CAPACITORS FOR POWER ELECTRONICS

Q-FLEX

Avantintie 7, FI-21420 Lieto
+358 2 4894 500
info@q-flex.fi | q-flex.fi

CDE CORNELL DUBILIER

ENERGIZING IDEAS

HARSH ENVIRONMENTS

TABLE OF CONTENTS

Type MLSH 125 °C Hermetic Slimpack, Aluminum Electrolytic Capacitor

The world's only hermetically sealed aluminum electrolytic capacitor with glass-to-metal seal, type MLSH has extraordinary long life and rugged construction for the most demanding power electronics applications.

Type MLSH has superior capacitance retention compared to axial wet tantalum capacitors at -55 °C. Packaged in a robust stainless steel case capable of withstanding 80g's, it replaces 3 or more axial wet tantalum capacitors in parallel. Unlike wet tantalums that require voltage derating at temperatures above 85 °C, type MLSH capacitors are rated for full operating voltage at 125 °C and tested to 5000 hrs at rated voltage and temperature.

Highlights

- Hermetically sealed with no dry out
- Alternative to axial wet tantalum
- High capacitance retention @ -55 ºC
- 5000 Hr DC life test
- Up to 80g vibration

Specifications

Temperature Range	–55 °C to +125 °C
Rated Voltage Range	30 Vdc to 250 Vdc
Capacitance Range	120 µF to 3200 µF
Capacitance Tolerance	±20%
Leakage Current	≤ 0.002 CV µA, @ 25 °C and 5 mins.
Ripple Current Multipliers	Case Temperature **45 °C** 1.41 / **55 °C** 1.32 / **65 °C** 1.22 / **75 °C** 1.12 / **85 °C** 1.00 / **95 °C** 0.87 / **105 °C** 0.71 / **115 °C** 0.50 / **125 °C** 0.00 Ambient Temperature, No Heatsink **45 °C** 0.63 / **55 °C** 0.58 / **65 °C** 0.54 / **75 °C** 0.49 / **85 °C** 0.44 / **95 °C** 0.38 / **105 °C** 0.31 / **115 °C** 0.22 / **125 °C** 0.00 Frequency **5 to 40 V**: 50 Hz 0.95 / 60 Hz 0.96 / 120 Hz 1.00 / 360 Hz 1.03 / 1 kHz 1.04 / 5 kHz 1.04 / 10 kHz & up 1.04 **60 to 250 V**: 50 Hz 0.80 / 60 Hz 0.84 / 120 Hz 1.00 / 360 Hz 1.18 / 1 kHz 1.25 / 5 kHz 1.30 / 10 kHz & up 1.30
Low Temperature Characteristics	Impedance ratio: $Z_{-55\,°C}/Z_{+25\,°C}$ @120 Hz ≤10 (5 - 20 Vdc), ≤3 (25 - 250 Vdc)
DC Life Test	5000 h @ rated voltage at 125 °C Δ Capacitance ±20% (<50 Vdc) Δ Capacitance ±10% (>50 Vdc) ESR 200% of limit DCL 100% of limit
Shelf Life Test	5 years @ <=40 ºC, for HRMLSH 10 years @ <=40 ºC Capacitance 100% of limit ESR 100% of limit DCL ≤ 0.004 CV µA 500 h @ 125 °C Capacitance 100% of limit ESR 100% of limit DCL ≤ 0.002 CV µA
Vibration *Mounting: Vibration capability is dependent upon mounting restraint.*	Standard MLSH Flatpack: 80g MIL-STD-202, Meth. 204, Condition H

Type MLSH 125 °C Hermetic Slimpack, Aluminum Electrolytic Capacitor

<table>
<tr><td>Vibration Test</td><td><u>Level</u>
The specimens, while deenergized or operating under the load conditions specified, shall be subjected to the vibration amplitude, frequency range, and duration specified for each case size.
<u>Amplitude</u>
The specimens shall be subjected to a simple harmonic motion having an amplitude of either 0.06-inch double amplitude (maximum total excursion) or peak level specified above, whichever is less. The tolerance on vibration amplitude shall be ±10 percent.
<u>Frequency Range</u>
The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz.
<u>Sweep Time and Duration</u>
The entire frequency range of 10 to 2,000 Hz and return to 10 Hz shall be traversed in 20 minutes. This cycle shall be performed 12 times in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours. Interruptions are permitted provided the requirements for rate of change and test duration are met.</td></tr>
<tr><td>High Reliability Test/Burn-in</td><td>Established Reliability capacitors shall be subjected to a minimum of 100 percent of the DC rated voltage at 85 ºC for 48 hours minimum but not to exceed 96 hours. During this test, capacitors shall be adequately protected against temporary voltage surges of 10 percent or more of the test voltage. After burn-in, the capacitors shall be returned to room ambient conditions and the DC leakage, capacitance, and ESR shall be measured with respect to specified limits.</td></tr>
<tr><td>Thermal Resistance</td><td>
<table>
<tr><th rowspan="2">Large Sides Heatsinked</th><th>Case Length</th><th>1.5"</th></tr>
<tr><th>Insulation</th><th>ºC/W</th></tr>
<tr><td rowspan="2">one</td><td>None</td><td>6.6</td></tr>
<tr><td>Polyester</td><td>7.2</td></tr>
<tr><td rowspan="2">both</td><td>None</td><td>4.4</td></tr>
<tr><td>Polyester</td><td>4.7</td></tr>
</table>
</td></tr>
<tr><td>Typical Weight</td><td>Case JK - 32g</td></tr>
<tr><td>Terminals</td><td>18 AWG copper wire with 60/40 tin-lead electroplate, 20 amps max</td></tr>
<tr><td>Case Material</td><td>Stainless Steel</td></tr>
<tr><td>Ripple Current Capability</td><td>The ripple current capability is set by the maximum permissible internal core temperature, 125 ºC.</td></tr>
<tr><td>Air Cooled</td><td>The ripple currents in the ratings tables are for 85 ºC case temperatures. For air temperatures without a heatsink use the multipliers for Ambient Temperature, No Heatsink.</td></tr>
<tr><td>Heatsink Cooled</td><td>Temperature rise from the hottest internal spot, the core, to ambient air is
$\Delta T = I^2(ESR)(\theta cc + \theta ca)$, recommended max ΔT of 30 ºC
where θcc is the thermal resistance from core to case and θca from case to ambient. To calculate maximum ripple capability with the MLSH attached to a heatsink use the maximum core temperature and the values for θcc.</td></tr>
<tr><td>Example</td><td>As an illustration, suppose you operate an noninsulated MLSH172M050JK0C in 95 ºC air and attach it to a commercial heatsink with a free-air thermal resistance of 2.7 ºC/W. Use a good thermal grease between the MLSH and the heatsink, and the total thermal resistance is 2.7 +6. 6 or 9.3º C/W. The power which would heat the core to 125 °C is (125 - 95)/9. 3 or 3.2 W. For an ESR of 108 mΩ, 3.2 W equates to a ripple current of 5.45 A.</td></tr>
</table>

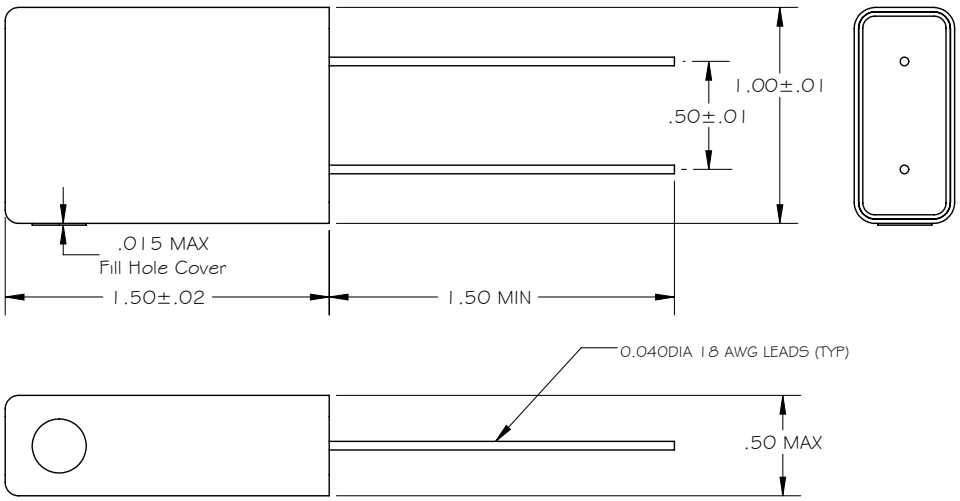
Type MLSH 125 °C Hermetic Slimpack, Aluminum Electrolytic Capacitor

Part Numbering System

MLSH	322	M	200	JK	0	A
Type	**Capacitance**	**Tolerance**	**Rated Voltage**	**Case Code**	**Insulation**	**Mounting Style**
MLSH	**322** =3200 µF **222** = 2200 µF **172** = 1700 µF	**M=**±20%	030 = 30 Vdc 075 = 75 Vdc 150 = 150 Vdc 200 = 200 Vdc	**JK,** L=1.5 in.	**0** = bare can **1** = polyester	**C** = two leads/no tabs

Outline Drawing

Note: The polyester tape wrap may add up to 0.020 inches to the thickness and width of the capacitor.



- Stainless steel case
- All dimensions are in inches
- Dimensions are for bare can, non-insulated

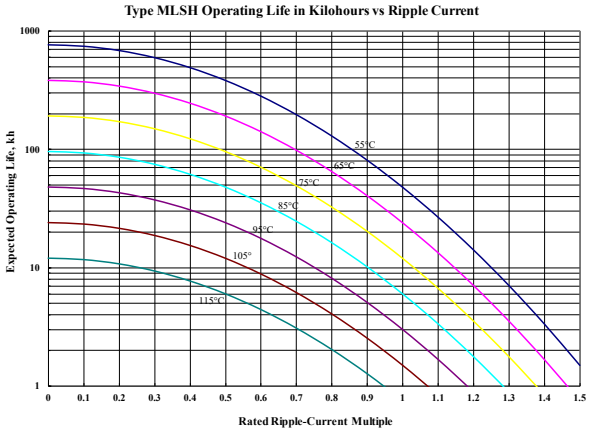
Type MLSH 125 °C Hermetic Slimpack, Aluminum Electrolytic Capacitor

Ratings

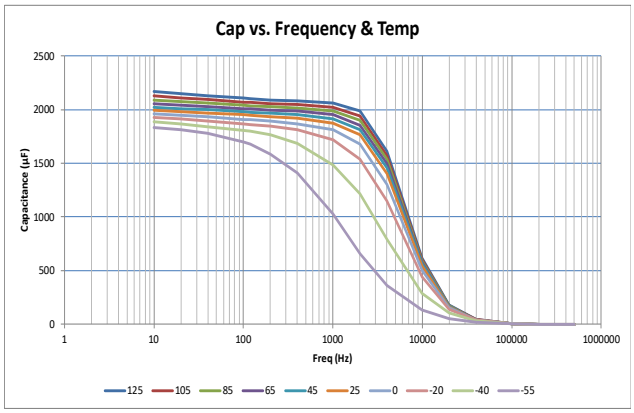
Voltage	Cap (µF)	Catalog Part Number	Length	ESR max 25 °C (Ω)		Ripple (A) Case @ 85°C	
				120 Hz	10 kHz	120 Hz	10 kHz
30 Vdc @ 125 °C 36 Vdc @ 105 °C 50 Vdc Surge @25 °C	3200	MLSH322M030JK0C	1.5	0.103	0.098	6.6	6.8
40 Vdc @ 125 °C 48 Vdc @ 105 °C 63 Vdc Surge @25 °C	2200	MLSH222M040JK0C	1.5	0.105	0.1	6.6	6.8
50 Vdc @ 125°C 60 Vdc @ 105°C 75 Vdc Surge @25°C	1700	MLSH172M050JK0C	1.5	0.108	0.101	6.6	6.8
60 Vdc @ 125°C 72 Vdc @ 105°C 90 Vdc Surge @25°C	1100	MLSH112M060JK0C	1.5	0.109	0.103	6.5	6.8
75 Vdc @ 125°C 90 Vdc @ 105°C 112 Vdc Surge @25°C	700	MLSH701M075JK0C	1.5	0.246	0.234	4.0	4.2
100 Vdc @ 125°C 120 Vdc @ 105°C 150 Vdc Surge @25°C	400	MLSH401M100JK0C	1.5	0.960	0.768	2.1	2.4
150 Vdc @ 125°C 180 Vdc @ 105°C 225 Vdc Surge @25°C	210	MLSH211M150JK0C	1.5	1.019	0.815	2.2	2.4
200 Vdc @ 125°C 250 Vdc @ 105°C 300 Vdc Surge @25°C	160	MLSH161M200JK0C	1.5	1.274	1.019	1.9	2.1
250 Vdc @ 125°C 275 Vdc @ 105°C 350 Vdc Surge @25°C	120	MLSH121M250JK0C	1.5	1.200	0.96	1.9	2.2

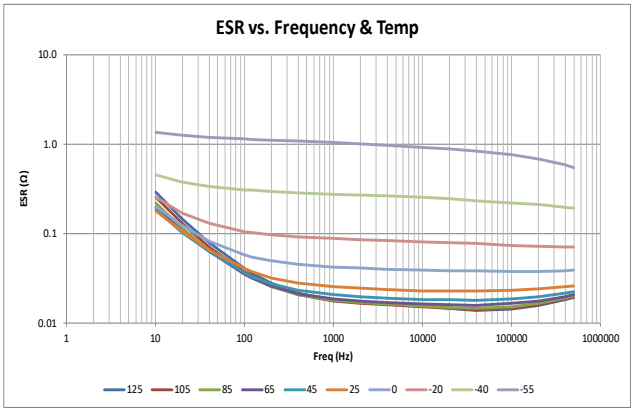
Type MLSH 125 °C Hermetic Slimpack, Aluminum Electrolytic Capacitor

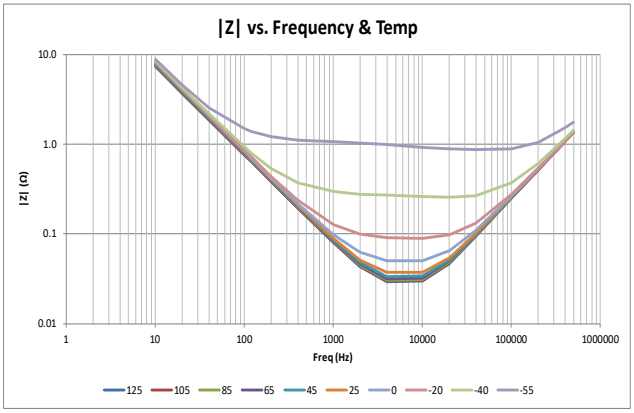
Typical Performance Curves



MLSH222M640JK0C







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.

Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Featuring high capacitance at high voltage and temperature, Type NHR-Slimpack™ offers considerable size and cost advantages over series-parallel banks of wet tantalum capacitors. Their applications in down-hole tools, military, and aerospace allow for solutions that use fewer components, lower weight, lower cost and improved reliability compared with banks of wet tantalum capacitors. Their rugged construction withstands vibration up to 80g.

Highlights

- Alternative to banks of wet tantalum capacitors
- No voltage derating required at 150 °C
- Rugged, stainless steel case
- Near hermetic seal, prevents dry-out
- Just 0.5" in height, by 1.0" wide (available in 4 lengths)
- High capacitance retention at low voltage, -55 °C

Specifications

Temperature Range	–55 °C to +150 °C
Rated Voltage Range	75 Vdc to 300 Vdc
Capacitance Range	60 µF to 960 µF
Capacitance Tolerance	20%
Leakage Current	≤ 0.006 CV µA, @ 25 °C and 5 mins.
Ripple Current Multipliers	Case Temperature

	65	85	105	125	150
0-250 Vdc	5.448	5.221	4.767	4.313	2.27
300 Vdc	4.767	4.54	4.313	3.859	2.27

Ambient Temperature, No Heatsink

	65	85	105	125	150
0-250 Vdc	2.4	2.3	2.1	1.9	1
300 Vdc	2.1	2	1.9	1.7	1

Frequency

	50 Hz	60 Hz	120 Hz	500Hz	1 KHz	20 KHz
0-250 Vdc	0.65	0.75	1	1.5	1.8	2.1
300 Vdc	0.65	0.7	1	1.3	1.4	1.6

Low Temperature Characteristics	Impedance ratio: Z–55 °C/Z+25 °C @ 120 Hz ≤ 3 (75 - 300 Vdc
Load Life Test	3000 h at rated voltage @ 150 °C Δ Capacitance +/- 10% ESR 200% of limit ≤ 0.004 CV µA, @ 25 °C and 5 mins.
Shelf Life Test	500 h @ 150 °C Capacitance 100% of limit ESR 100% of limit ≤ 0.006 CV µA, @ 25 °C and 5 mins.
Vibration *Mounting: Vibration capability is dependent upon mounting*	MIL-STD-202, Meth. 204, Sine Swept. IEC 60068-2-6 JK Case = 80g All Others = 50g
Vibration Test	**Level** The specimens, while deenergized or operating under the load conditions specified, shall be subjected to the vibration amplitude, frequency range, and duration specified for each case size. **Amplitude** The specimens shall be subjected to a simple harmonic motion having an amplitude of either 0.06-inch double amplitude (maximum total excursion) or peak level specified above (XXg peak), whichever is less. The tolerance on vibration amplitude shall be ±10 percent. **Frequency Range** The vibration frequency shall be varied logarithmically between the approximate limits of 10 to 2,000 Hz. **Sweep Time and Duration** The entire frequency range of 10 to 2,000 Hz and return to 10 Hz shall be traversed in 20 minutes. This cycle shall be performed 12 times in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours. Interruptions are permitted provided the requirements for rate of change and test duration are met.

Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Higher Reliability	All NHR capacitors are subjected to a minimum of 100 percent of the dc rated voltage at 150 °C for 48 hours minimum but not to exceed 96 hours. During this test, capacitors shall be adequately protected against temporary voltage surges of 10 percent or more of the test voltage. After burn-in, the capacitors shall be returned to room ambient conditions and the dc leakage, capacitance, and ESR shall be measured with respect to specified limits.
Thermal Resistance	
ESL	≤30 nH measured 1/4" from case at 1 MHz
Typical Weight	Case JK = 30 Case JA = 39 Case JH = 48 Case JB = 57
Terminals	18 AWG copper wire with 60/40 tin-lead electroplate, 20 amps max
Case Material	Stainless Steel
Ripple Current Capability	The ripple current capability is set by the maximum permissible internal core temperature,153 °C and a max ΔT of 30°C.
Air Cooled	The ripple currents in the ratings tables are for 150 °C case temperatures. For air temperatures without a heatsink use the multipliers Ambient Temperature, No Heatsink.
Heatsink Cooled	Temperature rise from the internal hottest spot, the core, to ambient air is $\Delta T = I^2(ESR)(\theta cc + \theta ca)$, recommended max ΔT of 30 °C where θcc is the thermal resistance from core to case and θca from case to ambient. To calculate maximum ripple capability with the NHR attached to a heatsink use the maximum core temperature and the values for θcc.
Example	As an illustration, suppose you operate an insulated NHR961M075JB0C in 135 °C air and attach it to a commercial heatsink with a free-air thermal resistance of 2.7 °C/W. Use a good thermal grease between the NHR and the heatsink, and the total thermal resistance is 2.7 +3. 4 or 6.1° C/W. The power which would heat the core to 150 °C is (150 - 135)/6. 1 or 2.46 W. For an ESR of 211 mΩ, 2.46 W equates to a ripple current of 3.42 A.

Large Sides Heatsinked	Case Length	1.5"	2.0"	2.5"	3.0"
	Insulation	°C/W	°C/W	°C/W	°C/W
one	None	6.6	4.8	3.8	3.1
	Polyester	7.2	5.3	4.2	3.4
both	None	4.4	3.1	2.4	2
	Polyester	4.7	3.3	2.6	2.2

Part Numbering System

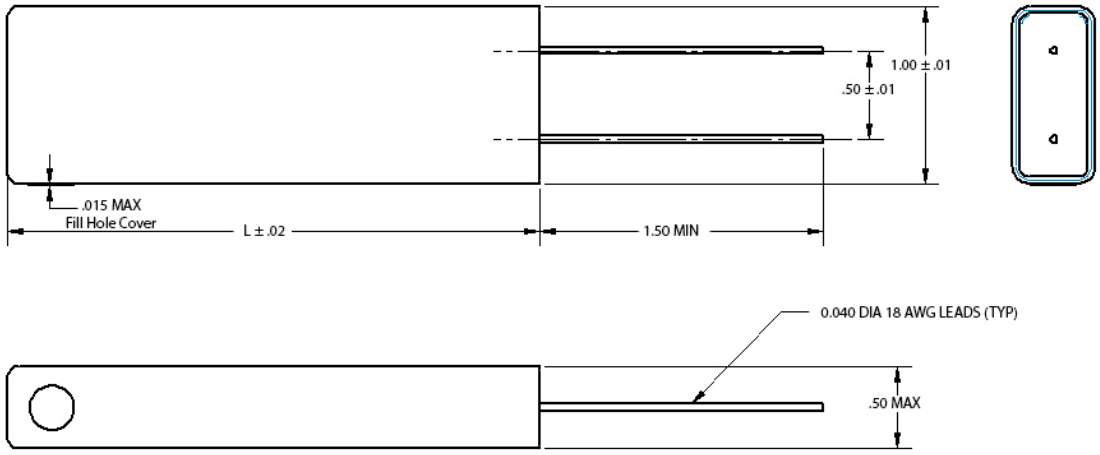
NHR	191	M	200	JB	0	C
Type	**Capacitance**	**Tolerance**	**Rated Voltage**	**Case Code**	**Insulation**	**Mounting Style**
NHR	**191** = 190 µF **102** = 1000 µF	**M=**±20%	005 = 5 Vdc 7R5 = 7.5 Vdc 200 = 200 Vdc	**JK,** L=1.5 in. **JA**, L=2.0 in **JH**, L=2.5 in **JB**, L=3.0 in. * other sizes available	**0** = bare can **1** = polyimide	**C** = two leads

Examples:
NHR191M250JB0C

Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Outline Drawing

Note: The polyester tape wrap may add up to 0.020 inches to the thickness and width of the capacitor.

