customer Support
- ◆ Training & Education

---

---

# Quality System Profile

- ◆ Quality Policy
- ◆ Quality Certificate
- ◆ Environmental Certificate
- ◆ Documentation for Quality system
- ◆ Organization Chart
- ◆ Document Control
- ◆ Continuous Improvement Activities
- ◆ Internal Audit Activities

---

---

## Quality Policy

- ◆ Total customer satisfaction
  - \* Zero defects
  - \* Zero delinquency
  - \* Short lead time
- ◆ Devotion to total quality management System
- ◆ Delegation to “success” thru the continuous improvement in quality and cost

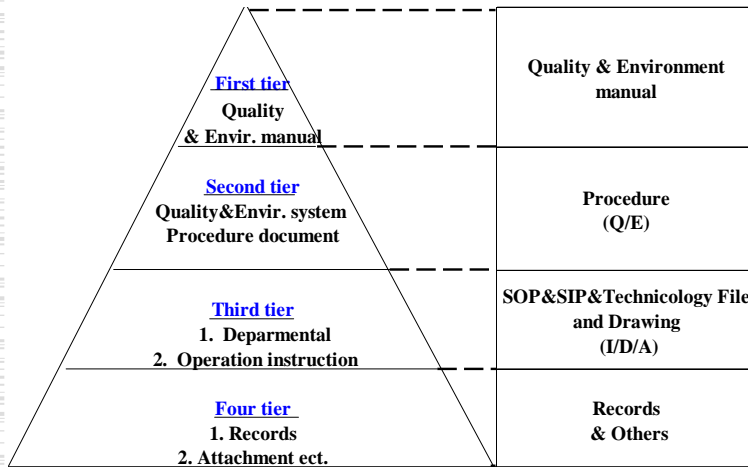
# Quality Certificate

Type of Certificate	Organization	Register Date
ISO9001:1994	BVQI	1996
ISO9001:2000	URS	2001
QS9000:1998	URS	2001
Major Customer Qualification for Quality System	Samsung	1998
	LG/ Philips Lighting	1999
	Sony	2000
	Toshiba	2002
	GE/ Philips CE/ ASTEC	2003
	Sharp/ Panasonic	2004

# Environmental Certificate

Type of Certificate	Organization	Register Date
ISO14001:1996	URS	2002-12
Environmental Quality Assurance Setups	Panasonic	2004-12
ECO-Partner	Samsung	2005-3
Green Partnership	LG	2005-6

