# CAPACITORS FOR POWER ELECTRONICS


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CDE CORNELL DUBILIER

ENERGIZING IDEAS

UTILITY METERS

# TABLE OF CONTENTS


| SERIES | DESCRIPTION |
| --- | --- |
| MYH | MYH: +85°C, Y2, EMI, RFI Suppression Capacitor |
| MXT | MXT: +85°C, X2, EMI, RFI Suppression Capacitor |
| DGH | DGH: +85°C Low ESR Supercapacitor |
| DSF | DSF: +85°C, High Voltage |
| EDC | EDC: +70°C, Long Life |
| EDS | EDS: +85°C, Long Life |

## THB 2,000 Hr @ 85 °C, 85% RH, and Vr, AEC-Q200


The MYH series of Y2, line-to-ground EMI suppression capacitors are designed for the most challenging environments. The series passes a 2,000-hour THB test, twice the 1,000-hour industry standard for THB testing. The MYH series is AEC-Q200 qualified and possesses international agency approvals for safety and performance for Y2, line-to-ground applications.

## Highlights

- Excels at EMI Suppression in harsh environmental conditions
- THB 2,000 Hr @ 85℃, 85% RH, and Vr
- Automotive Grade (AEC-Q200) qualified
- High operating temperature: up to 110 °C
- International agency approvals for safety and performance

## Specifications

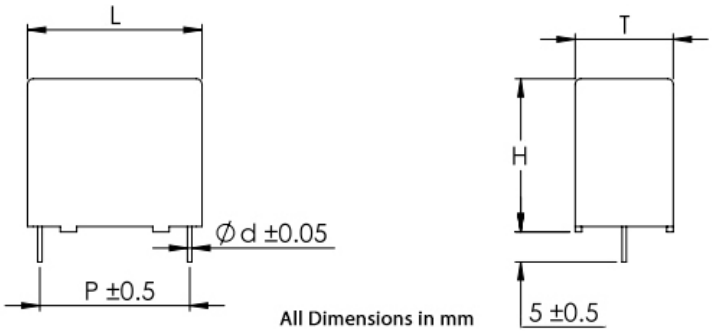
| | |
|---|---|
| **Capacitance Range** | .001 µF to 1 µF |
| **Capacitance Tolerance** | ±10 % (±20% optional) |
| **Rated Voltage** | 300 Vac, 1500 Vdc |
| **Operating Temperature Range** | –40 ºC to +110 ºC (+85 °C to 110 °C, voltage derating factor of 1.35% per Deg. C) |
| **Life Expectancy** | 100,000h at rated voltage and hot spot temperature ≤85 °C |
| **Voltage Between Terminals UTT** | AC Voltage: $U_R$+1200Vac for 60s or 2$U_R$+1200Vac for 2s DC Voltage: 4000VDC for 2s, charge current must be 1A maximum Withstanding (DC) voltage (cut off current 10mA), rise time 100V/S. |
| **Voltage Between Terminals and Case UTC** | 2200Vac, 60s (at +20/±2°C) |
| **Dissipation Factor** | 0.0020 @ 1KHz @ 20 ˚C |
| **Insulation Resistance** | C ≤0.33µF at 100V; 1 min. > 15000 MΩ<br>C >0.33µF at 100V; 1 min. > 5000 MΩ*µF |
| **IEC Climatic Category** | 40/110/56 IEC60068-1 |
| **Damp Heat, Steady State (Reference: IEC 60384-14; 2013/AMD1:2016)** | +40ºC / 93% RH @ rated voltage for 1,344 hrs +24/-0<br>Capacitance Change Rate: (ΔC/C): ≤±5%<br>DF Change (Δtgδ): ≤80*10-4 at 10 KHz (C ≤ 1µF)<br>DF Change (Δtgδ): ≤50*10-4 at 1 KHz (C > 1µF)<br>IR: ≥ 50% of initial limit |
| **THB Rating** | +85ºC / 85% RH @ rated voltage for 2,000hrs +24/-0<br>Capacitance Change Rate: (ΔC/C): ≤±10%<br>DF Change (Δtgδ): ≤240*10-4 at 10 KHz (C ≤ 1µF)<br>DF Change (Δtgδ): ≤150*10-4 at 1 KHz (C > 1µF)<br>IR: ≥ 50% of initial limit |
| **Storage Conditions** | -10 °C to +40 °C ≤24 months with RH ≤70% |
| RoHS Compliant | |

| Safety Agency | Standard | File Number |
|---|---|---|
| UL | UL 60384-14<br>CSA-E60384-14 | E171988 |
| VDE | IEC 60384-14:2013/<br>AMD1:2016 | 40055905 |
| CQC | IEC 60384-<br>14:2013+AMD1:2016 | CQC23001381668 |

| Construction Details | |
|---|---|
| Case Material | Plastic UL 94V-0 |
| Resin Material | Epoxy Resin UL 94V-0 |
| Terminal Material | Copper Clad Steel or Tinned Copper Wires |

## THB 2,000 Hr @ 85 °C, 85% RH, and Vr, AEC-Q200

## Dimensions




## Size Code Table

| Size | Dimensions (mm) | | | | | | Pitch (mm) | Lead Wire (mm) |
|---|---|---|---|---|---|---|---|---|
| Code | L | Tol. ± | H | Tol. ± | T | Tol. ± | P | Ød |
| D10 | 13 | 0.5 | 11 | 0.5 | 5 | 0.5 | 10 | 0.6 |
| D11 | 13 | 0.5 | 12 | 0.5 | 6 | 0.5 | 10 | 0.6 |
| D16 | 13 | 0.5 | 9 | 0.5 | 4 | 0.5 | 10 | 0.6 |
| E10 | 18 | 0.5 | 11 | 0.5 | 5 | 0.5 | 15 | 0.6 |
| E11 | 18 | 0.5 | 12 | 0.5 | 6 | 0.5 | 15 | 0.6 |
| E13 | 18 | 0.5 | 13.5 | 0.5 | 7.5 | 0.5 | 15 | 0.8 |
| E14 | 18 | 0.5 | 14.5 | 0.5 | 8.5 | 0.5 | 15 | 0.8 |
| E21 | 18 | 0.5 | 19 | 0.5 | 11 | 0.5 | 15 | 0.8 |
| G10 | 26 | 0.8 | 15.5 | 0.8 | 6 | 0.8 | 22.5 | 0.6 |
| G11 | 26 | 0.5 | 16.5 | 0.5 | 7 | 0.5 | 22.5 | 0.8 |
| G12 | 26 | 0.8 | 17 | 0.8 | 8.5 | 0.8 | 22.5 | 0.8 |
| G20 | 26 | 0.5 | 19 | 0.5 | 10 | 0.5 | 22.5 | 0.8 |
| G22 | 26 | 0.5 | 22 | 0.5 | 12 | 0.5 | 22.5 | 0.8 |
| G25 | 26 | 0.5 | 25 | 0.5 | 15 | 0.5 | 22.5 | 0.8 |
| H11 | 32 | 0.8 | 18 | 0.8 | 9 | 0.8 | 27.5 | 0.8 |
| H20 | 32 | 0.8 | 20 | 0.8 | 11 | 0.8 | 27.5 | 0.8 |
| H21 | 32 | 0.8 | 22 | 0.8 | 13 | 0.8 | 27.5 | 0.8 |
| H24 | 32 | 0.8 | 28 | 0.8 | 14 | 0.8 | 27.5 | 0.8 |
| H27 | 32 | 0.8 | 28 | 0.8 | 18 | 0.8 | 27.5 | 0.8 |
| H28 | 32 | 0.8 | 33 | 0.8 | 18 | 0.8 | 27.5 | 0.8 |
| H30 | 32 | 0.8 | 37 | 0.8 | 22 | 0.8 | 27.5 | 0.8 |
| N21 | 42 | 0.8 | 24 | 0.8 | 13 | 0.8 | 37.5 | 1 |
| N24 | 42 | 0.8 | 28 | 0.8 | 17 | 0.8 | 37.5 | 1 |
| N26 | 42 | 0.8 | 32 | 0.8 | 19 | 0.8 | 37.5 | 1 |
| N30 | 42 | 0.8 | 40 | 0.8 | 20 | 0.8 | 37.5 | 1 |

## Part Numbering System

| MYH | 104 | K | 300 | E10 |
|---|---|---|---|---|
| Series | Capacitance | Tolerance | Voltage | Case size |
| MYH | EIA Cap Code<br>472 = 0.0047 µF<br>183 = 0.018 µF<br>564 = 0.56 µF<br>105 = 1 µF | K = ±10% Standard<br>M = ±20% Optional | 300 = 300 VAC | See Size Code |

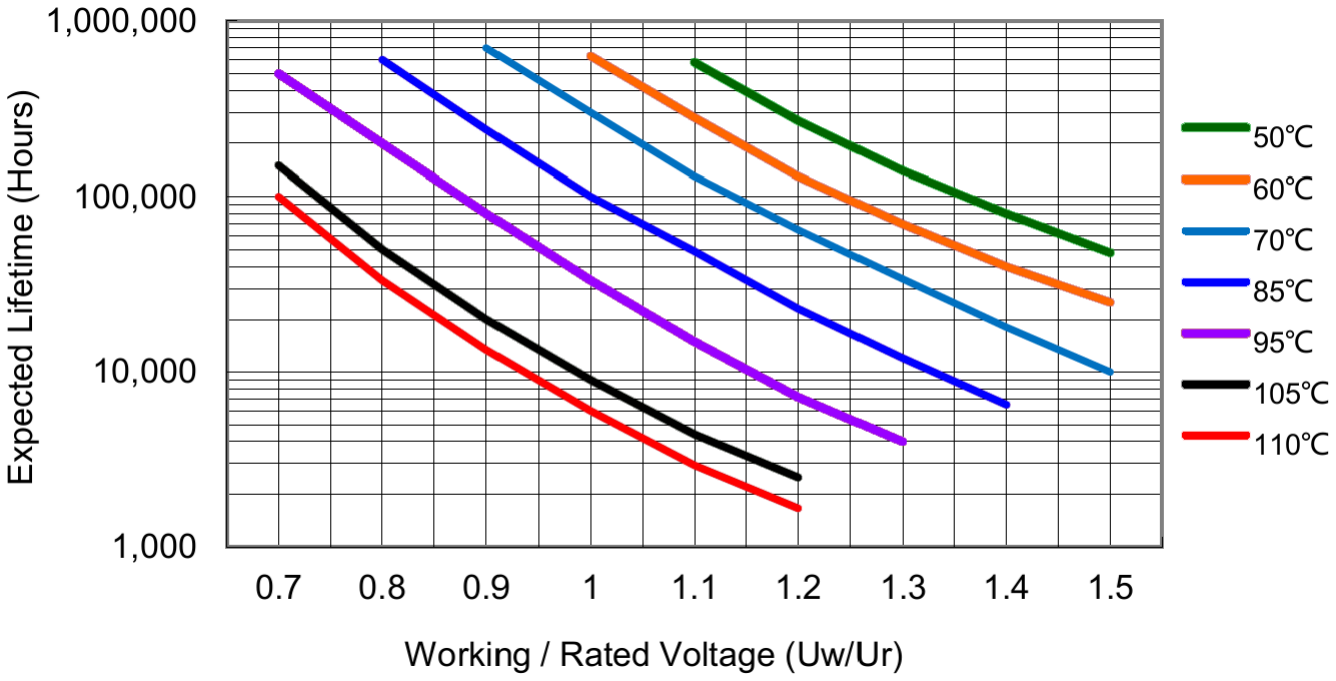
## THB 2,000 Hr @ 85 °C, 85% RH, and Vr, AEC-Q200

