

LATCH UP TEST REPORT

Company : 湖南进芯电子科技有限公司Model Name : AVP32F335QP176SDate Received : JUL 26, 2022Date Issued : JUL 27, 2022**TESTING LABORATORY IS ACCREDITED BY:**

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

WE HEREBY CERTIFY THAT:

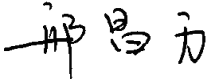
The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

NOTE :

1. This report will be invalid if reproduced in part or altered in any way.
2. This report refers only to the specimen(s) submitted to test, and is invalid if used otherwise.
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.

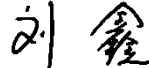
Approver : Changwan Xing

Date : 2022,07,27

Signature: 

Engineer : Xin Liu

Date : 2022,07,27

Signature: 

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1. Information

1.1 Case information

Company	湖南进芯电子科技有限公司
Module Name	AVP32F335QP176S
Packaged/Pin Count	QFP-176
E-mail	fansong@advancechip.com
Quantity	9
Requirement	LATCH-UP

1.2 Test condition

Test Model : LATCH-UP	
Reference Document : JEDEC EIA/JESD78C	
FAILURE CRITERIA : < 25mA 10mA + I normal or > 25mA 1.4 x I normal	
Test condition	
POSITIVE I	100mA~300mA(+), Step:100mA(+)
NEGATIVE I	100mA~300mA(-), Step:100mA(-)
V Supply Over Voltage Test	2.5V(+) 4.6V(+)

1.3 Environment

Temperature : 25±5°C

Relative humidity : 55%±10% (RH)

1.4 Equipment

Test Equipment	Equipment S/N	Calibration Date:
KEYTEK ZAPMASTER 7/4	ESD#02	Jul 13,2022

2. Analysis Result

2.1 Summary

Trigger Mode	Test Pin	Sample Quantity	Tested Result	I Trigger : Class I
I Trigger (+)	I/P3.6V	3	PASS+300mA	Class I Latch-up testing performed at room temperature. Class II Latch-up testing performed at maximum rated temperature.
	I/O3.6V			
	O/P3.6V			
I Trigger (-)	I/P3.6V	3	PASS-300mA	
	I/O3.6V			
	O/P3.6V			
Over Volt Test Vsupply	VCC1.8V	3	PASS+2.5V	
	VCC3.3V		PASS+4.6V	

I/O3.6V:1,2,5-7,10-13,16-21,24-28,62-69,72-75,8
 5,86,88-91,94-100,110-116,119,122-124,127-137, 2,103,106,108,118,120,125,140,144,147,155,16
 141,142,145,148,150-153,156-158,161-165,168,1
 69,172-176
 I/P3.6V:35-42,46-54,76,78,79,87,104,105
 O/P3.6V:77,102,138,149
 NC:55-57,81

VSS:3,8,14,22,30,32,33,43,44,58,60,70,82,83,9
 0,166,171
 VCC1.8V:4,15,23,29,31,59,61,101,109,117,126,
 139,146,154,167
 VCC3.3V:9,34,45,71,84,93,107,121,143,159,17
 0
 POWER:4,9,15,23,29,31,34,45,59,61,71,84,93,
 101,107,109,117,121,126,139,143,146,154,159,
 167,170

