LATCH UP TEST REPORT

Company : 南京凌鸥创芯电子有限公司

Address : 江苏省南京市栖霞区兴智路 6 号兴智科技园 C 栋 1310 室

Model Name : LKS32MC451VCT8

Date Received : June 25, 2021

Date Tested : June 25, 2021

TESTING LABORATORY IS APPROVEDED BY:

IECQ Certificate of Approval No.: IECQ-L DEKRA 17.0004-01 For Independent Test Laboratory According to ISO/IEC 17025

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

	Name	Signature	Date
Testing Engineer	Peter Pan	Peter Pan	2021/6/25
Approving Manager	Peng_Zhao	Peng_Zhao	2021/6/25

Note：

1. This report will be invalid if reproduced in whole or in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid if used separately.
3. This report is ONLY valid with the examination seal and signature of this institute.
4. The tested specimen(s) will only be preserved for thirty days from the date issued, if not collected by the applicant.
5. The failure criteria of all ESD tests should be based on the result of parametric and functional testing conducted by the customer, which follows the statement of international standards. Thus, the judgment of the curve traces provided in this report is for reference ONLY.

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1. GENERAL INFORMATION

1.1 DESCRIPTION OF UNIT

MANUFACTURER	: 南京凌鸥创芯电子有限公司
DEVICE NAME	: LKS32MC451VCT8
PACKAGED / PIN COUNT	: QFP100
REFERENCE DOCUMENT	: JEDEC STANDARD NO.78E NOVEMBER 2016
TRIGGER CURRENT	: 100mA(±), 200mA(±)
V SUPPLY OVER VOLTAGE TEST	: 3.5V~5.5V,Step:0.5V(+);
PULSE DURATION	: 10 ms
TEST TEMPERATURE	: ROOM TEMPERATURE
SAMPLE QUANTITY	: 6 pcs
FAILURE CRITERIA	: If absolute Inom is < 25 mA, then absolute Inom + 10mA is used; Or If absolute Inom is > 25 mA, then > 1.4X absolute Inom is used;

2. LATCH UP TEST

2.1 TEST EQUIPMENT

Test Equipment	Equipment S/N	Calibration Date:	Recommended Due Date:
KEYTEK ZAPMASTER MK2 768	0602221	July 7, 2020	July 6, 2021

2.2 LABORATORY AMBIENCE CONDITION

Temperature：25°C$^{+3°C}_{-5°C}$

Relative humidity：55%±10% (RH)

2.3 REFERENCE DOCUMENT

The test is based on JEDEC STANDARD NO.78E NOVEMBER 2016

2.4 TEST CONDITION

Trigger

Over Voltage Test

2.5 SUMMARY OF TEST

Trigger Mode	Test Pin	Sample Quantity	Tested Result	V or I Limits	I Trigger : Class Ⅰ A
Trigger(+)	I/O3.3V	3	PASS +200mA	+5.445V	Temperature Classification: CLASS Ⅰ Temperature For Latch-up test at room temperature Class ⅠA: Positive I-Test: ≧100mA Negative I-Test: ≧100mA Overvoltage Test: 1.5xVDD or MSV, whichever is less Class ⅠB: If immunity level A cannot be achieved CLASS Ⅱ For Latch-up test at maximum-rate ambient temperature Class ⅡA: Positive I-Test: ≧100mA Negative I-Test: ≧100mA Overvoltage Test: 1.5 x VDD or MSV, whichever is less Class ⅡB: If immunity level A cannot be achieved
Trigger(-)	I/O3.3V		PASS -200mA	-1.815V	
Over Volt Test V_{supply}	VCC3.3V	3	PASS +5.5V	+600mA	

Groups	Pins
GND	12,31,44,62,73,94,95
VCC3.3V	14,71,92,93
IO3.3V	1-4,6-11,13,15-28,30,32-41,43,45-59,61,63-70,74-91,96-100
NC	5,29,42,60,72

