ATTACHMENT 2.
ASSEMBLY FLOWCHART

INCOMING

QUALITY INSPECTION AND GATE

MANUFACTURING PROCESS

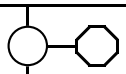
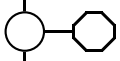
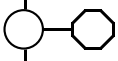
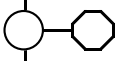
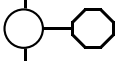
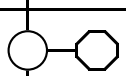
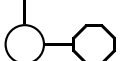
QUALITY MONITOR / SURVEILLANCE

REWORK

Vendor: Linear Technology Corporation
Product: BIPOLAR PROCESS
Package: TO-92
Location of Wafer Fab: Linear Technology Corp., Milpitas, CA.
Assembly: Carsem Maylasia
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. 427

FLOW CHART INCOMING ASSY 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	1 X INSPECTION	1.0 % AQL TO 2.5% AQL LEVEL I	% LAR TREND CHART AND % DEFECTIVE TREND CHART
			OXYGEN/CARBON MEASUREMENT	INFRARED SPECTROMETER	S/S = 2, ACC = Ø	
			RESISTIVITY/ CONDUCTIVITY	MAGNETRON V/I METER	S/S = 2, ACC = Ø	
			DIMENTIONAL	CALIPERS	2.5% AQL, LEVEL S1	
			THICKNESS AND TAPER/BOW	DIAL THICKNESS GUAGE	2.5% AQL, LEVEL S1	
			ORIENTATION	BREAK TEST	S/S = 1, ACC = 0	
			C of C VERIFICATION AGAINST "MPS"		EACH BATCH	
		CHEMICALS	REQUIREMENTS PLUS YEARLY		EACH BATCH	
		GASES	GAS ANALYSIS			
○—⬡	WAFER SORT	100% DIE LEVEL ELECTRICAL TEST REJECTS ARE RED INKED		WAFER PROBER		
	WAFER SORT MONITOR	MONITOR PROBING AND 2ND OPTICAL QUALITY	PROBE DEFECTS 2ND OPTICAL DEFECTS	3X TO 75X MICROSCOPE	MINIMUM OF 3 TIMES PER SHIFT. S/S = 1, ACC = 0	% DEFECTIVE TREND CHART
○	KIT FOR OVERSEAS ASSEMBLY	WAFERS ARE KITTED WITH LTC BONDING DIAGRAM AND LTC ASSEMBLY TRAVELER				
▽	INCOMING PIECE PARTS INSPECTION	LEAD FRAME	VISUAL	10X TO 30X MICROSCOPE	1% AQL, LEVEL 2	% LAR TREND CHART
			MECHANICAL	OPTICAL COMPARATOR, CALIPERS, X-RAY FLOURESENCE		
			FUNCTIONAL (ASSEMBLY PROCESS SIMULATION): BOND PULL TEST DIE SHEAR TEST			

FLOW CHART INCOMING FAB REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	INCOMING PIECE/PARTS INSPECTION (CONTINUED)	MOLDING COMPOUND	SPIRAL FLOW MOLDABILITY	SPIRAL MOLD PRESS	1% AQL, LEVEL 2 8 DRUMS FOR EVERY TRANSFER	% LAR TREND CHART
		BONDING WIRE 1.30 MIL GOLD	TENSILE STRENGTH	TENSILE STRENGTH TESTER	S/S = 1 TO 5 SPOOLS DEPENDING ON LOT SIZE, ACC = Ø.	% LAR TREND CHART X & R BOND STR CHART
		WIRE	ELONGATION	BONDER, BOND PULL TESTER		
		Ag FILLED EPOXY DIE ATTACH	BONDABILITY	DIE ATTACHER, DIE SHEAR TESTER	S/S = 20, ACC = Ø	% LAR TREND CHART
	WAFER SAW	DIE SEPERATION	ALIGNMENT ACCURACY	TV ALIGNMENT MICRO AUTOMATION ON DISCO SAW 10X TO 30X MICROSCOPE		
	WAFER SAW MONITOR		SAW QUALITY SAW ACCURACY	10X TO 30X MICROSCOPE	ONCE EVERY 2 HOURS, S/S = 1 WAFER, ACC = Ø S/S = 25 DIE, ACC = Ø	% DEFECTIVE TREND CHART
	100% 2ND OPTICAL INSPECTION	DIE QUALITY	DIE VISUAL QUALITY	75X MICROSCOPE	EVERY LOT 100% BASIS	YIELD ANALYSIS
	QA 2ND OPTICAL INSPECTION		DIE VISUAL QUALITY	75X MICROSCOPE	LTPD = 5% S/S = 45, ACC = Ø	% LAR AND % UNIT DEFECTIVE TREND CHART
	DIE ATTACH	DIE BONDED TO LEAD FRAME Ag FILLED EPOXY DIE ATTACH		AUTO DIE BONDER		
	DIE ATTACH MONITOR		VISUAL QUALITY DIE SHEAR TEST	10X TO 30X MICROSCOPE DIE SHEAR TESTER	4 TIMES PER SHIFT S/S = 20, ACC = Ø PER BONDER	% DEFECTIVE TREND CHART X & R DIE SHEAR STRENGTH CHART
	WIRE BOND	BALL BONDS GOLD 1.30 MIL WIRE		AUTO THERMOSONIC BALL BONDER		
	WIRE BOND MONITOR		WIRE DRESS BOND PULL STRENGTH	10X TO 30X MICROSCOPE BOND PULL TESTER	4 TIMES PER SHIFT S/S = 25, ACC = Ø	% DEF. TREND CHART. X & R DIE SHEAR STR. TREND CHART
	100% 3RD OPTICAL INSPECTION	CHECK FOR WORKMANSHIP QUALITY PRIOR TO MOLDING	DIE, DIE BOND, WIRE BOND VISUAL QUALITY	30X TO 60X MICROSCOPE	EVERY LOT 100% BASIS	YIELD CHART
	QA 3RD OPTICAL INSPECTION		ASSEMBLY VISUAL QUALITY	30X TO 60X MICROSCOPE	EVERY LOT LTPD = 5% S/S = 45, ACC = Ø	% LAR AND % UNIT DEFECTIVE TREND CHART