2.2 Contents Of Test

POSITIVE I			
Tested Pin	Sample No. & Failed Volt (mA)		
	#1	#2	#3
1	PASS+300mA	PASS+300mA	PASS+300mA
2	PASS+300mA	PASS+300mA	PASS+300mA
5	PASS+300mA	PASS+300mA	PASS+300mA
6	PASS+300mA	PASS+300mA	PASS+300mA
7	PASS+300mA	PASS+300mA	PASS+300mA
10	PASS+300mA	PASS+300mA	PASS+300mA
11	PASS+300mA	PASS+300mA	PASS+300mA
12	PASS+300mA	PASS+300mA	PASS+300mA
13	PASS+300mA	PASS+300mA	PASS+300mA
16	PASS+300mA	PASS+300mA	PASS+300mA
17	PASS+300mA	PASS+300mA	PASS+300mA
18	PASS+300mA	PASS+300mA	PASS+300mA
19	PASS+300mA	PASS+300mA	PASS+300mA
20	PASS+300mA	PASS+300mA	PASS+300mA
21	PASS+300mA	PASS+300mA	PASS+300mA
24	PASS+300mA	PASS+300mA	PASS+300mA
25	PASS+300mA	PASS+300mA	PASS+300mA
26	PASS+300mA	PASS+300mA	PASS+300mA
27	PASS+300mA	PASS+300mA	PASS+300mA
28	PASS+300mA	PASS+300mA	PASS+300mA
35	PASS+300mA	PASS+300mA	PASS+300mA
36	PASS+300mA	PASS+300mA	PASS+300mA
37	PASS+300mA	PASS+300mA	PASS+300mA
38	PASS+300mA	PASS+300mA	PASS+300mA
39	PASS+300mA	PASS+300mA	PASS+300mA
40	PASS+300mA	PASS+300mA	PASS+300mA
41	PASS+300mA	PASS+300mA	PASS+300mA
42	PASS+300mA	PASS+300mA	PASS+300mA
46	PASS+300mA	PASS+300mA	PASS+300mA
47	PASS+300mA	PASS+300mA	PASS+300mA
48	PASS+300mA	PASS+300mA	PASS+300mA
49	PASS+300mA	PASS+300mA	PASS+300mA
50	PASS+300mA	PASS+300mA	PASS+300mA
51	PASS+300mA	PASS+300mA	PASS+300mA
52	PASS+300mA	PASS+300mA	PASS+300mA
53	PASS+300mA	PASS+300mA	PASS+300mA
54	PASS+300mA	PASS+300mA	PASS+300mA
62	PASS+300mA	PASS+300mA	PASS+300mA
63	PASS+300mA	PASS+300mA	PASS+300mA
64	PASS+300mA	PASS+300mA	PASS+300mA
65	PASS+300mA	PASS+300mA	PASS+300mA
66	PASS+300mA	PASS+300mA	PASS+300mA

67	PASS+300mA	PASS+300mA	PASS+300mA
68	PASS+300mA	PASS+300mA	PASS+300mA
69	PASS+300mA	PASS+300mA	PASS+300mA
72	PASS+300mA	PASS+300mA	PASS+300mA
73	PASS+300mA	PASS+300mA	PASS+300mA
74	PASS+300mA	PASS+300mA	PASS+300mA
75	PASS+300mA	PASS+300mA	PASS+300mA
76	PASS+300mA	PASS+300mA	PASS+300mA
77	PASS+300mA	PASS+300mA	PASS+300mA
78	PASS+300mA	PASS+300mA	PASS+300mA
79	PASS+300mA	PASS+300mA	PASS+300mA
85	PASS+300mA	PASS+300mA	PASS+300mA
86	PASS+300mA	PASS+300mA	PASS+300mA
87	PASS+300mA	PASS+300mA	PASS+300mA
88	PASS+300mA	PASS+300mA	PASS+300mA
89	PASS+300mA	PASS+300mA	PASS+300mA
90	PASS+300mA	PASS+300mA	PASS+300mA
91	PASS+300mA	PASS+300mA	PASS+300mA
94	PASS+300mA	PASS+300mA	PASS+300mA
95	PASS+300mA	PASS+300mA	PASS+300mA
96	PASS+300mA	PASS+300mA	PASS+300mA
97	PASS+300mA	PASS+300mA	PASS+300mA
98	PASS+300mA	PASS+300mA	PASS+300mA
99	PASS+300mA	PASS+300mA	PASS+300mA
100	PASS+300mA	PASS+300mA	PASS+300mA
102	PASS+300mA	PASS+300mA	PASS+300mA
104	PASS+300mA	PASS+300mA	PASS+300mA
105	PASS+300mA	PASS+300mA	PASS+300mA
110	PASS+300mA	PASS+300mA	PASS+300mA
111	PASS+300mA	PASS+300mA	PASS+300mA
112	PASS+300mA	PASS+300mA	PASS+300mA
113	PASS+300mA	PASS+300mA	PASS+300mA
114	PASS+300mA	PASS+300mA	PASS+300mA
115	PASS+300mA	PASS+300mA	PASS+300mA
116	PASS+300mA	PASS+300mA	PASS+300mA
119	PASS+300mA	PASS+300mA	PASS+300mA
122	PASS+300mA	PASS+300mA	PASS+300mA
123	PASS+300mA	PASS+300mA	PASS+300mA
124	PASS+300mA	PASS+300mA	PASS+300mA
127	PASS+300mA	PASS+300mA	PASS+300mA
128	PASS+300mA	PASS+300mA	PASS+300mA
129	PASS+300mA	PASS+300mA	PASS+300mA
130	PASS+300mA	PASS+300mA	PASS+300mA
131	PASS+300mA	PASS+300mA	PASS+300mA
132	PASS+300mA	PASS+300mA	PASS+300mA
133	PASS+300mA	PASS+300mA	PASS+300mA

