

Wet Tantalum Capacitors, Military Established Reliability, MIL-PRF-39006 Qualified Styles CLR65, 79, 81, 90, 91



FEATURES

- Hermetically sealed
- Metal cased
- Axial lead
- Tubular

SPECIFICATIONS

- Style CLR65, M39006/09
- Style CLR69, M39006/21
- Style CLR79, M39006/22
- Style CLR81, M39006/25
- Style CLR90, M39006/30
- Style CLR91, M39006/31

Established Reliability Tantalum Capacitors to Military Specification MIL-PRF-39006: In accordance with the Military Specification, MIL-PRF-39006 all capacitors are marked with the Military Part Number (M39006/xx-xxxx) rather than the older Style designation (CLRxxxxxxxx) and should be ordered as such.

For information on the performance characteristics of these capacitors, please refer to the latest issue of the Military

Specification. MIL-PRF-39006 establishes 1000 h failure rate levels of 2 %, 1 %, 0.1 %, and 0.01 %. When ordering these parts, care must be exercised that the correct part number expressing the appropriate failure level be specified.

Each order for Military Style capacitors requiring government inspection must state whether inspection is to be at the destination or at the Vishay Sprague plant. Orders requiring source inspection cannot be shipped until this has been accomplished



Note

The material in this section has been abstracted from MIL-PRF-39006/09/22/25/30/31.



| CASE CODE | BARE CASE | | WITH INSULATING SLEEVE | | E LEAD LENGTH | WEIGHT (oz./g) (Max.) |
|-----------|-----------------------------|---|------------------------|---------------|------------------------------|-----------------------|
| | D | L | D (Max.) | L (Max.) | | |
| T1 | 0.188 ± 0.016 [4.78 ± 0.41] | 0.453 + 0.031 - 0.016 [11.51 + 0.79 - 0.41] | 0.219 [5.56] | 0.515 [13.08] | 1.500 ± 0.250 [38.10 ± 6.35] | 0.07 [2.0] |
| T2 | 0.281 ± 0.016 [7.14 ± 0.41] | 0.641 + 0.031 - 0.016 [16.28 + 0.79 - 0.41] | 0.312 [7.92] | 0.704 [17.88] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.18 [5.1] |
| T3 | 0.375 ± 0.016 [9.53 ± 0.41] | 0.766 + 0.031 - 0.016 [19.46 + 0.79 - 0.41] | 0.406 [10.31] | 0.828 [21.03] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.36 [10.2] |
| T4 | 0.375 ± 0.016 [9.53 ± 0.41] | 1.062 + 0.031 - 0.016 [26.97 + 0.79 - 0.41] | 0.406 [10.31] | 1.126 [28.60] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.49 [13.9] |



| CASE CODE | BARE CASE | | WITH INSULATING SLEEVE | | E LEAD LENGTH | WEIGHT (oz./g) (Max.) |
|-----------|-----------------------------|---|------------------------|---------------|------------------------------|-----------------------|
| | D | L | D (Max.) | L (Max.) | | |
| T1 | 0.188 ± 0.016 [4.78 ± 0.41] | 0.453 + 0.031 - 0.016 [11.51 + 0.79 - 0.41] | 0.219 [5.56] | 0.515 [13.08] | 1.500 ± 0.250 [38.10 ± 6.35] | 0.09 [2.6] |
| T2 | 0.281 ± 0.016 [7.14 ± 0.41] | 0.641 + 0.031 - 0.016 [16.28 + 0.79 - 0.41] | 0.312 [7.92] | 0.704 [17.88] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.22 [6.2] |
| T3 | 0.375 ± 0.016 [9.53 ± 0.41] | 0.766 + 0.031 - 0.016 [19.46 + 0.79 - 0.41] | 0.406 [10.31] | 0.828 [21.03] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.41 [11.6] |
| T4 | 0.375 ± 0.016 [9.53 ± 0.41] | 1.062 + 0.031 - 0.016 [26.97 + 0.79 - 0.41] | 0.406 [10.31] | 1.126 [28.60] | 2.250 ± 0.250 [57.15 ± 6.35] | 0.62 [17.7] |



| STANDARD/EXTENDED RATINGS: CLR65*, M39006/09-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|------|---------------------|---------------------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/09- FAILURE RATE LEVEL (%/1000 h) | | | | MAX. DCL (μA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | |
| | | | L | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C |
| | | | 2.0 | 1.0 | 0.1 | 0.01 | | | | | | | |
| 6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C | | | | | | | | | | | | | |
| 30.0 | T1 | 20 | 8001 | 8206 | 8411 | 8616 | 1.0 | 2.0 | 9.1 | 100 | - 40 | + 10.5 | + 12 |
| 30.0 | T1 | 10 | 8002 | 8207 | 8412 | 8617 | 1.0 | 2.0 | 9.1 | 100 | - 40 | + 10.5 | + 12 |
| 30.0 | T1 | 5 | 8003 | 8208 | 8413 | 8618 | 1.0 | 2.0 | 9.1 | 100 | - 40 | + 10.5 | + 12 |
| 68.0 | T1 | 20 | 8004 | 8209 | 8414 | 8619 | 1.0 | 2.0 | 20.4 | 60 | - 40 | + 14 | + 16 |
| 68.0 | T1 | 10 | 8005 | 8210 | 8415 | 8620 | 1.0 | 2.0 | 20.4 | 60 | - 40 | + 14 | + 16 |
| 68.0 | T1 | 5 | 8006 | 8211 | 8416 | 8621 | 1.0 | 2.0 | 20.4 | 60 | - 40 | + 14 | + 16 |
| 140.0 | T2 | 20 | 8007 | 8212 | 8417 | 8622 | 1.0 | 3.0 | 21.3 | 40 | - 40 | + 14 | + 16 |
| 140.0 | T2 | 10 | 8008 | 8213 | 8418 | 8623 | 1.0 | 3.0 | 21.3 | 40 | - 40 | + 14 | + 16 |
| 140.0 | T2 | 5 | 8009 | 8214 | 8419 | 8624 | 1.0 | 3.0 | 21.3 | 40 | - 40 | + 14 | + 16 |
| 270.0 | T2 | 20 | 8010 | 8215 | 8420 | 8625 | 1.0 | 6.5 | 81.8 | 25 | - 44 | + 17.5 | + 20 |
| 270.0 | T2 | 10 | 8011 | 8216 | 8421 | 8626 | 1.0 | 6.5 | 81.8 | 25 | - 44 | + 17.5 | + 20 |
| 270.0 | T2 | 5 | 8012 | 8217 | 8422 | 8627 | 1.0 | 6.5 | 81.8 | 25 | - 44 | + 17.5 | + 20 |
| 330.0 | T3 | 20 | 8013 | 8218 | 8423 | 8628 | 2.0 | 7.9 | 49.6 | 20 | - 44 | + 14 | + 16 |
| 330.0 | T3 | 10 | 8014 | 8219 | 8424 | 8629 | 2.0 | 7.9 | 49.6 | 20 | - 44 | + 14 | + 16 |
| 330.0 | T3 | 5 | 8015 | 8220 | 8425 | 8630 | 2.0 | 7.9 | 49.6 | 20 | - 44 | + 14 | + 16 |
| 560.0 | T3 | 20 | 8016 | 8221 | 8426 | 8631 | 2.0 | 13.0 | 128.0 | 25 | - 64 | + 17.5 | + 20 |
| 560.0 | T3 | 10 | 8017 | 8222 | 8427 | 8632 | 2.0 | 13.0 | 128.0 | 25 | - 64 | + 17.5 | + 20 |
| 560.0 | T3 | 5 | 8018 | 8223 | 8428 | 8633 | 2.0 | 13.0 | 128.0 | 25 | - 64 | + 17.5 | + 20 |
| 1200.0 | T4 | 20 | 8019 | 8224 | 8429 | 8634 | 3.0 | 14.0 | 144.4 | 20 | - 80 | + 25 | + 25 |
| 1200.0 | T4 | 10 | 8020 | 8225 | 8430 | 8635 | 3.0 | 14.0 | 144.4 | 20 | - 80 | + 25 | + 25 |
| 8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C | | | | | | | | | | | | | |
| 25.0 | T1 | 20 | 8021 | 8226 | 8431 | 8636 | 1.0 | 2.0 | 7.6 | 100 | - 40 | + 10.5 | + 12 |
| 25.0 | T1 | 10 | 8022 | 8227 | 8432 | 8637 | 1.0 | 2.0 | 7.6 | 100 | - 40 | + 10.5 | + 12 |
| 25.0 | T1 | 5 | 8023 | 8228 | 8433 | 8638 | 1.0 | 2.0 | 7.6 | 100 | - 40 | + 10.5 | + 12 |
| 56.0 | T1 | 20 | 8024 | 8229 | 8434 | 8639 | 1.0 | 2.0 | 17.0 | 59 | - 40 | + 14 | + 16 |
| 56.0 | T1 | 10 | 8025 | 8230 | 8435 | 8640 | 1.0 | 2.0 | 17.0 | 59 | - 40 | + 14 | + 16 |
| 56.0 | T1 | 5 | 8026 | 8231 | 8436 | 8641 | 1.0 | 2.0 | 17.0 | 59 | - 40 | + 14 | + 16 |
| 220.0 | T2 | 20 | 8027 | 8232 | 8437 | 8642 | 1.0 | 7.0 | 66.4 | 30 | - 44 | + 17.5 | + 20 |
| 220.0 | T2 | 10 | 8028 | 8233 | 8438 | 8643 | 1.0 | 7.0 | 66.4 | 30 | - 44 | + 17.5 | + 20 |
| 220.0 | T2 | 5 | 8029 | 8234 | 8439 | 8644 | 1.0 | 7.0 | 66.4 | 30 | - 44 | + 17.5 | + 20 |
| 430.0 | T3 | 20 | 8030 | 8235 | 8440 | 8645 | 2.0 | 14.0 | 91.5 | 25 | - 64 | + 17.5 | + 20 |
| 430.0 | T3 | 10 | 8031 | 8236 | 8441 | 8646 | 2.0 | 14.0 | 91.5 | 25 | - 64 | + 17.5 | + 20 |
| 430.0 | T3 | 5 | 8032 | 8237 | 8442 | 8647 | 2.0 | 14.0 | 91.5 | 25 | - 64 | + 17.5 | + 20 |
| 850.0 | T4 | 20 | 8033 | 8238 | 8443 | 8648 | 4.0 | 16.0 | 65.8 | 22 | - 80 | + 25 | + 25 |
| 850.0 | T4 | 10 | 8034 | 8239 | 8444 | 8649 | 4.0 | 16.0 | 65.8 | 22 | - 80 | + 25 | + 25 |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 20.0 | T1 | 20 | 8035 | 8240 | 8445 | 8650 | 1.0 | 2.0 | 6.1 | 175 | - 32 | + 10.5 | + 12 |
| 20.0 | T1 | 10 | 8036 | 8241 | 8446 | 8651 | 1.0 | 2.0 | 6.1 | 175 | - 32 | + 10.5 | + 12 |
| 20.0 | T1 | 5 | 8037 | 8242 | 8447 | 8652 | 1.0 | 2.0 | 6.1 | 175 | - 32 | + 10.5 | + 12 |
| 47.0 | T1 | 20 | 8038 | 8243 | 8448 | 8653 | 1.0 | 2.0 | 18.1 | 100 | - 36 | + 14 | + 16 |
| 47.0 | T1 | 10 | 8039 | 8244 | 8449 | 8654 | 1.0 | 2.0 | 18.1 | 100 | - 36 | + 14 | + 16 |
| 47.0 | T1 | 5 | 8040 | 8245 | 8450 | 8655 | 1.0 | 2.0 | 18.1 | 100 | - 36 | + 14 | + 16 |
| 100.0 | T2 | 20 | 8041 | 8246 | 8451 | 8656 | 1.0 | 4.0 | 15.2 | 60 | - 36 | + 14 | + 16 |
| 100.0 | T2 | 10 | 8042 | 8247 | 8452 | 8657 | 1.0 | 4.0 | 15.2 | 60 | - 36 | + 14 | + 16 |
| 100.0 | T2 | 5 | 8043 | 8248 | 8453 | 8658 | 1.0 | 4.0 | 15.2 | 60 | - 36 | + 14 | + 16 |
| 180.0 | T2 | 20 | 8044 | 8249 | 8454 | 8659 | 1.0 | 7.0 | 54.4 | 40 | - 36 | + 14 | + 16 |
| 180.0 | T2 | 10 | 8045 | 8250 | 8455 | 8660 | 1.0 | 7.0 | 54.4 | 40 | - 36 | + 14 | + 16 |
| 180.0 | T2 | 5 | 8046 | 8251 | 8456 | 8661 | 1.0 | 7.0 | 54.4 | 40 | - 36 | + 14 | + 16 |
| 250.0 | T3 | 20 | 8047 | 8252 | 8457 | 8662 | 2.0 | 10.0 | 37.8 | 30 | - 40 | + 14 | + 16 |
| 250.0 | T3 | 10 | 8048 | 8253 | 8458 | 8663 | 2.0 | 10.0 | 37.8 | 30 | - 40 | + 14 | + 16 |
| 250.0 | T3 | 5 | 8049 | 8254 | 8459 | 8664 | 2.0 | 10.0 | 37.8 | 30 | - 40 | + 14 | + 16 |
| 390.0 | T3 | 20 | 8050 | 8255 | 8460 | 8665 | 2.0 | 16.0 | 87.6 | 25 | - 64 | + 17.5 | + 20 |
| 390.0 | T3 | 10 | 8051 | 8256 | 8461 | 8666 | 2.0 | 16.0 | 87.6 | 25 | - 64 | + 17.5 | + 20 |
| 390.0 | T3 | 5 | 8052 | 8257 | 8462 | 8667 | 2.0 | 16.0 | 87.6 | 25 | - 64 | + 17.5 | + 20 |
| 750.0 | T4 | 20 | 8053 | 8258 | 8463 | 8668 | 4.0 | 16.0 | 56.5 | 23 | - 80 | + 25 | + 25 |
| 750.0 | T4 | 10 | 8054 | 8259 | 8464 | 8669 | 4.0 | 16.0 | 56.5 | 23 | - 80 | + 25 | + 25 |

Note

* Style CLR65 is inactive for new military design. For new design use Style CLR79.



| STANDARD/EXTENDED RATINGS: CLR65*, M39006/09-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|------|---------------------|---------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/09- FAILURE RATE LEVEL (%/1000 h) | | | | MAX. DCL (µA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | |
| | | | L | M | P | R | + 25 °C | + 85 °C | | | - 55 °C | + 85 °C | + 125 °C |
| | | | 2.0 | 1.0 | 0.1 | 0.01 | | | | | | | |
| 15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C | | | | | | | | | | | | | |
| 15.0 | T1 | 20 | 8055 | 8260 | 8465 | 8670 | 1.0 | 2.0 | 5.7 | 155 | - 24 | + 10.5 | + 12 |
| 15.0 | T1 | 10 | 8056 | 8261 | 8466 | 8671 | 1.0 | 2.0 | 5.7 | 155 | - 24 | + 10.5 | + 12 |
| 15.0 | T1 | 5 | 8057 | 8262 | 8467 | 8672 | 1.0 | 2.0 | 5.7 | 155 | - 24 | + 10.5 | + 12 |
| 33.0 | T1 | 20 | 8058 | 8263 | 8468 | 8673 | 1.0 | 2.0 | 12.5 | 90 | - 28 | + 14 | + 16 |
| 33.0 | T1 | 10 | 8059 | 8264 | 8469 | 8674 | 1.0 | 2.0 | 12.5 | 90 | - 28 | + 14 | + 16 |
| 33.0 | T1 | 5 | 8060 | 8265 | 8470 | 8675 | 1.0 | 2.0 | 12.5 | 90 | - 28 | + 14 | + 16 |
| 70.0 | T2 | 20 | 8061 | 8266 | 8471 | 8676 | 1.0 | 4.0 | 13.1 | 75 | - 28 | + 14 | + 16 |
| 70.0 | T2 | 10 | 8062 | 8267 | 8472 | 8677 | 1.0 | 4.0 | 13.1 | 75 | - 28 | + 14 | + 16 |
| 70.0 | T2 | 5 | 8063 | 8268 | 8473 | 8678 | 1.0 | 4.0 | 13.1 | 75 | - 28 | + 14 | + 16 |
| 120.0 | T2 | 20 | 8064 | 8269 | 8474 | 8679 | 1.0 | 7.0 | 36.8 | 50 | - 28 | + 17.5 | + 20 |
| 120.0 | T2 | 10 | 8065 | 8270 | 8475 | 8680 | 1.0 | 7.0 | 36.8 | 50 | - 28 | + 17.5 | + 20 |
| 120.0 | T2 | 5 | 8066 | 8271 | 8476 | 8681 | 1.0 | 7.0 | 36.8 | 50 | - 28 | + 17.5 | + 20 |
| 170.0 | T3 | 20 | 8067 | 8272 | 8477 | 8682 | 2.0 | 10.0 | 25.4 | 35 | - 32 | + 14 | + 16 |
| 170.0 | T3 | 10 | 8068 | 8273 | 8478 | 8683 | 2.0 | 10.0 | 25.4 | 35 | - 32 | + 14 | + 16 |
| 170.0 | T3 | 5 | 8069 | 8274 | 8479 | 8684 | 2.0 | 10.0 | 25.4 | 35 | - 32 | + 14 | + 16 |
| 270.0 | T3 | 20 | 8070 | 8275 | 8480 | 8685 | 2.0 | 16.0 | 60.9 | 30 | - 56 | + 17.5 | + 20 |
| 270.0 | T3 | 10 | 8071 | 8276 | 8481 | 8686 | 2.0 | 16.0 | 60.9 | 30 | - 56 | + 17.5 | + 20 |
| 270.0 | T3 | 5 | 8072 | 8277 | 8482 | 8687 | 2.0 | 16.0 | 60.9 | 30 | - 56 | + 17.5 | + 20 |
| 540.0 | T4 | 20 | 8073 | 8278 | 8483 | 8688 | 6.0 | 24.0 | 49.0 | 23 | - 80 | + 25 | + 25 |
| 540.0 | T4 | 10 | 8074 | 8279 | 8484 | 8689 | 6.0 | 24.0 | 49.0 | 23 | - 80 | + 25 | + 25 |
| 25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10.0 | T1 | 20 | 8075 | 8280 | 8485 | 8690 | 1.0 | 2.0 | 4.6 | 220 | - 16 | + 8 | + 9 |
| 10.0 | T1 | 10 | 8076 | 8281 | 8486 | 8691 | 1.0 | 2.0 | 4.6 | 220 | - 16 | + 8 | + 9 |
| 10.0 | T1 | 5 | 8077 | 8282 | 8487 | 8692 | 1.0 | 2.0 | 4.6 | 220 | - 16 | + 8 | + 9 |
| 22.0 | T1 | 20 | 8078 | 8283 | 8488 | 8693 | 1.0 | 2.0 | 8.3 | 140 | - 20 | + 10.5 | + 12 |
| 22.0 | T1 | 10 | 8079 | 8284 | 8489 | 8694 | 1.0 | 2.0 | 8.3 | 140 | - 20 | + 10.5 | + 12 |
| 22.0 | T1 | 5 | 8080 | 8285 | 8490 | 8695 | 1.0 | 2.0 | 8.3 | 140 | - 20 | + 10.5 | + 12 |
| 100.0 | T2 | 20 | 8081 | 8286 | 8491 | 8696 | 1.0 | 10.0 | 31.4 | 50 | - 28 | + 13 | + 15 |
| 100.0 | T2 | 10 | 8082 | 8287 | 8492 | 8697 | 1.0 | 10.0 | 31.4 | 50 | - 28 | + 13 | + 15 |
| 100.0 | T2 | 5 | 8083 | 8288 | 8493 | 8698 | 1.0 | 10.0 | 31.4 | 50 | - 28 | + 13 | + 15 |
| 180.0 | T3 | 20 | 8084 | 8289 | 8494 | 8699 | 2.0 | 18.0 | 54.3 | 32 | - 48 | + 13 | + 15 |
| 180.0 | T3 | 10 | 8085 | 8290 | 8495 | 8700 | 2.0 | 18.0 | 54.3 | 32 | - 48 | + 13 | + 15 |
| 180.0 | T3 | 5 | 8086 | 8291 | 8496 | 8701 | 2.0 | 18.0 | 54.3 | 32 | - 48 | + 13 | + 15 |
| 350.0 | T4 | 20 | 8087 | 8292 | 8497 | 8702 | 7.0 | 28.0 | 35.0 | 24 | - 70 | + 25 | + 25 |
| 350.0 | T4 | 10 | 8088 | 8293 | 8498 | 8703 | 7.0 | 28.0 | 35.0 | 24 | - 70 | + 25 | + 25 |
| 30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C | | | | | | | | | | | | | |
| 8.0 | T1 | 20 | 8089 | 8294 | 8499 | 8704 | 1.0 | 2.0 | 4.5 | 275 | - 16 | + 8 | + 12 |
| 8.0 | T1 | 10 | 8090 | 8295 | 8500 | 8705 | 1.0 | 2.0 | 4.5 | 275 | - 16 | + 8 | + 12 |
| 8.0 | T1 | 5 | 8091 | 8296 | 8501 | 8706 | 1.0 | 2.0 | 4.5 | 275 | - 16 | + 8 | + 12 |
| 15.0 | T1 | 20 | 8092 | 8297 | 8502 | 8707 | 1.0 | 2.0 | 9.1 | 175 | - 20 | + 10.5 | + 12 |
| 15.0 | T1 | 10 | 8093 | 8298 | 8503 | 8708 | 1.0 | 2.0 | 9.1 | 175 | - 20 | + 10.5 | + 12 |
| 15.0 | T1 | 5 | 8094 | 8299 | 8504 | 8709 | 1.0 | 2.0 | 9.1 | 175 | - 20 | + 10.5 | + 12 |
| 40.0 | T2 | 20 | 8095 | 8300 | 8505 | 8710 | 1.0 | 5.0 | 12.2 | 65 | - 24 | + 10.5 | + 12 |
| 40.0 | T2 | 10 | 8096 | 8301 | 8506 | 8711 | 1.0 | 5.0 | 12.2 | 65 | - 24 | + 10.5 | + 12 |
| 40.0 | T2 | 5 | 8097 | 8302 | 8507 | 8712 | 1.0 | 5.0 | 12.2 | 65 | - 24 | + 10.5 | + 12 |
| 68.0 | T2 | 20 | 8098 | 8303 | 8508 | 8713 | 1.0 | 8.0 | 31.0 | 60 | - 24 | + 13 | + 15 |
| 68.0 | T2 | 10 | 8099 | 8304 | 8509 | 8714 | 1.0 | 8.0 | 31.0 | 60 | - 24 | + 13 | + 15 |
| 68.0 | T2 | 5 | 8100 | 8305 | 8510 | 8715 | 1.0 | 8.0 | 31.0 | 60 | - 24 | + 13 | + 15 |
| 100.0 | T3 | 20 | 8101 | 8306 | 8511 | 8716 | 2.0 | 12.0 | 19.0 | 40 | - 28 | + 10.5 | + 12 |
| 100.0 | T3 | 10 | 8102 | 8307 | 8512 | 8717 | 2.0 | 12.0 | 19.0 | 40 | - 28 | + 10.5 | + 12 |
| 100.0 | T3 | 5 | 8103 | 8308 | 8513 | 8718 | 2.0 | 12.0 | 19.0 | 40 | - 28 | + 10.5 | + 12 |
| 150.0 | T3 | 20 | 8104 | 8309 | 8514 | 8719 | 2.0 | 18.0 | 46.0 | 35 | - 48 | + 13 | + 15 |
| 150.0 | T3 | 10 | 8105 | 8310 | 8515 | 8720 | 2.0 | 18.0 | 46.0 | 35 | - 48 | + 13 | + 15 |
| 150.0 | T3 | 5 | 8106 | 8311 | 8516 | 8721 | 2.0 | 18.0 | 46.0 | 35 | - 48 | + 13 | + 15 |
| 300.0 | T4 | 20 | 8107 | 8312 | 8517 | 8722 | 8.0 | 32.0 | 35.0 | 25 | - 60 | + 25 | + 25 |
| 300.0 | T4 | 10 | 8108 | 8313 | 8518 | 8723 | 8.0 | 32.0 | 35.0 | 25 | - 60 | + 25 | + 25 |