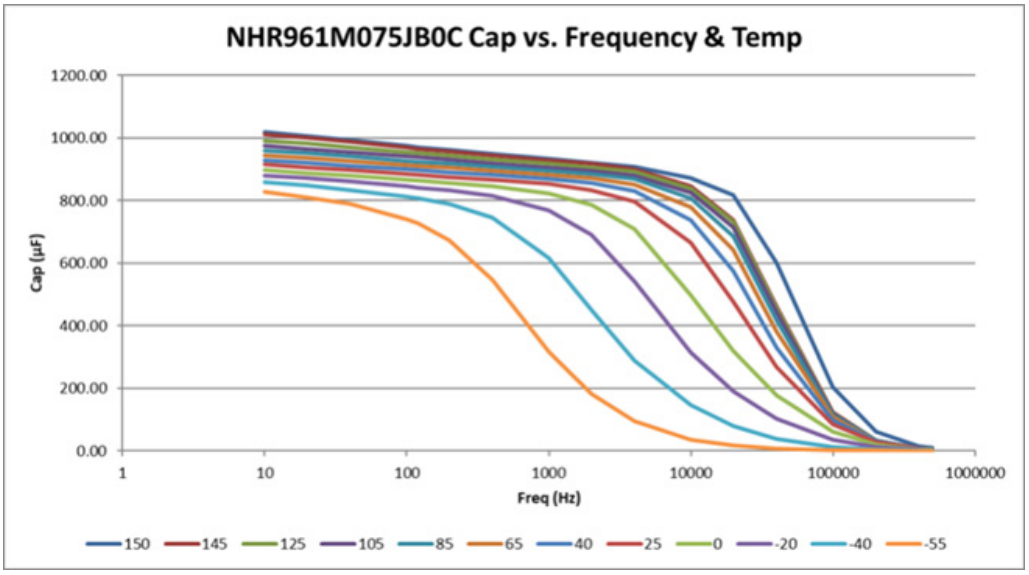


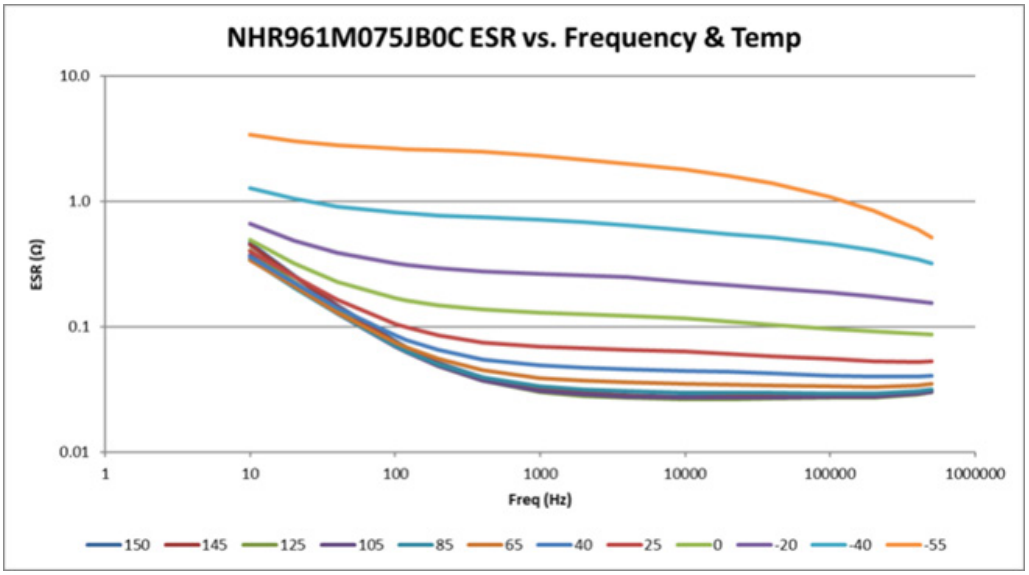
Ratings

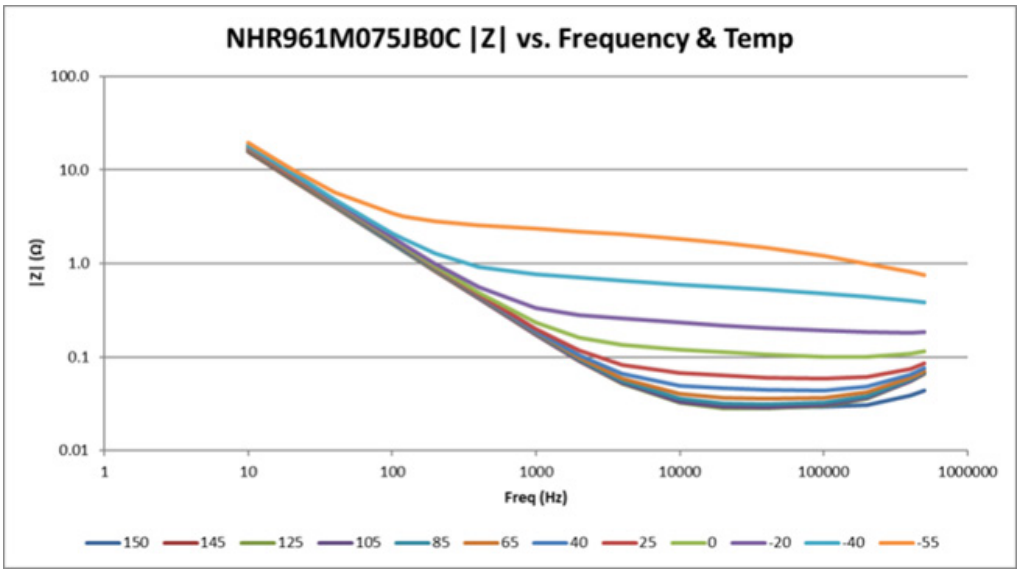
Voltage Vdc	Cap µF	P/N	120Hz 25 °C Cat. ESR	20KHz 25 °C Cat. ESR	150 °C Ripple 120Hz	150 °C Ripple 20KHz	Case	Width (in)	Length (in)	Surge 25 °C Vdc
75	390	NHR391M075JK0C	0.538	0.206	0.75	1.58	1X1.5	1	1.5	110
75	550	NHR551M075JA0C	0.366	0.140	0.95	2.01	1X2	1	2.0	110
75	750	NHR751M075JH0C	0.268	0.103	1.15	2.44	1X2.5	1	2.5	110
75	960	NHR961M075JB0C	0.211	0.081	1.34	2.84	1X3	1	3.0	110
100	310	NHR311M100JK0C	1.048	0.402	0.54	1.13	1X1.5	1	1.5	150
100	430	NHR431M100JA0C	0.712	0.273	0.68	1.44	1X2	1	2.0	150
100	590	NHR591M100JH0C	0.521	0.200	0.83	1.75	1X2.5	1	2.5	150
100	750	NHR751M100JB0C	0.411	0.158	0.96	2.03	1X3	1	3.0	150
150	180	NHR181M150JK0C	1.088	0.417	0.53	1.11	1X1.5	1	1.5	220
150	260	NHR261M150JA0C	0.738	0.283	0.67	1.41	1X2	1	2.0	220
150	360	NHR361M150JH0C	0.541	0.207	0.81	1.71	1X2.5	1	2.5	220
150	450	NHR451M150JB0C	0.427	0.164	0.94	2.00	1X3	1	3.0	220
200	120	NHR121M200JK0C	1.107	0.424	0.52	1.10	1X1.5	1	1.5	300
200	170	NHR171M200JA0C	0.752	0.288	0.66	1.40	1X2	1	2.0	300
200	230	NHR231M200JH0C	0.551	0.211	0.80	1.70	1X2.5	1	2.5	300
200	290	NHR291M200JB0C	0.434	0.166	0.94	1.98	1X3	1	3.0	300
250	80	NHR800M250JK0C	1.500	0.575	0.45	0.95	1X1.5	1	1.5	350
250	110	NHR111M250JA0C	1.018	0.390	0.57	1.20	1X2	1	2.0	350
250	150	NHR151M250JH0C	0.746	0.286	0.69	1.46	1X2.5	1	2.5	350
250	190	NHR191M250JB0C	0.589	0.226	0.80	1.70	1X3	1	3.0	350
300	60	NHR600M300JK0C	2.547	1.273	0.37	0.64	1X1.5	1	1.5	400
300	90	NHR900M300JA0C	1.729	0.864	0.47	0.82	1X2	1	2.0	400
300	130	NHR131M300JH0C	1.267	0.633	0.57	0.99	1X2.5	1	2.5	400
300	160	NHR161M300JB0C	1.000	0.500	0.66	1.16	1X3	1	3.0	400

Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Typical Performance Curves

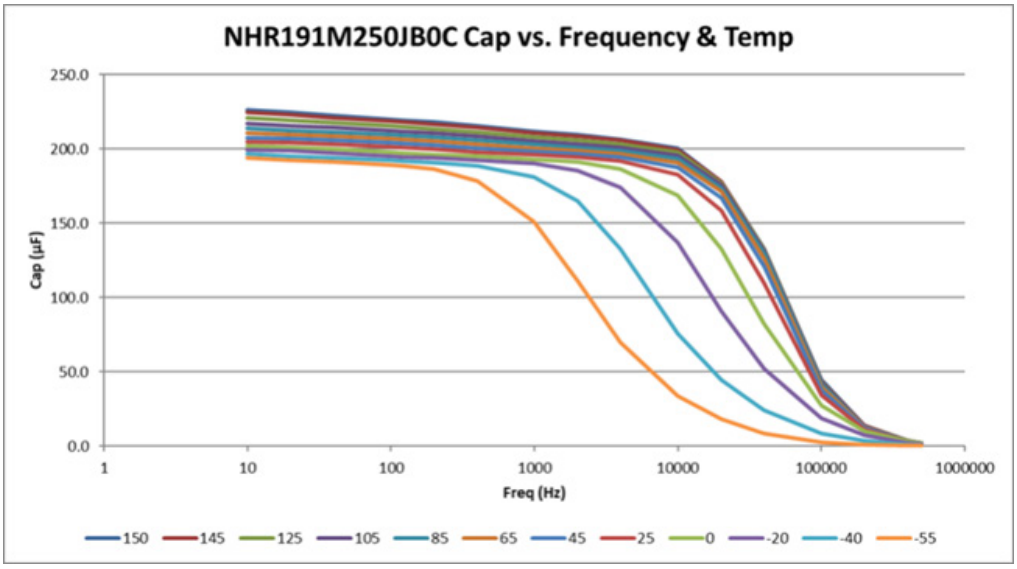


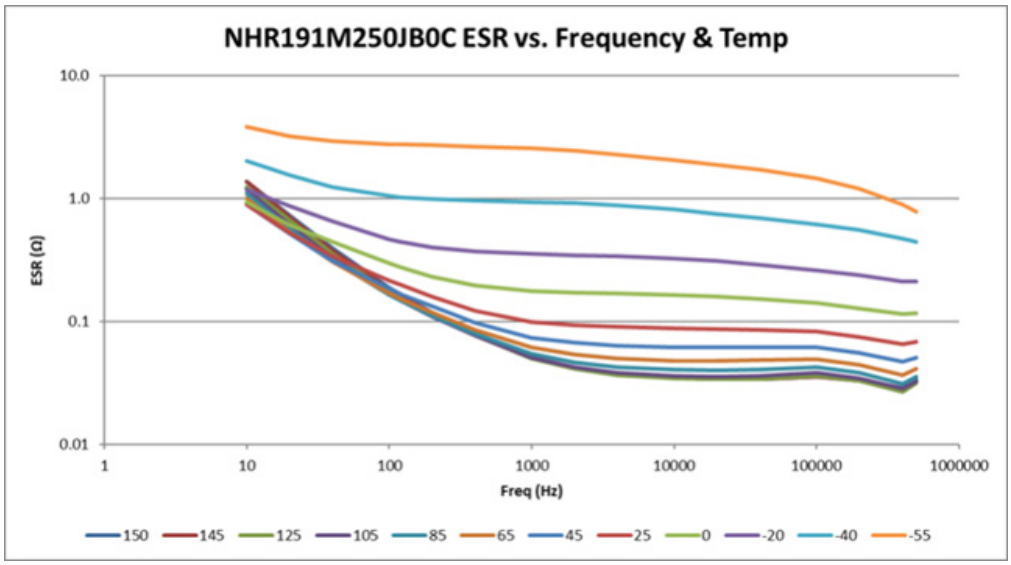


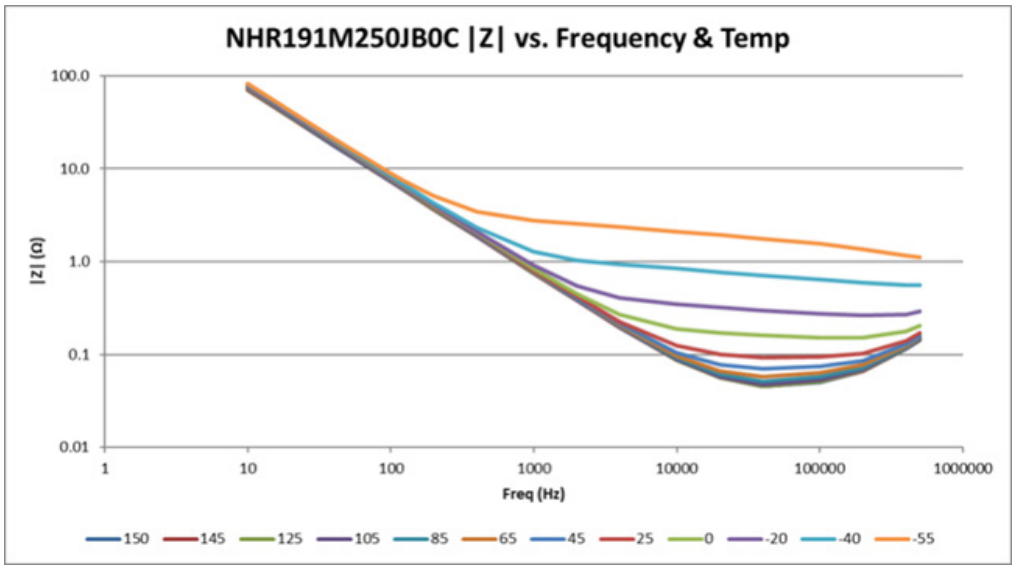


Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Typical Performance Curves

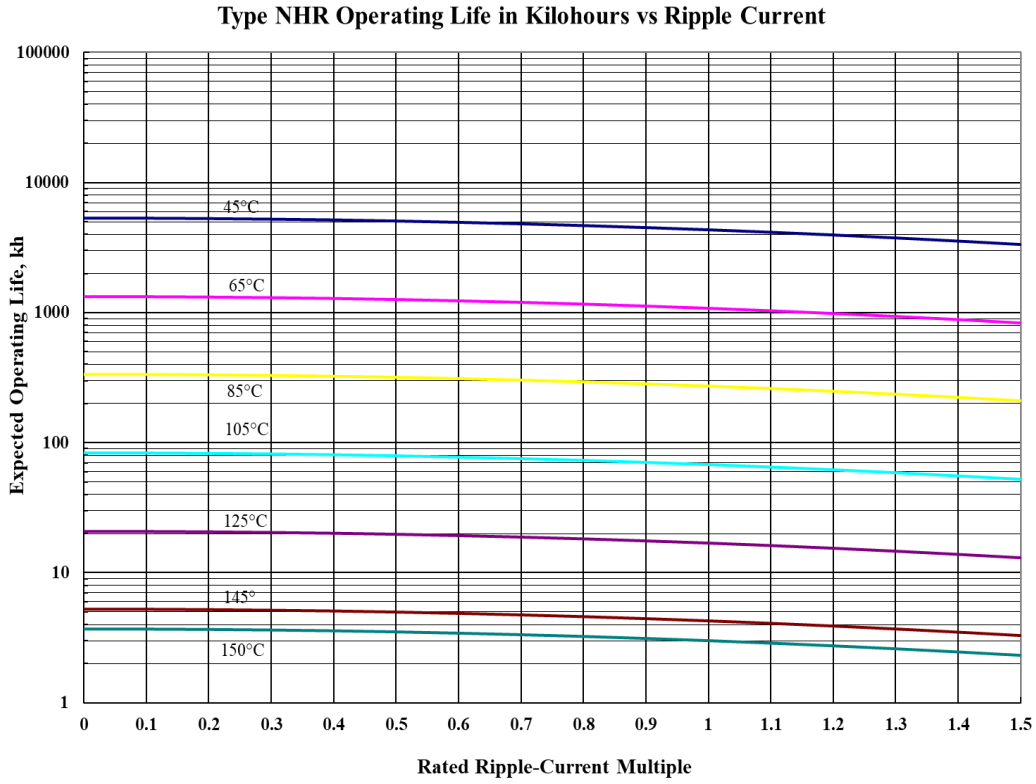


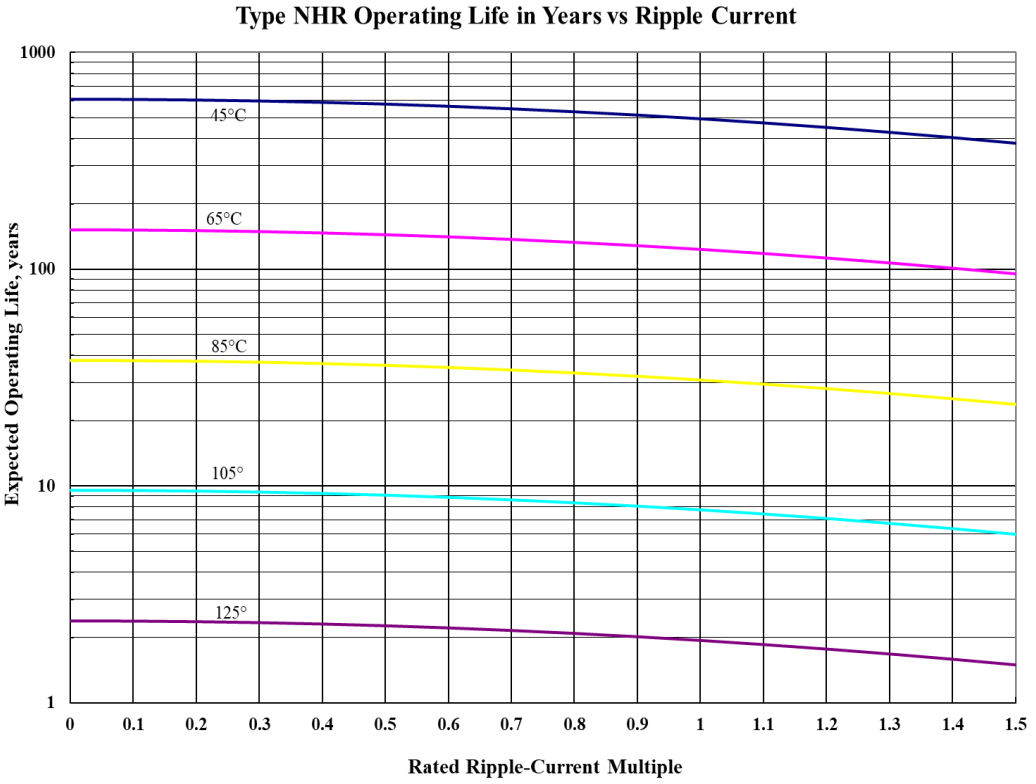




Type NHR – Slimpack™, 3000 hr@150 °C, Aluminum Electrolytic

Typical Performance Curves





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.

Type HZA -55 ºC to +105 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

For filtering, Bypassing and Power Supply Decoupling with Long Life Requirements

Rated for 105°C, type HZA combines the advantages of aluminum electrolytic and aluminum polymer technology. These hybrid capacitors have the ultra-low ESR characteristics of conductive aluminum polymer capacitors packaged in a V-chip, SMT case with high capacitance and voltage ratings

Highlights

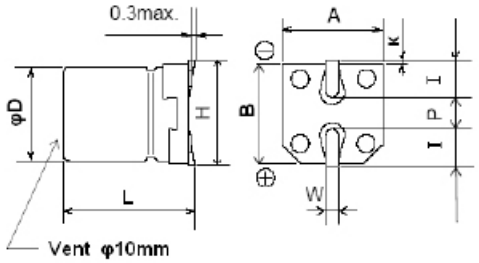
- +105 °C, Up to 10,000 Hours Load Life
- Low Leakage Current
- Very Low ESR and High Ripple Current
- 260 °C reflow soldering
- AEC-Q200 Compliant

Specifications

Capacitance Range	10 to 330 µF
Capacitance Tolerance	±20% @ 120 Hz/+20 °C
Rated Voltage	25, 35, 50, 63, 80 Vdc
Leakage Current (at 20°C)	I = .01CV or 3 µA max., whichever is greater after 2 minutes I = leakage current in µAmps C = rated capacitance in µF V = rated DC Working voltage in Volts
Low Temperature Characteristics (at 120 Hz)	Z(-25 ºC)/Z(+20 ºC): 2 Z(-55 ºC)/Z(+20 ºC): 2.5
Ripple Current Frequency Multiplier	See table below
RoHS Compliant	

Frequency	120 Hz	1000 Hz	10,000 Hz	100 KHz
Correction Factor	0.1	0.3	0.6	1

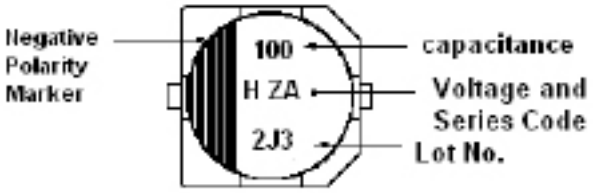
Outline Drawing



mm

Case Code	D (± 0.5)	L (± 0.3)	A (± 0.2)	B (± 0.2)	H (max.)	I (ref.)	W	P (ref.)	K
C	5.0	5.8	5.3	5.3	6.5	2.2	0.65 ± 0.1	1.5	$0.35^{+0.15/-0.20}$
D	6.3	5.8	6.6	6.6	7.8	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15/-0.20}$
X	6.3	7.7	6.6	6.6	7.8	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15/-0.20}$
F	8.0	10.2	8.3	8.3	10.0	3.4	0.90 ± 0.2	3.1	0.70 ± 0.2
G	10.0	10.2	10.3	10.3	12.0	3.5	0.90 ± 0.2	4.6	0.70 ± 0.2

Capacitor Markings



Lot, Number: Year, Line, Month

Voltage Code	Voltage Vdc
E	25
V	35
H	50
J	63
K	80

Type HZA -55 ºC to +105 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Part Numbering System

HZA	227	M	25	F	24T	–F
Type	Capacitance	Capacitance Tolerance	Voltage Code	Case Code	Packaging Code	RoHS Compliant Indicator
	227 = 220 µF	M = ±20%	25 = 25 Vdc	See Ratings Table	24 = Tape carrier width (mm) T = Tape & Reel	

Ratings

Capacitance (µF)	Voltage Rating (Vdc)	CDE Part Number	MAX DCL (µA)	MAX DF @ 120 Hz/20°C	MAX E.S.R. @ 100kHz/+20°C (ohms)	MAX Ripple Current @ 100kHz/+105°C (A rms)	D (mm)	L (mm)	Case Code	QTY/reel
25 Vdc (32 Vdc Surge)										
33	25	HZA336M025C12T-F	8.2	0.14	0.080	0.9	5.0	5.8	C	1000
56	25	HZA566M025D16T-F	14.0	0.14	0.050	1.3	6.3	5.8	D	1000
100	25	HZA107M025X16T-F	25.0	0.14	0.030	2.0	6.3	7.7	X	900
220	25	HZA227M025F24T-F	55.0	0.14	0.027	2.3	8.0	10.2	F	500
330	25	HZA337M025G24T-F	82.5	0.14	0.020	2.5	10.0	10.2	G	500
35 Vdc (44 Vdc Surge)										
22	35	HZA226M035C12T-F	7.7	0.12	0.100	0.9	5.0	5.8	C	1000
27	35	HZA276M035D16T-F	9.4	0.12	0.060	1.3	6.3	5.8	D	1000
47	35	HZA476M035D16T-F	16.4	0.12	0.060	1.3	6.3	5.8	D	1000
68	35	HZA686M035X16T-F	23.8	0.12	0.035	2.0	6.3	7.7	X	900
150	35	HZA157M035F24T-F	52.5	0.12	0.027	2.3	8.0	10.2	F	500
270	35	HZA277M035G24T-F	94.5	0.12	0.020	2.5	10.0	10.2	G	500
50 Vdc (63 Vdc Surge)										
10	50	HZA106M050C12T-F	5.0	0.10	0.120	0.75	5.0	5.8	C	1000
22	50	HZA226M050D16T-F	11.0	0.10	0.080	1.1	6.3	5.8	D	1000
33	50	HZA336M050X16T-F	16.5	0.10	0.040	1.6	6.3	7.7	X	900
68	50	HZA686M050F24T-F	34.0	0.10	0.030	1.8	8.0	10.2	F	500
100	50	HZA107M050G24T-F	50.0	0.10	0.028	2.0	10.0	10.2	G	500
63 Vdc (79 Vdc Surge)										
10	63	HZA106M063D16T-F	6.3	0.08	0.120	1.0	6.3	5.8	D	1000
22	63	HZA226M063X16T-F	13.8	0.08	0.080	1.5	6.3	7.7	X	900
33	63	HZA336M063F24T-F	20.7	0.08	0.040	1.7	8.0	10.2	F	500
56	63	HZA566M063G24T-F	35.2	0.08	0.030	1.8	10.0	10.2	G	500
80 Vdc (100 Vdc Surge)										
22	80	HZA226M080F24T-F	17.6	0.08	0.045	1.55	8.0	10.2	F	500
33	80	HZA336M080G24T-F	26.4	0.08	0.036	1.70	10.0	10.2	G	500

Type HZA -55 ºC to +105 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Load Life Test

Test	Apply the maximum rated voltage for 10,000 hrs at +105 °C with full rated ripple current. After the test measure the capacitance, DF, DCL and ESR at +20 °C. Also measure the ESR at -40 °C and 100kHz.
ΔC at 120Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100kHz/+20 °C	ESR will be ≤ 200% of the initial specified value
Max. ESR at 100kHz/-40 °C after Load Life test	Case Code C : 2.0 Ω; Case Code D : 1.4 Ω; Case Code X : 0.8 Ω; Case Code F : 0.4 Ω; Case Code G : 0.3 Ω

Shelf Life Test

Test	Subject the capacitor to 1000 hrs at +105 °C without voltage. After the test, return the capacitor to room temperature for two hours and then apply rated voltage for 30 minutes. The after test measurements for capacitance, DF, DCL and ESR at +20 °C will meet the following.
ΔC at 120 Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100Khz/+20 °C	ESR will be ≤ 200% of the initial specified value

Moisture Resistance Test

Test	Subject the capacitor to 2000 hrs at +85 °C/85%RH with rated voltage. After the test, return the capacitor to room temperature and humidity for two hours. The after test measurements for capacitance, DF, DCL and ESR at +20 °C will meet the following.
ΔC at 120 Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100Khz/+20 °C	ESR will be ≤ 200% of the initial specified value

Temperature Cycle Test

Test	Subject the capacitor to 1000 cycles of temperature change from -55 °C to +105 °C using the following sequence and durations.