2.6 CONTENTS OF TEST

Trigger(Positive)			
Tested Pin	Sample No. & Failed Current		
	#19	#20	#21
1	PASS +200mA	PASS +200mA	PASS +200mA
2	PASS +200mA	PASS +200mA	PASS +200mA
3	PASS +200mA	PASS +200mA	PASS +200mA
4	PASS +200mA	PASS +200mA	PASS +200mA
6	PASS +200mA	PASS +200mA	PASS +200mA
7	PASS +200mA	PASS +200mA	PASS +200mA
8	PASS +200mA	PASS +200mA	PASS +200mA
9	PASS +200mA	PASS +200mA	PASS +200mA
10	PASS +200mA	PASS +200mA	PASS +200mA
11	PASS +200mA	PASS +200mA	PASS +200mA
13	PASS +200mA	PASS +200mA	PASS +200mA
15	PASS +200mA	PASS +200mA	PASS +200mA
16	PASS +200mA	PASS +200mA	PASS +200mA
17	PASS +200mA	PASS +200mA	PASS +200mA
18	PASS +200mA	PASS +200mA	PASS +200mA
19	PASS +200mA	PASS +200mA	PASS +200mA
20	PASS +200mA	PASS +200mA	PASS +200mA
21	PASS +200mA	PASS +200mA	PASS +200mA
22	PASS +200mA	PASS +200mA	PASS +200mA
23	PASS +200mA	PASS +200mA	PASS +200mA
24	PASS +200mA	PASS +200mA	PASS +200mA
25	PASS +200mA	PASS +200mA	PASS +200mA
26	PASS +200mA	PASS +200mA	PASS +200mA
27	PASS +200mA	PASS +200mA	PASS +200mA
28	PASS +200mA	PASS +200mA	PASS +200mA
30	PASS +200mA	PASS +200mA	PASS +200mA
32	PASS +200mA	PASS +200mA	PASS +200mA
33	PASS +200mA	PASS +200mA	PASS +200mA
34	PASS +200mA	PASS +200mA	PASS +200mA
35	PASS +200mA	PASS +200mA	PASS +200mA
36	PASS +200mA	PASS +200mA	PASS +200mA
37	PASS +200mA	PASS +200mA	PASS +200mA
38	PASS +200mA	PASS +200mA	PASS +200mA
39	PASS +200mA	PASS +200mA	PASS +200mA
40	PASS +200mA	PASS +200mA	PASS +200mA
41	PASS +200mA	PASS +200mA	PASS +200mA
43	PASS +200mA	PASS +200mA	PASS +200mA
45	PASS +200mA	PASS +200mA	PASS +200mA
46	PASS +200mA	PASS +200mA	PASS +200mA
47	PASS +200mA	PASS +200mA	PASS +200mA

48	PASS +200mA	PASS +200mA	PASS +200mA
49	PASS +200mA	PASS +200mA	PASS +200mA
50	PASS +200mA	PASS +200mA	PASS +200mA
51	PASS +200mA	PASS +200mA	PASS +200mA
52	PASS +200mA	PASS +200mA	PASS +200mA
53	PASS +200mA	PASS +200mA	PASS +200mA
54	PASS +200mA	PASS +200mA	PASS +200mA
55	PASS +200mA	PASS +200mA	PASS +200mA
56	PASS +200mA	PASS +200mA	PASS +200mA
57	PASS +200mA	PASS +200mA	PASS +200mA
58	PASS +200mA	PASS +200mA	PASS +200mA
59	PASS +200mA	PASS +200mA	PASS +200mA
61	PASS +200mA	PASS +200mA	PASS +200mA
63	PASS +200mA	PASS +200mA	PASS +200mA
64	PASS +200mA	PASS +200mA	PASS +200mA
65	PASS +200mA	PASS +200mA	PASS +200mA
66	PASS +200mA	PASS +200mA	PASS +200mA
67	PASS +200mA	PASS +200mA	PASS +200mA
68	PASS +200mA	PASS +200mA	PASS +200mA
69	PASS +200mA	PASS +200mA	PASS +200mA
70	PASS +200mA	PASS +200mA	PASS +200mA
74	PASS +200mA	PASS +200mA	PASS +200mA
75	PASS +200mA	PASS +200mA	PASS +200mA
76	PASS +200mA	PASS +200mA	PASS +200mA
77	PASS +200mA	PASS +200mA	PASS +200mA
78	PASS +200mA	PASS +200mA	PASS +200mA
79	PASS +200mA	PASS +200mA	PASS +200mA
80	PASS +200mA	PASS +200mA	PASS +200mA
81	PASS +200mA	PASS +200mA	PASS +200mA
82	PASS +200mA	PASS +200mA	PASS +200mA
83	PASS +200mA	PASS +200mA	PASS +200mA
84	PASS +200mA	PASS +200mA	PASS +200mA
85	PASS +200mA	PASS +200mA	PASS +200mA
86	PASS +200mA	PASS +200mA	PASS +200mA
87	PASS +200mA	PASS +200mA	PASS +200mA
88	PASS +200mA	PASS +200mA	PASS +200mA
89	PASS +200mA	PASS +200mA	PASS +200mA
90	PASS +200mA	PASS +200mA	PASS +200mA
91	PASS +200mA	PASS +200mA	PASS +200mA
96	PASS +200mA	PASS +200mA	PASS +200mA
97	PASS +200mA	PASS +200mA	PASS +200mA
98	PASS +200mA	PASS +200mA	PASS +200mA
99	PASS +200mA	PASS +200mA	PASS +200mA
100	PASS +200mA	PASS +200mA	PASS +200mA

