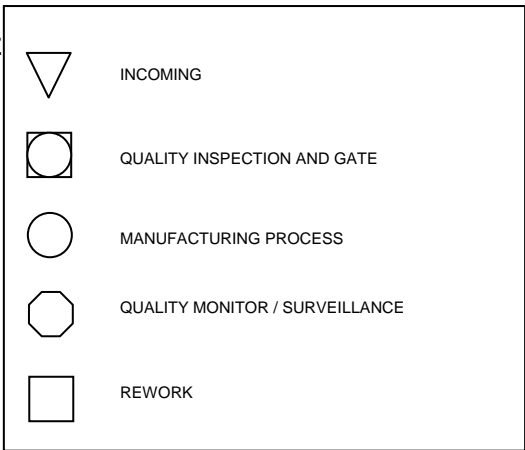


ASSEMBLY FLOWCHART
MSOP/MSOP (EXPOSED) PACKAGE
 Updated 02/26/13


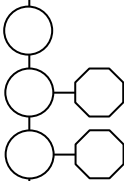


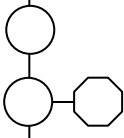

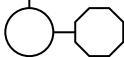
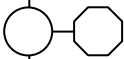

Vendor: Linear Technology Corporation
 Package: MSOP /MSOP (EXPOSED) Package
 Assembly: LTC - Penang - Malaysia
 UTAC - Thailand
 Final Test: Linear Technology Corp., Milpitas, CA.,& Singapore
 Q.C. Test: Linear Technology Corp., Milpitas, CA.,& Singapore
 Source Accept Test: Linear Technology Corp., 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 2 ND OPTICAL QUALITY	PROBE DEFECTS 2 ND OPTICAL DEFECTS	75X MICROSCOPE	MINIMUM OF 1 TIME PER SHIFT S/S= 1, ACC= Ø	LOG
	KIT FOR OVERSEAS ASSEMBLY (N/A FOR PENANG)	WAFERS ARE KITTED WITH LTC BONDING DIAGRAM AND LTC ASSEMBLY TRAVELER				
	WAFER MOUNT	PREPARATION FOR DIE SEPERATION	VISUAL INSPECTION	UNAIDED EYE	3 WAFERS/SHIFT Ø PPM TARGET	GO/NO GO INSPECTION
	WAFER MOUNT MONITOR					
	WAFER SAW	DIE SEPERATION	ALIGNMENT ACCURACY	TV ALIGNMENT MICRO AUTOMATION OR DISCO SAW 10X TO 30X MICROSCOPE	EVERY WAFER LOT/MACHINE, Ø PPM TARGET	LOG
	BACTERIA COUNT	BACTERIA CULTURE	10 COL/100 CC	BACTERIA CULTURE	1X PER WEEK	LOG
	SET-UP CHECK	INSPECTION	PER SPEC	VISUAL	EA WAFER LOT	LOG
		BLADE LIFE	45K IN SAW LINE	COUNT USAGE	N/A	LOG
		SAW KERF	1.0 TO 2.2 MILS	TM MICROSCOPE OR EQUIVALENT	ONCE PER SHIFT 4CUTS PER MACHINE	nP CHART
	PARAMETERS	PRESSURE, SPEED, CUT COUNT	PER SPEC	PER SPEC	1X PER SHIFT	LOG
	PARAMETERS	PRESSURE, SPEED, CUT, COUNT	PER SPEC	VISUAL	1X PER WEEK	LOG
	DI WATER QUALITY	RESISTIVITY	12M OHM MIN	REISISTIVITY METER	1X PER WEEK	LOG

FLOW CHART INCOMING ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTION/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	DIE SORT 2 nd 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 MICROSCOPE	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 MICROSCOPE	2 STRIPS/OVEN/DAY ZERO BLEED	LOG
	EPOXY CURE	CURE TEMP	EPOXY CURE +175°C +/-5°C	PYROMETER/TC	1X/DAY	LOG
	WIRE BOND	BALL BONDS	GOLD WIRE	AUTO THERMOSONIC BALL BONDER 2X 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 (<800K BONDS)	
	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 (1.5 MIL), 12GM (2MIL), 15gm (3MIL)	BOND PULL TESTER	EACH LOT/CAP CHANGE (ALL WIRES)	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	EACH LOT/CAP CHANGE (5 WIRES INCLUDING GND BONDS)	X BAR R CHART
	PRAMETERS	VISUAL	(POWER, FORCE TIME, TEMP)	75X MICROSCOPE	1X/ DAY	LOG
	BOND PEEL TEST	VISUAL	>25% AU REMAINING		1 WIRE/MACH/DAY	LOG
	BOND CRATER	VISUAL	NO CRATERING	75X MICROSCOPE	1X/MACH/DAY (10 UNITS)	LOG
	3 RD OPTICAL INSPECTION	VISUAL INSPECTION	PER SPEC	20X TO 40X MICROSCOPE	TIELD TRIGGER 95%	LOG
	QA 3 RD OPTICAL INSPECTION	CHECK FOR WORKMANSHIP QUALITY	PER SPEC	MIN 30X MICROSCOPE	125 PER LOT ACC=Ø, REJ=1 (MRB>10%, 3X REJ)	LOG