Note

* Style CLR65 is inactive for new military design. For new design use Style CLR79.



| STANDARD/EXTENDED RATINGS: CLR65*, M39006/09-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|------|---------------------|---------------------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/09- FAILURE RATE LEVEL (%/1000 h) | | | | MAX. DCL (μA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | Max. CAPACITANCE CHANGE (%) at | | |
| | | | L | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C |
| | | | 2.0 | 1.0 | 0.1 | 0.01 | | | | | | | |
| 50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C | | | | | | | | | | | | | |
| 5.0 | T1 | 20 | 8109 | 8314 | 8519 | 8724 | 1.0 | 2.0 | 3.4 | 400 | - 16 | + 5 | + 6 |
| 5.0 | T1 | 10 | 8110 | 8315 | 8520 | 8725 | 1.0 | 2.0 | 3.4 | 400 | - 16 | + 5 | + 6 |
| 5.0 | T1 | 5 | 8111 | 8316 | 8521 | 8726 | 1.0 | 2.0 | 3.4 | 400 | - 16 | + 5 | + 6 |
| 10.0 | T1 | 20 | 8112 | 8317 | 8522 | 8727 | 1.0 | 2.0 | 6.0 | 250 | - 24 | + 8 | + 9 |
| 10.0 | T1 | 10 | 8113 | 8318 | 8523 | 8728 | 1.0 | 2.0 | 6.0 | 250 | - 24 | + 8 | + 9 |
| 10.0 | T1 | 5 | 8114 | 8319 | 8524 | 8729 | 1.0 | 2.0 | 6.0 | 250 | - 24 | + 8 | + 9 |
| 25.0 | T2 | 20 | 8115 | 8320 | 8525 | 8730 | 1.0 | 5.0 | 11.2 | 95 | - 20 | + 10.5 | + 12 |
| 25.0 | T2 | 10 | 8116 | 8321 | 8526 | 8731 | 1.0 | 5.0 | 11.2 | 95 | - 20 | + 10.5 | + 12 |
| 25.0 | T2 | 5 | 8117 | 8322 | 8527 | 8732 | 1.0 | 5.0 | 11.2 | 95 | - 20 | + 10.5 | + 12 |
| 47.0 | T2 | 20 | 8118 | 8323 | 8528 | 8733 | 1.0 | 9.0 | 21.4 | 70 | - 28 | + 13 | + 15 |
| 47.0 | T2 | 10 | 8119 | 8324 | 8529 | 8734 | 1.0 | 9.0 | 21.4 | 70 | - 28 | + 13 | + 15 |
| 47.0 | T2 | 5 | 8120 | 8325 | 8530 | 8735 | 1.0 | 9.0 | 21.4 | 70 | - 28 | + 13 | + 15 |
| 60.0 | T3 | 20 | 8121 | 8326 | 8531 | 8736 | 2.0 | 12.0 | 13.6 | 45 | - 16 | + 10.5 | + 12 |
| 60.0 | T3 | 10 | 8122 | 8327 | 8532 | 8737 | 2.0 | 12.0 | 13.6 | 45 | - 16 | + 10.5 | + 12 |
| 60.0 | T3 | 5 | 8123 | 8328 | 8533 | 8738 | 2.0 | 12.0 | 13.6 | 45 | - 16 | + 10.5 | + 12 |
| 82.0 | T3 | 20 | 8124 | 8329 | 8534 | 8739 | 2.0 | 16.0 | 24.9 | 45 | - 32 | + 13 | + 15 |
| 82.0 | T3 | 10 | 8125 | 8330 | 8535 | 8740 | 2.0 | 16.0 | 24.9 | 45 | - 32 | + 13 | + 15 |
| 82.0 | T3 | 5 | 8126 | 8331 | 8536 | 8741 | 2.0 | 16.0 | 24.9 | 45 | - 32 | + 13 | + 15 |
| 160.0 | T4 | 20 | 8127 | 8332 | 8537 | 8742 | 8.0 | 32.0 | 25.7 | 27 | - 50 | + 25 | + 25 |
| 160.0 | T4 | 10 | 8128 | 8333 | 8538 | 8743 | 8.0 | 32.0 | 25.7 | 27 | - 50 | + 25 | + 25 |
| 60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C | | | | | | | | | | | | | |
| 4.0 | T1 | 20 | 8129 | 8334 | 8539 | 8744 | 1.0 | 2.0 | 3.0 | 550 | - 16 | + 5 | + 6 |
| 4.0 | T1 | 10 | 8130 | 8335 | 8540 | 8745 | 1.0 | 2.0 | 3.0 | 550 | - 16 | + 5 | + 6 |
| 4.0 | T1 | 5 | 8131 | 8336 | 8541 | 8746 | 1.0 | 2.0 | 3.0 | 550 | - 16 | + 5 | + 6 |
| 8.2 | T1 | 20 | 8132 | 8337 | 8542 | 8747 | 1.0 | 2.0 | 5.0 | 275 | - 24 | + 8 | + 9 |
| 8.2 | T1 | 10 | 8133 | 8338 | 8543 | 8748 | 1.0 | 2.0 | 5.0 | 275 | - 24 | + 8 | + 9 |
| 8.2 | T1 | 5 | 8134 | 8339 | 8544 | 8749 | 1.0 | 2.0 | 5.0 | 275 | - 24 | + 8 | + 9 |
| 20.0 | T2 | 20 | 8135 | 8340 | 8545 | 8750 | 1.0 | 5.0 | 7.6 | 105 | - 16 | + 10.5 | + 12 |
| 20.0 | T2 | 10 | 8136 | 8341 | 8546 | 8751 | 1.0 | 5.0 | 7.6 | 105 | - 16 | + 10.5 | + 12 |
| 20.0 | T2 | 5 | 8137 | 8342 | 8547 | 8752 | 1.0 | 5.0 | 7.6 | 105 | - 16 | + 10.5 | + 12 |
| 39.0 | T2 | 20 | 8138 | 8343 | 8548 | 8753 | 1.0 | 9.0 | 20.7 | 90 | - 28 | + 10.5 | + 12 |
| 39.0 | T2 | 10 | 8139 | 8344 | 8549 | 8754 | 1.0 | 9.0 | 20.7 | 90 | - 28 | + 10.5 | + 12 |
| 39.0 | T2 | 5 | 8140 | 8345 | 8550 | 8755 | 1.0 | 9.0 | 20.7 | 90 | - 28 | + 10.5 | + 12 |
| 50.0 | T3 | 20 | 8141 | 8346 | 8551 | 8756 | 2.0 | 12.0 | 15.3 | 50 | - 16 | + 10.5 | + 12 |
| 50.0 | T3 | 10 | 8142 | 8347 | 8552 | 8757 | 2.0 | 12.0 | 15.3 | 50 | - 16 | + 10.5 | + 12 |
| 50.0 | T3 | 5 | 8143 | 8348 | 8553 | 8758 | 2.0 | 12.0 | 15.3 | 50 | - 16 | + 10.5 | + 12 |
| 68.0 | T3 | 20 | 8144 | 8349 | 8554 | 8759 | 2.0 | 16.0 | 30.7 | 50 | - 32 | + 10.5 | + 12 |
| 68.0 | T3 | 10 | 8145 | 8350 | 8555 | 8760 | 2.0 | 16.0 | 30.7 | 50 | - 32 | + 10.5 | + 12 |
| 68.0 | T3 | 5 | 8146 | 8351 | 8556 | 8761 | 2.0 | 16.0 | 30.7 | 50 | - 32 | + 10.5 | + 12 |
| 140.0 | T4 | 20 | 8147 | 8352 | 8557 | 8762 | 8.0 | 32.0 | 25.7 | 28 | - 40 | + 20 | + 20 |
| 140.0 | T4 | 10 | 8148 | 8353 | 8558 | 8763 | 8.0 | 32.0 | 25.7 | 28 | - 40 | + 20 | + 20 |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 3.5 | T1 | 20 | 8149 | 8354 | 8559 | 8764 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 |
| 3.5 | T1 | 10 | 8150 | 8355 | 8560 | 8765 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 |
| 3.5 | T1 | 5 | 8151 | 8356 | 8561 | 8766 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 |
| 6.8 | T1 | 20 | 8152 | 8357 | 8562 | 8767 | 1.0 | 2.0 | 4.1 | 300 | - 20 | + 8 | + 9 |
| 6.8 | T1 | 10 | 8153 | 8358 | 8563 | 8768 | 1.0 | 2.0 | 4.1 | 300 | - 20 | + 8 | + 9 |
| 6.8 | T1 | 5 | 8154 | 8359 | 8564 | 8769 | 1.0 | 2.0 | 4.1 | 300 | - 20 | + 8 | + 9 |
| 15.0 | T2 | 20 | 8155 | 8360 | 8565 | 8770 | 1.0 | 5.0 | 7.5 | 150 | - 16 | + 8 | + 9 |
| 15.0 | T2 | 10 | 8156 | 8361 | 8566 | 8771 | 1.0 | 5.0 | 7.5 | 150 | - 16 | + 8 | + 9 |
| 15.0 | T2 | 5 | 8157 | 8362 | 8567 | 8772 | 1.0 | 5.0 | 7.4 | 150 | - 16 | + 8 | + 9 |
| 33.0 | T2 | 20 | 8158 | 8363 | 8568 | 8773 | 1.0 | 10.0 | 17.5 | 90 | - 24 | + 10.5 | + 15 |
| 33.0 | T2 | 10 | 8159 | 8364 | 8569 | 8774 | 1.0 | 10.0 | 17.5 | 90 | - 24 | + 10.5 | + 15 |
| 33.0 | T2 | 5 | 8160 | 8365 | 8570 | 8775 | 1.0 | 10.0 | 17.5 | 90 | - 24 | + 10.5 | + 15 |
| 40.0 | T3 | 20 | 8161 | 8366 | 8571 | 8776 | 2.0 | 12.0 | 15.2 | 60 | - 16 | + 10.5 | + 12 |
| 40.0 | T3 | 10 | 8162 | 8367 | 8572 | 8777 | 2.0 | 12.0 | 15.2 | 60 | - 16 | + 10.5 | + 12 |
| 40.0 | T3 | 5 | 8163 | 8368 | 8573 | 8778 | 2.0 | 12.0 | 15.2 | 60 | - 16 | + 10.5 | + 12 |
| 56.0 | T3 | 20 | 8164 | 8369 | 8574 | 8779 | 2.0 | 17.0 | 26.0 | 60 | - 28 | + 10.5 | + 15 |
| 56.0 | T3 | 10 | 8165 | 8370 | 8575 | 8780 | 2.0 | 17.0 | 26.0 | 60 | - 28 | + 10.5 | + 15 |
| 56.0 | T3 | 5 | 8166 | 8371 | 8576 | 8781 | 2.0 | 17.0 | 26.0 | 60 | - 28 | + 10.5 | + 15 |
| 110.0 | T4 | 20 | 8167 | 8372 | 8577 | 8782 | 9.0 | 36.0 | 25.7 | 29 | - 35 | + 20 | + 20 |
| 110.0 | T4 | 10 | 8168 | 8373 | 8578 | 8783 | 9.0 | 36.0 | 25.7 | 29 | - 35 | + 20 | + 20 |

Note

* Style CLR65 is inactive for new military design. For new design use Style CLR79.



| STANDARD/EXTENDED RATINGS: CLR65*, M39006/09-XXXX | | | | | | | | | | | | | |
|--|-----------|-----------------|--|-------|-------|--------|------------------|----------------|-----------------------|-------------------------|--------------------------------|--------|---------|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/09-FAILURE RATE LEVEL (%/1000 h) | | | | MAX. DCL (µA) at | | MAX. DF at +25 °C (%) | MAX. IMP. at -55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | |
| | | | L 2.0 | M 1.0 | P 0.1 | R 0.01 | +25 °C | +85 °C +125 °C | | | -55 °C | +85 °C | +125 °C |
| 100 WVDC at +85 °C . . . 65 WVDC at +125 °C | | | | | | | | | | | | | |
| 2.5 | T1 | 20 | 8169 | 8374 | 8579 | 8784 | 1.0 | 2.0 | 5.0 | 950 | -16 | +7 | +8 |
| 2.5 | T1 | 10 | 8170 | 8375 | 8580 | 8785 | 1.0 | 2.0 | 5.0 | 950 | -16 | +7 | +8 |
| 2.5 | T1 | 5 | 8171 | 8376 | 8581 | 8786 | 1.0 | 2.0 | 5.0 | 950 | -16 | +7 | +8 |
| 4.7 | T1 | 20 | 8172 | 8377 | 8582 | 8787 | 1.0 | 2.0 | 3.6 | 500 | -16 | +7 | +8 |
| 4.7 | T1 | 10 | 8173 | 8378 | 8583 | 8788 | 1.0 | 2.0 | 3.6 | 500 | -16 | +7 | +8 |
| 4.7 | T1 | 5 | 8174 | 8379 | 8584 | 8789 | 1.0 | 2.0 | 3.6 | 500 | -16 | +7 | +8 |
| 11.0 | T2 | 20 | 8175 | 8380 | 8585 | 8790 | 1.0 | 4.0 | 5.0 | 200 | -16 | +7 | +8 |
| 11.0 | T2 | 10 | 8176 | 8381 | 8586 | 8791 | 1.0 | 4.0 | 5.0 | 200 | -16 | +7 | +8 |
| 11.0 | T2 | 5 | 8177 | 8382 | 8587 | 8792 | 1.0 | 4.0 | 5.0 | 200 | -16 | +7 | +8 |
| 22.0 | T2 | 20 | 8178 | 8383 | 8588 | 8793 | 1.0 | 9.0 | 11.8 | 100 | -16 | +7 | +8 |
| 22.0 | T2 | 10 | 8179 | 8384 | 8589 | 8794 | 1.0 | 9.0 | 11.8 | 100 | -16 | +7 | +8 |
| 22.0 | T2 | 5 | 8180 | 8385 | 8590 | 8795 | 1.0 | 9.0 | 11.8 | 100 | -16 | +7 | +8 |
| 30.0 | T3 | 20 | 8181 | 8386 | 8591 | 8796 | 2.0 | 12.0 | 9.1 | 80 | -16 | +7 | +8 |
| 30.0 | T3 | 10 | 8182 | 8387 | 8592 | 8797 | 2.0 | 12.0 | 9.1 | 80 | -16 | +7 | +8 |
| 30.0 | T3 | 5 | 8183 | 8388 | 8593 | 8798 | 2.0 | 12.0 | 9.1 | 80 | -16 | +7 | +8 |
| 43.0 | T3 | 20 | 8184 | 8389 | 8594 | 8799 | 2.0 | 17.0 | 19.7 | 70 | -20 | +7 | +8 |
| 43.0 | T3 | 10 | 8185 | 8390 | 8595 | 8800 | 2.0 | 17.0 | 19.7 | 70 | -20 | +7 | +8 |
| 43.0 | T3 | 5 | 8186 | 8391 | 8596 | 8801 | 2.0 | 17.0 | 19.7 | 70 | -20 | +7 | +8 |
| 86.0 | T4 | 20 | 8187 | 8392 | 8597 | 8802 | 9.0 | 36.0 | 20.7 | 30 | -25 | +15 | +15 |
| 86.0 | T4 | 10 | 8188 | 8393 | 8598 | 8803 | 9.0 | 36.0 | 20.7 | 30 | -25 | +15 | +15 |
| 125 WVDC at +85 °C . . . 85 WVDC at +125 °C | | | | | | | | | | | | | |
| 1.7 | T1 | 20 | 8189 | 8394 | 8599 | 8804 | 1.0 | 2.0 | 7.0 | 1250 | -16 | +7 | +8 |
| 1.7 | T1 | 10 | 8190 | 8395 | 8600 | 8805 | 1.0 | 2.0 | 7.0 | 1250 | -16 | +7 | +8 |
| 1.7 | T1 | 5 | 8191 | 8396 | 8601 | 8806 | 1.0 | 2.0 | 7.0 | 1250 | -16 | +7 | +8 |
| 3.6 | T1 | 20 | 8192 | 8397 | 8602 | 8807 | 1.0 | 2.0 | 4.1 | 600 | -16 | +7 | +8 |
| 3.6 | T1 | 10 | 8193 | 8398 | 8603 | 8808 | 1.0 | 2.0 | 4.1 | 600 | -16 | +7 | +8 |
| 3.6 | T1 | 5 | 8194 | 8399 | 8604 | 8809 | 1.0 | 2.0 | 4.1 | 600 | -16 | +7 | +8 |
| 9.0 | T2 | 20 | 8195 | 8400 | 8605 | 8810 | 1.0 | 5.0 | 10.2 | 240 | -16 | +7 | +8 |
| 9.0 | T2 | 10 | 8196 | 8401 | 8606 | 8811 | 1.0 | 5.0 | 10.2 | 240 | -16 | +7 | +8 |
| 9.0 | T2 | 5 | 8197 | 8402 | 8607 | 8812 | 1.0 | 5.0 | 10.2 | 240 | -16 | +7 | +8 |
| 14.0 | T2 | 20 | 8198 | 8403 | 8608 | 8813 | 1.0 | 7.0 | 12.7 | 167 | -16 | +7 | +8 |
| 14.0 | T2 | 10 | 8199 | 8404 | 8609 | 8814 | 1.0 | 7.0 | 12.7 | 167 | -16 | +7 | +8 |
| 14.0 | T2 | 5 | 8200 | 8405 | 8610 | 8815 | 1.0 | 7.0 | 12.7 | 167 | -16 | +7 | +8 |
| 18.0 | T3 | 20 | 8201 | 8406 | 8611 | 8816 | 2.0 | 9.0 | 15.0 | 129 | -16 | +7 | +8 |
| 18.0 | T3 | 10 | 8202 | 8407 | 8612 | 8817 | 2.0 | 9.0 | 15.0 | 129 | -16 | +7 | +8 |
| 18.0 | T3 | 5 | 8203 | 8408 | 8613 | 8818 | 2.0 | 9.0 | 15.0 | 129 | -16 | +7 | +8 |
| 25.0 | T3 | 20 | 8204 | 8409 | 8614 | 8819 | 2.0 | 13.0 | 19.0 | 93 | -16 | +7 | +8 |
| 25.0 | T3 | 10 | 8205 | 8410 | 8615 | 8820 | 2.0 | 13.0 | 19.0 | 93 | -16 | +7 | +8 |
| 25.0 | T3 | 5 | 9026 | 9029 | 9032 | 9035 | 2.0 | 13.0 | 19.0 | 93 | -16 | +7 | +8 |
| 56.0 | T4 | 20 | 9027 | 9030 | 9033 | 9036 | 10.0 | 40.0 | 17.5 | 32 | -25 | +15 | +15 |
| 56.0 | T4 | 10 | 9028 | 9031 | 9034 | 9037 | 10.0 | 40.0 | 17.5 | 32 | -25 | +15 | +15 |

Note
* Style CLR65 is inactive for new military design. For new design use Style CLR79.





