

**TRACO
POWER**

Product: **TES 2 Series**
Single Output Models

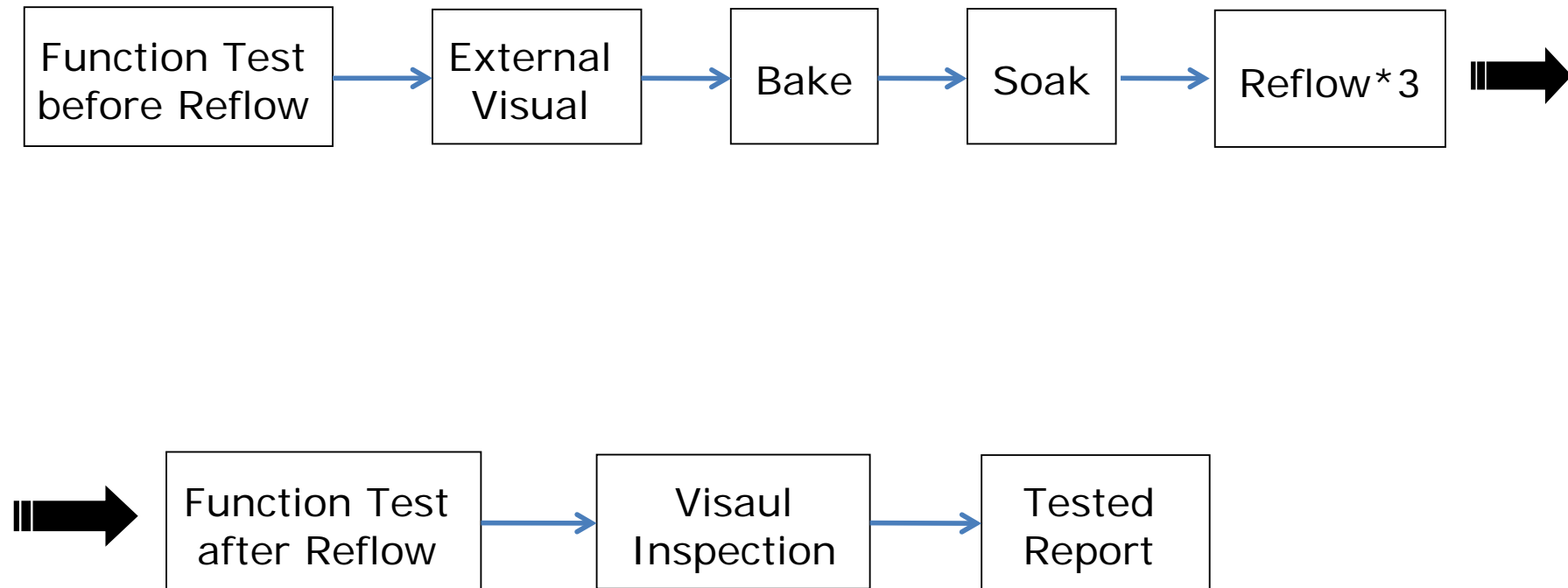
Moisture Sensitivity Level (MSL) Test Report
as per IPC/JEDEC J-STD-020D



Table of Contents

	<u>page</u>
Tested Flowchart	<u>1</u>
Tested Data before Reflow	<u>2</u>
245°C Temperature Reflow Profile	<u>3</u>
Tested Data after Reflow	<u>4</u>
Pictures	<u>5-13</u>
Conclusion	<u>14</u>

Tested Flowchart for TES 2 Products



Test Report

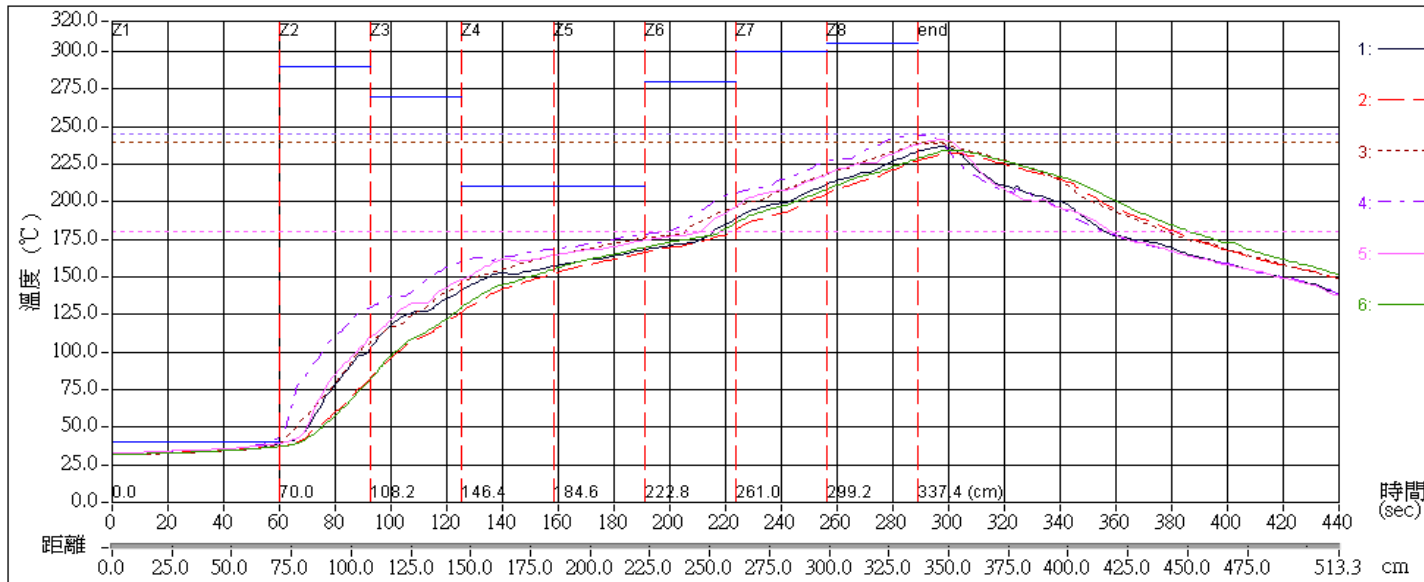
Model Number : TES 2-0511H(date code : 0903)
Q'TY : 30 pcs

