



**ZIPPY TECHNOLOGY CORP.**

**Mean Time Between Failures  
PREDICTION REPORT**

**MIL-HDBK-217F, Notice 2**

**Product : Redundant Switching Power Supply**

**Model/Type : M1R2-5800K2H(RoHS)(PMBus WP1.2)**

|                    |                                                                                     |                    |                                                                                      |
|--------------------|-------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------|
| <b>Approval By</b> |  | <b>正式資料<br/>月章</b> |  |
| <b>Prepared By</b> |  |                    |                                                                                      |

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: MAR-06-2018  
End Item Title : M1R2 SERIES MTBF  
End Item Part Number : M1R2-5800K2H(RoHS)(PMBus WP1.2)  
M1R2-5800K2H(RoHS)(PMBus WP1.2) MTBF : 230,921  
Module Title: ZIPPY TECHNOLOGY CORP  
Module Part Number : M1R / MTBF  
Power Unit Module : M1R-2800K2(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.

$$\text{Total Failure Rate}(F) = M \lambda / (3/2) + B \lambda = 5.454599 / (3/2) + 0.694086 = 4.330485$$

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

$$\text{M1R2-5800K2H(RoHS)(PMBus WP1.2)(MTBF)} = F / 10^6 \text{ (Hrs)} = 1 / (4.330485 / 10^6) = 230,921$$

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

Date : MAR-06-2018      Time : 14:04:52  
End Item Title : M1R SERIES MTBF  
End Item Part Number : M1R-2800K2(RoHS)(PMBus WP1.2)  
M1R-2800K2(RoHS)(PMBus WP1.2) MTBF : 183,332  
Module Title : ZIPPY TECHNOLOGY CORP  
Module Part Number : M1R / MTBF  
Module Reference Designation : M1R  
Environmental Condition : GB  
Ambient Temperature: 25°C

**M1R-2800K2(RoHS)(PMBus WP1.2)**

| ITEM<br># | Part<br>Number | Ref<br>Desig | Qual<br>Level | Quant | Individual<br>Failure Rate<br>(F/10 <sup>6</sup> Hrs) | Total<br>Failure Rate<br>(F/10 <sup>6</sup> Hrs) |
|-----------|----------------|--------------|---------------|-------|-------------------------------------------------------|--------------------------------------------------|
| 1         | B105190088     | BOM          | SPECIAL       | 1     | 0.339641                                              | 0.339641                                         |
| 2         | B105190091     | BOM          | SPECIAL       | 1     | 0.270313                                              | 0.270313                                         |
| 3         | B105190092     | BOM          | SPECIAL       | 1     | 0.536205                                              | 0.536205                                         |
| 4         | B105190093     | BOM          | SPECIAL       | 1     | 0.218347                                              | 0.218347                                         |
| 5         | B200000627     | BOM          | NMIL          | 1     | 0.008946                                              | 0.008946                                         |
| 6         | B200000637     | BOM          | NMIL          | 1     | 0.006974                                              | 0.006974                                         |
| 7         | B200010052     | BOM          | NMIL          | 2     | 0.000337                                              | 0.000674                                         |
| 8         | B200010109     | BOM          | NMIL          | 4     | 0.000723                                              | 0.002892                                         |
| 9         | B200010167     | BOM          | NMIL          | 2     | 0.000747                                              | 0.001494                                         |
| 10        | B200010252     | BOM          | NMIL          | 6     | 0.072168                                              | 0.433008                                         |
| 11        | B200010253     | BOM          | NMIL          | 2     | 0.065527                                              | 0.131054                                         |
| 12        | B200010254     | BOM          | NMIL          | 2     | 0.065527                                              | 0.131054                                         |
| 13        | B200010260     | BOM          | NMIL          | 2     | 0.000674                                              | 0.001348                                         |
| 14        | B200010262     | BOM          | NMIL          | 3     | 0.072168                                              | 0.216504                                         |
| 15        | B200020024     | BOM          | NMIL          | 1     | 0.002332                                              | 0.002332                                         |
| 16        | B200020034     | BOM          | NMIL          | 1     | 0.016175                                              | 0.016175                                         |
| 17        | B200030069     | BOM          | NMIL          | 2     | 0.002308                                              | 0.004616                                         |
| 18        | B200030107     | BOM          | NMIL          | 1     | 0.002308                                              | 0.002308                                         |
| 19        | B200040065     | BOM          | NMIL          | 1     | 0.011646                                              | 0.011646                                         |
| 20        | B200040073     | BOM          | NMIL          | 6     | 0.011646                                              | 0.069876                                         |
| 21        | B200040147     | BOM          | NMIL          | 1     | 0.018259                                              | 0.018259                                         |
| 22        | B200050032     | BOM          | NMIL          | 1     | 0.003013                                              | 0.003013                                         |
| 23        | B200060030     | BOM          | NMIL          | 1     | 0.009149                                              | 0.009149                                         |
| 24        | B200090005     | BOM          | NMIL          | 1     | 0.001476                                              | 0.001476                                         |

