



ZIPPY TECHNOLOGY CORP.

Mean Time Between Failures PREDICTION REPORT

MIL-HDBK-217F, Notice 2

Product : Redundant Switching Power Supply

Model/Type : ZRP2-5400K2V(RoHS)(PMBus WP1.2)

Approval By	Jead chen	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: JAN-12-2021
End Item Title : ZRP2 SERIES MTBF
End Item Part Number : ZRP2-5400K2V(RoHS)(PMBus WP1.2)
ZRP2-5400K2V(RoHS)(PMBus WP1.2) MTBF : 273,940
Module Title: ZIPPY TECHNOLOGY CORP
Module Part Number : ZRP / MTBF
Power Unit Module : ZRP-2400K2(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.

$$\text{Total Failure Rate}(F) = M\lambda^{(3/2)} + B\lambda = 4.627554/(3/2) + 0.565393 = 3.650429$$

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

$$\text{ZRP2-5400K2V(RoHS)(PMBus WP1.2)(MTBF)} = F/10^6 \text{ (Hrs)} = 1/(3.650429/10^6) = 273,940$$

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

Date : JAN-12-2021 Time : 11:31:08
End Item Title : ZRP SERIES MTBF
End Item Part Number : ZRP-2400K2(RoHS)(PMBus WP1.2)
ZRP-2400K2(RoHS)(PMBus WP1.2) MTBF : 216,097
Module Title : ZIPPY TECHNOLOGY CORP
Module Part Number : ZRP / MTBF
Module Reference Designation : ZRP
Environmental Condition : GB
Ambient Temperature: 25°C

ZRP-2400K2(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	B106560004	BOM	SPECIAL	1	0.218272	0.218272
2	B106560011	BOM	SPECIAL	1	0.190997	0.190997
3	B106560012	BOM	SPECIAL	1	0.273934	0.273934
4	B106560013	BOM	SPECIAL	1	0.183063	0.183063
5	B106560014	BOM	SPECIAL	1	0.120478	0.120478
6	B200000144	BOM	NMIL	1	0.004901	0.004901
7	B200000207	BOM	NMIL	1	0.004579	0.004579
8	B200000268	BOM	NMIL	1	0.004579	0.004579
9	B200000308	BOM	NMIL	1	0.013289	0.013289
10	B200000559	BOM	NMIL	1	0.005483	0.005483
11	B200000565	BOM	NMIL	1	0.007379	0.007379
12	B200000598	BOM	NMIL	3	0.013289	0.039867
13	B200000603	BOM	NMIL	2	0.005248	0.010496
14	B200000659	BOM	NMIL	1	0.005182	0.005182
15	B200010022	BOM	NMIL	1	0.000843	0.000843
16	B200010052	BOM	NMIL	7	0.000627	0.004389
17	B200010083	BOM	NMIL	1	0.034881	0.034881
18	B200010109	BOM	NMIL	5	0.000627	0.003135
19	B200010252	BOM	NMIL	4	0.072168	0.288672
20	B200010253	BOM	NMIL	1	0.065527	0.065527
21	B200010256	BOM	NMIL	2	0.073390	0.146780
22	B200020017	BOM	NMIL	1	0.000414	0.000414
23	B200020024	BOM	NMIL	3	0.000414	0.001242
24	B200020046	BOM	NMIL	1	0.000755	0.000755

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25	B200030080	BOM	NMIL	1	0.001906	0.001906
26	B200030083	BOM	NMIL	1	0.000712	0.000712
27	B200040073	BOM	NMIL	1	0.011646	0.011646
28	B200040120	BOM	NMIL	1	0.014427	0.014427
29	B200040133	BOM	NMIL	11	0.008485	0.093335
30	B200040158	BOM	NMIL	1	0.015829	0.015829
31	B200040162	BOM	NMIL	1	0.003751	0.003751
32	B200050036	BOM	NMIL	3	0.003013	0.009039
33	B200050081	BOM	NMIL	1	0.003013	0.003013
34	B200050084	BOM	NMIL	1	0.003013	0.003013
35	B200050088	BOM	NMIL	2	0.003013	0.006026
36	B200060039	BOM	NMIL	1	0.003026	0.003026
37	B200090005	BOM	NMIL	1	0.001476	0.001476
38	B200110001	BOM	NMIL	1	0.002896	0.002896
39	B200110021	BOM	NMIL	1	0.002896	0.002896
40	B200110035	BOM	NMIL	1	0.002896	0.002896
41	B200110042	BOM	NMIL	8	0.002210	0.017680
42	B200110120	BOM	NMIL	1	0.002896	0.002896
43	B200110177	BOM	NMIL	1	0.002896	0.002896
44	B200110185	BOM	NMIL	1	0.002896	0.002896
45	B200110223	BOM	NMIL	3	0.003039	0.009117
46	B200110279	BOM	NMIL	2	0.002210	0.004420
47	B200110282	BOM	NMIL	1	0.002896	0.002896
48	B200110313	BOM	NMIL	2	0.002896	0.005792
49	B200110473	BOM	NMIL	3	0.002896	0.008688
50	B200110488	BOM	NMIL	1	0.002210	0.002210
51	B200110512	BOM	NMIL	1	0.002210	0.002210
52	B200110521	BOM	NMIL	1	0.002210	0.002210
53	B200110523	BOM	NMIL	1	0.002210	0.002210
54	B200110524	BOM	NMIL	2	0.002210	0.004420
55	B200110529	BOM	NMIL	1	0.002210	0.002210
56	B200110530	BOM	NMIL	2	0.002210	0.004420
57	B200110694	BOM	NMIL	1	0.002210	0.002210
58	B200110695	BOM	NMIL	3	0.003716	0.011148
59	B200110729	BOM	NMIL	2	0.002026	0.004052
60	B200110730	BOM	NMIL	1	0.002026	0.002026
61	B200110733	BOM	NMIL	2	0.002026	0.004052
62	B200110734	BOM	NMIL	1	0.002026	0.002026
63	B200110735	BOM	NMIL	1	0.002026	0.002026
64	B200110737	BOM	NMIL	4	0.002210	0.008840