## Ratings

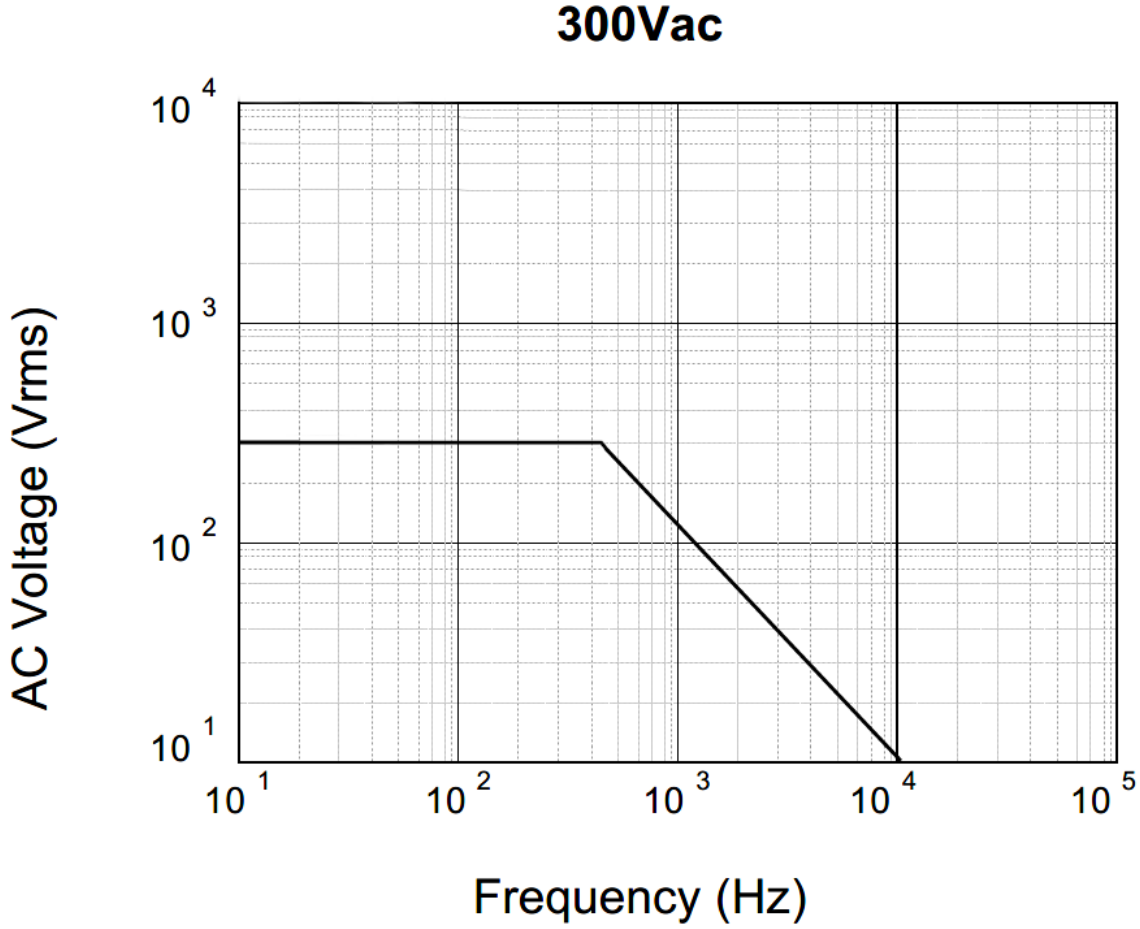
| Part Number | Cap (µF) | Dimensions W mm | H mm | T mm | P mm | dv/dt V/µs | Lead Wire mm |
|---|---|---|---|---|---|---|---|
| | | | 300 VAC | | | | |
| MYH102K300D16 | 0.0010 | 13 | 9 | 4 | 10 | 800 | 0.6 |
| MYH152K300D16 | 0.0015 | 13 | 9 | 4 | 10 | 800 | 0.6 |
| MYH222K300D16 | 0.0022 | 13 | 9 | 4 | 10 | 800 | 0.6 |
| MYH332K300D10 | 0.0033 | 13 | 11 | 5 | 10 | 800 | 0.6 |
| MYH472K300D10 | 0.0047 | 13 | 11 | 5 | 10 | 800 | 0.6 |
| MYH472K300D11 | 0.0047 | 13 | 12 | 6 | 10 | 800 | 0.6 |
| MYH472K300E10 | 0.0047 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH562K300E10 | 0.0056 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH682K300D11 | 0.0068 | 13 | 12 | 6 | 10 | 800 | 0.6 |
| MYH682K300E10 | 0.0068 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH822K300E10 | 0.0082 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH103K300D11 | 0.010 | 13 | 12 | 6 | 10 | 800 | 0.6 |
| MYH103K300E10 | 0.010 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH153K300D11 | 0.015 | 13 | 12 | 6 | 10 | 800 | 0.6 |
| MYH153K300E10 | 0.015 | 18 | 11 | 5 | 15 | 600 | 0.6 |
| MYH183K300E11 | 0.018 | 18 | 12 | 6 | 15 | 600 | 0.6 |
| MYH223K300E11 | 0.022 | 18 | 12 | 6 | 15 | 600 | 0.6 |
| MYH333K300E13 | 0.033 | 18 | 13.5 | 7.5 | 15 | 600 | 0.8 |
| MYH393K300E13 | 0.039 | 18 | 13.5 | 7.5 | 15 | 600 | 0.8 |
| MYH473K300E14 | 0.047 | 18 | 14.5 | 8.5 | 15 | 600 | 0.8 |
| MYH473K300G10 | 0.047 | 26 | 15.5 | 6 | 22.5 | 500 | 0.6 |
| MYH563K300G10 | 0.056 | 26 | 15.5 | 6 | 22.5 | 500 | 0.6 |
| MYH683K300E21 | 0.068 | 18 | 19 | 11 | 15 | 600 | 0.8 |
| MYH683K300G11 | 0.068 | 26 | 16.5 | 7 | 22.5 | 500 | 0.8 |
| MYH823K300E21 | 0.082 | 18 | 19 | 11 | 15 | 600 | 0.8 |
| MYH823K300G11 | 0.082 | 26 | 16.5 | 7 | 22.5 | 500 | 0.8 |
| MYH104K300G12 | 0.10 | 26 | 17 | 8.5 | 22.5 | 500 | 0.8 |
| MYH104K300H11 | 0.10 | 32 | 18 | 9 | 27.5 | 400 | 0.8 |
| MYH154K300G20 | 0.15 | 26 | 19 | 10 | 22.5 | 500 | 0.8 |
| MYH154K300H11 | 0.15 | 32 | 18 | 9 | 27.5 | 400 | 0.8 |
| MYH184K300H20 | 0.18 | 32 | 20 | 11 | 27.5 | 400 | 0.8 |
| MYH224K300G22 | 0.22 | 26 | 22 | 12 | 22.5 | 500 | 0.8 |
| MYH224K300H20 | 0.22 | 32 | 20 | 11 | 27.5 | 400 | 0.8 |
| MYH274K300H21 | 0.27 | 32 | 22 | 13 | 27.5 | 400 | 0.8 |
| MYH334K300G25 | 0.33 | 26 | 25 | 15 | 22.5 | 500 | 0.8 |
| MYH334K300H24 | 0.33 | 32 | 28 | 14 | 27.5 | 400 | 0.8 |
| MYH474K300H27 | 0.47 | 32 | 28 | 18 | 27.5 | 400 | 0.8 |
| MYH474K300N21 | 0.47 | 42 | 24 | 13 | 37.5 | 300 | 1 |
| MYH564K300H28 | 0.56 | 32 | 33 | 18 | 27.5 | 400 | 0.8 |
| MYH684K300H28 | 0.68 | 32 | 33 | 18 | 27.5 | 400 | 0.8 |
| MYH684K300N24 | 0.68 | 42 | 28 | 17 | 37.5 | 300 | 1 |
| MYH824K300H30 | 0.82 | 32 | 37 | 22 | 27.5 | 400 | 0.8 |
| MYH824K300N26 | 0.82 | 42 | 32 | 19 | 37.5 | 300 | 1 |
| MYH105K300H30 | 1 | 32 | 37 | 22 | 27.5 | 400 | 0.8 |
| MYH105K300N30 | 1 | 42 | 40 | 20 | 37.5 | 300 | 1 |

## THB 2,000 Hr @ 85 °C, 85% RH, and Vr, AEC-Q200

### Expected Life Curve




### Maximum Voltage (Vrms) Versus Frequency



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# TYPE MXT, X2, EMI/RFI Suppression Capacitors, Harsh Environment

## THB 1,000 Hr @ 85 °C, 85% RH, and Vr


The MXT series is constructed of Metallized Polypropylene Film encapsulated with self-extinguishing resin in plastic box of material meeting the UL 94V-0 requirements. The series is suitable for harsh environment conditions. Applications include "across the line" class X2 and EMI/RFI suppression.

## Highlights

- THB 1,000 Hr @ 85˚C, 85% RH, and Vr
- High stability of capacitance
- High operating temperature: 110 °C
- Self-healing property
- Flame-retardant plastic case and resin
- Suitable for harsh environmental conditions

## Specifications

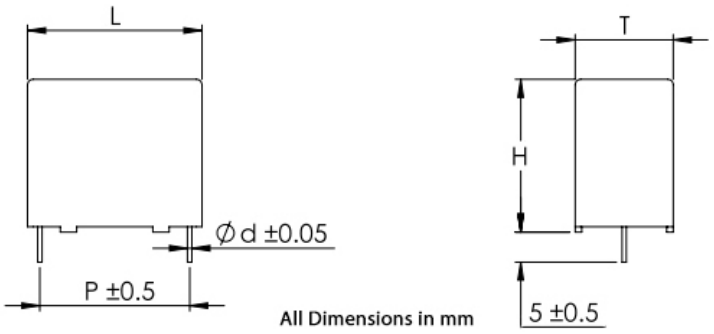
| | |
|---|---|
| **Capacitance Range** | 0.1 µF to 40 µF |
| **Capacitance Tolerance** | ±10 % (±20% optional) |
| **Rated Voltage** | 305 Vac, 630 Vdc |
| **Operating Temperature Range** | –40 ºC to +110 ºC (+85 °C to 110 °C, voltage derating factor of 1.35% per Deg. C) |
| **Life Expectancy** | 100,000h at rated voltage and hot spot temperature <85 °C |
| **Voltage Between Terminals UTT** | DC Voltage: 4.3Ur for 60s or √2(2UR + 1000 Vac) VDC for 2s, charge current must be 1A max.<br>Withstanding DC voltage (cut-off current 10 mA) Rise time 100V/s |
| **Voltage Between Terminals and Case UTC** | 2UR + 1500 Vac, 60s at 20 °C |
| **Dissipation Factor** | .001 @ 1 kHz @ 20 ˚C |
| **Insulation Resistance** | C ≤0.33 µF at 100V; 1 min. > 15000 MΩ<br>C >0.33 µF at 100V; 1 min. > 5000 MΩ x µF |
| **IEC Climatic Category** | 40/110/56 IEC60068-1 |
| **Damp Heat, Steady State** | +40 ºC / 93% RH @ rated voltage for 1,344 hrs +24/-0<br>Capacitance Change Rate: (ΔC/C): ≤±5%<br>DF Change (Δtgδ): ≤80*10-4 at 10 kHz (C ≤ 1µF)<br>DF Change (Δtgδ): ≤50*10-4 at 1 kHz (C > 1µF)<br>IR: ≥ 50% of initial limit |
| **THB Rating** | +85ºC / 85% RH @ rated voltage for 1,000 hrs +24/-0<br>Capacitance Change Rate: (ΔC/C): ≤±10%<br>DF Change (Δtgδ): ≤240*10-4 at 10 kHz (C ≤ 1 µF)<br>DF Change (Δtgδ): ≤150*10-4 at 1 kHz (C > 1 µF)<br>IR: ≥ 50% of initial limit |
| **Storage Conditions** | -40 °C to +85 °C ≤24 months from date code, Average RH ≤70% |
| RoHS Compliant | |

