

MARCH 16, 1999

TEST REPORT #99041

DURABILITY TESTING  
TIGER EYE LIGHT

SAMTEC



APPROVED BY: MAX PEEL  
PRESIDENT AND DIRECTOR OF ADVANCED RESEARCH  
CONTECH RESEARCH, INC.



**Contech Research**

## CERTIFICATION

This is to certify that the evaluation described herein was designed and executed by personnel of Contech Research, Inc. It was performed in concurrence of Samtec of New Albany, IL who was the test sponsor.

All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO 10012-1 and ANSI/NCSL Z540-1, as applicable.

All data, raw and summarized, analysis and conclusions presented herein are the property of the test sponsor. No copy of this report, in part or in full, shall be forwarded to any agency, customer, etc., by Contech Research without the written approval of the test sponsor.



Max Peel

President And Director Of Advanced Research  
Contech Research, Inc.

MP:dl



TEST RESULTS



PROJECT NO.: 99041                      SPECIFICATION: EIA 364, TP 09  
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PART NO.: C-119 Contact    PART DESCRIPTION: Tiger Eye Light  
-----  
SAMPLE SIZE: One Each            TECHNICIAN: LL  
-----  
START DATE: 2-18-99            COMPLETE DATE: 2-26-99  
-----  
ROOM AMBIENT: 22°C            RELATIVE HUMIDITY: 28%  
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EQUIPMENT ID#: 476, 691, 562, 488  
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DURABILITY

PROCEDURE:

1. The following test samples were submitted by the test sponsor, Samtec, for the evaluation to be performed by Contech Research, Inc.
  - a) Connector with C-119 Contact (PhBr)
  - b) Connector with C-119 Contact (BeCu)
2. All test samples were coded and identified by (Contech Research or the test sponsor) to maintain continuity throughout the test sequences. Upon initiating testing, mated test samples remained with each other throughout the test sequences for which they were designated.
3. The test samples were assembled to test boards and "hand" soldered in place.
4. The test was performed in accordance with EIA 364, Test Procedure 09.
5. Test Conditions:
  - a) No. of Cycles                      : 10,000
  - b) Rate                                      : 500 cycles/Hr
6. The test samples were assembled to special holding devices and attached to the automatic cycling equipment utilizing constant speed control and counter systems.
7. The test samples were axially aligned to accomplish the mating and unmating function allowing for self-centering movement.



PROCEDURE: Continued

8. Initial and all subsequent low level circuit resistance was performed in accordance with EIA 364, Test Procedure 23 with a 100 ma maximum test current and 20 mv open circuit voltage.

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REQUIREMENTS:

The low level circuit resistance shall be measured and recorded after 100 cycles, after 1000 cycles and every 1000 cycles thereafter until 10,000 cycles has been reached or a +15.0mΩ change is recorded.

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RESULTS:

The following is a summary of the data observed:

CHANGE IN LOW LEVEL CIRCUIT RESISTANCE  
(Milliohms)

<u>No of Cycles</u>	PhBr		BeCu	
	<u>Avg.</u>	<u>Max.</u>	<u>Avg.</u>	<u>Max.</u>
100	+0.1	+2.7	-0.3	+0.8
1000	-0.1	+3.0	-0.1	+2.8
2000	+0.3	+4.2	+0.4	+2.8
3000	+0.4	+5.3	+0.7	+3.0
4000	+1.2	+6.2	+1.2	+4.2
5000	+1.6	+4.7	+1.6	+3.8
6000	+1.8	+6.3	+2.1	+4.5
7000	+0.8	+6.2	+2.3	+6.0
8000	+1.9	+5.0	+2.3	+6.1
9000	+2.2	+6.1	+2.7	+5.6
10,000	+2.6	+6.4	+3.0	+6.8

See data files 904101 and 904102 for individual data points.