# Documentation for Quality System



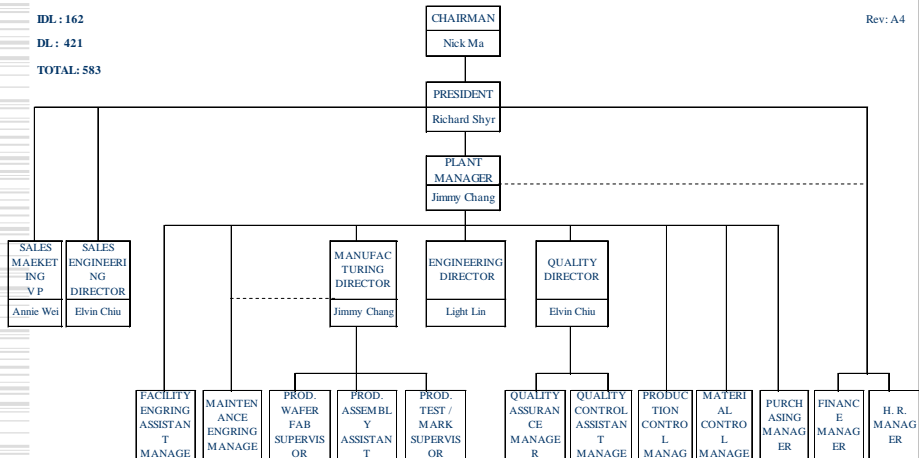
2005-6-10

Rev: A2

Page 7

# Organization Chart

-Company

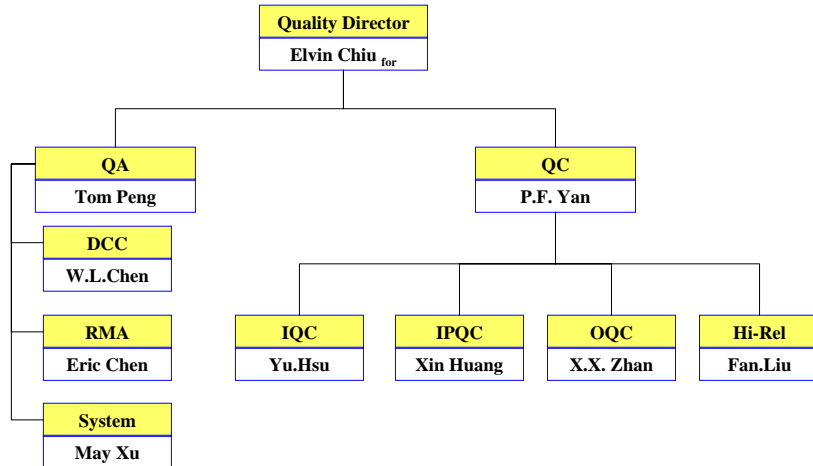


2005-6-10

Rev: A2

Page 8

# Organization Chart - Quality



2005-6-10

Rev: A2

Page 9

## Document Control

- ◆ Reviewed and approved prior to issue
- ◆ Issue current documents to points of use
- ◆ Obsolete documents identification and control
- ◆ Documents of external origin control
- ◆ Revised history control

2005-6-10

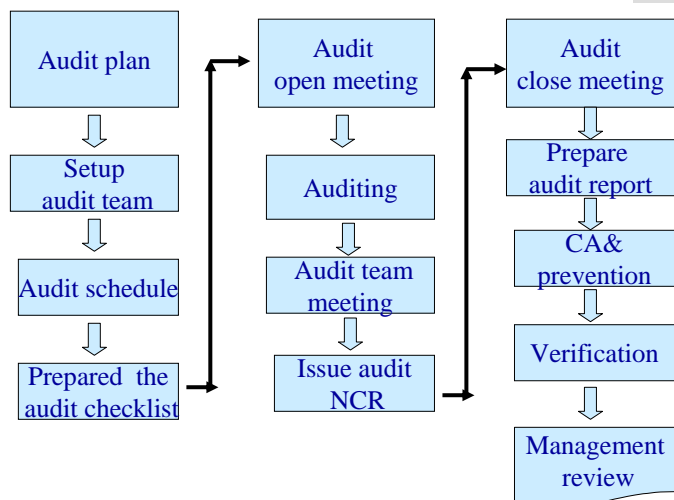
Rev: A2

Page 10

# Continuous Improvement Activities

1. QS 9000 and ISO14001 management system
2. 5S Program implementation
3. MRP-II and ERP system
4. Six Sigma project

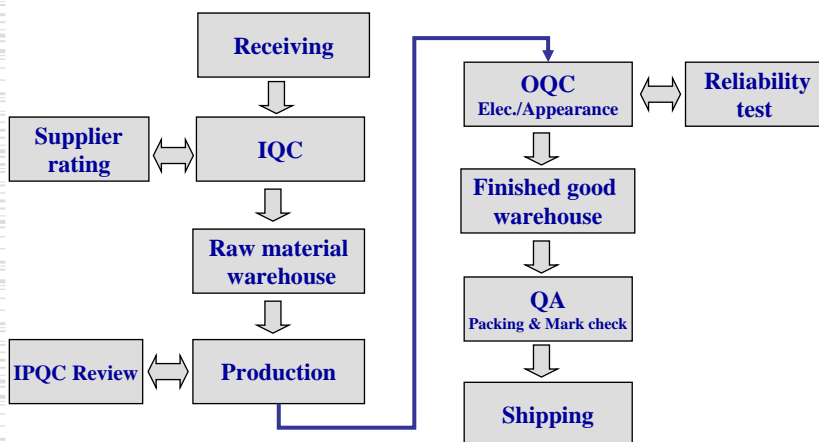
# Internal Audit Activities



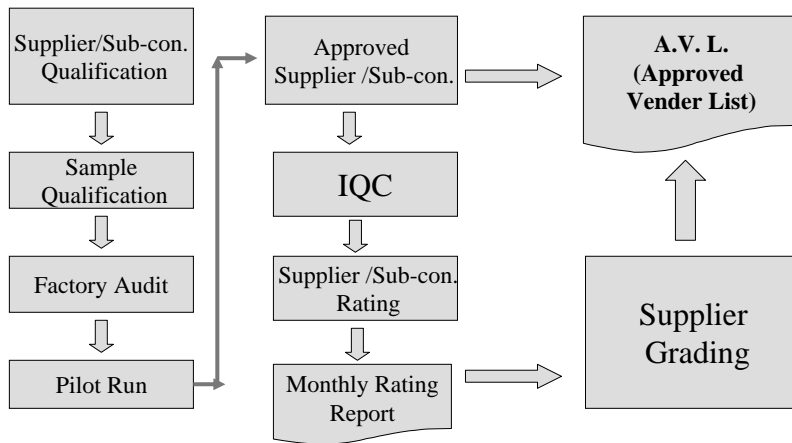
# Quality Assurance

- ◆ Quality Inspection Flow
- ◆ Supplier/ Sub-contractor Management
- ◆ Process Control
  - Process Control Tools
  - SPC
- ◆ Control on Non-conformance
- ◆ Reliability & Retained Samples Surveillance Test