134	PASS+300mA	PASS+300mA	PASS+300mA
135	PASS+300mA	PASS+300mA	PASS+300mA
136	PASS+300mA	PASS+300mA	PASS+300mA
137	PASS+300mA	PASS+300mA	PASS+300mA
138	PASS+300mA	PASS+300mA	PASS+300mA
141	PASS+300mA	PASS+300mA	PASS+300mA
142	PASS+300mA	PASS+300mA	PASS+300mA
145	PASS+300mA	PASS+300mA	PASS+300mA
148	PASS+300mA	PASS+300mA	PASS+300mA
149	PASS+300mA	PASS+300mA	PASS+300mA
150	PASS+300mA	PASS+300mA	PASS+300mA
151	PASS+300mA	PASS+300mA	PASS+300mA
152	PASS+300mA	PASS+300mA	PASS+300mA
153	PASS+300mA	PASS+300mA	PASS+300mA
156	PASS+300mA	PASS+300mA	PASS+300mA
157	PASS+300mA	PASS+300mA	PASS+300mA
158	PASS+300mA	PASS+300mA	PASS+300mA
161	PASS+300mA	PASS+300mA	PASS+300mA
162	PASS+300mA	PASS+300mA	PASS+300mA
163	PASS+300mA	PASS+300mA	PASS+300mA
164	PASS+300mA	PASS+300mA	PASS+300mA
165	PASS+300mA	PASS+300mA	PASS+300mA
168	PASS+300mA	PASS+300mA	PASS+300mA
169	PASS+300mA	PASS+300mA	PASS+300mA
172	PASS+300mA	PASS+300mA	PASS+300mA
173	PASS+300mA	PASS+300mA	PASS+300mA
174	PASS+300mA	PASS+300mA	PASS+300mA
175	PASS+300mA	PASS+300mA	PASS+300mA
176	PASS+300mA	PASS+300mA	PASS+300mA

NEGATIVE I			
Tested Pin	Sample No. & Failed Volt (mA)		
	#4	#5	#6
1	PASS-300mA	PASS-300mA	PASS-300mA
2	PASS-300mA	PASS-300mA	PASS-300mA
5	PASS-300mA	PASS-300mA	PASS-300mA
6	PASS-300mA	PASS-300mA	PASS-300mA
7	PASS-300mA	PASS-300mA	PASS-300mA
10	PASS-300mA	PASS-300mA	PASS-300mA
11	PASS-300mA	PASS-300mA	PASS-300mA
12	PASS-300mA	PASS-300mA	PASS-300mA
13	PASS-300mA	PASS-300mA	PASS-300mA
16	PASS-300mA	PASS-300mA	PASS-300mA
17	PASS-300mA	PASS-300mA	PASS-300mA
18	PASS-300mA	PASS-300mA	PASS-300mA
19	PASS-300mA	PASS-300mA	PASS-300mA