Step	Temperature	Time at Temperature
1	-55 ºC	30 minutes
2	+20 ºC	3 minutes max
3	+105 ºC	30 minutes
4	+20 ºC	3 minutes max

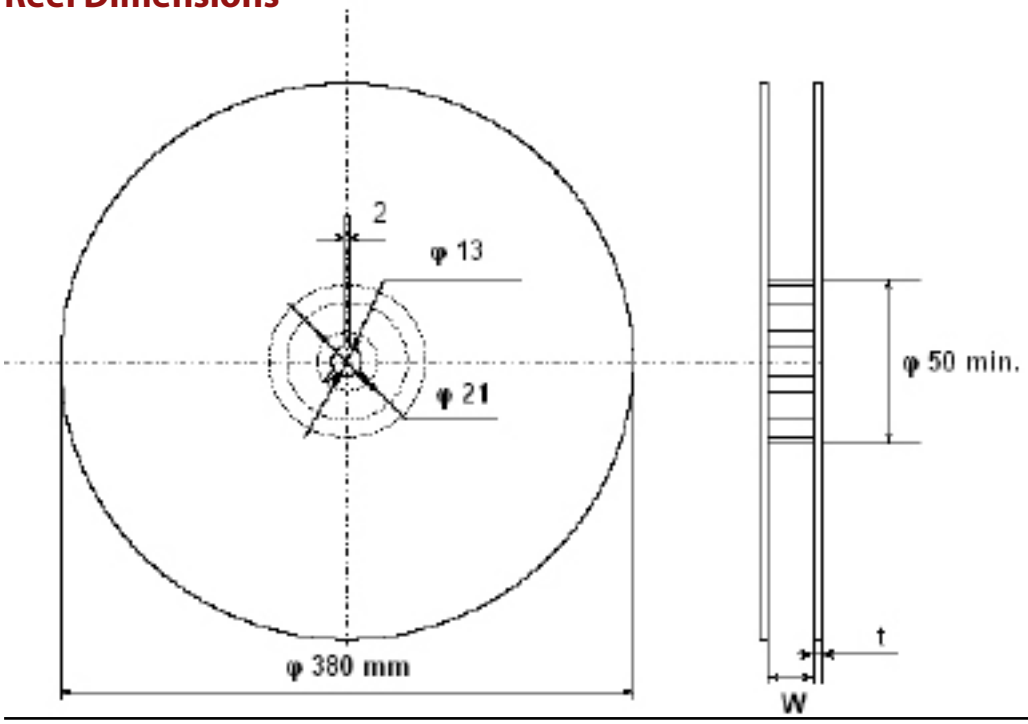
After the test, return the capacitor to +20°C for one to two hours before measurement. The after test measurements for capacitance, DF, and DCL at +20 °C will meet the following;

ΔC at 120 Hz	Capacitance will be within ±20% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
Appearance	No significant change in appearance

Type HZA -55 ºC to +105 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

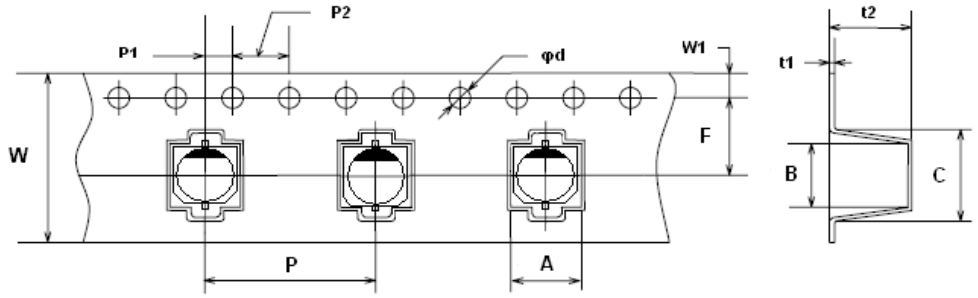
Reel Dimensions



mm

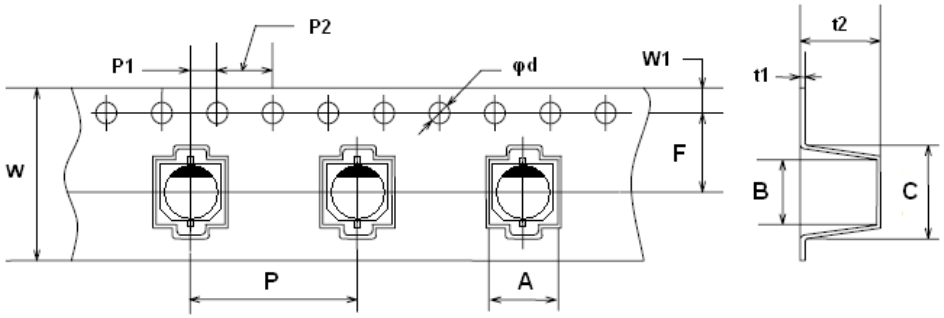
Case Dia.	5	6.3	8	10
W	14	18	26	26
t	3	3	3	3

Tape Dimensions



mm

Case Size (mm)	Case Code	W ± 0.3	A ± 0.2	B +0.3/-0.2	C ± 0.5	F ± 0.1	P ± 0.1	t1	t2 ± 0.2	φd +0.1/-0	P1 ± 0.1	P2 ± 0.1	W1 ± 0.1
5 x 5.8	C	12	5.7	5.7	8.0	5.5	12	0.4	6.4	1.5	2	4	1.75



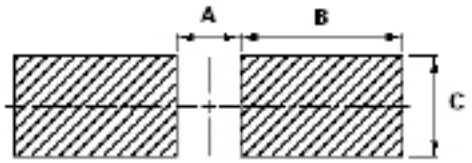
mm

Case Size (mm)	Case Code	W ± 0.3	A ± 0.2	B +0.3/-0.2	C ± 0.5	F ± 0.1	P ± 0.1	t1	t2 ± 0.2	φd +0.1/-0	P1 ± 0.1	P2 ± 0.1	W1 ± 0.1
6.3 x 5.8	D	16	7	7	9.0	7.5	12	0.4	6.4	1.5	2	4	1.75
6.3 x 7.7	X								8.4				
8 x 10.2	F	24	8.7	8.7	12.5	11.5	16	0.4	11				
10 x 10.2	G		10.7	10.7	14.5								

Type HZA -55 ºC to +105 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

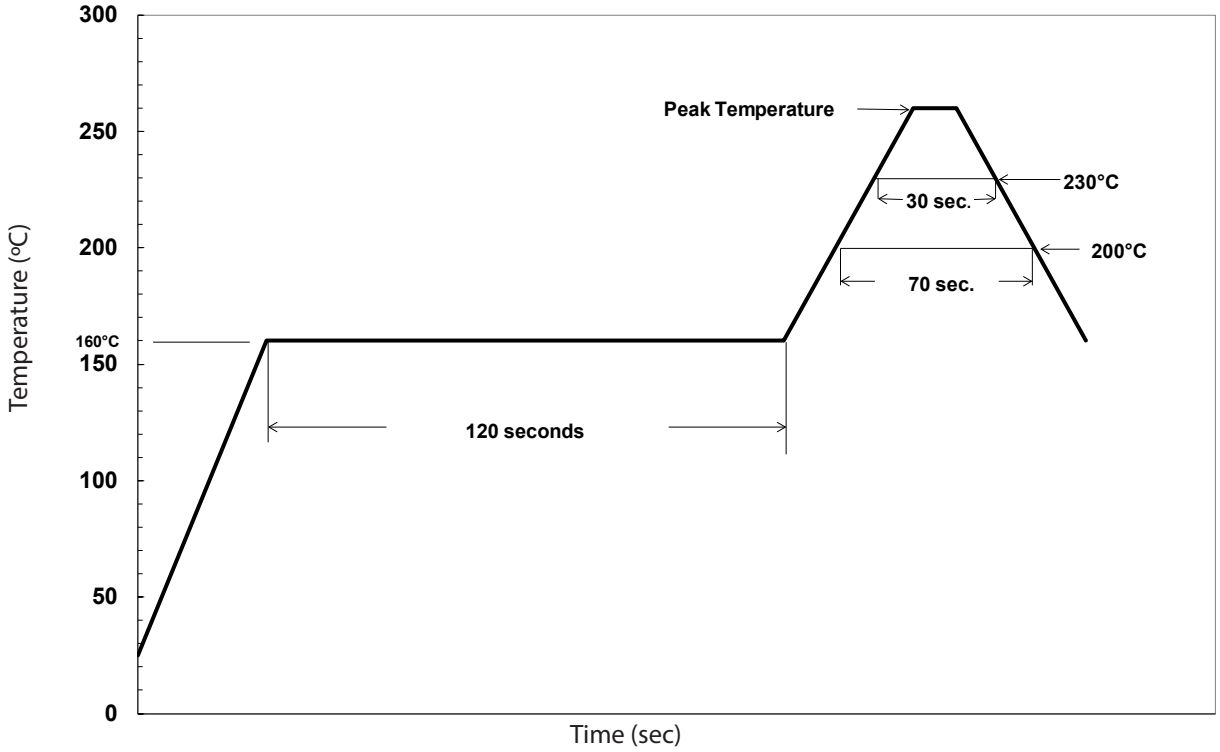
Recommended Land Dimensions



mm

Case Code	D (mm)	A	B	C
C	5	1.5	2.8	1.6
D	6.3	1.8	3.2	1.6
X	6.3	1.8	3.2	1.6
F	8	3.1	4.0	2.0
G	10	4.6	4.1	2.0

Recommended Reflow Soldering



Case Code	Case Dia. (mm)	Peak Temperature	Time at or above 250 °C	Time at or above 230 °C	Time at or above 217 °C	Time at or above 200 °C	Number of Reflow Processes
C	5	260°C	5 seconds	30 seconds	40 seconds	70 seconds	2
D	6.3						
X	6.3						
F	8						1
G	10						

Notes:

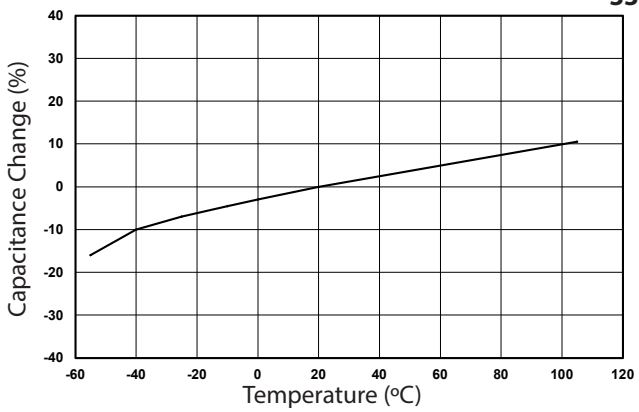
1. For 5mm and 6.3 mm case dia., if the peak temperature does not exceed 255 °C the time at or above 250 °C can increase to 10 seconds.
2. The capacitors in the 8m and 10 mm case dia. can withstand 2 reflow processes, if the peak temperature does not exceed 245 °C and the time at or above 240 °C does not exceed 10 seconds.
3. The 2nd reflow process should be performed after the capacitors have returned to room temperature.
4. Temperature should be measured with a thermal couple placed on the top surface of the capacitor.
5. After reflow soldering, the leakage current, D.F., and e.s.r., will meet the initial specifications, and the capacitance will be within ±10% of the initial measured value when measured at room conditions.

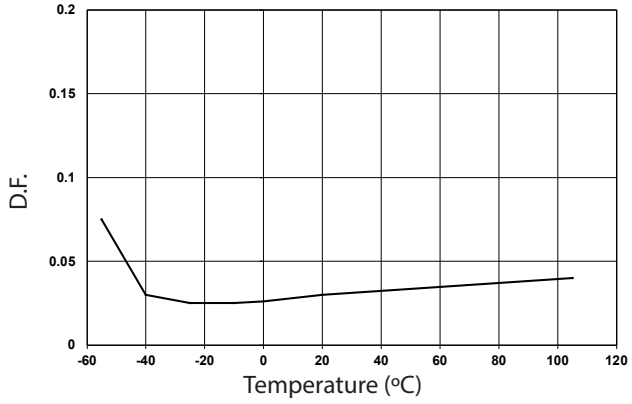
Type HZA -55 ºC to +105 ºC

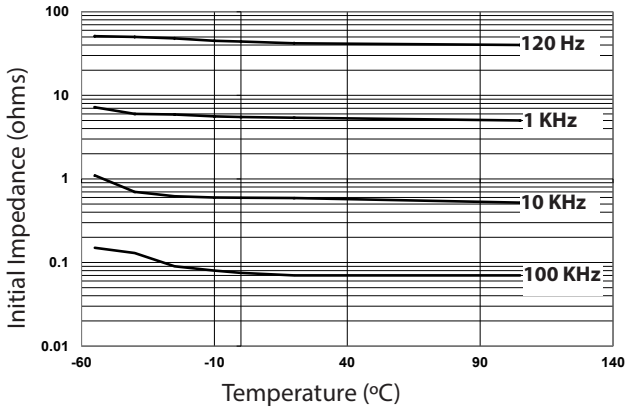
SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

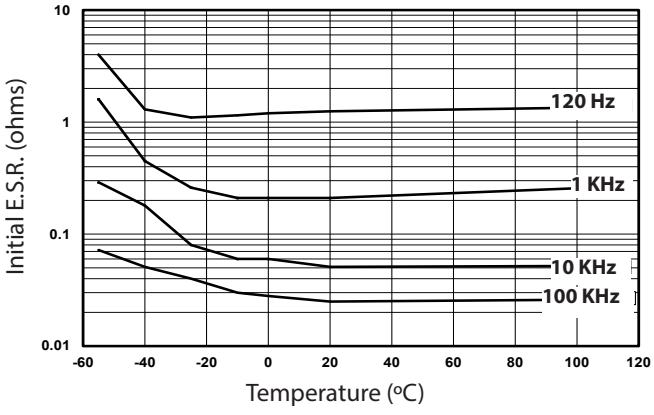
Capacitor Temperature Characteristics

33 µF/25V



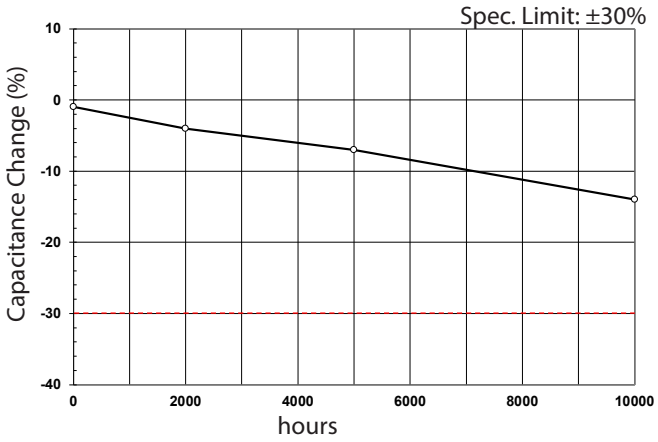


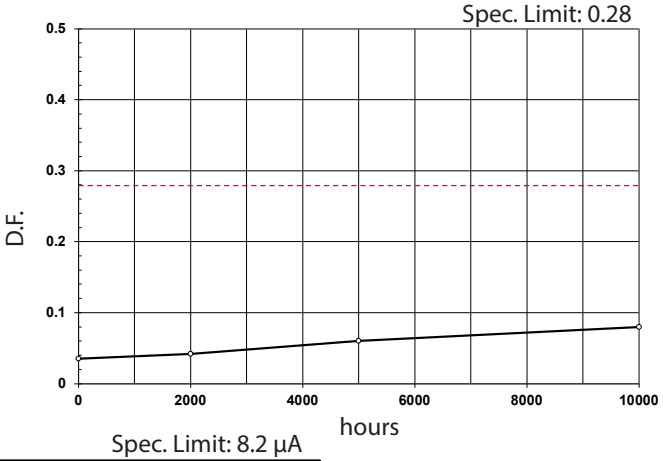


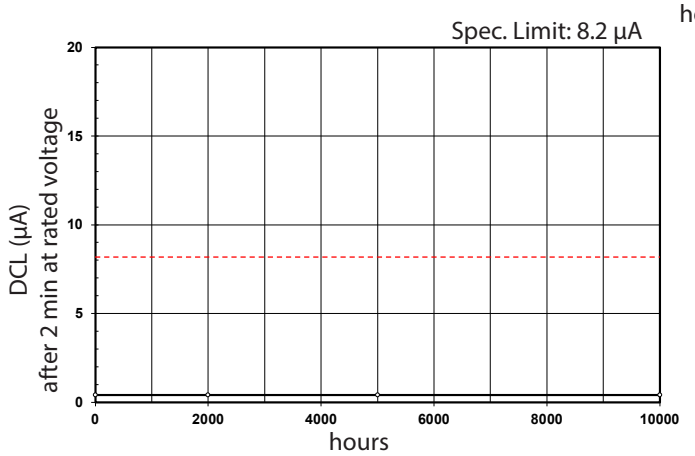


Life Test Results

33 µF/25V at +105 ºC with rated voltage





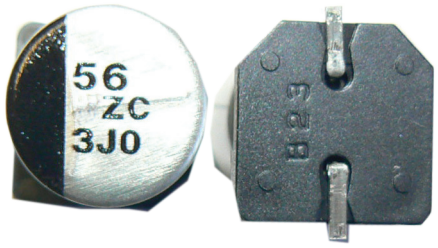


Notice and Disclaimer: All product drawings, descriptions, specifications, statements, information and data (collectively, the "Information") in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information 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.

Type HZC -55 ºC to +125 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

For filtering, Bypassing and Power Supply Decoupling with Long Life Requirements



Rated for 125°C, type HZC combines the advantages of aluminum electrolytic and aluminum polymer technology. These hybrid capacitors have the ultra-low ESR characteristics of conductive aluminum polymer capacitors packaged in a V-chip, SMT case with high capacitance and voltage ratings that were previously available only in aluminum electrolytic technology. Applications for type 125°C hybrid capacitors include a variety of industrial power conversion, lighting control and automotive applications.

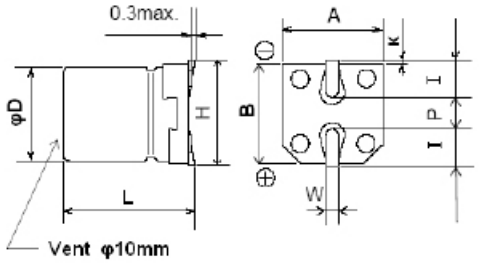
Highlights

- +125 °C, Up to 4,000 Hours Load Life
- Low Leakage Current
- Very Low ESR and High Ripple Current
- 260 °C reflow soldering
- AEC-Q200 Compliant

Specifications

Capacitance Range	10 to 330 µF
Capacitance Tolerance	±20% @ 120 Hz/+20 °C
Rated Voltage	25, 35, 50, 63 Vdc
Leakage Current (at 20°C)	I = .01CV or 3 µA max., whichever is greater after 2 minutes I = leakage current in µAmps C = rated capacitance in µF V = rated DC Working voltage in Volts
Low Temperature Characteristics (at 120 Hz)	Z(-25 ºC)/Z(+20 ºC): 2 Z(-55 ºC)/Z(+20 ºC): 2.5
Ripple Current Frequency Multiplier	Frequency: 120 Hz | 1000 Hz | 10,000 Hz | 100 KHz Correction Factor: 0.1 | 0.3 | 0.6 | 1
RoHS Compliant	

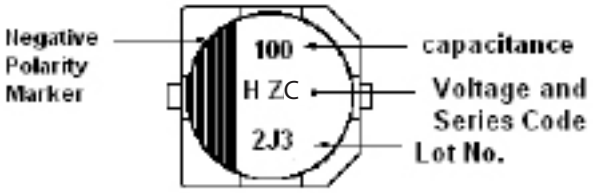
Outline Drawing



mm

Case Code	D (± 0.5)	L (± 0.3)	A (± 0.2)	B (± 0.2)	H (max.)	I (ref.)	W	P (ref.)	K
C	5.0	5.8	5.3	5.3	6.5	2.2	0.65 ± 0.1	1.5	$0.35^{+0.15/-0.20}$
D	6.3	5.8	6.6	6.6	7.8	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15/-0.20}$
X	6.3	7.7	6.6	6.6	7.8	2.6	0.65 ± 0.1	1.8	$0.35^{+0.15/-0.20}$
F	8.0	10.2	8.3	8.3	10.0	3.4	0.90 ± 0.2	3.1	0.70 ± 0.2
G	10.0	10.2	10.3	10.3	12.0	3.5	0.90 ± 0.2	4.6	0.70 ± 0.2

Capacitor Markings



Lot, Number: Year, Line, Month

Voltage Code	Voltage Vdc
E	25
V	35
H	50
J	63

Type HZC -55 ºC to +125 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Part Numbering System

HZC	227	M	25	F	24T	–F
Type	Capacitance	Capacitance Tolerance	Voltage Code	Case Code	Packaging Code	RoHS Compliant Indicator
	227 = 220 µF	M = ±20%	25 = 25 Vdc	See Ratings Table	24 = Tape carrier width (mm) T = Tape & Reel	

Ratings

Capacitance (µF)	Voltage Rating (Vdc)	CDE Part Number	MAX DCL (µA)	MAX DF @ 120 Hz/20°C	MAX E.S.R. @ 100kHz/+20°C (ohms)	MAX Ripple Current @ 100kHz/+125°C (A rms)	D (mm)	L (mm)	Case Code	QTY/reel
25 Vdc (32 Vdc Surge)										
33	25	HZC336M025C12T-F	8.2	0.14	0.080	0.55	5.0	5.8	C	1000
56	25	HZC566M025D16T-F	14.0	0.14	0.050	0.90	6.3	5.8	D	1000
100	25	HZC107M025X16T-F	25.0	0.14	0.030	1.40	6.3	7.7	X	900
220	25	HZC227M025F24T-F	55.0	0.14	0.027	1.60	8.0	10.2	F	500
330	25	HZC337M025G24T-F	82.5	0.14	0.020	2.00	10.0	10.2	G	500
35 Vdc (44 Vdc Surge)										
22	35	HZC226M035C12T-F	7.7	0.12	0.100	0.55	5.0	5.8	C	1000
47	35	HZC476M035D16T-F	16.4	0.12	0.060	0.90	6.3	5.8	D	1000
68	35	HZC686M035X16T-F	23.8	0.12	0.035	1.40	6.3	7.7	X	900
150	35	HZC157M035F24T-F	52.5	0.12	0.027	1.60	8.0	10.2	F	500
270	35	HZC277M035G24T-F	94.5	0.12	0.020	2.00	10.0	10.2	G	500
50 Vdc (63 Vdc Surge)										
10	50	HZC106M050C12T-F	5.0	0.10	0.120	0.50	5.0	5.8	C	1000
22	50	HZC226M050D16T-F	11.0	0.10	0.080	0.75	6.3	5.8	D	1000
33	50	HZC336M050X16T-F	16.5	0.10	0.040	1.10	6.3	7.7	X	900
68	50	HZC686M050F24T-F	34.0	0.10	0.030	1.25	8.0	10.2	F	500
100	50	HZC107M050G24T-F	50.0	0.10	0.028	1.60	10.0	10.2	G	500
63 Vdc (79 Vdc Surge)										
10	63	HZC106M063D16T-F	6.3	0.08	0.120	0.70	6.3	5.8	D	1000
22	63	HZC226M063X16T-F	13.8	0.08	0.080	0.90	6.3	7.7	X	900
33	63	HZC336M063F24T-F	20.7	0.08	0.040	1.10	8.0	10.2	F	500
56	63	HZC566M063G24T-F	35.2	0.08	0.030	1.40	10.0	10.2	G	500

Type HZC -55 ºC to +125 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Load Life Test

Test	Apply the maximum rated voltage for 4,000 hrs at +125 °C with full rated ripple current. After the test measure the capacitance, DF, DCL and ESR at +20 °C. Also measure the ESR at -40 °C and 100kHz.
ΔC at 120Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100kHz/+20 °C	ESR will be ≤ 200% of the initial specified value
Max. ESR at 100kHz/-40 °C after Load Life test	Case Code C : 2.0 Ω; Case Code D : 1.4 Ω; Case Code X : 0.8 Ω; Case Code F : 0.4 Ω; Case Code G : 0.3 Ω

Shelf Life Test

Test	Subject the capacitor to 1000 hrs at +125 °C without voltage. After the test, return the capacitor to room temperature for two hours and then apply rated voltage for 30 minutes. The after test measurements for capacitance, DF, DCL and ESR at +20 °C will meet the following.
ΔC at 120 Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100Khz/+20 °C	ESR will be ≤ 200% of the initial specified value

Moisture Resistance Test

Test	Subject the capacitor to 2000 hrs at +85 °C/85%RH with rated voltage. After the test, return the capacitor to room temperature and humidity for two hours. The after test measurements for capacitance, DF, DCL and ESR at +20 °C will meet the following.
ΔC at 120 Hz	Capacitance will be within ±30% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
ESR at 100Khz/+20 °C	ESR will be ≤ 200% of the initial specified value

Temperature Cycle Test

Test	Subject the capacitor to 1000 cycles of temperature change from -55 °C to +125 °C using the following sequence and durations.