| Safety Agency | Standard | File Number |
|---|---|---|
| UL | UL 60384-14<br>CSA-E60384-14 | E171988 |
| VDE | IEC 60384-14:2013<br>IEC 60384-14:2013/<br>AMD1:2016 | 40055249 |
| CQC | IEC 60384-14<br>GB/T6346.14-2015 | CQC23001381667 |

| Construction Details | |
|---|---|
| Case Material | Plastic UL 94V-0 |
| Resin Material | Epoxy Resin UL 94V-0 |
| Terminal Material | Pitch ≤27.5mm = Copper Clad Steel<br>Pitch ≥37.5mm = Tinned Copper Wire |

## THB 1,000 Hr @ 85 °C, 85% RH, and Vr

## Dimensions




## Size Code Table

| Size | Dimensions (mm) | | | | | | Pitch (mm) | Lead Wire (mm) |
|---|---|---|---|---|---|---|---|---|
| Code | L | Tol. ± | H | Tol. ± | T | Tol. ± | P | Ød |
| E10 | 18 | 0.5 | 11 | 0.5 | 5 | 0.5 | 15 | 0.6 |
| E11 | 18 | 0.5 | 12 | 0.5 | 6 | 0.5 | 15 | 0.6 |
| E13 | 18 | 0.5 | 13.5 | 0.5 | 7.5 | 0.5 | 15 | 0.8 |
| E14 | 18 | 0.5 | 14.5 | 0.5 | 8.5 | 0.5 | 15 | 0.8 |
| E20 | 18 | 0.5 | 16 | 0.5 | 10 | 0.5 | 15 | 0.8 |
| E21 | 18 | 0.5 | 19 | 0.5 | 11 | 0.5 | 15 | 0.8 |
| G11 | 26 | 0.5 | 16.5 | 0.5 | 7 | 0.5 | 22.5 | 0.8 |
| G20 | 26 | 0.5 | 19 | 0.5 | 10 | 0.5 | 22.5 | 0.8 |
| G22 | 26 | 0.5 | 22 | 0.5 | 12 | 0.5 | 22.5 | 0.8 |
| G23 | 26 | 0.5 | 23 | 0.5 | 13 | 0.5 | 22.5 | 0.8 |
| G24 | 26 | 0.5 | 29.5 | 0.5 | 14.5 | 0.5 | 22.5 | 0.8 |
| H11 | 32 | 0.8 | 18 | 0.8 | 9 | 0.8 | 27.5 | 0.8 |
| H20 | 32 | 0.8 | 20 | 0.8 | 11 | 0.8 | 27.5 | 0.8 |
| H22 | 32 | 0.8 | 24.5 | 0.8 | 13 | 0.8 | 27.5 | 0.8 |
| H23 | 32 | 0.8 | 24 | 0.8 | 14 | 0.8 | 27.5 | 0.8 |
| H27 | 32 | 0.8 | 28 | 0.8 | 18 | 0.8 | 27.5 | 0.8 |
| H28 | 32 | 0.8 | 33 | 0.8 | 18 | 0.8 | 27.5 | 0.8 |
| H30 | 32 | 0.8 | 37 | 0.8 | 22 | 0.8 | 27.5 | 0.8 |
| N31 | 42 | 1.0 | 37 | 1.0 | 22 | 1.0 | 37.5 | 1.0 |
| N30 | 42 | 1.0 | 40 | 1.0 | 20 | 1.0 | 37.5 | 1.0 |
| N32 | 42 | 1.0 | 44 | 1.0 | 24 | 1.0 | 37.5 | 1.0 |
| N40 | 42 | 1.0 | 45 | 1.0 | 30 | 1.0 | 37.5 | 1.0 |
| R40 | 57.5 | 1.0 | 45 | 1.0 | 30 | 1.0 | 52.5 | 1.2 |
| R52 | 57.5 | 1.0 | 60 | 1.0 | 45 | 1.0 | 52.5 | 1.2 |

## Part Numbering System

| MXT Series | 104 Capacitance | K Tolerance | 305 Voltage | E10 Case |
|---|---|---|---|---|
| MXT | EIA Cap Code<br>104 = 0.1 µF<br>125 = 1.2 µF<br>156 = 15 µF | K = ±10% Standard<br>M = ±20% Optional | 305 = 305 Vac | See Size CodeTable |

## THB 1,000 Hr @ 85 °C, 85% RH, and Vr

## Ratings

| Part Number | Cap (µF) | Dimensions L (mm) | H (mm) | T (mm) | P (mm) | dv/dt (V/µs) | Ød (mm) |
|---|---|---|---|---|---|---|---|
| | | | 305 VAC | | | | |
| MXT104K305E10 | 0.10 | 18 | 11 | 5 | 15 | 400 | 0.6 |
| MXT154K305E11 | 0.15 | 18 | 12 | 6 | 15 | 400 | 0.6 |
| MXT224K305E13 | 0.22 | 18 | 13.5 | 7.5 | 15 | 400 | 0.8 |
| MXT224K305G11 | 0.22 | 26 | 16.5 | 7 | 22.5 | 200 | 0.8 |
| MXT274K305E14 | 0.27 | 18 | 14.5 | 8.5 | 15 | 400 | 0.8 |
| MXT334K305E14 | 0.33 | 18 | 14.5 | 8.5 | 15 | 400 | 0.8 |
| MXT334K305G11 | 0.33 | 26 | 16.5 | 7 | 22.5 | 200 | 0.8 |
| MXT474K305E20 | 0.47 | 18 | 16 | 10 | 15 | 400 | 0.8 |
| MXT474K305G11 | 0.47 | 26 | 16.5 | 7 | 22.5 | 200 | 0.8 |
| MXT564K305E21 | 0.56 | 18 | 19 | 11 | 15 | 400 | 0.8 |
| MXT564K305G20 | 0.56 | 26 | 19 | 10 | 22.5 | 200 | 0.8 |
| MXT684K305G20 | 0.68 | 18 | 19 | 11 | 15 | 400 | 0.8 |
| MXT684K305E21 | 0.68 | 26 | 19 | 10 | 22.5 | 200 | 0.8 |
| MXT684K305H11 | 0.68 | 32 | 18 | 9 | 27.5 | 150 | 0.8 |
| MXT824K305H11 | 0.82 | 32 | 18 | 9 | 27.5 | 150 | 0.8 |
| MXT105K305G20 | 1.0 | 26 | 19 | 10 | 22.5 | 200 | 0.8 |
| MXT105K305H20 | 1.0 | 32 | 20 | 11 | 27.5 | 150 | 0.8 |
| MXT125K305G22 | 1.2 | 26 | 22 | 12 | 22.5 | 200 | 0.8 |
| MXT155K305G23 | 1.5 | 26 | 23 | 13 | 22.5 | 200 | 0.8 |
| MXT155K305H22 | 1.5 | 32 | 24.5 | 13 | 27.5 | 150 | 0.8 |
| MXT185K305G24 | 1.8 | 26 | 29.5 | 14.5 | 22.5 | 200 | 0.8 |
| MXT185K305H22 | 1.8 | 32 | 24.5 | 13 | 27.5 | 150 | 0.8 |
| MXT225M305G24 | 2.2 | 26 | 29.5 | 14.5 | 22.5 | 200 | 0.8 |
| MXT225K305G24 | 2.2 | 26 | 29.5 | 14.5 | 22.5 | 200 | 0.8 |
| MXT225K305H23 | 2.2 | 32 | 24 | 14 | 27.5 | 150 | 0.8 |
| MXT275K305H27 | 2.7 | 32 | 28 | 18 | 27.5 | 150 | 0.8 |
| MXT335K305H28 | 3.3 | 32 | 33 | 18 | 27.5 | 150 | 0.8 |
| MXT395K305H28 | 3.9 | 32 | 33 | 18 | 27.5 | 150 | 0.8 |
| MXT475K305H30 | 4.7 | 32 | 37 | 22 | 27.5 | 150 | 0.8 |
| MXT685K305N30 | 6.8 | 42 | 37 | 22 | 37.5 | 100 | 1.0 |
| MXT685K305N31 | 6.8 | 42 | 40 | 20 | 37.5 | 100 | 1.0 |
| MXT106K305N32 | 10 | 42 | 44 | 24 | 37.5 | 100 | 1.0 |
| MXT126K305N40 | 12 | 42 | 45 | 30 | 37.5 | 100 | 1.0 |
| MXT156K305N40 | 15 | 42 | 45 | 30 | 37.5 | 100 | 1.0 |
| MXT186K305R40 | 18 | 57.5 | 45 | 30 | 52.5 | 80 | 1.2 |
| MXT206K305R40 | 20 | 57.5 | 45 | 30 | 52.5 | 80 | 1.2 |
| MXT406K305R52 | 40 | 57.5 | 60 | 45 | 52.5 | 80 | 1.2 |

**Notice and Disclaimer:** All product drawings, descriptions, specifications, statements, information and data (collectively, the “Information”) in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements (“Cornell Dubilier”) has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.

