

ZIPPY TECHNOLOGY CORP  
10F, No. 50, MIN CHYUAN 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: JUL-05-2013  
End Item Title : M1V2 SERIES MTBF  
End Item Part Number : M1V2-5807V4D (RoHS)  
M1V2-5807V4D (RoHS) MTBF : 163,887  
Module Title: ZIPPY TECHNOLOGY CORP  
Module Part Number : M1V / MTBF  
Power Unit Module : M1V-2800V (RoHS)  
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.

$$\text{Total Failure Rate}(F) = M \lambda / (3/2) + B \lambda = 7.070361 / (3/2) + 1.388172 = 6.101746$$

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

$$\text{M1V2-5807V4D (RoHS)(MTBF)} = F / 10^6 \text{Hrs} = 6.101746 / 10^6 = 163,887$$

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

Date : JUL-05-2013      Time : 15:55:45  
End Item Title : M1V SERIES MTBF  
End Item Part Number : M1V-2800V (RoHS)  
M1V-2800V (RoHS) MTBF : 141,435  
Module Title : ZIPPY TECHNOLOGY CORP  
Module Part Number : M1V / MTBF  
Module Reference Designation : M1V  
Environmental Condition : GB  
Ambient Temperature: 25°C

**M1V-2800V (RoHS)**

| 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         | B102270003     | BOM          | NMIL          | 1     | 0.128027                                              | 0.128027                                         |
| 2         | B102330003     | BOM          | NMIL          | 1     | 0.132621                                              | 0.132621                                         |
| 3         | B102330004     | BOM          | NMIL          | 1     | 0.069564                                              | 0.069564                                         |
| 4         | B102330005     | BOM          | NMIL          | 1     | 0.125731                                              | 0.125731                                         |
| 5         | B102620003     | BOM          | NMIL          | 1     | 0.074349                                              | 0.074349                                         |
| 6         | B103080011     | BOM          | NMIL          | 1     | 1.222003                                              | 1.222003                                         |
| 7         | B103080014     | BOM          | NMIL          | 1     | 0.008316                                              | 0.008316                                         |
| 8         | B103180007     | BOM          | NMIL          | 1     | 0.044939                                              | 0.044939                                         |
| 9         | B200000001     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 10        | B200000296     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 11        | B200000332     | BOM          | SPECIAL       | 2     | 0.094935                                              | 0.189870                                         |
| 12        | B200000333     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 13        | B200000364     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 14        | B200010052     | BOM          | NMIL          | 3     | 0.000798                                              | 0.002394                                         |
| 15        | B200010091     | BOM          | NMIL          | 1     | 0.000814                                              | 0.000814                                         |
| 16        | B200010098     | BOM          | NMIL          | 1     | 0.000798                                              | 0.000798                                         |
| 17        | B200010105     | BOM          | NMIL          | 6     | 0.032026                                              | 0.192156                                         |
| 18        | B200010109     | BOM          | NMIL          | 6     | 0.000798                                              | 0.004788                                         |
| 19        | B200010112     | BOM          | NMIL          | 4     | 0.032026                                              | 0.128104                                         |
| 20        | B200020017     | BOM          | NMIL          | 2     | 0.005156                                              | 0.010312                                         |
| 21        | B200020020     | BOM          | NMIL          | 2     | 0.005156                                              | 0.010312                                         |
| 22        | B200020021     | BOM          | NMIL          | 1     | 0.005156                                              | 0.005156                                         |
| 23        | B200030037     | BOM          | NMIL          | 2     | 0.018136                                              | 0.036272                                         |
| 24        | B200040053     | BOM          | NMIL          | 1     | 0.016433                                              | 0.016433                                         |