Before Reflow Process

Date: 12.02.2009
Tested By: *Nicole Wang*

Sample No	Input Voltage (Vdc)	Input Current Full Load (mA)	Efficiency (%)	Output Voltage (V)	Ripple&Noise (mVp-p)	Line Regulation (%)	Load Regulation (%)	Isolation Voltage	Result
		< 547.9	> 73%	4.7 ~ 5.1	< 120	-1.5 ~1.5	-11~11		
1	5	501.7	79.88646	5.002	88.8	1.159	5.598	OK	pass
2		503.3	79.69779	5.006	110.4	1.159	5.593	OK	pass
3		505.1	79.40945	5.002	146.4	1.159	5.698	OK	pass
4		504.2	79.45371	4.997	136.8	1.159	5.823	OK	pass
5		505	79.34415	4.996	127.2	1.161	5.785	OK	pass
6		504.8	79.3868	4.999	98.4	1.161	5.681	OK	pass
7		504.9	79.3363	4.997	104	1.16	5.723	OK	pass
8		503.2	79.54774	4.994	145.6	1.159	5.727	OK	pass
9		505.2	79.3148	4.999	136.8	1.161	5.761	OK	pass
10		504.3	79.46688	5	163.2	1.161	5.72	OK	pass
11		504.1	79.5077	5.001	106.4	1.161	5.679	OK	pass
12		503.9	79.52129	5	108.8	1.159	5.66	OK	pass
13		505.4	79.27411	4.999	160.8	1.159	5.721	OK	pass
14		504.8	79.33251	4.997	124.8	1.161	5.743	OK	pass
15		507.8	78.88658	4.998	143.2	1.159	5.862	OK	pass
16		504.5	79.37676	4.997	155.2	1.162	5.723	OK	pass
17		506.1	79.31876	5.009	132.8	1.16	5.59	OK	pass
18		504.9	79.24899	4.993	131.2	1.163	5.808	OK	pass
19		503.4	79.57706	4.999	154.4	1.16	5.641	OK	pass
20		502.6	79.71724	5	132.8	1.159	5.62	OK	pass
21		505.2	79.34605	5.002	122.4	1.159	5.638	OK	pass
22		503.6	79.60912	5.003	144	1.159	5.617	OK	pass
23		503.4	79.62464	5.002	124	1.158	5.618	OK	pass
24		503.3	79.60635	5	110.4	1.162	5.68	OK	pass
25		503.6	79.62747	5.004	109.6	1.161	5.556	OK	pass
26		505.5	79.25527	4.999	157.6	1.16	5.721	OK	pass
27		505.4	79.34893	5.004	98.4	1.16	5.596	OK	pass
28		504.9	79.4076	5.003	163.2	1.159	5.677	OK	pass
29		504.5	79.44084	5.001	118.4	1.159	5.699	OK	pass
30		500.8	79.99996	5	110.4	1.159	5.6	OK	pass

THERMOTRACKER 測溫報告



日期(日/月/年)	27/02/2009
公司名稱	TRACO
產品名稱	TES 2-0511H
速度設定值	70.00 cm/Min
下載資訊	
取樣速率(分:秒):	00:01.0
日期(日/月/年):	27/02/09
時間(時:分:秒):	13:53:45
資料檔名稱	THERMOTRACKER

各熱區溫度設定值(°C)及間距 (cm)

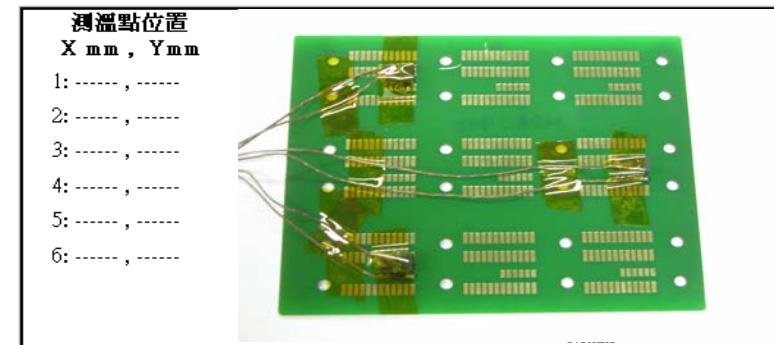
熱區	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8
TOP	40	290	270	210	210	280	300	305
BOTTOM	40	290	270	210	210	280	300	305
間距	70.0	38.2	38.2	38.2	38.2	38.2	38.2	38.2

備註

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最高溫度及時間分析

測溫點名稱	最高溫度 (°C)	位於 (秒)	高於180.0°C 的時間(秒)	高於240.0°C 的時間(秒)	高於245.0°C 的時間(秒)
Z1	236.5	298.00	140.00	0.00	0.00
Z2	232.3	302.00	159.00	0.00	0.00
Z3	239.1	296.00	172.00	0.00	0.00
Z4	244.6	288.00	157.00	21.00	0.00
Z5	241.0	297.00	148.00	8.00	0.00
Z6	234.3	303.00	168.00	0.00	0.00
Z7					
Z8					



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* The temperatures of package topside surfaces meet the definition of JEDEC J-STD-020D.

