



ZIPPY TECHNOLOGY CORP.

**Mean Time Between Failures
PREDICTION REPORT**

MIL-HDBK-217F, Notice 2

Product : Redundant Switching Power Supply

Model/Type : USP2-5A00K2H(RoHS)(PMBus WP1.2)

Approval By	Carl chen	正 式 資 料 用 章	A red circular stamp with a double border. Inside, the text '正式資料' (Official Document) is at the top, 'APR-30-2018' is in the middle, and '研發本部' (R&D Department) is at the bottom.
Prepared By	Jian Huang Lin		

ZIPPY TECHNOLOGY CORP.
10F.,No.50,MINQUAN RD.,
XINDIAN 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: APR-30-2018
End Item Title : USP2 SERIES MTBF
End Item Part Number : USP2-5A00K2H(RoHS)(PMBus WP1.2)
USP2-5A00K2H(RoHS)(PMBus WP1.2) MTBF : 227,600
Module Title: ZIPPY TECHNOLOGY CORP
Module Part Number : USP / MTBF
Power Unit Module : USP-2A00K2(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.

$$\text{Total Failure Rate}(F) = M \lambda / (3/2) + B \lambda = 5.915264 / (3/2) + 0.450172 = 4.393681$$

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

$$\text{USP2-5A00K2H(RoHS)(PMBus WP1.2)(MTBF)} = F / 10^6 \text{ (Hrs)} = 1 / (4.393681 / 10^6) = 227,600$$

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

Date : APR-30-2018 Time : 15:25:41
End Item Title : USP SERIES MTBF
End Item Part Number : USP-2A00K2(RoHS)(PMBus WP1.2)
USP-2A00K2(RoHS)(PMBus WP1.2) MTBF : 169,054
Module Title : ZIPPY TECHNOLOGY CORP
Module Part Number : USP / MTBF
Module Reference Designation : USP
Environmental Condition : GB
Ambient Temperature: 25°C

USP-2A00K2(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	B104770004	BOM	SPECIAL	1	0.108713	0.108713
2	B105830005	BOM	SPECIAL	1	0.119286	0.119286
3	B106110002	BOM	SPECIAL	1	0.171015	0.171015
4	B106110003	BOM	SPECIAL	1	0.121707	0.121707
5	B106110004	BOM	SPECIAL	1	0.603405	0.603405
6	B106110005	BOM	SPECIAL	1	0.275465	0.275465
7	B106110007	BOM	SPECIAL	1	0.260255	0.260255
8	B200000272	BOM	NMIL	1	0.004579	0.004579
9	B200000308	BOM	NMIL	1	0.013289	0.013289
10	B200000455	BOM	NMIL	1	0.008308	0.008308
11	B200000601	BOM	NMIL	2	0.005806	0.011612
12	B200000603	BOM	NMIL	1	0.005248	0.005248
13	B200000612	BOM	NMIL	1	0.004716	0.004716
14	B200010052	BOM	NMIL	3	0.000627	0.001881
15	B200010109	BOM	NMIL	3	0.000627	0.001881
16	B200010235	BOM	NMIL	4	0.065527	0.262108
17	B200010243	BOM	NMIL	8	0.072168	0.577344
18	B200010245	BOM	NMIL	4	0.072168	0.288672
19	B200010253	BOM	NMIL	2	0.065527	0.131054
20	B200020034	BOM	NMIL	1	0.002941	0.002941
21	B200020037	BOM	NMIL	15	0.000424	0.006360
22	B200020038	BOM	NMIL	4	0.002120	0.008480
23	B200030085	BOM	NMIL	1	0.002308	0.002308
24	B200040104	BOM	NMIL	1	0.004278	0.004278