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65	B200110739	BOM	NMIL	1	0.002026	0.002026
66	B200110743	BOM	NMIL	2	0.002026	0.004052
67	B200110775	BOM	NMIL	3	0.002026	0.006078
68	B200110776	BOM	NMIL	4	0.002026	0.008104
69	B200110777	BOM	NMIL	1	0.002026	0.002026
70	B200110800	BOM	NMIL	2	0.002026	0.004052
71	B200110806	BOM	NMIL	1	0.002026	0.002026
72	B200110813	BOM	NMIL	2	0.002026	0.004052
73	B200110814	BOM	NMIL	1	0.002026	0.002026
74	B200110834	BOM	NMIL	1	0.002026	0.002026
75	B200110848	BOM	NMIL	1	0.002026	0.002026
76	B200110851	BOM	NMIL	1	0.002026	0.002026
77	B200110891	BOM	NMIL	1	0.002126	0.002126
78	B200110928	BOM	NMIL	1	0.002026	0.002026
79	B200110949	BOM	NMIL	1	0.002126	0.002126
80	B200111016	BOM	NMIL	1	0.002026	0.002026
81	B200111055	BOM	NMIL	1	0.002026	0.002026
82	B200111066	BOM	NMIL	1	0.002026	0.002026
83	B200120170	BOM	NMIL	1	0.005001	0.005001
84	B200160011	BOM	NMIL	1	0.008611	0.008611
85	B200160017	BOM	NMIL	1	0.004760	0.004760
86	B200170019	BOM	NMIL	1	0.003721	0.003721
87	B200170085	BOM	NMIL	2	0.003952	0.007904
88	B200180095	BOM	NMIL	2	0.001907	0.003814
89	B200180117	BOM	NMIL	1	0.001529	0.001529
90	B200190038	BOM	NMIL	1	0.011714	0.011714
91	B200190064	BOM	NMIL	1	0.012538	0.012538
92	B200190072	BOM	NMIL	1	0.010940	0.010940
93	B200190088	BOM	NMIL	1	0.011714	0.011714
94	B200200057	BOM	NMIL	1	0.008988	0.008988
95	B200200070	BOM	NMIL	1	0.007077	0.007077
96	B200200075	BOM	NMIL	1	0.009676	0.009676
97	B200200083	BOM	NMIL	1	0.004199	0.004199
98	B200200113	BOM	NMIL	1	0.005166	0.005166
99	B200200116	BOM	NMIL	4	0.004199	0.016796
100	B200200121	BOM	NMIL	1	0.006824	0.006824
101	B200200140	BOM	NMIL	1	0.003664	0.003664
102	B200200193	BOM	NMIL	1	0.004827	0.004827
103	B200200204	BOM	NMIL	1	0.007306	0.007306
104	B200200205	BOM	NMIL	1	0.007820	0.007820

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105	B200200208	BOM	NMIL	9	0.006356	0.057204
106	B200200209	BOM	NMIL	1	0.004508	0.004508
107	B200200213	BOM	NMIL	1	0.003924	0.003924
108	B200220020	BOM	NMIL	1	0.003440	0.003440
109	B200220046	BOM	NMIL	2	0.001125	0.002250
110	B200220082	BOM	NMIL	3	0.001208	0.003624
111	B200230210	BOM	NMIL	1	0.009001	0.009001
112	B200230276	BOM	NMIL	2	0.001263	0.002526
113	B200230288	BOM	NMIL	1	0.001165	0.001165
114	B200230417	BOM	NMIL	1	0.001661	0.001661
115	B200230436	BOM	NMIL	1	0.001803	0.001803
116	B200230445	BOM	NMIL	2	0.001978	0.003956
117	B200230491	BOM	NMIL	3	0.016249	0.048747
118	B200230499	BOM	NMIL	1	0.013545	0.013545
119	B200230542	BOM	NMIL	1	0.019375	0.019375
120	B200250009	BOM	NMIL	1	0.000205	0.000205
121	B200260208	BOM	NMIL	1	0.000251	0.000251
122	B200280012	BOM	NMIL	1	0.000623	0.000623
123	B200290015	BOM	NMIL	2	0.011159	0.022318
124	B200300382	BOM	NMIL	1	0.046007	0.046007
125	B200300422	BOM	NMIL	1	0.038592	0.038592
126	B200300485	BOM	NMIL	1	0.036934	0.036934
127	B200300524	BOM	NMIL	1	0.032940	0.032940
128	B200300555	BOM	NMIL	1	0.082262	0.082262
129	B200310019	BOM	NMIL	1	0.005232	0.005232
130	B200360067	BOM	NMIL	1	0.001671	0.001671
131	B200370003	BOM	NMIL	1	0.000962	0.000962
132	B200370088	BOM	NMIL	1	0.001373	0.001373
133	B200370115	BOM	NMIL	2	0.001196	0.002392
134	B210060136	BOM	NMIL	1	0.024396	0.024396
135	B210090274	BOM	SPECIAL	1	1.995000	1.995000
136	B210160023	BOM	NMIL	1	0.010000	0.010000
137	B210192677	BOM	NMIL	1	0.001193	0.001193
138	B210193249	BOM	NMIL	1	0.012434	0.012434

Total Failure Rate (F/10⁶Hrs) : 4.627554
Mean Time (in hours) Between Failures (MTBF) : 216,097