



HOSONIC ELECTRONIC CO., LTD.



SMD CRYSTAL UNIT SPECIFICATIONS

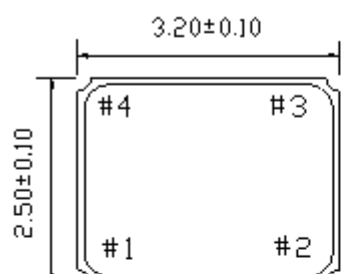
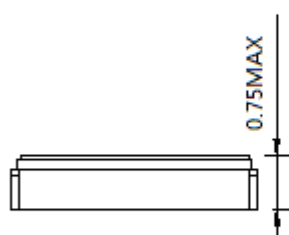
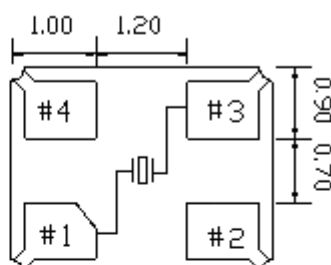
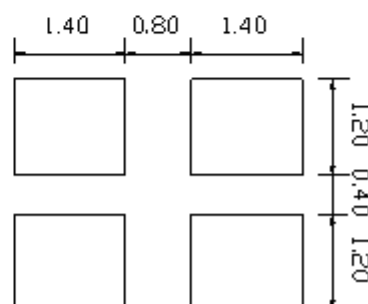
Issue	May 10, 2013
Rev.	1.0
Page	9

Customer	FOXCONN
Customer P/N	
Product	3225 Seam Sealing X'tal
Nominal Frequency	25.000000MHz
HOSONIC P/N	E3SB25.0000F18G11

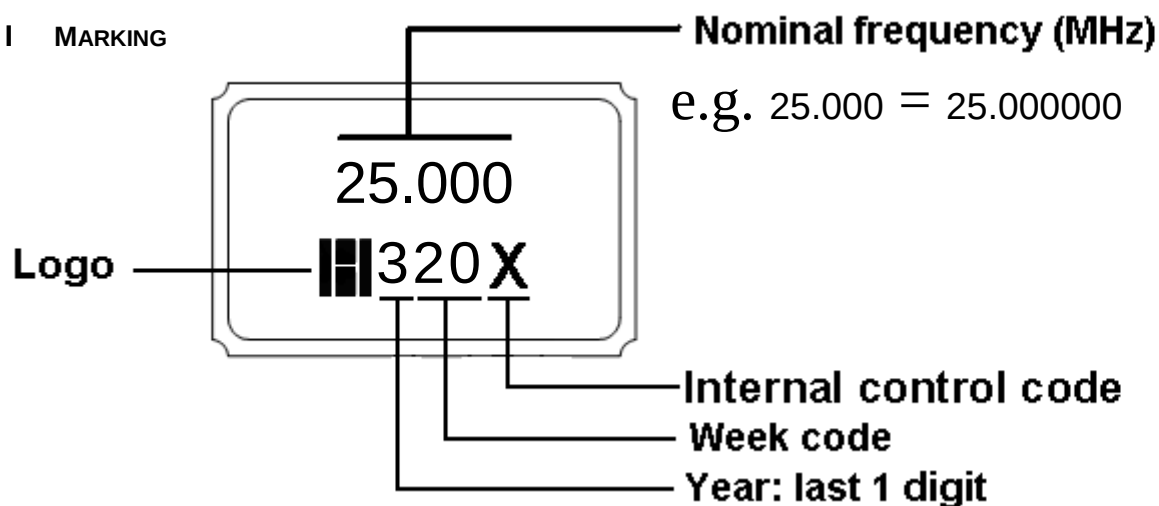
Drawn	Checked	Approved
ZOE	TOM	JOHN

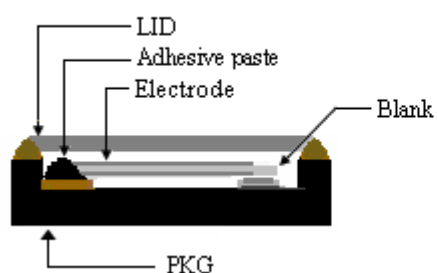
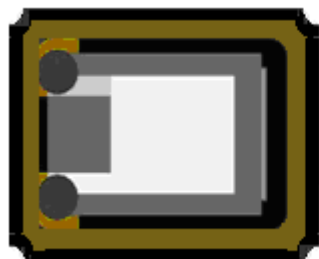
I ELECTRICAL PARAMETERS

No.	Item	Symb.	Electrical Specification				Remark
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	25.000000				MHz
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F0$	-10	-	10	ppm	at 25°C±3°C
4	Operating Temperature Range	T _{OPR}	-30	-	85	°C	
5	Frequency Stability	TC	-10	-	10	ppm	
6	Storage Temperature	T _{STG}	-55	-	125	°C	
7	Load capacitance	CL	-	18	-	pF	
8	Equivalent Series Resistance	ESR	-	-	50	Ω	
9	Drive Level	DL	-	100	200	μW	
10	Insulation Resistance	IR	500	-	-	MΩ	At 100V _{DC}
11	Drive level Dependency:	DLD2	-	-	15	Ω	
		RLD2	-	-	50	Ω	
12	SPDB		-	-	-3	dB	+/-5000ppm
13	Trim sensitivity	TS	-	4.2	-	ppm/pF	
14	Shunt Capacitance	C0	-	-	3	pF	
15	Aging Per Year	Fa	-2	-	2	ppm	First Year
16	Package type	HCX-3SB					

I OUTLINE DIMENSIONS (UNIT: mm)