20	PASS-300mA	PASS-300mA	PASS-300mA
21	PASS-300mA	PASS-300mA	PASS-300mA
24	PASS-300mA	PASS-300mA	PASS-300mA
25	PASS-300mA	PASS-300mA	PASS-300mA
26	PASS-300mA	PASS-300mA	PASS-300mA
27	PASS-300mA	PASS-300mA	PASS-300mA
28	PASS-300mA	PASS-300mA	PASS-300mA
35	PASS-300mA	PASS-300mA	PASS-300mA
36	PASS-300mA	PASS-300mA	PASS-300mA
37	PASS-300mA	PASS-300mA	PASS-300mA
38	PASS-300mA	PASS-300mA	PASS-300mA
39	PASS-300mA	PASS-300mA	PASS-300mA
40	PASS-300mA	PASS-300mA	PASS-300mA
41	PASS-300mA	PASS-300mA	PASS-300mA
42	PASS-300mA	PASS-300mA	PASS-300mA
46	PASS-300mA	PASS-300mA	PASS-300mA
47	PASS-300mA	PASS-300mA	PASS-300mA
48	PASS-300mA	PASS-300mA	PASS-300mA
49	PASS-300mA	PASS-300mA	PASS-300mA
50	PASS-300mA	PASS-300mA	PASS-300mA
51	PASS-300mA	PASS-300mA	PASS-300mA
52	PASS-300mA	PASS-300mA	PASS-300mA
53	PASS-300mA	PASS-300mA	PASS-300mA
54	PASS-300mA	PASS-300mA	PASS-300mA
62	PASS-300mA	PASS-300mA	PASS-300mA
63	PASS-300mA	PASS-300mA	PASS-300mA
64	PASS-300mA	PASS-300mA	PASS-300mA
65	PASS-300mA	PASS-300mA	PASS-300mA
66	PASS-300mA	PASS-300mA	PASS-300mA
67	PASS-300mA	PASS-300mA	PASS-300mA
68	PASS-300mA	PASS-300mA	PASS-300mA
69	PASS-300mA	PASS-300mA	PASS-300mA
72	PASS-300mA	PASS-300mA	PASS-300mA
73	PASS-300mA	PASS-300mA	PASS-300mA
74	PASS-300mA	PASS-300mA	PASS-300mA
75	PASS-300mA	PASS-300mA	PASS-300mA
76	PASS-300mA	PASS-300mA	PASS-300mA
77	PASS-300mA	PASS-300mA	PASS-300mA
78	PASS-300mA	PASS-300mA	PASS-300mA
79	PASS-300mA	PASS-300mA	PASS-300mA
85	PASS-300mA	PASS-300mA	PASS-300mA
86	PASS-300mA	PASS-300mA	PASS-300mA
87	PASS-300mA	PASS-300mA	PASS-300mA
88	PASS-300mA	PASS-300mA	PASS-300mA
89	PASS-300mA	PASS-300mA	PASS-300mA
90	PASS-300mA	PASS-300mA	PASS-300mA

91	PASS-300mA	PASS-300mA	PASS-300mA
94	PASS-300mA	PASS-300mA	PASS-300mA
95	PASS-300mA	PASS-300mA	PASS-300mA
96	PASS-300mA	PASS-300mA	PASS-300mA
97	PASS-300mA	PASS-300mA	PASS-300mA
98	PASS-300mA	PASS-300mA	PASS-300mA
99	PASS-300mA	PASS-300mA	PASS-300mA
100	PASS-300mA	PASS-300mA	PASS-300mA
102	PASS-300mA	PASS-300mA	PASS-300mA
104	PASS-300mA	PASS-300mA	PASS-300mA
105	PASS-300mA	PASS-300mA	PASS-300mA
110	PASS-300mA	PASS-300mA	PASS-300mA
111	PASS-300mA	PASS-300mA	PASS-300mA
112	PASS-300mA	PASS-300mA	PASS-300mA
113	PASS-300mA	PASS-300mA	PASS-300mA
114	PASS-300mA	PASS-300mA	PASS-300mA
115	PASS-300mA	PASS-300mA	PASS-300mA
116	PASS-300mA	PASS-300mA	PASS-300mA
119	PASS-300mA	PASS-300mA	PASS-300mA
122	PASS-300mA	PASS-300mA	PASS-300mA
123	PASS-300mA	PASS-300mA	PASS-300mA
124	PASS-300mA	PASS-300mA	PASS-300mA
127	PASS-300mA	PASS-300mA	PASS-300mA
128	PASS-300mA	PASS-300mA	PASS-300mA
129	PASS-300mA	PASS-300mA	PASS-300mA
130	PASS-300mA	PASS-300mA	PASS-300mA
131	PASS-300mA	PASS-300mA	PASS-300mA
132	PASS-300mA	PASS-300mA	PASS-300mA
133	PASS-300mA	PASS-300mA	PASS-300mA
134	PASS-300mA	PASS-300mA	PASS-300mA
135	PASS-300mA	PASS-300mA	PASS-300mA
136	PASS-300mA	PASS-300mA	PASS-300mA
137	PASS-300mA	PASS-300mA	PASS-300mA
138	PASS-300mA	PASS-300mA	PASS-300mA
141	PASS-300mA	PASS-300mA	PASS-300mA
142	PASS-300mA	PASS-300mA	PASS-300mA
145	PASS-300mA	PASS-300mA	PASS-300mA
148	PASS-300mA	PASS-300mA	PASS-300mA
149	PASS-300mA	PASS-300mA	PASS-300mA
150	PASS-300mA	PASS-300mA	PASS-300mA
151	PASS-300mA	PASS-300mA	PASS-300mA
152	PASS-300mA	PASS-300mA	PASS-300mA
153	PASS-300mA	PASS-300mA	PASS-300mA
156	PASS-300mA	PASS-300mA	PASS-300mA
157	PASS-300mA	PASS-300mA	PASS-300mA
158	PASS-300mA	PASS-300mA	PASS-300mA