Trigger(Negative)			
Tested Pin	Sample No. & Failed Current		
	#19	#20	#21
1	PASS -200mA	PASS -200mA	PASS -200mA
2	PASS -200mA	PASS -200mA	PASS -200mA
3	PASS -200mA	PASS -200mA	PASS -200mA
4	PASS -200mA	PASS -200mA	PASS -200mA
6	PASS -200mA	PASS -200mA	PASS -200mA
7	PASS -200mA	PASS -200mA	PASS -200mA
8	PASS -200mA	PASS -200mA	PASS -200mA
9	PASS -200mA	PASS -200mA	PASS -200mA
10	PASS -200mA	PASS -200mA	PASS -200mA
11	PASS -200mA	PASS -200mA	PASS -200mA
13	PASS -200mA	PASS -200mA	PASS -200mA
15	PASS -200mA	PASS -200mA	PASS -200mA
16	PASS -200mA	PASS -200mA	PASS -200mA
17	PASS -200mA	PASS -200mA	PASS -200mA
18	PASS -200mA	PASS -200mA	PASS -200mA
19	PASS -200mA	PASS -200mA	PASS -200mA
20	PASS -200mA	PASS -200mA	PASS -200mA
21	PASS -200mA	PASS -200mA	PASS -200mA
22	PASS -200mA	PASS -200mA	PASS -200mA
23	PASS -200mA	PASS -200mA	PASS -200mA
24	PASS -200mA	PASS -200mA	PASS -200mA
25	PASS -200mA	PASS -200mA	PASS -200mA
26	PASS -200mA	PASS -200mA	PASS -200mA
27	PASS -200mA	PASS -200mA	PASS -200mA
28	PASS -200mA	PASS -200mA	PASS -200mA
30	PASS -200mA	PASS -200mA	PASS -200mA
32	PASS -200mA	PASS -200mA	PASS -200mA
33	PASS -200mA	PASS -200mA	PASS -200mA
34	PASS -200mA	PASS -200mA	PASS -200mA
35	PASS -200mA	PASS -200mA	PASS -200mA
36	PASS -200mA	PASS -200mA	PASS -200mA
37	PASS -200mA	PASS -200mA	PASS -200mA
38	PASS -200mA	PASS -200mA	PASS -200mA
39	PASS -200mA	PASS -200mA	PASS -200mA
40	PASS -200mA	PASS -200mA	PASS -200mA
41	PASS -200mA	PASS -200mA	PASS -200mA
43	PASS -200mA	PASS -200mA	PASS -200mA
45	PASS -200mA	PASS -200mA	PASS -200mA
46	PASS -200mA	PASS -200mA	PASS -200mA
47	PASS -200mA	PASS -200mA	PASS -200mA
48	PASS -200mA	PASS -200mA	PASS -200mA
49	PASS -200mA	PASS -200mA	PASS -200mA

50	PASS -200mA	PASS -200mA	PASS -200mA
51	PASS -200mA	PASS -200mA	PASS -200mA
52	PASS -200mA	PASS -200mA	PASS -200mA
53	PASS -200mA	PASS -200mA	PASS -200mA
54	PASS -200mA	PASS -200mA	PASS -200mA
55	PASS -200mA	PASS -200mA	PASS -200mA
56	PASS -200mA	PASS -200mA	PASS -200mA
57	PASS -200mA	PASS -200mA	PASS -200mA
58	PASS -200mA	PASS -200mA	PASS -200mA
59	PASS -200mA	PASS -200mA	PASS -200mA
61	PASS -200mA	PASS -200mA	PASS -200mA
63	PASS -200mA	PASS -200mA	PASS -200mA
64	PASS -200mA	PASS -200mA	PASS -200mA
65	PASS -200mA	PASS -200mA	PASS -200mA
66	PASS -200mA	PASS -200mA	PASS -200mA
67	PASS -200mA	PASS -200mA	PASS -200mA
68	PASS -200mA	PASS -200mA	PASS -200mA
69	PASS -200mA	PASS -200mA	PASS -200mA
70	PASS -200mA	PASS -200mA	PASS -200mA
74	PASS -200mA	PASS -200mA	PASS -200mA
75	PASS -200mA	PASS -200mA	PASS -200mA
76	PASS -200mA	PASS -200mA	PASS -200mA
77	PASS -200mA	PASS -200mA	PASS -200mA
78	PASS -200mA	PASS -200mA	PASS -200mA
79	PASS -200mA	PASS -200mA	PASS -200mA
80	PASS -200mA	PASS -200mA	PASS -200mA
81	PASS -200mA	PASS -200mA	PASS -200mA
82	PASS -200mA	PASS -200mA	PASS -200mA
83	PASS -200mA	PASS -200mA	PASS -200mA
84	PASS -200mA	PASS -200mA	PASS -200mA
85	PASS -200mA	PASS -200mA	PASS -200mA
86	PASS -200mA	PASS -200mA	PASS -200mA
87	PASS -200mA	PASS -200mA	PASS -200mA
88	PASS -200mA	PASS -200mA	PASS -200mA
89	PASS -200mA	PASS -200mA	PASS -200mA
90	PASS -200mA	PASS -200mA	PASS -200mA
91	PASS -200mA	PASS -200mA	PASS -200mA
96	PASS -200mA	PASS -200mA	PASS -200mA
97	PASS -200mA	PASS -200mA	PASS -200mA
98	PASS -200mA	PASS -200mA	PASS -200mA
99	PASS -200mA	PASS -200mA	PASS -200mA
100	PASS -200mA	PASS -200mA	PASS -200mA

Over Volt Test V_{supply}			
Tested Pin	Sample No. & Failed Volt		
	#22	#23	#24
14	PASS	PASS	PASS
71	PASS	PASS	PASS
92	PASS	PASS	PASS
93	PASS	PASS	PASS