Top View

Recommended Solder Pattern


Pin	Connection
#1,#3	X'tal
#2,#4	GND

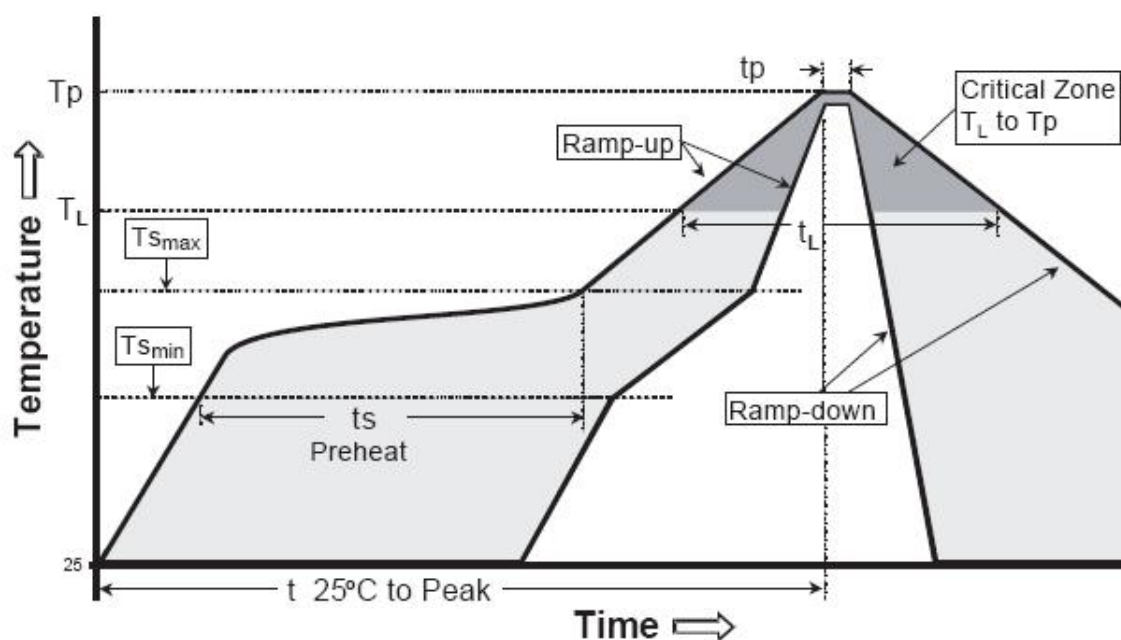
I MARKING


I PRODUCT LAYOUT


NO.	Part	Material	Remark
1	LID	KOVAR(Fe+Co+Ni alloy)	
2	PKG	Al ₂ O ₃	Base
3	Blank	SiO ₂	Quartz
4	Adhesive paste	Ag/Silicon	Support
5	Electrode	Noble metal	

I REFLOW PROFILES

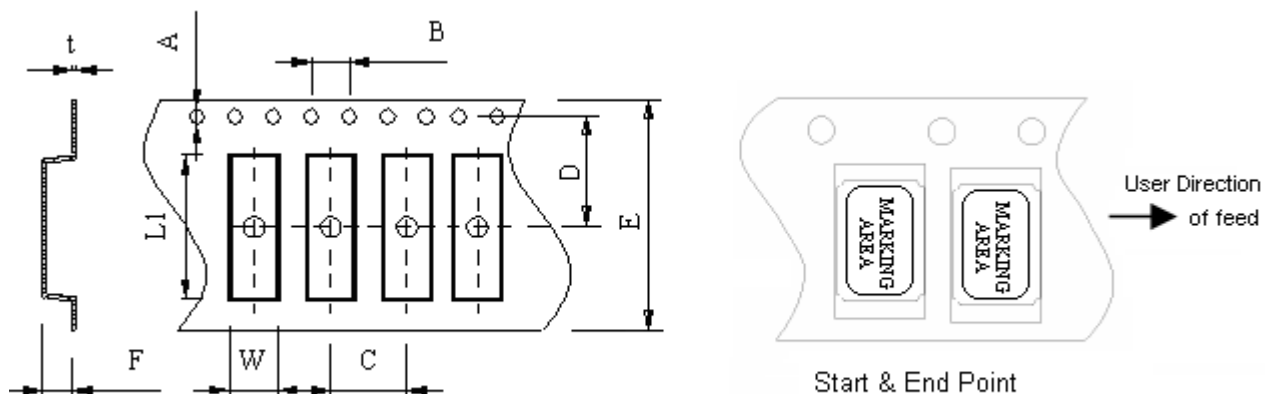
Profiles Feature	Pb-Free Assembly
Average Ramp-up Rate (T_s max to T_p)	3°C/second max.
Preheat ■ Temperature Min (T_s min) ■ Temperature Max (T_s max) ■ Time (t_s min to t_s max)	125°C 200°C 60~180 seconds
Time maintained above ■ Temperature (T_L) ■ Time (t_L)	217°C 60~150 seconds
Peak/Classification Temperature (T_p)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20~40 seconds
Ramp-down rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.
Suggest reflow times	3 Times max



Remark: To reference JEDEC J-STD-020C

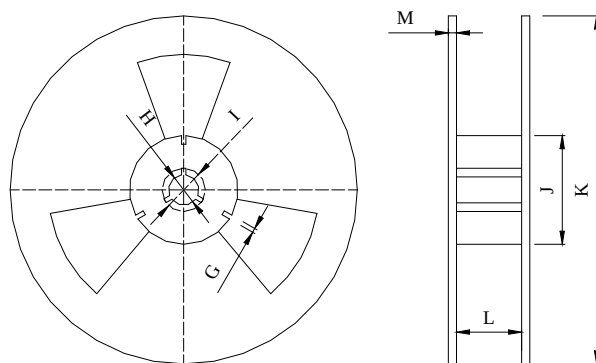
I PACKAGE

Tape Dimensions(unit : mm)



A	B	C	D	E	F	L1	W	t
1.50	4.0	4.0	3.5	8.0	1.0	3.4	2.7	0.3

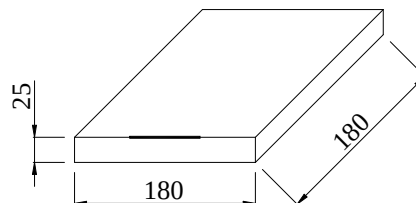
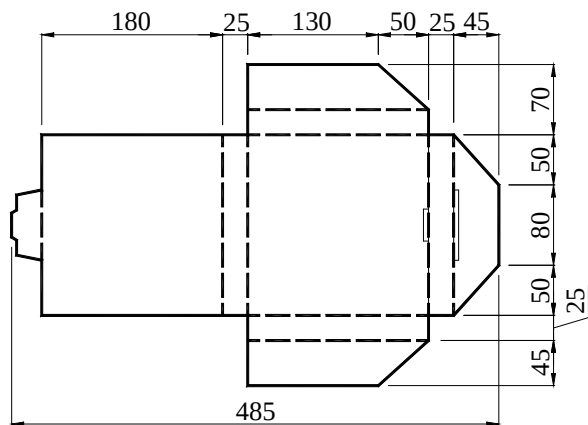
Reel Dimensions(unit: mm)



