

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: JAN-30-2013  
End Item Title : BMRW SERIES MTBF  
End Item Part Number : BMRW-5360V4V (RoHS)  
BMRW-5360V4V (RoHS) MTBF : 166,719  
Module Title: ZIPPY TECHNOLOGY CORP  
Module Part Number : BMRW / MTBF  
Power Unit Module : BMRW-3360V-R (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.

$$\text{Total Failure Rate}(F) = M \lambda / (3/2) + B \lambda = 7.978886 / (3/2) + 0.678840 = 5.998097$$

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

$$\text{BMRW-5360V3V (RoHS)(MTBF)} = F / 10^6 \text{Hrs} = 5.998097 / 10^6 = 166,719$$

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(Sorted by Part Number)  
MIL - HDBK - 217F, Notice 2

Date : JAN-30-2013      Time : 14:21:42  
End Item Title : BMRW SERIES MTBF  
End Item Part Number : BMRW-3360V-R (RoHS)  
BMRW-3360V-R (RoHS) MTBF : 125,331  
Module Title : ZIPPY TECHNOLOGY CORP  
Module Part Number : BMRW / MTBF  
Module Reference Designation : BMRW  
Environmental Condition : GB  
Ambient Temperature: 25°C

**BMRW-3360V-R (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         | B102720004     | BOM          | NMIL          | 1     | 0.069564                                              | 0.069564                                         |
| 2         | B102970002     | BOM          | NMIL          | 1     | 0.074349                                              | 0.074349                                         |
| 3         | B103210004     | BOM          | NMIL          | 1     | 0.065162                                              | 0.065162                                         |
| 4         | B104220002     | BOM          | NMIL          | 1     | 0.339591                                              | 0.339591                                         |
| 5         | B200000058     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 6         | B200000080     | BOM          | SPECIAL       | 2     | 0.094935                                              | 0.189870                                         |
| 7         | B200000144     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 8         | B200000207     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 9         | B200000252     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 10        | B200000257     | BOM          | SPECIAL       | 1     | 0.094935                                              | 0.094935                                         |
| 11        | B200000308     | BOM          | SPECIAL       | 4     | 0.094935                                              | 0.379740                                         |
| 12        | B200010009     | BOM          | NMIL          | 1     | 0.000798                                              | 0.000798                                         |
| 13        | B200010014     | BOM          | NMIL          | 1     | 0.000798                                              | 0.000798                                         |
| 14        | B200010022     | BOM          | NMIL          | 2     | 0.000798                                              | 0.001596                                         |
| 15        | B200010052     | BOM          | NMIL          | 1     | 0.000798                                              | 0.000798                                         |
| 16        | B200010056     | BOM          | NMIL          | 2     | 0.000798                                              | 0.001596                                         |
| 17        | B200010066     | BOM          | NMIL          | 1     | 0.029640                                              | 0.029640                                         |
| 18        | B200010067     | BOM          | NMIL          | 2     | 0.000798                                              | 0.001596                                         |
| 19        | B200010080     | BOM          | NMIL          | 5     | 0.029640                                              | 0.148200                                         |
| 20        | B200010088     | BOM          | NMIL          | 2     | 0.029640                                              | 0.059280                                         |
| 21        | B200010112     | BOM          | NMIL          | 2     | 0.029640                                              | 0.059280                                         |
| 22        | B200010122     | BOM          | NMIL          | 1     | 0.029640                                              | 0.029640                                         |
| 23        | B200010153     | BOM          | NMIL          | 2     | 0.029640                                              | 0.059280                                         |
| 24        | B200020004     | BOM          | NMIL          | 13    | 0.005156                                              | 0.067028                                         |

