

# HSM

## +125°C Standard Radial Lead Aluminum Electrolytic Capacitors



*For automotive and telecommunication applications*

### FEATURES

- 125°C Temperature rating
- Extended Life
- Voltage range: 10 WVDC to 63WVDC
- Capacitance Range: 1.0μF to 4,700μF

### SPECIFICATIONS

|                                                                                |          |                                                                                           |               |                |                                                                                                     |      |                 |      |     |      |
|--------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------|---------------|----------------|-----------------------------------------------------------------------------------------------------|------|-----------------|------|-----|------|
| Capacitance Tolerance                                                          |          | ±20% at 120Hz, 20°C                                                                       |               |                |                                                                                                     |      |                 |      |     |      |
| Operating Temperature Range                                                    |          | -40°C to +125°C                                                                           |               |                |                                                                                                     |      |                 |      |     |      |
| Dissipation Factor<br>120Hz, 20°C                                              | WVDC     | 10                                                                                        | 16            | 25             | 35                                                                                                  | 50   | 63              |      |     |      |
|                                                                                | tan δ    | .2                                                                                        | .16           | .14            | .12                                                                                                 | .1   | .1              |      |     |      |
| Note: For above D.F. specifications, add .02 for every 1,000 μf above 1,000 μf |          |                                                                                           |               |                |                                                                                                     |      |                 |      |     |      |
| Impedance Ratio<br>(Max.) @120Hz                                               | WVDC     | 10                                                                                        | 16            | 25             | 35                                                                                                  | 50   | 63              |      |     |      |
|                                                                                | -25/20°C | 3                                                                                         | 2             | 2              | 2                                                                                                   | 2    | 2               |      |     |      |
|                                                                                | -40/20°C | 4                                                                                         | 4             | 4              | 4                                                                                                   | 4    | 4               |      |     |      |
| Leakage Current                                                                | WVDC     | ≤ 63WVDC                                                                                  |               |                |                                                                                                     |      |                 |      |     |      |
|                                                                                | Time     | 1 minute                                                                                  |               | 2 minutes      |                                                                                                     |      |                 |      |     |      |
|                                                                                |          | .03 CV or 4 μA                                                                            |               | .01 CV or 3 μA |                                                                                                     |      |                 |      |     |      |
|                                                                                |          | Whichever is greater                                                                      |               |                |                                                                                                     |      |                 |      |     |      |
| Load Life                                                                      |          | 1,000 hours at 125°C with rated WVDC                                                      |               |                |                                                                                                     |      |                 |      |     |      |
|                                                                                |          | Capacitance change<br>Dissipation factor<br>Leakage current                               |               |                | < 20% of initial measured value<br><200% of initial specified value<br><100%Initial specified value |      |                 |      |     |      |
| Shelf Life                                                                     |          | 1,000 hours at 105°C with no voltage applied.<br>Units will meet load life specification. |               |                |                                                                                                     |      |                 |      |     |      |
| Ripple Current Multipliers                                                     |          |                                                                                           | Frequency(Hz) |                |                                                                                                     |      | Temperature(°C) |      |     |      |
|                                                                                |          | Capacitance (μF)                                                                          | 50            | 120            | 300                                                                                                 | 1K   | 10K             | +105 | +85 | +70  |
|                                                                                |          | C≤47                                                                                      | .75           | 1.0            | 1.35                                                                                                | 1.57 | 2               | 1.00 | 1.4 | 1.65 |
|                                                                                |          | 47<C≤470                                                                                  | .8            | 1.0            | 1.23                                                                                                | 1.34 | 1.5             | 1.00 | 1.4 | 1.65 |
|                                                                                |          | C>470                                                                                     | .85           | 1.0            | 1.1                                                                                                 | 1.13 | 1.15            | 1.00 | 1.4 | 1.65 |

### SPECIAL ORDER OPTIONS

(See pages 33 thru 37)

- Special tolerances: ±10% (K), -10% + 30% (Q)
- Tape and Reel/Ammo Pack
- Cut, Formed, Cut and Formed, and Snap In Leads



