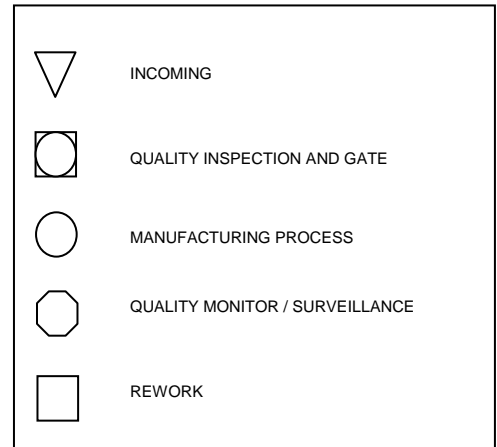


**ASSEMBLY FLOWCHART**  
**LQFP/EXPOSED PAD LQFP PACKAGE**



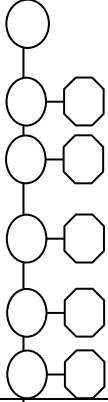
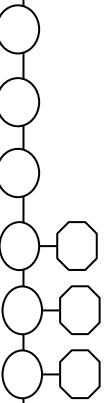
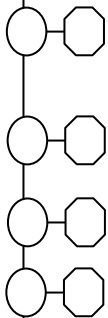

Updated 05/23/2011

Vendor: Linear Technology Corporation  
 Package: LQFP/Exposed Pad LQFP package  
 Assembly: ASE 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: 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  WAFER SORT MONITOR	100% DIE LEVEL ELECTRICAL TEST REJECTS ARE INKED  MONITOR PROBING AND 2 <sup>ND</sup> OPTICAL QUALITY	PROBE DEFECTS 2 <sup>ND</sup> OPTICAL DEFECTS	WAFER PROBER  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  INSPECTION BLADE LIFE SAW KERF  PRESSURE, SPEED, CUT, COUNT  PRESSURE, SPEED, CUT, COUNT  RESISTIVITY	ALIGNMENT ACCURACY  10 COL/100CC  PER SPEC 45K IN SAW LIFE 1.0 TO 2.2 MILS  PER SPEC  PER SPEC	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 SHIFT	LOG  LOG LOG LOG NP CHART  LOG  LOG  LOG


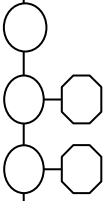
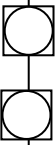
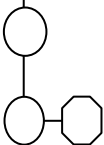

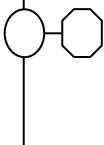
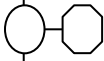

Revision Ø.

FLOW CHART INCOMING ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	DIE SORT 2 <sup>ND</sup> OPT	VISUAL INSPECTION	PER SPEC	75X MICROSCOPE	YIELD TRIGGER 93.0%	LOG
	DIE SORT BUY OFF	VISUAL INSPECTION	PER SPEC	75X MICROSCOPE	32/LOT ACC= Ø, REJ= 1	LOG
	DIE ATTACH	DIE BONDED WITH EPOXY	PER SPEC	AUTO DIE ATTACHER 20X MICRO SCOPE	1 STRIP/MAG ACC= Ø, REJ= 1	LOG
	DIE PLACEMENT	VISUAL	PER SPEC	20X TO 40X MICROSCOPE	1 STRIP/WAFER LOT ACC= Ø, REJ= 1	LOG
	DIE BACK CRACK	VISUAL	PER SPEC	75X TO 200X MICROSCOPE	4 UNITS/WAFER LOT CHIPS, CRACKS	LOG
	DIE ATTACH MONITOR	VISUAL QUALITY	DIE SHEAR TESTER	30X TO 60X MICROSCOPE	3 UNITS PER OVEN LOAD	NP CHART
	RESIN BLEED	VISUAL		20X TO 40X	2 STRIPS/OVEN/DAY ZERO BLEED	LOG
	EPOXY CURE	CURE TEMP	EPOXY CURE +175°C +/-5°C	PYROMETER	1X/DAY	LOG
	WIRE BOND	BALL BONDS	GOLD WIRE	AUTO THERMOSONIC BALL BONDER 20X TO 40X	10 UNITS/LOT ACC= Ø, REJ= 1	LOG
	SURVEILLANCE	VISUAL	PER SPEC	20X TO 40X MICROSCOPE	10 UNITS/MAG ACC= Ø, REJ= 1	LOG
	PARAMETERS	VISUAL	PER SPEC		1X PER LOT	LOG
	CAPILLARY LIFE	VISUAL	COUNT USAGE		EVERY 6 SHIFTS	LOG
	SET-UP	VISUAL		20X TO 40X MICROSCOPE	10 UNITS/LOT ACC= Ø, REJ= 1	LOG
	WIRE BOND MONITOR	WIRE PULL	5GM(1MIL), 7GM (1.3MIL), 8GM (1.5MIL), 12GM (2MIL), 15GM (3MIL)	BOND PULL TESTER		X BAR R CHART
	BALL SHEAR	VISUAL	36GM (1ML); 40GM (OTHER SIZES) GND BOND 60GM (1ML) 80GM (1.3MIL), 120GM (1.5MIL)	BALL SHEAR TESTER	EACH LOT/CAP CHANGE (5 WIRES INCLUDING GND BONDS)	X BAR R CHART
	PARAMETERS	VISUAL	(POWER FORCE TIME, TEMP)		1X / DAY	LOG
	BOND PEEL TEST	VISUAL	>25% AU REMAINING	75X MICROSCOPE	1 WIRE/MACH/DAY	LOG
	BOND CRATER	VISUAL	NO CRATERING	75X MICROSCOPE	1X/MACH/DAY (10 UNITS)	LOG
	3 <sup>RD</sup> OPTICAL INSPECTION	VISUAL INSPECTION	PER SPEC	20X TO 40X MICROSCOPE	YIELD TRIGGER 95%	LOG
	QA 3 <sup>RD</sup> OPTICAL INSPECTION	CHECK FOR WORKMANSHIP QUALITY	PER SPEC	MIN 30X MICROSCOPE	125 PER LOT ACC= Ø, REJ= 1 (MRB>10%, 3X REJ)	LOG