# DGH

## Low ESR Supercapacitor

| | |
|---|---|
| FEATURES | Very Fast Charge/Discharge – High Power Density – Lower ESR – RoHS Compliant |
| APPLICATIONS | Battery Backup/Alternative – Pulse Power – Energy Harvesting – LED Displays – Mechanical Actuators – Audio Systems |

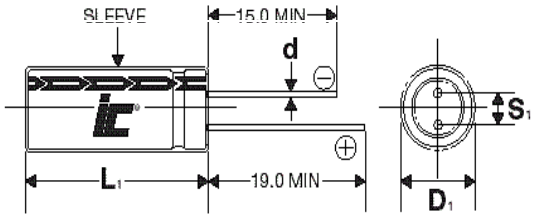
| | | |
|---|---|---|
| **Operating Temperature Range** | **-40°C to +85°C** | |
| **Storage Temperature** | **-40°C to +70°C** | |
| **Capacitance Tolerance @ 20°C** | **-10% +30% (Q Tolerance)**<br>**-20% +20% (M Tolerance)** | |
| **Voltage (Vdc) (+65°C / +85°C)** | **2.7V / 2.3V** | |
| **Life Time** | **1500 hours with rated voltage applied at rated temperature** | |
| | **Capacitance change** | ≤30% of initially measured values |
| | **ESR** | ≤200% of initially specified values* |
| | **Leakage current** | ≤100% specified maximum value |
| **Shelf Life** | **1000 hours with no voltage applied at 65°C** | |
| | **Capacitance change** | ≤30% of initially measured values |
| | **ESR** | ≤200% of initially specified values |
| **Life Cycles**<br>**( 25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10s** | **500,000 cycles** | |
| | **Capacitance change** | <30% of initially measured values |
| | **ESR change** | <200% of initially specified values |

*ESR Change ≤4x at 85°C

RoHS Compliant

**810a Recognized**

## D = 6.3 to 18mm




| Lead spacing VS. Case diameter | | | | | | |
|---|---|---|---|---|---|---|
| **D** | **6.3** | **8** | **10** | **12.5** | **16** | **18** |
| **S** | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| **d** | 0.6 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| **α** | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 |

$L_1$=L+α mm
$D_1$=D+0.5mm
$S_1$=S±0.5mm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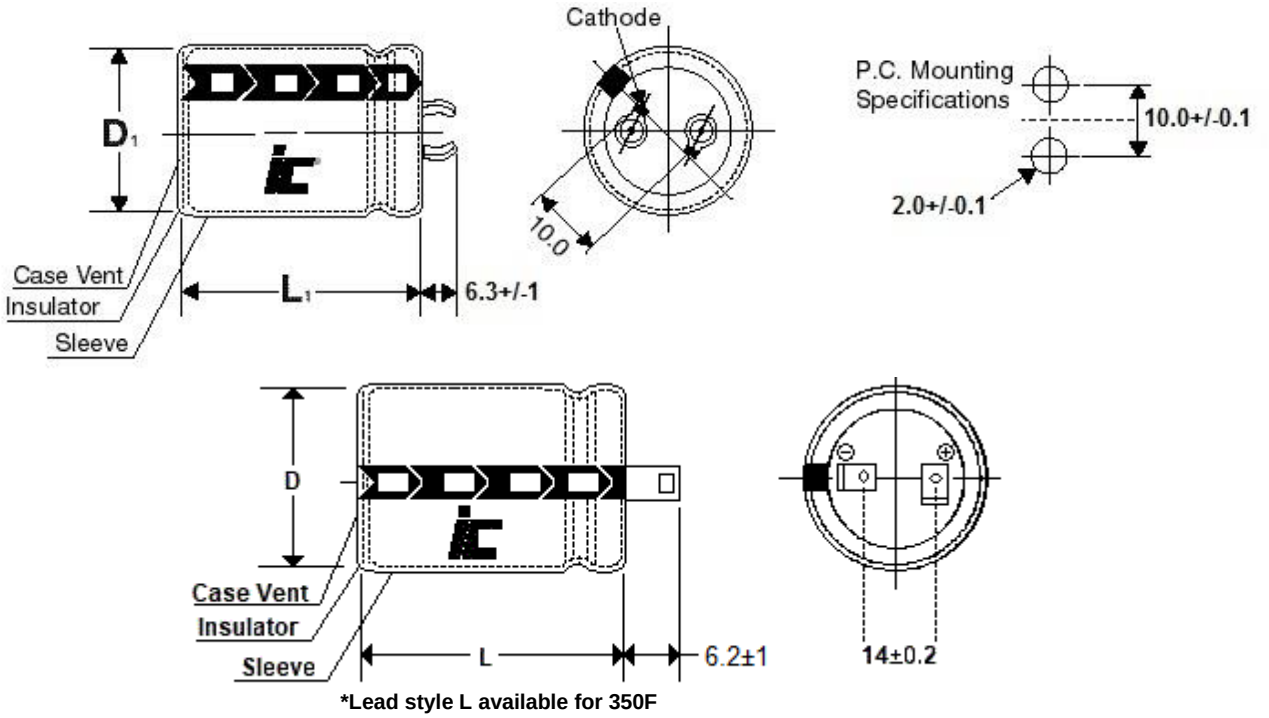
# DGH

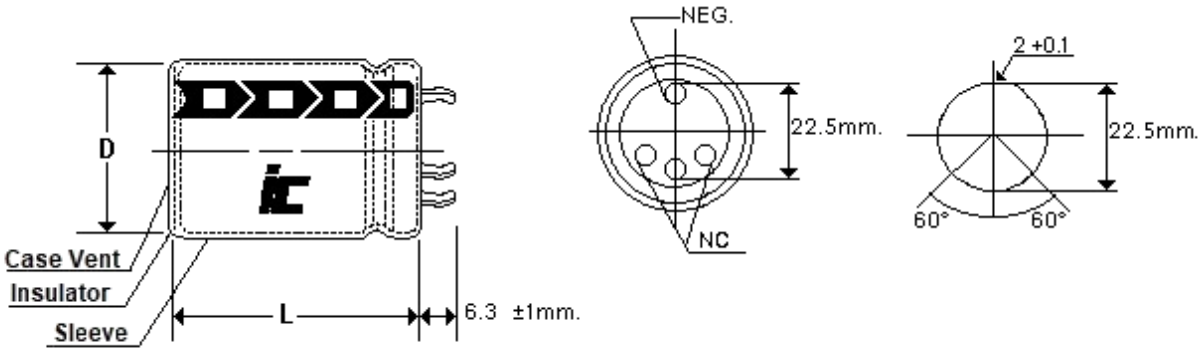
## Low ESR Supercapacitor

### Capacitance 100F to 350F

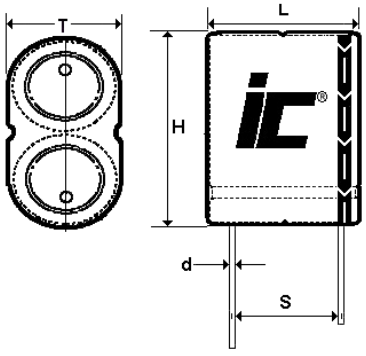



*Lead style L available for 350F

### Capacitance 400F to 600F




### 5.5 Volt Parts




| Capacitance (F) | Dims (LxHxT) (mm) ±2.0mm | Lead spacing (S) (mm) +/-0.5mm | Lead diameter (d) (mm) |
|---|---|---|---|
| 0.5 | 17x17x8.5 | 12 | 0.6 |
| 1 | 17x17x8.5 | 12 | 0.6 |
| 1.5 | 17x23x8.5 | 12 | 0.6 |
| 2.5 | 21x23x11 | 15.5 | 0.6 |
| 3.5 | 21x27x11 | 15.5 | 0.6 |
| 5 | 26x27x13 | 18 | 0.6 |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# DGH

**High pulse power, extends battery life**

| WVDC | Capacitance (F) | IC PART NUMBER | MAX Current (A) (1 Sec.) | Maximum Continuous Current (A) (ΔT=15°C) | Short Circuit Current (A) | ESR AC 1 kHz (mΩ) | DC ESR (mΩ) 20°C | Max stored energy (mWh) | LC (mA), (72 hrs) | Energy Density (Wh/kg) | Energy Volumetric Density (Wh/l) | Power Density (kW/kg) | Power Volumetric Density (kW/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.7 | 1.0 | DGH105Q2R7 | 0.96 | 0.6 | 6.8 | 200 | 400 | 1.01 | 0.008 | 0.92 | 1.44 | 1.988 | 3.109 |
| 2.7 | 1.2 | DGH125M2R7 | 0.94 | 0.10 | 4.5 | 300 | 600 | 1.22 | 0.008 | 1.52 | 2.59 | 1.82 | 3.12 |
| 2.7 | 1.5 | DGH155M2R7 | 1.1 | 0.13 | 4.8 | 280 | 560 | 1.5 | 0.008 | 1.6 | 2.7 | 1.64 | 2.78 |
| 2.7 | 2.0 | DGH205Q2R7 | 1.8 | 0.7 | 11 | 130 | 250 | 2.03 | 0.01 | 1.688 | 2.879 | 2.916 | 4.975 |
| 2.7 | 3.0 | DGH305Q2R7 | 2.8 | 1.2 | 18 | 80 | 150 | 3.04 | 0.012 | 2.17 | 3.023 | 4.166 | 5.804 |
| 2.7 | 3.3 | DGH335Q2R7 | 3 | 1.2 | 18 | 80 | 150 | 3.34 | 0.014 | 2.228 | 3.325 | 3.888 | 5.804 |
| 2.7 | 5.0 | DGH505Q2R7 | 4.1 | 1.3 | 21 | 70 | 130 | 5.06 | 0.016 | 2.531 | 3.225 | 3.365 | 4.286 |
| 2.7 | 6.0 | DGH605Q2R7 | 4.5 | 0.51 | 21 | 70 | 130 | 6.08 | 0.016 | 2.89 | 3.86 | 3.2 | 4.28 |
| 2.7 | 7.0 | DGH705Q2R7 | 6.1 | 1.7 | 34 | 55 | 80 | 7.09 | 0.02 | 2.835 | 3.611 | 4.374 | 5.572 |
| 2.7 | 10.0 | DGH106Q2R7 | 8.4 | 3.5 | 45 | 40 | 60 | 10.13 | 0.03 | 3.894 | 5.159 | 5.608 | 7.429 |
| 2.7 | 10.0 | DGH106Q2R7B | 8.4 | 3.5 | 45 | 40 | 60 | 10.13 | 0.03 | 2.978 | 4.299 | 4.288 | 6.191 |
| 2.7 | 10.0 | DGH106Q2R7C | 8.4 | 3.5 | 45 | 40 | 60 | 10.13 | 0.03 | 3.38 | 5.16 | 4.86 | 7.4 |
| 2.7 | 15.0 | DGH156Q2R7 | 11.6 | 2.4 | 54 | 30 | 50 | 15.19 | 0.045 | 3.375 | 4.127 | 3.888 | 4.755 |
| 2.7 | 20.0 | DGH206Q2R7 | 15 | 2.6 | 68 | 30 | 40 | 20.25 | 0.06 | 3.11 | 4.02 | 3.36 | 4.3 |
| 2.7 | 25.0 | DGH256Q2R7 | 18 | 3.1 | 77 | 25 | 35 | 25.31 | 0.08 | 2.978 | 5.038 | 2.941 | 4.975 |
| 2.7 | 30.0 | DGH306Q2R7 | 21.3 | 4.0 | 90 | 22 | 30 | 30.38 | 0.1 | 3.79 | 5.03 | 3.64 | 4.8 |
| 2.7 | 50.0 | DGH506Q2R7 | 32.1 | 5.2 | 123 | 15 | 22 | 50.63 | 0.14 | 3.616 | 4.976 | 2.84 | 3.909 |
| 2.7 | 70.0 | DGH706Q2R7 | 39.4 | 5.8 | 135 | 14 | 20 | 70.88 | 0.16 | 3.938 | 5.573 | 2.43 | 3.439 |
| 2.7 | 100.0 | DGH107Q2R7 | 61.4 | 8.3 | 225 | 8 | 12 | 101.25 | 0.3 | 4.821 | 5.922 | 3.471 | 4.264 |
| 2.7 | 200.0 | DGH207Q2R7 | 90 | 10 | 270 | 6 | 10 | 202.5 | 0.7 | 5.192 | 5.732 | 2.243 | 2.476 |
| 2.7 | 350.0 | DGH357Q2R7 | 212 | 18.9 | 771 | 3 | 3.5 | 354.38 | 1 | 5.452 | 6.134 | 3.845 | 4.329 |
| 2.7 | 350.0 | DGH357Q2R7L | 212 | 18.9 | 771 | 3 | 3.5 | 354.4 | 1 | 5.452 | 6.134 | 3.845 | 4.329 |
| 2.7 | 400.0 | DGH407Q2R7 | 225 | 18.9 | 771 | 3 | 3.5 | 405 | 1 | 5.956 | 7.016 | 4.02 | 4.736 |
| 2.7 | 470.0 | DGH477Q2R7 | 240 | 18.9 | 771 | 3 | 3.5 | 475.88 | 1.3 | 6.609 | 8.244 | 3.471 | 4.33 |
| 2.7 | 600.0 | DGH607Q2R7 | 261 | 18 | 771 | 3 | 3.5 | 608 | 1.5 | 7.41 | 9.02 | 3.05 | 3.71 |
| 5.5 | 0.5 | DGH504Q5R5 | 0.96 | 0.6 | 6.8 | 400 | 800 | 2.1 | 0.008 | 0.955 | 0.855 | 2.063 | 1.847 |
| 5.5 | 1.0 | DGH105Q5R5 | 1.8 | 0.7 | 11 | 280 | 520 | 4.2 | 0.01 | 1.681 | 1.71 | 2.904 | 2.955 |
| 5.5 | 1.5 | DGH155Q5R5 | 2.8 | 1.2 | 18 | 160 | 300 | 6.3 | 0.012 | 2.101 | 1.896 | 4.033 | 3.641 |
| 5.5 | 2.5 | DGH255Q5R5 | 4.1 | 1.3 | 21 | 140 | 260 | 10.5 | 0.016 | 2.02 | 1.977 | 2.685 | 2.628 |
| 5.5 | 3.5 | DGH355Q5R5 | 6.1 | 1.7 | 34 | 110 | 160 | 14.71 | 0.02 | 2.451 | 2.358 | 3.781 | 3.638 |
| 5.5 | 5.0 | DGH505Q5R5 | 8.4 | 3.5 | 45 | 80 | 120 | 21 | 0.03 | 2.531 | 2.302 | 3.645 | 3.315 |