## Quality Inspection Flow



# Supplier/ Sub-contractor Management



2005-6-10

Rev: A2

Page 15

# Process Control Tools

- ◆ First Article Inspection (FAI)
- ◆ Production Self check
- ◆ OI Review
- ◆ In Process and Process Final Inspection
- ◆ SPC
- ◆ 5S Program Implementation
- ◆ Visual Management

2005-6-10

Rev: A2

Page 16

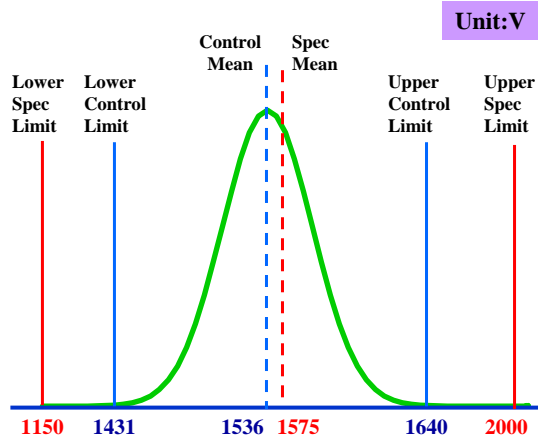
# SPC Control Point

No	Control Point	Control Method		Measurement Equipment
		SPC Tools	CP/Cpk	
1	Base width	/	CP/Cpk	Digital Thickness Tester
2	Dice Diameter of Sand Blasting	X(bar)-R Control Chart	CP/Cpk	Microscope
3	Dice TRR Test	X(bar)-R Control Chart	CP/Cpk	TRR-170 Tester
4	Brazing Yield	P Chart		Visual
5	VF on Glass Firing for GP VF on Molding for GPP	X(bar)-R Control Chart	CP/Cpk	TK-168 Tester
6	VR on Glass Firing for GP VR on Molding for GPP	X(bar)-R Control Chart	CP/Cpk	TK-168 Tester
7	IR on Glass Firing for GP IR on Molding for GPP	X(bar)-R Control Chart	CP/Cpk	TK-168 Tester

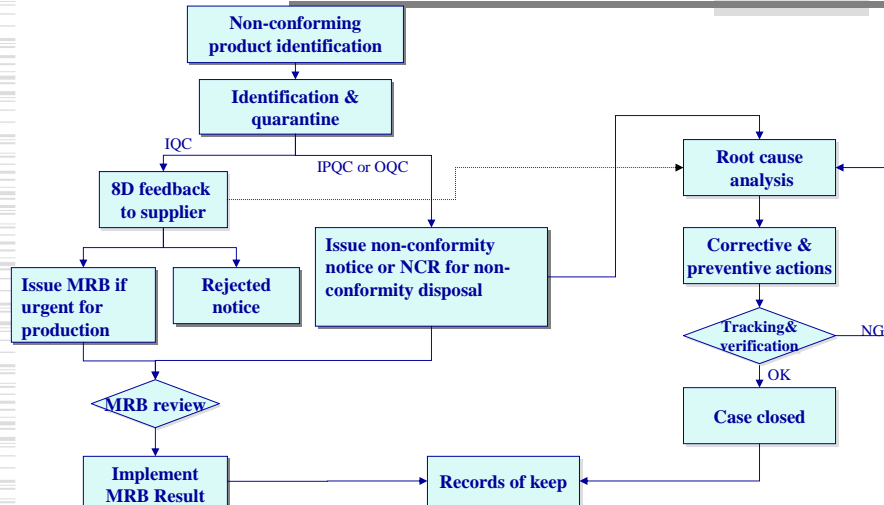
# Process Performance Index

## Example - 1N4007 GP VR Normal Distribution

Sample size(N)=100  
 Group(n)=5  
 X bar=1536  
 R bar=180  
 Standard Deviation=81.1  
 Cpk=1.59



# Control on Non-conformance



# Reliability Surveillance Test

Process	Surveillant Test Item		Sample Size	Frequency	
OQC	Hot Tin Dip		0/50	Every Lot	
	HTIR		0/100	Every Lot	
Routine Surveillant Test	HTRB	Solderability	LTPD-10	0/22	Every month
	OPL	Thermal Shock			
	PCT	Forward Surge			
	Hot Tin Dip				
Periodical Surveillant Test	HTRB	Solderability	LTPD-10	0/22	Every 6 months
	OPL	Thermal Shock			
	PCT	Forward Surge			
	Hot Tin Dip	Hi Temp Storage			

Per MIL-STD-750C Semiconductor Experiment Standard

# Reliability Equipments



Reliability Lab.