Revision Ø.

FLOW CHART INCOMING 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 X BAR R CHART
	TEMPERATURE	MOLD TEMP	+175°C +/- 5°C	PYROMETER	1X/SHIFT/MACH/ MOLD CHANGE	CHECKLIST
	SURVEILLANCE	VISUAL	PER SPEC	MIN 3X	1 SHOT/LOT ACC= Ø, REJ= 1	X BAR R CHART
	TEMPERATURE	MOLD TEMP	+175°C +/- 5°C	PYROMETER	1X/SHIFT/MATCH/ MOLD CHANGE	
	SURVEILLANCE	VISUAL	PER SPEC	30X TO 40X MICROSCOPE	6 STRIPS/MATCH/ SHIFT/CONVERSION	
	COMPOUND AGEING CHECK	VISUAL	AGE LIFE	VISUAL	1X/SHIFT	LOG
	MISMATCH	OFFSET	<2.5MIL (SSOP)	TOOLMAKER'S	1X/DAY/MC 4 UNITS/SHOT	LOG
	PARAMETERS MOLD QUALITY	PRESS XRAY VISUAL	PER SPEC SWEEP, VOIDS, WIRE DEFECTS	VISUAL SOFT XRAY	1X / MACH / DAY/ 1X/ DAY EVERY LOT 20 UNITE ACC= Ø, REJ = 1	LOG LOG LOG
	POST MOLD CURE	TEMPERATURE	+175°C +/- 5°C 6HOURS	PYROMETER	CONTINUOUS	
	POST MOLD CURE MONITOR	TEMPERATURE	+175°C +/- 5°C 6HOURS	PYROMETER	1X/OVEN/DAY	
	DEFLASH VISUAL	REMOVE MOLD FLASH FROM PACAKGE	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
			3 SOLUTIONS	UNAIDED EYE	1X/WEEK (11 UNITS/ SOLUTION ACC = Ø, REJ = 1	
IR, VISCOSITY	VISUAL	PER SPEC		1X/SHIFT	Np CHART	
	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 CLEANLINES	1.7µG/INCH SQUARED	IONOGRAPH	3 LOTS/SHIFT 3 TESTS/ LOT	LOG

Revision Ø.

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	UNAIDED EYE	5 UNITS/SHIFT 2 UNITS/LOT ACC= Ø, REJ= 1  1X/ DAY/ MACH/ 5UNITS  1X/ WK/ MACH 2 LEADS	CHECKLIST
		COPPLANARITY LEAD SPREAD STANDOFF	PER SPEC	COMPARATOR		nP CHART
		LEAD FATIGUE	PER SPEC	LEAD TESTER		LOG
	CRACK/GAP BUYOFF	VISUAL	PER SPEC	30X TO 45X MICROSCOPE (SINGULATED)	45/LOT/ CONVERSION 200/1 <sup>ST</sup> LOT OF SHIFT ACC= Ø, REJ= 1	LOG
	DELAMINATION/C 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	UNAIDED EYE	5 UNITS/SHIFT 2 UNITS/ LOT ACC= Ø, REJ= 1  45 UNITS HOURLY/ CONVERSION 100 UNITS/1 <sup>ST</sup> LOT OF SHIFT ACC= Ø, REJ= 1	LOG
		VISUAL	PER SPEC	30X TO 40X MICROSCOPE		
	FINAL VISUAL INSPECTION	VISUAL QUALITY	PER SPEC	UNAIDED EYE	100%-YIELD TRIGGER 95.0%	LOG
	QA FINAL VISUAL INSPECTION	CORRECT MARK MARKING PERMANENCY TEST (IF INK MARKED)	PER SPEC	UNAIDED EYE	S/S= 125 ACC= Ø, REJ= 1	LOG
		VISUAL BENT LEADS MOLD FLASH, SOLDER QUALITY ETC.				
	QA PACK & DOCUMENTATION CHECK	PACKING & PREPERATION FOR DELIVERY	PER SPEC	UNAIDED EYE	5 TUBES ACC= Ø, REJ= 1	LOG
	SHIP TO LTC	ANTISTATIC TUBES			EVERY LOT 100% BASIS	

Revision Ø.