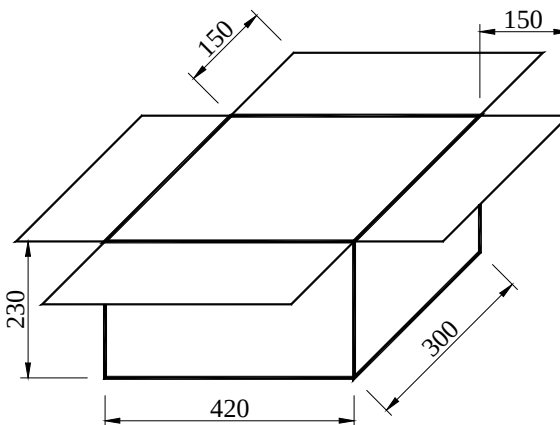
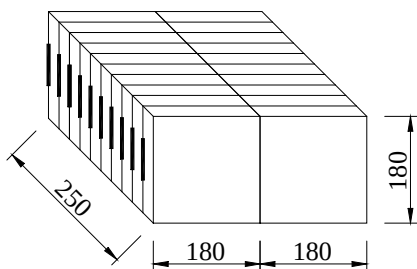
G	H	I	J	K	L	M
2.5	13.5	21.6	60.0	178	9.5	1.6

*3000pcs/Reel

Carton Dimension (unit : mm)



1 reel = 1 Inner box



20 Inner boxes = 1 Carton

60kpcs = 1 Carton

I RELIABILITY SPECIFICATIONS

No.	Test Item	Test Conditions	Reference
1	High Temperature Storage	Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 1000 ± 12 Hours	MIL-STD-883E-1016
2	Temperature Cycle	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature change between T1 and T2 at soonest Run 1000 cycles, maintain T1 and T2 5minutes each in one cycle	JESD22 Method JA-104
3	Solder Heat Resistance	Pre-heat: 125°C 60~120 Seconds Solder Temperature: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 30 Seconds	MIL-STD-202F 210 E
4	Drop Test	3 Times Free Fall from 75cm height table to 3cm thickness hard wood board	MIL-STD-202F-203B
5	High Temperature, High Humidity Storage	Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Relative Humidity: 80%~85% Time: 250Hours $\pm$ 24 Hours	MIL-STD-202F-103B
6	Steam Aging	Temperature: $97^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 24 Hours 260°C solder pot to check solderability	MIL-STD-883 C-1008.2B
7	Solderability	Dip in flux 5~10 seconds Temperature: $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 10 Seconds	MIL-STD-202F-208H
8	Aging	Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 250 ± 12 Hours	MIL-STD-202 F-108A
9	Thermal Shock	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature change between T1 and T2: 5 seconds 100 cycles, maintain T1 and T2 for 30 minutes each in one cycle	MIL-STD-883E-1011.9B
10	Vibration	Frequency Range: 10Hz~2000Hz Amplitude: 1.5mm or 20G 4Hours in each direction, total 12Hours	MIL-STD-202F-204D

Referenc 25,000,000.00 (Using Measured FL)

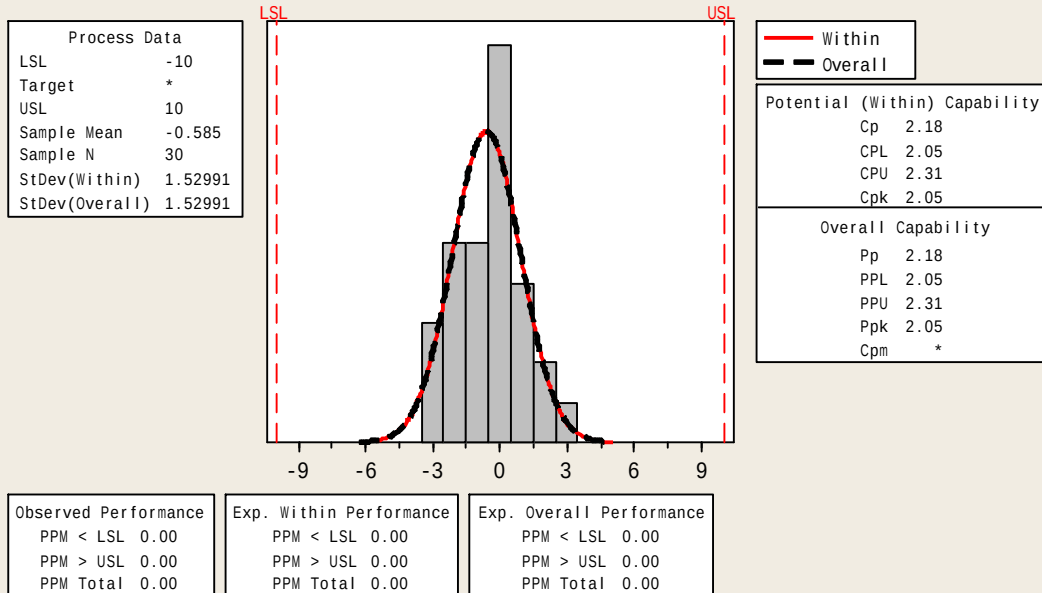
Power: 100.00 uW Into RR

(Before Reflow)