Equipment Name	Equipment Function
HTRB Chamber	HTRB/HTIR Test
O.P. Life Chamber	O.P.L. Test
Thermal Shock Chamber	Thermal Shock Test
Pressure Cook Tester	Pressure Cook Test
Auto-Soldering Tester	Solder Dip Test
Forward Surge Tester	Forward Surge Test
Hi-Temp. Storage Life Chamber	H.T.S.L. Test

# Retained Samples Surveillance Test

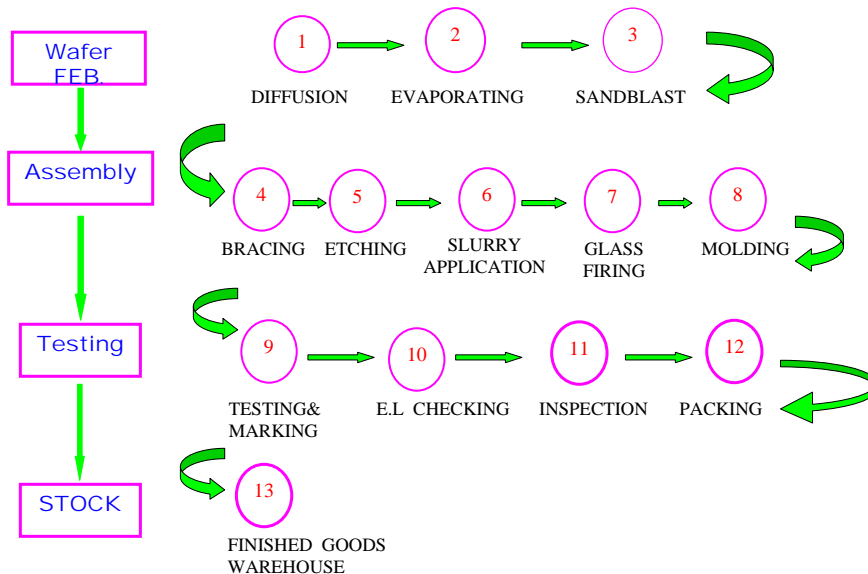
- Retained 50 samples on every Lot No

Category	Routine Electrical Verification	Routine HTRB Verification
Normal Product	Every retained sample of OQC lot : - Once a month on initial 3 months, plus 6th month - then keep for 2 years	4Hrs HTRB on every 10 lots and same part no. after OQC 1Hr HTIR
New Part Number	Every retained sample of OQC lot : - Once a week on initial month - and once a month for continue 5 months - then keep for 2 years	24Hrs HTRB on every OQC lot after 1Hr HTIR

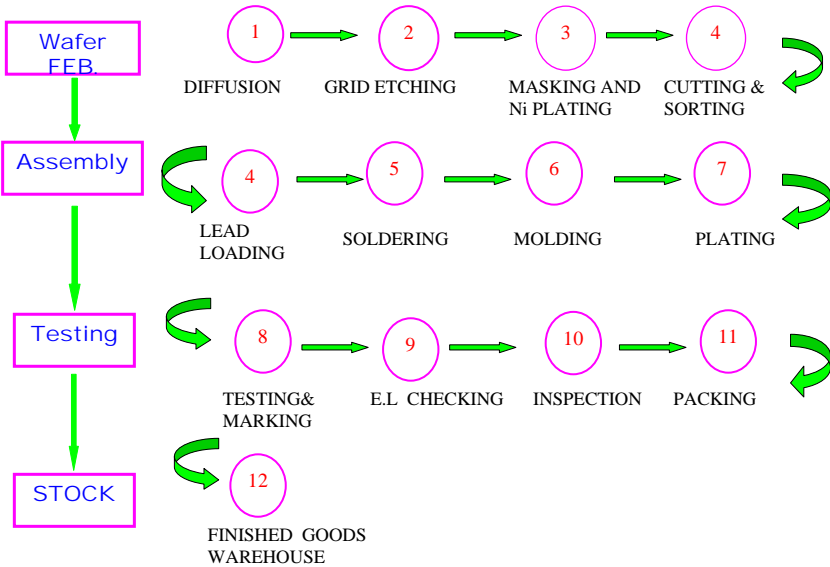
# Production

- ◆ Manufacturing Flow Chart
- ◆ Production Control
- ◆ Material/Product Traceability
- ◆ Production Equipments
- ◆ Equipments Calibration & Maintenance