Step	Temperature	Time at Temperature
1	-55 ºC	30 minutes
2	+20 ºC	3 minutes max
3	+125 ºC	30 minutes
4	+20 ºC	3 minutes max

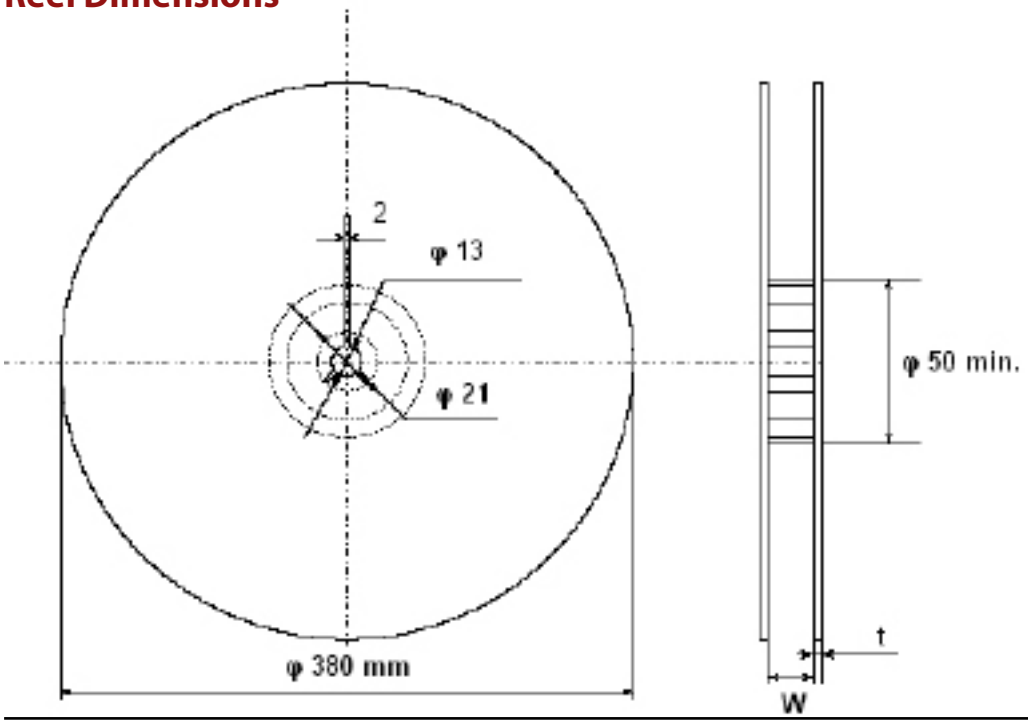
After the test, return the capacitor to +20°C for one to two hours before measurement. The after test measurements for capacitance, DF, and DCL at +20 °C will meet the following;

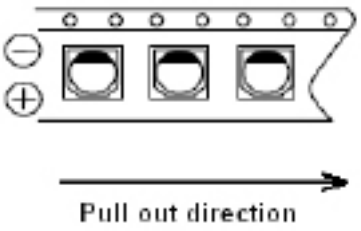
ΔC at 120 Hz	Capacitance will be within ±20% of the initial measured value
DF at 120 Hz	DF will be ≤ 200% of the initial specified value
DCL after 2 minute charge	Leakage current will be ≤ the initial specified value
Appearance	No significant change in appearance

Type HZC -55 ºC to +125 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Reel Dimensions

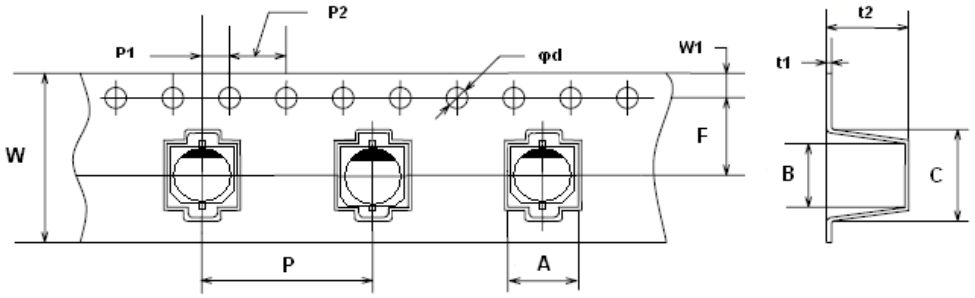




mm

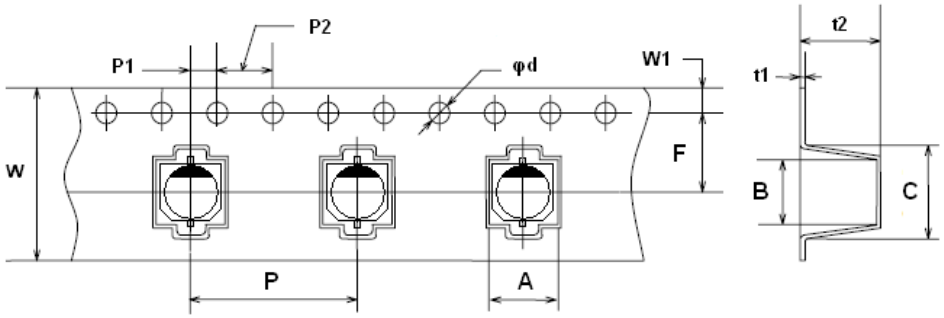
Case Dia.	5	6.3	8	10
W	14	18	26	26
t	3	3	3	3

Tape Dimensions



mm

Case Size (mm)	Case Code	W ± 0.3	A ± 0.2	B +0.3/-0.2	C ± 0.5	F ± 0.1	P ± 0.1	t1	t2 ± 0.2	φd +0.1/-0	P1 ± 0.1	P2 ± 0.1	W1 ± 0.1
5 x 5.8	C	12	5.7	5.7	8.0	5.5	12	0.4	6.4	1.5	2	4	1.75



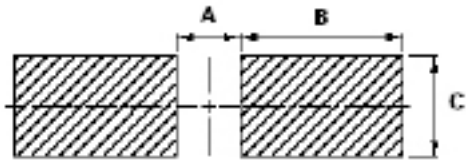
mm

Case Size (mm)	Case Code	W ± 0.3	A ± 0.2	B +0.3/-0.2	C ± 0.5	F ± 0.1	P ± 0.1	t1	t2 ± 0.2	φd +0.1/-0	P1 ± 0.1	P2 ± 0.1	W1 ± 0.1
6.3 x 5.8	D	16	7	7	9.0	7.5	12	0.4	6.4	1.5	2	4	1.75
6.3 x 7.7	X								8.4				
8 x 10.2	F	24	8.7	8.7	12.5	11.5	16	0.4	11				
10 x 10.2	G		10.7	10.7	14.5								

Type HZC -55 ºC to +125 ºC

SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

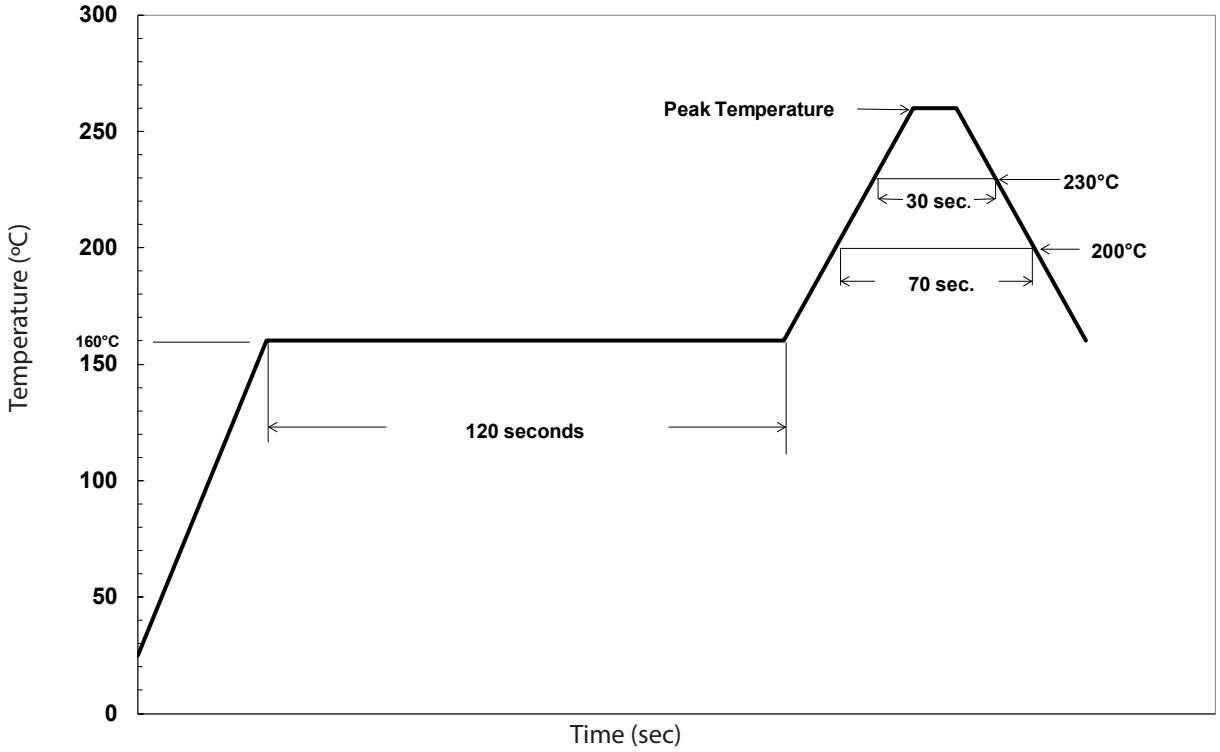
Recommended Land Dimensions



mm

Case Code	D (mm)	A	B	C
C	5	1.5	2.8	1.6
D	6.3	1.8	3.2	1.6
X	6.3	1.8	3.2	1.6
F	8	3.1	4.0	2.0
G	10	4.6	4.1	2.0

Recommended Reflow Soldering



Case Code	Case Dia. (mm)	Peak Temperature	Time at or above 250 °C	Time at or above 230 °C	Time at or above 217 °C	Time at or above 200 °C	Number of Reflow Processes
C	5	260°C	5 seconds	30 seconds	40 seconds	70 seconds	2
D	6.3						
X	6.3						
F	8						1
G	10						

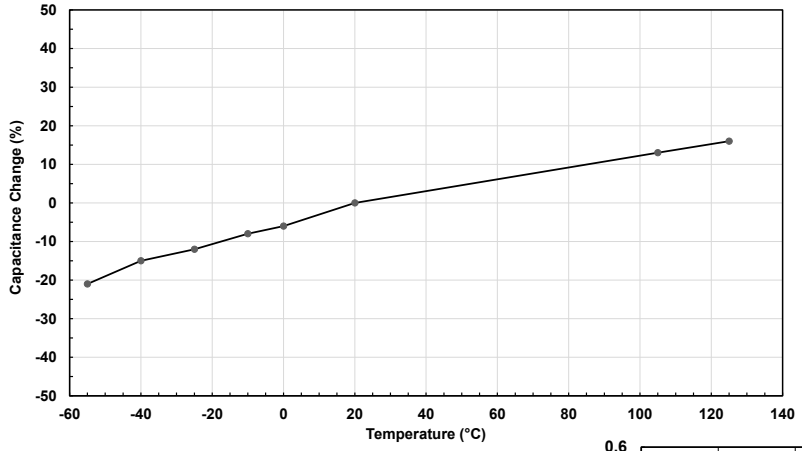
Notes:

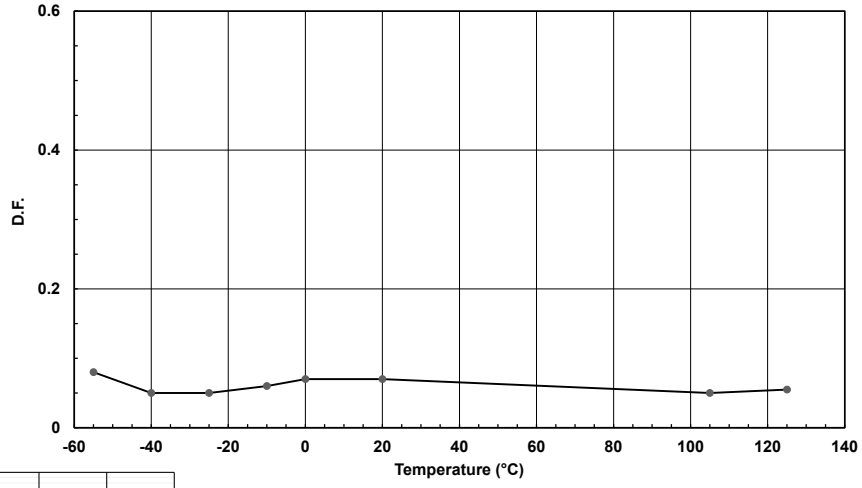
1. For 5mm and 6.3 mm case dia., if the peak temperature does not exceed 255 °C the time at or above 250 °C can increase to 10 seconds.
2. The capacitors in the 8m and 10 mm case dia. can withstand 2 reflow processes, if the peak temperature does not exceed 245 °C and the time at or above 240 °C does not exceed 10 seconds.
3. The 2nd reflow process should be performed after the capacitors have returned to room temperature.
4. Temperature should be measured with a thermal couple placed on the top surface of the capacitor.
5. After reflow soldering, the leakage current, D.F., and e.s.r., will meet the initial specifications, and the capacitance will be within ±10% of the initial measured value when measured at room conditions.

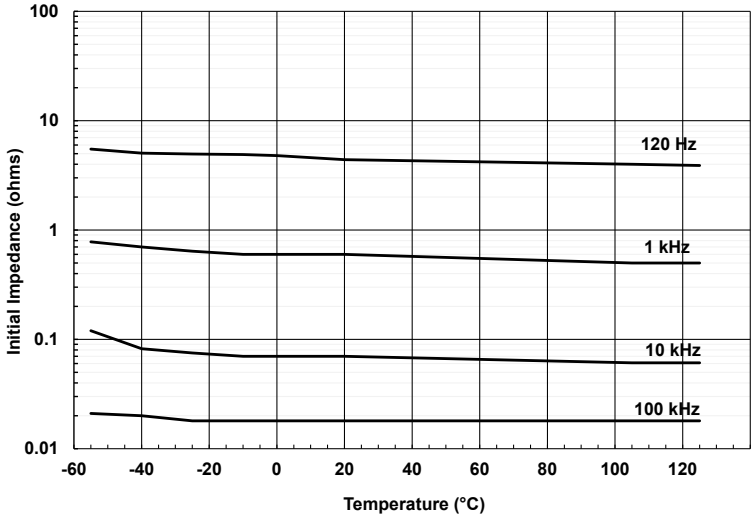
Type HZC -55 ºC to +125 ºC

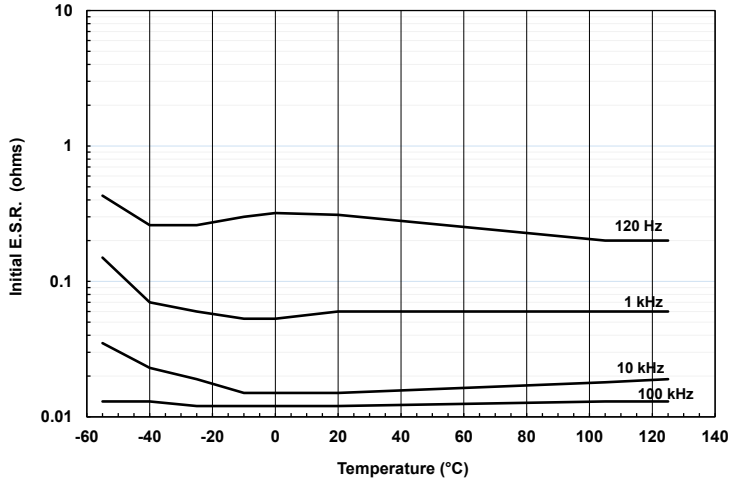
SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

Capacitor Temperature Characteristics 330 µF/25V









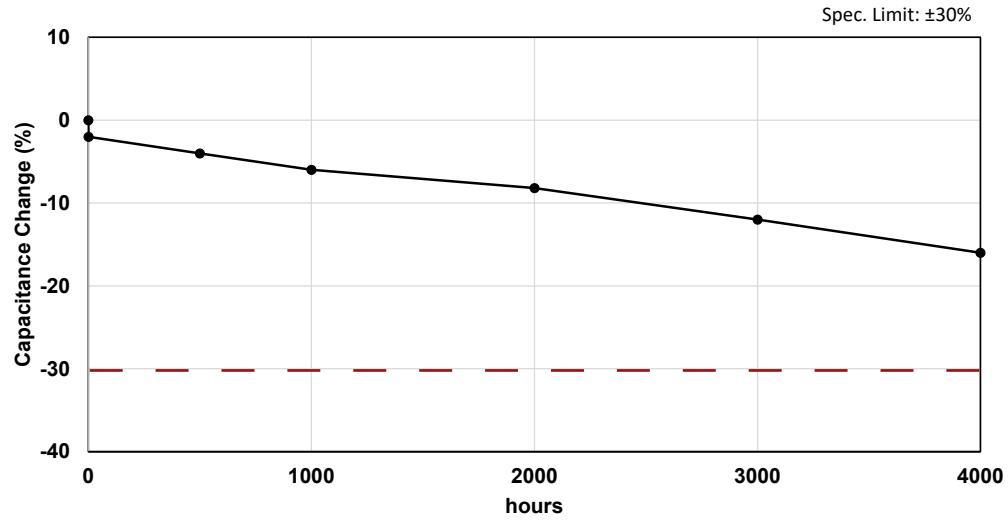
Type HZC -55 ºC to +125 ºC

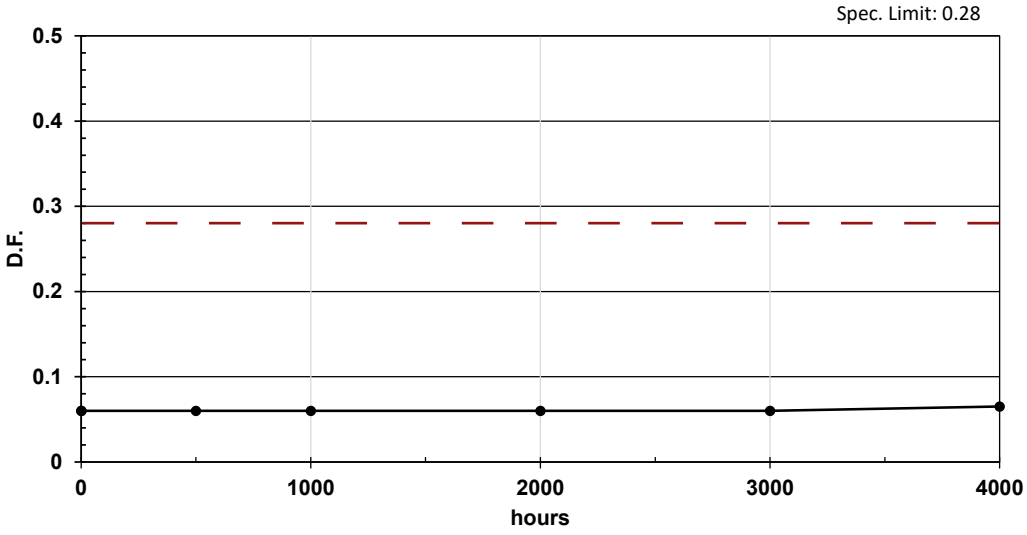
SMT Hybrid Polymer-Aluminum Electrolytic Capacitors

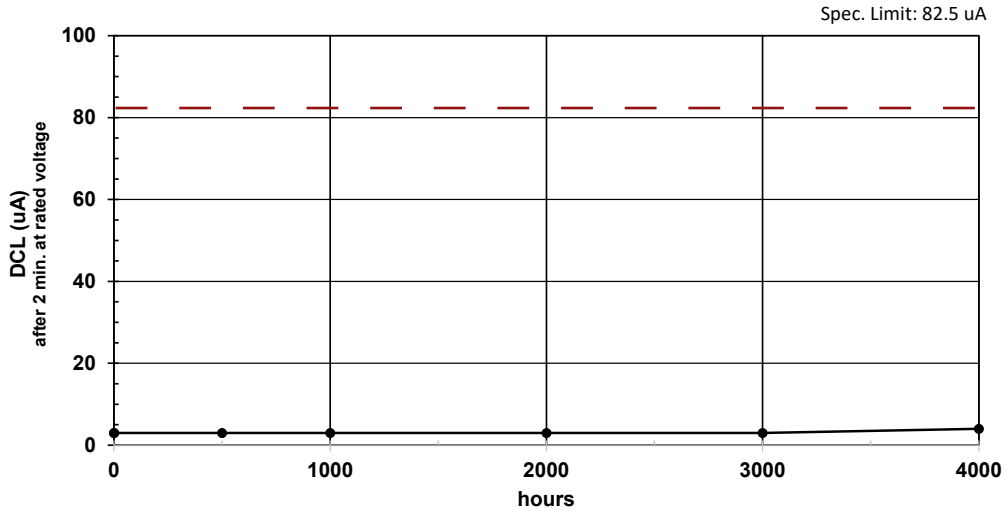
Capacitor Temperature Characteristics

Life Test Results

330 µF/25V at +125 ºC with rated voltage







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.

Type 953B, Metallized Polypropylene Film Capacitors

AC Rated, Radial Leaded Box, UL 810 Fail Safe, Rated 10,000 AFC

Type 953B radial leaded metallized polypropyene capacitors are designed for UPS systems and other AC output filtering applications. With an integrated fused metallization pattern, this product features UL 810 recognition for fail-safe operation at temperatures up to 85 ºC.