LOW-LEVEL CONTACT RESISTANCE

Project #: 99041  
 Customer: SAMTEC  
 Product: C-119 [ SFM ]  
 Description: TIGER EYE LIGHT [ Ph Br ]  
 Open circuit voltage: 20 millivolts

Spec: EIA-364 TP-09  
 SubGroup: N/A  
 File #: 904101.LCR

Test current: 100 milliamps

Units: milliohms  
 Delta values

Temp °C	+22	+22	+22	+22	+21	+21	+21	+21	+21	+22	+22	+22
R.H. %	28	28	26	26	20	20	18	18	18	18	18	21
Date	18Feb99	18Feb99	19Feb99	19Feb99	22Feb99	22Feb99	23Feb99	23Feb99	23Feb99	24Feb99	24Feb99	26Feb99
Pos ID	INITIAL	100xDUR	1KxDUR	2KxDUR	3KxDUR	4KxDUR	5KxDUR	6KxDUR	7KxDUR	8KxDUR	9KxDUR	10KxDUR
1	13.6	+0.5	+0.4	+0.4	-0.1	+0.4	+0.6	+0.5	+2.1	+1.8	+1.3	+1.2
3	14.8	-0.3	+0.5	+0.1	+1.1	+0.0	+2.1	+2.9	+1.4	+2.6	+2.6	+2.8
5	10.0	+0.2	-0.2	-0.2	-0.5	+0.1	+1.0	+0.3	+1.2	+3.3	+6.1	+5.7
7	14.8	+0.6	+0.7	+0.7	+0.9	+0.9	+2.6	+2.5	+2.6	+2.5	+2.8	+2.9
9	14.7	+0.9	-1.5	-0.5	+0.2	+1.8	+2.9	+1.3	+3.3	+3.5	+4.2	+5.9
11	14.8	-0.6	-0.0	+0.4	-0.0	+1.5	+1.3	+1.2	+1.2	+1.7	+1.8	+2.2
13	14.9	+0.2	-1.9	+0.3	-2.4	+0.4	+2.0	+0.0	-2.1	+1.8	+2.5	+2.8
15	15.4	-0.3	-0.5	-1.0	-0.8	-0.5	-0.4	-0.4	-0.9	+0.2	+0.8	+0.3
17	11.4	+0.1	-0.9	-0.0	-1.1	+4.0	+1.8	+3.1	-1.1	+2.6	+3.1	+3.6
19	15.2	+0.6	+0.4	-0.7	-1.4	-0.7	+2.7	+1.8	+1.2	+1.6	+1.2	+1.8
21	14.3	+0.3	+0.6	+0.4	+2.3	-0.1	-0.0	+0.4	-0.3	+0.4	+0.4	+0.9
23	15.3	+0.2	+0.3	-0.9	+0.6	-0.4	-0.1	+2.5	+0.7	-0.2	+1.8	+2.6
25	15.7	+0.1	+0.5	+0.5	+0.5	+1.4	+1.9	+3.0	+2.2	+3.4	+4.3	+4.0