ZIPPY TECHNOLOGY CORP.  
10F.,No.50,MINQUAN RD.,  
XINDIAN DIST.,NEW TAIPEI CITY,TAIWAN,R.O.C.

| ITEM<br># | Part<br>Number | Ref<br>Desig | Qual<br>Level | Quant | Individual<br>Failure Rate<br>(F/10 <sup>6</sup> Hrs) | Total<br>Failure Rate<br>(F/10 <sup>6</sup> Hrs) |
|-----------|----------------|--------------|---------------|-------|-------------------------------------------------------|--------------------------------------------------|
| 25        | B200110006     | BOM          | NMIL          | 2     | 0.002896                                              | 0.005792                                         |
| 26        | B200110042     | BOM          | NMIL          | 6     | 0.002210                                              | 0.013260                                         |
| 27        | B200110128     | BOM          | NMIL          | 1     | 0.001551                                              | 0.001551                                         |
| 28        | B200110223     | BOM          | NMIL          | 4     | 0.003039                                              | 0.012156                                         |
| 29        | B200110235     | BOM          | NMIL          | 2     | 0.002896                                              | 0.005792                                         |
| 30        | B200110279     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 31        | B200110317     | BOM          | NMIL          | 1     | 0.002896                                              | 0.002896                                         |
| 32        | B200110325     | BOM          | NMIL          | 2     | 0.002896                                              | 0.005792                                         |
| 33        | B200110490     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 34        | B200110496     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 35        | B200110501     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 36        | B200110503     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 37        | B200110550     | BOM          | NMIL          | 2     | 0.002210                                              | 0.004420                                         |
| 38        | B200110574     | BOM          | NMIL          | 1     | 0.002319                                              | 0.002319                                         |
| 39        | B200110635     | BOM          | NMIL          | 2     | 0.002210                                              | 0.004420                                         |
| 40        | B200110652     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 41        | B200110733     | BOM          | NMIL          | 1     | 0.002026                                              | 0.002026                                         |
| 42        | B200110737     | BOM          | NMIL          | 2     | 0.002210                                              | 0.004420                                         |
| 43        | B200110743     | BOM          | NMIL          | 1     | 0.002026                                              | 0.002026                                         |
| 44        | B200110789     | BOM          | NMIL          | 1     | 0.002210                                              | 0.002210                                         |
| 45        | B200110864     | BOM          | NMIL          | 1     | 0.002026                                              | 0.002026                                         |
| 46        | B200111088     | BOM          | NMIL          | 1     | 0.002896                                              | 0.002896                                         |
| 47        | B200111099     | BOM          | NMIL          | 2     | 0.002210                                              | 0.004420                                         |
| 48        | B200160022     | BOM          | NMIL          | 1     | 0.009711                                              | 0.009711                                         |
| 49        | B200170018     | BOM          | NMIL          | 2     | 0.003177                                              | 0.006354                                         |
| 50        | B200170069     | BOM          | NMIL          | 3     | 0.003177                                              | 0.009531                                         |
| 51        | B200180092     | BOM          | NMIL          | 1     | 0.001845                                              | 0.001845                                         |
| 52        | B200180095     | BOM          | NMIL          | 2     | 0.001907                                              | 0.003814                                         |
| 53        | B200190065     | BOM          | NMIL          | 1     | 0.010191                                              | 0.010191                                         |
| 54        | B200190100     | BOM          | NMIL          | 1     | 0.013004                                              | 0.013004                                         |
| 55        | B200200070     | BOM          | NMIL          | 1     | 0.007077                                              | 0.007077                                         |
| 56        | B200200083     | BOM          | NMIL          | 1     | 0.004199                                              | 0.004199                                         |
| 57        | B200200092     | BOM          | NMIL          | 23    | 0.009620                                              | 0.221260                                         |
| 58        | B200200126     | BOM          | NMIL          | 2     | 0.010356                                              | 0.020712                                         |
| 59        | B200200156     | BOM          | NMIL          | 2     | 0.006356                                              | 0.012712                                         |
| 60        | B200200204     | BOM          | NMIL          | 1     | 0.007306                                              | 0.007306                                         |
| 61        | B200200205     | BOM          | NMIL          | 1     | 0.007820                                              | 0.007820                                         |
| 62        | B200200208     | BOM          | NMIL          | 1     | 0.006356                                              | 0.006356                                         |
| 63        | B200210007     | BOM          | NMIL          | 1     | 0.021267                                              | 0.021267                                         |
| 64        | B200220010     | BOM          | NMIL          | 1     | 0.003943                                              | 0.003943                                         |