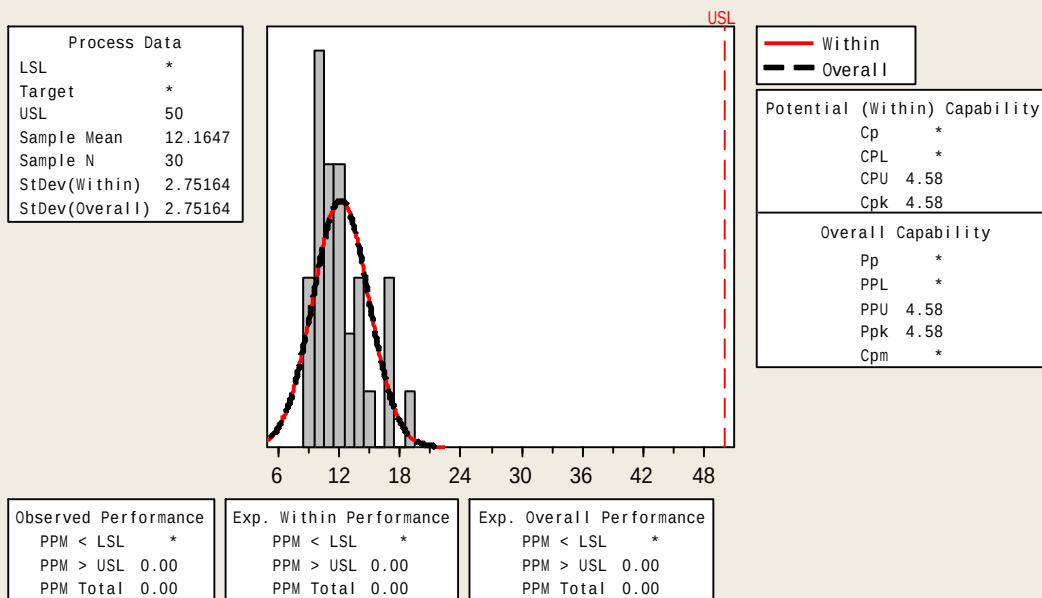
PL: No Load CL: 18.00 pF

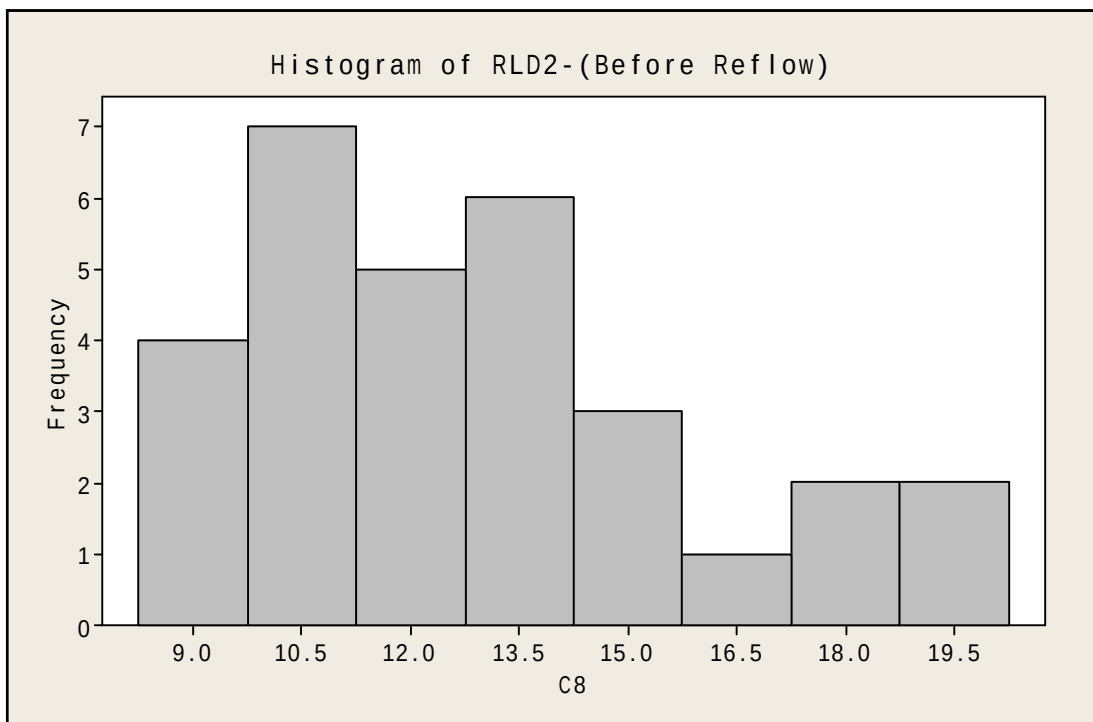
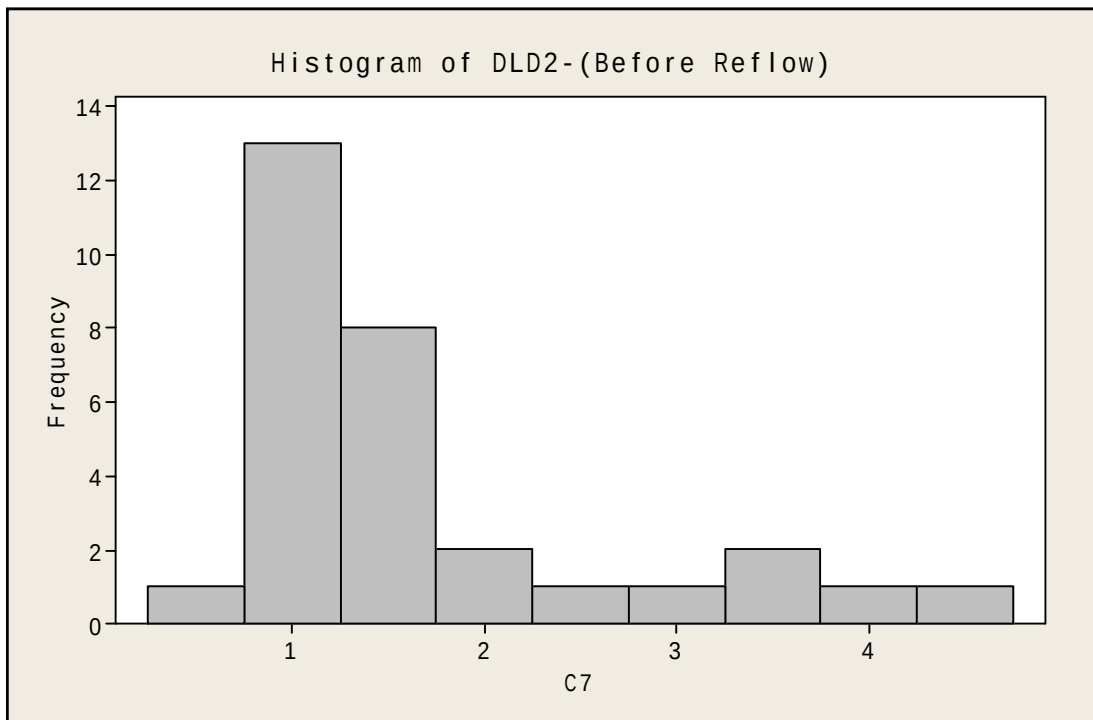
Crystal	First Fail	DLD2	RLD2	FDLD	FL	RR	C0	C1	L	Q	TS	SPDB
		Ohms	Ohms	ppm	ppm	Ohms	pF	fF	mH	k	ppm/pF	dB
High Limit		15.00	50.00	10.00	10.0	50.00	3.00					-3.00
Low Limit					-10.0							
1	PASS	1.02	9.12	4.87	-3.29	9.13	1.15	3.16	12.82	220.61	4.31	-9,999.00
2	PASS	1.10	11.88	4.38	-0.18	11.79	1.16	3.08	13.18	175.53	4.19	-9,999.00
3	PASS	1.78	11.85	4.20	-0.06	11.33	1.11	3.05	13.28	184.11	4.18	-9,999.00
4	PASS	2.17	13.60	3.82	-1.43	11.89	1.15	3.10	13.06	172.62	4.23	-9,999.00
5	PASS	1.09	9.96	4.82	-2.03	9.96	1.18	3.15	12.88	203.19	4.28	-9,999.00
6	PASS	1.23	14.01	4.22	1.00	13.82	1.17	3.03	13.36	151.80	4.13	-9,999.00
7	PASS	1.42	18.03	2.81	-1.12	17.49	1.16	3.04	13.33	119.67	4.14	-9,999.00
8	PASS	1.02	10.63	5.03	2.55	10.66	1.16	2.97	13.63	200.84	4.05	-9,999.00
9	PASS	1.09	9.74	4.20	-0.35	9.73	1.18	3.14	12.93	208.76	4.26	-9,999.00
10	PASS	3.65	18.91	3.76	-0.29	16.51	1.18	3.06	13.23	125.86	4.16	-9,999.00
11	PASS	1.31	9.90	5.25	-0.95	9.84	1.15	3.07	13.22	211.02	4.18	-9,999.00
12	PASS	1.18	11.21	4.03	0.58	11.15	1.17	3.15	12.86	181.14	4.29	-9,999.00
13	PASS	0.98	8.68	5.21	-3.17	8.68	1.17	3.08	13.16	238.17	4.19	-9,999.00
14	PASS	1.59	11.17	6.08	0.03	10.21	1.13	3.07	13.19	202.87	4.20	-9,999.00
15	PASS	4.35	14.57	5.84	-0.50	12.00	1.12	3.00	13.53	177.11	4.10	-9,999.00
16	PASS	3.28	14.80	5.12	2.18	13.29	1.16	3.00	13.49	159.40	4.09	-9,999.00
17	PASS	1.02	14.19	5.49	1.05	13.67	1.19	3.11	13.02	149.66	4.23	-9,999.00
18	PASS	1.14	15.94	7.02	-2.25	15.10	1.16	3.02	13.44	139.88	4.11	-9,999.00
19	PASS	1.50	14.66	3.36	1.49	14.11	1.16	3.06	13.25	147.54	4.17	-9,999.00
20	PASS	0.85	8.84	4.69	-2.69	8.90	1.14	3.17	12.79	225.84	4.32	-9,999.00
21	PASS	0.94	12.63	3.65	-1.65	12.40	1.14	3.09	13.10	165.97	4.22	-9,999.00
22	PASS	1.32	11.83	4.13	-0.31	11.65	1.16	3.10	13.07	176.16	4.23	-9,999.00
23	PASS	1.68	14.11	6.35	-0.30	13.29	1.18	3.13	12.96	153.18	4.25	-9,999.00
24	PASS	1.06	9.77	4.29	1.69	9.75	1.17	3.16	12.81	206.42	4.31	-9,999.00
25	PASS	1.37	17.82	5.44	-1.91	17.03	1.18	3.04	13.35	116.25	4.13	-9,999.00
26	PASS	2.47	13.20	4.71	-1.24	11.47	1.17	3.11	13.04	178.51	4.23	-9,999.00
27	PASS	0.69	9.99	4.37	-0.38	9.88	1.13	3.12	12.98	206.42	4.26	-9,999.00
28	PASS	3.87	13.26	5.95	-2.46	10.23	1.18	3.12	13.01	199.79	4.23	-9,999.00
29	PASS	1.66	19.91	2.75	-1.38	19.30	1.20	3.10	13.10	106.57	4.20	-9,999.00
30	PASS	2.76	12.31	4.47	-0.18	10.68	1.16	3.08	13.18	193.71	4.19	-9,999.00
MAX		4.35	19.91	7.02	2.55	19.30	1.20	3.17	13.63	238.17	4.32	-9,999.00
MIN		0.69	8.68	2.75	-3.29	8.68	1.11	2.97	12.79	106.57	4.05	-9,999.00
AVER		1.69	12.88	4.68	-0.59	12.16	1.16	3.09	13.14	176.62	4.20	-9,999.00
STD		0.97	3.04	1.00	1.52	2.73	0.02	0.05	0.22	34.20	0.07	0.00