| STANDARD/EXTENDED RATINGS: CLR69*, M39006/21-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|------|---------------------|---------------------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/21- FAILURE RATE LEVEL (%/1000 h) | | | | MAX. DCL (μA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | |
| | | | L | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C |
| | | | 2.0 | 1.0 | 0.1 | 0.01 | | | | | | | |
| 6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C | | | | | | | | | | | | | |
| 220.0 | T1 | 20 | 0001 | 0089 | 0177 | 0265 | 2.0 | 9.0 | 50 | 36 | - 64 | + 13 | + 16 |
| 220.0 | T1 | 10 | 0002 | 0090 | 0178 | 0266 | 2.0 | 9.0 | 50 | 36 | - 64 | + 13 | + 16 |
| 820.0 | T2 | 20 | 0003 | 0091 | 0179 | 0267 | 3.0 | 14.0 | 155 | 18 | - 88 | + 16 | + 20 |
| 820.0 | T2 | 10 | 0004 | 0092 | 0180 | 0268 | 3.0 | 14.0 | 155 | 18 | - 88 | + 16 | + 20 |
| 1500.0 | T3 | 20 | 0005 | 0093 | 0181 | 0269 | 5.0 | 20.0 | 172 | 18 | - 90 | + 20 | + 25 |
| 1500.0 | T3 | 10 | 0006 | 0094 | 0182 | 0270 | 5.0 | 20.0 | 172 | 18 | - 90 | + 20 | + 25 |
| 2200.0 | T4 | 20 | 0007 | 0095 | 0183 | 0271 | 6.0 | 24.0 | 170 | 13 | - 90 | + 25 | + 30 |
| 2200.0 | T4 | 10 | 0008 | 0096 | 0184 | 0272 | 6.0 | 24.0 | 170 | 13 | - 90 | + 25 | + 30 |
| 8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C | | | | | | | | | | | | | |
| 180.0 | T1 | 20 | 0009 | 0097 | 0185 | 0273 | 2.0 | 9.0 | 41 | 45 | - 60 | + 13 | + 16 |
| 180.0 | T1 | 10 | 0010 | 0098 | 0186 | 0274 | 2.0 | 9.0 | 41 | 45 | - 60 | + 13 | + 16 |
| 680.0 | T2 | 20 | 0011 | 0099 | 0187 | 0275 | 3.0 | 14.0 | 130 | 22 | - 83 | + 16 | + 20 |
| 680.0 | T2 | 10 | 0012 | 0100 | 0188 | 0276 | 3.0 | 14.0 | 130 | 22 | - 83 | + 16 | + 20 |
| 1500.0 | T3 | 20 | 0013 | 0101 | 0189 | 0277 | 5.0 | 20.0 | 170 | 18 | - 90 | + 20 | + 25 |
| 1500.0 | T3 | 10 | 0014 | 0102 | 0190 | 0278 | 5.0 | 20.0 | 170 | 18 | - 90 | + 20 | + 25 |
| 1800.0 | T4 | 20 | 0015 | 0103 | 0191 | 0279 | 7.0 | 25.0 | 138 | 14 | - 90 | + 25 | + 30 |
| 1800.0 | T4 | 10 | 0016 | 0104 | 0192 | 0280 | 7.0 | 25.0 | 138 | 14 | - 90 | + 25 | + 30 |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 150.0 | T1 | 20 | 0017 | 0105 | 0193 | 0281 | 2.0 | 9.0 | 34 | 54 | - 55 | + 13 | + 16 |
| 150.0 | T1 | 10 | 0018 | 0106 | 0194 | 0282 | 2.0 | 9.0 | 34 | 54 | - 55 | + 13 | + 16 |
| 560.0 | T2 | 20 | 0019 | 0107 | 0195 | 0283 | 3.0 | 16.0 | 106 | 27 | - 77 | + 16 | + 20 |
| 560.0 | T2 | 10 | 0020 | 0108 | 0196 | 0284 | 3.0 | 16.0 | 106 | 27 | - 77 | + 16 | + 20 |
| 1200.0 | T3 | 20 | 0021 | 0109 | 0197 | 0285 | 5.0 | 20.0 | 137 | 18 | - 88 | + 20 | + 25 |
| 1200.0 | T3 | 10 | 0022 | 0110 | 0198 | 0286 | 5.0 | 20.0 | 137 | 18 | - 88 | + 20 | + 25 |
| 1500.0 | T4 | 20 | 0023 | 0111 | 0199 | 0287 | 7.0 | 25.0 | 114 | 15 | - 88 | + 25 | + 30 |
| 1500.0 | T4 | 10 | 0024 | 0112 | 0200 | 0288 | 7.0 | 25.0 | 114 | 15 | - 88 | + 25 | + 30 |
| 15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C | | | | | | | | | | | | | |
| 100.0 | T1 | 20 | 0025 | 0113 | 0201 | 0289 | 2.0 | 9.0 | 30 | 72 | - 44 | + 13 | + 16 |
| 100.0 | T1 | 10 | 0026 | 0114 | 0202 | 0290 | 2.0 | 9.0 | 30 | 72 | - 44 | + 13 | + 16 |
| 390.0 | T2 | 20 | 0027 | 0115 | 0203 | 0291 | 3.0 | 16.0 | 74 | 31 | - 66 | + 16 | + 20 |
| 390.0 | T2 | 10 | 0028 | 0116 | 0204 | 0292 | 3.0 | 16.0 | 74 | 31 | - 66 | + 16 | + 20 |
| 820.0 | T3 | 20 | 0029 | 0117 | 0205 | 0293 | 6.0 | 24.0 | 111 | 22 | - 77 | + 20 | + 25 |
| 820.0 | T3 | 10 | 0030 | 0118 | 0206 | 0294 | 6.0 | 24.0 | 111 | 22 | - 77 | + 20 | + 25 |
| 1000.0 | T4 | 20 | 0031 | 0119 | 0207 | 0295 | 8.0 | 32.0 | 92 | 17 | - 77 | + 25 | + 30 |
| 1000.0 | T4 | 10 | 0032 | 0120 | 0208 | 0296 | 8.0 | 32.0 | 92 | 17 | - 77 | + 25 | + 30 |
| 25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C | | | | | | | | | | | | | |
| 68.0 | T1 | 20 | 0033 | 0121 | 0209 | 0297 | 2.0 | 9.0 | 22 | 90 | - 40 | + 12 | + 15 |
| 68.0 | T1 | 10 | 0034 | 0122 | 0210 | 0298 | 2.0 | 9.0 | 22 | 90 | - 40 | + 12 | + 15 |
| 270.0 | T2 | 20 | 0035 | 0123 | 0211 | 0299 | 3.0 | 16.0 | 55 | 33 | - 62 | + 13 | + 16 |
| 270.0 | T2 | 10 | 0036 | 0124 | 0212 | 0300 | 3.0 | 16.0 | 55 | 33 | - 62 | + 13 | + 16 |
| 560.0 | T3 | 20 | 0037 | 0125 | 0213 | 0301 | 7.0 | 28.0 | 76 | 24 | - 72 | + 20 | + 25 |
| 560.0 | T3 | 10 | 0038 | 0126 | 0214 | 0302 | 7.0 | 28.0 | 76 | 24 | - 72 | + 20 | + 25 |
| 680.0 | T4 | 20 | 0039 | 0127 | 0215 | 0303 | 8.0 | 32.0 | 63 | 19 | - 72 | + 25 | + 30 |
| 680.0 | T4 | 10 | 0040 | 0128 | 0216 | 0304 | 8.0 | 32.0 | 63 | 19 | - 72 | + 25 | + 30 |
| 30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C | | | | | | | | | | | | | |
| 56.0 | T1 | 20 | 0041 | 0129 | 0217 | 0305 | 2.0 | 9.0 | 22 | 100 | - 38 | + 12 | + 15 |
| 56.0 | T1 | 10 | 0042 | 0130 | 0218 | 0306 | 2.0 | 9.0 | 22 | 100 | - 38 | + 12 | + 15 |
| 220.0 | T2 | 20 | 0043 | 0131 | 0219 | 0307 | 3.0 | 16.0 | 42 | 36 | - 60 | + 13 | + 16 |
| 220.0 | T2 | 10 | 0044 | 0132 | 0220 | 0308 | 3.0 | 16.0 | 42 | 36 | - 60 | + 13 | + 16 |
| 470.0 | T3 | 20 | 0045 | 0133 | 0221 | 0309 | 8.0 | 32.0 | 64 | 25 | - 65 | + 20 | + 25 |
| 470.0 | T3 | 10 | 0046 | 0134 | 0222 | 0310 | 8.0 | 32.0 | 64 | 25 | - 65 | + 20 | + 25 |
| 560.0 | T4 | 20 | 0047 | 0135 | 0223 | 0311 | 9.0 | 36.0 | 55 | 20 | - 65 | + 25 | + 30 |
| 560.0 | T4 | 10 | 0048 | 0136 | 0224 | 0312 | 9.0 | 36.0 | 55 | 20 | - 65 | + 25 | + 30 |

Note

* Style CLR65 is inactive for new military design. For new design use Style CLR81.



| STANDARD/EXTENDED RATINGS: CLR69*, M39006/21-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|-------------------------------|----------|----------|-----------|---------------|---------------------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/21- | | | | MAX. DCL (µA) | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | | at | | | | - 55 °C | + 85 °C | + 125 °C |
| | | | L 2.0 | M 1.0 | P 0.1 | R 0.01 | + 25 °C | + 85 °C + 125 °C | | | | | |
| 50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C | | | | | | | | | | | | | |
| 33.0 | T1 | 20 | 0049 | 0137 | 0225 | 0313 | 2.0 | 9.0 | 12.3 | 135 | - 29 | + 10 | + 12 |
| 33.0 | T1 | 10 | 0050 | 0138 | 0226 | 0314 | 2.0 | 9.0 | 12.3 | 135 | - 29 | + 10 | + 12 |
| 120.0 | T2 | 20 | 0051 | 0139 | 0227 | 0315 | 4.0 | 24.0 | 22.5 | 49 | - 42 | + 12 | + 15 |
| 120.0 | T2 | 10 | 0052 | 0140 | 0228 | 0316 | 4.0 | 24.0 | 22.5 | 49 | - 42 | + 12 | + 15 |
| 270.0 | T3 | 20 | 0053 | 0141 | 0229 | 0317 | 8.0 | 32.0 | 37 | 29 | - 46 | + 20 | + 25 |
| 270.0 | T3 | 10 | 0054 | 0142 | 0230 | 0318 | 8.0 | 32.0 | 37 | 29 | - 46 | + 20 | + 25 |
| 330.0 | T4 | 20 | 0055 | 0143 | 0231 | 0319 | 9.0 | 36.0 | 38 | 22 | - 46 | + 25 | + 30 |
| 330.0 | T4 | 10 | 0056 | 0144 | 0232 | 0320 | 9.0 | 36.0 | 38 | 22 | - 46 | + 25 | + 30 |
| 60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C | | | | | | | | | | | | | |
| 27.0 | T1 | 20 | 0057 | 0145 | 0233 | 0321 | 3.0 | 12.0 | 10.2 | 144 | - 24 | + 10 | + 12 |
| 27.0 | T1 | 10 | 0058 | 0146 | 0234 | 0322 | 3.0 | 12.0 | 10.2 | 144 | - 24 | + 10 | + 12 |
| 100.0 | T2 | 20 | 0059 | 0147 | 0235 | 0323 | 4.0 | 20.0 | 19 | 54 | - 36 | + 12 | + 15 |
| 100.0 | T2 | 10 | 0060 | 0148 | 0236 | 0324 | 4.0 | 20.0 | 19 | 54 | - 36 | + 12 | + 15 |
| 220.0 | T3 | 20 | 0061 | 0149 | 0237 | 0325 | 8.0 | 32.0 | 30 | 29 | - 40 | + 16 | + 20 |
| 220.0 | T3 | 10 | 0062 | 0150 | 0238 | 0326 | 8.0 | 32.0 | 30 | 29 | - 40 | + 16 | + 20 |
| 270.0 | T4 | 20 | 0063 | 0151 | 0239 | 0327 | 9.0 | 36.0 | 27 | 23 | - 45 | + 20 | + 25 |
| 270.0 | T4 | 10 | 0064 | 0152 | 0240 | 0328 | 9.0 | 36.0 | 27 | 23 | - 45 | + 20 | + 25 |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 22.0 | T1 | 20 | 0065 | 0153 | 0241 | 0329 | 3.0 | 12.0 | 8.5 | 157 | - 19 | + 10 | + 12 |
| 22.0 | T1 | 10 | 0066 | 0154 | 0242 | 0330 | 3.0 | 12.0 | 8.5 | 157 | - 19 | + 10 | + 12 |
| 82.0 | T2 | 20 | 0067 | 0155 | 0243 | 0331 | 4.0 | 24.0 | 15.2 | 63 | - 30 | + 12 | + 15 |
| 82.0 | T2 | 10 | 0068 | 0156 | 0244 | 0332 | 4.0 | 24.0 | 15.2 | 63 | - 30 | + 12 | + 15 |
| 180.0 | T3 | 20 | 0069 | 0157 | 0245 | 0333 | 9.0 | 36.0 | 24.4 | 30 | - 35 | + 16 | + 20 |
| 180.0 | T3 | 10 | 0070 | 0158 | 0246 | 0334 | 9.0 | 36.0 | 24.4 | 30 | - 35 | + 16 | + 20 |
| 220.0 | T4 | 20 | 0071 | 0159 | 0247 | 0335 | 10.0 | 40.0 | 37.0 | 24 | - 40 | + 20 | + 25 |
| 220.0 | T4 | 10 | 0072 | 0160 | 0248 | 0336 | 10.0 | 40.0 | 37.0 | 24 | - 40 | + 20 | + 25 |
| 100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10.0 | T1 | 20 | 0073 | 0161 | 0249 | 0337 | 3.0 | 12.0 | 4.5 | 200 | - 17 | + 10 | + 12 |
| 10.0 | T1 | 10 | 0074 | 0162 | 0250 | 0338 | 3.0 | 12.0 | 4.5 | 200 | - 17 | + 10 | + 12 |
| 39.0 | T2 | 20 | 0075 | 0163 | 0251 | 0339 | 5.0 | 24.0 | 10.4 | 80 | - 20 | + 12 | + 15 |
| 39.0 | T2 | 10 | 0076 | 0164 | 0252 | 0340 | 5.0 | 24.0 | 10.4 | 80 | - 20 | + 12 | + 15 |
| 68.0 | T3 | 20 | 0077 | 0165 | 0253 | 0341 | 10.0 | 40.0 | 11.3 | 40 | - 30 | + 14 | + 16 |
| 68.0 | T3 | 10 | 0078 | 0166 | 0254 | 0342 | 10.0 | 40.0 | 11.3 | 40 | - 30 | + 14 | + 16 |
| 120.0 | T4 | 20 | 0079 | 0167 | 0255 | 0343 | 12.0 | 48.0 | 25 | 30 | - 35 | + 15 | + 17 |
| 120.0 | T4 | 10 | 0080 | 0168 | 0256 | 0344 | 12.0 | 48.0 | 25 | 30 | - 35 | + 15 | + 17 |
| 125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C | | | | | | | | | | | | | |
| 6.8 | T1 | 20 | 0081 | 0169 | 0257 | 0345 | 3.0 | 12.0 | 6.0 | 300 | - 14 | + 10 | + 12 |
| 6.8 | T1 | 10 | 0082 | 0170 | 0258 | 0346 | 3.0 | 12.0 | 6.0 | 300 | - 14 | + 10 | + 12 |
| 27.0 | T2 | 20 | 0083 | 0171 | 0259 | 0347 | 5.0 | 24.0 | 7.2 | 90 | - 18 | + 12 | + 15 |
| 27.0 | T2 | 10 | 0084 | 0172 | 0260 | 0348 | 5.0 | 24.0 | 7.2 | 90 | - 18 | + 12 | + 15 |
| 47.0 | T3 | 20 | 0085 | 0173 | 0261 | 0349 | 10.0 | 40.0 | 7.9 | 50 | - 26 | + 14 | + 16 |
| 47.0 | T3 | 10 | 0086 | 0174 | 0262 | 0350 | 10.0 | 40.0 | 7.9 | 50 | - 26 | + 14 | + 16 |
| 82.0 | T4 | 20 | 0087 | 0175 | 0263 | 0351 | 12.0 | 48.0 | 17.4 | 32 | - 30 | + 15 | + 17 |
| 82.0 | T4 | 10 | 0088 | 0176 | 0264 | 0352 | 12.0 | 48.0 | 17.4 | 32 | - 30 | + 15 | + 17 |

Note

* Style CLR65 is inactive for new military design. For new design use Style CLR81.