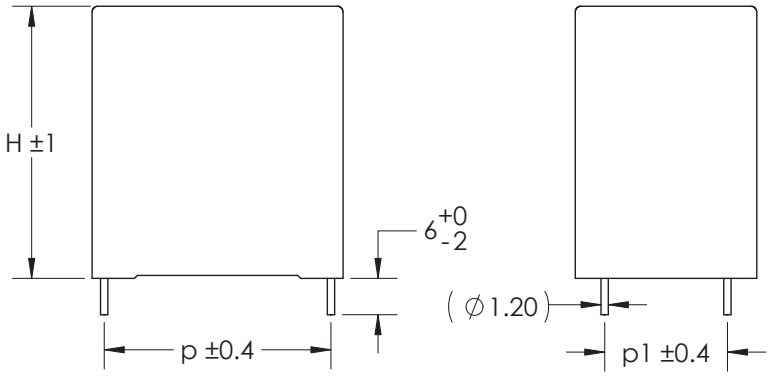
Highlights

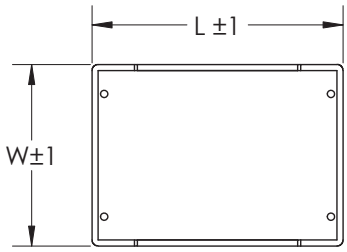
– Fuse protection
– UL 810 recognized
– Low dissipation factor
– Self healing

Specifications

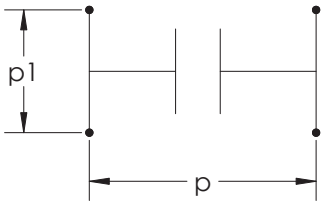
Capacitance Range	2.5 µF to 50 µF
Capacitance Tolerance	±10 % (±5% optional)
Rated Voltage	160 Vac, 250 Vac, 275 Vac
Operating Temperature Range	–40 ºC to 85 ºC
IEC Climatic Category	40/85/56 (test conditions 40 ºC, 93% RH, rated voltage, 1000 hours)
Sevice Life Objective	10,000 h at rated voltage and 85 ºC
Protection	UL 810 file number E71645
RoHS Compliant	

Dimensions





Construction Details	
Case Material	Plastic UL 94V-0
Resin Material	Dry Resin UL 94V-0
Terminal Material	Tin Plated Copper



Type 953B, Metallized Polypropylene Film Capacitors

AC Rated, Radial Leaded Box, UL 810 Fail Safe, Rated 10,000 AFC

Part Numbering System

953B	X	W	2P5	K	SF	-F
Series	Voltage Code I = 160 Vdc Q = 250 Vdc X = 275 Vdc	Cap Decimal P = 0. W = No Decimal Point	Cap Rating in µF 2P5 = 2.5 µF 8 = 8 µF 25 = 25 µF	Tolerance K = ±10% J = ±5%	Metallization Type SF = Segmented Fused	RoHs Compliant

Case Code	W	H	L	p	p1	d
A	20	40	41.5	37.5	10.2	1.2
B	28	37	41.5	37.5	10.2	1.2
C	24	44	41.5	37.5	10.2	1.2
D	30	45	41.5	37.5	20.3	1.2
E	30	45	57.5	52.5	20.3	1.2
F	35	50	57.5	52.5	20.3	1.2

Ratings

Part Number	Cap 1 kHz (µF)	Typ. ESR 10 kHz (mΩ)	Typ. ESL (nH)	Ipeak (A)	dV/dt (V/µs)	Rth (°C/W)	Irms 10 kHz 85°C (A)	Case Code
160 VAC								
953BIW10KSF-F	10	9	30	285	29	16	8.0	A
953BIW16KSF-F	16	7	30	475	30	14	9.3	B
953BIW17P5KSF-F	17.5	7	30	570	33	13	9.6	C
953BIW25KSF-F	25	6	30	760	30	12	10.4	D
953BIW38KSF-F	38	7	38	760	20	9	11.3	E
953BIW50KSF-F	50	6	38	1045	21	8	12.2	F
250 VAC								
953BQW4P5KSF-F	4.5	12	30	190	42	16	7.1	A
953BQW7KSF-F	7	9	30	285	41	14	8.3	B
953BQW7P5KSF-F	7.5	9	30	380	51	13	8.7	C
953BQW10KSF-F	10	8	30	475	48	12	9.0	D
953BQW16P5KSF-F	16.5	8	38	475	29	9	10.3	E
953BQW22KSF-F	22	7	38	665	30	8	11.3	F
275 VAC								
953BXW2P5KSF-F	2.5	14	30	190	76	16	6.4	A
953BXW3P5KSF-F	3.5	11	30	190	54	14	7.4	B
953BXW4KSF-F	4	11	30	285	71	13	7.9	C
953BXW6KSF-F	6	8	30	380	63	12	9.0	D
953BXW9KSF-F	9	10	38	380	42	9	9.5	E
953BXW12KSF-F	12	8	38	475	40	8	10.5	F

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.

Type ALH, AC Filter Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Type ALH AC harmonic filter capacitors use the most advanced construction technology to meet the challenges of harsh environments. The series offers 50% greater life than competitive 85/85 THB-rated power film capacitors with designs that pass the rigors of automotive-grade electrical and mechanical testing.

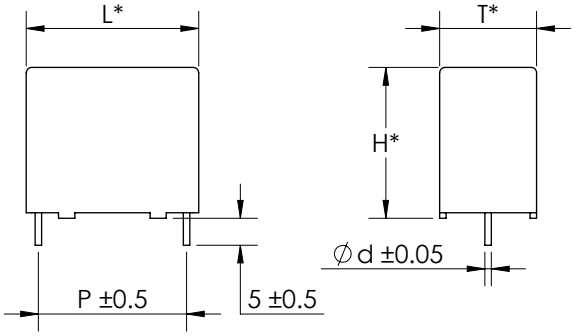
Highlights

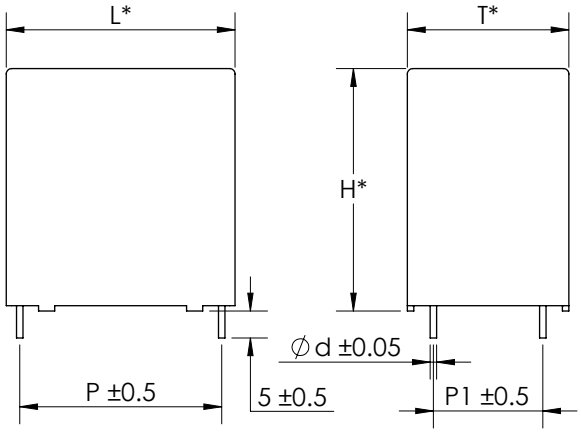
- Optimized AC voltage performance
- THB 85 °C / 85% RH 1500 h at rated voltage
- Self-healing and low loss
- Suitable for high frequency applications

Specifications

Capacitance Range	0.22 to 50 µF
Capacitance Tolerance	±10% standard , ±5% optional
Rated Voltage	160 to 450 Vac
Operating Temperature Range	-40 °C to 105 °C (>85 °C derate voltage 1.35% per °C)
Maximum rms Current	see data tables
Test Voltage between Terminals @ 25 °C	150% equivalent DC voltage (1.414 x Vac) for 10s
Test Voltage between Terminals and Case @ 25°C	3 kVac @ 50/60 Hz for 10 s
Insulation Resistance	≥30,000 MΩxµF @ 100 Vdc 25 °C after 1 minute
Life Expectancy	100,000 h @ 70°C hot spot, rated voltage
THB Rating	85 °C / 85% RH - rated voltage - 1500 h
Reference Standards	IEC 61071, AEC-Q200 qualified
RoHS Compliant	

Dimensions

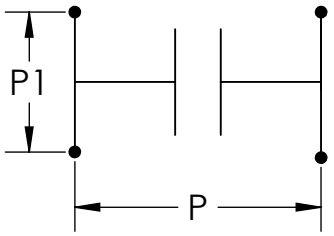




* ±0.8 for L ≤ 42.5mm
±1.0 for L = 57.5mm

Construction Details	
Case Material	Plastic UL94V-0
Resin Material	Dry Resin UL94V-0
Terminal Material	Tin Plated Copper

c UL us UL Recognized E128034
construction only - unprotected



Type ALH, AC Filter Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Numbering System

ALH	406	K	251	C08	4
Series	Capacitance	Tolerance	Voltage	Case	Leads
ALH	EIA Cap Code 684 = 0.68 µF 105 = 1 µF 406 = 40 µF	K = ±10% Standard J = ±5% Optional	161 = 160 Vac 251 = 250 Vac 271 = 275 Vac 351 = 350 Vac 401 = 400 Vac 451 = 450 Vac	See ratings table	2 = 2 Leads 4 = 4 Leads

Ratings

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)
160 Vac													
ALH105K161A022	1.0	30.3	19.8	5	24	32	32.0	32.0	20	11.0	27.5	\	0.8
ALH225K161A022	2.2	15.3	20.0	7	24	32	70.4	32.0	20	11.0	27.5	\	0.8
ALH335K161A032	3.3	11.3	27.1	7	24	32	105.6	32.0	22	13.0	27.5	\	0.8
ALH505K161A052	5.0	8.8	34.8	7	26	32	160.0	32.0	28	14.0	27.5	\	0.8
ALH106K161A072	10.0	6.8	45.0	7	26	32	320.0	32.0	33	18.0	27.5	\	0.8
ALH106K161B064	10.0	7.2	14.5	12	30	22	220.0	42.5	37	28.0	37.5	10.2	1.2
ALH206K161B064	20.0	6.9	15.1	12	30	22	440.0	42.5	37	28.0	37.5	10.2	1.2
ALH306K161B104	30.0	7.4	14.1	12	30	22	660.0	42.5	45	30.0	37.5	20.3	1.2
ALH406K161C064	40.0	7.6	13.7	12	35	16	640.0	57.5	45	30.0	52.5	20.3	1.2
ALH506K161C084	50.0	7.5	13.9	12	35	16	800.0	57.5	50	35.0	52.5	20.3	1.2
250 Vac													
ALH105K251A022	1.0	14.0	16.7	8	24	40	40.0	32.0	20	11.0	27.5	\	0.8
ALH155K251A022	1.5	10.0	23.4	8	24	40	60.0	32.0	20	11.0	27.5	\	0.8
ALH205K251A032	2.0	8.2	22.6	9	24	40	80.0	32.0	22	13.0	27.5	\	0.8
ALH335K251A052	3.3	6.2	29.9	9	26	40	132.0	32.0	28	14.0	27.5	\	0.8
ALH405K251A072	4.0	5.9	31.4	9	26	40	160.0	32.0	33	18.0	27.5	\	0.8
ALH505K251A072	5.0	5.2	35.6	9	26	40	200.0	32.0	33	18.0	27.5	\	0.8
ALH685K251A082	6.8	4.9	15.6	9	28	40	272.0	32.0	37	22.0	27.5	\	0.8
ALH106K251B084	10.0	5.6	13.7	14	30	30	300.0	42.5	40	20.0	37.5	10.2	1.2
ALH156K251B064	15.0	5.2	14.7	14	30	30	450.0	42.5	37	28.0	37.5	10.2	1.2
ALH206K251B104	20.0	4.8	15.9	14	30	30	600.0	42.5	45	30.0	37.5	20.3	1.2
ALH256K251C064	25.0	5.7	13.4	14	35	25	625.0	57.5	45	30.0	52.5	20.3	1.2
ALH306K251C064	30.0	5.3	14.4	14	35	25	750.0	57.5	45	30.0	52.5	20.3	1.2
ALH356K251C084	35.0	5.5	13.9	14	35	25	875.0	57.5	50	35.0	52.5	20.3	1.2
ALH406K251C084	40.0	5.2	14.7	14	35	25	1000.0	57.5	50	35.0	52.5	20.3	1.2

Type ALH Polypropylene Board Mount AC Filtering Capacitors

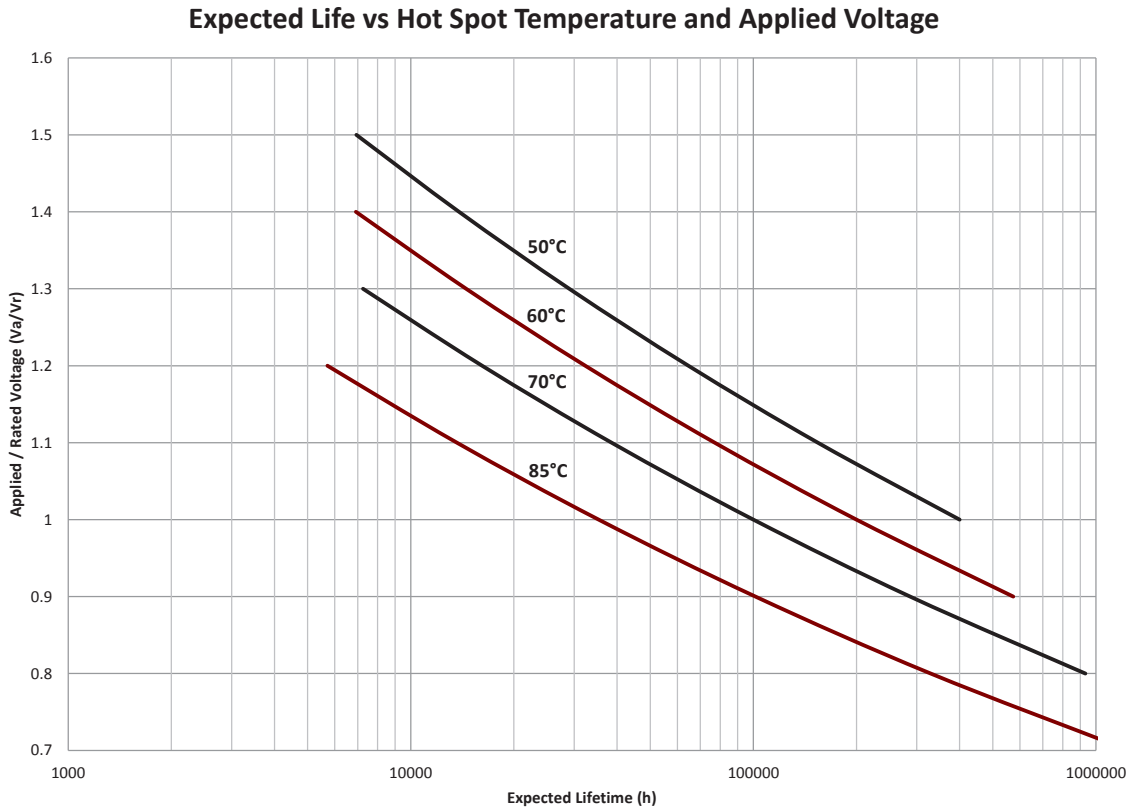
85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)
275 Vac													
ALH105K271A022	1.0	13.0	18.0	8	24	40	40.0	32.0	20	11.0	27.5	\	0.8
ALH335K271A072	3.3	6.2	29.9	9	26	40	132.0	32.0	33	18.0	27.5	\	0.8
ALH685K271A082	6.8	4.7	39.4	9	28	40	272.0	32.0	37	22.0	27.5	\	0.8
ALH106K271B084	10.0	5.9	13.0	14	30	30	300.0	42.5	40	20.0	37.5	10.2	1.2
ALH156K271B104	15.0	5.1	15.0	14	30	30	450.0	42.5	45	30.0	37.5	20.3	1.2
ALH206K271C064	20.0	6.0	12.8	14	35	25	500.0	57.5	45	30.0	52.5	20.3	1.2
ALH306K271C084	30.0	5.3	14.4	14	35	25	750.0	57.5	50	35.0	52.5	20.3	1.2
350 Vac													
ALH684K351A022	0.68	15.0	15.6	8	24	45	30.6	32.0	20	11.0	27.5	\	0.8
ALH105K351A032	1.0	10.9	17.0	9	24	45	45.0	32.0	22	13.0	27.5	\	0.8
ALH205K351A072	2.0	7.3	25.4	9	26	45	90.0	32.0	33	18.0	27.5	\	0.8
ALH225K351A072	2.2	6.9	26.8	9	26	45	99.0	32.0	33	18.0	27.5	\	0.8
ALH335K351A082	3.3	5.7	32.5	9	28	45	148.5	32.0	37	22.0	27.5	\	0.8
ALH475K351B084	4.7	6.9	11.1	14	30	34	159.8	42.5	40	20.0	37.5	10.2	1.2
ALH505K351B084	5.0	6.8	11.3	14	30	34	170.0	42.5	40	20.0	37.5	10.2	1.2
ALH685K351B064	6.8	6.2	12.3	14	30	34	231.2	42.5	37	28.0	37.5	10.2	1.2
ALH106K351B104	10.0	5.3	14.4	14	30	34	340.0	42.5	45	30.0	37.5	20.3	1.2
ALH126K351C064	12.0	6.8	11.3	14	35	28	336.0	57.5	45	30.0	52.5	20.3	1.2
ALH206K351C084	20.0	5.9	13.0	14	35	28	560.0	57.5	50	35.0	52.5	20.3	1.2
400 Vac													
ALH474K401A022	0.47	18.6	16.5	7	24	50	23.5	32.0	20	11.0	27.5	\	0.8
ALH105K401A052	1.0	10.3	18.0	9	26	50	50.0	32.0	28	14.0	27.5	\	0.8
ALH155K401A072	1.5	8.1	22.9	9	26	50	75.0	32.0	33	18.0	27.5	\	0.8
ALH225K401A072	2.2	6.4	28.9	9	26	50	110.0	32.0	33	18.0	27.5	\	0.8
ALH305K401A082	3.0	5.7	32.5	9	28	50	150.0	32.0	37	22.0	27.5	\	0.8
ALH505K401B064	5.0	6.2	12.3	14	30	40	200.0	42.5	37	28.0	37.5	10.2	1.2
ALH106K401C064	10.0	6.9	11.1	14	35	35	350.0	57.5	45	30.0	52.5	20.3	1.2
ALH156K401C084	15.0	6.1	12.5	14	35	35	525.0	57.5	50	35.0	52.5	20.3	1.2
450 Vac													
ALH224K451A022	0.22	30.9	19.4	5	24	55	12.1	32.0	20	11.0	27.5	\	0.8
ALH474K451A032	0.47	15.7	14.9	8	24	55	25.9	32.0	22	13.0	27.5	\	0.8
ALH105K451A072	1.0	9.2	25.5	8	26	55	55.0	32.0	33	18.0	27.5	\	0.8
ALH155K451A082	1.5	7.3	32.1	8	28	55	82.5	32.0	37	22.0	27.5	\	0.8
ALH335K451B064	3.3	7.4	10.3	14	30	45	148.5	42.5	37	28.0	37.5	10.2	1.2
ALH475K451B104	4.7	6.2	12.3	14	30	45	211.5	42.5	45	30.0	37.5	20.3	1.2
ALH685K451C064	6.8	7.5	10.2	14	35	38	258.4	57.5	45	30.0	52.5	20.3	1.2
ALH106K451C084	10.0	6.6	11.6	14	35	38	380.0	57.5	50	35.0	52.5	20.3	1.2

Type ALH, AC Filter Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Typical Performance Curves



Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Type BLH DC Link capacitors use the most advanced construction and technology to meet the challenges of harsh environments. Tested for 1,500-hour at 85 °C / 85% relative humidity with rated voltage applied (50% greater than competitive THB test life). The series is qualified to automotive-grade electrical and mechanical testing per standard AEC-Q200.

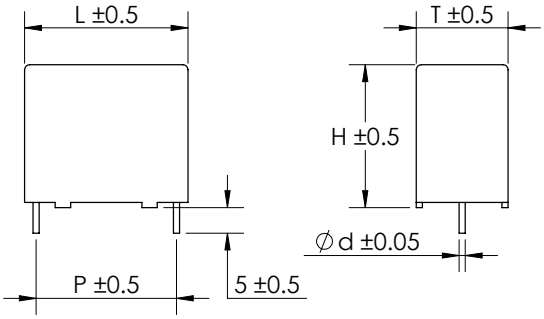
Highlights

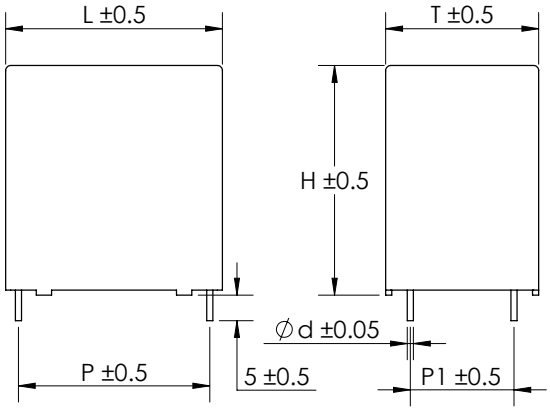
- High capacitance
- High ripple current
- Self-healing and low loss
- THB 85 ºC / 85% RH 1500 h at rated voltage

Specifications

Capacitance Range	1 to 170 µF
Capacitance Tolerance	±10% standard , ±5% optional
Rated Voltage	450 to 1200 Vdc
Operating Temperature Range	-40 °C to 105 °C (>85 ºC derate voltage 1.35% per ºC)
Maximum rms Current	see data tables
Maximum rms Voltage	230 Vac
Test Voltage between Terminals @ 25 °C	150% rated DC voltage for 10 s
Test Voltage between Terminals and Case @ 25°C	3 kVac @ 50/60 Hz for 10 s
Insulation Resistance	≥30,000 MΩxµF @ 100 Vdc 25 ºC after 1 minute
Life Expectancy	100,000 h @ 70°C hot spot, rated voltage
THB Rating	85 ºC / 85% RH - rated voltage - 1500 h
Reference Standards	IEC 61071, AEC- Q200 qualified (as noted)
RoHS Compliant	

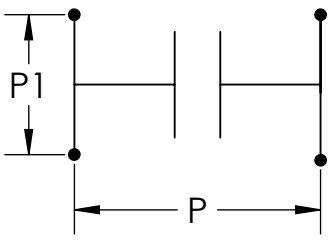
Dimensions





Construction Details	
Case Material	Plastic UL94V-0
Resin Material	Dry Resin UL94V-0
Terminal Material	Tin Plated Copper

UL Recognized E128034
construction only - unprotected



Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Numbering System

BLH	107	K	701	C13	4
Series	Capacitance	Tolerance	Voltage	Case	Leads
BLH	EIA Cap Code 305 = 3 µF 226 = 22 µF 107 = 100 µF	K = ±10% Standard J = ±5% Optional	451 = 450 Vdc 551 = 550 Vdc 601 = 600 Vdc 701 = 700 Vdc 801 = 800 Vdc 901 = 900 Vdc 102 = 1000 Vdc 112 = 1100 Vdc 122 = 1200 Vdc	Case Code	2 = 2 Leads 4 = 4 Leads