Test Report

Model Number : TES 2-0511H(date code : 0903)
Q'TY : 30 pcs

After Reflow Process

Date: 03.03.2009
Tested By: *Nicole Wang*

Sample No	Input Voltage (Vdc)	Input Current Full Load (mA)	Efficiency (%)	Output Voltage (V)	Ripple&Noise (mVp-p)	Line Regulation (%)	Load Regulation (%)	Isolation Voltage	Result
		< 547.9	> 73%	4.7 ~ 5.1	< 120	-1.5 ~1.5	-11~11		
1	5	502	79.74575	4.986	107.2	1.162	5.796	OK	pass
2		503	79.66275	4.988	115.2	1.16	5.814	OK	pass
3		505	79.37493	4.988	152	1.16	5.854	OK	pass
4		503.9	79.48623	4.985	144.8	1.161	5.898	OK	pass
5		505.4	79.2562	4.986	132.8	1.159	5.897	OK	pass
6		504.3	79.45829	4.989	97.6	1.159	5.813	OK	pass
7		504.7	79.35662	4.988	102.4	1.161	5.874	OK	pass
8		503.1	79.56934	4.985	148	1.162	5.777	OK	pass
9		505	79.35133	4.99	145.6	1.161	5.852	OK	pass
10		503.9	79.48731	4.988	164	1.16	5.874	OK	pass
11		503.7	79.53515	4.989	105.6	1.161	5.853	OK	pass
12		503.9	79.50098	4.989	114.4	1.16	5.793	OK	pass
13		505.2	79.2505	4.986	161.6	1.161	5.876	OK	pass
14		504.9	79.26171	4.984	141.6	1.163	5.919	OK	pass
15		507	78.97034	4.984	145.6	1.165	6.039	OK	pass
16		504.2	79.34502	4.981	161.6	1.162	5.963	OK	pass
17		505.9	79.30781	4.994	136	1.162	5.807	OK	pass
18		504.6	79.27834	4.98	132	1.161	5.964	OK	pass
19		503.2	79.55595	4.984	164	1.16	5.879	OK	pass
20		502.1	79.77312	4.987	136	1.16	5.775	OK	pass
21		505	79.34211	4.988	116.8	1.158	5.834	OK	pass
22		504	79.50505	4.989	148	1.16	5.853	OK	pass
23		503.3	79.52332	4.983	128	1.159	5.9	OK	pass
24		503	79.5994	4.985	116	1.162	5.898	OK	pass
25		503.6	79.58001	4.99	123.2	1.16	5.792	OK	pass
26		505.1	79.30518	4.988	161.6	1.158	5.814	OK	pass
27		505.3	79.33891	4.991	100.8	1.161	5.81	OK	pass
28		504.9	79.36641	4.99	166.4	1.16	5.892	OK	pass
29		504.8	79.36067	4.989	128.8	1.16	5.873	OK	pass
30		500.7	79.97759	4.988	116.8	1.161	5.754	OK	pass

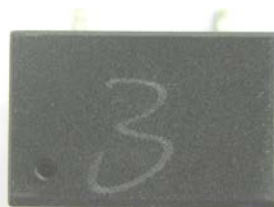
Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 13】 After Reflow