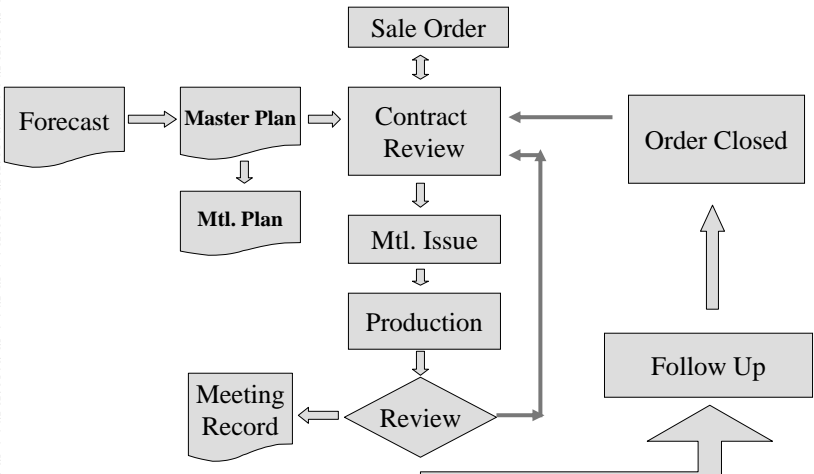
## Manufacturing Flow Chart-GP



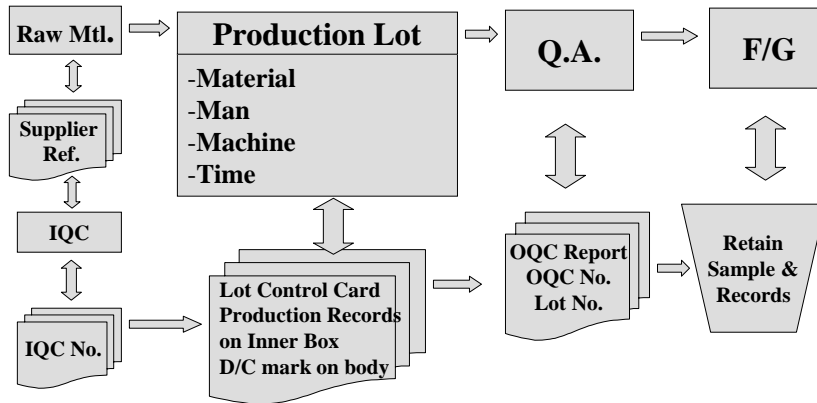
# Manufacturing Flow Chart-GPP



# Production Control



# Material/Product Traceability



2005-6-10

Rev: A2

Page 27

**GULF SEMI**

# Production Equipments

## Front end:

Diffusion Furnace	24 tubes
Aluminum Evaporator	4
Dice Sand blasting Machine	4
Wet station	Full set
Cutting Machine	2
Dice Probing and Sorting Machine	6

## Assembly:

Brazing furnace	4
Automatic Etching system	2
Automatic glass slurry coating machine	6
Glass sintering furnace	5
Epoxy mold press	9

## Back end:

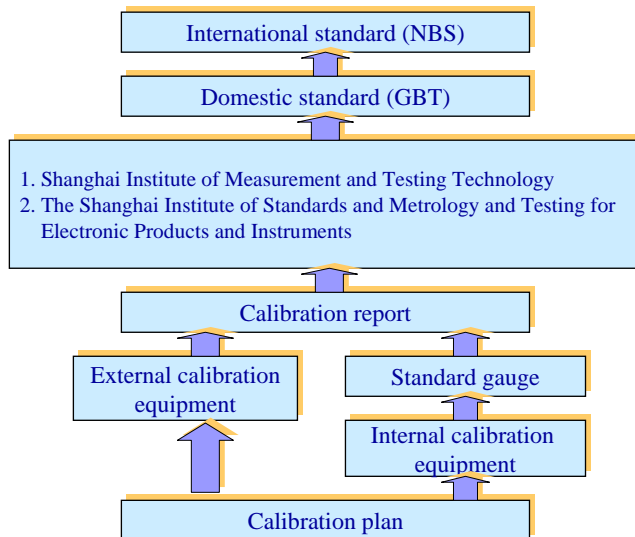
In-line automatic test-mark-tape (T-M-T) system	14
---	----