27	14.6	+0.7	-2.4	+0.3	-0.2	-0.2	+0.9	+1.6	+1.3	-0.2	+0.5	+0.8
29	14.4	-2.4	-0.7	+1.6	-1.5	-1.6	+3.0	+0.8	-2.6	+1.4	+3.5	+2.9
31	15.6	-2.2	-3.2	-1.9	-2.7	-1.3	+1.0	+1.6	-0.7	+1.6	+0.9	+2.1
33	10.0	+1.2	+0.2	+2.3	+1.5	+3.6	+3.8	+3.5	-0.2	+5.0	+5.2	+5.2
35	15.1	-3.5	-3.2	-1.8	-4.1	-2.1	-0.6	-0.9	-0.9	-0.7	+2.9	+1.7
37	14.4	-1.3	-1.2	+0.3	-1.8	+0.9	-0.4	+0.3	-3.0	+1.4	+2.4	+4.1
39	15.1	-0.2	-1.6	-1.3	-1.3	-2.5	-1.1	+1.0	-1.2	-1.4	+1.4	+0.9
41	10.6	+0.1	-0.1	+0.4	+1.1	+4.8	+3.4	+3.9	-0.5	+2.0	+2.3	+3.2
43	13.7	+0.9	+2.2	+1.4	+2.3	+2.7	+1.6	+0.3	-0.2	+3.9	+1.3	+3.2
45	13.1	+1.2	+0.4	-0.8	-0.4	+1.7	+1.6	+0.5	-0.1	+3.1	+2.9	+3.0
47	15.1	+1.0	+0.2	-0.6	-1.1	-0.3	+0.3	+0.4	-0.7	+0.5	-0.2	+0.2
49	14.6	+0.2	-0.0	-0.2	-0.4	-0.4	-0.2	+0.4	-2.3	-0.3	-1.6	-0.0
51	15.4	-0.5	-0.9	-0.9	-1.8	-0.0	-1.4	-2.5	-1.4	-0.8	-1.9	-0.8
53	11.2	+2.4	+0.6	+1.9	+3.4	+3.6	+4.7	+4.2	+2.1	+2.8	+2.7	+3.2
55	10.6	+1.9	-0.2	+1.5	+2.6	+0.8	+2.2	+1.5	+3.6	+4.2	+3.8	+5.5
57	10.9	+2.3	+3.0	+2.2	+2.7	+3.4	+3.0	+5.8	+2.9	+3.8	+4.0	+4.6
59	12.4	+2.7	+2.5	+2.2	+3.8	+5.4	+4.3	+6.3	+4.1	+4.7	+5.0	+5.9
61	10.9	+1.2	+1.0	+2.7	+1.9	+1.6	+2.8	+3.1	+6.2	+3.8	+5.5	+6.4
63	11.1	-0.0	-0.4	+0.2	+1.7	+1.3	+3.2	+4.9	+4.8	+3.8	+4.3	+4.9
65	9.9	+1.3	+1.5	+2.8	+5.3	+4.1	+4.0	+4.3	+4.0	+4.7	+4.9	+5.1
67	10.8	+1.0	+1.9	+2.8	+1.7	+4.7	+3.8	+2.7	+3.6	+3.7	+4.2	+4.9
69	11.1	+1.7	+2.4	+4.2	+3.8	+6.2	+4.2	+4.2	+4.7	+5.0	+3.7	+4.5

