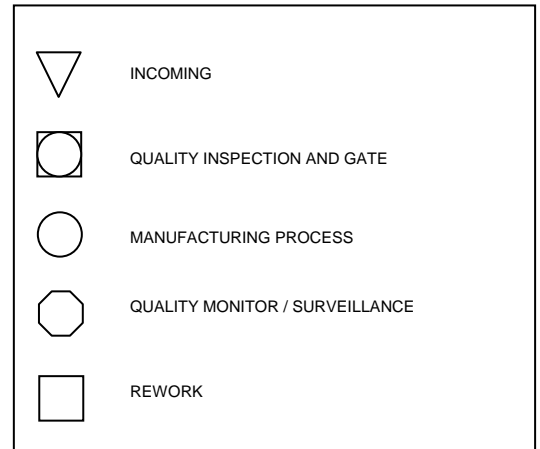


**ASSEMBLY FLOWCHART**  
**TO-220 PACKAGE**  
 Updated 08/25/08

Vendor: Linear Technology Corporation  
 Package: TO-220 package  
 Assembly: Penang & Carsem-Malaysia, & Chinteik-Thailand  
 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 INCOMING ASSY Rework	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	WAFER SORT	100% DIE LEVEL ELECTRICAL TEST REJECTS ARE INKED		WAFER PROBER		
	WAFER SORT MONITOR	MONITOR PROBING AND 2ND OPTICAL QUALITY	PROBE DEFECTS 2ND OPTICAL DEFECTS	75X MICROSCOPE	MINIMUM OF 1 TIME PER SHIFT. S/S = 1, ACC = 0	LOG
	KIT FOR OVERSEAS ASSEMBLY (N/A FOR PENANG)	WAFERS ARE KITTED WITH LTC BONDING DIAGRAM AND LTC ASSEMBLY TRAVELER				
	WAFER MOUNT WAFER MOUNT MONITOR	PREPARATION FOR DIE SEPERATION	VISUAL INSPECTION	UNAIDED EYE	3 WAFERS/SHIFT Ø PPM TARGET	GO/NO GO INSPECTION
	WAFER SAW  BACTERIA COUNT SET-UP CHECK  PARAMETERS PARAMETERS DI WATER QUALITY	DIE SEPERATION  BACTERIA CULTURE  BLADE LIFE SAW KERF  PRESSURE, SPEED, CUT COUNT PRESSURE, SPEED, CUT COUNT RESISTIVITY	ALIGNMENT ACCURACY  10 COL / 100 CC PER SPEC 45K IN SAW LINE 1.0 TO 2.2 MILS  PER SPEC PER SPEC 12 MOHM MIN	TV ALIGNMENT MICRO AUTOMATION OR DISCO SAW 10X TO 30X MICROSCOPE  BACTERIA CULTURE  VISUAL COUNT USAGE TM MICROSCOPE OR EQUIVALENT  VISUAL RESISTIVITY METER	EVERY WAFER LOT / MACHINE. Ø PPM TARGET  1X PER WEEK  EA WAFER LOT N/A ONCE PER SHIFT 4 CUTS PER MACHINE  1X PER SHIFT 1X PER WEEK 1X PER WEEK	LOG  LOG LOG LOG LOG LOG LOG LOG

Revision A.



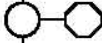
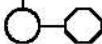



