



ZIPPY TECHNOLOGY CORP.

Mean Time Between Failures PREDICTION REPORT

MIL-HDBK-217F, Notice 2

Product : Redundant Switching Power Supply

Model/Type : ZRH2-5AF0T2V(RoHS)(PMBus WP1.2)

Approval By	<i>Wei Di Huang</i>	正式 資料 用 章	
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ZIPPY TECHNOLOGY CORP.
6F.,NO.48,WUQUAN RD.,
WUGU DIST.,NEW TAIPEI CITY,TAIWAN,R.O.C.
RELIABILITY PREDICTION STANDARD REPORT
(Sorted by Part Number)
MIL-HDBK-217F, Notice 2

PRED-FIRST (c) Reliability Prediction Program, BJM Engineering Services

Date: SEP-29-2022
End Item Title : ZRH2 SERIES MTBF
End Item Part Number : ZRH2-5AF0T2V(RoHS)(PMBus WP1.2)
ZRH2-5AF0T2V(RoHS)(PMBus WP1.2) MTBF : 186,261
Module Title: ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Power Unit Module : ZRH-2AF0T2(RoHS)(PMBus WP1.2)
Environmental Condition: GB
Ambient Temperature: 25°C

RELIABILITY MODELING OF REDUNDANT UNITS

Two Redundant Units:

Two identical units may be connected in parallel, each capable of supplying the total required output. If one unit fails and can be removed from the system (does not interfere with the operation of the other unit), then the other unit supplies the required output. Using a constant failure rate, the following relations apply.

$$\text{Total Failure Rate}(F) = M\lambda^{(3/2)} + B\lambda = 7.510971/(3/2) + 0.361510 = 5.368824$$

$M\lambda$ = Main power failure rate , $B\lambda$ = Back plane failure rate

$$\text{ZRH2-5AF0T2V(RoHS)(PMBus WP1.2)(MTBF)} = F/10^6 \text{ (Hrs)} = 1/(5.368824/10^6) = 186,261$$

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RELIABILITY PREDICTION STANDARD REPORT
(Sorted by Part Number)
MIL-HDBK-217F, Notice 2

Date : JAN-04-2021 Time : 11:42:16
End Item Title : ZRH SERIES MTBF
End Item Part Number : ZRH-2AF0T2(RoHS)(PMBus WP1.2)
ZRH-2AF0T2(RoHS)(PMBus WP1.2) MTBF : 133,139
Module Title : ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Module Reference Designation : ZRH
Environmental Condition : GB
Ambient Temperature: 25°C

ZRH-2AF0T2(RoHS)(PMBus WP1.2)

ITEM #	Part Number	Ref Desig	Qual Level	Quant	Individual Failure Rate (F/10 ⁶ Hrs)	Total Failure Rate (F/10 ⁶ Hrs)
1	B106020031	BOM	SPECIAL	1	0.357649	0.357649
2	B106020038	BOM	SPECIAL	1	1.509427	1.509427
3	B106020040	BOM	SPECIAL	1	0.255002	0.255002
4	B106020041	BOM	SPECIAL	1	1.146475	1.146475
5	B200000582	BOM	NMIL	1	0.009454	0.009454
6	B200000641	BOM	NMIL	2	0.008063	0.016126
7	B200000694	BOM	NMIL	3	0.006522	0.019566
8	B200010052	BOM	NMIL	1	0.000627	0.000627
9	B200010109	BOM	NMIL	1	0.000627	0.000627
10	B200010192	BOM	NMIL	1	0.009694	0.009694
11	B200010261	BOM	NMIL	1	0.000689	0.000689
12	B200010262	BOM	NMIL	1	0.072168	0.072168
13	B200010263	BOM	NMIL	1	0.002333	0.002333
14	B200010273	BOM	NMIL	6	0.072168	0.433008
15	B200010276	BOM	NMIL	4	0.065527	0.262108
16	B200010299	BOM	NMIL	2	0.073390	0.146780
17	B200020039	BOM	NMIL	1	0.002071	0.002071
18	B200030115	BOM	NMIL	2	0.000712	0.001424
19	B200040062	BOM	NMIL	1	0.001242	0.001242
20	B200040141	BOM	NMIL	13	0.008485	0.110305
21	B200040142	BOM	NMIL	1	0.011646	0.011646
22	B200040157	BOM	NMIL	1	0.018259	0.018259
23	B200050070	BOM	NMIL	1	0.003013	0.003013
24	B200050082	BOM	NMIL	1	0.003013	0.003013