【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow

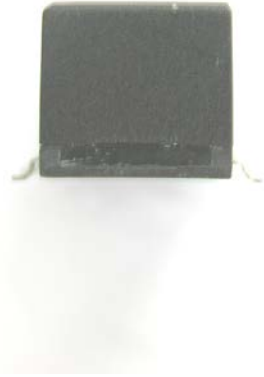


【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow

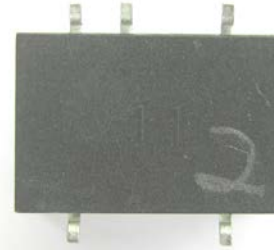


【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow

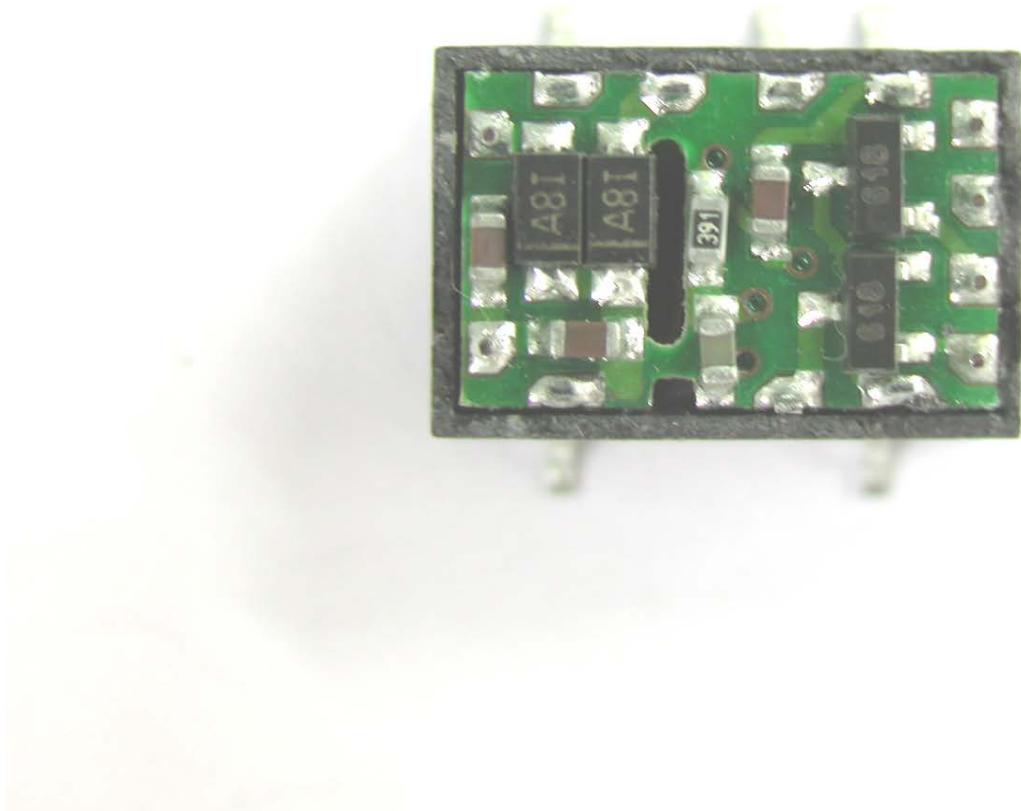


【NO : 2】 After Reflow



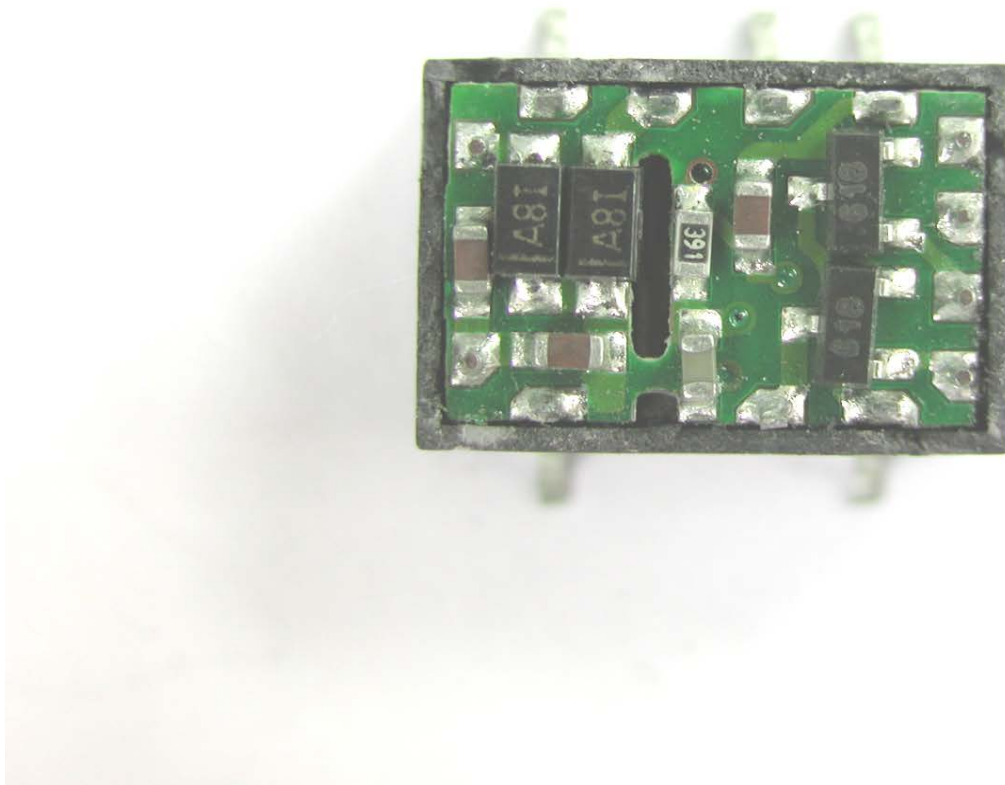
【NO : 3】 After Reflow

Visual Inspection after Reflow Process



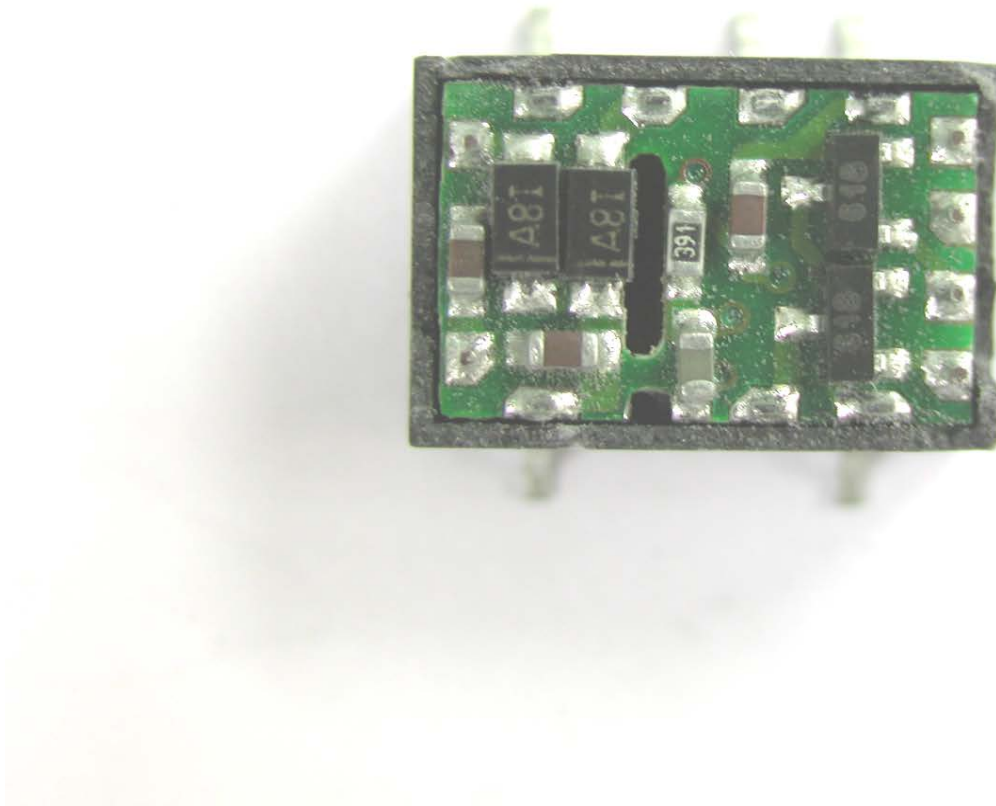
【NO : 1】 After Reflow

Visual Inspection after Reflow Process



【NO : 2】 After Reflow

Visual Inspection after Reflow Process



【NO : 3】 After Reflow

Conclusion