Process Capability of FL-Before Reflow



Process Capability of RR-(Before Reflow)





Reference 25,000,000.00 (Using Measured FL)

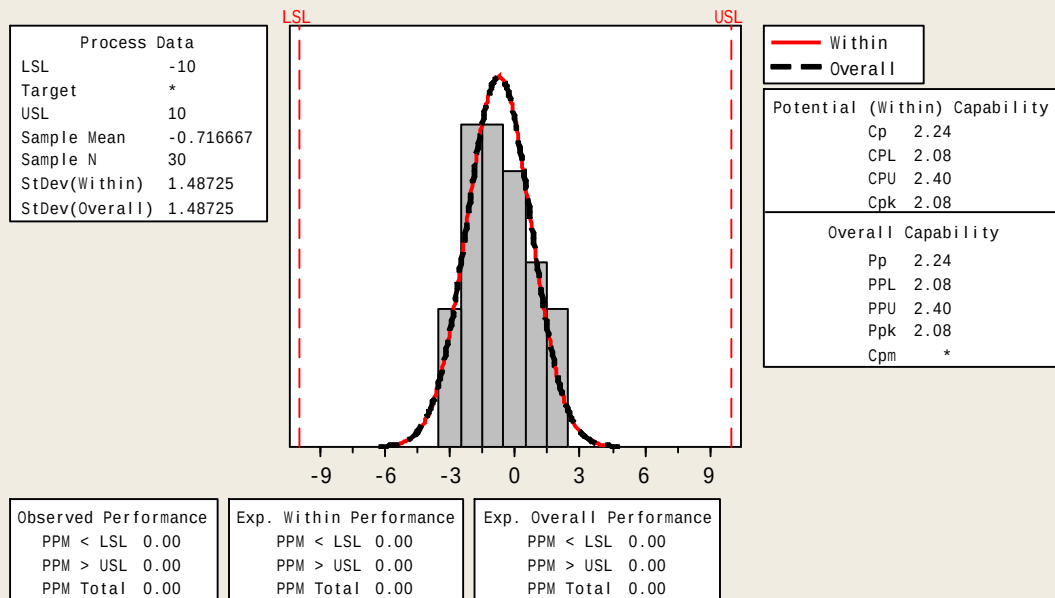
Power: 100.00 uW Into RR

(After Reflow 1 Times)