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|    |            |     |      |    |          |          |
|----|------------|-----|------|----|----------|----------|
| 25 | B200040065 | BOM | NMIL | 1  | 0.005967 | 0.005967 |
| 26 | B200040073 | BOM | NMIL | 13 | 0.005967 | 0.077571 |
| 27 | B200040083 | BOM | NMIL | 1  | 0.016433 | 0.016433 |
| 28 | B200040085 | BOM | NMIL | 1  | 0.016433 | 0.016433 |
| 29 | B200050024 | BOM | NMIL | 1  | 0.005218 | 0.005218 |
| 30 | B200050032 | BOM | NMIL | 7  | 0.005218 | 0.036526 |
| 31 | B200050070 | BOM | NMIL | 2  | 0.005218 | 0.010436 |
| 32 | B200060009 | BOM | NMIL | 1  | 0.014899 | 0.014899 |
| 33 | B200070007 | BOM | NMIL | 2  | 0.014015 | 0.028030 |
| 34 | B200090005 | BOM | NMIL | 1  | 0.018095 | 0.018095 |
| 35 | B200110006 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 36 | B200110042 | BOM | NMIL | 5  | 0.004650 | 0.023250 |
| 37 | B200110095 | BOM | NMIL | 10 | 0.004650 | 0.046500 |
| 38 | B200110120 | BOM | NMIL | 4  | 0.004650 | 0.018600 |
| 39 | B200110123 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 40 | B200110172 | BOM | NMIL | 6  | 0.004650 | 0.027900 |
| 41 | B200110192 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 42 | B200110202 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 43 | B200110223 | BOM | NMIL | 4  | 0.005115 | 0.020460 |
| 44 | B200110227 | BOM | NMIL | 6  | 0.004650 | 0.027900 |
| 45 | B200110235 | BOM | NMIL | 3  | 0.004650 | 0.013950 |
| 46 | B200110276 | BOM | NMIL | 4  | 0.004650 | 0.018600 |
| 47 | B200110279 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 48 | B200110282 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 49 | B200110311 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 50 | B200110489 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 51 | B200110493 | BOM | NMIL | 6  | 0.005115 | 0.030690 |
| 52 | B200110494 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 53 | B200110502 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 54 | B200110503 | BOM | NMIL | 1  | 0.005115 | 0.005115 |
| 55 | B200110506 | BOM | NMIL | 2  | 0.004650 | 0.009300 |
| 56 | B200110524 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 57 | B200110525 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 58 | B200110527 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 59 | B200110551 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 60 | B200110583 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 61 | B200110608 | BOM | NMIL | 3  | 0.007440 | 0.022320 |
| 62 | B200110659 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 63 | B200120170 | BOM | NMIL | 1  | 0.010780 | 0.010780 |
| 64 | B200120171 | BOM | NMIL | 1  | 0.006870 | 0.006870 |
| 65 | B200160028 | BOM | NMIL | 1  | 0.065000 | 0.065000 |
| 66 | B200170015 | BOM | NMIL | 2  | 0.005156 | 0.010312 |
| 67 | B200170021 | BOM | NMIL | 3  | 0.005156 | 0.015468 |
| 68 | B200180075 | BOM | N/A  | 2  | 0.008923 | 0.017846 |

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|-----|------------|-----|----------|---|----------|----------|
| 69  | B200180079 | BOM | N/A      | 1 | 0.008923 | 0.008923 |
| 70  | B200190024 | BOM | N/A      | 1 | 0.015889 | 0.015889 |
| 71  | B200190065 | BOM | N/A      | 1 | 0.014104 | 0.014104 |
| 72  | B200200012 | BOM | N/A      | 2 | 0.009203 | 0.018406 |
| 73  | B200200017 | BOM | N/A      | 7 | 0.011856 | 0.082992 |
| 74  | B200200053 | BOM | N/A      | 4 | 0.014056 | 0.056224 |
| 75  | B200200057 | BOM | N/A      | 1 | 0.018108 | 0.018108 |
| 76  | B200200060 | BOM | N/A      | 4 | 0.012930 | 0.051720 |
| 77  | B200200062 | BOM | N/A      | 1 | 0.007791 | 0.007791 |
| 78  | B200200069 | BOM | N/A      | 1 | 0.006575 | 0.006575 |
| 79  | B200200096 | BOM | N/A      | 2 | 0.008147 | 0.016294 |
| 80  | B200220010 | BOM | N/A      | 1 | 0.002761 | 0.002761 |
| 81  | B200220021 | BOM | N/A      | 1 | 0.002337 | 0.002337 |
| 82  | B200220036 | BOM | N/A      | 2 | 0.002647 | 0.005294 |
| 83  | B200220047 | BOM | N/A      | 1 | 0.002537 | 0.002537 |
| 84  | B200230226 | BOM | N/A      | 3 | 0.022678 | 0.068034 |
| 85  | B200230277 | BOM | N/A      | 1 | 0.042323 | 0.042323 |
| 86  | B200230337 | BOM | N/A      | 1 | 0.022488 | 0.022488 |
| 87  | B200230356 | BOM | N/A      | 3 | 0.044972 | 0.134916 |
| 88  | B200230381 | BOM | N/A      | 2 | 0.048063 | 0.096126 |
| 89  | B200230383 | BOM | N/A      | 2 | 0.153441 | 0.306882 |
| 90  | B200260219 | BOM | NMIL     | 1 | 0.089812 | 0.089812 |
| 91  | B200260232 | BOM | NMIL     | 1 | 0.089812 | 0.089812 |
| 92  | B200260268 | BOM | NMIL     | 1 | 0.089812 | 0.089812 |
| 93  | B200260269 | BOM | NMIL     | 2 | 0.089812 | 0.179624 |
| 94  | B200280018 | BOM | NMIL     | 1 | 0.015958 | 0.015958 |
| 95  | B200290011 | BOM | NMIL     | 2 | 0.013740 | 0.027480 |
| 96  | B200300283 | BOM | NMIL     | 1 | 0.026667 | 0.026667 |
| 97  | B200300284 | BOM | NMIL     | 1 | 0.003922 | 0.003922 |
| 98  | B210090090 | BOM | KNOWNFR  | 1 | 2.030494 | 2.030494 |
| 99  | B210160002 | BOM | N/A      | 1 | 0.010000 | 0.010000 |
| 100 | B210191093 | N/A | STANDARD | 1 | 0.020588 | 0.020588 |

Total Failure Rate (F/10<sup>6</sup>Hrs) : 7.070361  
Mean Time (in hours) Between Failures (MTBF) : 141,435