



ZIPPY TECHNOLOGY CORP.

Mean Time Between Failures PREDICTION REPORT

MIL-HDBK-217F, Notice 2

Product : Redundant Switching Power Supply

Model/Type : ZRH2-5BB0K2H(RoHS)(PMBus WP1.2)

Approval By	<i>Matthew - Chiu</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: NOV-03-2020
End Item Title : ZRH2 SERIES MTBF
End Item Part Number : ZRH2-5BB0K2H(RoHS)(PMBus WP1.2)
ZRH2-5BB0K2H(RoHS)(PMBus WP1.2) MTBF : 227,096
Module Title: ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Power Unit Module : ZRH-2BB0K2(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.

$$\text{Total Failure Rate}(F) = M\lambda^{(3/2)} + B\lambda = 5.905411/(3/2) + 0.466482 = 4.403423$$

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

$$\text{ZRH2-5BB0K2H(RoHS)(PMBus WP1.2)(MTBF)} = F/10^6 \text{ (Hrs)} = 1/(4.403423/10^6) = 227,096$$

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

Date : MAR-06-2019 Time : 15:18:37
End Item Title : ZRH SERIES MTBF
End Item Part Number : ZRH-2BB0K2(RoHS)(PMBus WP1.2)
ZRH-2BB0K2(RoHS)(PMBus WP1.2) MTBF : 169,336
Module Title : ZIPPY TECHNOLOGY CORP
Module Part Number : ZRH / MTBF
Module Reference Designation : ZRH
Environmental Condition : GB
Ambient Temperature: 25°C

ZRH-2BB0K2(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	B105950008	BOM	SPECIAL	1	0.150631	0.150631
2	B106310003	BOM	SPECIAL	1	0.232935	0.232935
3	B106310004	BOM	SPECIAL	1	0.192139	0.192139
4	B106310006	BOM	SPECIAL	1	0.523067	0.523067
5	B106310009	BOM	SPECIAL	1	0.906912	0.906912
6	B200000558	BOM	NMIL	1	0.005248	0.005248
7	B200000601	BOM	NMIL	2	0.005806	0.011612
8	B200000603	BOM	NMIL	1	0.005248	0.005248
9	B200000637	BOM	NMIL	1	0.006974	0.006974
10	B200000638	BOM	NMIL	1	0.013289	0.013289
11	B200000656	BOM	NMIL	1	0.005248	0.005248
12	B200010052	BOM	NMIL	2	0.000627	0.001254
13	B200010109	BOM	NMIL	2	0.000627	0.001254
14	B200010167	BOM	NMIL	1	0.000648	0.000648
15	B200010249	BOM	NMIL	1	0.000540	0.000540
16	B200010260	BOM	NMIL	2	0.000585	0.001170
17	B200010262	BOM	NMIL	6	0.072168	0.433008
18	B200010280	BOM	NMIL	2	0.065527	0.131054
19	B200010282	BOM	NMIL	4	0.065527	0.262108
20	B200020016	BOM	NMIL	2	0.000647	0.001294
21	B200020024	BOM	NMIL	1	0.000424	0.000424
22	B200020045	BOM	NMIL	2	0.001228	0.002456
23	B200030069	BOM	NMIL	2	0.001906	0.003812
24	B200030119	BOM	NMIL	1	0.000712	0.000712

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25	B200040065	BOM	NMIL	2	0.011646	0.023292
26	B200040073	BOM	NMIL	4	0.011646	0.046584
27	B200040108	BOM	NMIL	1	0.011646	0.011646
28	B200040152	BOM	NMIL	1	0.011646	0.011646
29	B200040157	BOM	NMIL	1	0.003751	0.003751
30	B200050083	BOM	NMIL	2	0.003013	0.006026
31	B200050084	BOM	NMIL	4	0.003013	0.012052
32	B200060030	BOM	NMIL	1	0.009149	0.009149
33	B200090005	BOM	NMIL	1	0.001476	0.001476
34	B200110006	BOM	NMIL	4	0.002896	0.011584
35	B200110042	BOM	NMIL	7	0.002210	0.015470
36	B200110046	BOM	NMIL	4	0.002896	0.011584
37	B200110095	BOM	NMIL	2	0.002896	0.005792
38	B200110123	BOM	NMIL	2	0.002210	0.004420
39	B200110128	BOM	NMIL	1	0.001551	0.001551
40	B200110190	BOM	NMIL	1	0.002896	0.002896
41	B200110202	BOM	NMIL	1	0.002896	0.002896
42	B200110223	BOM	NMIL	4	0.003039	0.012156
43	B200110227	BOM	NMIL	1	0.002896	0.002896
44	B200110235	BOM	NMIL	2	0.002896	0.005792
45	B200110279	BOM	NMIL	1	0.002210	0.002210
46	B200110309	BOM	NMIL	2	0.002896	0.005792
47	B200110313	BOM	NMIL	1	0.002896	0.002896
48	B200110325	BOM	NMIL	2	0.002896	0.005792
49	B200110441	BOM	NMIL	1	0.002896	0.002896
50	B200110468	BOM	NMIL	1	0.002896	0.002896
51	B200110490	BOM	NMIL	1	0.002210	0.002210
52	B200110501	BOM	NMIL	1	0.002210	0.002210
53	B200110524	BOM	NMIL	1	0.002210	0.002210
54	B200110550	BOM	NMIL	2	0.002210	0.004420
55	B200110574	BOM	NMIL	1	0.002319	0.002319
56	B200110635	BOM	NMIL	2	0.002210	0.004420
57	B200110646	BOM	NMIL	1	0.002210	0.002210
58	B200110652	BOM	NMIL	1	0.002210	0.002210
59	B200110709	BOM	NMIL	1	0.002026	0.002026
60	B200110733	BOM	NMIL	1	0.002026	0.002026
61	B200110743	BOM	NMIL	1	0.002026	0.002026
62	B200110864	BOM	NMIL	1	0.002026	0.002026
63	B200110888	BOM	NMIL	1	0.002210	0.002210
64	B200111089	BOM	NMIL	2	0.002896	0.005792