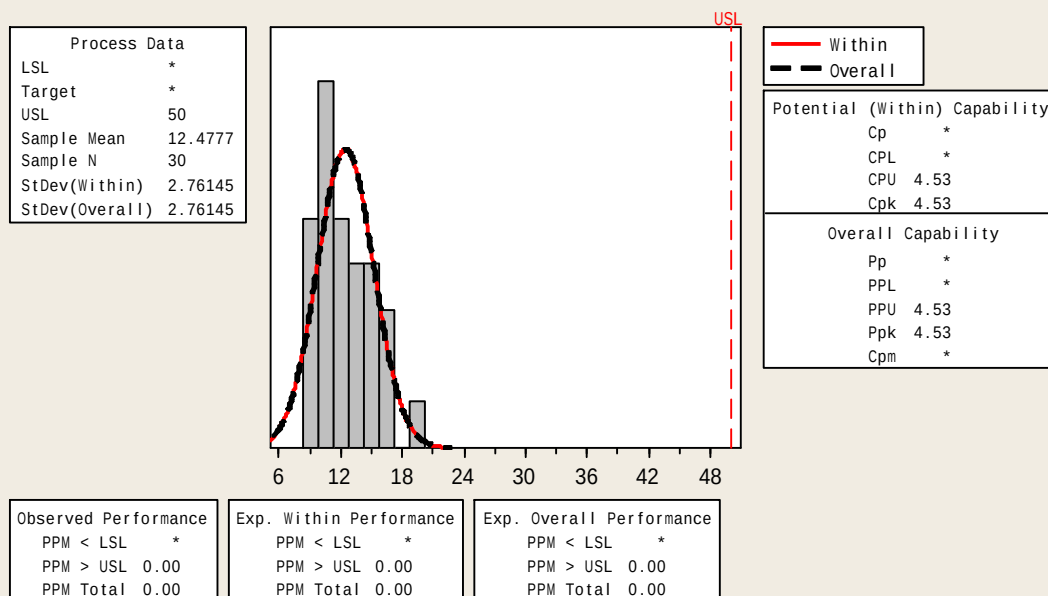
PL: No Load CL: 18.00 pF

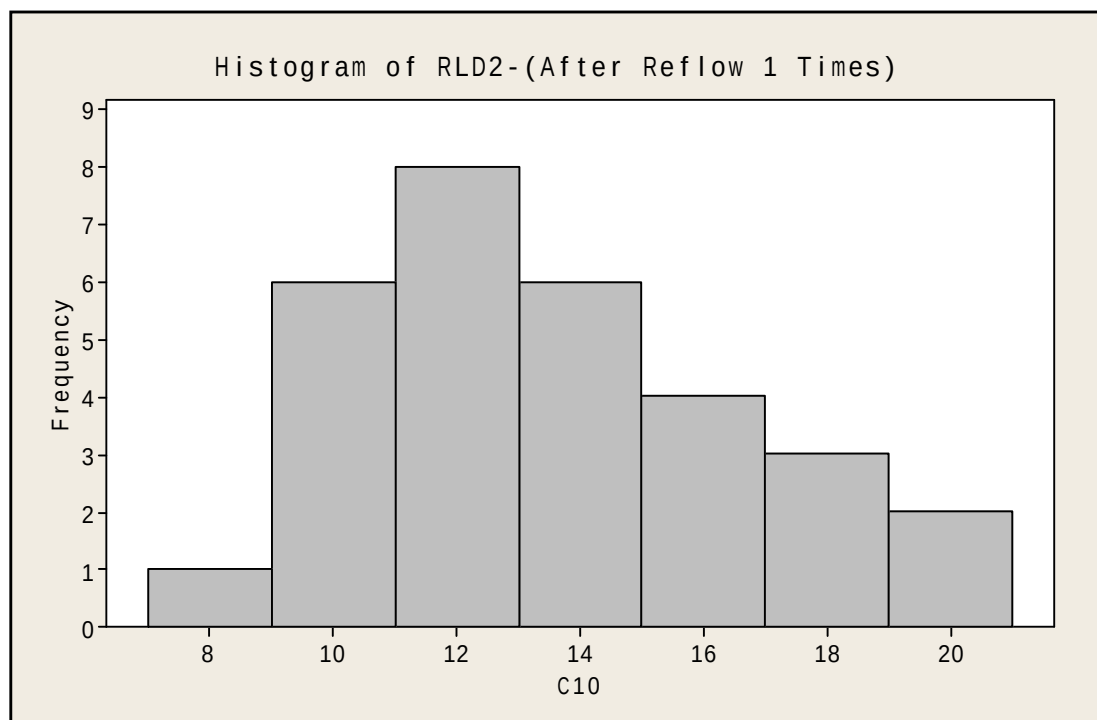
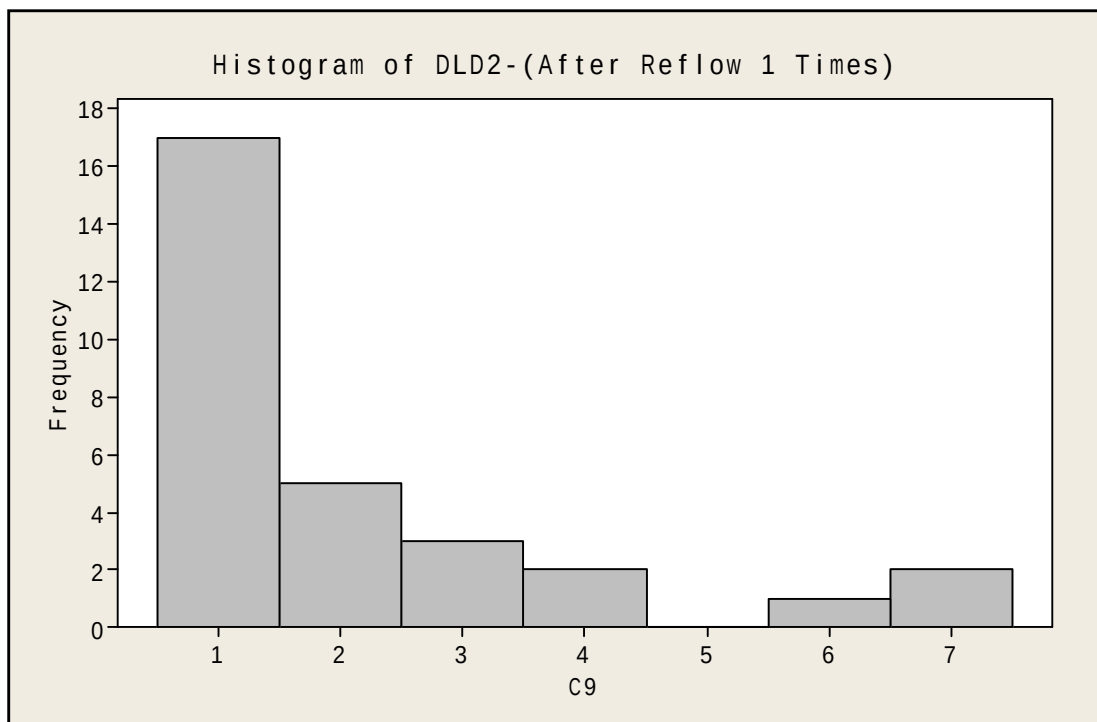
Crystal	First Failure	DLD2	RLD2	FDLD	FL	RR	C0	C1	L	Q	TS	SPDB
		Ohms	Ohms	ppm	ppm	Ohms	pF	fF	mH	k	ppm/pF	dB
High Limit		15.00	50.00	10.00	10.0	50.00	3.00					-3.00
Low Limit					-10.0							
1	PASS	1.13	13.42	3.57	-3.29	13.12	1.15	3.16	12.83	153.67	4.31	-9,999.00
2	PASS	1.02	11.76	4.40	-0.59	11.69	1.16	3.07	13.19	177.22	4.19	-9,999.00
3	PASS	1.53	10.94	4.43	-0.64	10.55	1.11	3.05	13.30	197.90	4.17	-9,999.00
4	PASS	3.02	16.91	3.13	-1.73	14.33	1.15	3.10	13.09	143.46	4.23	-9,999.00
5	PASS	2.65	17.78	3.01	-2.16	17.00	1.18	3.14	12.91	119.29	4.27	-9,999.00
6	PASS	2.33	20.40	3.04	0.55	19.87	1.17	3.03	13.39	105.82	4.12	-9,999.00
7	PASS	1.32	14.75	3.37	-1.73	14.46	1.16	3.03	13.36	145.11	4.13	-9,999.00
8	PASS	1.04	11.09	4.90	2.23	11.04	1.16	2.98	13.62	193.73	4.05	-9,999.00
9	PASS	1.03	9.37	4.33	-0.46	9.39	1.17	3.13	12.93	216.32	4.26	-9,999.00
10	PASS	3.82	18.14	3.90	-0.89	15.11	1.19	3.06	13.26	137.86	4.15	-9,999.00
11	PASS	1.41	11.14	4.84	-1.34	11.00	1.15	3.06	13.24	189.00	4.18	-9,999.00
12	PASS	1.14	10.81	4.16	0.64	10.77	1.17	3.15	12.88	187.86	4.28	-9,999.00
13	PASS	6.81	20.28	3.12	-3.37	16.29	1.17	3.08	13.16	126.83	4.19	-9,999.00
14	PASS	1.72	11.33	6.02	-0.15	10.27	1.12	3.08	13.18	201.54	4.21	-9,999.00
15	PASS	6.77	16.82	6.06	-0.71	11.74	1.12	3.00	13.52	180.89	4.10	-9,999.00
16	PASS	6.03	16.60	5.47	1.88	12.52	1.15	3.01	13.47	169.01	4.10	-9,999.00