Project #: 99041  
Customer : SAMTEC

File:904101.LCR

Date	18Feb99	18Feb99	19Feb99	19Feb99	22Feb99	22Feb99	23Feb99	23Feb99	23Feb99	24Feb99	24Feb99	26Feb99
Pos ID	INITIAL	100xDUR	1KxDUR	2KxDUR	3KxDUR	4KxDUR	5KxDUR	6KxDUR	7KxDUR	8KxDUR	9KxDUR	10KxDUR
71	14.6	-1.1	-1.4	-1.9	-2.2	+0.2	-1.2	-0.5	-1.6	-0.7	-0.3	-0.2
73	11.1	+0.2	+2.7	+2.6	+2.7	+4.4	+4.1	+4.0	+3.9	+3.4	+3.6	+3.7
75	14.5	-0.9	-0.7	-1.0	-0.0	+1.9	+1.7	+0.7	-0.3	+1.5	-0.0	+0.4
77	15.3	-0.4	-0.9	-0.8	+1.5	+3.2	+1.3	+1.5	+0.4	+1.3	+0.4	+0.2
79	16.2	-0.2	+0.4	-0.1	-0.1	+0.4	+1.5	+3.0	-0.8	+1.1	+1.1	+0.4
81	16.2	-0.7	+0.0	-0.7	-1.2	+0.4	+2.1	+1.8	+1.4	+0.9	+0.6	+0.5
83	14.6	-0.5	-0.2	-1.2	-0.3	+0.6	-0.4	+0.2	-0.1	+1.4	+0.1	+0.9
85	15.2	+0.9	+0.6	+0.1	+0.0	+0.6	+1.6	+1.6	-0.0	+2.5	+3.7	+2.1
87	16.1	+0.2	-0.4	-0.2	+0.6	-0.3	+0.7	+0.9	-0.2	+0.3	+1.1	+1.0
89	14.4	-0.6	-0.8	-1.0	0.0	+0.5	+2.1	+0.9	-0.3	-0.1	+0.6	+0.5
91	15.8	-1.6	-1.3	-1.3	-1.4	-0.5	-0.6	-0.9	-1.0	+1.1	-1.0	+2.8
93	13.8	-0.3	-0.6	-0.6	-0.3	+2.7	+1.6	+1.7	+0.5	+1.3	+3.7	+3.1
95	16.4	-0.6	-0.9	+0.4	+0.2	+0.3	-0.0	+0.9	+0.1	+0.2	+0.7	+1.1
97	12.6	+0.5	+1.7	+1.1	+4.1	+2.6	+4.1	+5.1	+3.2	+4.7	+2.8	+4.1
99	14.0	-0.8	-1.0	-1.0	-0.6	-2.6	+0.9	+0.2	-0.9	+0.2	+3.8	+0.4
HIGH	16.4	+2.7	+3.0	+4.2	+5.3	+6.2	+4.7	+6.3	+6.2	+5.0	+6.1	+6.4
LOW	9.9	-3.5	-3.2	-1.9	-4.1	-2.6	-1.4	-2.5	-3.0	-1.4	-1.9	-0.8
AVG	13.7	+0.1	-0.1	+0.3	+0.4	+1.2	+1.6	+1.8	+0.8	+1.9	+2.2	+2.6
STD DEV	2.0	1.2	1.4	1.4	1.9	2.1	1.6	1.9	2.1	1.7	1.9	1.9
OPENS	0	0	0	0	0	0	0	0	0	0	0	0

INITIALS LL LL LL LL LL LL LL LL LL LL LL LL

## NOTES:

- 1 - An asterisk (\*) indicates an open circuit or a value greater than 20 ohms.

LOW-LEVEL CONTACT RESISTANCE

Project #: 99041

Customer: SAMTEC

Product: C-119 [ SFM ]

Description: TIGER EYE LIGHT [ Be Cu ]