FLOW CHART INCOMING ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTIO N/TEST CRITERIA	METHOD & EQUIPMENT	SAMPLING PLAN	SPC TECHNIQUE
	MOLD – EPOXY NOVOLAC SURVEILLANCE TEMPERATURE SURVEILLANCE COMPOUND AGEING CHECK MISMATCH PARAMETERS MOLD QUALITY	ENCAPSULATIO N PARAMETER VISUAL MOLD TEMP VISUAL VISUAL OFFSET PRESS, SPEED XRAY VISUAL	PER SPEC PER SPEC +175°C +/- 5°C PER SPEC AGE LIFE <2.5MIL (SSOP) PER SPEC SWEEP, VOIDS WIRE DEFECTS	VISUAL MIN 3X PYROMETER 30X TO 40X MICROSCOPE VISUAL TOOLMAKER'S VISUAL SOFT XRAY	1X / SHIFT 1 HOT/ LOT ACC= Ø, REJ = 1 1X/SHIFT/MACH/ MOLD CHANGE 6 STRIPS/MACH/SHIFT/ CONVERSION 1X / SHIFT 1X/DAY/MC 4 UNITS/SHOT 1X/ MACH/DAY 1X/ DAY EVERY LOT 20 UNITS ACC= Ø, REJ = 1	CHECKLIST CHECKLIST X BAR R CHART LOG LOG LOG
	POST MOLD CURE POST MOLD CURE MONITOR	TEMPERATURE TEMPERATURE	+175°C +/- 5°C 6 HOURS +175°C +/- 5°C 6 HOURS	PYROMETER PYROMETER	CONTINUOUS 1X/ OVEN/ DAY	
	DEFASH VISUAL DEFLASH MONITOR	REMOVE MOLD FLASH FROM PACKAGE PRESSURE	PER SPEC PER SPEC	UNAIDED EYE PRESSURE GAGE	2X/ SHIFT/ PKG CHANGE – 5 STRIPS ACC=Ø, REJ = 1 2X/ SHIFT/ MACH	LOG LOG
	MARKING SET-UP CHECK PERMANENCY IR, VISCOSITY	VISUAL INSPECTION VISUAL MARK PERMANENCY VISUAL	PER SPEC PER SPEC 1 SOLUTION 3 SOLUTIONS PER SPEC	UNAIDED EYE UNAIDED EYE UNAIDED EYE	2 STRIPS/ 3X/ SHIFT ACC= Ø, REJ = 1 1X / SHIFT 1 LOT/ MACH/ SHIFT 11 UNITS ACC= Ø, REJ= 1 1X/WEEK (11 UNITS/SOLUTION ACC= Ø, REJ = 1 1X/SHIFT	LOG CHECKLIST LOG nP CHART
	SOLDER PLATE INSPECTION	PARAMETERS THICKNESS AND COMPOSITION SOLDERABILITY (W&WO AGING) PACKAGE CLEANLINESS	PER SPEC 300 – 800 µ INCH 85% ± 10% 95% COVERAGE 1.7 µG/INCH SQUARED	UNAIDED EYE XRF 20X TO 40X MICROSCOPE IONOGRAPH	1X/ PKG/ SHIFT 1X/ SHIFT/ MACH/ CHANGE OF SOLDER BATH – MIN OF 10 READINGS 1X/ SHIFT 10 UNITS 3 LOTS/ SHIFT 3 TESTS/ LOT	LOG nP CHART LOG LOG

FLOW CHART INCOMING ASSY REWORK	PROCESS STEP	DESCRIPTION	INSPECTIO N/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 COPLANARITY LEAD SPREAD STANDOFF LEAD FATIGUE	PER SPEC PER SPEC PER SPEC	UNAIDED EYE COMPARATOR LEAD TESTER	5 UNITS/ SHIFT 2 UNITS/ LOT ACC= Ø, REJ= 1 1X/ DAY/ MACH 5 UNITS 1X/WK/ MACH 2 LEADS	CHECKLIST nP CHART LOG
	CRACK/ GAP BUYOFF	VISUAL	PER SPEC	30X TO 45X MICROSCOPE (SINGULATED)	45/ LOT/CONVERSION 200/1 ST 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 VISUAL	PER SPEC PER SPEC	UNAIDED EYE 30X TO 40X MICROSCOPE	5 UNITS/ SHIFT 2 UNITS/ LOT ACC= Ø, REJ =1	LOG LOG
	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) VISUAL: BENT LEADS MOLD FLASH, SOLDER QULAITY ETC	PER SPEC	UNAIDED EYE	S/S = 125 ACC= Ø, REJ= 1	LOG
	QA PACK & DOCUMENTATIO N CHECK	PACKING & PREPARATION FOR DELIVERY	PER SPEC	UNAIDED EYE	5 TUBES ACC= Ø, REJ= 1	LOG
	SHIP TO LTC	ANTISTATIC TUBES			EVERY LOT 100% BASIS	