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65	B200160059	BOM	NMIL	1	0.008611	0.008611
66	B200170078	BOM	NMIL	3	0.003177	0.009531
67	B200170080	BOM	NMIL	2	0.004163	0.008326
68	B200180095	BOM	NMIL	1	0.001907	0.001907
69	B200180097	BOM	NMIL	1	0.002048	0.002048
70	B200180098	BOM	NMIL	1	0.001845	0.001845
71	B200190065	BOM	NMIL	1	0.010191	0.010191
72	B200190098	BOM	NMIL	1	0.004493	0.004493
73	B200200057	BOM	NMIL	2	0.008988	0.017976
74	B200200070	BOM	NMIL	1	0.007077	0.007077
75	B200200092	BOM	NMIL	2	0.009620	0.019240
76	B200200094	BOM	NMIL	1	0.004508	0.004508
77	B200200126	BOM	NMIL	2	0.010356	0.020712
78	B200200156	BOM	NMIL	4	0.006356	0.025424
79	B200200166	BOM	NMIL	2	0.006824	0.013648
80	B200200204	BOM	NMIL	3	0.007306	0.021918
81	B200200208	BOM	NMIL	1	0.006356	0.006356
82	B200210007	BOM	NMIL	1	0.021267	0.021267
83	B200220010	BOM	NMIL	1	0.003943	0.003943
84	B200220074	BOM	NMIL	2	0.002117	0.004234
85	B200220082	BOM	NMIL	5	0.001208	0.006040
86	B200230342	BOM	NMIL	1	0.002999	0.002999
87	B200230506	BOM	NMIL	1	0.001165	0.001165
88	B200230507	BOM	NMIL	2	0.014141	0.028282
89	B200230553	BOM	NMIL	2	0.028457	0.056914
90	B200230561	BOM	NMIL	3	0.011573	0.034719
91	B200240010	BOM	NMIL	4	0.004594	0.018376
92	B200250018	BOM	NMIL	1	0.000231	0.000231
93	B200260407	BOM	NMIL	1	0.000251	0.000251
94	B200260439	BOM	NMIL	1	0.000251	0.000251
95	B200280012	BOM	NMIL	1	0.000623	0.000623
96	B200290011	BOM	NMIL	2	0.002901	0.005802
97	B200300315	BOM	NMIL	1	0.050163	0.050163
98	B200300458	BOM	NMIL	1	0.008277	0.008277
99	B200300499	BOM	NMIL	1	0.038174	0.038174
100	B200310010	BOM	NMIL	1	0.009156	0.009156
101	B200360064	BOM	NMIL	1	0.001528	0.001528
102	B200370111	BOM	NMIL	1	0.001196	0.001196
103	B200370115	BOM	NMIL	2	0.001196	0.002392
104	B200370116	BOM	NMIL	1	0.001196	0.001196

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105	B210060136	BOM	NMIL	1	0.024396	0.024396
106	B210090247	BOM	SPECIAL	1	2.182912	2.182912
107	B210160078	BOM	NMIL	1	0.010000	0.010000
108	B210191722	BOM	NMIL	2	0.000429	0.000858
109	B210192888	BOM	NMIL	1	0.046214	0.046214
110	B210192891	BOM	NMIL	1	0.003548	0.003548

Total Failure Rate (F/10^6Hrs) : 5.905411
Mean Time (in hours) Between Failures (MTBF) : 169,336