| STANDARD/EXTENDED RATINGS: CLR79, M39006/22-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|----------------------------------|------|------|---------------|---------------------|----------------|----------------|-----------------------------------|---------|----------|---|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/22-* | | | MAX. DCL (μA) | | MAX. DF | MAX. IMP. | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | at | | | | + | | | |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | + 25 °C (%) | - 55 °C (Ω) | - 55 °C | + 85 °C | + 125 °C | |
| 6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C | | | | | | | | | | | | | |
| 30.0 | T1 | 20 | 0001 | 0221 | 0441 | 1.0 | 2.0 | 9 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 30.0 | T1 | 10 | 0002 | 0222 | 0442 | 1.0 | 2.0 | 9 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 30.0 | T1 | 5 | 0003 | 0223 | 0443 | 1.0 | 2.0 | 9 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 68.0 | T1 | 20 | 0004 | 0224 | 0444 | 1.0 | 2.0 | 15 | 60 | - 40 | + 14 | + 16 | 960 |
| 68.0 | T1 | 10 | 0005 | 0225 | 0445 | 1.0 | 2.0 | 15 | 60 | - 40 | + 14 | + 16 | 960 |
| 68.0 | T1 | 5 | 0006 | 0226 | 0446 | 1.0 | 2.0 | 15 | 60 | - 40 | + 14 | + 16 | 960 |
| 140.0 | T2 | 20 | 0007 | 0227 | 0447 | 1.0 | 3.0 | 21 | 40 | - 40 | + 14 | + 16 | 1200 |
| 140.0 | T2 | 10 | 0008 | 0228 | 0448 | 1.0 | 3.0 | 21 | 40 | - 40 | + 14 | + 16 | 1200 |
| 140.0 | T2 | 5 | 0009 | 0229 | 0449 | 1.0 | 3.0 | 21 | 40 | - 40 | + 14 | + 16 | 1200 |
| 270.0 | T2 | 20 | 0010 | 0230 | 0450 | 1.0 | 6.5 | 45 | 25 | - 44 | + 17.5 | + 20 | 1375 |
| 270.0 | T2 | 10 | 0011 | 0231 | 0451 | 1.0 | 6.5 | 45 | 25 | - 44 | + 17.5 | + 20 | 1375 |
| 270.0 | T2 | 5 | 0012 | 0232 | 0452 | 1.0 | 6.5 | 45 | 25 | - 44 | + 17.5 | + 20 | 1375 |
| 330.0 | T3 | 20 | 0013 | 0233 | 0453 | 2.0 | 7.9 | 36 | 20 | - 44 | + 14 | + 16 | 1800 |
| 330.0 | T3 | 10 | 0014 | 0234 | 0454 | 2.0 | 7.9 | 36 | 20 | - 44 | + 14 | + 16 | 1800 |
| 330.0 | T3 | 5 | 0015 | 0235 | 0455 | 2.0 | 7.9 | 36 | 20 | - 44 | + 14 | + 16 | 1800 |
| 560.0 | T3 | 20 | 0016 | 0236 | 0456 | 2.0 | 13.0 | 55 | 25 | - 64 | + 17.5 | + 20 | 1900 |
| 560.0 | T3 | 10 | 0017 | 0237 | 0457 | 2.0 | 13.0 | 55 | 25 | - 64 | + 17.5 | + 20 | 1900 |
| 560.0 | T3 | 5 | 0018 | 0238 | 0458 | 2.0 | 13.0 | 55 | 25 | - 64 | + 17.5 | + 20 | 1900 |
| 1200.0 | T4 | 20 | 0019 | 0239 | 0459 | 3.0 | 14.0 | 90 | 20 | - 80 | + 25 | + 25 | 2265 |
| 1200.0 | T4 | 10 | 0020 | 0240 | 0460 | 3.0 | 14.0 | 90 | 20 | - 80 | + 25 | + 25 | 2265 |
| 8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C | | | | | | | | | | | | | |
| 25.0 | T1 | 20 | 0021 | 0241 | 0461 | 1.0 | 2.0 | 7.5 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 25.0 | T1 | 10 | 0022 | 0242 | 0462 | 1.0 | 2.0 | 7.5 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 25.0 | T1 | 5 | 0023 | 0243 | 0463 | 1.0 | 2.0 | 7.5 | 100 | - 40 | + 10.5 | + 12 | 820 |
| 56.0 | T1 | 20 | 0024 | 0244 | 0464 | 1.0 | 2.0 | 14 | 59 | - 40 | + 14 | + 16 | 900 |
| 56.0 | T1 | 10 | 0025 | 0245 | 0465 | 1.0 | 2.0 | 14 | 59 | - 40 | + 14 | + 16 | 900 |
| 56.0 | T1 | 5 | 0026 | 0246 | 0466 | 1.0 | 2.0 | 14 | 59 | - 40 | + 14 | + 16 | 900 |
| 120.0 | T2 | 20 | 0027 | 0247 | 0467 | 1.0 | 2.0 | 20 | 50 | - 44 | + 17.5 | + 20 | 1220 |
| 120.0 | T2 | 10 | 0028 | 0248 | 0468 | 1.0 | 2.0 | 20 | 50 | - 44 | + 17.5 | + 20 | 1220 |
| 120.0 | T2 | 5 | 0029 | 0249 | 0469 | 1.0 | 2.0 | 20 | 50 | - 44 | + 17.5 | + 20 | 1220 |
| 220.0 | T2 | 20 | 0030 | 0250 | 0470 | 1.0 | 7.0 | 37 | 30 | - 44 | + 17.5 | + 20 | 1370 |
| 220.0 | T2 | 10 | 0031 | 0251 | 0471 | 1.0 | 7.0 | 37 | 30 | - 44 | + 17.5 | + 20 | 1370 |
| 220.0 | T2 | 5 | 0032 | 0252 | 0472 | 1.0 | 7.0 | 37 | 30 | - 44 | + 17.5 | + 20 | 1370 |
| 290.0 | T3 | 20 | 0033 | 0253 | 0473 | 2.0 | 6.0 | 34 | 25 | - 64 | + 17.5 | + 20 | 1770 |
| 290.0 | T3 | 10 | 0034 | 0254 | 0474 | 2.0 | 6.0 | 34 | 25 | - 64 | + 17.5 | + 20 | 1770 |
| 290.0 | T3 | 5 | 0035 | 0255 | 0475 | 2.0 | 6.0 | 34 | 25 | - 64 | + 17.5 | + 20 | 1770 |
| 430.0 | T3 | 20 | 0036 | 0256 | 0476 | 2.0 | 14.0 | 46 | 25 | - 64 | + 17.5 | + 20 | 1825 |
| 430.0 | T3 | 10 | 0037 | 0257 | 0477 | 2.0 | 14.0 | 46 | 25 | - 64 | + 17.5 | + 20 | 1825 |
| 430.0 | T3 | 5 | 0038 | 0258 | 0478 | 2.0 | 14.0 | 46 | 25 | - 64 | + 17.5 | + 20 | 1825 |
| 850.0 | T4 | 20 | 0039 | 0259 | 0479 | 4.0 | 16.0 | 60 | 22 | - 80 | + 25 | + 25 | 2330 |
| 850.0 | T4 | 10 | 0040 | 0260 | 0480 | 4.0 | 16.0 | 60 | 22 | - 80 | + 25 | + 25 | 2330 |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 20.0 | T1 | 20 | 0041 | 0261 | 0481 | 1.0 | 2.0 | 6 | 175 | - 32 | + 10.5 | + 12 | 820 |
| 20.0 | T1 | 10 | 0042 | 0262 | 0482 | 1.0 | 2.0 | 6 | 175 | - 32 | + 10.5 | + 12 | 820 |
| 20.0 | T1 | 5 | 0043 | 0263 | 0483 | 1.0 | 2.0 | 6 | 175 | - 32 | + 10.5 | + 12 | 820 |
| 47.0 | T1 | 20 | 0044 | 0264 | 0484 | 1.0 | 2.0 | 13 | 100 | - 36 | + 14 | + 16 | 855 |
| 47.0 | T1 | 10 | 0045 | 0265 | 0485 | 1.0 | 2.0 | 13 | 100 | - 36 | + 14 | + 16 | 855 |
| 47.0 | T1 | 5 | 0046 | 0266 | 0486 | 1.0 | 2.0 | 13 | 100 | - 36 | + 14 | + 16 | 855 |
| 100.0 | T2 | 20 | 0047 | 0267 | 0487 | 1.0 | 4.0 | 15 | 60 | - 36 | + 14 | + 16 | 1200 |
| 100.0 | T2 | 10 | 0048 | 0268 | 0488 | 1.0 | 4.0 | 15 | 60 | - 36 | + 14 | + 16 | 1200 |
| 100.0 | T2 | 5 | 0049 | 0269 | 0489 | 1.0 | 4.0 | 15 | 60 | - 36 | + 14 | + 16 | 1200 |
| 180.0 | T2 | 20 | 0050 | 0270 | 0490 | 1.0 | 7.0 | 30 | 40 | - 36 | + 14 | + 16 | 1365 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR79, M39006/22-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|--|------|------|---------------------|---------------------|------------------------------------|--------------------------------------|-----------------------------------|---------|----------|---|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/22-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (µA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 180.0 | T2 | 10 | 0051 | 0271 | 0491 | 1.0 | 7.0 | 30 | 40 | - 36 | + 14 | + 16 | 1365 |
| 180.0 | T2 | 5 | 0052 | 0272 | 0492 | 1.0 | 7.0 | 30 | 40 | - 36 | + 14 | + 16 | 1365 |
| 250.0 | T3 | 20 | 0053 | 0273 | 0493 | 2.0 | 10.0 | 30 | 30 | - 40 | + 14 | + 16 | 1720 |
| 250.0 | T3 | 10 | 0054 | 0274 | 0494 | 2.0 | 10.0 | 30 | 30 | - 40 | + 14 | + 16 | 1720 |
| 250.0 | T3 | 5 | 0055 | 0275 | 0495 | 2.0 | 10.0 | 30 | 30 | - 40 | + 14 | + 16 | 1720 |
| 390.0 | T3 | 20 | 0056 | 0276 | 0496 | 2.0 | 16.0 | 44 | 25 | - 64 | + 17.5 | + 20 | 1800 |
| 390.0 | T3 | 10 | 0057 | 0277 | 0497 | 2.0 | 16.0 | 44 | 25 | - 64 | + 17.5 | + 20 | 1800 |
| 390.0 | T3 | 5 | 0058 | 0278 | 0498 | 2.0 | 16.0 | 44 | 25 | - 64 | + 17.5 | + 20 | 1800 |
| 750.0 | T4 | 20 | 0059 | 0279 | 0499 | 4.0 | 16.0 | 50 | 23 | - 80 | + 25 | + 25 | 2360 |
| 750.0 | T4 | 10 | 0060 | 0280 | 0500 | 4.0 | 16.0 | 50 | 23 | - 80 | + 25 | + 25 | 2360 |
| 15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C | | | | | | | | | | | | | |
| 15.0 | T1 | 20 | 0061 | 0281 | 0501 | 1.0 | 2.0 | 5 | 155 | - 24 | + 10.5 | + 12 | 780 |
| 15.0 | T1 | 10 | 0062 | 0282 | 0502 | 1.0 | 2.0 | 5 | 155 | - 24 | + 10.5 | + 12 | 780 |
| 15.0 | T1 | 5 | 0063 | 0283 | 0503 | 1.0 | 2.0 | 5 | 155 | - 24 | + 10.5 | + 12 | 780 |
| 33.0 | T1 | 20 | 0064 | 0284 | 0504 | 1.0 | 2.0 | 10 | 90 | - 28 | + 14 | + 16 | 820 |
| 33.0 | T1 | 10 | 0065 | 0285 | 0505 | 1.0 | 2.0 | 10 | 90 | - 28 | + 14 | + 16 | 820 |
| 33.0 | T1 | 5 | 0066 | 0286 | 0506 | 1.0 | 2.0 | 10 | 90 | - 28 | + 14 | + 16 | 820 |
| 70.0 | T2 | 20 | 0067 | 0287 | 0507 | 1.0 | 4.0 | 13 | 75 | - 28 | + 14 | + 16 | 1150 |
| 70.0 | T2 | 10 | 0068 | 0288 | 0508 | 1.0 | 4.0 | 13 | 75 | - 28 | + 14 | + 16 | 1150 |
| 70.0 | T2 | 5 | 0069 | 0289 | 0509 | 1.0 | 4.0 | 13 | 75 | - 28 | + 14 | + 16 | 1150 |
| 120.0 | T2 | 20 | 0070 | 0290 | 0510 | 1.0 | 7.0 | 18 | 50 | - 28 | + 17.5 | + 20 | 1450 |
| 120.0 | T2 | 10 | 0071 | 0291 | 0511 | 1.0 | 7.0 | 18 | 50 | - 28 | + 17.5 | + 20 | 1450 |
| 120.0 | T2 | 5 | 0072 | 0292 | 0512 | 1.0 | 7.0 | 18 | 50 | - 28 | + 17.5 | + 20 | 1450 |
| 170.0 | T3 | 20 | 0073 | 0293 | 0513 | 2.0 | 10.0 | 25 | 35 | - 32 | + 14 | + 16 | 1480 |
| 170.0 | T3 | 10 | 0074 | 0294 | 0514 | 2.0 | 10.0 | 25 | 35 | - 32 | + 14 | + 16 | 1480 |
| 170.0 | T3 | 5 | 0075 | 0295 | 0515 | 2.0 | 10.0 | 25 | 35 | - 32 | + 14 | + 16 | 1480 |
| 270.0 | T3 | 20 | 0076 | 0296 | 0516 | 2.0 | 16.0 | 32 | 30 | - 56 | + 17.5 | + 20 | 1740 |
| 270.0 | T3 | 10 | 0077 | 0297 | 0517 | 2.0 | 16.0 | 32 | 30 | - 56 | + 17.5 | + 20 | 1740 |
| 270.0 | T3 | 5 | 0078 | 0298 | 0518 | 2.0 | 16.0 | 32 | 30 | - 56 | + 17.5 | + 20 | 1740 |
| 540.0 | T4 | 20 | 0079 | 0299 | 0519 | 6.0 | 24.0 | 40 | 23 | - 80 | + 25 | + 25 | 2330 |
| 540.0 | T4 | 10 | 0080 | 0300 | 0520 | 6.0 | 24.0 | 40 | 23 | - 80 | + 25 | + 25 | 2330 |
| 25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10.0 | T1 | 20 | 0081 | 0301 | 0521 | 1.0 | 2.0 | 4 | 220 | - 16 | + 8 | + 9 | 715 |
| 10.0 | T1 | 10 | 0082 | 0302 | 0522 | 1.0 | 2.0 | 4 | 220 | - 16 | + 8 | + 9 | 715 |
| 10.0 | T1 | 5 | 0083 | 0303 | 0523 | 1.0 | 2.0 | 4 | 220 | - 16 | + 8 | + 9 | 715 |
| 22.0 | T1 | 20 | 0084 | 0304 | 0524 | 1.0 | 2.0 | 6.6 | 140 | - 20 | + 10.5 | + 12 | 825 |
| 22.0 | T1 | 10 | 0085 | 0305 | 0525 | 1.0 | 2.0 | 6.6 | 140 | - 20 | + 10.5 | + 12 | 825 |
| 22.0 | T1 | 5 | 0086 | 0306 | 0526 | 1.0 | 2.0 | 6.6 | 140 | - 20 | + 10.5 | + 12 | 825 |
| 50.0 | T2 | 20 | 0087 | 0307 | 0527 | 1.0 | 2.0 | 11.0 | 70 | - 28 | + 13 | + 15 | 1130 |
| 50.0 | T2 | 10 | 0088 | 0308 | 0528 | 1.0 | 2.0 | 11.0 | 70 | - 28 | + 13 | + 15 | 1130 |
| 50.0 | T2 | 5 | 0089 | 0309 | 0529 | 1.0 | 2.0 | 11.0 | 70 | - 28 | + 13 | + 15 | 1130 |
| 100.0 | T2 | 20 | 0090 | 0310 | 0530 | 1.0 | 10.0 | 15 | 50 | - 28 | + 13 | + 15 | 1435 |
| 100.0 | T2 | 10 | 0091 | 0311 | 0531 | 1.0 | 10.0 | 15 | 50 | - 28 | + 13 | + 15 | 1435 |
| 100.0 | T2 | 5 | 0092 | 0312 | 0532 | 1.0 | 10.0 | 15 | 50 | - 28 | + 13 | + 15 | 1435 |
| 120.0 | T3 | 20 | 0093 | 0313 | 0533 | 2.0 | 6.0 | 21 | 38 | - 32 | + 13 | + 15 | 1450 |
| 120.0 | T3 | 10 | 0094 | 0314 | 0534 | 2.0 | 6.0 | 21 | 38 | - 32 | + 13 | + 15 | 1450 |
| 120.0 | T3 | 5 | 0095 | 0315 | 0535 | 2.0 | 6.0 | 21 | 38 | - 32 | + 13 | + 15 | 1450 |
| 180.0 | T3 | 20 | 0096 | 0316 | 0536 | 2.0 | 18.0 | 26 | 32 | - 48 | + 13 | + 15 | 1525 |
| 180.0 | T3 | 10 | 0097 | 0317 | 0537 | 2.0 | 18.0 | 26 | 32 | - 48 | + 13 | + 15 | 1525 |
| 180.0 | T3 | 5 | 0098 | 0318 | 0538 | 2.0 | 18.0 | 26 | 32 | - 48 | + 13 | + 15 | 1525 |
| 350.0 | T4 | 20 | 0099 | 0319 | 0539 | 7.0 | 28.0 | 35 | 24 | - 70 | + 25 | + 25 | 1970 |
| 350.0 | T4 | 10 | 0100 | 0320 | 0540 | 7.0 | 28.0 | 35 | 24 | - 70 | + 25 | + 25 | 1970 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR79, M39006/22-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|----------------------------------|------|------|---------------------|-------------------|-----------------------------------|-------------------------------------|-----------------------------------|--------|---------|--|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/22-* | | | MAX. DCL (µA) at | | MAX. DF at +25 °C (%) | MAX. IMP. at -55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at +85 °C 40 kHz (mA) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | +25 °C | +85 °C +125 °C | | | -55 °C | +85 °C | +125 °C | |
| | | | M | P | R | 1.0 | 0.1 | | | 0.01 | | | |
| 30 WVDC at +85 °C . . . 20 WVDC at +125 °C | | | | | | | | | | | | | |
| 8.0 | T1 | 20 | 0101 | 0321 | 0541 | 1.0 | 2.0 | 4 | 275 | -16 | +8 | +12 | 640 |
| 8.0 | T1 | 10 | 0102 | 0322 | 0542 | 1.0 | 2.0 | 4 | 275 | -16 | +8 | +12 | 640 |
| 8.0 | T1 | 5 | 0103 | 0323 | 0543 | 1.0 | 2.0 | 4 | 275 | -16 | +8 | +12 | 640 |
| 15.0 | T1 | 20 | 0104 | 0324 | 0544 | 1.0 | 2.0 | 5 | 175 | -20 | +10.5 | +12 | 780 |
| 15.0 | T1 | 10 | 0105 | 0325 | 0545 | 1.0 | 2.0 | 5 | 175 | -20 | +10.5 | +12 | 780 |
| 15.0 | T1 | 5 | 0106 | 0326 | 0546 | 1.0 | 2.0 | 5 | 175 | -20 | +10.5 | +12 | 780 |
| 40.0 | T2 | 20 | 0107 | 0327 | 0547 | 1.0 | 5.0 | 10 | 65 | -24 | +10.5 | +12 | 1120 |
| 40.0 | T2 | 10 | 0108 | 0328 | 0548 | 1.0 | 5.0 | 10 | 65 | -24 | +10.5 | +12 | 1120 |
| 40.0 | T2 | 5 | 0109 | 0329 | 0549 | 1.0 | 5.0 | 10 | 65 | -24 | +10.5 | +12 | 1120 |
| 68.0 | T2 | 20 | 0110 | 0330 | 0550 | 1.0 | 8.0 | 13 | 60 | -24 | +13 | +15 | 1285 |
| 68.0 | T2 | 10 | 0111 | 0331 | 0551 | 1.0 | 8.0 | 13 | 60 | -24 | +13 | +15 | 1285 |
| 68.0 | T2 | 5 | 0112 | 0332 | 0552 | 1.0 | 8.0 | 13 | 60 | -24 | +13 | +15 | 1285 |
| 100.0 | T3 | 20 | 0113 | 0333 | 0553 | 2.0 | 12.0 | 17 | 40 | -28 | +10.5 | +12 | 1450 |
| 100.0 | T3 | 10 | 0114 | 0334 | 0554 | 2.0 | 12.0 | 17 | 40 | -28 | +10.5 | +12 | 1450 |
| 100.0 | T3 | 5 | 0115 | 0335 | 0555 | 2.0 | 12.0 | 17 | 40 | -28 | +10.5 | +12 | 1450 |
| 150.0 | T3 | 20 | 0116 | 0336 | 0556 | 2.0 | 18.0 | 23 | 35 | -48 | +13 | +15 | 1525 |
| 150.0 | T3 | 10 | 0117 | 0337 | 0557 | 2.0 | 18.0 | 23 | 35 | -48 | +13 | +15 | 1525 |
| 150.0 | T3 | 5 | 0118 | 0338 | 0558 | 2.0 | 18.0 | 23 | 35 | -48 | +13 | +15 | 1525 |
| 300.0 | T4 | 20 | 0119 | 0339 | 0559 | 8.0 | 32.0 | 31 | 25 | -60 | +25 | +25 | 1950 |
| 300.0 | T4 | 10 | 0120 | 0340 | 0560 | 8.0 | 32.0 | 31 | 25 | -60 | +25 | +25 | 1950 |
| 50 WVDC at +85 °C . . . 30 WVDC at +125 °C | | | | | | | | | | | | | |
| 5.0 | T1 | 20 | 0121 | 0341 | 0561 | 1.0 | 2.0 | 3 | 400 | -16 | +5 | +6 | 580 |
| 5.0 | T1 | 10 | 0122 | 0342 | 0562 | 1.0 | 2.0 | 3 | 400 | -16 | +5 | +6 | 580 |
| 5.0 | T1 | 5 | 0123 | 0343 | 0563 | 1.0 | 2.0 | 3 | 400 | -16 | +5 | +6 | 580 |
| 10.0 | T1 | 20 | 0124 | 0344 | 0564 | 1.0 | 2.0 | 4 | 250 | -24 | +8 | +9 | 715 |
| 10.0 | T1 | 10 | 0125 | 0345 | 0565 | 1.0 | 2.0 | 4 | 250 | -24 | +8 | +9 | 715 |
| 10.0 | T1 | 5 | 0126 | 0346 | 0566 | 1.0 | 2.0 | 4 | 250 | -24 | +8 | +9 | 715 |
| 25.0 | T2 | 20 | 0127 | 0347 | 0567 | 1.0 | 5.0 | 8 | 95 | -20 | +10.5 | +12 | 1005 |
| 25.0 | T2 | 10 | 0128 | 0348 | 0568 | 1.0 | 5.0 | 8 | 95 | -20 | +10.5 | +12 | 1005 |
| 25.0 | T2 | 5 | 0129 | 0349 | 0569 | 1.0 | 5.0 | 8 | 95 | -20 | +10.5 | +12 | 1005 |
| 47.0 | T2 | 20 | 0130 | 0350 | 0570 | 1.0 | 9.0 | 11 | 70 | -28 | +13 | +15 | 1155 |
| 47.0 | T2 | 10 | 0131 | 0351 | 0571 | 1.0 | 9.0 | 11 | 70 | -28 | +13 | +15 | 1155 |
| 47.0 | T2 | 5 | 0132 | 0352 | 0572 | 1.0 | 9.0 | 11 | 70 | -28 | +13 | +15 | 1155 |
| 60.0 | T3 | 20 | 0133 | 0353 | 0573 | 2.0 | 12.0 | 12 | 45 | -16 | +10.5 | +12 | 1335 |
| 60.0 | T3 | 10 | 0134 | 0354 | 0574 | 2.0 | 12.0 | 12 | 45 | -16 | +10.5 | +12 | 1335 |
| 60.0 | T3 | 5 | 0135 | 0355 | 0575 | 2.0 | 12.0 | 12 | 45 | -16 | +10.5 | +12 | 1335 |
| 82.0 | T3 | 20 | 0136 | 0356 | 0576 | 2.0 | 16.0 | 15 | 45 | -32 | +13 | +15 | 1400 |
| 82.0 | T3 | 10 | 0137 | 0357 | 0577 | 2.0 | 16.0 | 15 | 45 | -32 | +13 | +15 | 1400 |
| 82.0 | T3 | 5 | 0138 | 0358 | 0578 | 2.0 | 16.0 | 15 | 45 | -32 | +13 | +15 | 1400 |
| 160.0 | T4 | 20 | 0139 | 0359 | 0579 | 8.0 | 32.0 | 17 | 27 | -50 | +25 | +25 | 1900 |
| 160.0 | T4 | 10 | 0140 | 0360 | 0580 | 8.0 | 32.0 | 17 | 27 | -50 | +25 | +25 | 1900 |
| 60 WVDC at +85 °C . . . 40 WVDC at +125 °C | | | | | | | | | | | | | |
| 4.0 | T1 | 20 | 0141 | 0361 | 0581 | 1.0 | 2.0 | 2.8 | 550 | -16 | +5 | +6 | 525 |
| 4.0 | T1 | 10 | 0142 | 0362 | 0582 | 1.0 | 2.0 | 2.8 | 550 | -16 | +5 | +6 | 525 |
| 4.0 | T1 | 5 | 0143 | 0363 | 0583 | 1.0 | 2.0 | 2.8 | 550 | -16 | +5 | +6 | 525 |
| 8.2 | T1 | 20 | 0144 | 0364 | 0584 | 1.0 | 2.0 | 4 | 275 | -24 | +8 | +9 | 625 |
| 8.2 | T1 | 10 | 0145 | 0365 | 0585 | 1.0 | 2.0 | 4 | 275 | -24 | +8 | +9 | 625 |
| 8.2 | T1 | 5 | 0146 | 0366 | 0586 | 1.0 | 2.0 | 4 | 275 | -24 | +8 | +9 | 625 |
| 20.0 | T2 | 20 | 0147 | 0367 | 0587 | 1.0 | 5.0 | 7 | 105 | -16 | +10.5 | +12 | 930 |
| 20.0 | T2 | 10 | 0148 | 0368 | 0588 | 1.0 | 5.0 | 7 | 105 | -16 | +10.5 | +12 | 930 |
| 20.0 | T2 | 5 | 0149 | 0369 | 0589 | 1.0 | 5.0 | 7 | 105 | -16 | +10.5 | +12 | 930 |
| 39.0 | T2 | 20 | 0150 | 0370 | 0590 | 1.0 | 9.0 | 10 | 90 | -28 | +10.5 | +12 | 1110 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR79, M39006/22-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|---------------------|---------------------|---------------------------------|--------------------------------------|-----------------------------------|---------|----------|--|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/22-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (µA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C | | | | | | | | | | | | | |
| 39.0 | T2 | 10 | 0151 | 0371 | 0591 | 1.0 | 9.0 | 10 | 90 | - 28 | + 10.5 | + 12 | 1110 |
| 39.0 | T2 | 5 | 0152 | 0372 | 0592 | 1.0 | 9.0 | 10 | 90 | - 28 | + 10.5 | + 12 | 1110 |
| 50.0 | T3 | 20 | 0153 | 0373 | 0593 | 2.0 | 12.0 | 10 | 50 | - 16 | + 10.5 | + 12 | 1330 |
| 50.0 | T3 | 10 | 0154 | 0374 | 0594 | 2.0 | 12.0 | 10 | 50 | - 16 | + 10.5 | + 12 | 1330 |
| 50.0 | T3 | 5 | 0155 | 0375 | 0595 | 2.0 | 12.0 | 10 | 50 | - 16 | + 10.5 | + 12 | 1330 |
| 68.0 | T3 | 20 | 0156 | 0376 | 0596 | 2.0 | 16.0 | 13 | 50 | - 32 | + 10.5 | + 12 | 1365 |
| 68.0 | T3 | 10 | 0157 | 0377 | 0597 | 2.0 | 16.0 | 13 | 50 | - 32 | + 10.5 | + 12 | 1365 |
| 68.0 | T3 | 5 | 0158 | 0378 | 0598 | 2.0 | 16.0 | 13 | 50 | - 32 | + 10.5 | + 12 | 1365 |
| 140.0 | T4 | 20 | 0159 | 0379 | 0599 | 8.0 | 32.0 | 16 | 28 | - 40 | + 20 | + 20 | 1850 |
| 140.0 | T4 | 10 | 0160 | 0380 | 0600 | 8.0 | 32.0 | 16 | 28 | - 40 | + 20 | + 20 | 1850 |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 3.5 | T1 | 20 | 0161 | 0381 | 0601 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 | 525 |
| 3.5 | T1 | 10 | 0162 | 0382 | 0602 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 | 525 |
| 3.5 | T1 | 5 | 0163 | 0383 | 0603 | 1.0 | 2.0 | 2.5 | 650 | - 16 | + 5 | + 6 | 525 |
| 6.8 | T1 | 20 | 0164 | 0384 | 0604 | 1.0 | 2.0 | 3.5 | 300 | - 20 | + 8 | + 9 | 610 |
| 6.8 | T1 | 10 | 0165 | 0385 | 0605 | 1.0 | 2.0 | 3.5 | 300 | - 20 | + 8 | + 9 | 610 |
| 6.8 | T1 | 5 | 0166 | 0386 | 0606 | 1.0 | 2.0 | 3.5 | 300 | - 20 | + 8 | + 9 | 610 |
| 15.0 | T2 | 20 | 0167 | 0387 | 0607 | 1.0 | 5.0 | 6 | 150 | - 16 | + 8 | + 9 | 890 |
| 15.0 | T2 | 10 | 0168 | 0388 | 0608 | 1.0 | 5.0 | 6 | 150 | - 16 | + 8 | + 9 | 890 |
| 15.0 | T2 | 5 | 0169 | 0389 | 0609 | 1.0 | 5.0 | 6 | 150 | - 16 | + 8 | + 9 | 890 |
| 33.0 | T2 | 20 | 0170 | 0390 | 0610 | 1.0 | 10.0 | 10 | 90 | - 24 | + 10.5 | + 15 | 1000 |
| 33.0 | T2 | 10 | 0171 | 0391 | 0611 | 1.0 | 10.0 | 10 | 90 | - 24 | + 10.5 | + 15 | 1000 |
| 33.0 | T2 | 5 | 0172 | 0392 | 0612 | 1.0 | 10.0 | 10 | 90 | - 24 | + 10.5 | + 15 | 1000 |
| 40.0 | T3 | 20 | 0173 | 0393 | 0613 | 2.0 | 12.0 | 9 | 60 | - 16 | + 10.5 | + 12 | 1250 |
| 40.0 | T3 | 10 | 0174 | 0394 | 0614 | 2.0 | 12.0 | 9 | 60 | - 16 | + 10.5 | + 12 | 1250 |
| 40.0 | T3 | 5 | 0175 | 0395 | 0615 | 2.0 | 12.0 | 9 | 60 | - 16 | + 10.5 | + 12 | 1250 |
| 56.0 | T3 | 20 | 0176 | 0396 | 0616 | 2.0 | 17.0 | 11 | 60 | - 28 | + 10.5 | + 15 | 1335 |
| 56.0 | T3 | 10 | 0177 | 0397 | 0617 | 2.0 | 17.0 | 11 | 60 | - 28 | + 10.5 | + 15 | 1335 |
| 56.0 | T3 | 5 | 0178 | 0398 | 0618 | 2.0 | 17.0 | 11 | 60 | - 28 | + 10.5 | + 15 | 1335 |
| 110.0 | T4 | 20 | 0179 | 0399 | 0619 | 9.0 | 36.0 | 12 | 29 | - 35 | + 20 | + 20 | 1850 |
| 110.0 | T4 | 10 | 0180 | 0400 | 0620 | 9.0 | 36.0 | 12 | 29 | - 35 | + 20 | + 20 | 1850 |
| 100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C | | | | | | | | | | | | | |
| 2.5 | T1 | 20 | 0181 | 0401 | 0621 | 1.0 | 2.0 | 2 | 950 | - 16 | + 7 | + 8 | 505 |
| 2.5 | T1 | 10 | 0182 | 0402 | 0622 | 1.0 | 2.0 | 2 | 950 | - 16 | + 7 | + 8 | 505 |
| 2.5 | T1 | 5 | 0183 | 0403 | 0623 | 1.0 | 2.0 | 2 | 950 | - 16 | + 7 | + 8 | 505 |
| 4.7 | T1 | 20 | 0184 | 0404 | 0624 | 1.0 | 2.0 | 3 | 500 | - 16 | + 7 | + 8 | 565 |
| 4.7 | T1 | 10 | 0185 | 0405 | 0625 | 1.0 | 2.0 | 3 | 500 | - 16 | + 7 | + 8 | 565 |
| 4.7 | T1 | 5 | 0186 | 0406 | 0626 | 1.0 | 2.0 | 3 | 500 | - 16 | + 7 | + 8 | 565 |
| 11.0 | T2 | 20 | 0187 | 0407 | 0627 | 1.0 | 4.0 | 5 | 200 | - 16 | + 8 | + 8 | 835 |
| 11.0 | T2 | 10 | 0188 | 0408 | 0628 | 1.0 | 4.0 | 5 | 200 | - 16 | + 8 | + 8 | 835 |
| 11.0 | T2 | 5 | 0189 | 0409 | 0629 | 1.0 | 4.0 | 5 | 200 | - 16 | + 8 | + 8 | 835 |
| 22.0 | T2 | 20 | 0190 | 0410 | 0630 | 1.0 | 9.0 | 7.5 | 100 | - 16 | + 8 | + 8 | 965 |
| 22.0 | T2 | 10 | 0191 | 0411 | 0631 | 1.0 | 9.0 | 7.5 | 100 | - 16 | + 8 | + 8 | 965 |
| 22.0 | T2 | 5 | 0192 | 0412 | 0632 | 1.0 | 9.0 | 7.5 | 100 | - 16 | + 8 | + 8 | 965 |
| 30.0 | T3 | 20 | 0193 | 0413 | 0633 | 2.0 | 12.0 | 7 | 80 | - 16 | + 8 | + 8 | 1240 |
| 30.0 | T3 | 10 | 0194 | 0414 | 0634 | 2.0 | 12.0 | 7 | 80 | - 16 | + 8 | + 8 | 1240 |
| 30.0 | T3 | 5 | 0195 | 0415 | 0635 | 2.0 | 12.0 | 7 | 80 | - 16 | + 8 | + 8 | 1240 |
| 43.0 | T3 | 20 | 0196 | 0416 | 0636 | 2.0 | 17.0 | 8.5 | 70 | - 20 | + 8 | + 8 | 1335 |
| 43.0 | T3 | 10 | 0197 | 0417 | 0637 | 2.0 | 17.0 | 8.5 | 70 | - 20 | + 8 | + 8 | 1335 |
| 43.0 | T3 | 5 | 0198 | 0418 | 0638 | 2.0 | 17.0 | 8.5 | 70 | - 20 | + 8 | + 8 | 1335 |
| 86.0 | T4 | 20 | 0199 | 0419 | 0639 | 9.0 | 36.0 | 10 | 30 | - 25 | + 15 | + 15 | 1800 |
| 86.0 | T4 | 10 | 0200 | 0420 | 0640 | 9.0 | 36.0 | 10 | 30 | - 25 | + 15 | + 15 | 1800 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR79, M39006/22-XXXX | | | | | | | | | | | | | |
|---|--------------|----------------------------|--|------|------|---------------------------|---------------------|------------------------------------|---|-----------------------------------|---------|----------|---|
| CAPACITANCE (μ F) | CASE CODE | CAP. TOL. (\pm %) | PART NO. M39006/22-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (μ A) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C | | | | | | | | | | | | | |
| 1.7 | T1 | 20 | 0201 | 0421 | 0641 | 1.0 | 2.0 | 2 | 1250 | - 16 | + 7 | + 8 | 415 |
| 1.7 | T1 | 10 | 0202 | 0422 | 0642 | 1.0 | 2.0 | 2 | 1250 | - 16 | + 7 | + 8 | 415 |
| 1.7 | T1 | 5 | 0203 | 0423 | 0643 | 1.0 | 2.0 | 2 | 1250 | - 16 | + 7 | + 8 | 415 |
| 3.6 | T1 | 20 | 0204 | 0424 | 0644 | 1.0 | 2.0 | 2.7 | 600 | - 16 | + 7 | + 8 | 520 |
| 3.6 | T1 | 10 | 0205 | 0425 | 0645 | 1.0 | 2.0 | 2.7 | 600 | - 16 | + 7 | + 8 | 520 |
| 3.6 | T1 | 5 | 0206 | 0426 | 0646 | 1.0 | 2.0 | 2.7 | 600 | - 16 | + 7 | + 8 | 520 |
| 9.0 | T2 | 20 | 0207 | 0427 | 0647 | 1.0 | 5.0 | 5 | 240 | - 16 | + 7 | + 8 | 755 |
| 9.0 | T2 | 10 | 0208 | 0428 | 0648 | 1.0 | 5.0 | 5 | 240 | - 16 | + 7 | + 8 | 755 |
| 9.0 | T2 | 5 | 0209 | 0429 | 0649 | 1.0 | 5.0 | 5 | 240 | - 16 | + 7 | + 8 | 755 |
| 14.0 | T2 | 20 | 0210 | 0430 | 0650 | 1.0 | 7.0 | 6 | 167 | - 16 | + 7 | + 8 | 860 |
| 14.0 | T2 | 10 | 0211 | 0431 | 0651 | 1.0 | 7.0 | 6 | 167 | - 16 | + 7 | + 8 | 860 |
| 14.0 | T2 | 5 | 0212 | 0432 | 0652 | 1.0 | 7.0 | 6 | 167 | - 16 | + 7 | + 8 | 860 |
| 18.0 | T3 | 20 | 0213 | 0433 | 0653 | 2.0 | 9.0 | 5 | 129 | - 16 | + 7 | + 8 | 1130 |
| 18.0 | T3 | 10 | 0214 | 0434 | 0654 | 2.0 | 9.0 | 5 | 129 | - 16 | + 7 | + 8 | 1130 |
| 18.0 | T3 | 5 | 0215 | 0435 | 0655 | 2.0 | 9.0 | 5 | 129 | - 16 | + 7 | + 8 | 1130 |
| 25.0 | T3 | 20 | 0216 | 0436 | 0656 | 2.0 | 13.0 | 6 | 93 | - 16 | + 7 | + 8 | 1200 |
| 25.0 | T3 | 10 | 0217 | 0437 | 0657 | 2.0 | 13.0 | 6 | 93 | - 16 | + 7 | + 8 | 1200 |
| 25.0 | T3 | 5 | 0218 | 0438 | 0658 | 2.0 | 13.0 | 6 | 93 | - 16 | + 7 | + 8 | 1200 |
| 56.0 | T4 | 20 | 0219 | 0439 | 0659 | 10.0 | 40.0 | 6.5 | 32 | - 25 | + 15 | + 15 | 1800 |
| 56.0 | T4 | 10 | 0220 | 0440 | 0660 | 10.0 | 40.0 | 6.5 | 32 | - 25 | + 15 | + 15 | 1800 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.

