

# MR Series

## Miniature Size 7mm Height

### Features

- The MR series is employing etched foils for higher gain effect.
- Designed for use in VTRs, car radios, car stereos, micro-cassette tape recorders, pocket calculators and watches.

### Specifications

| Items                                                  | Performance Characteristics                                                                                                                                   |                                                                              |      |      |      |      |      |      |      |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------|------|------|------|------|------|------|
| Operating Temperature Range                            | -40 to +85°C                                                                                                                                                  |                                                                              |      |      |      |      |      |      |      |
| Rated Working Voltage Range                            | 6.3 to 63V DC                                                                                                                                                 |                                                                              |      |      |      |      |      |      |      |
| Nominal Capacitance Range                              | 0.1 to 470 $\mu$ F                                                                                                                                            |                                                                              |      |      |      |      |      |      |      |
| Capacitance Tolerance                                  | $\pm 20^\circ\text{C}$ (120Hz, +20°C)                                                                                                                         |                                                                              |      |      |      |      |      |      |      |
| Leakage Current                                        | 1 $\leq$ 0.01CV or 3( $\mu$ A) <span style="float: right;">whichever is greater measured after 3 minutes application of rated working voltage at +20°C</span> |                                                                              |      |      |      |      |      |      |      |
| Dissipation Factor ( $\tan \delta$ )<br>(120Hz, +20°C) | Working voltage (v)                                                                                                                                           | 4                                                                            | 6.3  | 10   | 16   | 25   | 35   | 50   | 63   |
|                                                        | $\tan \delta$ (max)                                                                                                                                           | 0.35                                                                         | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 |
| Characteristics at Low Temperature                     | Impedance ratio max. at 120Hz                                                                                                                                 |                                                                              |      |      |      |      |      |      |      |
|                                                        | Working voltage (v)                                                                                                                                           | 4                                                                            | 6.3  | 10   | 16   | 25   | 35   | 50   | 63   |
|                                                        | -25°C/+20°C                                                                                                                                                   | 6                                                                            | 4    | 3    | 2    | 2    | 2    | 2    | 2    |
|                                                        | -40°C/+20°C                                                                                                                                                   | 12                                                                           | 8    | 6    | 4    | 4    | 3    | 3    | 3    |
| High Temperature Loading                               | Test conditions                                                                                                                                               |                                                                              |      |      |      |      |      |      |      |
|                                                        | Duration : 1000 hours                                                                                                                                         |                                                                              |      |      |      |      |      |      |      |
|                                                        | Ambient temperature : +85°C                                                                                                                                   |                                                                              |      |      |      |      |      |      |      |
|                                                        | Applied Voltage : Rated DC working voltage                                                                                                                    |                                                                              |      |      |      |      |      |      |      |
|                                                        | Post test requirements at +20°C                                                                                                                               |                                                                              |      |      |      |      |      |      |      |
|                                                        | Leakage current : $\leq$ initial specified value                                                                                                              |                                                                              |      |      |      |      |      |      |      |
| Shelf Life                                             | Capacitance change : $\leq +20\%$ of initial measured value (4V: $\leq +30\%$ )                                                                               |                                                                              |      |      |      |      |      |      |      |
|                                                        | $\tan \delta$ : $\leq 150\%$ of initial specified value                                                                                                       |                                                                              |      |      |      |      |      |      |      |
|                                                        | Test conditions                                                                                                                                               |                                                                              |      |      |      |      |      |      |      |
| Others                                                 | Duration : 500 hour                                                                                                                                           |                                                                              |      |      |      |      |      |      |      |
|                                                        | Ambient temperature : +85°C                                                                                                                                   |                                                                              |      |      |      |      |      |      |      |
|                                                        | Applied voltage : (None)                                                                                                                                      |                                                                              |      |      |      |      |      |      |      |
|                                                        |                                                                                                                                                               | Post test requirements at +20°C<br>Same limits for high temperature loading. |      |      |      |      |      |      |      |
|                                                        |                                                                                                                                                               | Satisfies characteristic W of JIS C 5141-1982                                |      |      |      |      |      |      |      |

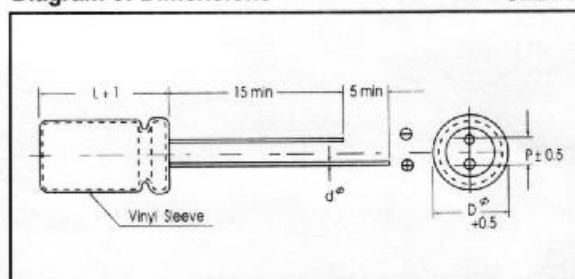
### Case Size Table

$\phi D \times L$  (mm)

| WV<br>(SV)<br>$\mu$ F | 6.3<br>(8)                                              | 10<br>(13) | 16<br>(20) | 25<br>(32) | 35<br>(44) | 50<br>(63) | 63<br>(79) |
|-----------------------|---------------------------------------------------------|------------|------------|------------|------------|------------|------------|
| 0.1                   |                                                         |            |            |            |            | 4×7        | 4×7        |
| 0.22                  | Blank item can be substituted<br>by nearest column item |            |            |            |            | 4×7        | 4×7        |
| 0.33                  |                                                         |            |            |            |            | 4×7        | 4×7        |
| 0.47                  |                                                         |            |            |            |            | 4×7        | 4×7        |
| 1.0                   |                                                         |            |            |            |            | 4×7        | 4×7        |
| 2.2                   |                                                         |            |            |            |            | 4×7        | 4×7        |
| 3.3                   |                                                         |            |            |            |            | 4×7        | 4×7        |
| 4.7                   |                                                         |            |            | 4×7        | 4×7        | 4×7        | 5×7        |
| 10                    |                                                         |            | 4×7        | 4×7        | 5×7        | 5×7        | 6.3×7      |
| 22                    |                                                         |            | 4×7        | 5×7        | 5×7        | 6×7        |            |
| 33                    |                                                         | 4×7        | 5×7        | 6×7        | 6.3×7      | 8×7(8×9)   |            |
| 47                    | 4×7                                                     | 4×7        | 5×7        | 6×7        | 6.3×7      | 8×7(8×9)   |            |
| 100                   | 5×7                                                     | 5×7        | 6×7        | 8×9        | 8×7(8×9)   |            |            |
| 220                   | 6×7                                                     | 6×7        | 8×9        |            |            |            |            |
| 330                   | 8×7(8×9)                                                | 8×7(8×9)   | 8×7(8×9)   |            |            |            |            |
| 470                   | 8×9                                                     | 8×9        | 8×9        |            |            |            |            |

### Diagram of Dimensions

Unit: mm



| D $\phi$ | 4             | 5             | 6.3           | 8             |
|----------|---------------|---------------|---------------|---------------|
| P        | 1.5 $\pm$ 0.5 | 2.0 $\pm$ 0.5 | 2.5 $\pm$ 0.5 | 3.5 $\pm$ 0.5 |
| d $\phi$ | 0.45          | 0.45          | 0.45          | 0.50          |