All tested samples have passed above test procedure without any damage and still met published specifications.

All models of the TES 2 series can be classified for MSL level 2 as defined by IPC/JEDEC J-STD-020D

TRACO ELECTRONIC AG

Date: 2009/3/6

**TRACO
POWER**

Product: **TES 2 Series**
Dual Output Models

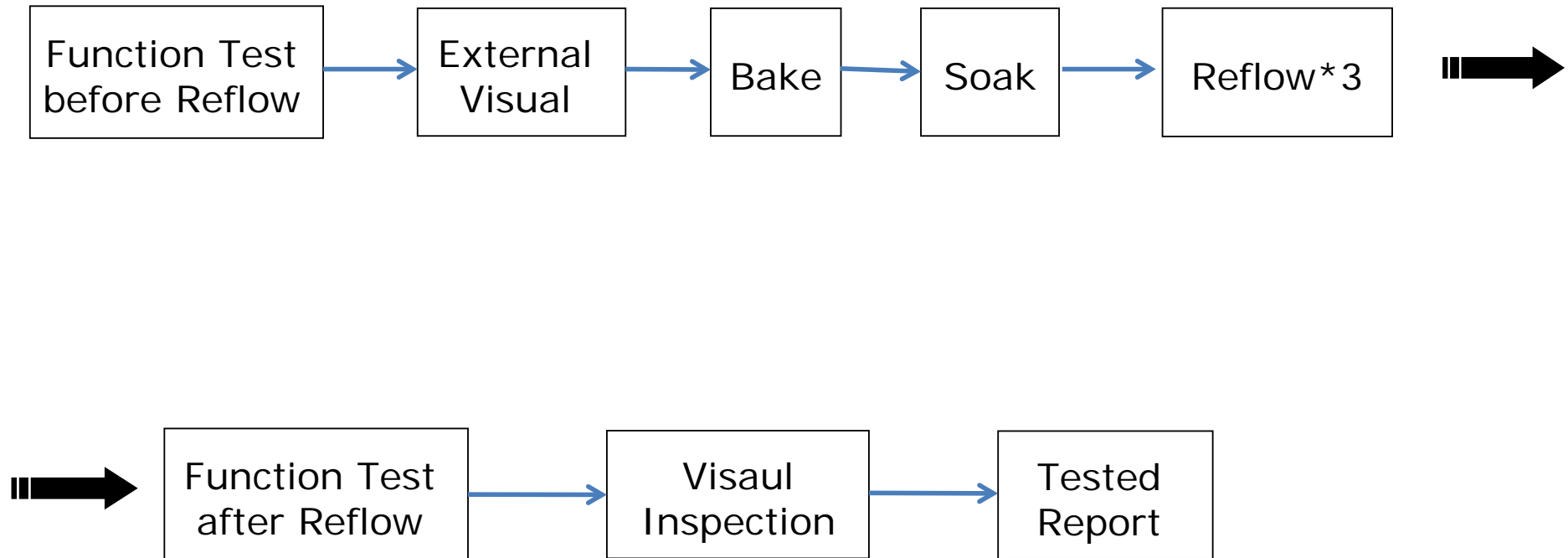
Moisture Sensitivity Level (MSL) Test Report
as per IPC/JEDEC J-STD-020D



Table of Contents

	<u>Page</u>
Tested Flowchart	<u>1</u>
Tested Data before Reflow	<u>2</u>
245°C Temperature Reflow Profile	<u>3</u>
Tested Data after Reflow	<u>4</u>
Pictures	<u>5-13</u>
Conclusion	<u>14</u>