161	PASS-300mA	PASS-300mA	PASS-300mA
162	PASS-300mA	PASS-300mA	PASS-300mA
163	PASS-300mA	PASS-300mA	PASS-300mA
164	PASS-300mA	PASS-300mA	PASS-300mA
165	PASS-300mA	PASS-300mA	PASS-300mA
168	PASS-300mA	PASS-300mA	PASS-300mA
169	PASS-300mA	PASS-300mA	PASS-300mA
172	PASS-300mA	PASS-300mA	PASS-300mA
173	PASS-300mA	PASS-300mA	PASS-300mA
174	PASS-300mA	PASS-300mA	PASS-300mA
175	PASS-300mA	PASS-300mA	PASS-300mA
176	PASS-300mA	PASS-300mA	PASS-300mA

Vsupply OVERVOLTAGE TEST			
Tested Pin	Sample No. & Failed Volt (V)		
	#7	#8	#9
4	PASS+2.5V	PASS+2.5V	PASS+2.5V
9	PASS+4.6V	PASS+4.6V	PASS+4.6V
15	PASS+2.5V	PASS+2.5V	PASS+2.5V
23	PASS+2.5V	PASS+2.5V	PASS+2.5V
29	PASS+2.5V	PASS+2.5V	PASS+2.5V
31	PASS+2.5V	PASS+2.5V	PASS+2.5V
34	PASS+4.6V	PASS+4.6V	PASS+4.6V
45	PASS+4.6V	PASS+4.6V	PASS+4.6V
59	PASS+2.5V	PASS+2.5V	PASS+2.5V
61	PASS+2.5V	PASS+2.5V	PASS+2.5V
71	PASS+4.6V	PASS+4.6V	PASS+4.6V
84	PASS+4.6V	PASS+4.6V	PASS+4.6V
93	PASS+4.6V	PASS+4.6V	PASS+4.6V
101	PASS+2.5V	PASS+2.5V	PASS+2.5V
107	PASS+4.6V	PASS+4.6V	PASS+4.6V
109	PASS+2.5V	PASS+2.5V	PASS+2.5V
117	PASS+2.5V	PASS+2.5V	PASS+2.5V
121	PASS+4.6V	PASS+4.6V	PASS+4.6V
126	PASS+2.5V	PASS+2.5V	PASS+2.5V
139	PASS+2.5V	PASS+2.5V	PASS+2.5V
143	PASS+4.6V	PASS+4.6V	PASS+4.6V
146	PASS+2.5V	PASS+2.5V	PASS+2.5V
154	PASS+2.5V	PASS+2.5V	PASS+2.5V
159	PASS+4.6V	PASS+4.6V	PASS+4.6V
167	PASS+2.5V	PASS+2.5V	PASS+2.5V
170	PASS+4.6V	PASS+4.6V	PASS+4.6V

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