2005-6-10

Rev: A2

Page 28

# Equipment Calibration Procedure



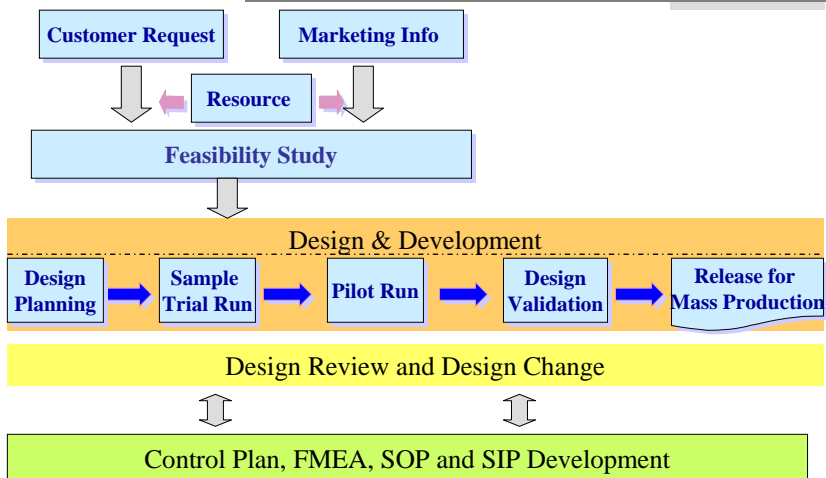
## Maintenance Procedure

- ◆ **Equipment Maintenance**
  - Daily maintenance
  - Weekly maintenance
  - Monthly maintenance
  - Level-I maintenance
  - Level-II maintenance
- ◆ **Mold Usage life-time control**
- ◆ **Maintenance Spare Parts**
  - Define the safety stock of spare parts
  - Spare parts stock management

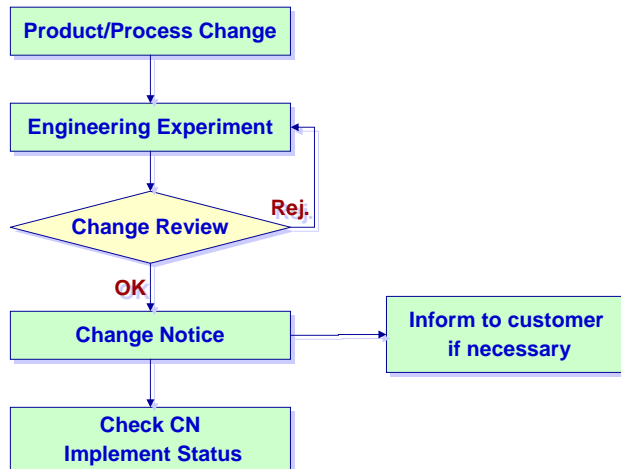
# Design & Engineering

- ◆ APQP Procedure
- ◆ Engineering Change Procedure
- ◆ Field Application Engineering
- ◆ Failure Analysis Capacity

## APQP Procedure



# Engineering Change Procedure



2005-6-10

Rev: A2

Page 33

# Field Application Engineering



Display



Power Supply



Ballast



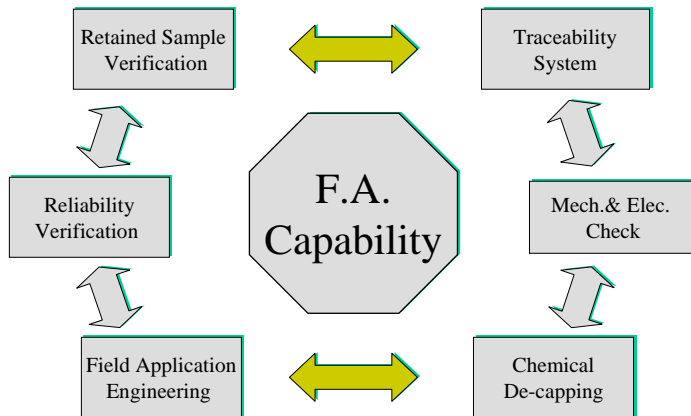
Lighting

2005-6-10

Rev: A2

Page 34

# F.A. Process Flow



# Major Analysis Equipments(1)

Equipment Name	Equipment Function
Digital Oscilloscope (500MHz)	Waveform measurement
TK-168 Electrical Tester	Electrical parameters test
TRR Tester	Recover time test
VF Tester	Forward voltage test
Curve Tracer	Electrical parameters analysis
Polisher	Cross section
Digital Microscope (400 X)	Base-width & Junction measurement

## Major Analysis Equipments(2)



Digital Microscope ( 400 X)