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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	B200050048	BOM	NMIL	1	0.002839	0.002839
26	B200050085	BOM	NMIL	2	0.003013	0.006026
27	B200050088	BOM	NMIL	2	0.003013	0.006026
28	B200060029	BOM	NMIL	1	0.013678	0.013678
29	B200090005	BOM	NMIL	1	0.001476	0.001476
30	B200110001	BOM	NMIL	1	0.002896	0.002896
31	B200110035	BOM	NMIL	1	0.002896	0.002896
32	B200110040	BOM	NMIL	1	0.002896	0.002896
33	B200110042	BOM	NMIL	4	0.002210	0.008840
34	B200110046	BOM	NMIL	2	0.002896	0.005792
35	B200110095	BOM	NMIL	2	0.002896	0.005792
36	B200110099	BOM	NMIL	4	0.002896	0.011584
37	B200110151	BOM	NMIL	1	0.002896	0.002896
38	B200110172	BOM	NMIL	1	0.002896	0.002896
39	B200110254	BOM	NMIL	1	0.002896	0.002896
40	B200110303	BOM	NMIL	2	0.003039	0.006078
41	B200110305	BOM	NMIL	1	0.001551	0.001551
42	B200110313	BOM	NMIL	1	0.002896	0.002896
43	B200110317	BOM	NMIL	2	0.002896	0.005792
44	B200110512	BOM	NMIL	4	0.002210	0.008840
45	B200110529	BOM	NMIL	12	0.002210	0.026520
46	B200110729	BOM	NMIL	1	0.002026	0.002026
47	B200110733	BOM	NMIL	4	0.002026	0.008104
48	B200110741	BOM	NMIL	1	0.002026	0.002026
49	B200110814	BOM	NMIL	1	0.002026	0.002026
50	B200110829	BOM	NMIL	3	0.003716	0.011148
51	B200110854	BOM	NMIL	3	0.002026	0.006078
52	B200120198	BOM	NMIL	1	0.004848	0.004848
53	B200160022	BOM	NMIL	1	0.009711	0.009711
54	B200170021	BOM	NMIL	1	0.003177	0.003177
55	B200170032	BOM	NMIL	2	0.003177	0.006354
56	B200170055	BOM	NMIL	2	0.003721	0.007442
57	B200180075	BOM	NMIL	1	0.001907	0.001907
58	B200180108	BOM	NMIL	1	0.001974	0.001974
59	B200190038	BOM	NMIL	1	0.011714	0.011714
60	B200200074	BOM	NMIL	3	0.007820	0.023460
61	B200200075	BOM	NMIL	1	0.009676	0.009676
62	B200200114	BOM	NMIL	3	0.006356	0.019068
63	B200200167	BOM	NMIL	1	0.010356	0.010356
64	B200200170	BOM	NMIL	1	0.007306	0.007306

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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)
65	B200200204	BOM	NMIL	2	0.007306	0.014612
66	B200200213	BOM	NMIL	1	0.003924	0.003924
67	B200220082	BOM	NMIL	3	0.001208	0.003624
68	B200230315	BOM	NMIL	3	0.021090	0.063270
69	B200230336	BOM	NMIL	1	0.001779	0.001779
70	B200230338	BOM	NMIL	3	0.002034	0.006102
71	B200230469	BOM	NMIL	4	0.013030	0.052120
72	B200260266	BOM	NMIL	1	0.000196	0.000196
73	B200260280	BOM	NMIL	1	0.000196	0.000196
74	B200260374	BOM	NMIL	1	0.000219	0.000219
75	B200260419	BOM	NMIL	1	0.000221	0.000221
76	B200260420	BOM	NMIL	1	0.000223	0.000223
77	B200280012	BOM	NMIL	1	0.000623	0.000623
78	B200290005	BOM	NMIL	1	0.002901	0.002901
79	B200290011	BOM	NMIL	2	0.002901	0.005802
80	B200300482	BOM	NMIL	1	0.007802	0.007802
81	B200300483	BOM	NMIL	1	0.094536	0.094536
82	B200310012	BOM	NMIL	1	0.005232	0.005232
83	B200370088	BOM	NMIL	1	0.001373	0.001373
84	B200370115	BOM	NMIL	1	0.001196	0.001196
85	B210060136	BOM	NMIL	1	0.024396	0.024396
86	B210140059	BOM	SPECIAL	1	2.277217	2.277217
87	B210160059	BOM	NMIL	1	0.010000	0.010000
88	B210192724	BOM	NMIL	1	0.063288	0.063288

Total Failure Rate (F/10⁶Hrs) : 5.915264
Mean Time (in hours) Between Failures (MTBF) : **169,054**