FLOW CHART INCOMING ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	MOLD	ENCAPSULATION WITH EPOXY NOVALAC COMPOSITION		TRANSFER MOLD	2 TIMES PER SHIFT PER MOLD 1 SHOT, ACC = Ø	
	MOLD MONITOR	MOLDING QUALITY	VISUAL: CHIP, VOID AND CRACKS, MISALIGNMENT ETC.	30X TO 60X MICROSCOPE		% LAR TREND CHART
	BACK MARK	TRACEABILITY MARK	VISUAL QUALITY	UN-AIDED EYE	S/S = 15, ACC = Ø	LOG BOOK
	POST MOLD BAKE	CURE MOLDING COMPOUND		BAKE IN +175°C OVEN FOR 6 HOURS		
	MOLD BAKE MONITOR	PROCESS MONITOR	CHECK OVEN TEMPERATURE	MOLD CURE IN OVEN	EACH OVEN AT START AND 1 TIME PER SHIFT	% FAILED MONITOR TREND CHART
	DEFLASH	REMOVE MOLD FLASH FROM PACKAGE	L/F & HEATSINK MUST BE FREE FROM MOLD FLASH			
	DEFLASH MONITOR	PROCESS MONITOR	VISUAL: INCOMPLETE DEFLASH, PACKAGE DAMAGE	7X TO 30X MICROSCOPE	2 STRIPS EVERY 2 HOURS, ACC = Ø	% UNIT DEFECTIVE TREND CHART
	SOLDER PLATE	LEAD FINISH				
	SOLDER INSPECTION	SOLDER PLATING QUALITY	COVERAGE, THICKNESS, QUALITY	UN-AIDED EYE	100%	% DEFECTIVE TREND CHART
	SOLDERABILITY TEST	SOLDER PLATING QUALITY	MINIMUM 95% COVERAGE	3X TO 10X MICROSCOPE	S/S = 11, ACC = Ø	% LAR CHART
	TRIM & FORM SINGULATION	SINGULATE UNIT AND PLACE IN BLACK CON-DUCTIVE TUBE				
	MARK	DATE CODE & DEVICE MARKING		OFFSET MARKING WITH MARKEM 7226 OR LAZER MARK	EVERY HALF HOUR, S/S = 15 UNITS, ACC = Ø PER MACHINE.	
	MARK MONITOR	CHECK MARKING QUALITY	VISUAL: ILLEGIBLE MARK, CORRECT MARK, MARKING PERMANENCY TEST (IF INK MARKED)	UN-AIDED EYE, 6 INCHES UNDER NORMAL ROOM LIGHTING METHOD 2015 MIL-STD-883	2 TIMES PER SHIFT PER MACHINE S/S = 20, ACC = Ø	% UNIT DEFECTIVE P.A. TREND CHART
	FINAL VISUAL INSPECT	100% INSPECT	VISUAL: BENT LEADS MOLD FLASH, SOLDER QUALITY ETC	UN-AIDED EYE TO 10X MICROSCOPE	EVERY LOT 100% BASIS	% LAR AND % UNIT DEFECTIVE P.A. TREND CHART
	PACK	PACKING & PREPERATION FOR DELIVERY		ANTI-STATIC SHIPPING TUBE		
	SHIP TO LTC					