



ZIPPY TECHNOLOGY CORP.

Mean Time Between Failures PREDICTION REPORT

MIL-HDBK-217F, Notice 2

Product : Redundant Switching Power Supply

Model/Type : ZRH2-5BD0K2H(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: DEC-15-2022
End Item Title : ZRH2 SERIES MTBF
End Item Part Number : ZRH2-5BD0K2H(RoHS)(PMBus WP1.2)
ZRH2-5BD0K2H(RoHS)(PMBus WP1.2) MTBF : 173,784
Module Title: ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Power Unit Module : ZRH-2BD0K2(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.

$$\text{Total Failure Rate}(F) = M\lambda / (3/2) + B\lambda = 7.303180 / (3/2) + 0.885492 = 5.754279$$

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

$$\text{ZRH2-5BD0K2H(RoHS)(PMBus WP1.2)(MTBF)} = F / 10^6 \text{ (Hrs)} = 1 / (5.754279 / 10^6) = 173,784$$

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

Date : MAY-25-2022 Time : 15:23:46
End Item Title : ZRH SERIES MTBF
End Item Part Number : ZRH-2BD0K2(RoHS)(PMBus WP1.2)
ZRH-2BD0K2(RoHS)(PMBus WP1.2) MTBF : 136,927
Module Title : ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Module Reference Designation : ZRH
Environmental Condition : GB
Ambient Temperature: 25°C

ZRH-2BD0K2(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	B106020072	BOM	SPECIAL	1	1.469735	1.469735
2	B106020073	BOM	SPECIAL	1	1.291162	1.291162
3	B106020074	BOM	SPECIAL	1	0.359310	0.359310
4	B106020075	BOM	SPECIAL	1	0.376952	0.376952
5	B200000582	BOM	NMIL	1	0.009454	0.009454
6	B200000640	BOM	NMIL	3	0.006522	0.019566
7	B200000641	BOM	NMIL	2	0.008063	0.016126
8	B200010192	BOM	NMIL	1	0.009694	0.009694
9	B200010261	BOM	NMIL	1	0.000689	0.000689
10	B200010262	BOM	NMIL	1	0.072168	0.072168
11	B200010263	BOM	NMIL	1	0.002333	0.002333
12	B200010269	BOM	NMIL	1	0.000652	0.000652
13	B200010270	BOM	NMIL	1	0.000652	0.000652
14	B200010281	BOM	NMIL	2	0.065527	0.131054
15	B200010328	BOM	NMIL	4	0.065527	0.262108
16	B200020039	BOM	NMIL	1	0.002071	0.002071
17	B200030115	BOM	NMIL	2	0.000712	0.001424
18	B200040062	BOM	NMIL	1	0.001242	0.001242
19	B200040141	BOM	NMIL	13	0.008485	0.110305
20	B200040142	BOM	NMIL	1	0.011646	0.011646
21	B200040184	BOM	NMIL	1	0.003751	0.003751
22	B200050070	BOM	NMIL	1	0.003013	0.003013
23	B200050082	BOM	NMIL	1	0.003013	0.003013
24	B200050090	BOM	NMIL	2	0.003013	0.006026