Ratings

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
450 Vdc														
BLH105K451A012	1	45	51.7	2.5	25	60	60	32	18	9	27.5	\	0.8	Yes
BLH205K451A012	2	30	50.5	3	25	60	120	32	18	9	27.5	\	0.8	Yes
BLH305K451A022	3	20	49.3	4	25	60	180	32	20	11	27.5	\	0.8	Yes
BLH405K451A022	4	18	48.4	4	25	60	240	32	20	11	27.5	\	0.8	Yes
BLH505K451A022	5	12	47.1	5	25	60	300	32	20	11	27.5	\	0.8	Yes
BLH505K451A032	5	11	46.5	5.5	25	60	300	32	22	13	27.5	\	0.8	Yes
BLH106K451A052	10	8.5	23.7	7.5	25	60	600	32	28	14	27.5	\	0.8	Yes
BLH106K451A062	10	8	23.7	9	25	60	600	32	28	18	27.5	\	0.8	Yes
BLH126K451A072	12	7	20.5	10	25	60	720	32	33	18	27.5	\	0.8	Yes
BLH156K451A082	15	6	14.5	11.5	25	60	900	32	37	22	27.5	\	0.8	Yes
BLH156K451B012	15	8.5	15.5	9.5	25	30	450	42.5	18	24	37.5	\	1	Yes
BLH186K451A082	18	6	13.8	10	28	60	1080	32	37	22	27.5	\	0.8	Yes
BLH206K451A082	20	5	12.8	11	28	60	1200	32	37	22	27.5	\	0.8	Yes
BLH226K451A082	22	5	12.8	12.5	28	60	1320	32	37	22	27.5	\	0.8	Yes
BLH256K451B054	25	5.5	12.3	12.5	30	35	875	42.5	37	22	37.5	10.2	1.2	Yes
BLH306K451B084	30	6	11.6	12	30	35	1050	42.5	40	20	37.5	10.2	1.2	Yes
BLH406K451B064	40	5.5	9.3	14	30	35	1400	42.5	37	28	37.5	10.2	1.2	Yes
BLH406K451B094	40	5.2	9.0	15	30	35	1400	42.5	44	24	37.5	10.2	1.2	Yes
BLH406K451C014	40	8	9.5	12	30	35	1400	57.5	22	43	52.5	20.3	1.2	Yes
BLH506K451B104	50	4	11.1	15	30	35	1750	42.5	45	30	37.5	20.3	1.2	Yes
BLH506K451C014	50	6.5	9.5	14	30	35	1750	57.5	22	43	52.5	20.3	1.2	Yes
BLH556K451C064	55	5	9.8	15.5	30	35	1925	57.5	45	30	52.5	20.3	1.2	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
450 Vdc														
BLH606K451C064	60	4.5	9.2	16.5	30	35	2100	57.5	45	30	52.5	20.3	1.2	Yes
BLH606K451B104	60	4	8.6	16.5	30	35	2100	42.5	45	30	37.5	20.3	1.2	Yes
BLH806K451C064	80	4	7.4	16	35	20	1600	57.5	45	30	52.5	20.3	1.2	Yes
BLH107K451C084	100	3.8	6.2	18	35	20	2000	57.5	50	35	52.5	20.3	1.2	Yes
BLH137K451C124	130	3.5	5.5	22	35	20	2600	57.5	60	35	52.5	20.3	1.2	*
BLH147K451C134	140	3.4	5.4	24	35	20	2800	57.5	65	35	52.5	20.3	1.2	*
BLH157K451C154	150	3.2	5.2	26	35	20	3000	57.5	70	35	52.5	20.3	1.2	*
BLH167K451C164	160	3.1	5.0	28	35	20	3200	57.5	80	35	52.5	20.3	1.2	*
BLH177K451C164	170	3	4.8	30	35	20	3400	57.5	80	35	52.5	20.3	1.2	*
550 Vdc														
BLH305K551A022	3	28	22.3	4	25	60	180	32	20	11	27.5	\	0.8	Yes
BLH505K551A032	5	14	16.8	6	25	60	300	32	22	13	27.5	\	0.8	Yes
BLH805K551A052	8	12.5	12.6	8.5	25	60	480	32	28	14	27.5	\	0.8	Yes
BLH106K551A072	10	8	12.5	10	25	60	600	32	33	18	27.5	\	0.8	Yes
BLH156K551A082	15	6.5	9.1	12	28	60	900	32	37	22	27.5	\	0.8	Yes
BLH156K551A084	15	5.5	8.1	13	28	60	900	32	37	22	27.5	10.2	1.2	Yes
BLH156K551B012	15	6.5	8.3	10.5	28	60	900	42.5	18	24	37.5	\	1	Yes
BLH206K551B084	20	6.5	9.8	12.5	30	35	700	42.5	40	20	37.5	10.2	1.2	Yes
BLH226K551B084	22	6.5	8.4	13.5	30	35	770	42.5	40	20	37.5	10.2	1.2	Yes
BLH256K551B084	25	6.5	7.3	14.5	30	35	875	42.5	40	20	37.5	10.2	1.2	Yes
BLH306K551B094	30	6	6.5	16	30	35	1050	42.5	44	24	37.5	10.2	1.2	Yes
BLH356K551B104	35	6	5.1	18	30	35	1225	42.5	45	30	37.5	20.3	1.2	Yes
BLH406K551B104	40	5.5	5.1	18	30	35	1400	42.5	45	30	37.5	20.3	1.2	Yes
BLH406K551C014	40	5.8	5.2	16	30	35	1400	57.5	22	43	52.5	20.3	1.2	Yes
BLH506K551B114	50	5	5.0	20	30	35	1750	42.5	50	35	37.5	20.3	1.2	Yes
BLH606K551C064	60	4.8	6.2	18	35	20	1200	57.5	45	30	37.5	20.3	1.2	Yes
BLH756K551C084	75	5	5.0	20	35	20	1500	57.5	50	35	52.5	20.3	1.2	Yes
BLH107K551C114	100	4.5	3.9	24	35	20	2000	57.5	55	45	52.5	20.3	1.2	Yes
BLH117K551C114	110	4	3.7	26	35	20	2200	57.5	55	45	52.5	20.3	1.2	Yes
BLH137K551C124	130	3.4	5.4	23	35	20	2600	57.5	60	35	52.5	20.3	1.2	*
BLH147K551C134	140	3.3	5.3	25	35	20	2800	57.5	65	35	52.5	20.3	1.2	*
BLH157K551C154	150	3.1	5.0	27	35	20	3000	57.5	70	35	52.5	20.3	1.2	*
BLH167K551C164	160	3	4.8	29	35	20	3200	57.5	80	35	52.5	20.3	1.2	*
BLH177K551C164	170	2.8	4.7	32	35	20	3400	57.5	80	35	52.5	20.3	1.2	*
600 Vdc														
BLH305K601A022	3	28	22.3	4	25	60	180	32	20	11	27.5	\	0.8	Yes
BLH405K601A022	4	26	14.3	5	25	60	240	32	20	11	27.5	\	0.8	Yes
BLH505K601A052	5	14.5	26.5	6	25	60	300	32	28	14	27.5	\	0.8	Yes
BLH805K601A052	8	12	17.8	7.5	25	60	480	32	28	14	27.5	\	0.8	Yes
BLH106K601A072	10	7.5	19.8	8.5	25	60	600	32	33	18	27.5	\	0.8	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
600 Vdc														
BLH126K601A072	12	7.5	15.8	9.5	25	60	720	32	33	18	27.5	\	0.8	Yes
BLH126K601B012	12	9.5	16.8	8	25	35	420	42.5	18	24	37.5	\	1	Yes
BLH156K601A082	15	7.5	12.1	10.5	28	60	900	32	37	22	27.5	\	0.8	Yes
BLH156K601B012	15	6	16.2	12	28	35	525	42.5	18	24	37.5	\	1	Yes
BLH206K601B084	20	6	13.8	11	30	35	700	42.5	40	20	37.5	10.2	1.2	Yes
BLH306K601B064	30	5.5	10.8	13	30	35	1050	42.5	37	28	37.5	10.2	1.2	Yes
BLH356K601B094	35	5	8.5	16.5	30	35	1225	42.5	44	24	37.5	10.2	1.2	Yes
BLH356K601C014	35	5.5	10.7	13.5	30	20	700	57.5	22	43	52.5	20.3	1.2	Yes
BLH406K601B104	40	4	7.7	18	30	35	1400	42.5	45	30	37.5	20.3	1.2	Yes
BLH506K601C084	50	6.5	7.8	14	35	20	1000	57.5	50	35	52.5	20.3	1.2	Yes
BLH606K601C084	60	5	7.8	16	35	20	1200	57.5	50	35	52.5	20.3	1.2	Yes
BLH706K601C084	70	5	6.2	18	35	20	1400	57.5	50	35	52.5	20.3	1.2	Yes
BLH806K601C114	80	4	6.3	20	35	20	1600	57.5	55	45	52.5	20.3	1.2	Yes
BLH906K601C114	90	4	4.3	24	35	20	1800	57.5	55	45	52.5	20.3	1.2	Yes
BLH107K601C094	100	4	3.7	26	35	20	2000	57.5	53	50	52.5	20.3	1.2	Yes
BLH117K601C094	110	3.5	3.6	28	35	20	2200	57.5	53	50	52.5	20.3	1.2	Yes
BLH127K601C124	120	3.4	3.5	30	35	20	2400	57.5	60	35	52.5	20.3	1.2	*
BLH137K601C134	130	3.3	3.4	32	35	20	2600	57.5	65	35	52.5	20.3	1.2	*
BLH147K601C154	140	3.2	3.4	34	35	20	2800	57.5	70	35	52.5	20.3	1.2	*
BLH147K601C144	140	3.2	3.4	34	35	20	2800	57.5	65	45	52.5	20.3	1.2	Yes
BLH157K601C164	150	3	3.3	36	35	20	3000	57.5	80	35	52.5	20.3	1.2	*
700 Vdc														
BLH105K701A012	1	54	50.6	2.5	25	60	60	32	18	9	27.5	\	0.8	Yes
BLH205K701A012	2	35	49.5	3	25	60	120	32	18	9	27.5	\	0.8	Yes
BLH305K701A022	3	28	47.0	4.5	25	60	180	32	20	11	27.5	\	0.8	Yes
BLH335K701A052	3.3	26	31.5	5.5	25	60	198	32	28	14	27.5	\	0.8	Yes
BLH505K701A052	5	14	26.5	6	25	60	300	32	28	14	27.5	\	0.8	Yes
BLH605K701A062	6	14	16.9	6	25	60	360	32	28	18	27.5	\	0.8	Yes
BLH805K701A072	8	10	12.3	9	25	60	480	32	33	18	27.5	\	0.8	Yes
BLH106K701A072	10	7	14.3	10	25	60	600	32	33	18	27.5	\	0.8	Yes
BLH106K701A082	10	6.5	10.7	12	28	60	600	32	37	22	27.5	\	0.8	Yes
BLH106K701B012	10	7.5	10.1	11.5	30	35	350	42.5	18	24	37.5	\	1	Yes
BLH126K701A082	12	6	9.2	12.5	28	60	720	32	37	22	27.5	\	0.8	Yes
BLH126K701B012	12	7	9.8	12	30	35	420	42.5	18	24	37.5	\	1	Yes
BLH156K701B042	15	9	13.7	9	30	35	525	42.5	33.5	22	37.5	\	1	Yes
BLH156K701B044	15	8	12.5	10	30	35	525	42.5	33.5	22	37.5	10.2	1.2	Yes
BLH156K701B084	15	8	12.5	10	30	35	525	42.5	40	20	37.5	10.2	1.2	Yes
BLH206K701B064	20	7.5	11.6	12	30	35	700	42.5	37	28	37.5	10.2	1.2	Yes
BLH226K701B094	22	6.5	9.3	14	30	35	770	42.5	44	24	37.5	10.2	1.2	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
700 Vdc														
BLH256K701B094	25	6	7.8	16	30	35	875	42.5	44	24	37.5	10.2	1.2	Yes
BLH306K701B104	30	5.8	8.7	16	30	35	1050	42.5	45	30	37.5	20.3	1.2	Yes
BLH306K701C014	30	8.5	9.8	12	30	20	600	57.5	22	43	52.5	20.3	1.2	Yes
BLH356K701B114	35	5.5	6.3	20	30	35	1225	42.5	50	35	37.5	20.3	1.2	Yes
BLH406K701C064	40	5	8.5	14	35	20	800	57.5	45	30	52.5	20.3	1.2	Yes
BLH456K701C064	45	5	7.6	15.5	35	20	900	57.5	45	30	52.5	20.3	1.2	Yes
BLH506K701C084	50	4.8	8.1	15	35	20	1000	57.5	50	35	52.5	20.3	1.2	Yes
BLH556K701C084	55	4.5	8.7	16	35	20	1100	57.5	50	35	52.5	20.3	1.2	Yes
BLH606K701C084	60	4	7.7	18	35	20	1200	57.5	50	35	52.5	20.3	1.2	Yes
BLH656K701C084	65	5	7.7	18	35	20	1300	57.5	50	35	52.5	20.3	1.2	Yes
BLH656K701C114	65	4	6.3	20	35	20	1300	57.5	55	45	52.5	20.3	1.2	Yes
BLH706K701C114	70	3.8	6.3	20	35	20	1400	57.5	55	45	52.5	20.3	1.2	Yes
BLH756K701C114	75	3.8	6.3	20	35	20	1500	57.5	55	45	52.5	20.3	1.2	Yes
BLH806K701C114	80	3.5	5.9	22	35	20	1600	57.5	55	45	52.5	20.3	1.2	Yes
BLH806K701C124	80	3.4	5.8	23	35	20	1600	57.5	60	35	52.5	20.3	1.2	*
BLH906K701C114	90	3.5	5.0	24	35	20	1800	57.5	55	45	52.5	20.3	1.2	Yes
BLH906K701C124	90	3.5	5.0	24	35	20	1800	57.5	60	35	52.5	20.3	1.2	*
BLH107K701C134	100	3.5	5.9	26	35	20	2000	57.5	65	35	52.5	20.3	1.2	*
BLH117K701C154	110	3.4	5.8	28	35	20	2200	57.5	70	35	52.5	20.3	1.2	*
BLH127K701C164	120	3	5.6	30	35	20	2400	57.5	80	35	52.5	20.3	1.2	*
BLH137K701C144	130	2.8	5.4	32	35	20	2600	57.5	65	45	52.5	20.3	1.2	Yes
800 Vdc														
BLH105K801A012	1	62	45.7	2	25	60	60	32	18	9	27.5	\	0.8	Yes
BLH205K801A022	2	31	42.5	3.5	25	60	120	32	20	11	27.5	\	0.8	Yes
BLH305K801A032	3	21	35.4	4.5	25	60	180	32	22	13	27.5	\	0.8	Yes
BLH335K801A052	3.3	25	32.1	4	25	60	198	32	28	14	27.5	\	0.8	Yes
BLH505K801A052	5	12	26.5	6	25	60	300	32	28	14	27.5	\	0.8	Yes
BLH605K801A062	6	10.5	18.6	7.5	25	60	360	32	28	18	27.5	\	0.8	Yes
BLH805K801A072	8	9.5	14.3	9.5	25	60	480	32	33	18	27.5	\	0.8	Yes
BLH905K801A072	9	8.5	9.1	10	25	60	540	32	33	18	27.5	\	0.8	Yes
BLH106K801A082	10	9.5	8.0	11.5	28	60	600	32	37	22	27.5	\	0.8	Yes
BLH106K801B032	10	12.5	15.8	8	30	35	350	42.5	32	19	37.5	\	1	Yes
BLH156K801B084	15	8	12.5	10	30	35	525	42.5	40	20	37.5	10.2	1.2	Yes
BLH206K801B064	20	7	11.6	12	30	35	700	42.5	37	28	37.5	10.2	1.2	Yes
BLH206K801B094	20	6.5	11.8	13.5	30	35	700	42.5	44	24	37.5	10.2	1.2	Yes
BLH226K801B094	22	6	9.3	14	30	35	770	42.5	44	24	37.5	10.2	1.2	Yes
BLH256K801B104	25	5.5	7.5	14	30	35	875	42.5	45	30	37.5	20.3	1.2	Yes
BLH306K801B104	30	4.5	8.7	16	30	35	1050	42.5	45	30	37.5	20.3	1.2	Yes
BLH356K801C064	35	6.5	7.6	14.2	35	20	700	57.5	45	30	52.5	20.3	1.2	Yes
BLH406K801C064	40	6	8.5	14	35	20	800	57.5	45	30	52.5	20.3	1.2	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
800 Vdc														
BLH456K801C064	45	5.5	7.6	15.5	35	20	900	57.5	45	30	52.5	20.3	1.2	Yes
BLH476K801C084	47	5	6.5	17.5	35	20	940	57.5	50	35	52.5	20.3	1.2	Yes
BLH506K801C084	50	5	7.8	16	35	20	1000	57.5	50	35	52.5	20.3	1.2	Yes
BLH556K801C084	55	4.6	6.9	17	35	20	1100	57.5	50	35	52.5	20.3	1.2	Yes
BLH656K801C124	65	4	7.3	19	35	20	1300	57.5	60	35	52.5	20.3	1.2	*
BLH656K801C114	65	4	6.3	20	35	20	1300	57.5	55	45	52.5	20.3	1.2	Yes
BLH706K801C114	70	3.8	6.3	20	35	20	1400	57.5	55	45	52.5	20.3	1.2	Yes
BLH706K801C124	70	3.8	6.3	20	35	20	1400	57.5	60	35	52.5	20.3	1.2	*
BLH756K801C114	75	3.8	6.0	22	35	20	1500	57.5	55	45	52.5	20.3	1.2	Yes
BLH756K801C134	75	3.8	6.0	22	35	20	1500	57.5	65	35	52.5	20.3	1.2	*
BLH806K801C144	80	3.5	5.9	23	35	20	1600	57.5	65	45	52.5	20.3	1.2	Yes
BLH806K801C154	80	3.5	5.9	23	35	20	1600	57.5	70	35	52.5	20.3	1.2	*
BLH906K801C144	90	3.3	5.0	25	35	20	1800	57.5	65	45	52.5	20.3	1.2	Yes
BLH906K801C164	90	3.3	5.0	25	35	20	1800	57.5	80	35	52.5	20.3	1.2	*
BLH107K801C144	100	3.2	4.8	28	35	20	2000	57.5	65	45	52.5	20.3	1.2	Yes
900 Vdc														
BLH105K901A012	1	63	46.8	2	25	60	60	32	18	9	27.5	\	0.8	Yes
BLH205K901A022	2	25	44.4	3	25	60	120	32	20	11	27.5	\	0.8	Yes
BLH305K901A032	3	18.5	21.6	5	25	60	180	32	22	13	27.5	\	0.8	Yes
BLH335K901A042	3.3	18.5	21.6	5	25	60	198	32	24.5	15	27.5	\	0.8	Yes
BLH505K901A062	5	12.5	16.3	7	25	60	300	32	28	18	27.5	\	0.8	Yes
BLH605K901A072	6	11	14.2	8	25	60	360	32	33	18	27.5	\	0.8	Yes
BLH805K901A082	8	10	9.1	10.5	28	60	480	32	37	22	27.5	\	0.8	Yes
BLH106K901A082	10	10	6.9	12	28	60	600	32	37	22	27.5	\	0.8	Yes
BLH106K901B082	10	12	11.5	8.5	30	35	350	42.5	40	20	37.5	\	1	Yes
BLH106K901B084	10	11.5	9.6	9.5	30	35	350	42.5	40	20	37.5	10.2	1.2	Yes
BLH156K901B092	15	8	11.3	10.5	30	35	525	42.5	44	24	37.5	\	1	Yes
BLH156K901B094	15	7.5	9.3	12	30	35	525	42.5	44	24	37.5	10.2	1.2	Yes
BLH186K901B092	18	8	11.3	10.5	30	35	630	42.5	44	24	37.5	\	1	Yes
BLH186K901B094	18	7.5	9.3	12	30	35	630	42.5	44	24	37.5	10.2	1.2	Yes
BLH206K901B102	20	6	8.5	14	30	35	700	42.5	45	30	37.5	\	1	Yes
BLH206K901B104	20	5.5	8.1	15	30	35	700	42.5	45	30	37.5	20.3	1.2	Yes
BLH206K901C014	20	8.6	10.5	12	30	20	400	57.5	22	43	52.5	20.3	1.2	Yes
BLH256K901B104	25	5.5	6.3	17	30	35	875	42.5	45	30	37.5	20.3	1.2	Yes
BLH306K901B114	30	5	5.5	19	30	35	1050	42.5	50	35	37.5	20.3	1.2	Yes
BLH306K901C064	30	5.5	8.1	15	35	20	600	57.5	45	30	52.5	20.3	1.2	Yes
BLH356K901C084	35	5.5	7.6	15.5	35	20	700	57.5	50	35	52.5	20.3	1.2	Yes
BLH406K901C084	40	6.5	6.0	16	35	20	800	57.5	50	35	52.5	20.3	1.2	Yes
BLH506K901C084	50	3.6	8.6	18	35	20	1000	57.5	50	35	52.5	20.3	1.2	Yes

***AEC Q200 may be available**

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
900 Vdc														
BLH556K901C124	55	3.5	7.9	19	35	20	1100	57.5	60	35	52.5	20.3	1.2	*
BLH556K901C114	55	3.4	7.4	20	35	20	1100	57.5	55	45	52.5	20.3	1.2	Yes
BLH606K901C114	60	3.4	7.4	20	35	20	1200	57.5	55	45	52.5	20.3	1.2	Yes
BLH656K901C154	65	3.3	7.0	22	35	20	1300	57.5	70	35	52.5	20.3	1.2	*
BLH706K901C114	70	3.2	6.8	24	35	20	1400	57.5	55	45	52.5	20.3	1.2	Yes
BLH706K901C164	70	3.2	6.8	24	35	20	1400	57.5	80	35	52.5	20.3	1.2	*
BLH806K901C144	80	3.2	6.7	25	35	20	1600	57.5	65	45	52.5	20.3	1.2	Yes
1000 Vdc														
BLH105K102A022	1	45	35.6	2.5	25	80	80	32	20	11	27.5	\	0.8	Yes
BLH205K102A032	2	30	27.2	3.5	25	80	160	32	22	13	27.5	\	0.8	Yes
BLH305K102A042	3	25	16.0	5	25	80	240	32	24.5	15	27.5	\	0.8	Yes
BLH505K102A072	5	14	11.2	8	25	80	400	32	33	18	27.5	\	0.8	Yes
BLH805K102A082	8	12	8.3	10	28	80	640	32	37	22	27.5	\	0.8	Yes
BLH106K102B082	10	12	11.5	8.5	30	40	400	42.5	40	20	37.5	\	1	Yes
BLH106K102B084	10	11.5	9.6	9.5	30	40	400	42.5	40	20	37.5	10.2	1.2	Yes
BLH126K102B094	12	9	10.1	10.5	30	40	480	42.5	44	24	37.5	10.2	1.2	Yes
BLH156K102B092	15	8	11.3	10.5	30	40	600	42.5	44	24	37.5	\	1	Yes
BLH156K102B094	15	7.5	9.3	12	30	40	600	42.5	44	24	37.5	10.2	1.2	Yes
BLH156K102B104	15	7.5	6.8	14	30	40	600	42.5	45	30	37.5	20.3	1.2	Yes
BLH156K102C014	15	8.5	7.9	12	30	40	600	57.5	22	43	52.5	20.3	1.2	Yes
BLH206K102B104	20	6.5	6.8	15	30	40	800	42.5	45	30	37.5	20.3	1.2	Yes
BLH256K102B114	25	5.5	5.6	18	30	40	1000	42.5	50	35	37.5	20.3	1.2	Yes
BLH306K102C064	30	5.5	8.1	15	35	25	750	57.5	45	30	52.5	20.3	1.2	Yes
BLH356K102C084	35	5.5	7.1	16	35	25	875	57.5	50	35	52.5	20.3	1.2	Yes
BLH406K102C084	40	5	7.8	16	35	25	1000	57.5	50	35	52.5	20.3	1.2	Yes
BLH406K102C114	40	5	7.6	17	35	25	1000	57.5	55	45	52.5	20.3	1.2	Yes
BLH506K102C114	50	4.5	6.2	19	35	25	1250	57.5	55	45	52.5	20.3	1.2	Yes
BLH506K102C134	50	4.5	6.2	19	35	25	1250	57.5	65	35	52.5	20.3	1.2	*
BLH556K102C154	55	4.4	6.1	20	35	25	1375	57.5	70	35	52.5	20.3	1.2	*
BLH606K102C164	60	4	5.2	22	35	25	1500	57.5	80	35	52.5	20.3	1.2	*
BLH606K102C144	60	4	5.2	22	35	25	1500	57.5	65	45	52.5	20.3	1.2	Yes
1100 Vdc														
BLH105K112A022	1	45	35.6	2.5	25	80	80	32	20	11	27.5	\	0.8	Yes
BLH155K112A032	1.5	30	27.2	3.5	25	80	120	32	22	13	27.5	\	0.8	Yes
BLH205K112A042	2	25	25.0	4	25	80	160	32	24.5	15	27.5	\	0.8	Yes
BLH225K112A052	2.2	16.5	24.2	5	25	80	176	32	28	14	27.5	\	0.8	Yes
BLH335K112A062	3.3	11.5	20.6	6.5	25	80	264	32	28	18	27.5	\	0.8	Yes
BLH405K112A072	4	10.5	14.9	8	25	80	320	32	33	18	27.5	\	0.8	Yes
BLH505K112A082	5	9.5	14.6	8.5	28	80	400	32	37	22	27.5	\	0.8	Yes
BLH685K112B044	6.8	13.5	5.1	12	30	40	272	42.5	33.5	22	37.5	10.2	1.2	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