Curve Tracer



Polisher



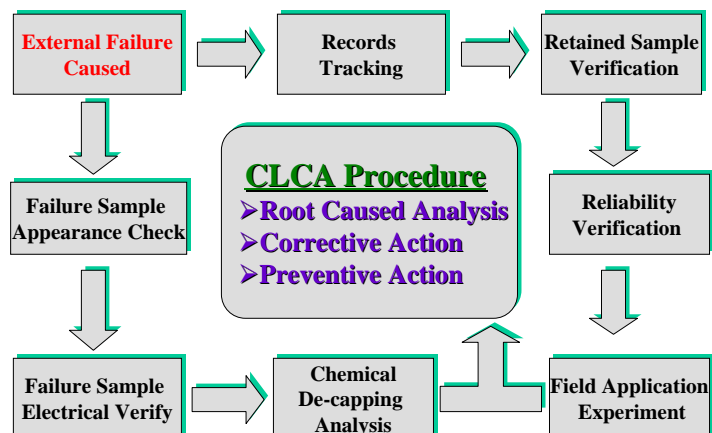
Digital Oscilloscope (500MHz)

2005-6-10

Rev: A2

Page 37

## Process Flow of External Failure

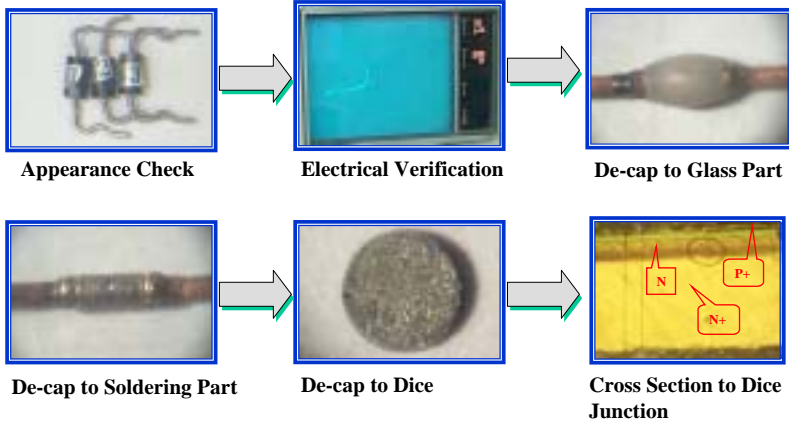


2005-6-10

Rev: A2

Page 38

## Example for F.A.



2005-6-10

Rev: A2

Page 39

## Logistic

- ◆ Warehouse Management
- ◆ On Time Delivery Assurance

---

# Warehouse Management

---

- ◆ ERP System implementation
- ◆ FIFO management
- ◆ Shelf life control
- ◆ Identification management
- ◆ Store environment control
- ◆ Handling control
- ◆ Bar Code implementation

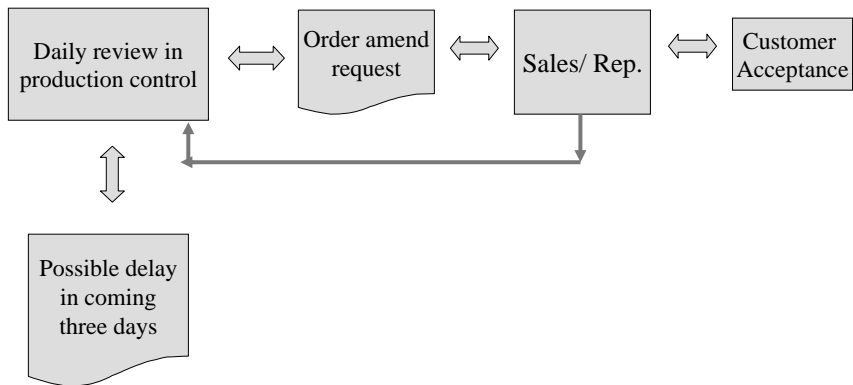
---

# On Time Delivery Assurance

---

- ◆ Forecast & Advance production plan
- ◆ WIP stock for normal product (**5WD**)
- ◆ Urgent production for special product (**10WD**)
- ◆ ERP System implementation
- ◆ Daily review on production
- ◆ Hub and VMI

## Early Warning System (possible delay in delivery)



2005-6-10

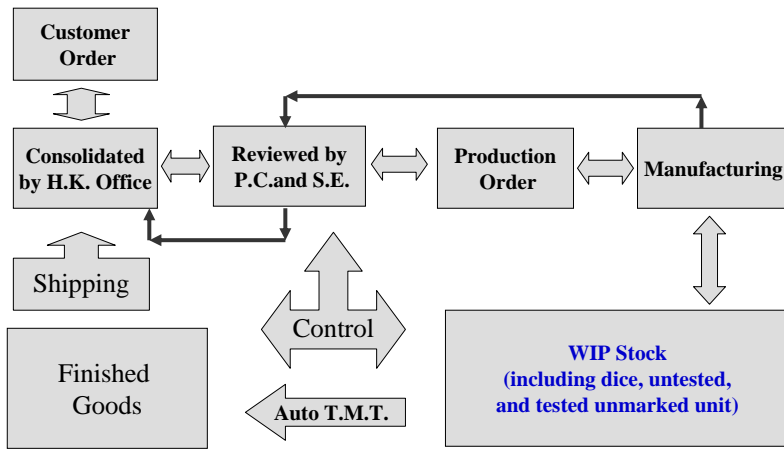
Rev: A2

Page 43

## Marketing and Customer Support

- ◆ Contract Review Flowchart
- ◆ Customer Complaint Handling Procedure
- ◆ Customer Service