Open circuit voltage: 20 millivolts

Spec: EIA-364 TP-09

SubGroup: N/A

File #: 904102.LCR

Test current: 100 milliamps

Units: milliohms

Delta values

Temp °C	+22	+22	+22	+22	+21	+21	+21	+21	+21	+22	+21	+22
R.H. %	28	28	26	26	20	20	18	18	18	18	20	21
Date	18Feb99	18Feb99	19Feb99	19Feb99	22Feb99	22Feb99	23Feb99	23Feb99	23Feb99	24Feb99	25Feb99	26Feb99
Pos ID	INITIAL	100xDUR	1KxDUR	2KxDUR	3KxDUR	4KxDUR	5KxDUR	6KxDUR	7KxDUR	8KxDUR	9KxDUR	10KxDUR
1	9.4	+0.8	+0.3	-0.9	+1.9	+0.4	+2.0	+2.2	+1.9	+2.3	+2.5	+2.5
3	9.8	-0.7	-0.7	+0.3	+1.3	+0.3	+0.6	+1.8	+1.7	+2.6	+2.7	+4.0
5	10.7	-1.3	-1.1	-0.3	-0.4	+0.1	+0.1	+0.9	-0.2	+0.5	-0.2	+0.1
7	7.8	-0.5	-0.4	+0.2	+1.2	+1.4	+3.1	+3.2	+2.9	+3.5	+4.0	+4.4
9	10.1	-0.3	-0.1	-0.3	-0.1	+0.4	+1.2	+0.8	+0.3	+0.7	+1.2	+0.8
11	8.0	-0.2	+0.1	-0.3	+0.2	+1.0	+1.5	+2.9	+2.6	+3.1	+3.3	+3.0
13	9.9	+0.0	+0.3	+0.5	+0.8	+1.2	+2.1	+2.8	+1.8	+1.6	+2.6	+1.7
15	10.5	-0.6	-0.5	-0.4	+0.9	+0.8	+3.2	+2.9	+4.4	+2.2	+3.5	+2.8
17	8.4	-0.2	+1.6	+1.5	+1.6	+2.1	+2.0	+2.1	+2.3	+1.6	+4.7	+2.2
19	8.4	-0.3	+1.1	+0.2	+0.8	+2.7	+3.2	+4.5	+5.1	+5.6	+3.8	+3.5
21	9.7	-0.1	-1.4	+0.4	+1.1	+1.3	+1.8	+2.4	+2.8	+2.9	+3.9	+2.4
23	7.0	-0.2	+2.8	+0.2	+0.4	+0.3	+0.5	+3.9	+2.8	+2.4	+3.9	+3.3
25	7.9	-0.1	-0.9	+0.5	+1.3	+1.9	+1.3	+2.5	+2.0	+1.5	+4.2	+3.2
27	8.1	+0.1	+0.0	+0.4	+1.0	+2.1	+1.1	+3.5	+2.9	+3.6	+3.7	+4.0
29	8.8	-0.6	-0.2	+0.1	+0.1	+1.7	+3.3	+2.2	+3.7	+3.3	+4.1	+2.9
31	8.7	-0.4	+0.2	-0.1	+2.2	+2.9	+2.9	+3.6	+5.4	+3.6	+4.0	+3.6
33	8.8	-0.0	-0.1	+1.4	+0.9	+2.2	+2.2	+2.7	+2.7	+2.3	+1.3	+1.6
35	8.2	+0.0	+0.8	+0.3	+1.0	+2.7	+2.0	+3.2	+4.0	+3.4	+4.8	+3.8
37	8.6	-0.5	-0.1	+1.3	+2.3	-0.1	+0.4	+3.4	+4.2	+2.6	+4.1	+2.8
39	10.3	-0.5	-2.2	-0.0	-0.3	+0.1	+0.6	+0.6	+0.2	+0.1	+1.4	+0.7
41	9.3	-0.4	+1.3	+0.1	+1.1	+1.9	+2.3	+3.5	+3.8	+2.8	+3.7	+2.3
43	9.9	-0.2	-0.8	+0.7	+1.0	+2.4	+1.4	+1.3	+1.0	+1.0	+2.1	+1.4
45	9.4	-0.4	+0.4	-0.5	-0.5	+0.2	+0.4	+0.5	+0.0	+0.6	+2.2	+0.3
47	9.3	+0.0	-0.2	-0.1	+0.3	-0.3	+0.3	+0.3	-0.2	+0.2	+1.5	+0.6
49	10.3	-1.2	-0.3	-1.0	-0.5	-0.3	+0.3	+0.5	+0.1	+1.5	+3.0	+4.3
51	7.3	+0.0	+0.2	+0.3	+0.8	+1.2	+1.6	+1.0	+3.0	+2.5	+0.4	+4.8
53	8.2	-0.2	-0.1	+0.3	+0.6	+0.4	+0.8	+0.9	+4.0	+1.7	+2.0	+5.7
55	6.7	-0.1	+0.1	+0.0	+0.1	+0.1	+0.3	+0.7	+0.3	+1.1	+2.2	+2.1
57	7.9	-0.3	+0.3	+0.1	+0.2	-0.2	+0.3	+1.2	+3.2	+5.1	+5.6	+6.8
59	7.7	-0.1	+0.0	+0.2	+0.2	+0.1	+2.1	+3.2	+3.1	+3.0	+2.3	+5.2
61	9.2	-1.0	-0.1	+1.1	+2.8	+0.1	+0.8	-0.3	+1.8	+3.5	+1.3	+4.7
63	7.9	+0.1	+0.3	+2.8	+0.7	+1.4	+1.2	+2.9	+3.3	+1.6	+2.8	+5.4
65	7.6	-0.1	+0.0	+0.5	+0.5	+1.1	+2.8	+2.9	+4.4	+6.1	+3.4	+3.6
67	8.6	+0.2	+0.1	+1.7	+1.9	+3.1	+2.3	+3.2	+3.6	+3.0	+3.1	+6.0
69	8.6	-0.5	-0.4	+0.4	+0.3	+2.9	+3.8	+3.7	+6.0	+5.2	+4.9	+3.7