17	PASS	1.58	14.31	5.56	0.93	13.30	1.18	3.12	13.01	153.66	4.23	-9,999.00
18	PASS	1.41	13.90	7.71	-2.24	13.78	1.16	3.02	13.44	153.11	4.11	-9,999.00
19	PASS	1.47	14.12	3.49	1.46	13.69	1.16	3.07	13.22	151.69	4.18	-9,999.00
20	PASS	0.96	8.54	4.84	-2.70	8.56	1.14	3.17	12.80	234.92	4.32	-9,999.00
21	PASS	1.16	11.27	4.07	-1.71	11.21	1.14	3.10	13.07	183.14	4.23	-9,999.00
22	PASS	1.28	11.46	4.30	-0.36	11.29	1.16	3.11	13.05	181.59	4.23	-9,999.00
23	PASS	1.18	15.66	6.01	0.09	14.85	1.18	3.13	12.95	136.98	4.25	-9,999.00
24	PASS	1.01	9.43	4.38	1.70	9.45	1.16	3.17	12.80	212.59	4.32	-9,999.00
25	PASS	1.02	17.19	6.66	-1.63	16.99	1.17	3.04	13.34	123.32	4.14	-9,999.00
26	PASS	1.96	10.67	5.34	-1.17	9.61	1.16	3.11	13.03	213.04	4.24	-9,999.00
27	PASS	0.78	9.20	4.66	-0.49	9.13	1.13	3.13	12.96	222.94	4.27	-9,999.00
28	PASS	4.21	13.11	6.09	-2.20	9.99	1.18	3.12	13.01	204.60	4.24	-9,999.00
29	PASS	1.24	12.93	4.06	-1.40	12.73	1.20	3.10	13.08	161.37	4.20	-9,999.00
30	PASS	2.67	12.16	4.54	-0.02	10.60	1.16	3.08	13.14	194.69	4.20	-9,999.00
MAX		6.81	20.40	7.71	2.23	19.87	1.20	3.17	13.62	234.92	4.32	-9,999.00
MIN		0.78	8.54	3.01	-3.37	8.56	1.11	2.98	12.80	105.82	4.05	-9,999.00
AVER		2.16	13.52	4.65	-0.72	12.48	1.16	3.09	13.14	172.44	4.20	-9,999.00
STD		1.71	3.30	1.16	1.47	2.74	0.02	0.05	0.22	33.92	0.07	0.00

Process Capability of FL-(After Reflow 1 Times)



Process Capability of RR(After Reflow 1 Times)





Reference: 25,000,000.00 (Using Measured FL)