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# DGH

**High pulse power, extends battery life**

| WVDC | Capacitance (F) | IC PART NUMBER | Weight (grams) | Volume (mL) | Dims DxL LxHxT (mm) | Lead Spacing S (mm) | Lead Diameter d (mm) |
|---|---|---|---|---|---|---|---|
| 2.7 | 1.0 | DGH105Q2R7 | 0.8 | 0.703 | 8x14 | 3.5 | 0.6 |
| 2.7 | 1.2 | DGH125M2R7 | 0.8 | 0.47 | 6.3x15 | 2.5 | 0.5 |
| 2.7 | 1.5 | DGH155M2R7 | 0.95 | 0.56 | 6.3x18 | 2.6 | 0.5 |
| 2.7 | 2.0 | DGH205Q2R7 | 1 | 0.703 | 8x14 | 3.5 | 0.6 |
| 2.7 | 3.0 | DGH305Q2R7 | 1.4 | 1.01 | 8x20 | 3.5 | 0.6 |
| 2.7 | 3.3 | DGH335Q2R7 | 1.5 | 1.01 | 8x20 | 3.5 | 0.6 |
| 2.7 | 5.0 | DGH505Q2R7 | 2.1 | 1.57 | 10x20 | 5 | 0.6 |
| 2.7 | 6.0 | DGH605Q2R7 | 2.1 | 1.57 | 10x20 | 5 | 0.6 |
| 2.7 | 7.0 | DGH705Q2R7 | 2.3 | 1.96 | 10x25 | 5 | 0.6 |
| 2.7 | 10.0 | DGH106Q2R7 | 3.2 | 1.96 | 10x30 | 5 | 0.6 |
| 2.7 | 10.0 | DGH106Q2R7B | 3.6 | 2.36 | 12.5x25 | 5 | 0.6 |
| 2.7 | 10.0 | DGH106Q2R7C | 2.7 | 1.96 | 10x25 | 5 | 0.6 |
| 2.7 | 15.0 | DGH156Q2R7 | 4.5 | 3.68 | 12.5x30 | 5 | 0.6 |
| 2.7 | 20.0 | DGH206Q2R7 | 7 | 5.03 | 16x25 | 7.5 | 0.8 |
| 2.7 | 25.0 | DGH256Q2R7 | 7 | 5.03 | 16x25 | 7.5 | 0.8 |
| 2.7 | 30.0 | DGH306Q2R7 | 9.7 | 6.03 | 16x30 | 7.5 | 0.8 |
| 2.7 | 50.0 | DGH506Q2R7 | 12.8 | 10.17 | 18x40 | 7.5 | 0.8 |
| 2.7 | 70.0 | DGH706Q2R7 | 15 | 12.72 | 18x50 | 7.5 | 0.8 |
| 2.7 | 100.0 | DGH107Q2R7 | 20 | 17.1 | 22x45 | 10 | 1.2 |
| 2.7 | 200.0 | DGH207Q2R7 | 36 | 35.33 | 30x50 | 10 | 1.2 |
| 2.7 | 350.0 | DGH357Q2R7 | 64 | 57.73 | 35x60 | 10 | 1.2 |
| 2.7 | 350.0 | DGH357Q2R7L | 64 | 57.73 | 35x60 | 18.4 | 1.2 |
| 2.7 | 400.0 | DGH407Q2R7 | 70 | 57.73 | 35x60 | 22.5 | 1.2 |
| 2.7 | 470.0 | DGH477Q2R7 | 75 | 57.73 | 35x60 | 22.5 | 1.2 |
| 2.7 | 600.0 | DGH607Q2R7 | 82 | 67.35 | 35x70 | 22.5 | 1.2 |
| 5.5 | 0.5 | DGH504Q5R5 | 2.2 | 2.46 | 17x17x8.5 | 12 | 0.6 |
| 5.5 | 1.0 | DGH105Q5R5 | 2.5 | 2.46 | 17x17x8.5 | 12 | 0.6 |
| 5.5 | 1.5 | DGH155Q5R5 | 3 | 3.32 | 17x23x8.5 | 12 | 0.6 |
| 5.5 | 2.5 | DGH255Q5R5 | 5.2 | 5.31 | 21x23x11 | 15.5 | 0.6 |
| 5.5 | 3.5 | DGH355Q5R5 | 6 | 6.24 | 21x27x11 | 15.5 | 0.6 |
| 5.5 | 5.0 | DGH505Q5R5 | 8.3 | 9.13 | 26x27x13 | 18 | 0.6 |


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# DSF

## 3 Volt Supercapacitor

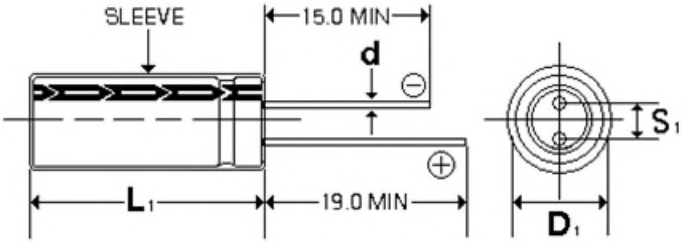

| | |
|---|---|
| FEATURES | High Voltage – Very Fast Charge/Discharge – High Power Density – Lower ESR<br>RoHS Compliant |
| APPLICATIONS | Battery Backup/Alternative – Pulse Power – Energy Harvesting – LED Displays – Mechanical Actuators – Audio Systems |

| | | |
|---|---|---|
| **Operating Temperature Range** | **-40°C to +85°C** | |
| **Storage Temperature** | **-40°C to +70°C** | |
| **Capacitance Tolerance @ 20°C** | **-10% +30% (Q Tolerance)**<br>**-20% +20% (M Tolerance)** | |
| **Voltage (Vdc) (+65°C/+85°C)** | **3.0V / 2.5V**<br>**6.0V / 5.0V**<br>**9.0V / 7.5V** | |
| **Life Time** | **1000 hours with rated voltage applied at rated temperature** | |
| | **Capacitance change** | ±30% of initially measured values |
| | **ESR** | <400% of initially specified values<br><200% of initially specified values (100F to 600F) |
| | **Leakage current** | ≤100% specified maximum value |
| **Shelf Life** | **1000 hours with no voltage applied at 65°C** | |
| | **Capacitance change** | ±30% of initially measured values |
| | **ESR** | <200% of initially specified values |
| **Life Cycles**<br>**( 25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10s** | **500,000 cycles** | |
| | **Capacitance change** | ±30% of initially measured values |
| | **ESR change** | <200% of initially specified values |

RoHS Compliant

**810a Recognized**

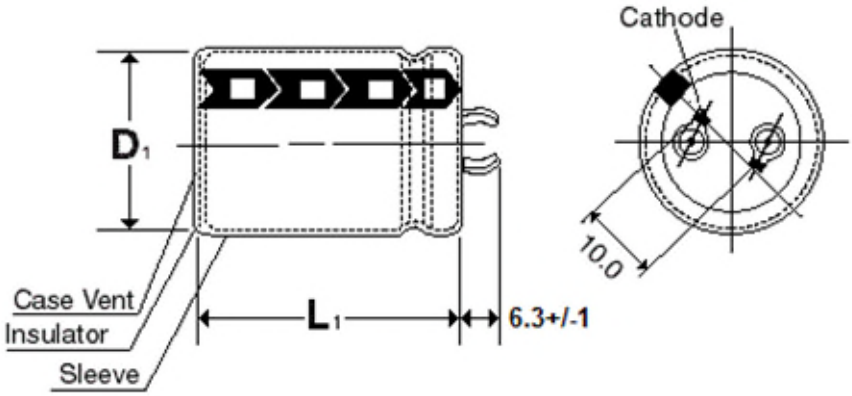

## Diameter 6.3 mm to 18 mm

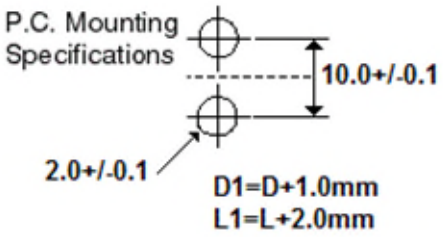



| Lead spacing VS. Case diameter | | | | | | |
|---|---|---|---|---|---|---|
| **D** | **6.3** | **8** | **10** | **12.5** | **16** | **18** |
| **S** | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| **d** | 0.6 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| **α** | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 |

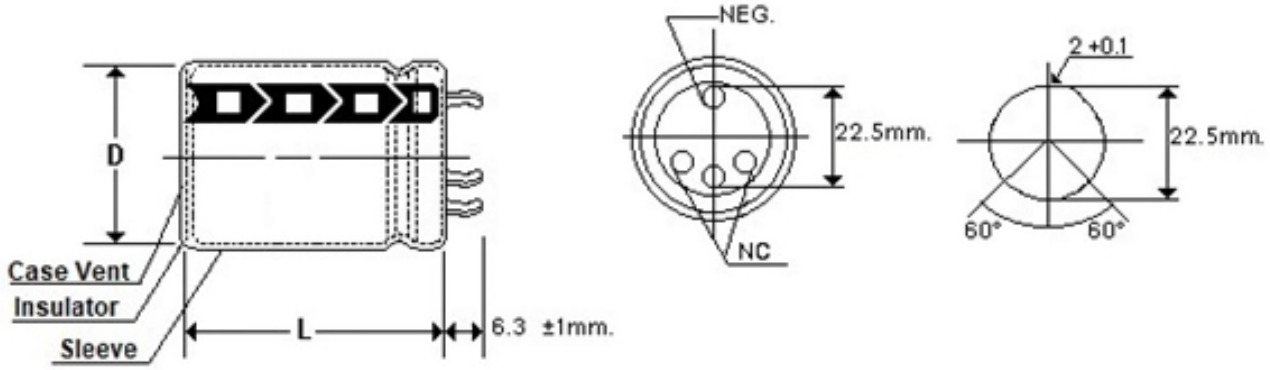
$L_1$=L+α mm
$D_1$=D+0.5 mm
$S_1$=S±0.5 mm
d=d±0.05mm