| STANDARD/EXTENDED RATINGS: CLR81, M39006/25-XXXX | | | | | | | | | | | | | |
|---|--------------|----------------------------|--|------|------|---------------------------|---------------------|------------------------------------|---|-----------------------------------|---------|----------|---|
| CAPACITANCE (μ F) | CASE CODE | CAP. TOL. (\pm %) | PART NO. M39006/25-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (μ A) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C | | | | | | | | | | | | | |
| 220.0 | T1 | 20 | 0001 | 0089 | 0177 | 2.0 | 9.0 | 50 | 36 | - 64 | + 13 | + 16 | 1000 |
| 220.0 | T1 | 10 | 0002 | 0090 | 0178 | 2.0 | 9.0 | 50 | 36 | - 64 | + 13 | + 16 | 1000 |
| 820.0 | T2 | 20 | 0003 | 0091 | 0179 | 3.0 | 14.0 | 155 | 18 | - 88 | + 16 | + 20 | 1500 |
| 820.0 | T2 | 10 | 0004 | 0092 | 0180 | 3.0 | 14.0 | 155 | 18 | - 88 | + 16 | + 20 | 1500 |
| 1500.0 | T3 | 20 | 0005 | 0093 | 0181 | 5.0 | 20.0 | 172 | 18 | - 90 | + 20 | + 25 | 1900 |
| 1500.0 | T3 | 10 | 0006 | 0094 | 0182 | 5.0 | 20.0 | 172 | 18 | - 90 | + 20 | + 25 | 1900 |
| 2200.0 | T4 | 20 | 0007 | 0095 | 0183 | 6.0 | 24.0 | 170 | 13 | - 90 | + 25 | + 30 | 2300 |
| 2200.0 | T4 | 10 | 0008 | 0096 | 0184 | 6.0 | 24.0 | 170 | 13 | - 90 | + 25 | + 30 | 2300 |
| 8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C | | | | | | | | | | | | | |
| 180.0 | T1 | 20 | 0009 | 0097 | 0185 | 2.0 | 9.0 | 41 | 45 | - 60 | + 13 | + 16 | 1000 |
| 180.0 | T1 | 10 | 0010 | 0098 | 0186 | 2.0 | 9.0 | 41 | 45 | - 60 | + 13 | + 16 | 1000 |
| 680.0 | T2 | 20 | 0011 | 0099 | 0187 | 3.0 | 14.0 | 130 | 22 | - 83 | + 16 | + 20 | 1500 |
| 680.0 | T2 | 10 | 0012 | 0100 | 0188 | 3.0 | 14.0 | 130 | 22 | - 83 | + 16 | + 20 | 1500 |
| 1500.0 | T3 | 20 | 0013 | 0101 | 0189 | 5.0 | 20.0 | 170 | 18 | - 90 | + 20 | + 25 | 1900 |
| 1500.0 | T3 | 10 | 0014 | 0102 | 0190 | 5.0 | 20.0 | 170 | 18 | - 90 | + 20 | + 25 | 1900 |
| 1800.0 | T4 | 20 | 0015 | 0103 | 0191 | 7.0 | 25.0 | 138 | 14 | - 90 | + 25 | + 30 | 2300 |
| 1800.0 | T4 | 10 | 0016 | 0104 | 0192 | 7.0 | 25.0 | 138 | 14 | - 90 | + 25 | + 30 | 2300 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR81, M39006/25-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|----------------------------------|------|------|---------------|---------------------|-----------------------------|-------------------------------|-----------------------------------|---------|----------|---|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/25-* | | | MAX. DCL (μA) | | MAX. DF at + 25 °C | MAX. IMP. at - 55 °C | MAX. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | at | | | | + | | | |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | + 25 °C (%) | - 55 °C (Ω) | - 55 °C | + 85 °C | + 125 °C | |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 150.0 | T1 | 20 | 0017 | 0105 | 0193 | 2.0 | 9.0 | 34 | 54 | - 55 | + 13 | + 16 | 900 |
| 150.0 | T1 | 10 | 0018 | 0106 | 0194 | 2.0 | 9.0 | 34 | 54 | - 55 | + 13 | + 16 | 900 |
| 560.0 | T2 | 20 | 0019 | 0107 | 0195 | 3.0 | 16.0 | 106 | 27 | - 77 | + 16 | + 20 | 1450 |
| 560.0 | T2 | 10 | 0020 | 0108 | 0196 | 3.0 | 16.0 | 106 | 27 | - 77 | + 16 | + 20 | 1450 |
| 1200.0 | T3 | 20 | 0021 | 0109 | 0197 | 5.0 | 20.0 | 137 | 18 | - 88 | + 20 | + 25 | 1850 |
| 1200.0 | T3 | 10 | 0022 | 0110 | 0198 | 5.0 | 20.0 | 137 | 18 | - 88 | + 20 | + 25 | 1850 |
| 1500.0 | T4 | 20 | 0023 | 0111 | 0199 | 7.0 | 25.0 | 114 | 15 | - 88 | + 25 | + 30 | 2300 |
| 1500.0 | T4 | 10 | 0024 | 0112 | 0200 | 7.0 | 25.0 | 114 | 15 | - 88 | + 25 | + 30 | 2300 |
| 15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C | | | | | | | | | | | | | |
| 100.0 | T1 | 20 | 0025 | 0113 | 0201 | 2.0 | 9.0 | 30 | 72 | - 44 | + 13 | + 16 | 900 |
| 100.0 | T1 | 10 | 0026 | 0114 | 0202 | 2.0 | 9.0 | 30 | 72 | - 44 | + 13 | + 16 | 900 |
| 390.0 | T2 | 20 | 0027 | 0115 | 0203 | 3.0 | 16.0 | 74 | 31 | - 66 | + 16 | + 20 | 1450 |
| 390.0 | T2 | 10 | 0028 | 0116 | 0204 | 3.0 | 16.0 | 74 | 31 | - 66 | + 16 | + 20 | 1450 |
| 820.0 | T3 | 20 | 0029 | 0117 | 0205 | 6.0 | 24.0 | 111 | 22 | - 77 | + 20 | + 25 | 1800 |
| 820.0 | T3 | 10 | 0030 | 0118 | 0206 | 6.0 | 24.0 | 111 | 22 | - 77 | + 20 | + 25 | 1800 |
| 1000.0 | T4 | 20 | 0031 | 0119 | 0207 | 8.0 | 32.0 | 92 | 17 | - 77 | + 25 | + 30 | 2300 |
| 1000.0 | T4 | 10 | 0032 | 0120 | 0208 | 8.0 | 32.0 | 92 | 17 | - 77 | + 25 | + 30 | 2300 |
| 25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C | | | | | | | | | | | | | |
| 68.0 | T1 | 20 | 0033 | 0121 | 0209 | 2.0 | 9.0 | 22 | 90 | - 40 | + 12 | + 15 | 850 |
| 68.0 | T1 | 10 | 0034 | 0122 | 0210 | 2.0 | 9.0 | 22 | 90 | - 40 | + 12 | + 15 | 850 |
| 270.0 | T2 | 20 | 0035 | 0123 | 0211 | 3.0 | 16.0 | 55 | 33 | - 62 | + 13 | + 16 | 1400 |
| 270.0 | T2 | 10 | 0036 | 0124 | 0212 | 3.0 | 16.0 | 55 | 33 | - 62 | + 13 | + 16 | 1400 |
| 560.0 | T3 | 20 | 0037 | 0125 | 0213 | 7.0 | 28.0 | 76 | 24 | - 72 | + 20 | + 25 | 1750 |
| 560.0 | T3 | 10 | 0038 | 0126 | 0214 | 7.0 | 28.0 | 76 | 24 | - 72 | + 20 | + 25 | 1750 |
| 680.0 | T4 | 20 | 0039 | 0127 | 0215 | 8.0 | 32.0 | 63 | 19 | - 72 | + 25 | + 30 | 2100 |
| 680.0 | T4 | 10 | 0040 | 0128 | 0216 | 8.0 | 32.0 | 63 | 19 | - 72 | + 25 | + 30 | 2100 |
| 30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C | | | | | | | | | | | | | |
| 56.0 | T1 | 20 | 0041 | 0129 | 0217 | 2.0 | 9.0 | 22 | 100 | - 38 | + 12 | + 15 | 800 |
| 56.0 | T1 | 10 | 0042 | 0130 | 0218 | 2.0 | 9.0 | 22 | 100 | - 38 | + 12 | + 15 | 800 |
| 220.0 | T2 | 20 | 0043 | 0131 | 0219 | 3.0 | 16.0 | 42 | 36 | - 60 | + 13 | + 16 | 1200 |
| 220.0 | T2 | 10 | 0044 | 0132 | 0220 | 3.0 | 16.0 | 42 | 36 | - 60 | + 13 | + 16 | 1200 |
| 470.0 | T3 | 20 | 0045 | 0133 | 0221 | 8.0 | 32.0 | 64 | 25 | - 65 | + 20 | + 25 | 1500 |
| 470.0 | T3 | 10 | 0046 | 0134 | 0222 | 8.0 | 32.0 | 64 | 25 | - 65 | + 20 | + 25 | 1500 |
| 560.0 | T4 | 20 | 0047 | 0135 | 0223 | 9.0 | 36.0 | 55 | 20 | - 65 | + 25 | + 30 | 2000 |
| 560.0 | T4 | 10 | 0048 | 0136 | 0224 | 9.0 | 36.0 | 55 | 20 | - 65 | + 25 | + 30 | 2000 |
| 50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C | | | | | | | | | | | | | |
| 33.0 | T1 | 20 | 0049 | 0137 | 0225 | 2.0 | 9.0 | 12.3 | 135 | - 29 | + 10 | + 12 | 700 |
| 33.0 | T1 | 10 | 0050 | 0138 | 0226 | 2.0 | 9.0 | 12.3 | 135 | - 29 | + 10 | + 12 | 700 |
| 120.0 | T2 | 20 | 0051 | 0139 | 0227 | 4.0 | 24.0 | 22.5 | 49 | - 42 | + 12 | + 15 | 1200 |
| 120.0 | T2 | 10 | 0052 | 0140 | 0228 | 4.0 | 24.0 | 22.5 | 49 | - 42 | + 12 | + 15 | 1200 |
| 270.0 | T3 | 20 | 0053 | 0141 | 0229 | 8.0 | 32.0 | 37 | 29 | - 46 | + 20 | + 25 | 1450 |
| 270.0 | T3 | 10 | 0054 | 0142 | 0230 | 8.0 | 32.0 | 37 | 29 | - 46 | + 20 | + 25 | 1450 |
| 330.0 | T4 | 20 | 0055 | 0143 | 0231 | 9.0 | 36.0 | 38 | 22 | - 46 | + 25 | + 30 | 1900 |
| 330.0 | T4 | 10 | 0056 | 0144 | 0232 | 9.0 | 36.0 | 38 | 22 | - 46 | + 25 | + 30 | 1900 |
| 60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C | | | | | | | | | | | | | |
| 27.0 | T1 | 20 | 0057 | 0145 | 0233 | 3.0 | 12.0 | 10.2 | 144 | - 24 | + 10 | + 12 | 700 |
| 27.0 | T1 | 10 | 0058 | 0146 | 0234 | 3.0 | 12.0 | 10.2 | 144 | - 24 | + 10 | + 12 | 700 |
| 100.0 | T2 | 20 | 0059 | 0147 | 0235 | 4.0 | 20.0 | 19 | 54 | - 36 | + 12 | + 15 | 1100 |
| 100.0 | T2 | 10 | 0060 | 0148 | 0236 | 4.0 | 20.0 | 19 | 54 | - 36 | + 12 | + 15 | 1100 |
| 220.0 | T3 | 20 | 0061 | 0149 | 0237 | 8.0 | 32.0 | 30 | 29 | - 40 | + 16 | + 20 | 1400 |
| 220.0 | T3 | 10 | 0062 | 0150 | 0238 | 8.0 | 32.0 | 30 | 29 | - 40 | + 16 | + 20 | 1400 |
| 270.0 | T4 | 20 | 0063 | 0151 | 0239 | 9.0 | 36.0 | 27 | 23 | - 45 | + 20 | + 25 | 1850 |
| 270.0 | T4 | 10 | 0064 | 0152 | 0240 | 9.0 | 36.0 | 27 | 23 | - 45 | + 20 | + 25 | 1850 |

Notes

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).

** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.



| STANDARD/EXTENDED RATINGS: CLR81, M39006/25-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|----------------------------------|------|------|---------------|---------------------|------------------------------------|--------------------------------------|------------------------------------|---------|---------|---|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/25-* | | | MAX. DCL (μA) | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX.. CAPACITANCE CHANGE (%) at | | | MAX.** RIPPLE CURRENT at + 85 °C 40 kHz (mA) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | at | | | | + 25 °C | | | |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | | | + 25 °C | - 55 °C | - 55 °C | |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 22.0 | T1 | 20 | 0065 | 0153 | 0241 | 3.0 | 12.0 | 8.5 | 157 | - 19 | + 10 | + 12 | 600 |
| 22.0 | T1 | 10 | 0066 | 0154 | 0242 | 3.0 | 12.0 | 8.5 | 157 | - 19 | + 10 | + 12 | 600 |
| 82.0 | T2 | 20 | 0067 | 0155 | 0243 | 4.0 | 24.0 | 15.2 | 63 | - 30 | + 12 | + 15 | 1000 |
| 82.0 | T2 | 10 | 0068 | 0156 | 0244 | 4.0 | 24.0 | 15.2 | 63 | - 30 | + 12 | + 15 | 1000 |
| 180.0 | T3 | 20 | 0069 | 0157 | 0245 | 9.0 | 36.0 | 24.4 | 30 | - 35 | + 16 | + 20 | 1300 |
| 180.0 | T3 | 10 | 0070 | 0158 | 0246 | 9.0 | 36.0 | 24.4 | 30 | - 35 | + 16 | + 20 | 1300 |
| 220.0 | T4 | 20 | 0071 | 0159 | 0247 | 10.0 | 40.0 | 37.0 | 24 | - 40 | + 20 | + 25 | 1800 |
| 220.0 | T4 | 10 | 0072 | 0160 | 0248 | 10.0 | 40.0 | 37.0 | 24 | - 40 | + 20 | + 25 | 1800 |
| 100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10.0 | T1 | 20 | 0073 | 0161 | 0249 | 3.0 | 12.0 | 4.5 | 200 | - 17 | + 10 | + 12 | 800 |
| 10.0 | T1 | 10 | 0074 | 0162 | 0250 | 3.0 | 12.0 | 4.5 | 200 | - 17 | + 10 | + 12 | 800 |
| 39.0 | T2 | 20 | 0075 | 0163 | 0251 | 5.0 | 24.0 | 10.4 | 80 | - 20 | + 12 | + 15 | 1300 |
| 39.0 | T2 | 10 | 0076 | 0164 | 0252 | 5.0 | 24.0 | 10.4 | 80 | - 20 | + 12 | + 15 | 1300 |
| 68.0 | T3 | 20 | 0077 | 0165 | 0253 | 10.0 | 40.0 | 11.3 | 40 | - 30 | + 14 | + 16 | 1600 |
| 68.0 | T3 | 10 | 0078 | 0166 | 0254 | 10.0 | 40.0 | 11.3 | 40 | - 30 | + 14 | + 16 | 1600 |
| 120.0 | T4 | 20 | 0079 | 0167 | 0255 | 12.0 | 48.0 | 25 | 30 | - 35 | + 15 | + 17 | 2000 |
| 120.0 | T4 | 10 | 0080 | 0168 | 0256 | 12.0 | 48.0 | 25 | 30 | - 35 | + 15 | + 17 | 2000 |
| 125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C | | | | | | | | | | | | | |
| 6.8 | T1 | 20 | 0081 | 0169 | 0257 | 3.0 | 12.0 | 6.0 | 300 | - 14 | + 10 | + 12 | 700 |
| 6.8 | T1 | 10 | 0082 | 0170 | 0258 | 3.0 | 12.0 | 6.0 | 300 | - 14 | + 10 | + 12 | 700 |
| 27.0 | T2 | 20 | 0083 | 0171 | 0259 | 5.0 | 24.0 | 7.2 | 90 | - 18 | + 12 | + 15 | 1200 |
| 27.0 | T2 | 10 | 0084 | 0172 | 0260 | 5.0 | 24.0 | 7.2 | 90 | - 18 | + 12 | + 15 | 1200 |
| 47.0 | T3 | 20 | 0085 | 0173 | 0261 | 10.0 | 40.0 | 7.9 | 50 | - 26 | + 14 | + 16 | 1500 |
| 47.0 | T3 | 10 | 0086 | 0174 | 0262 | 10.0 | 40.0 | 7.9 | 50 | - 26 | + 14 | + 16 | 1500 |
| 82.0 | T4 | 20 | 0087 | 0175 | 0263 | 12.0 | 48.0 | 17.4 | 32 | - 30 | + 15 | + 17 | 1900 |
| 82.0 | T4 | 10 | 0088 | 0176 | 0264 | 12.0 | 48.0 | 17.4 | 32 | - 30 | + 15 | + 17 | 1900 |

Notes

- * Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).
- ** For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current Table.

| CLR79, CLR81 RIPPLE CURRENT MULTIPLIERS VS. FREQUENCY, TEMPERATURE AND APPLIED PEAK VOLTAGE | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|------|------|------|---------|------|------|------|---------|------|------|------|---------|------|------|------|---------|------|------|------|---------|------|------|------|
| FREQUENCY OF APPLIED RIPPLE CURRENT | | 120 Hz | | | | 800 Hz | | | | 1 kHz | | | | 10 kHz | | | | 40 kHz | | | | 100 kHz | | | |
| AMBIENT STILL AIR | | TEMP °C | | | | TEMP °C | | | | TEMP °C | | | | TEMP °C | | | | TEMP °C | | | | | | | |
| | | ≤ 55 | 85 | 105 | 125 | ≤ 55 | 85 | 105 | 125 | ≤ 55 | 85 | 105 | 125 | ≤ 55 | 85 | 105 | 125 | ≤ 55 | 85 | 105 | 125 | ≤ 55 | 85 | 105 | 125 |
| % of APPLIED VOLTAGE | 100 % | 0.60 | 0.39 | - | - | 0.71 | 0.43 | - | - | 0.72 | 0.46 | - | - | 0.88 | 0.55 | - | - | 1.0 | 0.63 | - | - | 1.1 | 0.69 | - | - |
| | 90 % | 0.60 | 0.46 | - | - | 0.71 | 0.55 | - | - | 0.72 | 0.55 | - | - | 0.88 | 0.67 | - | - | 1.0 | 0.77 | - | - | 1.1 | 0.85 | - | - |
| | 80 % | 0.60 | 0.52 | 0.35 | - | 0.71 | 0.62 | 0.42 | - | 0.72 | 0.62 | 0.42 | - | 0.88 | 0.76 | 0.52 | - | 1.0 | 0.87 | 0.59 | - | 1.1 | 0.96 | 0.65 | - |
| | 70 % | 0.60 | 0.58 | 0.44 | - | 0.71 | 0.69 | 0.52 | - | 0.72 | 0.70 | 0.52 | - | 0.88 | 0.85 | 0.64 | - | 1.0 | 0.97 | 0.73 | - | 1.1 | 1.07 | 0.80 | - |
| | 66 2/3 % | 0.60 | 0.60 | 0.46 | 0.27 | 0.71 | 0.71 | 0.55 | 0.32 | 0.72 | 0.72 | 0.55 | 0.32 | 0.88 | 0.88 | 0.68 | 0.40 | 1.0 | 1.0 | 0.77 | 0.45 | 1.1 | 1.1 | 0.85 | 0.50 |

Notes

- At + 125 °C the rated voltage of the capacitors decreases to 66 2/3 percent of the + 85 °C rated voltage.
- The peak of the applied AC ripple voltage plus the applied DC voltage must not exceed the DC voltage rating of the capacitor either forward or reverse.
- The ripple current listed represents a rating calculated using a maximum internal temperature rise (ΔT) of + 50 °C at 40 kHz at + 85 °C ambient with a maximum peak rated voltage of 66 2/3 percent of the + 85 °C peak voltage rating.
- The maximum allowable internal temperature rise (ΔT) decreases linearly to a calculated + 10 °C rise at + 125 °C ambient.
- The internal temperature rise is directly proportional to the equivalent series resistance of the capacitor and equivalent series resistance increases with decreasing frequency.



| STANDARD/EXTENDED RATINGS: CLR90, M39006/30-XXXX | | | | | | | | | | | | | |
|--|-----------|-----------------|--|------|------|------------------|----------------|-----------------------|-------------------------|--------------------------------|--------|---------|-------------------------------|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/30-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (µA) at | | MAX. DF at +25 °C (%) | MAX. IMP. at -55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX. ESR at +25 °C 120 Hz (Ω) |
| | | | M | P | R | +25 °C | +85 °C +125 °C | | | -55 °C | +85 °C | +125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 6 WVDC at +85 °C . . . 4 WVDC at +125 °C | | | | | | | | | | | | | |
| 30.0 | T1 | 20 | 0001 | 0221 | 0441 | 1.0 | 2.0 | 4.5 | 100 | -40 | +10.5 | +12 | 1.99 |
| 30.0 | T1 | 10 | 0002 | 0222 | 0442 | 1.0 | 2.0 | 4.5 | 100 | -40 | +10.5 | +12 | 1.99 |
| 30.0 | T1 | 5 | 0003 | 0223 | 0443 | 1.0 | 2.0 | 4.5 | 100 | -40 | +10.5 | +12 | 1.99 |
| 68.0 | T1 | 20 | 0004 | 0224 | 0444 | 1.0 | 2.0 | 7.5 | 60 | -40 | +14 | +16 | 1.58 |
| 68.0 | T1 | 10 | 0005 | 0225 | 0445 | 1.0 | 2.0 | 7.5 | 60 | -40 | +14 | +16 | 1.58 |
| 68.0 | T1 | 5 | 0006 | 0226 | 0446 | 1.0 | 2.0 | 7.5 | 60 | -40 | +14 | +16 | 1.58 |
| 140.0 | T2 | 20 | 0007 | 0227 | 0447 | 1.0 | 3.0 | 10.5 | 40 | -40 | +14 | +16 | 0.99 |
| 140.0 | T2 | 10 | 0008 | 0228 | 0448 | 1.0 | 3.0 | 10.5 | 40 | -40 | +14 | +16 | 0.99 |
| 140.0 | T2 | 5 | 0009 | 0229 | 0449 | 1.0 | 3.0 | 10.5 | 40 | -40 | +14 | +16 | 0.99 |
| 270.0 | T2 | 20 | 0010 | 0230 | 0450 | 1.0 | 6.5 | 22.5 | 25 | -44 | +17.5 | +20 | 1.11 |
| 270.0 | T2 | 10 | 0011 | 0231 | 0451 | 1.0 | 6.5 | 22.5 | 25 | -44 | +17.5 | +20 | 1.11 |
| 270.0 | T2 | 5 | 0012 | 0232 | 0452 | 1.0 | 6.5 | 22.5 | 25 | -44 | +17.5 | +20 | 1.11 |
| 330.0 | T3 | 20 | 0013 | 0233 | 0453 | 2.0 | 7.9 | 18.0 | 20 | -44 | +14 | +16 | 0.73 |
| 330.0 | T3 | 10 | 0014 | 0234 | 0454 | 2.0 | 7.9 | 18.0 | 20 | -44 | +14 | +16 | 0.73 |
| 330.0 | T3 | 5 | 0015 | 0235 | 0455 | 2.0 | 7.9 | 18.0 | 20 | -44 | +14 | +16 | 0.73 |
| 560.0 | T3 | 20 | 0016 | 0236 | 0456 | 2.0 | 13.0 | 27.5 | 25 | -64 | +17.5 | +20 | 0.65 |
| 560.0 | T3 | 10 | 0017 | 0237 | 0457 | 2.0 | 13.0 | 27.5 | 25 | -64 | +17.5 | +20 | 0.65 |
| 560.0 | T3 | 5 | 0018 | 0238 | 0458 | 2.0 | 13.0 | 27.5 | 25 | -64 | +17.5 | +20 | 0.65 |
| 1200.0 | T4 | 20 | 0019 | 0239 | 0459 | 3.0 | 14.0 | 45.0 | 20 | -80 | +25 | +25 | 0.50 |
| 1200.0 | T4 | 10 | 0020 | 0240 | 0460 | 3.0 | 14.0 | 45.0 | 20 | -80 | +25 | +25 | 0.50 |
| 8 WVDC at +85 °C . . . 5 WVDC at +125 °C | | | | | | | | | | | | | |
| 25 | T1 | 20 | 0021 | 0241 | 0461 | 1.0 | 2.0 | 3.75 | 100 | -40 | +10.5 | +12 | 1.99 |
| 25 | T1 | 10 | 0022 | 0242 | 0462 | 1.0 | 2.0 | 3.75 | 100 | -40 | +10.5 | +12 | 1.99 |
| 25 | T1 | 5 | 0023 | 0243 | 0463 | 1.0 | 2.0 | 3.75 | 100 | -40 | +10.5 | +12 | 1.99 |
| 56 | T1 | 20 | 0024 | 0244 | 0464 | 1.0 | 2.0 | 7.0 | 59 | -40 | +14 | +16 | 1.66 |
| 56 | T1 | 10 | 0025 | 0245 | 0465 | 1.0 | 2.0 | 7.0 | 59 | -40 | +14 | +16 | 1.66 |
| 56 | T1 | 5 | 0026 | 0246 | 0466 | 1.0 | 2.0 | 7.0 | 59 | -40 | +14 | +16 | 1.66 |
| 120 | T2 | 20 | 0027 | 0247 | 0467 | 1.0 | 2.0 | 10.0 | 50 | -44 | +17.5 | +20 | 1.11 |
| 120 | T2 | 10 | 0028 | 0248 | 0468 | 1.0 | 2.0 | 10.0 | 50 | -44 | +17.5 | +20 | 1.11 |
| 120 | T2 | 5 | 0029 | 0249 | 0469 | 1.0 | 2.0 | 10.0 | 50 | -44 | +17.5 | +20 | 1.11 |
| 220 | T2 | 20 | 0030 | 0250 | 0470 | 1.0 | 7.0 | 18.5 | 30 | -44 | +17.5 | +20 | 1.12 |
| 220 | T2 | 10 | 0031 | 0251 | 0471 | 1.0 | 7.0 | 18.5 | 30 | -44 | +17.5 | +20 | 1.12 |
| 220 | T2 | 5 | 0032 | 0252 | 0472 | 1.0 | 7.0 | 18.5 | 30 | -44 | +17.5 | +20 | 1.12 |
| 290 | T3 | 20 | 0033 | 0253 | 0473 | 2.0 | 6.0 | 17.0 | 25 | -64 | +17.5 | +20 | 0.78 |
| 290 | T3 | 10 | 0034 | 0254 | 0474 | 2.0 | 6.0 | 17.0 | 25 | -64 | +17.5 | +20 | 0.78 |
| 290 | T3 | 5 | 0035 | 0255 | 0475 | 2.0 | 6.0 | 17.0 | 25 | -64 | +17.5 | +20 | 0.78 |
| 430 | T3 | 20 | 0036 | 0256 | 0476 | 2.0 | 14.0 | 23.0 | 25 | -64 | +17.5 | +20 | 0.71 |
| 430 | T3 | 10 | 0037 | 0257 | 0477 | 2.0 | 14.0 | 23.0 | 25 | -64 | +17.5 | +20 | 0.71 |
| 430 | T3 | 5 | 0038 | 0258 | 0478 | 2.0 | 14.0 | 23.0 | 25 | -64 | +17.5 | +20 | 0.71 |
| 850 | T4 | 20 | 0039 | 0259 | 0479 | 4.0 | 16.0 | 30.0 | 22 | -80 | +25 | +25 | 0.47 |
| 850 | T4 | 10 | 0040 | 0260 | 0480 | 4.0 | 16.0 | 30.0 | 22 | -80 | +25 | +25 | 0.47 |
| 10 WVDC at +85 °C . . . 7 WVDC at +125 °C | | | | | | | | | | | | | |
| 20 | T1 | 20 | 0041 | 0261 | 0481 | 1.0 | 2.0 | 3.0 | 175 | -32 | +10.5 | +12 | 1.99 |
| 20 | T1 | 10 | 0042 | 0262 | 0482 | 1.0 | 2.0 | 3.0 | 175 | -32 | +10.5 | +12 | 1.99 |
| 20 | T1 | 5 | 0043 | 0263 | 0483 | 1.0 | 2.0 | 3.0 | 175 | -32 | +10.5 | +12 | 1.99 |
| 47 | T1 | 20 | 0044 | 0264 | 0484 | 1.0 | 2.0 | 6.5 | 100 | -36 | +14 | +16 | 1.84 |
| 47 | T1 | 10 | 0045 | 0265 | 0485 | 1.0 | 2.0 | 6.5 | 100 | -36 | +14 | +16 | 1.84 |
| 47 | T1 | 5 | 0046 | 0266 | 0486 | 1.0 | 2.0 | 6.5 | 100 | -36 | +14 | +16 | 1.84 |
| 100 | T2 | 20 | 0047 | 0267 | 0487 | 1.0 | 4.0 | 7.5 | 60 | -36 | +14 | +16 | 0.99 |
| 100 | T2 | 10 | 0048 | 0268 | 0488 | 1.0 | 4.0 | 7.5 | 60 | -36 | +14 | +16 | 0.99 |
| 100 | T2 | 5 | 0049 | 0269 | 0489 | 1.0 | 4.0 | 7.5 | 60 | -36 | +14 | +16 | 0.99 |
| 180 | T2 | 20 | 0050 | 0270 | 0490 | 1.0 | 7.0 | 15.0 | 40 | -36 | +14 | +16 | 1.11 |
| 180 | T2 | 10 | 0051 | 0271 | 0491 | 1.0 | 7.0 | 15.0 | 40 | -36 | +14 | +16 | 1.11 |
| 180 | T2 | 5 | 0052 | 0272 | 0492 | 1.0 | 7.0 | 15.0 | 40 | -36 | +14 | +16 | 1.11 |
| 250 | T3 | 20 | 0053 | 0273 | 0493 | 2.0 | 10.0 | 15.0 | 30 | -40 | +14 | +16 | 0.80 |
| 250 | T3 | 10 | 0054 | 0274 | 0494 | 2.0 | 10.0 | 15.0 | 30 | -40 | +14 | +16 | 0.80 |
| 250 | T3 | 5 | 0055 | 0275 | 0495 | 2.0 | 10.0 | 15.0 | 30 | -40 | +14 | +16 | 0.80 |
| 390 | T3 | 20 | 0056 | 0276 | 0496 | 2.0 | 16.0 | 22.0 | 25 | -64 | +17.5 | +20 | 0.75 |

Note

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).