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|    |            |     |      |   |          |          |
|----|------------|-----|------|---|----------|----------|
| 25 | B200020010 | BOM | NMIL | 2 | 0.006751 | 0.013502 |
| 26 | B200030018 | BOM | NMIL | 1 | 0.007617 | 0.007617 |
| 27 | B200030019 | BOM | NMIL | 1 | 0.001995 | 0.001995 |
| 28 | B200030046 | BOM | NMIL | 1 | 0.003446 | 0.003446 |
| 29 | B200040012 | BOM | NMIL | 1 | 0.005967 | 0.005967 |
| 30 | B200040059 | BOM | NMIL | 1 | 0.005967 | 0.005967 |
| 31 | B200040063 | BOM | NMIL | 1 | 0.015209 | 0.015209 |
| 32 | B200040084 | BOM | NMIL | 1 | 0.007466 | 0.007466 |
| 33 | B200050024 | BOM | NMIL | 1 | 0.005218 | 0.005218 |
| 34 | B200050036 | BOM | NMIL | 2 | 0.005218 | 0.010436 |
| 35 | B200050039 | BOM | NMIL | 1 | 0.005218 | 0.005218 |
| 36 | B200050040 | BOM | NMIL | 1 | 0.005218 | 0.005218 |
| 37 | B200090006 | BOM | NMIL | 1 | 0.001518 | 0.001518 |
| 38 | B200110040 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 39 | B200110042 | BOM | NMIL | 8 | 0.004650 | 0.037200 |
| 40 | B200110046 | BOM | NMIL | 7 | 0.004650 | 0.032550 |
| 41 | B200110120 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 42 | B200110123 | BOM | NMIL | 4 | 0.004650 | 0.018600 |
| 43 | B200110130 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 44 | B200110149 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 45 | B200110172 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 46 | B200110190 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 47 | B200110192 | BOM | NMIL | 3 | 0.004650 | 0.013950 |
| 48 | B200110261 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 49 | B200110270 | BOM | NMIL | 3 | 0.004650 | 0.013950 |
| 50 | B200110282 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 51 | B200110302 | BOM | NMIL | 1 | 0.005115 | 0.005115 |
| 52 | B200110489 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 53 | B200110493 | BOM | NMIL | 1 | 0.005115 | 0.005115 |
| 54 | B200110501 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 55 | B200110506 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 56 | B200110508 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 57 | B200110509 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 58 | B200110510 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 59 | B200110512 | BOM | NMIL | 3 | 0.004650 | 0.013950 |
| 60 | B200110519 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 61 | B200110520 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 62 | B200110524 | BOM | NMIL | 2 | 0.004650 | 0.009300 |
| 63 | B200110525 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 64 | B200110529 | BOM | NMIL | 7 | 0.004650 | 0.032550 |
| 65 | B200110542 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 66 | B200110543 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 67 | B200110544 | BOM | NMIL | 1 | 0.004650 | 0.004650 |
| 68 | B200110550 | BOM | NMIL | 1 | 0.004650 | 0.004650 |