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ITEM #	Part Number	Ref Desig	Qual Level	Quant	Individual Failure Rate (F/10 ⁶ Hrs)	Total Failure Rate (F/10 ⁶ Hrs)
25	B200050090	BOM	NMIL	2	0.003013	0.006026
26	B200050094	BOM	NMIL	2	0.003013	0.006026
27	B200090055	BOM	NMIL	1	0.001476	0.001476
28	B200110042	BOM	NMIL	6	0.002210	0.013260
29	B200110046	BOM	NMIL	2	0.002896	0.005792
30	B200110120	BOM	NMIL	1	0.002896	0.002896
31	B200110198	BOM	NMIL	1	0.002896	0.002896
32	B200110223	BOM	NMIL	3	0.003039	0.009117
33	B200110325	BOM	NMIL	1	0.002896	0.002896
34	B200110346	BOM	NMIL	1	0.002896	0.002896
35	B200110470	BOM	NMIL	3	0.003716	0.011148
36	B200110508	BOM	NMIL	1	0.002210	0.002210
37	B200110512	BOM	NMIL	6	0.002210	0.013260
38	B200110573	BOM	NMIL	4	0.002319	0.009276
39	B200110574	BOM	NMIL	6	0.002319	0.013914
40	B200110629	BOM	NMIL	4	0.002319	0.009276
41	B200110727	BOM	NMIL	2	0.002210	0.004420
42	B200110732	BOM	NMIL	2	0.002026	0.004052
43	B200110733	BOM	NMIL	8	0.002026	0.016208
44	B200110737	BOM	NMIL	1	0.002210	0.002210
45	B200110739	BOM	NMIL	7	0.002026	0.014182
46	B200110744	BOM	NMIL	2	0.002026	0.004052
47	B200110771	BOM	NMIL	1	0.002026	0.002026
48	B200110775	BOM	NMIL	1	0.002026	0.002026
49	B200110789	BOM	NMIL	6	0.002210	0.013260
50	B200110794	BOM	NMIL	2	0.002026	0.004052
51	B200110800	BOM	NMIL	2	0.002026	0.004052
52	B200110806	BOM	NMIL	1	0.002026	0.002026
53	B200110821	BOM	NMIL	2	0.002126	0.004252
54	B200110850	BOM	NMIL	1	0.002126	0.002126
55	B200110865	BOM	NMIL	1	0.002026	0.002026
56	B200111014	BOM	NMIL	1	0.002026	0.002026
57	B200111107	BOM	NMIL	3	0.003716	0.011148
58	B200120204	BOM	NMIL	1	0.003637	0.003637
59	B200160054	BOM	NMIL	1	0.002852	0.002852
60	B200160056	BOM	NMIL	1	0.009711	0.009711
61	B200170029	BOM	NMIL	2	0.003721	0.007442
62	B200170073	BOM	NMIL	1	0.002424	0.002424
63	B200170074	BOM	NMIL	5	0.002840	0.014200
64	B200170075	BOM	NMIL	1	0.002424	0.002424

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65	B200180095	BOM	NMIL	1	0.001907	0.001907
66	B200180105	BOM	NMIL	1	0.001845	0.001845
67	B200190103	BOM	NMIL	1	0.013004	0.013004
68	B200200085	BOM	NMIL	1	0.007553	0.007553
69	B200200117	BOM	NMIL	1	0.005546	0.005546
70	B200200119	BOM	NMIL	1	0.004827	0.004827
71	B200200123	BOM	NMIL	5	0.003413	0.017065
72	B200200141	BOM	NMIL	1	0.007820	0.007820
73	B200200156	BOM	NMIL	3	0.006356	0.019068
74	B200200167	BOM	NMIL	1	0.010356	0.010356
75	B200200171	BOM	NMIL	2	0.003664	0.007328
76	B200200186	BOM	NMIL	1	0.003189	0.003189
77	B200200205	BOM	NMIL	4	0.007820	0.031280
78	B200200207	BOM	NMIL	1	0.005166	0.005166
79	B200200208	BOM	NMIL	2	0.006356	0.012712
80	B200200217	BOM	NMIL	3	0.006356	0.019068
81	B200200218	BOM	NMIL	11	0.009620	0.105820
82	B200200219	BOM	NMIL	4	0.005166	0.020664
83	B200220082	BOM	NMIL	1	0.001208	0.001208
84	B200220086	BOM	NMIL	2	0.001208	0.002416
85	B200220089	BOM	NMIL	2	0.001253	0.002506
86	B200230524	BOM	NMIL	1	0.001803	0.001803
87	B200230537	BOM	NMIL	4	0.016249	0.064996
88	B200230556	BOM	NMIL	1	0.027253	0.027253
89	B200260411	BOM	NMIL	1	0.000251	0.000251
90	B200260464	BOM	NMIL	1	0.000251	0.000251
91	B200260472	BOM	NMIL	1	0.000221	0.000221
92	B200270023	BOM	NMIL	1	0.000227	0.000227
93	B200280012	BOM	NMIL	1	0.000623	0.000623
94	B200290024	BOM	NMIL	2	0.011159	0.022318
95	B200310025	BOM	NMIL	1	0.005232	0.005232
96	B200360074	BOM	NMIL	1	0.001938	0.001938
97	B210000120	BOM	NMIL	3	0.002450	0.007350
98	B210000121	BOM	NMIL	1	0.001893	0.001893
99	B210060136	BOM	NMIL	1	0.024396	0.024396
100	B210090257	BOM	SPECIAL	1	2.276868	2.276868
101	B210160078	BOM	NMIL	1	0.010000	0.010000
102	B210192786	BOM	NMIL	1	0.002468	0.002468
103	B210193041	BOM	NMIL	1	0.095528	0.095528
104	B210193314	BOM	NMIL	1	0.025102	0.025102

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ITEM #	Part Number	Ref Desig	Qual Level	Quant	Individual Failure Rate (F/10 ⁶ Hrs)	Total Failure Rate (F/10 ⁶ Hrs)
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Total Failure Rate (F/10 ⁶ Hrs) :	7.510971
Mean Time (in hours) Between Failures (MTBF) :	133,139