Tested Flowchart for TES 2 Products



Test Report

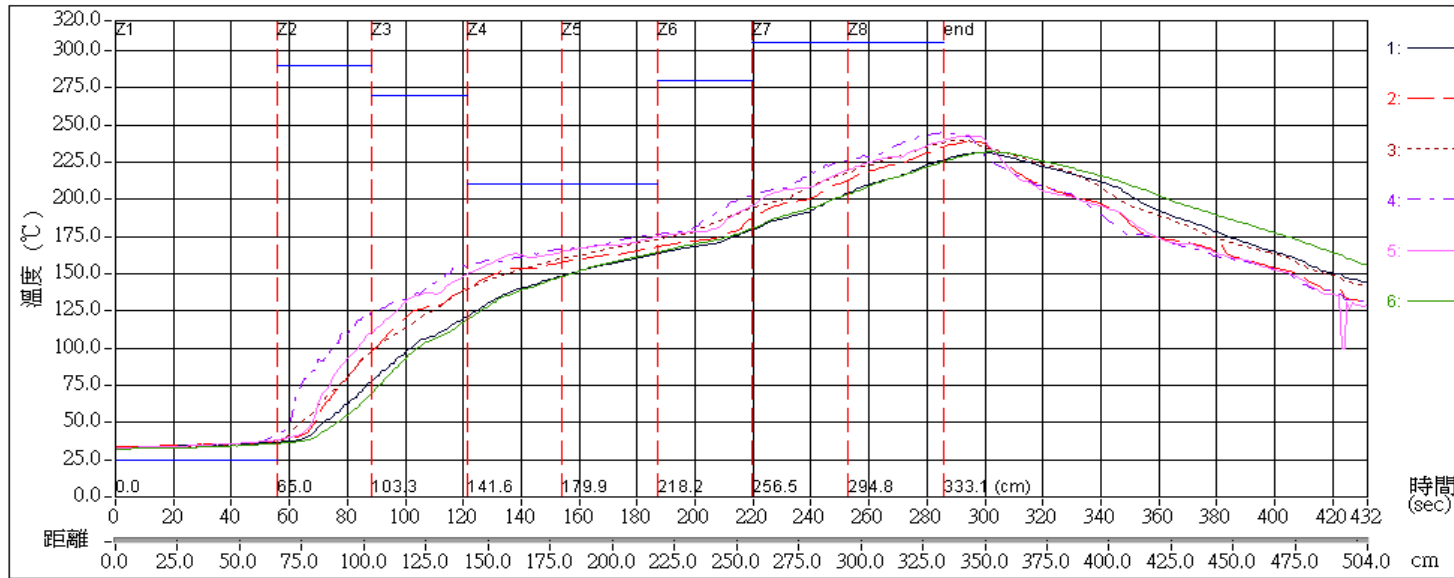
Model Number : TES 2-1222H(date code : 0903)
Q'TY : 30 pcs

Before Reflow Process

Date: 12.02.2009
Tested By: *Nicole Wang*

Sample No	Input Voltage (Vdc)	Input Current Full Load (mA)	Efficiency (%)	Output Voltage (V)		Ripple&Noise (mVp-p)		Line Regulation (%)		Load Regulation (%)		Isolation Voltage	Result
		< 212.8	> 78%	-11.64 ~ 12.36		< 120		-1.5 ~ 1.5		-5 ~ 5			
1	12	203	81.6368	-12.002	11.999	76	42	1.107	1.108	3.208	3.225	OK	pass
2		202.6	81.71993	-11.990	11.988	58	44	1.106	1.107	3.236	3.237	OK	pass
3		206	80.38811	-11.992	11.99	78	74	1.107	1.107	3.527	3.503	OK	pass
4		202.9	81.63538	-11.993	11.995	90	48	1.107	1.107	3.244	3.226	OK	pass
5		202.4	81.8597	-11.997	11.998	94	46	1.109	1.108	3.276	3.251	OK	pass
6		202.9	81.54846	-11.981	11.982	106	62	1.107	1.107	3.28	3.263	OK	pass
7		203.2	81.52416	-11.994	11.997	66	54	1.106	1.106	3.243	3.234	OK	pass
8		202.3	81.8278	-11.987	11.987	64	46	1.108	1.108	3.27	3.27	OK	pass
9		205.1	80.69769	-11.985	11.984	102	68	1.107	1.107	3.421	3.43	OK	pass
10		202.1	81.89129	-11.984	11.985	74	44	1.107	1.107	3.254	3.246	OK	pass
11		206.2	80.36077	-11.999	11.998	90	68	1.105	1.105	3.342	3.334	OK	pass
12		202.4	81.8758	-12.000	12	106	46	1.107	1.107	3.2	3.2	OK	pass
13		204.5	81.00578	-11.995	11.996	88	60	1.106	1.105	3.26	3.243	OK	pass
14		203.2	81.48039	-11.989	11.989	66	64	1.107	1.107	3.286	3.278	OK	pass
15		202.5	81.75381	-11.989	11.987	68	42	1.107	1.108	3.253	3.27	OK	pass
16		202.7	81.73337	-11.998	11.996	74	42	1.106	1.107	3.201	3.193	OK	pass
17		202.6	81.75053	-11.994	11.993	104	50	1.107	1.106	3.21	3.202	OK	pass
18		204.1	80.99159	-11.971	11.969	82	58	1.109	1.109	3.408	3.434	OK	pass
19		205.2	80.74741	-11.999	11.997	106	66	1.105	1.106	3.292	3.309	OK	pass
20		203.3	81.48013	-11.996	11.994	86	46	1.105	1.105	3.193	3.202	OK	pass
21		202.5	81.76009	-11.990	11.988	102	48	1.108	1.108	3.269	3.27	OK	pass
22		203	81.56844	-11.991	11.99	86	48	1.108	1.107	3.252	3.253	OK	pass
23		205.1	80.75352	-11.994	11.992	98	64	1.106	1.106	3.352	3.344	OK	pass
24		202.6	81.73568	-11.990	11.993	74	50	1.107	1.106	3.253	3.21	OK	pass
25		202.5	81.73935	-11.986	11.986	84	44	1.107	1.108	3.262	3.262	OK	pass
26		202.7	81.66354	-11.988	11.985	118	50	1.108	1.109	3.32	3.321	OK	pass
27		202.8	81.61537	-11.986	11.985	98	46	1.108	1.109	3.321	3.304	OK	pass
28		202.8	81.70117	-11.997	11.999	66	54	1.109	1.108	3.292	3.25	OK	pass
29		202.4	81.6881	-11.973	11.972	64	46	1.11	1.11	3.391	3.391	OK	pass
30		203.4	81.47972	-12.002	12	68	44	1.105	1.106	3.224	3.217	OK	pass