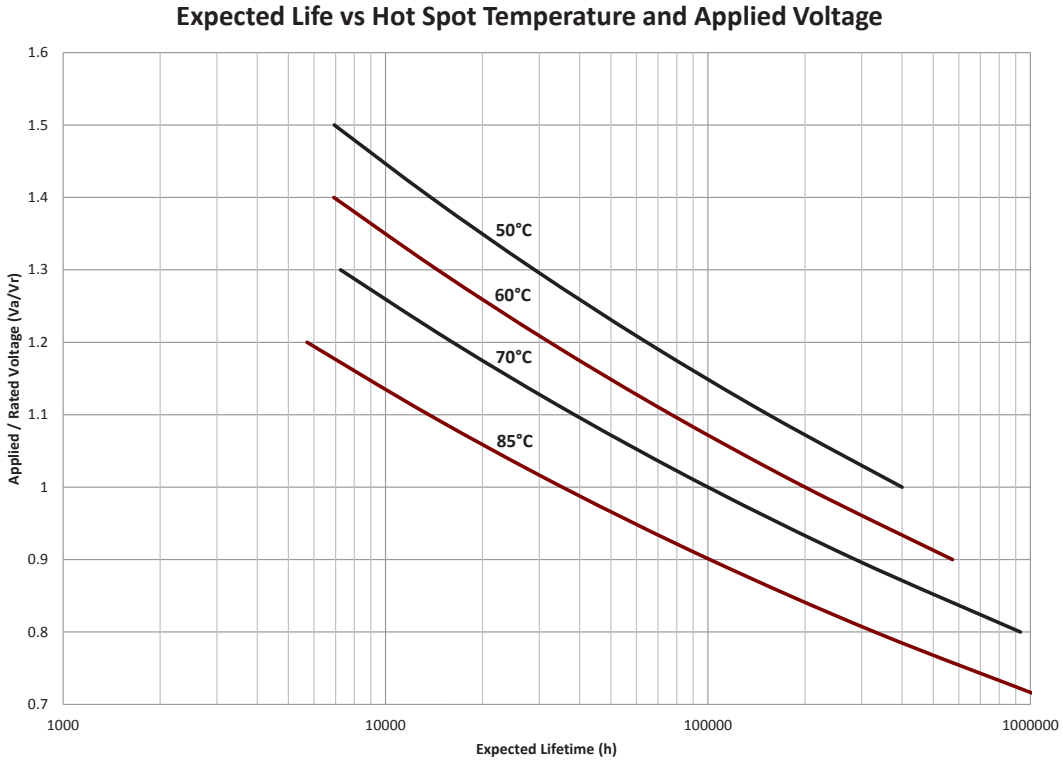
Part Number	Cap C (µF)	Typ ESR 10 kHz (mΩ)	Thermal Res (°C/W)	Irms 10 kHz 70 °C (A)	Typ ESL (nH)	dv/dt (V/µs)	Peak Current (A)	Dimensions L (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)	AEC Q200
1100 Vdc														
BLH805K112B082	8	14	6.5	10.5	30	40	320	42.5	40	20	37.5	\	1	Yes
BLH805K112B084	8	12.5	5.1	12.5	30	40	320	42.5	40	20	37.5	10.2	1.2	Yes
BLH805K112B054	8	12.5	5.1	12.5	30	40	320	42.5	37	22	37.5	10.2	1.2	Yes
BLH905K112B054	9	12.2	5.0	12.8	30	40	360	42.5	37	22	37.5	10.2	1.2	Yes
BLH106K112B092	10	9	5.7	14	30	40	400	42.5	44	24	37.5	\	1	Yes
BLH106K112B094	10	8.5	5.2	15	30	40	400	42.5	44	24	37.5	10.2	1.2	Yes
BLH126K112B104	12	7.5	5.5	15.5	30	40	480	42.5	45	30	37.5	20.3	1.2	Yes
BLH156K112B104	15	7	5.4	16	30	40	600	42.5	45	30	37.5	20.3	1.2	Yes
BLH186K112B114	18	7.5	5.5	15.5	30	40	720	42.5	50	35	37.5	20.3	1.2	Yes
BLH206K112B114	20	7.2	5.5	16.5	35	40	800	42.5	50	35	37.5	20.3	1.2	Yes
BLH206K112C064	20	8.5	8.2	12	35	25	500	57.5	45	30	52.5	20.3	1.2	Yes
BLH256K112C084	25	8.2	8.0	13	35	25	625	57.5	50	35	52.5	20.3	1.2	Yes
BLH306K112C084	30	5	8.9	15	35	25	750	57.5	50	35	52.5	20.3	1.2	Yes
BLH356K112C124	35	4.9	8.7	16	35	25	875	57.5	60	35	52.5	20.3	1.2	*
BLH406K112C134	40	5.5	6.3	17	35	25	1000	57.5	65	35	52.5	20.3	1.2	*
BLH406K112C114	40	5.5	6.3	17	35	25	1000	57.5	55	45	52.5	20.3	1.2	Yes
BLH456K112C154	45	5.4	6.2	18	35	25	1125	57.5	70	35	52.5	20.3	1.2	*
BLH506K112C144	50	5.2	5.8	19.5	35	25	1250	57.5	65	45	52.5	20.3	1.2	Yes
1200 Vdc														
BLH105K122A022	1	32.5	15.2	4.5	25	90	90	32	20	11	27.5	\	0.8	Yes
BLH205K122A042	2	32.5	12.3	5	25	90	180	32	24.5	15	27.5	\	0.8	Yes
BLH225K122A062	2.2	17	19.4	5.5	25	90	198	32	28	18	27.5	\	0.8	Yes
BLH305K122A062	3	16	12.8	7	25	90	270	32	28	18	27.5	\	0.8	Yes
BLH335K122A072	3.3	13.5	11.6	8	25	90	297	32	33	18	27.5	\	0.8	Yes
BLH505K122A082	5	12	8.3	10	28	90	450	32	37	22	27.5	\	0.8	Yes
BLH505K122B042	5	15.5	11.5	7.5	30	45	225	42.5	33.5	22	37.5	\	1	Yes
BLH605K122B082	6	15.5	11.5	7.5	30	45	270	42.5	40	20	37.5	\	1	Yes
BLH705K122B054	7	15.2	11.0	8	30	45	315	42.5	37	22	37.5	10.2	1.2	Yes
BLH805K122B094	8	12.5	9.9	9	30	45	360	42.5	44	24	37.5	10.2	1.2	Yes
BLH106K122B094	10	10.5	9.5	10	30	45	450	42.5	44	24	37.5	10.2	1.2	Yes
BLH106K122B104	10	8	8.7	12	30	45	450	42.5	45	30	37.5	20.3	1.2	Yes
BLH156K122B114	15	6.5	6.8	15	30	45	675	42.5	50	35	37.5	20.3	1.2	Yes
BLH206K122C064	20	8.5	9.7	13	35	30	600	57.5	45	30	52.5	20.3	1.2	Yes
BLH256K122C084	25	6.5	9.1	15	35	30	750	57.5	50	35	52.5	20.3	1.2	Yes
BLH306K122C114	30	5.5	8.1	17	35	30	900	57.5	55	45	52.5	20.3	1.2	Yes
BLH306K122C124	30	5.5	8.1	17	35	30	900	57.5	60	35	52.5	20.3	1.2	*
BLH356K122C114	35	5	6.9	18	35	30	1050	57.5	55	45	52.5	20.3	1.2	Yes
BLH356K122C154	35	5	6.9	18	35	30	1050	57.5	70	35	52.5	20.3	1.2	*
BLH406K122C144	40	4.5	5.6	20	35	30	1200	57.5	65	45	52.5	20.3	1.2	Yes
BLH456K122C144	45	4.3	5.5	22	35	30	1350	57.5	65	45	52.5	20.3	1.2	Yes

*AEC Q200 may be available

Type BLH, DC Link Capacitors for Harsh Environments

85 °C / 85% RH , 1500h @ Vr, AEC-Q200 Qualified

Typical Performance Curves



Type 953B, Metallized Polypropylene Film Capacitors

AC Rated, Radial Leaded Box, UL 810 Fail Safe, Rated 10,000 AFC

Type 953B radial leaded metallized polypropyene capacitors are designed for UPS systems and other AC output filtering applications. With an integrated fused metallization pattern, this product features UL 810 recognition for fail-safe operation at temperatures up to 85 ºC.

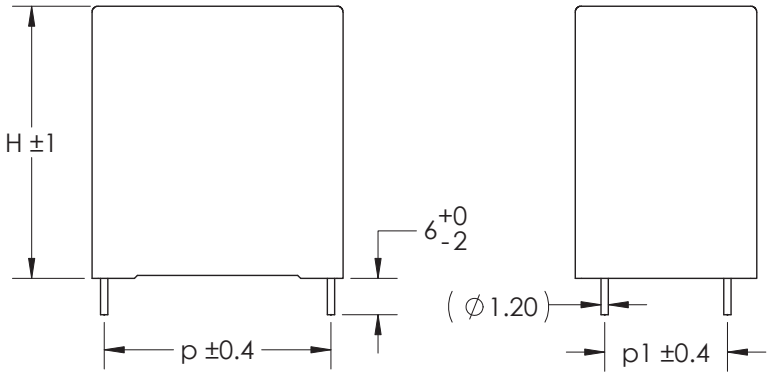
Highlights

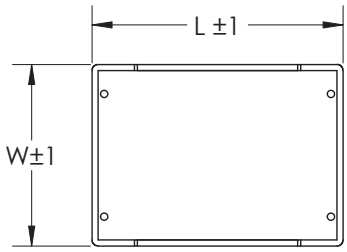
– Fuse protection
– UL 810 recognized
– Low dissipation factor
– Self healing

Specifications

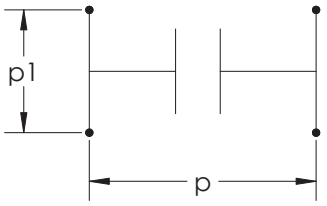
Capacitance Range	2.5 µF to 50 µF
Capacitance Tolerance	±10 % (±5% optional)
Rated Voltage	160 Vac, 250 Vac, 275 Vac
Operating Temperature Range	–40 ºC to 85 ºC
IEC Climatic Category	40/85/56 (test conditions 40 ºC, 93% RH, rated voltage, 1000 hours)
Sevice Life Objective	10,000 h at rated voltage and 85 ºC
Protection	UL 810 file number E71645
RoHS Compliant	

Dimensions





Construction Details	
Case Material	Plastic UL 94V-0
Resin Material	Dry Resin UL 94V-0
Terminal Material	Tin Plated Copper



Type 953B, Metallized Polypropylene Film Capacitors

AC Rated, Radial Leaded Box, UL 810 Fail Safe, Rated 10,000 AFC

Part Numbering System

953B	X	W	2P5	K	SF	-F
Series	Voltage Code I = 160 Vdc Q = 250 Vdc X = 275 Vdc	Cap Decimal P = 0. W = No Decimal Point	Cap Rating in µF 2P5 = 2.5 µF 8 = 8 µF 25 = 25 µF	Tolerance K = ±10% J = ±5%	Metallization Type SF = Segmented Fused	RoHs Compliant

Case Code	W	H	L	p	p1	d
A	20	40	41.5	37.5	10.2	1.2
B	28	37	41.5	37.5	10.2	1.2
C	24	44	41.5	37.5	10.2	1.2
D	30	45	41.5	37.5	20.3	1.2
E	30	45	57.5	52.5	20.3	1.2
F	35	50	57.5	52.5	20.3	1.2

Ratings

Part Number	Cap 1 kHz (µF)	Typ. ESR 10 kHz (mΩ)	Typ. ESL (nH)	Ipeak (A)	dV/dt (V/µs)	Rth (°C/W)	Irms 10 kHz 85°C (A)	Case Code
160 VAC								
953BIW10KSF-F	10	9	30	285	29	16	8.0	A
953BIW16KSF-F	16	7	30	475	30	14	9.3	B
953BIW17P5KSF-F	17.5	7	30	570	33	13	9.6	C
953BIW25KSF-F	25	6	30	760	30	12	10.4	D
953BIW38KSF-F	38	7	38	760	20	9	11.3	E
953BIW50KSF-F	50	6	38	1045	21	8	12.2	F
250 VAC								
953BQW4P5KSF-F	4.5	12	30	190	42	16	7.1	A
953BQW7KSF-F	7	9	30	285	41	14	8.3	B
953BQW7P5KSF-F	7.5	9	30	380	51	13	8.7	C
953BQW10KSF-F	10	8	30	475	48	12	9.0	D
953BQW16P5KSF-F	16.5	8	38	475	29	9	10.3	E
953BQW22KSF-F	22	7	38	665	30	8	11.3	F
275 VAC								
953BXW2P5KSF-F	2.5	14	30	190	76	16	6.4	A
953BXW3P5KSF-F	3.5	11	30	190	54	14	7.4	B
953BXW4KSF-F	4	11	30	285	71	13	7.9	C
953BXW6KSF-F	6	8	30	380	63	12	9.0	D
953BXW9KSF-F	9	10	38	380	42	9	9.5	E
953BXW12KSF-F	12	8	38	475	40	8	10.5	F

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.

MPX

Boxed Metallized Polypropylene Film Capacitors

CLASS X2 - 85/85 - THB

FEATURES	85/85 THB – Safety Agency Approved Metalized Polypropylene
APPLICATIONS	**MPX** for X2, Across the Line **MPXB** for In Series with Mains EMI Filters – Outdoor Applications

Operating Temperature Range	-40°C to +110°C			
Capacitance Tolerance	±10% or ±20% at 1 kHz, 25°C			
AC voltage (50/60 Hz)	**UL/CSA**	**ENEC**	**CQC**	
	275/305	275/305	305	
Dissipation Factor at 1 kHz and 25°C	**Tan δ**			
	0.01uF≤Cn≤1.0 uF	≤0.1%		
	1.0uF<Cn≤10.0 uF	≤0.3%		
	Cn>10.0 uF	≤0.4%		
Insulation Resistance @25°C (<70% RH) for 1 minute at 100VDC applied	**Capacitance**	**Terminal to Terminal**	**Terminal to Case**	
	≤0.33uF	15,000 MΩ	>30000 MΩ at 100VDC >5000 MΩ at 500VDC	
	>0.33uF	5,000 MΩxuF	>30000 MΩ at 100VDC >5000 MΩ at 500VDC	
Self-Inductance	≤1 nano-Henry per mm of lead spacing and lead length			
Dielectric Strength	**Terminal to Terminal**	1312 VDC applied for 60 seconds or 2000 VDC applied for 2 seconds Cut-off current: 2A ac or 10mAdc Current limiting resistance: 1Ω/V		
	Terminal to case	2050VDC (50/60 Hz) applied between the terminals and case for 60 Seconds and 25°C		
Life Expectancy	**100,000 hours at Un @Hot-Spot temperature T=85**°C			
	Capacitance change	≤10% of initially measured value		
	Dissipation Factor	≤1.0% at 1kHz		
	Insulation Resistance	≥100% of initially specified value (T-T) ≥3000 MΩ (Terminal to case)		
Humidity test	Temperature: 85°C + 2°C; Humidity: 85% + 2% Loading Voltage: 240Vac (50Hz/60Hz) Duration: 1000 hours			
	Capacitance change	≤10% of initially measured value		
	Dissipation Factor	≤1.0% at 1kHz		
	Insulation Resistance	≥50% of initially specified value (T-T) ≥15000 MΩ (Terminal to case)		
Impulse voltage (24 pulses)	C≤ 1uF Vp=2.5kVDC C> 1uF Vp=2.5kV √C			
Capacitance temperature coefficient	-200ppm/°C, ±100ppm/°C			
Construction	Metallized Polypropylene film			
Electrodes	Vacuum deposited Metal layers			
Coating	Flame retardant Solvent resistant plastic case with epoxy end fill (UL94V-0)			
Lead terminations	Tinned copper clad steel leads			

Special Order Options

Americas / EU
Phone: 1-508-996-8561
Email: cdena@cde.com

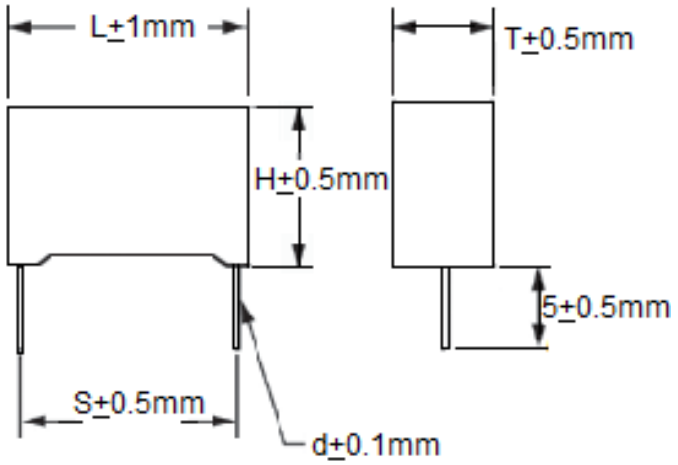
CDE CORNELL DUBILIER
ENERGIZING IDEAS
ILLINOIS CAPACITOR

Asia
Phone: 852-2793-0931
Email: cdeasia@cde.com

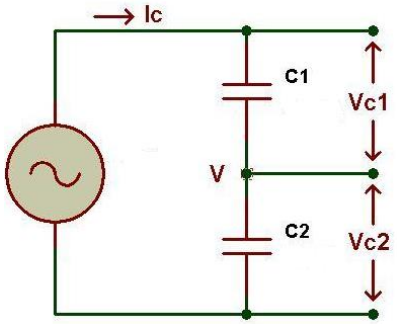
MPX

Boxed Metallized Polypropylene Film Capacitors

CLASS X2 - 85/85 - THB

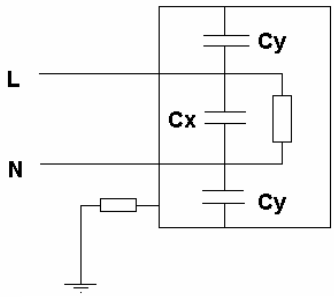


All dimensions in (mm)
***17mm lead length available upon request**



MPXB Series
In Series with Mains; 85/85 THB

EMI Suppression



MPX Series
Standard 85/85 X2 circuit

Safety agency	Standard	Voltage	Class	Certificate number
UL/CSA	UL 60384-14(.0047 to 46uF)	275/305	FOWX2*/FOWX8*	E317135
ENEC (VDE)	DIN EN60384-14 (VDE 0565-1-1):2014-04; EN60384-14:2013-08 DIN EN60384-14/A1 (VDE 0565-1-1/A1):2017-04; EN60384-14:2013/A1:2016 IEC 60384-14:2013 IEC 60384-14:2013/AMD1:2016	275/305	X2	40046436
		275/305		40046436
CQC	GB/T14472-1998	275	X2	
	GB/T14472-1998 (.0047 to 46uF)	305		

*Antenna coupling, Line bypass, across the line
^Electromagnetic interference filter

Americas / EU
Phone: 1-508-996-8561
Email: cdena@cde.com

CDE ENERGIZING IDEAS
CORNELL DUBILIER
ILLINOIS CAPACITOR

Asia
Phone: 852-2793-0931
Email: cdeasia@cde.com

MPX

Class X2 85/85 THB

Capacitance (µF)	IC PART NUMBER	dv/dt (v/µ sec.)	Dims LxHxT (mm)	S (MM)	d (MM)
0.01	MPX103K305D	500	13x11x5	10	0.6
0.022	MPX223K305D	500	13x11x5	10	0.6
0.033	MPX333K305D	500	13x11x5	10	0.6
0.047	MPX473K305D	500	13x12x6	10	0.6
0.047	MPX473K305E	400	18x12x6	15	0.6
0.068	MPX683K305D	500	13x12x6	10	0.6
0.068	MPX683K305E	400	18x12x6	15	0.6
0.082	MPX823K305D	500	13x12x6	10	0.6
0.082	MPX823K305E	400	18x12x6	15	0.6
0.1	MPX104K305D	500	13x12x6	10	0.6
0.1	MPX104K305E	400	18x12x6	15	0.6
0.15	MPX154K305D	500	13x14x8	10	0.6
0.15	MPX154K305E	400	18x12x6	15	0.6
0.22	MPX224K305E	400	18x14x8	15	0.8
0.22	MPX224K305G	200	26x16.5x7	22.5	0.8
0.27	MPX274K305E	400	18x14.5x8.5	15	0.8
0.27	MPX274K305G	200	26x16.5x7	22.5	0.8
0.33	MPX334K305E	400	18x16x10	15	0.8
0.33	MPX334K305G	200	26x17x8.5	22.5	0.8
0.47	MPX474K305E	400	18x19x11	15	0.8
0.47	MPX474K305G	200	26x19x10	22.5	0.8
0.56	MPX564K305E	400	18x19x11	15	0.8
0.56	MPX564K305G	200	26x19x10	22.5	0.8
0.68	MPX684K305E	400	18x22x12.5	15	0.8
0.68	MPX684K305G	200	26x20x11	22.5	0.8
0.82	MPX824K305E	400	18x22x12.5	15	0.8
0.82	MPX824K305G	200	26x20x11	22.5	0.8

Capacitance (µF)	IC PART NUMBER	dv/dt (v/µ sec.)	Dims LxHxT (mm)	S (MM)	d (MM)
1	MPX105K305G	200	26x22x12	22.5	0.8
1	MPX105K305H	150	32x20x11	27.5	0.8
1.2	MPX125K305G	200	26x23x13	22.5	0.8
1.2	MPX125K305H	150	32x22x13	27.5	0.8
1.5	MPX155K305G	200	26x24x14	22.5	0.8
1.5	MPX155K305H	130	32x22x13	27.5	0.8
2.2	MPX225K305H	150	32x28x14	27.5	0.8
3.3	MPX335K305H	150	32x33x18	27.5	0.8
4.7	MPX475K305H	150	32x37x22	27.5	0.8
4.7	MPX475K305N	100	42.5x32x19	37.5	1
6.8	MPX685K305N	100	42.5x44x24	37.5	1
10	MPX106K305N	100	42.5x45x30	37.5	1
12	MPX126K305N	100	42.5x45x30	37.5	1
12	MPX126K305R	100	57.5x45x30	52.5	1.2
15	MPX156K305N	100	42.5x45x30	37.5	1
15	MPX156K305R	100	57.5x45x30	52.5	1.2
18	MPX186K305R	100	57.5x45x30	52.5	1.2
20	MPX206K305R	100	57.5x45x30	52.5	1.2
22	MPX226K305R	100	57.5x45x30	52.5	1.2
25	MPX256K305R	100	57.5x45x30	52.5	1.2
30	MPX306K305R	100	57.5x45x30	52.5	1.2
33	MPX336K305R	100	57.5x50x35	52.5	1.2
39	MPX396K305R	100	57.5x50x35	52.5	1.2
40	MPX406K305R	100	57.5x50x35	52.5	1.2
45	MPX456K305R	100	57.5x53x50	52.5	1.2
45	MPX456K305RB	100	57.5x60x45	52.5	1.2

Americas / EU
Phone: 1-508-996-8561
Email: cdena@cde.com

CDE ENERGIZING IDEAS
CORNELL DUBILIER
ILLINOIS CAPACITOR

Asia
Phone: 852-2793-0931
Email: cdeasia@cde.com

MPXB

Capacitive Divider 85/85 THB X2

Capacitance (µF)	IC PART NUMBER	dv/dt (v/µ sec.)	Dims LxHxT (mm)	S (MM)	d (MM)
0.1	MPXB104K305E	400	18x13.5x7.5	15	0.8
0.15	MPXB154K305E	400	18x14.5x8.5	15	0.8
0.22	MPXB224K305E	400	18x16x10	15	0.8
0.33	MPXB334K305E	400	18x19x11	15	0.8
0.47	MPXB474K305G	200	26x20x11	22.5	0.8
0.56	MPXB564K305G	200	26x20x11	22.5	0.8
0.68	MPXB684K305G	200	26x22x12	22.5	0.8
0.82	MPXB824K305G	200	26x22x12	22.5	0.8

Capacitance (µF)	IC PART NUMBER	dv/dt (v/µ sec.)	Dims LxHxT (mm)	S (MM)	d (MM)
1	MPXB105K305G	200	26x23x13	22.5	0.8
1	MPXB105K305H	100	32x22x13	27.5	0.8
1.2	MPXB125K305H	100	32x28x14	27.5	0.8
1.5	MPXB155K305H	100	32x28x14	27.5	0.8
1.8	MPXB185K305H	100	32x33x18	27.5	0.8
2	MPXB205K305H	100	32x33x18	27.5	0.8
2.2	MPXB225K305H	100	32x33x18	27.5	0.8

Americas / EU
Phone: 1-508-996-8561
Email: cdena@cde.com

CDE ENERGIZING IDEAS
CORNELL DUBILIER
IC ILLINOIS CAPACITOR

Asia
Phone: 852-2793-0931
Email: cdeasia@cde.com

TYPE MXH, X2, EMI, RFI Suppression Capacitors, Harsh Environment

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

The MXH 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 and is compliant with AEC-Q200 requirements. Applications include “across the line” class X2 and EMI, RFI suppression.