## Diameter > 18 mm to < 35 mm

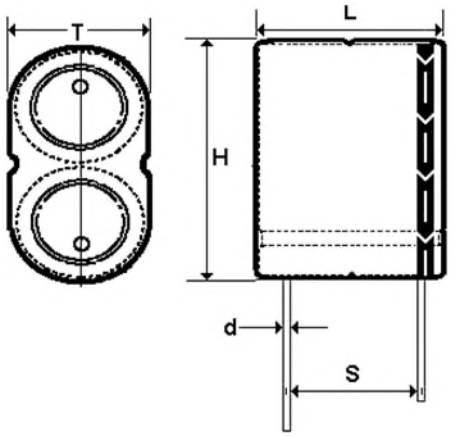



## Diameter 35 mm

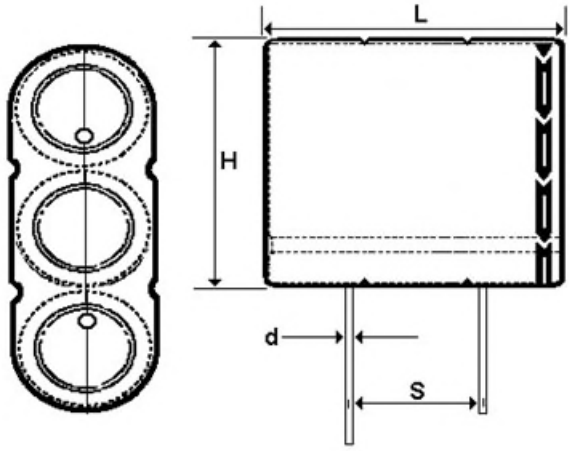



## Capacitance 1.5F to 5F
## 6 Volts




| Capacitance (F) | Dims (LxHxT) (mm) +1.0 mm | Lead spacing (S) (mm) ±0.5 mm | Lead diameter (d) (mm) ±0.05mm |
|---|---|---|---|
| 1.5 | 17x22x8.5 | 12 | 0.6 |
| 2.5 | 21x22x11 | 15.5 | 0.6 |
| 3.5 | 21x27x11 | 15.5 | 0.6 |
| 5 | 21x32x11 | 15.5 | 0.6 |

## Capacitance 0.33F to 5F
## 9 Volts




| Capacitance (F) | Dims (LxHxT) (mm) ±1.0 mm | Lead spacing (S) (mm) ±1.0 mm | Lead diameter (d) (mm) ±0.05mm |
|---|---|---|---|
| 0.33 | 25x16x8.5 | 13.5 | 0.6 |
| 0.5 | 21x20x6.5 | 11 | 0.6 |
| 0.67 | 25x16x8.5 | 13.5 | 0.6 |
| 1 | 25x22x8.5 | 13.5 | 0.6 |
| 1.66 | 31x23x11 | 16 | 0.6 |
| 3.3 | 31x27x11 | 16 | 0.6 |
| 5 | 39x33x13 | 21 | 0.6 |

# DSF

**High pulse power, extends battery life**

| WVDC | Capacitance (F) | IC PART NUMBER | MAX Current (A) (1 Sec.) | Maximum Continuous Current (A) (ΔT=15°C) | Short Circuit Current (A) | ESR AC 1 kHz (mΩ) | DC ESR (mΩ) 20°C | Max stored energy (mWh) | LC (mA), (72 hrs) | Energy Density (Wh/kg) | Energy Volumetric Density (Wh/l) | Power Density (kW/kg) | Power Volumetric Density (kW/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1.2 | DSF125M3R0 | 0.98 | 0.11 | 4.29 | 350 | 700 | 1.5 | 0.01 | 1.88 | 3.21 | 1.93 | 3.3 |
| 3 | 1.5 | DSF155M3R0 | 1.15 | 0.14 | 4.6 | 320 | 640 | 1.88 | 0.008 | 1.97 | 3.34 | 1.78 | 3.01 |
| 3 | 2.0 | DSF205Q3R0 | 1.9 | 1.80 | 9.38 | 160 | 320 | 2.5 | 0.012 | 2.5 | 3.55 | 3.38 | 4.8 |
| 3 | 3.0 | DSF305Q3R0 | 3.1 | 1.4 | 20 | 80 | 150 | 3.8 | 0.014 | 2.67 | 3.71 | 5.14 | 6.6 |
| 3 | 4.0 | DSF405M3R0 | 3.66 | 0.38 | 18.75 | 80 | 160 | 5 | 0.012 | 3.57 | 4.97 | 4.82 | 6.71 |
| 3 | 5.0 | DSF505Q3R0 | 4.5 | 2.2 | 23 | 70 | 130 | 6.3 | 0.02 | 2.97 | 3.98 | 3.95 | 5.3 |
| 3 | 7.0 | DSF705Q3R0 | 6.7 | 2.4 | 38 | 55 | 80 | 8.8 | 0.03 | 3.8 | 4.46 | 5.86 | 6.9 |
| 3 | 10.0 | DSF106Q3R0C | 5.3 | 0.89 | 16.6 | 90 | 180 | 12.5 | 0.045 | 4.46 | 3.36 | 2.14 | 3.1 |
| 3 | 10.0 | DSF106Q3R0 | 9.4 | 3.4 | 50 | 40 | 60 | 12.5 | 0.045 | 3.9 | 5.3 | 5.63 | 7.6 |
| 3 | 11.0 | DSF116Q3R0 | 7.86 | 1.02 | 30 | 50 | 100 | 13.75 | 0.045 | 4.3 | 5.83 | 3.38 | 4.58 |
| 3 | 15.0 | DSF156Q3R0B | 10.98 | 1.40 | 42 | 35 | 70 | 18.75 | 0.055 | 4.57 | 1.12 | 3.76 | 0.9 |
| 3 | 15.0 | DSF156Q3R0 | 10.98 | 1.40 | 42.86 | 35 | 70 | 18.75 | 0.055 | 3.99 | 5.09 | 3.283 | 4.191 |
| 3 | 25.0 | DSF256Q3R0 | 20 | 4.4 | 86 | 25 | 35 | 31.3 | 0.1 | 4.46 | 6.21 | 4.4 | 6.1 |
| 3 | 35.0 | DSF356Q3R0 | 19.09 | 3.13 | 60 | 25 | 50 | 43.75 | 0.1 | 4.97 | 6.91 | 2.45 | 3.41 |
| 3 | 50.0 | DSF506Q3R0 | 35.7 | 7.10 | 136 | 15 | 22 | 62.5 | 0.15 | 4.88 | 6.14 | 3.83 | 4.8 |
| 3 | 70.0 | DSF706Q3R0 | 27.3 | 5.9 | 75 | 20 | 40 | 87.5 | 0.45 | 5.18 | 8.7 | 1.6 | 2.7 |
| 3 | 100.0 | DSF107Q3R0 | 68.2 | 8.3 | 250 | 8 | 12 | 125 | 0.3 | 5.95 | 7.31 | 4.3 | 5.3 |
| 3 | 110.0 | DSF117Q3R0 | 59.8 | 6.3 | 188 | 18 | 36 | 137.5 | 0.21 | 6.25 | 9 | 3.07 | 4.4 |
| 3 | 200.0 | DSF207Q3R0 | 100 | 10 | 300 | 6 | 10 | 250 | 0.7 | 6.94 | 7.07 | 3 | 3.1 |
| 3 | 350.0 | DSF357Q3R0 | 236 | 18.9 | 857 | 3 | 3.5 | 437.5 | 1 | 6.73 | 7.58 | 4.75 | 5.4 |
| 3 | 400.0 | DSF407Q3R0 | 250 | 18.9 | 857 | 3 | 3.5 | 500 | 1 | 7.35 | 8.66 | 4.96 | 5.9 |
| 3 | 470.0 | DSF477Q3R0 | 267 | 18.9 | 857 | 3 | 3.5 | 587.5 | 1.3 | 8.05 | 10.18 | 4.23 | 5.4 |
| 3 | 600.0 | DSF607Q3R0 | 290 | 20 | 587 | 3 | 3.5 | 750 | 1.5 | 9.15 | 11.1 | 4.12 | 5.4 |
| 6 | 1.5 | DSF155Q6R0HAE | 3.1 | 1.4 | 20 | 180 | 320 | 7.5 | 0.013 | 2.5 | 2.52 | 16.6 | 16.8 |
| 6 | 2.5 | DSF255Q6R0JBE | 4.05 | 2.2 | 23 | 160 | 280 | 12.5 | 0.018 | 3.1 | 2.51 | 14.1 | 11.3 |
| 6 | 3.5 | DSF355Q6R0JBF | 6.7 | 2.40 | 38 | 130 | 180 | 17.5 | 0.025 | 3.5 | 3 | 13.8 | 11.9 |
| 6 | 5.0 | DSF505Q6R0JBG | 9.4 | 3.4 | 50 | 100 | 140 | 25 | 0.04 | 3.57 | 3.62 | 12.9 | 13 |
| 9 | 0.33 | DSF334Q9R0HDL | 0.83 | 0.09 | 3.75 | 1200 | 2400 | 4 | 0.2 | 1.56 | 2.66 | 1.56 | 2.7 |
| 9 | 0.5 | DSF504M9R0ZBN | 1.14 | 0.14 | 4.68 | 980 | 1940 | 5.6 | 0.2 | 1.97 | 3.35 | 1.97 | 3.4 |
| 9 | 0.67 | DSF674Q9R0HDL | 1.82 | 0.19 | 9.18 | 500 | 980 | 7.5 | 0.25 | 2.5 | 3.56 | 2.48 | 3.6 |
| 9 | 1.0 | DSF105Q9R0HDR | 3.04 | 0.29 | 18.75 | 320 | 620 | 11.2 | 0.3 | 2.68 | 3.71 | 2.68 | 3.71 |
| 9 | 1.66 | DSF165Q9R0JSE | 4.1 | 0.47 | 18 | 260 | 500 | 18.7 | 0.4 | 2.98 | 3.98 | 2.97 | 4 |
| 9 | 3.3 | DSF335Q9R0JSF | 5.34 | 0.88 | 16.6 | 290 | 560 | 37 | 0.9 | 4.46 | 6.4 | 4.46 | 6.4 |
| 9 | 5.0 | DSF505Q9R0KZT | 10.98 | 1.4 | 42.9 | 125 | 230 | 56.2 | 1.1 | 3.99 | 5.1 | 3.98 | 5.1 |