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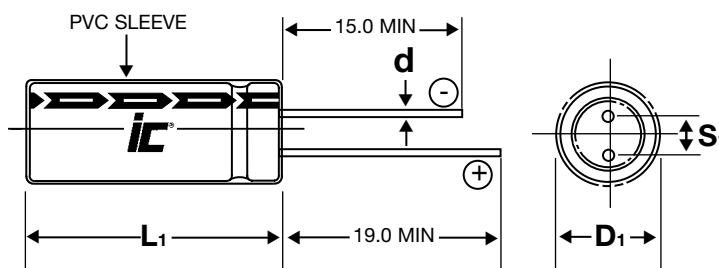
+ 125°C Standard  
Radial Lead Aluminum  
Electrolytic Capacitors

## PHYSICAL DIMENSIONS

| WVDC<br>(μF)<br>(SV) | 10<br>(13) | 16<br>(20) | 25<br>(32) | 35<br>(44) | 50<br>(63) | 63<br>(79) |
|----------------------|------------|------------|------------|------------|------------|------------|
| 1                    |            |            |            |            | 8x11.5     |            |
| 2.2                  |            |            |            |            | 8x11.5     |            |
| 3.3                  |            |            |            |            | 8x11.5     |            |
| 4.7                  |            |            |            |            | 8x11.5     |            |
| 10                   |            |            |            |            | 8x11.5     |            |
| 22                   |            |            |            |            | 8x11.5     |            |
| 33                   |            |            |            |            | 8x11.5     |            |
| 47                   |            |            |            |            | 8x11.5     | 10x12.5    |
| 100                  |            |            | 8x11.5     |            | 10x12.5    | 10x16      |
| 220                  | 8x11.5     |            | 10x12.5    | 10x16      | 10x20      | 12.5x20    |
| 330                  |            | 10x12.5    | 10x16      | 10x20      | 12.5x20    | 12.5x25    |
| 470                  | 10x12.5    | 10x16      | 10x20      | 12.5x20    | 12.5x25    | 16x25      |
| 1000                 | 10x20      | 12.5x20    | 12.5x25    | 16x25      | 16x31.5    |            |
| 2200                 | 12.5x25    | 16x25      | 16x31.5    |            |            |            |
| 3300                 | 16x25      | 16x31.5    |            |            |            |            |
| 4700                 | 16x31.5    |            |            |            |            |            |

Convert to inches, divide by 25.4.

DxL(mm)



NOTE: Case Vent is standard on all diameter ≥8.0mm

LEAD INFORMATION V.S. CASE DIAMETER

| D | 8.0 | 10.0 | 12.5 | 16  |
|---|-----|------|------|-----|
| S | 3.5 | 5.0  | 5.0  | 7.5 |
| d | 0.6 | 0.6  | 0.6  | 0.8 |
| B | 0.5 | 0.5  | 0.8  | 0.5 |

L<sub>1</sub>=L+2.0mm Max.

D<sub>1</sub>=D+B Max.