# Contract Review Flow Chart

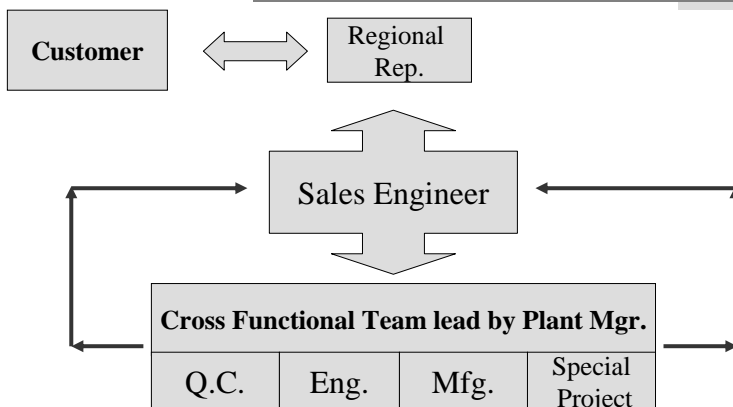


2005-6-10

Rev: A2

Page 45

# Customer Complain Handling Procedure



**Remark: 1. Initial response time target: 48 Hrs**

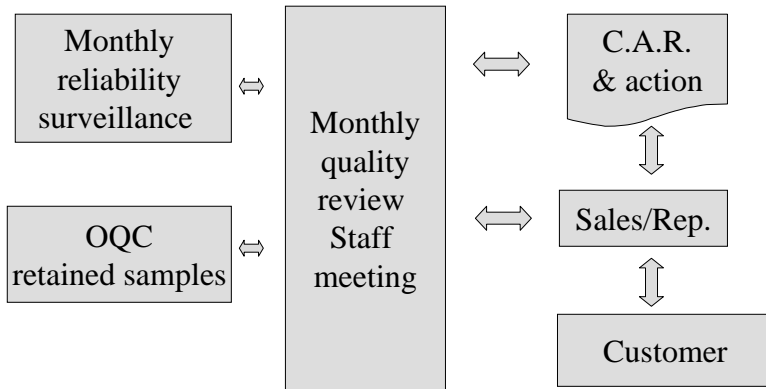
**2. Corrective action report time target: 10 WD**

2005-6-10

Rev: A2

Page 46

## Early Warning System (Quality issue)

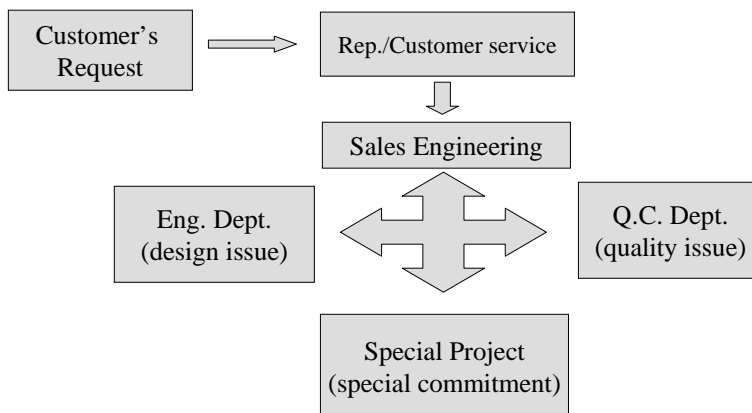


2005-6-10

Rev: A2

Page 47

## Customer Service



2005-6-10

Rev: A2

Page 48

# Training / Education

- ◆ Training System
- ◆ Certification & Re-certification System

## Training System



---

## Certification & Re-certification System

---

### ◆ Certification Required :

- Technical Engineer
- Quality Inspector
- Key Process Operator
- Calibration Lab.
- Internal Auditor
- Electrician
- Lift Operation
- Cart Driver

### ◆ Re-certification Required :

- Job Rotation
- Key Process Operator
- Certificate Expired Employee

---

## **Gulf Semiconductor Ltd.**

---

# **Thank You !**