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|-----|------------|-----|------|----|----------|----------|
| 69  | B200110551 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 70  | B200110554 | BOM | NMIL | 10 | 0.004650 | 0.046500 |
| 71  | B200110561 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 72  | B200110576 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 73  | B200110588 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 74  | B200110618 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 75  | B200110619 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 76  | B200110623 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 77  | B200110626 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 78  | B200110662 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 79  | B200110691 | BOM | NMIL | 3  | 0.004650 | 0.013950 |
| 80  | B200110767 | BOM | NMIL | 1  | 0.004650 | 0.004650 |
| 81  | B200120012 | BOM | NMIL | 1  | 0.007735 | 0.007735 |
| 82  | B200120015 | BOM | NMIL | 1  | 0.008509 | 0.008509 |
| 83  | B200120032 | BOM | NMIL | 1  | 0.006870 | 0.006870 |
| 84  | B200120102 | BOM | NMIL | 1  | 0.007735 | 0.007735 |
| 85  | B200160017 | BOM | NMIL | 1  | 0.065000 | 0.065000 |
| 86  | B200160034 | BOM | NMIL | 1  | 0.105000 | 0.105000 |
| 87  | B200170029 | BOM | NMIL | 3  | 0.004875 | 0.014625 |
| 88  | B200190031 | BOM | N/A  | 1  | 0.017894 | 0.017894 |
| 89  | B200200006 | BOM | N/A  | 2  | 0.007144 | 0.014288 |
| 90  | B200200012 | BOM | N/A  | 4  | 0.009203 | 0.036812 |
| 91  | B200200013 | BOM | N/A  | 1  | 0.009203 | 0.009203 |
| 92  | B200200021 | BOM | N/A  | 1  | 0.015274 | 0.015274 |
| 93  | B200200029 | BOM | N/A  | 1  | 0.006048 | 0.006048 |
| 94  | B200200047 | BOM | N/A  | 1  | 0.008470 | 0.008470 |
| 95  | B200200053 | BOM | N/A  | 2  | 0.014056 | 0.028112 |
| 96  | B200200060 | BOM | N/A  | 2  | 0.012930 | 0.025860 |
| 97  | B200200061 | BOM | N/A  | 3  | 0.008470 | 0.025410 |
| 98  | B200200062 | BOM | N/A  | 2  | 0.007791 | 0.015582 |
| 99  | B200200101 | BOM | N/A  | 1  | 0.016657 | 0.016657 |
| 100 | B200200156 | BOM | N/A  | 6  | 0.011856 | 0.071136 |
| 101 | B200220021 | BOM | N/A  | 1  | 0.002337 | 0.002337 |
| 102 | B200220028 | BOM | N/A  | 2  | 0.002647 | 0.005294 |
| 103 | B200220038 | BOM | N/A  | 1  | 0.002898 | 0.002898 |
| 104 | B200230198 | BOM | N/A  | 5  | 0.054950 | 0.274750 |
| 105 | B200230210 | BOM | N/A  | 1  | 0.047680 | 0.047680 |
| 106 | B200230217 | BOM | N/A  | 2  | 0.039169 | 0.078338 |
| 107 | B200230236 | BOM | N/A  | 1  | 0.015848 | 0.015848 |
| 108 | B200230288 | BOM | N/A  | 1  | 0.018168 | 0.018168 |
| 109 | B200230338 | BOM | N/A  | 4  | 0.027499 | 0.109996 |
| 110 | B200230377 | BOM | N/A  | 2  | 0.026984 | 0.053968 |
| 111 | B200230379 | BOM | N/A  | 5  | 0.034500 | 0.172500 |
| 112 | B200230436 | BOM | N/A  | 1  | 0.034192 | 0.034192 |

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|-----|------------|-----|----------|---|----------|----------|
| 113 | B200240003 | BOM | N/A      | 1 | 0.052174 | 0.052174 |
| 114 | B200250009 | BOM | NMIL     | 1 | 0.021863 | 0.021863 |
| 115 | B200260215 | BOM | NMIL     | 1 | 0.041498 | 0.041498 |
| 116 | B200260250 | BOM | NMIL     | 1 | 0.041498 | 0.041498 |
| 117 | B200260252 | BOM | NMIL     | 1 | 0.041498 | 0.041498 |
| 118 | B200300219 | BOM | NMIL     | 1 | 0.003630 | 0.003630 |
| 119 | B200300236 | BOM | NMIL     | 1 | 0.003630 | 0.003630 |
| 120 | B200300269 | BOM | NMIL     | 1 | 0.003630 | 0.003630 |
| 121 | B200300318 | BOM | NMIL     | 1 | 0.024680 | 0.024680 |
| 122 | B210090072 | BOM | KNOWNFR  | 2 | 1.915660 | 3.831320 |
| 123 | B210160043 | BOM | N/A      | 1 | 0.010000 | 0.010000 |
| 124 | B210191144 | N/A | STANDARD | 1 | 0.020588 | 0.020588 |

|                                                |          |
|------------------------------------------------|----------|
| Total Failure Rate (F/10 <sup>6</sup> Hrs) :   | 7.978886 |
| Mean Time (in hours) Between Failures (MTBF) : | 125,331  |