THERMOTRACKER 測溫報告



日期(日/月/年)	02/03/2009
公司名稱	TRACO
產品名稱	TES 2-1222H
速度設定值	70.00 cm/Min
下載資訊	
取樣速率(分:秒):	00:01.0
日期(日/月/年):	02/03/09
時間(時:分:秒):	14:24:38
資料檔名稱	THERMOTRACKER

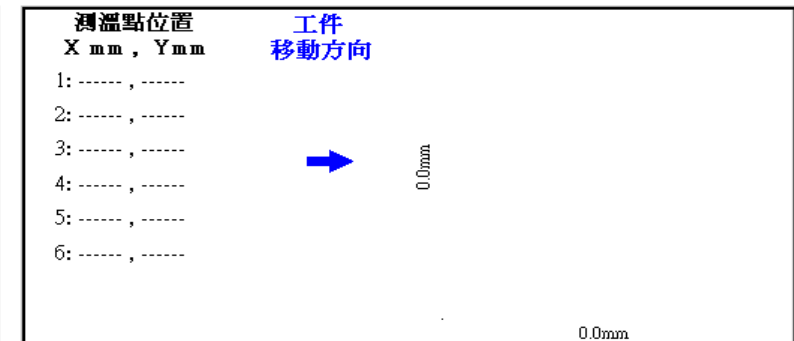
各熱區溫度設定值(°C)及間距 (cm)

熱區	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8
TOP	25	290	270	210	210	280	305	305
BOTTOM	25	290	270	210	210	280	305	305
間距	65.0	38.3	38.3	38.3	38.3	38.3	38.3	38.3

備註

最高溫度及時間分析

測溫點名稱	最高溫度 (°C)	位於 (秒)	高於180.0°C 的時間(秒)	高於240.0°C 的時間(秒)	高於245.0°C 的時間(秒)
	231.6	297.00	157.00	0.00	0.00
	238.9	295.00	137.00	0.00	0.00
	239.3	291.00	170.00	0.00	0.00
	244.8	285.00	148.00	21.00	0.00
	242.9	294.00	148.00	13.00	0.00
	231.9	302.00	176.00	0.00	0.00



* The temperatures of package topside surfaces meet the definition of JEDEC J-STD-020D.

Test Report

Model Number : TES 2-1222H(date code : 0903)
Q'TY : 30 pcs

After Reflow Process

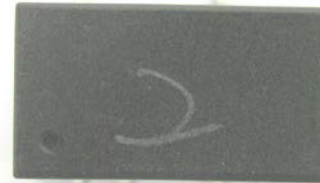
Date: 03.03.2009
Tested By: *Nicole Wang*

Sample No	Input Voltage (Vdc)	Input Current Full Load (mA)	Efficiency (%)	Output Voltage (V)		Ripple&Noise (mVp-p)		Line Regulation (%)		Load Regulation (%)		Isolation Voltage	Result
		< 212.8	> 78%	-11.64 ~ 12.36		< 120		-1.5 ~ 1.5		-5 ~ 5			
1	5	204.3	81.22126	-12.012	12	82	46	1.107	1.107	3.288	3.284	OK	pass
2		202.1	81.88148	-11.974	11.98	64	50	1.107	1.106	3.249	3.23	OK	pass
3		205.2	80.7174	-11.987	11.99	82	76	1.107	1.106	3.495	3.503	OK	pass
4		202.5	81.75728	-11.981	11.99	100	44	1.107	1.106	3.247	3.245	OK	pass
5		202	81.97607	-11.985	11.99	88	48	1.108	1.109	3.296	3.295	OK	pass
6		202.6	81.66724	-11.975	11.98	118	62	1.107	1.107	3.265	3.255	OK	pass
7		202.8	81.65836	-11.985	11.99	64	52	1.107	1.105	3.254	3.244	OK	pass
8		201.9	81.99582	-11.983	11.99	70	52	1.107	1.107	3.246	3.262	OK	pass
9		204.7	80.88475	-11.984	11.99	100	70	1.106	1.106	3.405	3.42	OK	pass
10		202	81.92719	-11.978	11.98	82	46	1.107	1.106	3.231	3.238	OK	pass
11		205.6	80.56112	-11.989	11.99	106	70	1.105	1.104	3.378	3.402	OK	pass
12		202.2	81.93298	-11.991	12	102	50	1.107	1.107	3.219	3.209	OK	pass
13		203.9	81.21918	-11.986	11.99	80	64	1.106	1.106	3.262	3.252	OK	pass
14		202.9	81.59334	-11.983	11.99	76	60	1.107	1.107	3.288	3.262	OK	pass
15		202.1	81.88187	-11.978	11.98	66	48	1.108	1.109	3.281	3.296	OK	pass
16		202.7	81.70192	-11.988	11.99	74	46	1.107	1.106	3.212	3.219	OK	pass
17		202.3	81.83827	-11.984	11.99	108	50	1.107	1.106	3.213	3.212	OK	pass
18		203.6	81.31017	-11.984	11.99	86	60	1.107	1.107	3.304	3.337	OK	pass
19		204.7	80.91843	-11.989	11.99	106	66	1.106	1.106	3.336	3.318	OK	pass
20		203.1	81.5319	-11.987	11.99	90	44	1.106	1.106	3.203	3.228	OK	pass
21		202.1	81.89336	-11.981	11.98	102	50	1.108	1.108	3.272	3.271	OK	pass
22		202.6	81.70993	-11.984	11.99	86	56	1.108	1.108	3.246	3.262	OK	pass
23		204.7	80.88294	-11.985	11.99	96	70	1.106	1.106	3.379	3.362	OK	pass
24		202.3	81.85131	-11.984	11.99	82	56	1.107	1.107	3.229	3.21	OK	pass
25		202.4	81.79478	-11.985	11.99	84	46	1.107	1.107	3.221	3.245	OK	pass
26		202.3	81.80688	-11.981	11.98	116	54	1.108	1.108	3.289	3.321	OK	pass
27		202.8	81.58672	-11.977	11.98	104	48	1.108	1.108	3.348	3.305	OK	pass
28		202.8	81.68854	-11.991	12	72	54	1.109	1.108	3.261	3.259	OK	pass
29		201.9	81.99693	-11.984	11.99	68	48	1.107	1.108	3.288	3.262	OK	pass
30		203.1	81.57719	-11.993	12	72	50	1.106	1.106	3.235	3.226	OK	pass