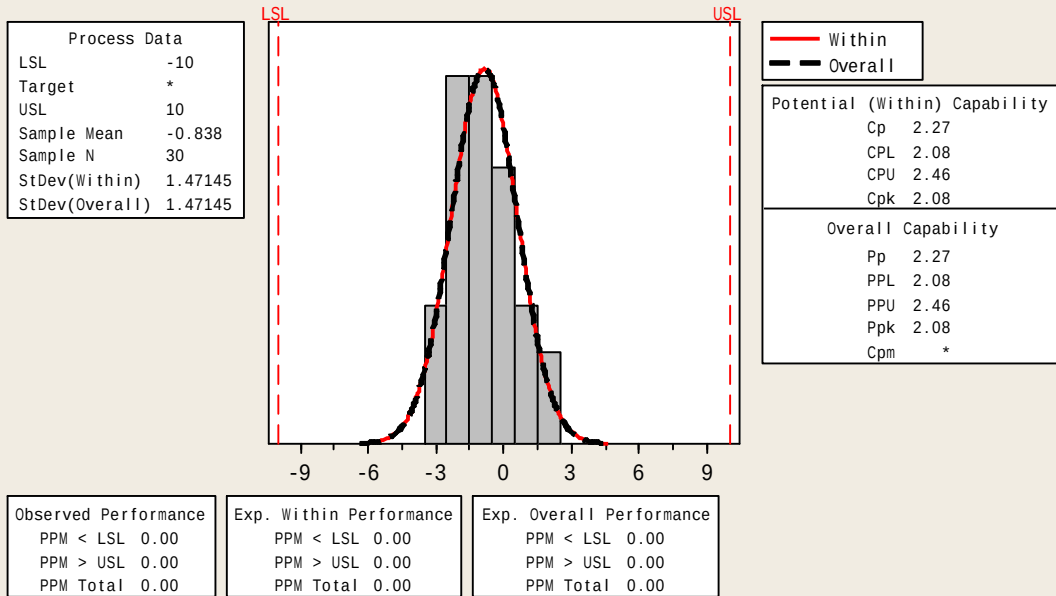
Power: 100.00 uW Into RR

(After Reflow 2 Times)

PL: No Load CL: 18.00 pF

Crystal	First Fail	DLD2	RLD2	FDDL	FL	RR	C0	C1	L	Q	TS	SPDB
		Ohms	Ohms	ppm	ppm	Ohms	pF	fF	mH	k	ppm/pF	dB
High Limit		15.00	50.00	10.00	10.0	50.00	3.00					-3.00
Low Limit					-10.0							
1	PASS	0.99	9.01	4.85	-3.38	9.03	1.17	3.16	12.84	223.34	4.30	-9,999.00
2	PASS	1.09	10.83	4.71	-0.64	10.82	1.16	3.07	13.21	191.74	4.18	-9,999.00
3	PASS	1.92	11.81	4.26	-0.47	11.53	1.11	3.05	13.29	180.97	4.18	-9,999.00
4	PASS	1.45	11.20	4.31	-2.02	10.28	1.14	3.10	13.09	200.07	4.22	-9,999.00
5	PASS	2.76	15.17	3.57	-2.26	14.98	1.18	3.14	12.92	135.48	4.27	-9,999.00
6	PASS	1.29	14.69	4.01	0.48	14.46	1.17	3.03	13.38	145.26	4.12	-9,999.00
7	PASS	1.35	14.07	3.51	-2.01	13.83	1.15	3.04	13.36	151.69	4.14	-9,999.00
8	PASS	1.00	10.62	5.06	2.26	10.63	1.16	2.97	13.63	201.42	4.05	-9,999.00
9	PASS	1.62	11.24	3.78	-0.65	11.15	1.17	3.13	12.94	182.38	4.26	-9,999.00
10	PASS	3.18	16.84	4.06	-0.61	14.91	1.19	3.06	13.24	139.49	4.16	-9,999.00
11	PASS	1.16	9.77	5.29	-1.77	9.78	1.18	3.07	13.22	212.42	4.17	-9,999.00
12	PASS	1.15	10.91	4.11	0.44	10.85	1.17	3.15	12.88	186.60	4.28	-9,999.00
13	PASS	0.94	8.36	5.40	-3.26	8.39	1.14	3.08	13.15	246.23	4.21	-9,999.00
14	PASS	1.74	11.28	5.96	-0.06	10.22	1.11	3.08	13.18	202.46	4.21	-9,999.00
15	PASS	6.25	16.57	6.24	-0.64	11.80	1.12	2.99	13.55	180.29	4.09	-9,999.00
16	PASS	5.76	16.47	5.58	1.88	12.61	1.14	3.00	13.49	167.99	4.10	-9,999.00
17	PASS	1.47	14.80	5.71	0.73	13.78	1.18	3.11	13.02	148.44	4.23	-9,999.00
18	PASS	1.75	16.80	6.93	-2.29	15.37	1.15	3.02	13.44	137.34	4.11	-9,999.00
19	PASS	1.34	14.36	3.40	1.16	13.97	1.15	3.07	13.22	148.65	4.18	-9,999.00
20	PASS	0.96	8.39	4.98	-2.77	8.43	1.14	3.16	12.81	238.70	4.32	-9,999.00
21	PASS	1.05	11.03	4.08	-1.85	10.99	1.14	3.10	13.07	186.90	4.23	-9,999.00
22	PASS	1.38	13.01	3.85	-0.72	12.68	1.15	3.10	13.07	161.83	4.23	-9,999.00
23	PASS	1.96	14.80	6.32	-0.28	13.96	1.18	3.13	12.96	145.89	4.25	-9,999.00
24	PASS	1.01	10.06	4.21	1.31	10.03	1.16	3.17	12.81	200.50	4.31	-9,999.00
25	PASS	1.18	17.81	6.85	-2.10	17.33	1.18	3.03	13.38	121.21	4.12	-9,999.00
26	PASS	2.09	15.83	4.00	-1.10	13.09	1.16	3.11	13.04	156.50	4.23	-9,999.00
27	PASS	0.78	9.63	4.49	-0.63	9.53	1.13	3.13	12.97	213.62	4.27	-9,999.00
28	PASS	4.22	14.47	5.82	-2.16	11.11	1.17	3.11	13.02	183.96	4.24	-9,999.00
29	PASS	1.21	13.40	3.88	-1.48	13.18	1.20	3.10	13.09	155.97	4.20	-9,999.00
30	PASS	2.58	12.25	4.47	-0.25	10.74	1.16	3.08	13.17	192.53	4.19	-9,999.00
MAX		6.25	17.81	6.93	2.26	17.33	1.20	3.17	13.63	246.23	4.32	-9,999.00
MIN		0.78	8.36	3.40	-3.38	8.39	1.11	2.97	12.81	121.21	4.05	-9,999.00
AVER		1.89	12.85	4.79	-0.84	11.98	1.16	3.08	13.15	178.00	4.20	-9,999.00
STD		1.35	2.77	1.01	1.46	2.24	0.02	0.05	0.22	31.96	0.07	0.00

Process Capability of FL-(After Reflow 2 Times)



Process Capability of RR-(After Reflow 2 Times)