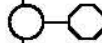


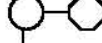

FLOW CHART INCOMNG ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	DIE SORT 2ND OPT	VISUAL INSPECTION	PER SPEC	75X MICROSCOPE		LOG
	DIE SORT BUY OFF	VISUAL INSPECTION	PER SPEC	75X MICROSCOPE		LOG
	DIE ATTACH	DIE BONDED WITH SOLDER	PER SPEC	AUTO DIE ATTACHER 20X MICROSCOPE		LOG
	DIE BACK, THICKNESS	VISUAL	PER SPEC	20X TO 40X MICROSCOPE		LOG
	DIE CRACK	VISUAL	PER SPEC	75X TO 200X MICROSCOPE		LOG
	SOLDER THICKNESS	VISUAL QUALITY	DIE SHEAR TESTER	TOOLMAKER'S		LOG
	VOIDS	VISUAL	<10%	XRAY		LOG
	DIE SHEAR	VISUAL	>2KG, <=5K SQ MIL >2.5KG, >5K SQ MIL	SHEAR TESTER		LOG
	WIRE BOND	BALL BONDS	GOLD WIRE	AUTO THERMOSONIC BALL BONDER 20X TO 40X		LOG
	SURVEILLANCE	VISUAL	PER SPEC	20X TO 40X MICROSCOPE		LOG
	PARAMETERS	VISUAL	PER SPEC			LOG
	CAPILLARY LIFE	VISUAL	COUNT USAGE			LOG
	SET-UP	VISUAL		20X TO 40X MICROSCOPE		LOG
	WIRE BOND MONITOR	WIRE PULL	5GM(1MIL), 7GM (1.3MIL), 8GM(1.5 MIL), 12GM(2MIL), 15GM(3MIL)	BOND PULL TESTER		X BAR R CHART
	BALL SHEAR	VISUAL	35GM(1MIL), 40GM (OTHER SIZES)GND BOND 60GM(1MIL) 80GM(1.3MIL), 120GM(1.5MIL)	BALL SHEAR TESTER		X BAR R CHART
	PARAMETERS	VISUAL	(POWER, FORCE TIME, T EMP)			LOG
	BOND PEEL TEST	VISUAL	>25% AU REMAINING	75X MICROSCOPE		LOG
	BOND CRATER	VISUAL	NO CRATERING	75X MICROSCOPE		LOG
	3RD OPTICAL INSPECTION	VISUAL INSPECTION	PER SPEC	20X TO 40X MICROSCOPE		LOG
	QA 3RD OPTICAL INSPECTION	CHECK FOR WORKMANSHIP QUALITY	PER SPEC	MIN 30X MICROSCOPE		LOG

Revision A.

FLOW CHART INCMNG ASSY	REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
		MOLD - EPOXY NOVOLAC	ENCAPSULATION PARAMETERS	PER SPEC	VISUAL	1X / SHIFT	CHECKLIST
		SURVEILANCE	VISUAL	PER SPEC	MIN 3X	1 SHOT / LOT ACC = Ø, REJ = 1	CHECKLIST
		TEMPERATURE	MOLD TEMP	+175°C +/- 5°C	PYROMETER	1X/SHIFT/MACH/ MOLD CHANGE	X BAR R CHART
		SURVEILLANCE	VISUAL	PER SPEC	30X TO 40X MICROSCOPE	6 STRIPS/MACH / SHIFT/CONVERSION	
		COMPOUND AGEING CHECK	VISUAL	AGE LIFE	VISUAL	1X / SHIFT	
		MISMATCH	OFFSET	≤4.0MIL(TO-220)	TOOLMAKER'S	1X/DAY/MC 4 UNITS/SHOT	LOG
		PARAMETERS	PRESS. SPEED	PER SPEC	VISUAL	1X / MACH / DAY 1X/DAY	LOG
		MOLD QUALITY	XRAY VISUAL	SWEEP,VOIDS WIRE DEFECTS	SOFT XRAY	EVERY LOT 20 UNITS ACC = Ø, REJ = 1	LOG
		POST MOLD CURE	TEMPERATURE	+175°C +/- 5°C 6 HOURS	PYROMETER	CONTINUOUS	
		POST MOLD CURE MONITOR	TEMPERATURE	+175°C +/- 5°C 6 HOURS	PYROMETER	1X/OVEN /DAY	
		SLURRY DEFLASH VISUAL	REMOVE MOLD FLASH FROM PACKAGE	PER SPEC	UNAIDED EYE	2X/SHIFT /PKG CHANGE - 5 STRIPS ACC = Ø, REJ = 1	LOG
		DEFLASH MONITOR	PRESSURE	PER SPEC	PRESSURE GAGE	2X/SHIFT /MACH	LOG
		MARKING	VISUAL INSPECTION	PER SPEC	UNAIDED EYE	2 STRIPS/3X/SHIFT ACC = Ø, REJ = 1	LOG
		SET-UP CHECK	VISUAL	PER SPEC		1X / SHIFT	CHECKLIST
		PERMANENCY	MARK PERMANENCY	1 SOLUTION	UNAIDED EYE	1 LOT/MACH/SHIFT 11 UNITS ACC = Ø, REJ = 1	LOG
		IR, VISOOSITY	VISUAL	3 SOLUTIONS	UNAIDED EYE	1X/WEEK(11 UNITS/ SOLUTION ACC = Ø, REJ = 1	
		SOLDER PLATE INSPECTION	PARAMETERS	PER SPEC	UNAIDED EYE	1X/PKG/SHIFT	LOG
			THICKNESS AND COMPOSITION	300 - 800 U INCH 85% ±10%	XRF	1X/SHIFT/MACH/ CHANGE OF SOLDER BATH - MIN OF 10 READINGS	np CHART
			SOLDERABILITY (W&WO AGING)	95% COVERAGE	20X TO 40X MICROSCOPE	1X / SHIFT 10 UNITS	LOG
			PACKAGE CLEANLINESS	1.7 µS/INCH SQUARED	IONOGRAPH	3 LOTS / SHIFT 3 TESTS / LOT	LOG