ZIPPY TECHNOLOGY CORP.  
10F.,No.50,MINQUAN RD.,  
XINDIAN DIST.,NEW TAIPEI CITY,TAIWAN,R.O.C.

| ITEM<br># | Part<br>Number | Ref<br>Desig | Qual<br>Level | Quant | Individual<br>Failure Rate<br>(F/10^6Hrs) | Total<br>Failure Rate<br>(F/10^6Hrs) |
|-----------|----------------|--------------|---------------|-------|-------------------------------------------|--------------------------------------|
| 65        | B200220073     | BOM          | NMIL          | 1     | 0.002605                                  | 0.002605                             |
| 66        | B200220074     | BOM          | NMIL          | 1     | 0.002117                                  | 0.002117                             |
| 67        | B200220082     | BOM          | NMIL          | 5     | 0.001208                                  | 0.006040                             |
| 68        | B200230354     | BOM          | NMIL          | 2     | 0.011573                                  | 0.023146                             |
| 69        | B200230542     | BOM          | NMIL          | 2     | 0.022086                                  | 0.044172                             |
| 70        | B200240010     | BOM          | NMIL          | 2     | 0.004594                                  | 0.009188                             |
| 71        | B200250018     | BOM          | NMIL          | 1     | 0.015652                                  | 0.015652                             |
| 72        | B200260332     | BOM          | NMIL          | 1     | 0.025995                                  | 0.025995                             |
| 73        | B200260401     | BOM          | NMIL          | 1     | 0.019936                                  | 0.019936                             |
| 74        | B200280012     | BOM          | NMIL          | 1     | 0.000623                                  | 0.000623                             |
| 75        | B200290015     | BOM          | NMIL          | 2     | 0.011159                                  | 0.022318                             |
| 76        | B200300480     | BOM          | NMIL          | 1     | 0.030704                                  | 0.030704                             |
| 77        | B200300481     | BOM          | NMIL          | 1     | 0.004799                                  | 0.004799                             |
| 78        | B200310019     | BOM          | NMIL          | 1     | 0.005232                                  | 0.005232                             |
| 79        | B200370051     | BOM          | NMIL          | 1     | 0.001196                                  | 0.001196                             |
| 80        | B200370085     | BOM          | NMIL          | 1     | 0.001196                                  | 0.001196                             |
| 81        | B210060136     | BOM          | NMIL          | 1     | 0.024396                                  | 0.024396                             |
| 82        | B210090240     | BOM          | SPECIAL       | 1     | 2.276868                                  | 2.276868                             |
| 83        | B210160002     | BOM          | NMIL          | 1     | 0.010000                                  | 0.010000                             |
| 84        | B210192701     | BOM          | NMIL          | 1     | 0.031846                                  | 0.031846                             |
| 85        | B210192704     | BOM          | NMIL          | 1     | 0.000482                                  | 0.000482                             |

Total Failure Rate (F/10^6Hrs) : 5.454599  
Mean Time (in hours) Between Failures (MTBF) : **183,332**