Project #: 99041  
Customer : SAMTEC

File:904102.LCR

Date	18Feb99	18Feb99	19Feb99	19Feb99	22Feb99	22Feb99	23Feb99	23Feb99	23Feb99	24Feb99	25Feb99	26Feb99
Pos ID	INITIAL	100xDUR	1KxDUR	2KxDUR	3KxDUR	4KxDUR	5KxDUR	6KxDUR	7KxDUR	8KxDUR	9KxDUR	10KxDUR
71	8.1	+0.0	+0.4	+2.7	+2.8	+2.9	+2.7	+3.4	+3.2	+3.8	+3.4	+4.2
73	8.6	+0.0	+0.6	+2.1	+3.0	+3.2	+2.8	+3.0	+3.4	+3.0	+2.7	+3.3
75	8.4	-0.2	-0.1	+2.6	+0.4	+4.2	+2.7	+3.3	+4.5	+4.2	+4.1	+6.4
77	10.2	-0.6	-0.5	-0.3	+0.0	+0.2	-0.2	+0.4	+0.6	-0.4	+0.3	+1.5
79	10.2	-0.0	-0.2	+0.4	+1.1	+0.9	+1.8	+1.8	+1.6	+1.8	+1.2	+2.6
81	10.0	-0.7	-0.1	+1.4	+1.3	+2.4	+2.2	+2.4	+2.0	+2.1	+1.3	+1.5
83	10.3	-0.4	-0.7	-0.1	+0.1	+0.6	+1.3	+1.5	+0.3	+0.4	+1.0	+1.2
85	10.5	-0.2	-0.5	+0.3	+0.0	+1.4	+1.8	+1.2	+1.3	+1.3	+0.6	+2.1
87	10.8	-0.6	-0.5	-0.4	-3.6	+0.9	+1.0	+0.1	+1.6	+0.9	-1.6	+1.0
89	7.3	-0.1	+0.1	-0.0	+2.9	-0.2	+0.3	+0.6	+0.2	+0.2	+3.4	+1.2
91	8.0	-0.2	-0.5	+0.8	+1.8	+0.9	+2.8	+2.8	+2.6	+2.3	+4.8	+3.4
93	10.8	-2.2	-1.8	-1.0	-2.6	+0.5	+0.3	+1.0	+1.5	+1.5	+1.1	+3.0
95	7.6	-0.3	-0.3	+0.0	+0.6	+0.9	+2.9	+3.7	+3.0	+2.9	+2.8	+4.2
97	9.8	-0.3	-0.3	+1.3	+1.5	+0.9	+1.4	+0.8	+0.3	+0.6	+0.7	+0.7
99	7.8	-0.4	-0.1	-0.4	-0.3	+0.4	+0.4	+0.3	+0.2	+2.3	+2.7	+3.0
HIGH	10.8	+0.8	+2.8	+2.8	+3.0	+4.2	+3.8	+4.5	+6.0	+6.1	+5.6	+6.8
LOW	6.7	-2.2	-2.2	-1.0	-3.6	-0.3	-0.2	-0.3	-0.2	-0.4	-1.6	+0.1
AVG	8.9	-0.3	-0.1	+0.4	+0.7	+1.2	+1.6	+2.1	+2.3	+2.3	+2.7	+3.0
STD DEV	1.1	0.4	0.8	0.9	1.2	1.1	1.0	1.3	1.6	1.5	1.5	1.6
OPENS	0	0	0	0	0	0	0	0	0	0	0	0
INITIALS	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL

## NOTES:

- 1 - An asterisk (\*) indicates an open circuit or a value greater than 20 ohms.