Revision A.

Pg. 4 of 4

FLOW CHART INCOMING ASSY    REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/ TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	SOLDER PLATE BUYOFF	VISUAL	SOLDER QUALITY ETC	3X TO 10X MICROSCOPE	S/S = 125 ACC = Ø, REJ = 1	LOG
	TRIM & FORM SINGULATION	SET-UP CHECK	PER SPEC	UNDAIDED EYE	5 UNITS / SHIFT 2 UNITS / LOT ACC = Ø, REJ = 1	CHECKLIST
		COPLANARITY LEAD SPREAD STANDOFF	PER SPEC	COMPARATOR	1X / DAY / MACH 5 UNITS	nP CHART
		LEAD FATIGUE	PER SPEC	LEAD TESTER	1X / WK / MACH 2 LEADS	LOG
	CRACK / GAP BUYOFF	VISUAL	PER SPEC	30X TO 45X MICROSCOPE (SINGULATED)	45 / LOT / CONVER- SION 200/1ST LOT OF SHIFT ACC = Ø, REJ = 1	LOG
	DELAMINATION/ CRACK	VISUAL	PER SPEC	SCANNING ACOUSTIC MICROSCOPE (STRIP FORM)	MIN 2 LOTS/SHIFT/ MACHINE ACC = Ø, REJ = 1	LOG
	DEJUNK	SET-UP CHECK	PER SPEC	UNDAIDED EYE	5 UNITS / SHIFT 2 UNITS / LOT ACC = Ø, REJ = 1	LOG
		VISUAL	PER SPEC	30X TO 40X MICROSCOPE	45 UNITS HOURLY/ CONVERSION 100 UNITS/1ST LOT OF SHIFT ACC = Ø, REJ = 1	LOG
	FINAL VISUAL INSPECTION	VISUAL QUALITY	PER SPEC	UNDAIDED EYE	100% - YIELD TRIGGER 95.0%	LOG
	QA FINAL VISUAL INSPECTION	CORRECT MARK, MARKING PERMANENCY TEST (IF INK MARKED) VISUAL: BENT LEADS MOLD FLASH, SOLDER QUALITY ETC	PER SPEC	UNDAIDED EYE	S/S = 125 ACC = Ø, REJ = 1	LOG
	QA PACK & DOCUMENTA- TION CHECK	PACKING & PREPERATION FOR DELIVERY	PER SPEC	UNDAIDED EYE	5 TUBES ACC = Ø, REJ = 1	LOG
	SHIP TO LTC	ANTISTATIC TUBES			EVERY LOT 100% BASIS	

Revision A.