| STANDARD/EXTENDED RATINGS: CLR90, M39006/30-XXXX | | | | | | | | | | | | | |
|---|--------------|-----------------------|----------------------------------|----------|-----------|---------------------|---------------------|---------------------------------|--------------------------------------|-----------------------------------|---------|----------|--|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/30-* | | | MAX. DCL (μA) at | | MAX. DF at + 25 °C (%) | MAX. IMP. at - 55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX. ESR at + 25 °C 120 Hz (Ω) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | + 25 °C | + 85 °C + 125 °C | | | - 55 °C | + 85 °C | + 125 °C | |
| | | | M 1.0 | P 0.1 | R 0.01 | | | | | | | | |
| 10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C | | | | | | | | | | | | | |
| 390 | T3 | 10 | 0057 | 0277 | 0497 | 2.0 | 16.0 | 22.0 | 25 | - 64 | + 17.5 | + 20 | 0.75 |
| 390 | T3 | 5 | 0058 | 0278 | 0498 | 2.0 | 16.0 | 22.0 | 25 | - 64 | + 17.5 | + 20 | 0.75 |
| 750 | T4 | 20 | 0059 | 0279 | 0499 | 4.0 | 16.0 | 25.0 | 23 | - 80 | + 25 | + 25 | 0.44 |
| 750 | T4 | 10 | 0060 | 0280 | 0500 | 4.0 | 16.0 | 25.0 | 23 | - 80 | + 25 | + 25 | 0.44 |
| 15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C | | | | | | | | | | | | | |
| 15 | T1 | 20 | 0061 | 0281 | 0501 | 1.0 | 2.0 | 2.5 | 155 | - 24 | + 10.5 | + 12 | 1.99 |
| 15 | T1 | 10 | 0062 | 0282 | 0502 | 1.0 | 2.0 | 2.5 | 155 | - 24 | + 10.5 | + 12 | 1.99 |
| 15 | T1 | 5 | 0063 | 0283 | 0503 | 1.0 | 2.0 | 2.5 | 155 | - 24 | + 10.5 | + 12 | 1.99 |
| 33 | T1 | 20 | 0064 | 0284 | 0504 | 1.0 | 2.0 | 5.0 | 90 | - 28 | + 14 | + 16 | 1.66 |
| 33 | T1 | 10 | 0065 | 0285 | 0505 | 1.0 | 2.0 | 5.0 | 90 | - 28 | + 14 | + 16 | 1.66 |
| 33 | T1 | 5 | 0066 | 0286 | 0506 | 1.0 | 2.0 | 5.0 | 90 | - 28 | + 14 | + 16 | 1.66 |
| 70 | T2 | 20 | 0067 | 0287 | 0507 | 1.0 | 4.0 | 6.5 | 75 | - 28 | + 14 | + 16 | 1.11 |
| 70 | T2 | 10 | 0068 | 0288 | 0508 | 1.0 | 4.0 | 6.5 | 75 | - 28 | + 14 | + 16 | 1.11 |
| 70 | T2 | 5 | 0069 | 0289 | 0509 | 1.0 | 4.0 | 6.5 | 75 | - 28 | + 14 | + 16 | 1.11 |
| 120 | T2 | 20 | 0070 | 0290 | 0510 | 1.0 | 7.0 | 9.0 | 50 | - 28 | + 17.5 | + 20 | 1.12 |
| 120 | T2 | 10 | 0071 | 0291 | 0511 | 1.0 | 7.0 | 9.0 | 50 | - 28 | + 17.5 | + 20 | 1.12 |
| 120 | T2 | 5 | 0072 | 0292 | 0512 | 1.0 | 7.0 | 9.0 | 50 | - 28 | + 17.5 | + 20 | 1.12 |
| 170 | T3 | 20 | 0073 | 0293 | 0513 | 2.0 | 10.0 | 12.5 | 35 | - 32 | + 14 | + 16 | 0.78 |
| 170 | T3 | 10 | 0074 | 0294 | 0514 | 2.0 | 10.0 | 12.5 | 35 | - 32 | + 14 | + 16 | 0.78 |
| 170 | T3 | 5 | 0075 | 0295 | 0515 | 2.0 | 10.0 | 12.5 | 35 | - 32 | + 14 | + 16 | 0.78 |
| 270 | T3 | 20 | 0076 | 0296 | 0516 | 2.0 | 16.0 | 16.0 | 30 | - 56 | + 17.5 | + 20 | 0.71 |
| 270 | T3 | 10 | 0077 | 0297 | 0517 | 2.0 | 16.0 | 16.0 | 30 | - 56 | + 17.5 | + 20 | 0.71 |
| 270 | T3 | 5 | 0078 | 0298 | 0518 | 2.0 | 16.0 | 16.0 | 30 | - 56 | + 17.5 | + 20 | 0.71 |
| 540 | T4 | 20 | 0079 | 0299 | 0519 | 6.0 | 24.0 | 20.0 | 23 | - 80 | + 25 | + 25 | 0.47 |
| 540 | T4 | 10 | 0080 | 0300 | 0520 | 6.0 | 24.0 | 20.0 | 23 | - 80 | + 25 | + 25 | 0.47 |
| 25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10 | T1 | 20 | 0081 | 0301 | 0521 | 1.0 | 2.0 | 2.0 | 220 | - 16 | + 8 | + 9 | 2.66 |
| 10 | T1 | 10 | 0082 | 0302 | 0522 | 1.0 | 2.0 | 2.0 | 220 | - 16 | + 8 | + 9 | 2.66 |
| 10 | T1 | 5 | 0083 | 0303 | 0523 | 1.0 | 2.0 | 2.0 | 220 | - 16 | + 8 | + 9 | 2.66 |
| 22 | T1 | 20 | 0084 | 0304 | 0524 | 1.0 | 2.0 | 3.3 | 140 | - 20 | + 10.5 | + 12 | 1.99 |
| 22 | T1 | 10 | 0085 | 0305 | 0525 | 1.0 | 2.0 | 3.3 | 140 | - 20 | + 10.5 | + 12 | 1.99 |
| 22 | T1 | 5 | 0086 | 0306 | 0526 | 1.0 | 2.0 | 3.3 | 140 | - 20 | + 10.5 | + 12 | 1.99 |
| 50 | T2 | 20 | 0087 | 0307 | 0527 | 1.0 | 2.0 | 5.5 | 70 | - 28 | + 13 | + 15 | 1.46 |
| 50 | T2 | 10 | 0088 | 0308 | 0528 | 1.0 | 2.0 | 5.5 | 70 | - 28 | + 13 | + 15 | 1.46 |
| 50 | T2 | 5 | 0089 | 0309 | 0529 | 1.0 | 2.0 | 5.5 | 70 | - 28 | + 13 | + 15 | 1.46 |
| 100 | T2 | 20 | 0090 | 0310 | 0530 | 1.0 | 10.0 | 7.5 | 50 | - 28 | + 13 | + 15 | 0.99 |
| 100 | T2 | 10 | 0091 | 0311 | 0531 | 1.0 | 10.0 | 7.5 | 50 | - 28 | + 13 | + 15 | 0.99 |
| 100 | T2 | 5 | 0092 | 0312 | 0532 | 1.0 | 10.0 | 7.5 | 50 | - 28 | + 13 | + 15 | 0.99 |
| 120 | T3 | 20 | 0093 | 0313 | 0533 | 2.0 | 6.0 | 10.5 | 38 | - 32 | + 13 | + 15 | 1.16 |
| 120 | T3 | 10 | 0094 | 0314 | 0534 | 2.0 | 6.0 | 10.5 | 38 | - 32 | + 13 | + 15 | 1.16 |
| 120 | T3 | 5 | 0095 | 0315 | 0535 | 2.0 | 6.0 | 10.5 | 38 | - 32 | + 13 | + 15 | 1.16 |
| 180 | T3 | 20 | 0096 | 0316 | 0536 | 2.0 | 18.0 | 13.0 | 32 | - 48 | + 13 | + 15 | 0.96 |
| 180 | T3 | 10 | 0097 | 0317 | 0537 | 2.0 | 18.0 | 13.0 | 32 | - 48 | + 13 | + 15 | 0.96 |
| 180 | T3 | 5 | 0098 | 0318 | 0538 | 2.0 | 18.0 | 13.0 | 32 | - 48 | + 13 | + 15 | 0.96 |
| 350 | T4 | 20 | 0099 | 0319 | 0539 | 7.0 | 28.0 | 17.5 | 24 | - 70 | + 25 | + 25 | 0.67 |
| 350 | T4 | 10 | 0100 | 0320 | 0540 | 7.0 | 28.0 | 17.5 | 24 | - 70 | + 25 | + 25 | 0.67 |
| 30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C | | | | | | | | | | | | | |
| 8 | T1 | 20 | 0101 | 0321 | 0541 | 1.0 | 2.0 | 2.0 | 275 | - 16 | + 8 | + 12 | 3.32 |
| 8 | T1 | 10 | 0102 | 0322 | 0542 | 1.0 | 2.0 | 2.0 | 275 | - 16 | + 8 | + 12 | 3.32 |
| 8 | T1 | 5 | 0103 | 0323 | 0543 | 1.0 | 2.0 | 2.0 | 275 | - 16 | + 8 | + 12 | 3.32 |
| 15 | T1 | 20 | 0104 | 0324 | 0544 | 1.0 | 2.0 | 2.5 | 175 | - 20 | + 10.5 | + 12 | 2.21 |
| 15 | T1 | 10 | 0105 | 0325 | 0545 | 1.0 | 2.0 | 2.5 | 175 | - 20 | + 10.5 | + 12 | 2.21 |
| 15 | T1 | 5 | 0106 | 0326 | 0546 | 1.0 | 2.0 | 2.5 | 175 | - 20 | + 10.5 | + 12 | 2.21 |
| 40 | T2 | 20 | 0107 | 0327 | 0547 | 1.0 | 5.0 | 5.0 | 65 | - 24 | + 10.5 | + 12 | 1.66 |
| 40 | T2 | 10 | 0108 | 0328 | 0548 | 1.0 | 5.0 | 5.0 | 65 | - 24 | + 10.5 | + 12 | 0.66 |
| 40 | T2 | 5 | 0109 | 0329 | 0549 | 1.0 | 5.0 | 5.0 | 65 | - 24 | + 10.5 | + 12 | 0.66 |
| 68 | T2 | 20 | 0110 | 0330 | 0550 | 1.0 | 8.0 | 6.5 | 60 | - 24 | + 13 | + 15 | 1.27 |

Note

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).



| STANDARD/EXTENDED RATINGS: CLR90, M39006/30-XXXX | | | | | | | | | | | | | |
|---|-----------|-----------------|---|------|------|------------------|----------------|-----------------------|-------------------------|--------------------------------|--------|---------|-------------------------------|
| CAPACITANCE (µF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/30-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (µA) at | | MAX. DF at +25 °C (%) | MAX. IMP. at -55 °C (Ω) | MAX. CAPACITANCE CHANGE (%) at | | | MAX. ESR at +25 °C 120 Hz (Ω) |
| | | | M | P | R | +25 °C | +85 °C +125 °C | | | -55 °C | +85 °C | +125 °C | |
| | | | 1.0 | 0.1 | 0.01 | | | | | | | | |
| 30 WVDC at +85 °C . . . 20 WVDC at +125 °C | | | | | | | | | | | | | |
| 68 | T2 | 10 | 0111 | 0331 | 0551 | 1.0 | 8.0 | 6.5 | 60 | -24 | +13 | +15 | 1.27 |
| 68 | T2 | 5 | 0112 | 0332 | 0552 | 1.0 | 8.0 | 6.5 | 60 | -24 | +13 | +15 | 1.27 |
| 100 | T3 | 20 | 0113 | 0333 | 0553 | 2.0 | 12.0 | 8.5 | 40 | -28 | +10.5 | +12 | 1.13 |
| 100 | T3 | 10 | 0114 | 0334 | 0554 | 2.0 | 12.0 | 8.5 | 40 | -28 | +10.5 | +12 | 1.13 |
| 100 | T3 | 5 | 0115 | 0335 | 0555 | 2.0 | 12.0 | 8.5 | 40 | -28 | +10.5 | +12 | 1.13 |
| 150 | T3 | 20 | 0116 | 0336 | 0556 | 2.0 | 18.0 | 11.5 | 35 | -48 | +13 | +15 | 1.02 |
| 150 | T3 | 10 | 0117 | 0337 | 0557 | 2.0 | 18.0 | 11.5 | 35 | -48 | +13 | +15 | 1.02 |
| 150 | T3 | 5 | 0118 | 0338 | 0558 | 2.0 | 18.0 | 11.5 | 35 | -48 | +13 | +15 | 1.02 |
| 300 | T4 | 20 | 0119 | 0339 | 0559 | 8.0 | 32.0 | 15.5 | 25 | -60 | +25 | +25 | 0.69 |
| 300 | T4 | 10 | 0120 | 0340 | 0560 | 8.0 | 32.0 | 15.5 | 25 | -60 | +25 | +25 | 0.69 |
| 50 WVDC at +85 °C . . . 30 WVDC at +125 °C | | | | | | | | | | | | | |
| 5 | T1 | 20 | 0121 | 0341 | 0561 | 1.0 | 2.0 | 1.5 | 400 | -16 | +5 | +6 | 3.98 |
| 5 | T1 | 10 | 0122 | 0342 | 0562 | 1.0 | 2.0 | 1.5 | 400 | -16 | +5 | +6 | 3.98 |
| 5 | T1 | 5 | 0123 | 0343 | 0563 | 1.0 | 2.0 | 1.5 | 400 | -16 | +5 | +6 | 3.98 |
| 10 | T1 | 20 | 0124 | 0344 | 0564 | 1.0 | 2.0 | 2.0 | 250 | -24 | +8 | +9 | 2.66 |
| 10 | T1 | 10 | 0125 | 0345 | 0565 | 1.0 | 2.0 | 2.0 | 250 | -24 | +8 | +9 | 2.66 |
| 10 | T1 | 5 | 0126 | 0346 | 0566 | 1.0 | 2.0 | 2.0 | 250 | -24 | +8 | +9 | 2.66 |
| 25 | T2 | 20 | 0127 | 0347 | 0567 | 1.0 | 5.0 | 4.0 | 95 | -20 | +10.5 | +12 | 2.13 |
| 25 | T2 | 10 | 0128 | 0348 | 0568 | 1.0 | 5.0 | 4.0 | 95 | -20 | +10.5 | +12 | 2.13 |
| 25 | T2 | 5 | 0129 | 0349 | 0569 | 1.0 | 5.0 | 4.0 | 95 | -20 | +10.5 | +12 | 2.13 |
| 47 | T2 | 20 | 0130 | 0350 | 0570 | 1.0 | 9.0 | 5.0 | 70 | -28 | +13 | +15 | 1.56 |
| 47 | T2 | 10 | 0131 | 0351 | 0571 | 1.0 | 9.0 | 5.0 | 70 | -28 | +13 | +15 | 1.56 |
| 47 | T2 | 5 | 0132 | 0352 | 0572 | 1.0 | 9.0 | 5.0 | 70 | -28 | +13 | +15 | 1.56 |
| 60 | T3 | 20 | 0133 | 0353 | 0573 | 2.0 | 12.0 | 6.0 | 45 | -16 | +10.5 | +12 | 1.33 |
| 60 | T3 | 10 | 0134 | 0354 | 0574 | 2.0 | 12.0 | 6.0 | 45 | -16 | +10.5 | +12 | 1.33 |
| 60 | T3 | 5 | 0135 | 0355 | 0575 | 2.0 | 12.0 | 6.0 | 45 | -16 | +10.5 | +12 | 1.33 |
| 82 | T3 | 20 | 0136 | 0356 | 0576 | 2.0 | 16.0 | 7.5 | 45 | -32 | +13 | +15 | 1.22 |
| 82 | T3 | 10 | 0137 | 0357 | 0577 | 2.0 | 16.0 | 7.5 | 45 | -32 | +13 | +15 | 1.22 |
| 82 | T3 | 5 | 0138 | 0358 | 0578 | 2.0 | 16.0 | 7.5 | 45 | -32 | +13 | +15 | 1.22 |
| 160 | T4 | 20 | 0139 | 0359 | 0579 | 6.0 | 32.0 | 8.5 | 27 | -50 | +25 | +25 | 0.71 |
| 160 | T4 | 10 | 0140 | 0360 | 0580 | 6.0 | 32.0 | 8.5 | 27 | -50 | +25 | +25 | 0.71 |
| 60 WVDC at +85 °C . . . 40 WVDC at +125 °C | | | | | | | | | | | | | |
| 4 | T1 | 20 | 0141 | 0361 | 0581 | 1.0 | 2.0 | 1.4 | 550 | -16 | +5 | +6 | 4.65 |
| 4 | T1 | 10 | 0142 | 0362 | 0582 | 1.0 | 2.0 | 1.4 | 550 | -16 | +5 | +6 | 4.65 |
| 4 | T1 | 5 | 0143 | 0363 | 0583 | 1.0 | 2.0 | 1.4 | 550 | -16 | +5 | +6 | 4.65 |
| 8.2 | T1 | 20 | 0144 | 0364 | 0584 | 1.0 | 2.0 | 2.0 | 275 | -24 | +8 | +9 | 3.24 |
| 8.2 | T1 | 10 | 0145 | 0365 | 0585 | 1.0 | 2.0 | 2.0 | 275 | -24 | +8 | +9 | 3.24 |
| 8.2 | T1 | 5 | 0146 | 0366 | 0586 | 1.0 | 2.0 | 2.0 | 275 | -24 | +8 | +9 | 3.24 |
| 20 | T2 | 20 | 0147 | 0367 | 0587 | 1.0 | 5.0 | 3.5 | 105 | -16 | +10.5 | +12 | 2.32 |
| 20 | T2 | 10 | 0148 | 0368 | 0588 | 1.0 | 5.0 | 3.5 | 105 | -16 | +10.5 | +12 | 2.32 |
| 20 | T2 | 5 | 0149 | 0369 | 0589 | 1.0 | 5.0 | 3.5 | 105 | -16 | +10.5 | +12 | 2.32 |
| 39 | T2 | 20 | 0150 | 0370 | 0590 | 1.0 | 9.0 | 5.0 | 90 | -28 | +10.5 | +12 | 1.70 |
| 39 | T2 | 10 | 0151 | 0371 | 0591 | 1.0 | 9.0 | 5.0 | 90 | -28 | +10.5 | +12 | 1.70 |
| 39 | T2 | 5 | 0152 | 0372 | 0592 | 1.0 | 9.0 | 5.0 | 90 | -28 | +10.5 | +12 | 1.70 |
| 50 | T3 | 20 | 0153 | 0373 | 0593 | 2.0 | 12.0 | 5.0 | 50 | -16 | +10.5 | +12 | 1.33 |
| 50 | T3 | 10 | 0154 | 0374 | 0594 | 2.0 | 12.0 | 5.0 | 50 | -16 | +10.5 | +12 | 1.33 |
| 50 | T3 | 5 | 0155 | 0375 | 0595 | 2.0 | 12.0 | 5.0 | 50 | -16 | +10.5 | +12 | 1.33 |
| 68 | T3 | 20 | 0156 | 0376 | 0596 | 2.0 | 16.0 | 6.5 | 50 | -32 | +10.5 | +12 | 1.27 |
| 68 | T3 | 10 | 0157 | 0377 | 0597 | 2.0 | 16.0 | 6.5 | 50 | -32 | +10.5 | +12 | 1.27 |
| 68 | T3 | 5 | 0158 | 0378 | 0598 | 2.0 | 16.0 | 6.5 | 50 | -32 | +10.5 | +12 | 1.27 |
| 140 | T4 | 20 | 0159 | 0379 | 0599 | 8.0 | 32.0 | 8.0 | 28 | -40 | +20 | +20 | 0.76 |
| 140 | T4 | 10 | 0160 | 0380 | 0600 | 8.0 | 32.0 | 8.0 | 28 | -40 | +20 | +20 | 0.76 |
| 75 WVDC at +85 °C . . . 50 WVDC at +125 °C | | | | | | | | | | | | | |
| 3.5 | T1 | 20 | 0161 | 0381 | 0601 | 1.0 | 2.0 | 1.25 | 650 | -16 | +5 | +6 | 4.74 |
| 3.5 | T1 | 10 | 0162 | 0382 | 0602 | 1.0 | 2.0 | 1.25 | 650 | -16 | +5 | +6 | 4.74 |
| 3.5 | T1 | 5 | 0163 | 0383 | 0603 | 1.0 | 2.0 | 1.25 | 650 | -16 | +5 | +6 | 4.74 |
| 6.8 | T1 | 20 | 0164 | 0384 | 0604 | 1.0 | 2.0 | 1.75 | 300 | -20 | +8 | +9 | 3.42 |

Note

* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).