Highlights

- THB 2,000 Hr @ 85˚C, 85% RH, and Vr
- Automotive Grade (AEC-Q200)
- High stability of capacitance
- High operating temperature: 110 °C
- Self-healing property
- Flame-retardant plastic case and resin
- Suitable for harsh environmental conditions

Specifications

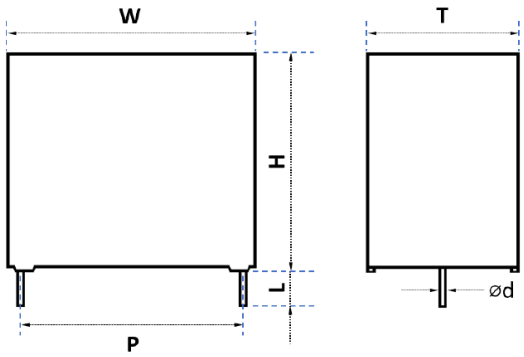
Capacitance Range	0.1 µF to 15 µF
Capacitance Tolerance	±10 % (±20% optional)
Rated Voltage	305 Vac, 630 Vdc
Operating Temperature Range	–40 ºC to +110 ºC (+85 °C to 110 °C, voltage derating factor of 1.35% per Deg. C)
Life Expectancy	100,000h at rated voltage and hot spot temperature ≤85 °C
Voltage Between Terminals UTT	DC Voltage: $4.3U_R$ for 60s or $\sqrt{2}(2U_R + 1000Vac)$ VDC for 2s, charge current must be 1A max. Withstanding DC voltage (cut-off current 10mA) Rise time 100V/s
Voltage Between Terminals and Case UTC	$2U_R$ + 1500Vac, 60s at 20 °C
Dissipation Factor	0.001 @ 1KHz @ 20 ˚C
Insulation Resistance	C ≤0.33µF at 100V; 1 min. > 15000 MΩ C >0.33µF at 100V; 1 min. > 5000 MΩ*µF
IEC Climatic Category	40/110/56 IEC60068-1
THB Rating	+85ºC / 85% RH @ rated voltage for 2,000hrs +24/-0 Capacitance Change Rate: (ΔC/C): ≤±10% DF Change (Δtgδ): ≤240*10-4 at 10 KHz (C ≤ 1µF) DF Change (Δtgδ): ≤150*10-4 at 1 KHz (C > 1µF) IR: ≥ 50% of initial limit
Damp Heat, Steady State **(Reference: IEC 60384-14; 2013/AMD1:2016)**	+40ºC / 93% RH @ rated voltage for 1,344 hrs +24/-0 Capacitance Change Rate: (ΔC/C): ≤±5% DF Change (Δtgδ): ≤80*10-4 at 10 KHz (C ≤ 1µF) DF Change (Δtgδ): ≤50*10-4 at 1 KHz (C > 1µF) 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 CSA-E60384-14	E171988
VDE	IEC 60384-14:2013 IEC 60384-14:2013/AMD1:2016	40055249
CQC	IEC 60384-14:2013/ AMD1:2016	CQC23001381667

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



2 pins

Size Code Table

Size	Dimensions (mm)						Pitch (mm)		Lead Wire (mm)		Lead Length (mm)
Code	W	Tol. ±	H	Tol. ±	T	Tol. ±	P	Tol. ±	Ød	Tol. ±	Tol ±0.05
E10	18	0.5	11	0.5	5	0.5	15	0.5	0.6	0.05	5
E11	18	0.5	12	0.5	6	0.5	15	0.5	0.6	0.05	5
E13	18	0.5	13.5	0.5	7.5	0.5	15	0.5	0.8	0.05	5
E14	18	0.5	14.5	0.5	8.5	0.5	15	0.5	0.8	0.05	5
E20	18	0.5	16	0.5	10	0.5	15	0.5	0.8	0.05	5
E21	18	0.5	19	0.5	11	0.5	15	0.5	0.8	0.05	5
G11	26	0.5	16.5	0.5	7	0.5	22.5	0.5	0.8	0.05	5
G20	26	0.5	19	0.5	10	0.5	22.5	0.5	0.8	0.05	5
G22	26	0.5	22	0.5	12	0.5	22.5	0.5	0.8	0.05	5
G23	26	0.5	23	0.5	13	0.5	22.5	0.5	0.8	0.05	5
G24	26	0.5	29.5	0.5	14.5	0.5	22.5	0.5	0.8	0.05	5
H11	32	0.8	18	0.8	9	0.8	27.5	0.5	0.8	0.05	5
H20	32	0.8	20	0.8	11	0.8	27.5	0.5	0.8	0.05	5
H22	32	0.8	24.5	0.8	13	0.8	27.5	0.5	0.8	0.05	5
H23	32	0.8	24	0.8	14	0.8	27.5	0.5	0.8	0.05	5
H27	32	0.8	28	0.8	18	0.8	27.5	0.5	0.8	0.05	5
H28	32	0.8	33	0.8	18	0.8	27.5	0.5	0.8	0.05	5
H30	32	0.8	37	0.8	22	0.8	27.5	0.5	0.8	0.05	5
N31	42	1	37	1	22	1	37.5	0.5	1	0.05	5
N30	42	1	40	1	20	1	37.5	0.5	1	0.05	5
N32	42	1	44	1	24	1	37.5	0.5	1	0.05	5

Part Numbering System

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

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

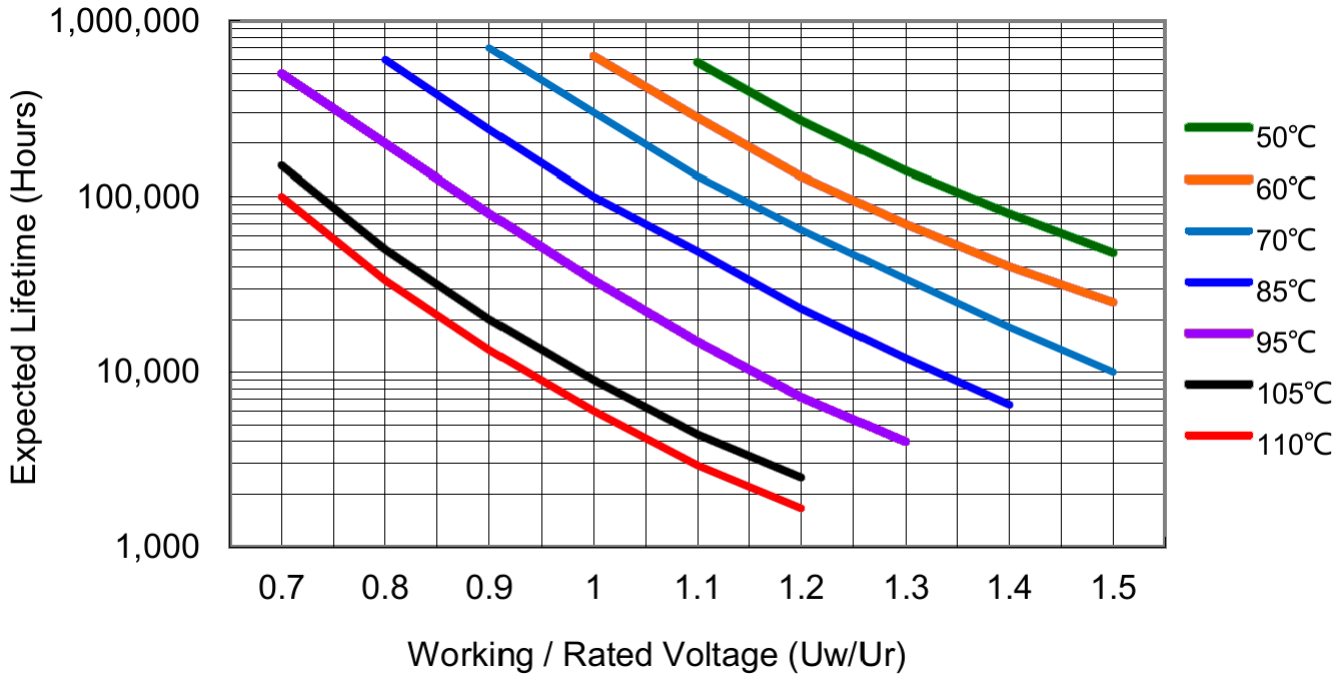
Ratings

Part Number	Cap (µF)	Dimensions W (mm)	H (mm)	T (mm)	P (mm)	dv/dt V/us	Lead Wire (mm)
			305 VAC				
MXH104K305E10	0.1	18	11	5	15	400	0.6
MXH154K305E11	0.15	18	12	6	15	400	0.6
MXH224K305E13	0.22	18	13.5	7.5	15	400	0.8
MXH224K305E14	0.22	18	14.5	8.5	15	400	0.8
MXH224K305G11	0.22	26	16.5	7	22.5	200	0.8
MXH274K305E14	0.27	18	14.5	8.5	15	400	0.8
MXH334K305E14	0.33	18	14.5	8.5	15	400	0.8
MXH334K305G11	0.33	26	16.5	7	22.5	200	0.8
MXH474K305E20	0.47	18	16	10	15	400	0.8
MXH474K305G11	0.47	26	16.5	7	22.5	200	0.8
MXH564K305E21	0.56	18	19	11	15	400	0.8
MXH564K305G20	0.56	26	19	10	22.5	200	0.8
MXH684K305E21	0.68	18	19	11	15	400	0.8
MXH684K305G20	0.68	26	19	10	22.5	200	0.8
MXH684K305H11	0.68	32	18	9	27.5	150	0.8
MXH824K305H11	0.82	32	18	9	27.5	150	0.8
MXH105K305G20	1	26	19	10	22.5	200	0.8
MXH105K305H20	1	32	20	11	27.5	150	0.8
MXH125K305G22	1.2	26	22	12	22.5	200	0.8
MXH155K305G23	1.5	26	23	13	22.5	200	0.8
MXH155K305H22	1.5	32	24.5	13	27.5	150	0.8
MXH185K305G24	1.8	26	29.5	14.5	22.5	200	0.8
MXH185K305H22	1.8	32	24.5	13	27.5	150	0.8
MXH225K305G24	2.2	26	29.5	14.5	22.5	200	0.8
MXH225K305H23	2.2	32	24	14	27.5	150	0.8
MXH275K305H27	2.7	32	28	18	27.5	150	0.8
MXH335K305H28	3.3	32	33	18	27.5	150	0.8
MXH395K305H28	3.9	32	33	18	27.5	150	0.8
MXH475K305H30	4.7	32	37	22	27.5	150	0.8
MXH685K305N31	6.8	42	37	22	37.5	100	1
MXH685K305N30	6.8	42	40	20	37.5	100	1
MXH106K305N32	10	42	44	24	37.5	100	1
MXH126K305N40	12	42	45	30	37.5	100	1
MXH156K305N40	15	42	45	30	37.5	100	1

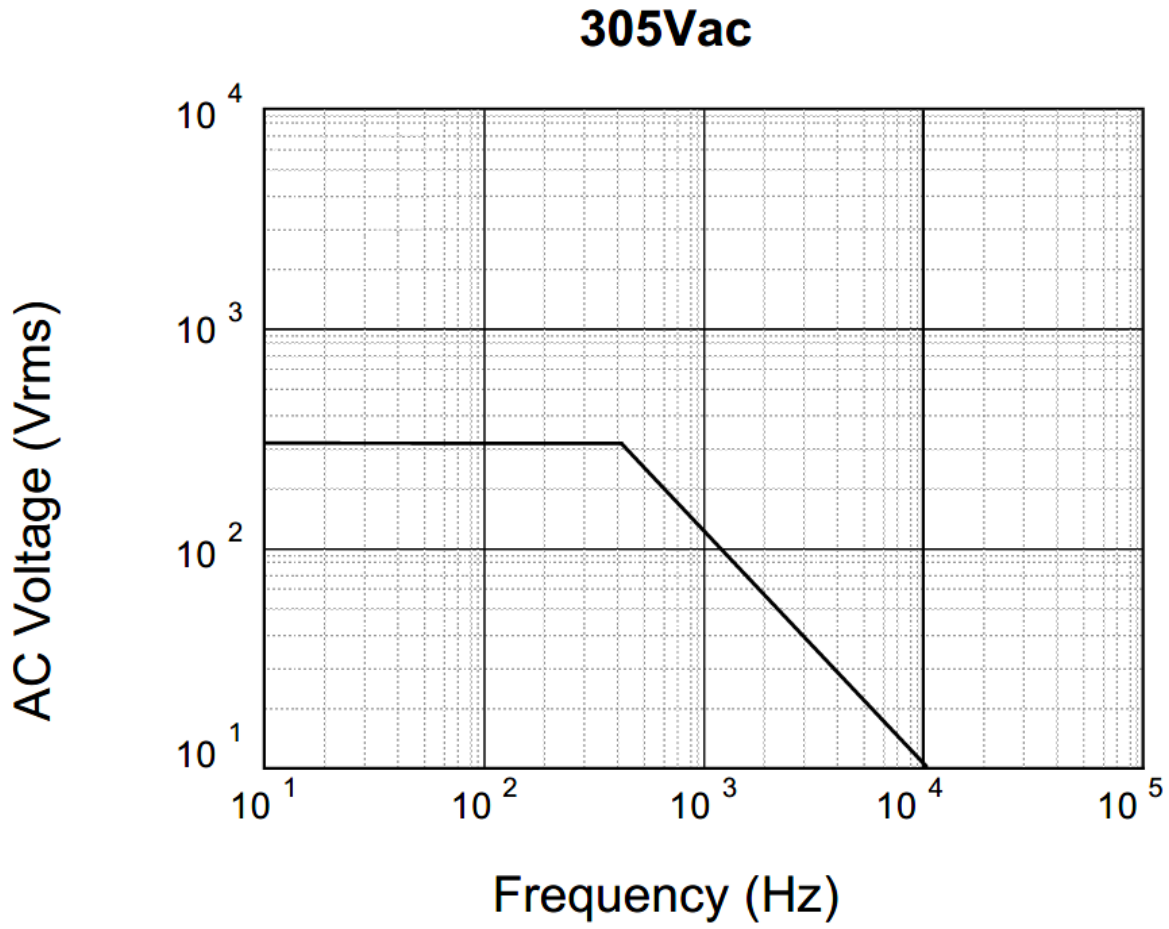
Note: Ammo Pack taping available.

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

Expected Life Curve



Maximum Voltage (Vrms) Versus Frequency



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.

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

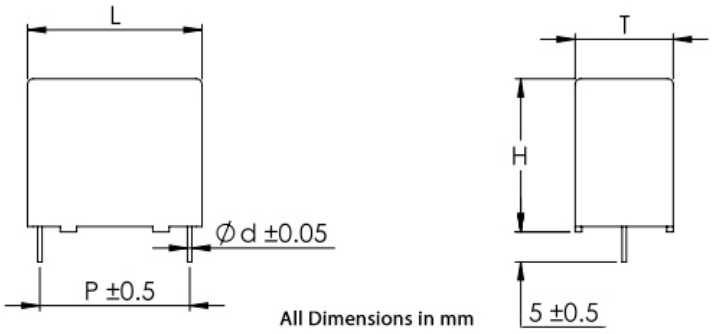
Capacitance Range	.001 µF to 1 µF
Capacitance Tolerance	±10 % (±20% optional)
Rated Voltage	300 Vac, 1500 Vdc
Operating Temperature Range	–40 ºC to +110 ºC (+85 °C to 110 °C, voltage derating factor of 1.35% per Deg. C)
Life Expectancy	100,000h at rated voltage and hot spot temperature ≤85 °C
Voltage Between Terminals UTT	AC Voltage: U_R+1200Vac for 60s or 2U_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 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 Capacitance Change Rate: (ΔC/C): ≤±5% DF Change (Δtgδ): ≤80*10-4 at 10 KHz (C ≤ 1µF) DF Change (Δtgδ): ≤50*10-4 at 1 KHz (C > 1µF) IR: ≥ 50% of initial limit
THB Rating	+85ºC / 85% RH @ rated voltage for 2,000hrs +24/-0 Capacitance Change Rate: (ΔC/C): ≤±10% DF Change (Δtgδ): ≤240*10-4 at 10 KHz (C ≤ 1µF) DF Change (Δtgδ): ≤150*10-4 at 1 KHz (C > 1µF) 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 CSA-E60384-14	E171988
VDE	IEC 60384-14:2013/ AMD1:2016	40055905
CQC	IEC 60384- 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



All Dimensions in mm

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 472 = 0.0047 µF 183 = 0.018 µF 564 = 0.56 µF 105 = 1 µF	K = ±10% Standard M = ±20% Optional	300 = 300 VAC	See Size Code

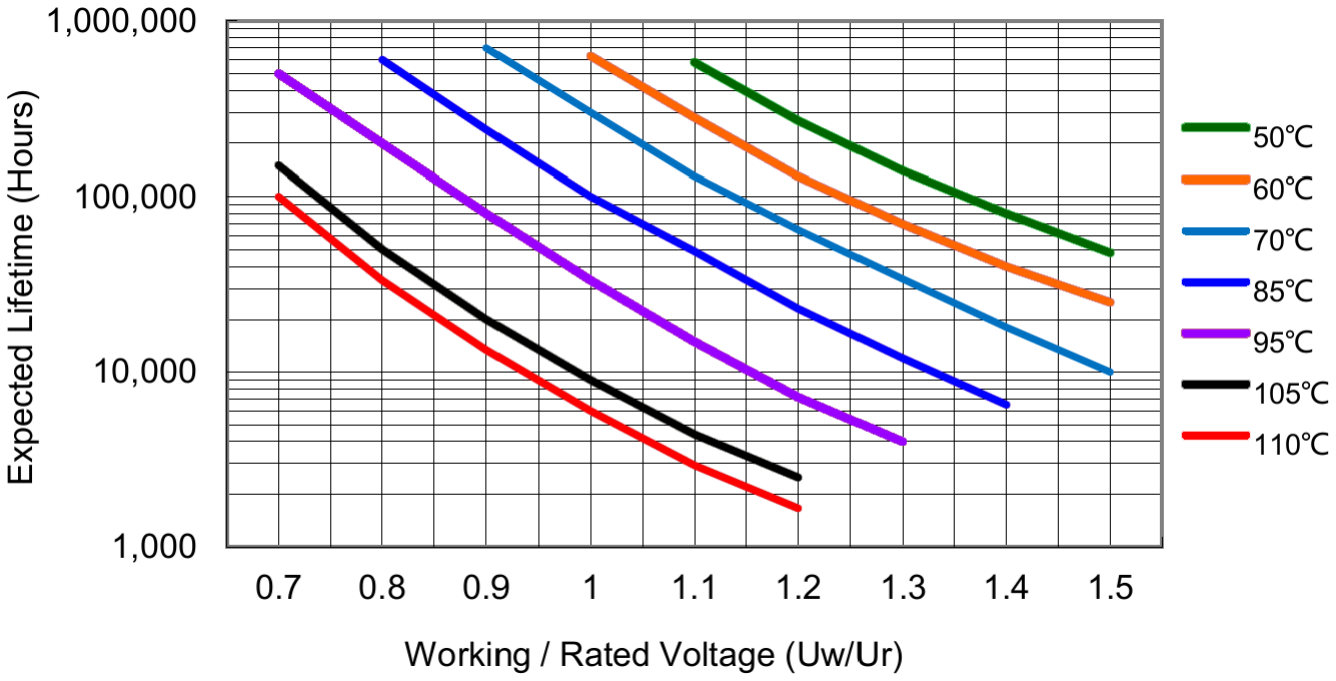
THB 2,000 Hr @ 85 °C, 85% RH, and Vr, AEC-Q200

Ratings

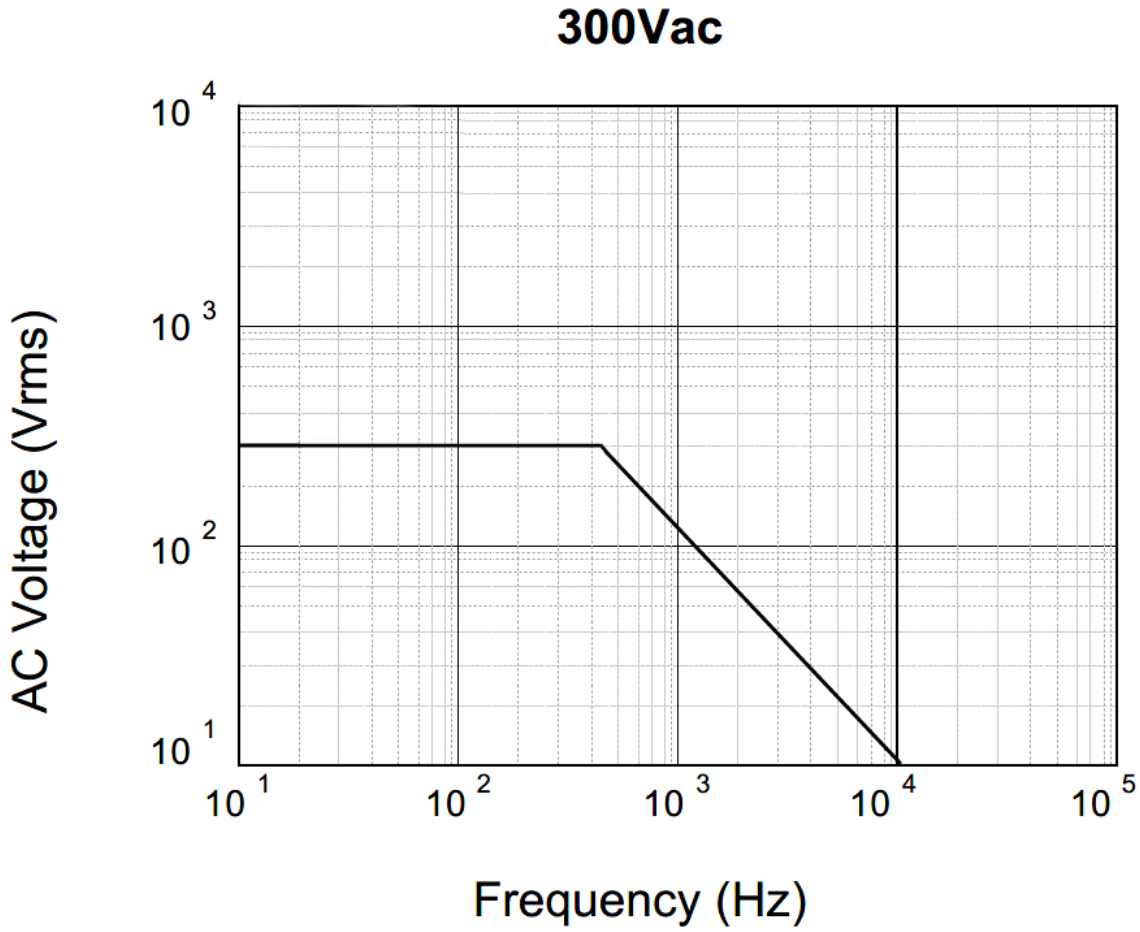
Part Number	Cap (µF)	Dimensions W mm	H mm	T mm	P mm	dv/dt V/µs	Lead Wire mm
			300 VAC				
MYH102K300D16	0.0010	13	9	4	10	800	0.6
MYH152K300D16	0.0015	13	9	4	10	800	0.6
MYH222K300D16	0.0022	13	9	4	10	800	0.6
MYH332K300D10	0.0033	13	11	5	10	800	0.6
MYH472K300D10	0.0047	13	11	5	10	800	0.6
MYH472K300D11	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



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.

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

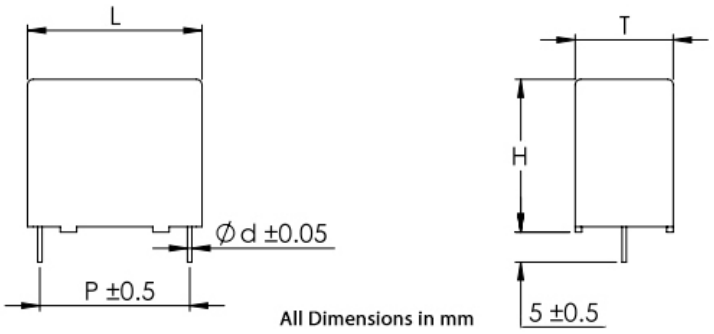
Capacitance Range	0.1 µF to 40 µF
Capacitance Tolerance	±10 % (±20% optional)
Rated Voltage	305 Vac, 630 Vdc
Operating Temperature Range	–40 ºC to +110 ºC (+85 °C to 110 °C, voltage derating factor of 1.35% per Deg. C)
Life Expectancy	100,000h at rated voltage and hot spot temperature <85 °C
Voltage Between Terminals UTT	DC Voltage: 4.3Ur for 60s or √2(2UR + 1000 Vac) VDC for 2s, charge current must be 1A max. 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 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 Capacitance Change Rate: (ΔC/C): ≤±5% DF Change (Δtgδ): ≤80*10-4 at 10 kHz (C ≤ 1µF) DF Change (Δtgδ): ≤50*10-4 at 1 kHz (C > 1µF) IR: ≥ 50% of initial limit
THB Rating	+85ºC / 85% RH @ rated voltage for 1,000 hrs +24/-0 Capacitance Change Rate: (ΔC/C): ≤±10% DF Change (Δtgδ): ≤240*10-4 at 10 kHz (C ≤ 1 µF) DF Change (Δtgδ): ≤150*10-4 at 1 kHz (C > 1 µF) 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 CSA-E60384-14	E171988
VDE	IEC 60384-14:2013 IEC 60384-14:2013/ AMD1:2016	40055249
CQC	IEC 60384-14 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 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 104 = 0.1 µF 125 = 1.2 µF 156 = 15 µF	K = ±10% Standard 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.

CDE CORNELL DUBILIER

ENERGIZING IDEAS

Phone: (864) 843-2277
Fax: (864) 843-3800
E-mail: info@cde.com

Address: 140 Technology Place
Liberty, SC 29657
USA

Apr 1, 2025