ATTACHMENT 1.
WAFER FABRICATION FLOWCHART

Symbol	Meaning
▽	INCOMING
□	QUALITY INSPECTION AND GATE
○	MANUFACTURING PROCESS
⬡	QUALITY MONITOR / SURVEILLANCE
□	REWORK

Vendor: Linear Technology Corporation
Product: CMOS Process
Package: All Package Types
Location of Wafer Fab: Linear Technology Corp., Milpitas, CA./ Camas, WA.
Assembly: Penang/Carsem/Unisem Malaysia
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: Dwight Somersett, LTC, Milpitas, CA.
(408) 432-1900 Ext. 2427

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
▽	INCOMING RAW MATERIAL INSPECTION	WAFERS	VISUAL: SCRATCHES, PITS, HAZE, CRATERS, DIMPLES, CONTAMINATION, OXYGEN/CARBON MEASUREMENT RESISTIVITY/ CONDUCTIVITY DIMENSIONAL THICKNESS AND TAPER/BOW ORIENTATION C OF C VERIFICATION AGAINST "MPS" REQUIREMENTS	1 X INSPECTION INFRARED SPECTROMETER MAGNETRON V/I METER CALIPERS DIAL THICKNESS GAGE BREAK TEST	1.0% AQL TO 2.5% AQL LEVEL 1. S/S = 2, ACC = 0 S/S = 2, ACC = 0 2.5% AQL, LEVEL 1 2.5% AQL, LEVEL 1 S/S = 1, ACC = 0 EACH BATCH	% LAR TREND CHART & % DEFECTIVE TREND CHART
○		PHOTO MASK PLATES	VISUAL C.D. MEASUREMENTS	AMS-100 CALIPERS COMPARATOR U.V.LAMP	EACH PLATE EACH BATCH	LOGBOOK LOGBOOK
○		CHEMICALS	C OF C VERIFICATION AGAINST "MPS" REQUIREMENTS			
		GASES	PLUS YEARLY GAS ANALYSIS	OUTSIDE LAB	EACH TARGET	LOGBOOK
		TARGETS	C OF C VERIFICATION			
○—⬡	INITIAL OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	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	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
○—⬡	PRE IMPLANT OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
○—⬡	P-WELL IMPLANT	IMPLANT	-	-	-	LOGBOOK
○—⬡	P- WELL DRIVE	FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	STRIP ALL OXIDE	HF ETCH BATH	-	-	-	LOGBOOK
	PAD OXIDATION	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	NITRIDE DEPOSITION	NITRIDE FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE LOGBOOK PASSIVE CRITICAL NODE > 2.0
			NITRIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	ACTIVE MASK	RF PLASMA ETCH	VISUAL INSPECTION CRITICAL DIMENSIONS	MICROSCOPE 400X	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	P FIELD IMPLANT MASK	RESIST MASK HF ETCH BATH	VISUAL INSPECTION	MICROSCOPE 400X	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	BORON FIELD IMPLANT	IMPLANT	-	-	-	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	N-FIELD IMPLANT MASK	RESIST MASK HF ETCH BATH	UV VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	PRODUCTION LOG
			VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	
	PHOS FIELD IMPLANT	IMPLANT	-	-	-	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	LOCOS OXIDE	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	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	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	CAP IMPLANT	IMPLANT	-	-	-	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	ETCH PAD OXIDE	HF ETCHANT BATH	-	-	-	LOGBOOK
	GATE OXIDE	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE LOGBOOK PASSIVE CRITICAL NODE > 2.0
			P CH OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
			VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			N CH OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	VTP IMPLANT MASK	RESIST MASK HF ETCHANT BATH	VISUAL	OPTICAL MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	BORON VT IMPLANT	IMPLANT	-	-	-	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	POLY DEPOSITION	FURNACE	POLY THICKNESS	-	-	AS APPLICABLE LOGBOOK PASSIVE CRITICAL NODE > 2.0
	BACK ETCH MASK	RESIST MASK RF PLASMA AND HF ETCH BATH	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
	SINKER PRE DEPOSITION	DEPOSITION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	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	"Z" PATTERN SCAN 100% OF THE WAFERS	AS APPLICABLE PRODUCTION LOG PASSIVE CRITICAL NODE > 2.0
	P+ IMPLANT MASK	RESIST MASK	VISUAL INSPECTION	OPTICAL MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	P+ S/D IMPLANT	IMPLANT	-	-	-	LOGBOOOK

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	N+ IMPLANT MASK	RESIST MASK	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	N+ S/D IMPLANT	IMPLANT	-	-	-	LOGBOOK
	CMOS STRIP RESIST	RF PLASMA SULFURIC ACID	VISUAL INSPECTION	MICROSCOPE 100X	"Z" PATTERN SCAN 100% OF THE WAFERS	LOGBOOK
	SOURCE DRAIN REOX	OXIDATION FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	LOGBOOK
			P + OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
			VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	
			N + OXIDE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	LPOE	LPOE LPCVD FURNACE	VISUAL	UV LAMP (100%) 20X MICROSCOPE	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW	AS APPLICABLE LOGBOOK PASSIVE CRITICAL NODE 1.61 - > 2.0
			LPOE THICKNESS	NANOSPEC	3 WAFERS/CYCLE	
	CMOS GETTER	FURNACE	RS (OHMS/SQ)	4 POINT PROBE	2 TEST WAFERS PER RUN	TREND CHART

FLOW CHART INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	CMOS CONTACT MASK	RESIST MASK HF ETCHANT BATH	UV VISUAL VISUAL INSPECTION	UV LAMP (100%) 20X MICROSCOPE MICROSCOPE 100X	2 WAFERS/RUN < 2 DEFECTS PER FIELD OF VIEW "Z" PATTERN SCAN 100% OF THE WAFERS	PRODUCTION LOG
	ALUMINUM DEPOSITION	DEPOSITI ON 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 ETCHANT BATH	FINAL INSPECT CRITICAL DIMENSIONS	OPTICAL MICROSCOPE 2 200X 1000X	"Z" PATTERN SCAN 100% OF THE WAFERS CRITICAL DIMENSION MEASURE 2 WAFERS PER RUN LOT, ACCEPT ON Ø FAILURES	AS APPLICABLE PRODUCTION LOG PASSIVE CRITICAL NODE > 2.0
	ALLOY	ANNEAL FURNACE	VISUAL	UV LAMP	100% <10 DEFECTS PER WAFER	LOGBOOK
	ELECTRICAL TEST	LOMAC PARAMETRIC ANALYZER	-	-	EVERY WAFER	LOGBOOK
	LPOM	PASSIVATION LPCVD FURNACE	VISUAL	UV LAMP	100%, MORE THAN 2 COLOR CHANGE IS FAIL.	AS APPLICABLE TREND CHART PASSIVE CRITICAL NODE 1.5 - > 2.0
				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 INCOMNG FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	PEN	PECVD NITRIDE DEPOSITION FURNACE	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	"Z" PATTERN SCAN 100% OF THE WAFERS.	PRODUCTION LOG
	ELECTRICAL TEST	LOMAC PARAMETRIC ANALYZER	-	-	100%	LOGBOOK
	BACKLAP	DISCO	N/A	N/A	N/A	LOGBOOK
	BACKSIDE GOLD	BACKSIDE METALIZATION	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	