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25	B200050094	BOM	NMIL	2	0.003013	0.006026
26	B200060022	BOM	NMIL	1	0.003776	0.003776
27	B200090055	BOM	NMIL	1	0.001476	0.001476
28	B200110001	BOM	NMIL	1	0.002896	0.002896
29	B200110042	BOM	NMIL	6	0.002210	0.013260
30	B200110046	BOM	NMIL	2	0.002896	0.005792
31	B200110120	BOM	NMIL	1	0.002896	0.002896
32	B200110192	BOM	NMIL	1	0.002210	0.002210
33	B200110198	BOM	NMIL	1	0.002896	0.002896
34	B200110223	BOM	NMIL	3	0.003039	0.009117
35	B200110325	BOM	NMIL	1	0.002896	0.002896
36	B200110508	BOM	NMIL	5	0.002210	0.011050
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	B200110695	BOM	NMIL	3	0.003716	0.011148
42	B200110727	BOM	NMIL	2	0.002210	0.004420
43	B200110732	BOM	NMIL	2	0.002026	0.004052
44	B200110733	BOM	NMIL	7	0.002026	0.014182
45	B200110737	BOM	NMIL	1	0.002210	0.002210
46	B200110739	BOM	NMIL	6	0.002026	0.012156
47	B200110743	BOM	NMIL	1	0.002026	0.002026
48	B200110744	BOM	NMIL	2	0.002026	0.004052
49	B200110745	BOM	NMIL	1	0.002026	0.002026
50	B200110771	BOM	NMIL	1	0.002026	0.002026
51	B200110775	BOM	NMIL	1	0.002026	0.002026
52	B200110789	BOM	NMIL	2	0.002210	0.004420
53	B200110794	BOM	NMIL	2	0.002026	0.004052
54	B200110800	BOM	NMIL	2	0.002026	0.004052
55	B200110821	BOM	NMIL	1	0.002126	0.002126
56	B200110839	BOM	NMIL	1	0.002126	0.002126
57	B200110848	BOM	NMIL	1	0.002026	0.002026
58	B200111014	BOM	NMIL	1	0.002026	0.002026
59	B200111107	BOM	NMIL	3	0.003716	0.011148
60	B200120204	BOM	NMIL	1	0.003637	0.003637
61	B200160054	BOM	NMIL	1	0.002852	0.002852
62	B200160056	BOM	NMIL	1	0.009711	0.009711
63	B200170029	BOM	NMIL	2	0.003721	0.007442
64	B200170073	BOM	NMIL	1	0.002424	0.002424

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ITEM #	Part Number	Ref Desig	Qual Level	Quant	Individual Failure Rate (F/10^6Hrs)	Total Failure Rate (F/10^6Hrs)
65	B200170074	BOM	NMIL	6	0.002840	0.017040
66	B200170075	BOM	NMIL	1	0.002424	0.002424
67	B200180095	BOM	NMIL	1	0.001907	0.001907
68	B200180105	BOM	NMIL	1	0.001845	0.001845
69	B200190103	BOM	NMIL	1	0.013004	0.013004
70	B200200085	BOM	NMIL	1	0.007553	0.007553
71	B200200117	BOM	NMIL	1	0.005546	0.005546
72	B200200119	BOM	NMIL	1	0.004827	0.004827
73	B200200123	BOM	NMIL	5	0.003413	0.017065
74	B200200141	BOM	NMIL	1	0.007820	0.007820
75	B200200156	BOM	NMIL	3	0.006356	0.019068
76	B200200167	BOM	NMIL	1	0.010356	0.010356
77	B200200171	BOM	NMIL	2	0.003664	0.007328
78	B200200186	BOM	NMIL	1	0.003189	0.003189
79	B200200205	BOM	NMIL	4	0.007820	0.031280
80	B200200207	BOM	NMIL	1	0.005166	0.005166
81	B200200208	BOM	NMIL	2	0.006356	0.012712
82	B200200217	BOM	NMIL	3	0.006356	0.019068
83	B200200218	BOM	NMIL	14	0.009620	0.134680
84	B200200219	BOM	NMIL	4	0.005166	0.020664
85	B200220082	BOM	NMIL	1	0.001208	0.001208
86	B200220083	BOM	NMIL	2	0.001253	0.002506
87	B200220089	BOM	NMIL	2	0.001253	0.002506
88	B200230524	BOM	NMIL	1	0.001803	0.001803
89	B200230537	BOM	NMIL	4	0.016249	0.064996
90	B200230556	BOM	NMIL	1	0.027253	0.027253
91	B200260411	BOM	NMIL	1	0.000251	0.000251
92	B200260464	BOM	NMIL	1	0.000251	0.000251
93	B200260498	BOM	NMIL	1	0.000221	0.000221
94	B200280012	BOM	NMIL	1	0.000623	0.000623
95	B200290024	BOM	NMIL	2	0.011159	0.022318
96	B200310027	BOM	NMIL	1	0.004075	0.004075
97	B200360095	BOM	NMIL	1	0.001938	0.001938
98	B210060185	BOM	NMIL	1	0.034771	0.034771
99	B210090257	BOM	SPECIAL	1	2.276868	2.276868
100	B210160078	BOM	NMIL	1	0.010000	0.010000
101	B210193338	BOM	NMIL	1	0.097031	0.097031
102	B210193561	BOM	NMIL	1	0.017022	0.017022
103	B210193562	BOM	NMIL	1	0.002468	0.002468

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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) :	7.303180
Mean Time (in hours) Between Failures (MTBF) :	136,927