S<sub>1</sub>=S±0.5mm

# HSM

+125°C, 2000 hours

| Capacitance (μF) | WVDC | IC PART NUMBER    | Maximum ESR (mΩ)<br>120 Hz,<br>+20°C | Maximum RMS Ripple Current (A)<br>120 Hz,<br>+105°C | Dims DxL (mm) |
|------------------|------|-------------------|--------------------------------------|-----------------------------------------------------|---------------|
| 1                | 50   | <b>105HSM050M</b> | 165.786                              | 10                                                  | 8x11.5        |
| 2.2              | 50   | <b>225HSM050M</b> | 75.357                               | 22                                                  | 8x11.5        |
| 3.3              | 50   | <b>335HSM050M</b> | 50.238                               | 27                                                  | 8x11.5        |
| 4.7              | 50   | <b>475HSM050M</b> | 35.274                               | 32                                                  | 8x11.5        |
| 10               | 50   | <b>106HSM050M</b> | 16.579                               | 47                                                  | 8x11.5        |
| 22               | 50   | <b>226HSM050M</b> | 7.536                                | 70                                                  | 8x11.5        |
| 33               | 50   | <b>336HSM050M</b> | 5.024                                | 85                                                  | 8x11.5        |
| 47               | 50   | <b>476HSM050M</b> | 3.527                                | 105                                                 | 8x11.5        |
| 47               | 63   | <b>476HSM063M</b> | 3.527                                | 120                                                 | 10x12.5       |
| 100              | 25   | <b>107HSM025M</b> | 2.321                                | 125                                                 | 8x11.5        |
| 100              | 50   | <b>107HSM050M</b> | 1.658                                | 180                                                 | 10x12.5       |
| 100              | 63   | <b>107HSM063M</b> | 1.658                                | 200                                                 | 10x16         |
| 220              | 10   | <b>227HSM010M</b> | 1.507                                | 155                                                 | 8x11.5        |
| 220              | 25   | <b>227HSM025M</b> | 1.055                                | 220                                                 | 10x12.5       |
| 220              | 35   | <b>227HSM035M</b> | 0.904                                | 260                                                 | 10x16         |
| 220              | 50   | <b>227HSM050M</b> | 0.754                                | 320                                                 | 10x20         |
| 220              | 63   | <b>227HSM063M</b> | 0.754                                | 360                                                 | 12.5x20       |
| 330              | 16   | <b>337HSM016M</b> | 0.804                                | 250                                                 | 10x12.5       |
| 330              | 25   | <b>337HSM025M</b> | 0.703                                | 300                                                 | 10x16         |
| 330              | 35   | <b>337HSM035M</b> | 0.603                                | 350                                                 | 10x20         |

| Capacitance (μF) | WVDC | IC PART NUMBER    | Maximum ESR (mΩ)<br>120 Hz,<br>+20°C | Maximum RMS Ripple Current (A)<br>120 Hz,<br>+105°C | Dims DxL (mm) |
|------------------|------|-------------------|--------------------------------------|-----------------------------------------------------|---------------|
| 330              | 50   | <b>337HSM050M</b> | 0.502                                | 430                                                 | 12.5x20       |
| 330              | 63   | <b>337HSM063M</b> | 0.502                                | 480                                                 | 12.5x25       |
| 470              | 10   | <b>477HSM010M</b> | 0.705                                | 270                                                 | 10x12.5       |
| 470              | 16   | <b>477HSM016M</b> | 0.564                                | 330                                                 | 10x16         |
| 470              | 25   | <b>477HSM025M</b> | 0.494                                | 390                                                 | 10x20         |
| 470              | 35   | <b>477HSM035M</b> | 0.423                                | 470                                                 | 12.5x20       |
| 470              | 50   | <b>477HSM050M</b> | 0.353                                | 570                                                 | 12.5x25       |
| 470              | 63   | <b>477HSM063M</b> | 0.353                                | 650                                                 | 16x25         |
| 1000             | 10   | <b>108HSM010M</b> | 0.332                                | 470                                                 | 10x20         |
| 1000             | 16   | <b>108HSM016M</b> | 0.265                                | 590                                                 | 12.5x20       |
| 1000             | 25   | <b>108HSM025M</b> | 0.232                                | 700                                                 | 12.5x25       |
| 1000             | 35   | <b>108HSM035M</b> | 0.199                                | 850                                                 | 16x25         |
| 1000             | 50   | <b>108HSM050M</b> | 0.166                                | 1030                                                | 16x31.5       |
| 2200             | 10   | <b>228HSM010M</b> | 0.181                                | 820                                                 | 12.5x25       |
| 2200             | 16   | <b>228HSM016M</b> | 0.151                                | 1030                                                | 16x25         |
| 2200             | 25   | <b>228HSM025M</b> | 0.136                                | 1210                                                | 16x31.5       |
| 3300             | 10   | <b>338HSM010M</b> | 0.131                                | 1090                                                | 16x25         |
| 3300             | 16   | <b>338HSM016M</b> | 0.111                                | 1330                                                | 16x31.5       |
| 4700             | 10   | <b>478HSM010M</b> | 0.099                                | 1390                                                | 16x31.5       |