Visual Inspection after Reflow Process



【NO : 1 】 After Reflow



【NO : 2 】 After Reflow



【NO : 3 】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1 】 After Reflow



【NO : 2 】 After Reflow



【NO : 3 】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow



【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1】 After Reflow



【NO : 2】 After Reflow

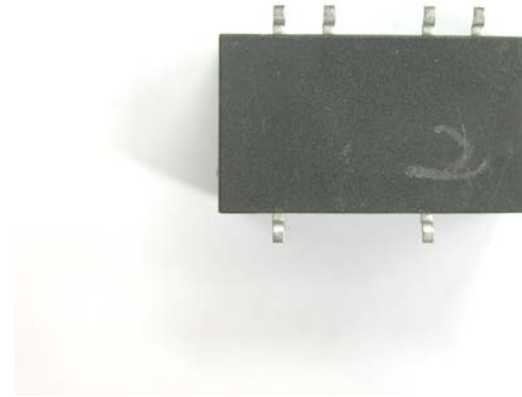


【NO : 3】 After Reflow

Visual Inspection after Reflow Process



【NO : 1 】 After Reflow

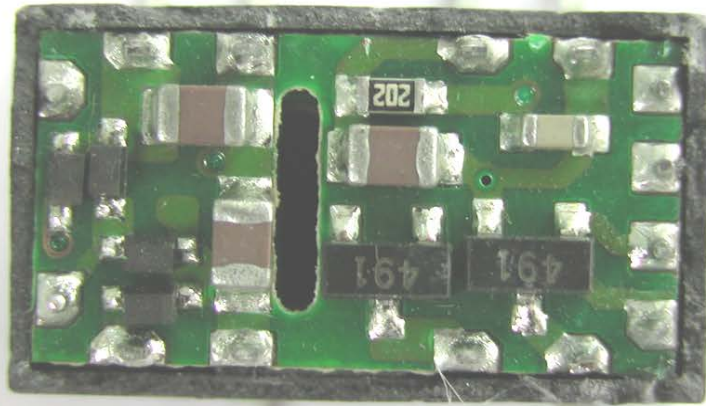


【NO : 2 】 After Reflow



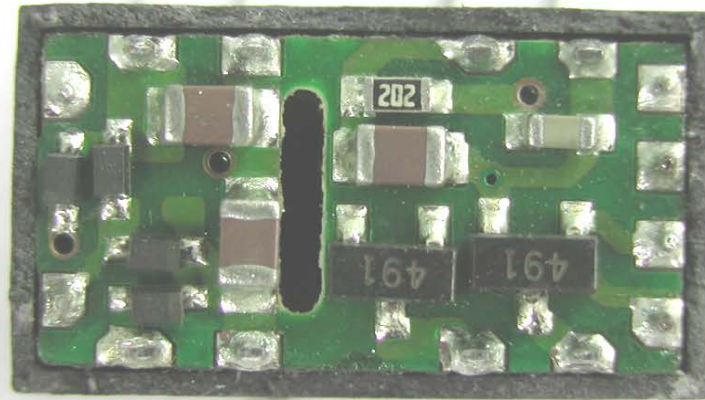
【NO : 3 】 After Reflow

Visual Inspection after Reflow Process



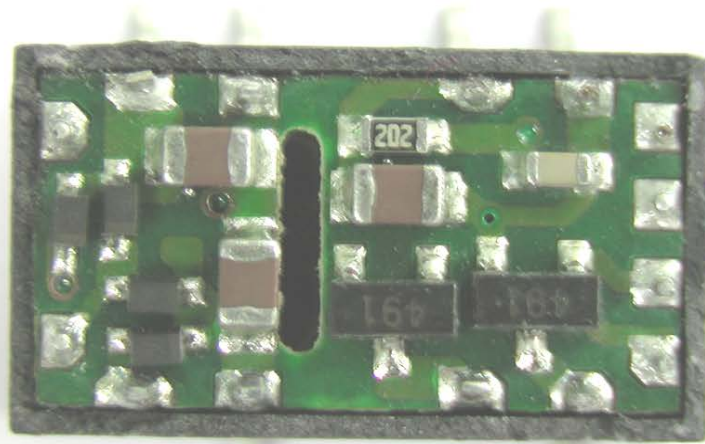
【NO : 1】 After Reflow

Visual Inspection after Reflow Process



【NO : 2 】 After Reflow

Visual Inspection after Reflow Process



【NO : 3 】 After Reflow

Conclusion

All tested samples have passed above test procedure without any damage and still met published specifications.

All models of the TES 2 series can be classified for MSL level 2 as defined by IPC/JEDEC J-STD-020D

TRACO ELECTRONIC AG

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