WAFER FABRICATION FLOWCHART

- INCOMING
- QUALITY INSPECTION AND GATE
- MANUFACTURING PROCESS
- QUALITY MONITOR / SURVEILLANCE
- REWORK

Vendor: Linear Technology Corporation
Product: CMOS Products
Package: All Package Types
Location of Wafer Fab: Linear Technology Corp., Milpitas, CA./ Camas, WA
Assembly: Linear Technology Corporation, Penang, Malaysia or any approved assembly subcontractor
Final Test: Linear Technology Corp., Milpitas, CA., Singapore
Q.C. Test: Linear Technology Corp., Milpitas, CA., Singapore
Source Accept Test: Linear Technology Corp., Milpitas, CA., Singapore
Quality Contact: Naib Girn, LTC Milpitas, CA
(408) 432-1900 Ext. 2519

FLOW CHART	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	INCOMING RAW MATERIAL INSPECTION	WAFERS	VISUAL: SCRATCHES, PITS, HAZE, CRATERS, DIMPLES, CONTAMINATION	1 X INSPECTION	1.0% AQL TO 2.5 AQL LEVEL 1	LOGBOOK
			OXYGEN/CARBON MEASUREMENT	INFRARED SPECTROMETER	S/S=2, ACC = 0	
			RESISTIVITY / CONDUCTIVITY	MAGNETRON V/I METER	S/S=2, ACC = 0	
			DIMENSIONAL	CALIPERS	2.5% AQL, LEVEL 1	
			THICKNESS AND TAPER/BOW	DIAL THICKNESS GAGE	2.5% AQL, LEVEL 1	
			ORIENTATION	BREAK TEST	S/S=1. ACC = 0	
			C OF C VERIFICATION AGAINST “MPS” REQUIREMENTS		EACH BATCH	
		RETICLE	VISUAL, C.D. MEASUREMENTS		EACH PLATE	LOGBOOK
		CHEMICALS	C OF C VERIFICATION AGAINST “MPS” REQUIREMENTS			
		GASES	C OF C VERIFICATION AGAINST “MPS” REQUIREMENTS			
		TARGETS	C OF C VERIFICATION			
	INITIAL OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS / CYCLE	
	P-WELL MASK	RESIST MASK HF ETCH BATH	VISUAL	OPTICAL MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	PRE IMPLANT OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	P-WELL IMPLANT	IMPLANT	DOSE CHECK	THERMAWAVE	2 WAFERS/LOT	LOGBOOK
	P-WELL DRIVE	FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	

FLOW CHART	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	STRIP ALL OXIDE	HF ETCH BATH	VISUAL	UV LAMP MICROSCOPE INSPECTION		LOGBOOK
			OXIDE THICKNESS	NANOSPEC	2 WAFERS /LOT	
	PAD OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	NITRIDE DEPOSITION	NITRIDE FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE LOGBOOK
			NITRIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	ACTIVE MASK	RF PLASMA ETCH	VISUAL INSPECTION CRITICAL DIMENSIONS	MICROSCOPE 400X	“S” PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	P FIELD IMPLANT MASK	RESIST MASK HF ETCH BATH	VISUAL INSPECTION	MICROSCOPE 400X	“S” PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	BORON FIELD IMPLANT	IMPLANT	DOSE CHECK	THERMAWAVE	2 WAFERS / LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	LOGBOOK
	N-FIELD IMPLANT MASK	RESIST MASK HF ETCH BATH	UV VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	PRODUCTION LOG
			VISUAL INSPECTION	MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	
	PHOS FIELD IMPLANT	IMPLANT	DOSE CHECK	THERMAWAVE	2 WAFERS / LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	LOGBOOK
	LOCOS OXIDE	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	PLASMA NITRIDE STRIP	RF PLASMA ETCH	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
	CMOS CAP MASK	RESIST MASK HF ETCHANT BATH	CRITICAL DIMENSIONS	OPTICAL MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	CAP IMPLANT	IMPLANT	DOSE CHECK	THERMAWAVE	2 WAFERS / LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	LOGBOOK
	ETCH PAD OXIDE	HF ETCHANT BATH	VISUAL	MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	1 WAFER /CYCLE	