# DSF

**High pulse power, extends battery life**

| WVDC | Capacitance (F) | IC PART NUMBER | Weight (grams) | Volume (mL) | Dims DxL LxHxT (mm) | Lead Spacing S (mm) | Lead Diameter d (mm) |
|---|---|---|---|---|---|---|---|
| 3 | 1.2 | DSF125M3R0 | 0.8 | 0.47 | 6.3x15 | 2.5 | 0.5 |
| 3 | 1.5 | DSF155M3R0 | 0.95 | 0.56 | 6.3x18 | 2.5 | 0.5 |
| 3 | 2.0 | DSF205Q3R0 | 1 | 0.7 | 8x14 | 3.5 | 0.6 |
| 3 | 3.0 | DSF305Q3R0 | 1.4 | 1.01 | 8x20 | 3.5 | 0.6 |
| 3 | 4.0 | DSF405M3R0 | 1.4 | 1.01 | 8x20 | 3.5 | 0.6 |
| 3 | 5.0 | DSF505Q3R0 | 2.2 | 1.57 | 10x20 | 5 | 0.6 |
| 3 | 7.0 | DSF705Q3R0 | 2.3 | 1.96 | 10x25 | 5 | 0.6 |
| 3 | 10.0 | DSF106Q3R0C | 2.8 | 1.96 | 10x25 | 5 | 0.6 |
| 3 | 10.0 | DSF106Q3R0 | 3.2 | 2.36 | 10x30 | 5 | 0.6 |
| 3 | 11.0 | DSF116Q3R0 | 3.2 | 2.36 | 10x30 | 5 | 0.6 |
| 3 | 15.0 | DSF156Q3R0B | 4.1 | 3.07 | 12.5x25 | 5 | 0.6 |
| 3 | 15.0 | DSF156Q3R0 | 4.7 | 3.68 | 12.5x30 | 5 | 0.6 |
| 3 | 25.0 | DSF256Q3R0 | 7.4 | 5.03 | 16x25 | 7.5 | 0.8 |
| 3 | 35.0 | DSF356Q3R0 | 8.8 | 6.33 | 16x31.5 | 7.5 | 0.8 |
| 3 | 50.0 | DSF506Q3R0 | 13.8 | 10.18 | 18x40 | 7.5 | 0.8 |
| 3 | 70.0 | DSF706Q3R0 | 16.9 | 10.05 | 16x50 | 7.5 | 0.8 |
| 3 | 100.0 | DSF107Q3R0 | 20 | 17.11 | 22x45 | 10 | 1.2 |
| 3 | 110.0 | DSF117Q3R0 | 22 | 15.27 | 18x60 | 7.5 | 0.8 |
| 3 | 200.0 | DSF207Q3R0 | 36 | 35.3 | 30x50 | 10 | 1.2 |
| 3 | 350.0 | DSF357Q3R0 | 73 | 57.73 | 35x60 | 22.5 | 1.2 |
| 3 | 400.0 | DSF407Q3R0 | 73 | 57.73 | 35x60 | 22.5 | 1.2 |
| 3 | 470.0 | DSF477Q3R0 | 73 | 57.73 | 35x60 | 22.5 | 1.2 |
| 3 | 600.0 | DSF607Q3R0 | 90 | 67.35 | 35x70 | 22.5 | 1.2 |
| 6 | 1.5 | DSF155Q6R0HAE | 3 | 2.97 | 17x23x8.5 | 12 | 0.6 |
| 6 | 2.5 | DSF255Q6R0JBE | 5.2 | 4.97 | 21x22x11 | 15.5 | 0.6 |
| 6 | 3.5 | DSF355Q6R0JBF | 6 | 5.83 | 21x27x11 | 15.5 | 0.6 |
| 6 | 5.0 | DSF505Q6R0JBG | 8.3 | 6.91 | 21x32x11 | 15.5 | 0.6 |
| 9 | 0.33 | DSF334Q9R0HDL | 4 | 3.4 | 25x16x8.5 | 13.5 | 0.6 |
| 9 | 0.5 | DSF504M9R0ZBN | 5 | 2.73 | 21x20x6.5 | 11 | 0.6 |
| 9 | 0.67 | DSF674Q9R0HDL | 4 | 3.4 | 25x16x8.5 | 13.5 | 0.6 |
| 9 | 1.0 | DSF105Q9R0HDR | 5.5 | 4.67 | 25x22x8.5 | 13.5 | 0.6 |
| 9 | 1.66 | DSF165Q9R0JSE | 7.5 | 7.84 | 31x23x11 | 16 | 0.6 |
| 9 | 3.3 | DSF335Q9R0JSF | 11 | 9.21 | 31x27x11 | 16 | 0.6 |
| 9 | 5.0 | DSF505Q9R0KZT | 13 | 16.7 | 39x33x13 | 21 | 0.6 |

# Type EDC, 70 °C Long Life Electric Double Layer Supercapacitor


Type EDC, 70 °C electric double layer supercapacitors offer high capacitance values in a thru hole stacked coin type package. Primarily designed for integrated circuit voltage backup, the capacitors can also be used to deliver the initial power from batteries.

## Highlights

- Long life
- High discharge current
- 70 °C Operating temperature

## Specifications

| | |
|---|---|
| **Operating Temperature Range** | –25 °C to +70 °C |
| **Rated Voltage Range** | 5.5 Vdc to 6.3 Vdc |
| **Capacitance Range** | 0.047 F to 1.5 F |
| **Life, Moisture and Temperature Characteristics** | After the following procedures have been performed, measure the capacitance and ESR at +20 °C. |
| **Life Test:** | Apply the max. operating voltage for 1000 h at +70 °C |
| **Capacitance Change**<br>**ESR** | ±30% of the initial measured value<br>≤ 4 times the initial specified value |
| **Shelf Life:** | Subject the capacitor to 1000 hours without voltage at +70 °C. |
| **Capacitance Change**<br>**ESR** | ±30% of the initial measured value<br>≤ 4 times the initial specified value |
| **Moisture Resistance:** | Subject the capacitor to 240 hours at +40 °C at 90 to 95% RH without voltage. |
| **Capacitance Change**<br>**ESR** | ±30% of the initial measured value<br>≤ 3 times the initial specified value |

| | |
|---|---|
| **Temperature Cycling** | Stabilize the capacitor at each of the following temperatures for 1 hour in sequence, and then measure the capacitance and ESR at that temperature. |
| | 1. +20 °C<br>2. -25 °C<br>3. +20 °C<br>4. +70 °C<br>5. +20 °C |
| **Capacitance Change (at -25 °C)**<br>**ESR (at -25 °C)**<br>**Capacitance Change (at +85 °C)**<br>**ESR (at +85 °C)**<br>**Capacitance Change (Step 5 at +20 °C)**<br>**ESR (Step 5 at +20 °C)** | ±30% of the initial measured value<br>≤ 5 times the initial measured value<br>±30% of the initial measured value<br>≤ 4 times the initial measured value<br>±10% of the initial measured value<br>meets the initial specified value |
| **RoHS Compliant without Exemptions** | |

# Type EDC, 70 °C Long Life Electric Double Layer Supercapacitor

## Ratings

| 5.5 VDC | | | | | |
|---|---|---|---|---|---|
| CDE Part Number | Cap F | ESR 1 kHz Ω | Case Code | | |
| | | | V Type | H Type | C Type |
| EDC473Z5R5* | 0.047 | 120 | V1 | H1 | C1 |
| EDC104Z5R5* | 0.1 | 75 | V1 | H1 | C1 |
| EDC224Z5R5* | 0.22 | 75 | V1 | H1 | C1 |
| EDC334Z5R5* | 0.33 | 75 | V1 | H1 | C1 |
| EDC474Z5R5* | 0.47 | 50 | V1 | H1 | C1 |
| EDC105Z5R5* | 1 | 30 | V2 | H2 | C2 |
| EDC155Z5R5* | 1.5 | 30 | V2 | H2 | C2 |

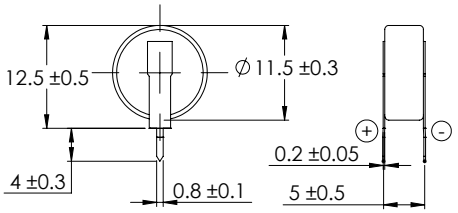
*V, H, or C

| 6.3 VDC | | | |
|---|---|---|---|
| CDE Part Number | Cap F | ESR 1 kHz Ω | Case Code |
| EDC104Z6R3C | 0.1 | 120 | C3 |
| EDC224Z6R3C | 0.22 | 75 | C3 |
| EDC334Z6R3C | 0.33 | 75 | C3 |
| EDC474Z6R3C | 0.47 | 50 | C4 |
| EDC684Z6R3C | 0.68 | 50 | C4 |
| EDC105Z6R3C | 1 | 30 | C4 |

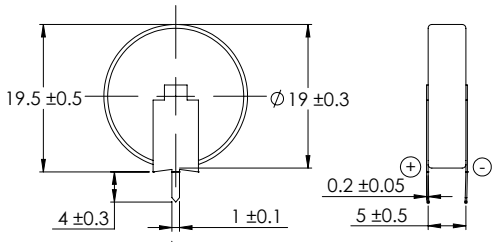
## Part Numbering System

| EDC | 224 | Z | 5R5 | C |
|---|---|---|---|---|
| Series | Capacitance | Tolerance | Voltage | Case Style |
| | 224 = 0.22 F<br>473 = 0.047 F<br>105 = 1.0 F | -20/+80% | 5R5 = 5.5 Vdc | C = Radial<br>H = Horizontal Style<br>V = Vertical Style |