| STANDARD/EXTENDED RATINGS: CLR90, M39006/30-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|----------------------------------|------|------|---------------------|---------------------|---------|---------------|------------------|---------|----------|----------------------|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/30-* | | | MAX. DCL (μA) at | | MAX. DF | MAX. | MAX. CAPACITANCE | | | MAX. |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | + 25 °C | | + 25 °C | IMP. | CHANGE (%) at | | | ESR |
| | | | M | P | R | + 25 °C | + 85 °C + 125 °C | (%) | at - 55 °C | - 55 °C | + 85 °C | + 125 °C | at + 25 °C 120 Hz |
| | | | 1.0 | 0.1 | 0.01 | | | (Ω) | | | | (Ω) | |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 6.8 | T1 | 10 | 0165 | 0385 | 0605 | 1.0 | 2.0 | 1.75 | 300 | - 20 | + 8 | + 9 | 3.42 |
| 6.8 | T1 | 5 | 0166 | 0386 | 0606 | 1.0 | 2.0 | 1.75 | 300 | - 20 | + 8 | + 9 | 3.42 |
| 15 | T2 | 20 | 0167 | 0387 | 0607 | 1.0 | 5.0 | 3.0 | 150 | - 16 | + 8 | + 9 | 2.66 |
| 15 | T2 | 10 | 0168 | 0388 | 0608 | 1.0 | 5.0 | 3.0 | 150 | - 16 | + 8 | + 9 | 2.66 |
| 15 | T2 | 5 | 0169 | 0389 | 0609 | 1.0 | 5.0 | 3.0 | 150 | - 16 | + 8 | + 9 | 2.66 |
| 33 | T2 | 20 | 0170 | 0390 | 0610 | 1.0 | 10.0 | 5.0 | 90 | - 24 | + 10.5 | + 15 | 2.01 |
| 33 | T2 | 10 | 0171 | 0391 | 0611 | 1.0 | 10.0 | 5.0 | 90 | - 24 | + 10.5 | + 15 | 2.01 |
| 33 | T2 | 5 | 0172 | 0392 | 0612 | 1.0 | 10.0 | 5.0 | 90 | - 24 | + 10.5 | + 15 | 2.01 |
| 40 | T3 | 20 | 0173 | 0393 | 0613 | 2.0 | 12.0 | 4.5 | 60 | - 16 | + 10.5 | + 12 | 1.50 |
| 40 | T3 | 10 | 0174 | 0394 | 0614 | 2.0 | 12.0 | 4.5 | 60 | - 16 | + 10.5 | + 12 | 1.50 |
| 40 | T3 | 5 | 0175 | 0395 | 0615 | 2.0 | 12.0 | 4.5 | 60 | - 16 | + 10.5 | + 12 | 1.50 |
| 56 | T3 | 20 | 0176 | 0396 | 0616 | 2.0 | 17.0 | 5.5 | 60 | - 28 | + 10.5 | + 15 | 1.31 |
| 56 | T3 | 10 | 0177 | 0397 | 0617 | 2.0 | 17.0 | 5.5 | 60 | - 28 | + 10.5 | + 15 | 1.31 |
| 56 | T3 | 5 | 0178 | 0398 | 0618 | 2.0 | 17.0 | 5.5 | 60 | - 28 | + 10.5 | + 15 | 1.31 |
| 110 | T4 | 20 | 0179 | 0399 | 0619 | 9.0 | 36.0 | 6.0 | 29 | - 35 | + 20 | + 20 | 0.73 |
| 110 | T4 | 10 | 0180 | 0400 | 0620 | 9.0 | 36.0 | 6.0 | 29 | - 35 | + 20 | + 20 | 0.73 |
| 100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C | | | | | | | | | | | | | |
| 2.5 | T1 | 20 | 0181 | 0401 | 0621 | 1.0 | 2.0 | 1.0 | 950 | - 16 | + 7 | + 8 | 5.31 |
| 2.5 | T1 | 10 | 0182 | 0402 | 0622 | 1.0 | 2.0 | 1.0 | 950 | - 16 | + 7 | + 8 | 5.31 |
| 2.5 | T1 | 5 | 0183 | 0403 | 0623 | 1.0 | 2.0 | 1.0 | 950 | - 16 | + 7 | + 8 | 5.31 |
| 4.7 | T1 | 20 | 0184 | 0404 | 0624 | 1.0 | 2.0 | 1.5 | 500 | - 16 | + 7 | + 8 | 4.24 |
| 4.7 | T1 | 10 | 0185 | 0405 | 0625 | 1.0 | 2.0 | 1.5 | 500 | - 16 | + 7 | + 8 | 4.24 |
| 4.7 | T1 | 5 | 0186 | 0406 | 0626 | 1.0 | 2.0 | 1.5 | 500 | - 16 | + 7 | + 8 | 4.24 |
| 11.0 | T2 | 20 | 0187 | 0407 | 0627 | 1.0 | 4.0 | 2.5 | 200 | - 16 | + 8 | + 8 | 3.02 |
| 11.0 | T2 | 10 | 0188 | 0408 | 0628 | 1.0 | 4.0 | 2.5 | 200 | - 16 | + 8 | + 8 | 3.02 |
| 11.0 | T2 | 5 | 0189 | 0409 | 0629 | 1.0 | 4.0 | 2.5 | 200 | - 16 | + 8 | + 8 | 3.02 |
| 22.0 | T2 | 20 | 0190 | 0410 | 0630 | 1.0 | 9.0 | 3.75 | 100 | - 16 | + 8 | + 8 | 2.26 |
| 22.0 | T2 | 10 | 0191 | 0411 | 0631 | 1.0 | 9.0 | 3.75 | 100 | - 16 | + 8 | + 8 | 2.26 |
| 22.0 | T2 | 5 | 0192 | 0412 | 0632 | 1.0 | 9.0 | 3.75 | 100 | - 16 | + 8 | + 8 | 2.26 |
| 30.0 | T3 | 20 | 0193 | 0413 | 0633 | 2.0 | 12.0 | 3.5 | 80 | - 16 | + 8 | + 8 | 1.55 |
| 30.0 | T3 | 10 | 0194 | 0414 | 0634 | 2.0 | 12.0 | 3.5 | 80 | - 16 | + 8 | + 8 | 1.55 |
| 30.0 | T3 | 5 | 0195 | 0415 | 0635 | 2.0 | 12.0 | 3.5 | 80 | - 16 | + 8 | + 8 | 1.55 |
| 43.0 | T3 | 20 | 0196 | 0416 | 0636 | 2.0 | 17.0 | 4.25 | 70 | - 20 | + 8 | + 8 | 1.31 |
| 43.0 | T3 | 10 | 0197 | 0417 | 0637 | 2.0 | 17.0 | 4.25 | 70 | - 20 | + 8 | + 8 | 1.31 |
| 43.0 | T3 | 5 | 0198 | 0418 | 0638 | 2.0 | 17.0 | 4.25 | 70 | - 20 | + 8 | + 8 | 1.31 |
| 86.0 | T4 | 20 | 0199 | 0419 | 0639 | 9.0 | 36.0 | 5.0 | 30 | - 25 | + 15 | + 15 | 0.77 |
| 86.0 | T4 | 10 | 0200 | 0420 | 0640 | 9.0 | 36.0 | 5.0 | 30 | - 25 | + 15 | + 15 | 0.77 |
| 125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C | | | | | | | | | | | | | |
| 1.7 | T1 | 20 | 0201 | 0421 | 0641 | 1.0 | 2.0 | 1.0 | 1250 | - 16 | + 7 | + 8 | 7.81 |
| 1.7 | T1 | 10 | 0202 | 0422 | 0642 | 1.0 | 2.0 | 1.0 | 1250 | - 16 | + 7 | + 8 | 7.81 |
| 1.7 | T1 | 5 | 0203 | 0423 | 0643 | 1.0 | 2.0 | 1.0 | 1250 | - 16 | + 7 | + 8 | 7.81 |
| 3.6 | T1 | 20 | 0204 | 0424 | 0644 | 1.0 | 2.0 | 1.35 | 600 | - 24 | + 7 | + 8 | 4.98 |
| 3.6 | T1 | 10 | 0205 | 0425 | 0645 | 1.0 | 2.0 | 1.35 | 600 | - 16 | + 7 | + 8 | 4.98 |
| 3.6 | T1 | 5 | 0206 | 0426 | 0646 | 1.0 | 2.0 | 1.35 | 600 | - 16 | + 7 | + 8 | 4.98 |
| 9.0 | T2 | 20 | 0207 | 0427 | 0647 | 1.0 | 5.0 | 2.5 | 240 | - 16 | + 7 | + 8 | 3.69 |
| 9.0 | T2 | 10 | 0208 | 0428 | 0648 | 1.0 | 5.0 | 2.5 | 240 | - 16 | + 7 | + 8 | 3.69 |
| 9.0 | T2 | 5 | 0209 | 0429 | 0649 | 1.0 | 5.0 | 2.5 | 240 | - 16 | + 7 | + 8 | 3.69 |
| 14.0 | T2 | 20 | 0210 | 0430 | 0650 | 1.0 | 7.0 | 3.0 | 167 | - 16 | + 7 | + 8 | 2.85 |
| 14.0 | T2 | 10 | 0211 | 0431 | 0651 | 1.0 | 7.0 | 3.0 | 167 | - 16 | + 7 | + 8 | 2.85 |
| 14.0 | T2 | 5 | 0212 | 0432 | 0652 | 1.0 | 7.0 | 3.0 | 167 | - 16 | + 7 | + 8 | 2.85 |
| 18.0 | T3 | 20 | 0213 | 0433 | 0653 | 2.0 | 9.0 | 2.5 | 129 | - 16 | + 7 | + 8 | 1.85 |
| 18.0 | T3 | 10 | 0214 | 0434 | 0654 | 2.0 | 9.0 | 2.5 | 129 | - 16 | + 7 | + 8 | 1.85 |
| 18.0 | T3 | 5 | 0215 | 0435 | 0655 | 2.0 | 9.0 | 2.5 | 129 | - 16 | + 7 | + 8 | 1.85 |
| 25.0 | T3 | 20 | 0216 | 0436 | 0656 | 2.0 | 13.0 | 3.0 | 93 | - 16 | + 7 | + 8 | 1.59 |
| 25.0 | T3 | 10 | 0217 | 0437 | 0657 | 2.0 | 13.0 | 3.0 | 93 | - 16 | + 7 | + 8 | 1.59 |
| 25.0 | T3 | 5 | 0218 | 0438 | 0658 | 2.0 | 13.0 | 3.0 | 93 | - 16 | + 7 | + 8 | 1.59 |
| 56.0 | T4 | 20 | 0219 | 0439 | 0659 | 10.0 | 40.0 | 3.25 | 32 | - 25 | + 15 | + 15 | 0.77 |
| 56.0 | T4 | 10 | 0220 | 0440 | 0660 | 10.0 | 40.0 | 3.25 | 32 | - 25 | + 15 | + 15 | 0.77 |

Note
* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).



| STANDARD/EXTENDED RATINGS: CLR91, M39006/31-XXXX | | | | | | | | | | | | | |
|---|--------------|----------------------------|----------------------------------|----------|-----------|---------------------|----|------------------------------------|---|--|----|----|---|
| CAPACITANCE (μ F) | CASE CODE | CAP. TOL. (\pm %) | PART NO. M39006/31-* | | | MAX. DCL (μ A) | | MAX. DF at + 25 $^{\circ}$ C | MAX. IMP. at - 55 $^{\circ}$ C | MAX.. CAPACITANCE CHANGE (%) at | | | MAX. ESR at + 25 $^{\circ}$ C 120 Hz (Ω) |
| | | | FAILURE RATE LEVEL (%/1000 h) | | | at | | | | + 25 $^{\circ}$ C + 85 $^{\circ}$ C + 125 $^{\circ}$ C | | | |
| | | | M 1.0 | P 0.1 | R 0.01 | | | | | | | | |
| 6 WVDC at + 85 $^{\circ}$C . . . 4 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 220 | T1 | 20 | 0001 | 0089 | 0177 | 2 | 9 | 25 | 36 | - 64 | 13 | 16 | 1.51 |
| 220 | T1 | 10 | 0002 | 0090 | 0178 | 2 | 9 | 25 | 36 | - 64 | 13 | 16 | 1.51 |
| 820 | T2 | 20 | 0003 | 0091 | 0179 | 3 | 14 | 77.5 | 18 | - 88 | 16 | 20 | 1.26 |
| 820 | T2 | 10 | 0004 | 0092 | 0180 | 3 | 14 | 77.5 | 18 | - 88 | 16 | 20 | 1.26 |
| 1500 | T3 | 20 | 0005 | 0093 | 0181 | 5 | 20 | 86 | 18 | - 90 | 20 | 25 | 0.76 |
| 1500 | T3 | 10 | 0006 | 0094 | 0182 | 5 | 20 | 86 | 18 | - 90 | 20 | 25 | 0.76 |
| 2200 | T4 | 20 | 0007 | 0095 | 0183 | 6 | 24 | 85 | 13 | - 90 | 25 | 30 | 0.52 |
| 2200 | T4 | 10 | 0008 | 0096 | 0184 | 6 | 24 | 85 | 13 | - 90 | 25 | 30 | 0.52 |
| 8 WVDC at + 85 $^{\circ}$C . . . 5 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 180 | T1 | 20 | 0009 | 0097 | 0185 | 2 | 9 | 20.5 | 45 | - 60 | 13 | 16 | 1.51 |
| 180 | T1 | 10 | 0010 | 0098 | 0186 | 2 | 9 | 20.5 | 45 | - 60 | 13 | 16 | 1.51 |
| 680 | T2 | 20 | 0011 | 0099 | 0187 | 3 | 14 | 65 | 22 | - 83 | 16 | 20 | 1.27 |
| 680 | T2 | 10 | 0012 | 0100 | 0188 | 3 | 14 | 65 | 22 | - 83 | 16 | 20 | 1.27 |
| 1500 | T3 | 20 | 0013 | 0101 | 0189 | 5 | 20 | 85 | 18 | - 90 | 20 | 25 | 0.75 |
| 1500 | T3 | 10 | 0014 | 0102 | 0190 | 5 | 20 | 85 | 18 | - 90 | 20 | 25 | 0.75 |
| 1800 | T4 | 20 | 0015 | 0103 | 0191 | 7 | 25 | 69 | 14 | - 90 | 25 | 30 | 0.51 |
| 1800 | T4 | 10 | 0016 | 0104 | 0192 | 7 | 25 | 69 | 14 | - 90 | 25 | 30 | 0.51 |
| 10 WVDC at + 85 $^{\circ}$C . . . 7 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 150 | T1 | 20 | 0017 | 0105 | 0193 | 2 | 9 | 17 | 54 | - 55 | 13 | 16 | 1.51 |
| 150 | T1 | 10 | 0018 | 0106 | 0194 | 2 | 9 | 17 | 54 | - 55 | 13 | 16 | 1.51 |
| 560 | T2 | 20 | 0019 | 0107 | 0195 | 3 | 16 | 53 | 27 | - 77 | 16 | 20 | 1.26 |
| 560 | T2 | 10 | 0020 | 0108 | 0196 | 3 | 16 | 53 | 27 | - 77 | 16 | 20 | 1.26 |
| 1200 | T3 | 20 | 0021 | 0109 | 0197 | 5 | 20 | 68.5 | 18 | - 88 | 20 | 25 | 0.76 |
| 1200 | T3 | 10 | 0022 | 0110 | 0198 | 5 | 20 | 68.5 | 18 | - 88 | 20 | 25 | 0.76 |
| 1500 | T4 | 20 | 0023 | 0111 | 0199 | 7 | 25 | 57 | 15 | - 88 | 25 | 30 | 0.51 |
| 1500 | T4 | 10 | 0024 | 0112 | 0200 | 7 | 25 | 57 | 15 | - 88 | 25 | 30 | 0.51 |
| 15 WVDC at + 85 $^{\circ}$C . . . 10 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 100 | T1 | 20 | 0025 | 0113 | 0201 | 2 | 9 | 15 | 72 | - 44 | 13 | 16 | 1.99 |
| 100 | T1 | 10 | 0026 | 0114 | 0202 | 2 | 9 | 15 | 72 | - 44 | 13 | 16 | 1.99 |
| 390 | T2 | 20 | 0027 | 0115 | 0203 | 3 | 16 | 37 | 31 | - 66 | 16 | 20 | 1.26 |
| 390 | T2 | 10 | 0028 | 0116 | 0204 | 3 | 16 | 37 | 31 | - 66 | 16 | 20 | 1.26 |
| 820 | T3 | 20 | 0029 | 0117 | 0205 | 6 | 24 | 55.5 | 22 | - 77 | 20 | 25 | 0.9 |
| 820 | T3 | 10 | 0030 | 0118 | 0206 | 6 | 24 | 55.5 | 22 | - 77 | 20 | 25 | 0.9 |
| 1000 | T4 | 20 | 0031 | 0119 | 0207 | 8 | 32 | 46 | 17 | - 77 | 25 | 30 | 0.61 |
| 1000 | T4 | 10 | 0032 | 0120 | 0208 | 8 | 32 | 46 | 17 | - 77 | 25 | 30 | 0.61 |
| 25 WVDC at + 85 $^{\circ}$C . . . 15 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 68 | T1 | 20 | 0033 | 0121 | 0209 | 2 | 9 | 11 | 90 | - 40 | 12 | 15 | 2.15 |
| 68 | T1 | 10 | 0034 | 0122 | 0210 | 2 | 9 | 11 | 90 | - 40 | 12 | 15 | 2.15 |
| 270 | T2 | 20 | 0035 | 0123 | 0211 | 3 | 16 | 27.5 | 33 | - 62 | 13 | 16 | 1.35 |
| 270 | T2 | 10 | 0036 | 0124 | 0212 | 3 | 16 | 27.5 | 33 | - 62 | 13 | 16 | 1.35 |
| 560 | T3 | 20 | 0037 | 0125 | 0213 | 7 | 28 | 38 | 24 | - 72 | 20 | 25 | 0.9 |
| 560 | T3 | 10 | 0038 | 0126 | 0214 | 7 | 28 | 38 | 24 | - 72 | 20 | 25 | 0.9 |
| 680 | T4 | 20 | 0039 | 0127 | 0215 | 8 | 32 | 31.5 | 19 | - 72 | 25 | 30 | 0.62 |
| 680 | T4 | 10 | 0040 | 0128 | 0216 | 8 | 32 | 31.5 | 19 | - 72 | 25 | 30 | 0.62 |
| 30 WVDC at + 85 $^{\circ}$C . . . 20 WVDC at + 125 $^{\circ}$C | | | | | | | | | | | | | |
| 56 | T1 | 20 | 0041 | 0129 | 0217 | 2 | 9 | 11 | 100 | - 38 | 12 | 15 | 2.61 |
| 56 | T1 | 10 | 0042 | 0130 | 0218 | 2 | 9 | 11 | 100 | - 38 | 12 | 15 | 2.61 |
| 220 | T2 | 20 | 0043 | 0131 | 0219 | 3 | 16 | 21 | 36 | - 60 | 13 | 16 | 1.27 |
| 220 | T2 | 10 | 0044 | 0132 | 0220 | 3 | 16 | 21 | 36 | - 60 | 13 | 16 | 1.27 |
| 470 | T3 | 20 | 0045 | 0133 | 0221 | 8 | 32 | 32 | 25 | - 65 | 20 | 25 | 0.91 |
| 470 | T3 | 10 | 0046 | 0134 | 0222 | 8 | 32 | 32 | 25 | - 65 | 20 | 25 | 0.91 |
| 560 | T4 | 20 | 0047 | 0135 | 0223 | 9 | 36 | 27.5 | 20 | - 65 | 25 | 30 | 0.65 |
| 560 | T4 | 10 | 0048 | 0136 | 0224 | 9 | 36 | 27.5 | 20 | - 65 | 25 | 30 | 0.65 |

Note
* Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 51 g random vibration, 80 g sinusoidal vibration and 500 g shock).



| STANDARD/EXTENDED RATINGS: CLR91, M39006/31-XXXX | | | | | | | | | | | | | |
|--|--------------|-----------------------|--|------|------|---------------------|---------------------|---------|----------------|-----------------------------------|---------|----------|---------------|
| CAPACITANCE (μF) | CASE CODE | CAP. TOL. (± %) | PART NO. M39006/31-* FAILURE RATE LEVEL (%/1000 h) | | | MAX. DCL (μA) at | | MAX. DF | MAX. IMP. | MAX. CAPACITANCE CHANGE (%) at | | | MAX. ESR |
| | | | M | P | R | + 25 °C | | + 25 °C | at | - 55 °C + 85 °C + 125 °C | | | at + 25 °C |
| | | | 1.0 | 0.1 | 0.01 | + 25 °C | + 85 °C + 125 °C | (%) | - 55 °C (Ω) | - 55 °C | + 85 °C | + 125 °C | 120 Hz (Ω) |
| 50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C | | | | | | | | | | | | | |
| 33 | T1 | 20 | 0049 | 0137 | 0225 | 2 | 9 | 6.15 | 135 | - 29 | 10 | 12 | 2.48 |
| 33 | T1 | 10 | 0050 | 0138 | 0226 | 2 | 9 | 6.15 | 135 | - 29 | 10 | 12 | 2.48 |
| 120 | T2 | 20 | 0051 | 0139 | 0227 | 4 | 24 | 11.3 | 49 | - 42 | 12 | 15 | 1.25 |
| 120 | T2 | 10 | 0052 | 0140 | 0228 | 4 | 24 | 11.3 | 49 | - 42 | 12 | 15 | 1.25 |
| 270 | T3 | 20 | 0053 | 0141 | 0229 | 8 | 32 | 18.5 | 29 | - 46 | 20 | 25 | 0.91 |
| 270 | T3 | 10 | 0054 | 0142 | 0230 | 8 | 32 | 18.5 | 29 | - 46 | 20 | 25 | 0.91 |
| 330 | T4 | 20 | 0055 | 0143 | 0231 | 9 | 36 | 19 | 22 | - 46 | 25 | 30 | 0.77 |
| 330 | T4 | 10 | 0056 | 0144 | 0232 | 9 | 36 | 19 | 22 | - 46 | 25 | 30 | 0.77 |
| 60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C | | | | | | | | | | | | | |
| 27 | T1 | 20 | 0057 | 0145 | 0233 | 3 | 12 | 5.1 | 144 | - 24 | 10 | 12 | 2.51 |
| 27 | T1 | 10 | 0058 | 0146 | 0234 | 3 | 12 | 5.1 | 144 | - 24 | 10 | 12 | 2.51 |
| 100 | T2 | 20 | 0059 | 0147 | 0235 | 4 | 20 | 9.5 | 54 | - 36 | 12 | 15 | 1.26 |
| 100 | T2 | 10 | 0060 | 0148 | 0236 | 4 | 20 | 9.5 | 54 | - 36 | 12 | 15 | 1.26 |
| 220 | T3 | 20 | 0061 | 0149 | 0237 | 8 | 32 | 15 | 29 | - 40 | 16 | 20 | 0.91 |
| 220 | T3 | 10 | 0062 | 0150 | 0238 | 8 | 32 | 15 | 29 | - 40 | 16 | 20 | 0.91 |
| 270 | T4 | 20 | 0063 | 0151 | 0239 | 9 | 36 | 13.5 | 23 | - 45 | 20 | 25 | 0.67 |
| 270 | T4 | 10 | 0064 | 0152 | 0240 | 9 | 36 | 13.5 | 23 | - 45 | 20 | 25 | 0.67 |
| 75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C | | | | | | | | | | | | | |
| 22 | T1 | 20 | 0065 | 0153 | 0241 | 3 | 12 | 4.25 | 157 | - 19 | 10 | 12 | 2.57 |
| 22 | T1 | 10 | 0066 | 0154 | 0242 | 3 | 12 | 4.25 | 157 | - 19 | 10 | 12 | 2.57 |
| 82 | T2 | 20 | 0067 | 0155 | 0243 | 4 | 24 | 7.6 | 63 | - 30 | 12 | 15 | 1.23 |
| 82 | T2 | 10 | 0068 | 0156 | 0244 | 4 | 24 | 7.6 | 63 | - 30 | 12 | 15 | 1.23 |
| 180 | T3 | 20 | 0069 | 0157 | 0245 | 9 | 36 | 12.2 | 30 | - 35 | 16 | 20 | 0.9 |
| 180 | T3 | 10 | 0070 | 0158 | 0246 | 9 | 36 | 12.2 | 30 | - 35 | 16 | 20 | 0.9 |
| 220 | T4 | 20 | 0071 | 0159 | 0247 | 10 | 40 | 18.5 | 24 | - 40 | 20 | 25 | 1.12 |
| 220 | T4 | 10 | 0072 | 0160 | 0248 | 10 | 40 | 18.5 | 24 | - 40 | 20 | 25 | 1.12 |
| 100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C | | | | | | | | | | | | | |
| 10 | T1 | 20 | 0073 | 0161 | 0249 | 3 | 12 | 2.25 | 200 | - 17 | 10 | 12 | 2.99 |
| 10 | T1 | 10 | 0074 | 0162 | 0250 | 3 | 12 | 2.25 | 200 | - 17 | 10 | 12 | 2.99 |
| 39 | T2 | 20 | 0075 | 0163 | 0251 | 5 | 24 | 5.2 | 80 | - 20 | 12 | 15 | 1.77 |
| 39 | T2 | 10 | 0076 | 0164 | 0252 | 5 | 24 | 5.2 | 80 | - 20 | 12 | 15 | 1.77 |
| 68 | T3 | 20 | 0077 | 0165 | 0253 | 10 | 40 | 5.65 | 40 | - 30 | 14 | 16 | 1.11 |
| 68 | T3 | 10 | 0078 | 0166 | 0254 | 10 | 40 | 5.65 | 40 | - 30 | 14 | 16 | 1.11 |
| 120 | T4 | 20 | 0079 | 0167 | 0255 | 12 | 48 | 12.5 | 30 | - 35 | 15 | 17 | 1.38 |
| 120 | T4 | 10 | 0080 | 0168 | 0256 | 12 | 48 | 12.5 | 30 | - 35 | 15 | 17 | 1.38 |
| 125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C | | | | | | | | | | | | | |
| 6.8 | T1 | 20 | 0081 | 0169 | 0257 | 3 | 12 | 3 | 300 | - 14 | 10 | 12 | 5.86 |
| 6.8 | T1 | 10 | 0082 | 0170 | 0258 | 3 | 12 | 3 | 300 | - 14 | 10 | 12 | 5.86 |
| 27 | T2 | 20 | 0083 | 0171 | 0259 | 5 | 24 | 3.6 | 90 | - 18 | 12 | 15 | 1.77 |
| 27 | T2 | 10 | 0084 | 0172 | 0260 | 5 | 24 | 3.6 | 90 | - 18 | 12 | 15 | 1.77 |
| 47 | T3 | 20 | 0085 | 0173 | 0261 | 10 | 40 | 3.95 | 50 | - 26 | 14 | 16 | 1.12 |
| 47 | T3 | 10 | 0086 | 0174 | 0262 | 10 | 40 | 3.95 | 50 | - 26 | 14 | 16 | 1.12 |
| 82 | T4 | 20 | 0087 | 0175 | 0263 | 12 | 48 | 8.7 | 32 | - 30 | 15 | 17 | 1.41 |
| 82 | T4 | 10 | 0088 | 0176 | 0264 | 12 | 48 | 8.7 | 32 | - 30 | 15 | 17 | 1.41 |

Note

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