FLOW CHART	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	GATE OXIDE	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE
			P CH OXIDE THICKNESS	NONOSPEC	3 WAFERS/CYCLE	LOGBOOK
			VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	
			N CH OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	VTP IMPLANT MASK	RESIST MASK HF ETCHANT BATH	VISUAL	OPTICAL MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	BORON VT IMPLANT	IMPLANT	DOSE CHECK	THEMAWAVE	2 WAFERS/LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"S" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	POLY DEPOSITION	FURNACE	POLY THICKNESS	NANOSPEC	2 WAFERS/CYCLE	AS APPLICABLE LOGBOOK CRITICAL NODE
	BACK ETCH MASK	RESIST MASK RF PLASMA AND HF ETCH BATH	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
	SINKER PRE DEPOSITION	DEPOSITION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	100% <10 DEFECTS PER WAFER	TREND CHART
			RS (OHMS/SQ)	4 POINT PROBE	2 TEST WAFERS PER RUN	
	CMOS GATE MASK	RESIST MASK RF PLASMA AND HF ETCHANT BATH	VISUAL INSPECTION	OPTICAL MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	AS APPLICABLE PRODUCTION LOG CRITICAL NODE
	P+ IMPLANT MASK	RESIST MASK	VISUAL INSPECTION	OPTICAL MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	P+ S/D IMPLANT	IMPLANT	DOSE CHECK	THERMAWAFE	2 WAFERS/LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	PRODUCTION LOG
	N+ IMPLANT MASK	RESIST MASK	VISUAL INSPECTION	MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	LOGBOOK
	N+ S/D IMPLANT	IMPLANT	DOSE CHECK	THERMAWAVE	2 WAFERS/LOT	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFERS	LOGBOOK

FLOW CHART	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	SOURCE DRAIN REOX	OXIDATION FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			P+ OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
			VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	
			N+ OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	LPOE	LPOE LPCVD FURNACE	VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE LOGBOOK
			LPOE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	CMOS GETTER	FURNACE	RS (OHMS/SQ)	4 POINT PROBE	2 TEST WAFERS PER RUN	TREND CHART
	CMOS CONTACT MASK	RESIST MASK HF ETCHANT BATH	UV VISUAL	UV LAMP MICROSCOPE INSPECTION	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	PRODUCTION LOG
			VISUAL INSPECTION	MICROSCOPE 100X	“S” PATTERN SCAN OF THE WAFERS	
	ALUMINUM DEPOSITION	DEPOSITION SPUTTER MACHINE	VISUAL	UV LAMP	<5 DEFECTS PER WAFER 100%	LOGBOOK
			RS (OHMS/SQ)	4 POINT PROBE	2 TEST CHIP/CYCLE	
	CMOS METAL MASK	RESIST MASK METAL ENCHANT BATH	FINAL INSPECT CRITICAL DIMENSIONS	OPTICAL MICROSCOPE 2 200X 1000X	“S” PATTERN SCAN OF THE WAFERS CRITICAL DIMENSIONS MEASURE 2 WAFERS PER RUN LOT, ACCEPT ON 0 FAILURES	AS APPLICABLE PRODUCTION LOG
	ALLOY	ANNEAL FURNACE	VISUAL	UV LAMP	100% <10 DEFECTS PER WAFER	LOGBOOK
	LPOM	PASSIVATION LPCVD FURNACE	VISUAL	UV LAMP	100%, MORE THAN 2 COLOR CHANGE IS FAIL	AS APPLICABLE
				10X MICROSCOPE	3 WAFERS/CYCLE <3 DEFECTS/PER FIELD OF VIEW	
			LPOM THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
			PHOSPHOROUS CONCENTRATION	10:1 HF ETCH RATE	3 WAFERS/CYCLE	

FLOW CHART	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	PEN	PECVD NITRIDE DEPOSITION	VISUAL	UV LAMP	100%, MORE THAN 2 COLOR CHANGE IS FAIL	TREND CHART
				10X MICROSCOPE	3 WAFERS/CYCLE <5 DEFECTS/PER FIELD OF VIEW	
			PEN THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
			INDEX OF REFRACTION	ELIPSOMETER	3 WAFERS/CYCLE	
	PAD MASK	RESIST MASK RF PLASMA ETCH AND HF ETCHANT BATH	FINAL INSPECT	OPTICAL MICROSCOPE 100X	"S" PATTERN SCAN OF THE WAFER	PRODUCTION LOG
	ELECTRICAL TEST	LOMAC PARAMETRIC ANALYZER			100%	LOGBOOK
	BACKLAP	DISCO	N/A	N/A	N/A	LOGBOOK
	BACKSIDE GOLD	BACKSIDE METALLIZATION	VISUAL	UN-AIDED EYE	100%	
	SEM	STEP COVERAGE	2 PHOTOS	SCANNING ELECTRON MICROSCOPE	CMOS = 1 WAFER PER WEEK	LOGBOOK
		GENERAL METAL	1 PHOTO		NWELL & PWELL = 1 WAFER EVERY RUN	