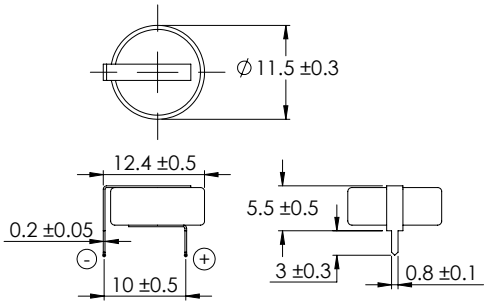
## EDC Outline Drawing



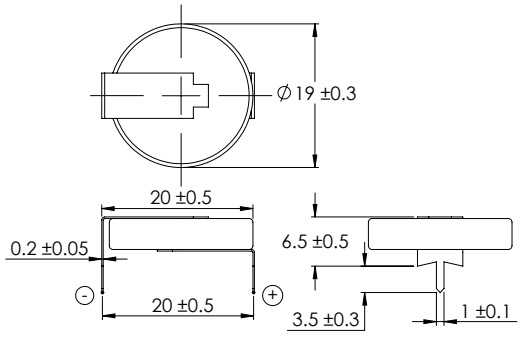

V1




V2



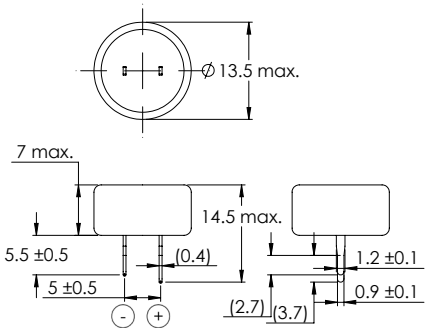

H1



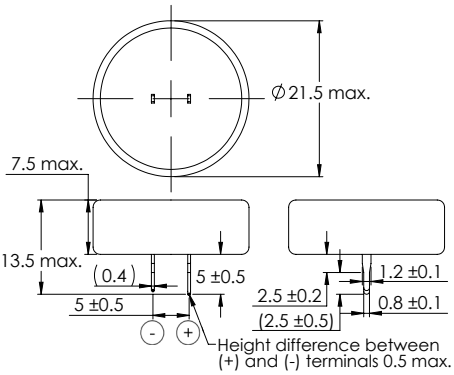

H2

# Type EDC, 70 ºC Long Life Electric Double Layer Supercapacitor

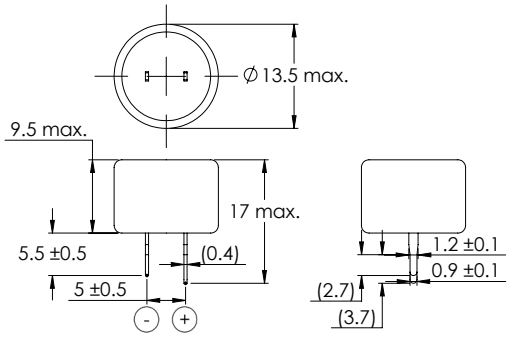
## EDC Outline Drawing



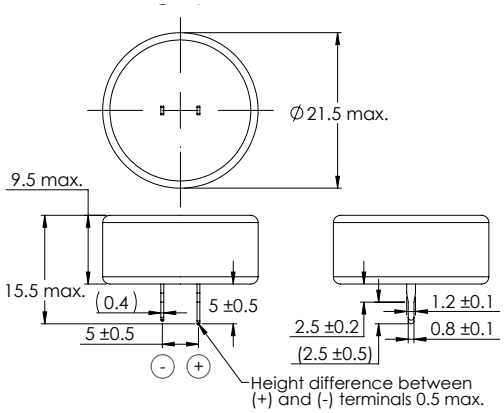

C1




C2




C3




C4

| Recommended Soldering Procedures | |
|---|---|
| Hand Soldering | Use a 30W iron with a max. temperature of 350 ºC for 3 seconds. |
| Wave Soldering | Pre-heat circuit board to a surface temp of 110 ºC for a max. of 60 seconds, with a max. component temperature of 100 ºC. Min. printed circuit board thickness of 0.8 mm. Recommended solder bath temperature of 240 ºC with a max. dipping time of 5 seconds. |

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# Type EDS, 85 ºC Long Life Electric Double Layer Supercapacitor


Type EDS, 85 ºC electric double layer supercapacitors offer high capacitance values in a thru hole stacked coin type package. Primarily designed for integrated circuit voltage backup, the capacitors can also be used to deliver the initial power from batteries.

## Highlights

- Long life
- High discharge current
- 85 ºC Operating temperature

## Specifications

| | |
|---|---|
| **Operating Temperature Range** | –25 ºC to +85 ºC |
| **Rated Voltage Range** | 3.6 Vdc to 5.5 Vdc |
| **Capacitance Range** | 0.047 F to 1.5 F |
| **Life, Moisture and Temperature Characteristics** | After the following procedures have been performed, measure the capacitance and ESR at +20 ºC. |
| **Life Test:** | Apply the max. operating voltage for 1000 h at +85 ºC |
| **Capacitance Change**<br>**ESR** | ±30% of the initial measured value<br>≤ 4 times the initial specified value |
| **Shelf Life:** | Subject the capacitor to 1000 hours without voltage at +85 ºC. |
| **Capacitance Change**<br>**ESR** | ±30% of the initial measured value<br>≤ 4 times the initial specified value |
| **Moisture Resistance:** | Subject the capacitor to 240 hours at +40 ºC at 90 to 95% RH without voltage. |
| **Capacitance Change**<br>**ESR** | ±10% of the initial measured value<br>meets the initial specified value |

| | |
|---|---|
| **Temperature Cycling** | Stabilize the capacitor at each of the following temperatures for 1 hour in sequence, and then measure the capacitance and ESR at that temperature. |
| | 1. +20 ºC<br>2. -25 ºC<br>3. +20 ºC<br>4. +85 ºC<br>5. +20 ºC |
| **Capacitance Change (at -25 ºC)**<br>**ESR (at -25 ºC)**<br>**Capacitance Change (at +85 ºC)**<br>**ESR (at +85 ºC)**<br>**Capacitance Change (Step 5 at +20 ºC)**<br>**ESR (Step 5 at +20 ºC)** | ±30% of the initial measured value<br>≤ 5 times the initial measured value<br>±30% of the initial measured value<br>≤ 4 times the initial measured value<br>±10% of the initial measured value<br>meets the initial specified value |
| **RoHS Compliant without Exemptions** | |

# Type EDS, 85 ºC Long Life Electric Double Layer Supercapacitor

| 3.6 VDC | | | | | |
|---|---|---|---|---|---|
| CDE Part Number | Cap F | ESR 1 kHz Ω | Case Code | | |
| | | | V Type | H Type | C Type |
| EDS473Z3R6* | 0.047 | 120 | V1 | H1 | C1 |
| EDS104Z3R6* | 0.1 | 75 | V1 | H1 | C1 |
| EDS224Z3R6* | 0.22 | 75 | V1 | H1 | C1 |
| EDS334Z3R6* | 0.33 | 75 | V1 | H1 | C1 |
| EDS474Z3R6* | 0.47 | 50 | V1 | H1 | C1 |
| EDS105Z3R6* | 1 | 30 | V2 | H2 | C2 |
| EDS155Z3R6* | 1.5 | 30 | V2 | H2 | C2 |

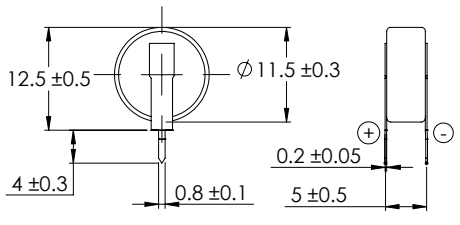
*V, H, or C

| 5.5 VDC | | | |
|---|---|---|---|
| CDE Part Number | Cap F | ESR 1 kHz Ω | Case Code |
| EDS104Z5R5C | 0.1 | 120 | C3 |
| EDS224Z5R5C | 0.22 | 75 | C3 |
| EDS334Z5R5C | 0.33 | 75 | C3 |
| EDS474Z5R5C | 0.47 | 50 | C4 |
| EDS684Z5R5C | 0.68 | 50 | C4 |
| EDS105Z5R5C | 1 | 30 | C4 |

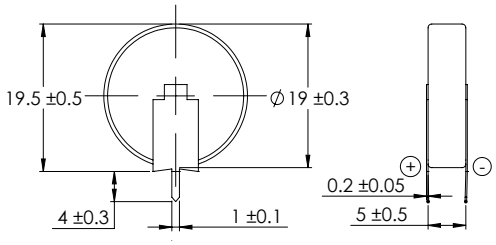
## Part Numbering System

| EDS | 224 | Z | 5R5 | C |
|---|---|---|---|---|
| Series | Capacitance | Tolerance | Voltage | Case Style |
| | 224 = 0.22 F<br>473 = 0.047 F<br>105 = 1.0 F | -20/+80% | 5R5 = 5.5 Vdc | C = Radial<br>H = Horizontal Style<br>V = Vertical Style |

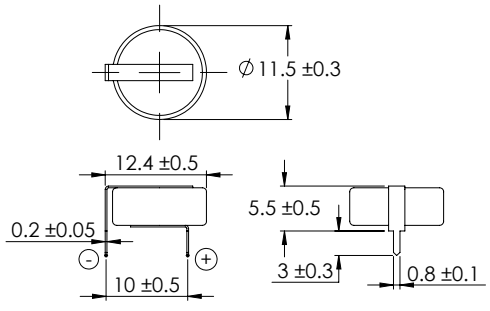
## EDS Outline Drawing



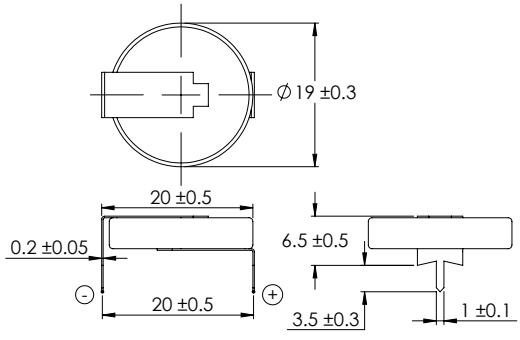

V1




V2



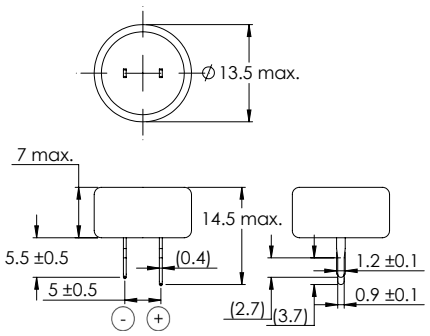

H1



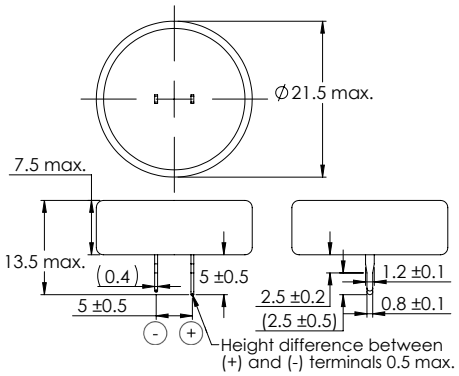

H2

# Type EDS, 85 ºC Long Life Electric Double Layer Supercapacitor

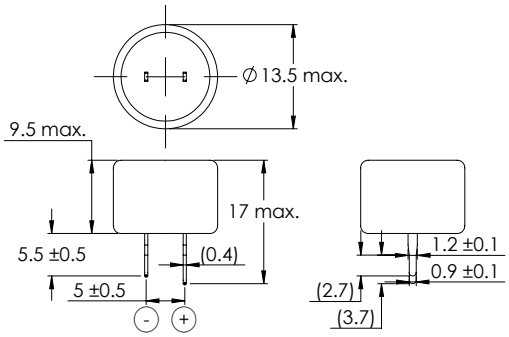
## EDS Outline Drawing



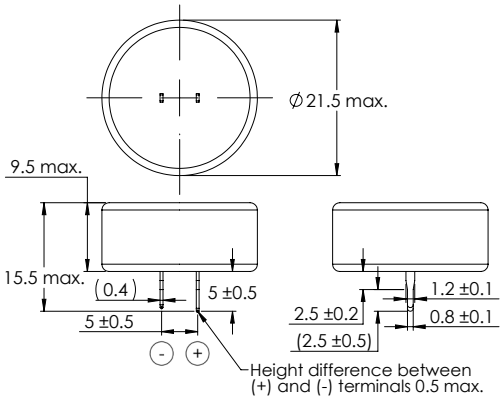

C1




C2




C3




C4

| Recommended Soldering Procedures | |
|---|---|
| Hand Soldering | Use a 30W iron with a max. temperature of 350 ºC for 3 seconds. |
| Wave Soldering | Pre-heat circuit board to a surface temp of 110 ºC for a max. of 60 seconds, with a max. component temperature of 100 ºC. Min. printed circuit board thickness of 0.8 mm. Recommended solder bath temperature of 240 ºC with a max. dipping time of 5 seconds. |

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