

### ZH SERIES ▪ LOW IMPEDANCE, MINIATURIZED 105°C TYPE

#### KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ THT type
- Endurance: 105°C ▪ 6 000 hours up to 10 000 hours
- Low impedance and high ripple current
- Wide capacitance range
- Low voltage version



#### SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +105°C										
Rated Voltage Range	V <sub>R</sub>	6.3 ~ 100V DC										
Surge Voltage	V <sub>S</sub>	V <sub>S</sub> = 1.15·V <sub>R</sub>										
Capacitance Range	C <sub>R</sub>	8.2 ~ 8200μF										
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)										
Leakage Current (20°C ▪ V <sub>R</sub> applied)	I <sub>LEAK</sub>	≤ 0.01·C <sub>R</sub> ·V <sub>R</sub> or 3μA, whichever is greater ▪ After 2 minutes [ I <sub>LEAK</sub> (μA) ; C <sub>R</sub> (μF) ; V <sub>R</sub> (V) ]										
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V <sub>R</sub> (V DC)	6.3	10	16	25	35	50	63	80	100	
		tanδ (%)	22	19	16	14	12	10	9	8	8	
		For C <sub>R</sub> > 1000μF, add 2% per every multiple 1000μF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V <sub>R</sub> (V DC)	6.3	10	16	25	35	50	63	80	100	
		Z-25°C/Z+20°C	2	2	2	2	2	2	2	2	2	
		Z-40°C/Z+20°C	3	3	3	3	3	3	3	3	3	
		For capacitance > 1000μF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000μF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000μF of rated capacitance value									
Lifetime Test												
Endurance 105°C (V <sub>R</sub> & I <sub>R</sub> applied)	Test	6 000 hours					ø D ≤ 6.3 mm					
		8 000 hours					ø D = 8 mm					
		10 000 hours					ø D ≥ 10 mm					
	ΔC/C <sub>R</sub>	≤ ±25% of initial measured value										
	tanδ	≤ 200% of initial specified value										
	I <sub>Leak</sub>	≤ the initial specified value										
Shelf Life 105°C (V <sub>R</sub> = 0)	Test	1 000 hours										
		ΔC/C <sub>R</sub> ≤ ±25% of initial measured value										
		tanδ ≤ 200% of initial specified value										
		I <sub>Leak</sub> ≤ the initial specified value										
	Before measurement: Restore capacitor to 20°C, apply V <sub>R</sub> for 30 min according JIS-C-5101-4											

## STANDARD RATINGS

Part number shows bulk version with straight leads

V <sub>R</sub> (V)	C <sub>R</sub> (μF)	ø D (mm)	L (mm)	Z • Max. Impedance +20°C • 100kHz (mΩ)	I <sub>R</sub> • Max. Ripple Current +105°C • 100kHz (mA rms)	CapXon Part Number
6.3	220	5	11	230	355	ZH221M6R3C110A
	470	6.3	11	100	550	ZH471M6R3E110A
	820	8	11.5	60	955	ZH821M6R3F115A
	1200	8	16	50	1260	ZH122M6R3F160A
	1200	10	12.5	44	1340	ZH122M6R3G125A
	1500	8	20	34	1510	ZH152M6R3F200A
	1800	10	16	33	1770	ZH182M6R3G160A
	2200	10	20	25	1970	ZH222M6R3G200A
	2700	10	25	23	2260	ZH272M6R3G250A
	3900	13	20	22	2490	ZH392M6R3I200A
	4700	13	25	20	2910	ZH472M6R3I250A
	5600	13	30	18	3460	ZH562M6R3I300A
	6800	13	35	17	3580	ZH682M6R3I350A
	6800	16	20	20	3260	ZH682M6R3J200A
	8200	16	25	18	3640	ZH822M6R3J250A
10	150	5	11	230	355	ZH151M010C110A
	330	6.3	11	100	550	ZH331M010E110A
	680	8	11.5	60	955	ZH681M010F115A
	1000	8	16	50	1260	ZH102M010F160A
	1000	10	12.5	49	1340	ZH102M010G125A
	1500	8	20	34	1510	ZH152M010F200A
	1500	10	16	33	1770	ZH152M010G160A
	1800	10	20	25	1970	ZH182M010G200A
	2200	10	25	23	2260	ZH222M010G250A
	2700	13	20	22	2440	ZH272M010I200A
	3300	13	20	21	2490	ZH332M010I200A
	3900	13	25	20	2910	ZH392M010I250A
	4700	13	30	18	3460	ZH472M010I300A
	4700	16	20	20	3260	ZH472M010J200A
	5600	13	35	17	3580	ZH562M010I350A
	6800	16	25	18	3640	ZH682M010J250A
16	100	5	11	230	355	ZH101M016C110A
	220	6.3	11	100	550	ZH221M016E110A
	470	8	11.5	60	955	ZH471M016F115A
	680	8	16	50	1260	ZH681M016F160A
	680	10	12.5	44	1340	ZH681M016G125A
	1000	8	20	34	1510	ZH102M016F200A
	1000	10	16	33	1770	ZH102M016G160A
	1500	10	20	25	1970	ZH152M016G200A
	1800	10	25	23	2260	ZH182M016G250A
	2200	13	20	22	2490	ZH222M016I200A
	2700	13	25	20	2910	ZH272M016I250A
	3300	13	30	18	3460	ZH332M016I300A
	3300	16	20	23	3260	ZH332M016J200A

See "PACKAGING INFORMATION" to taped or formed products.

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V <sub>R</sub> (V)	C <sub>R</sub> (μF)	ø D (mm)	L (mm)	Z • Max. Impedance +20°C • 100kHz (mΩ)	I <sub>R</sub> • Max. Ripple Current +105°C • 100kHz (mA rms)	CapXon Part Number
16	3900	13	35	17	3580	ZH392M016I350A
	4700	16	25	18	3640	ZH472M016J250A
25	68	5	11	240	355	ZH680M025C110A
	150	6.3	11	100	550	ZH151M025E110A
	330	8	11.5	60	955	ZH331M025F115A
	390	8	16	50	1260	ZH391M025F160A
	470	10	12.5	44	1340	ZH471M025G125A
	560	8	20	34	1510	ZH561M025F200A
	680	10	16	33	1770	ZH681M025G160A
	820	10	20	25	1970	ZH821M025G200A
	1000	10	20	24	2045	ZH102M025G200A
	1000	10	25	23	2260	ZH102M025G250A
	1500	13	20	22	2490	ZH152M025I200A
	1800	13	25	20	2910	ZH182M025I250A
	2200	13	30	18	3460	ZH222M025I300A
	2200	16	20	20	3260	ZH222M025J200A
	2700	13	35	17	3580	ZH272M025I350A
	3300	16	25	18	3640	ZH332M025J250A
35	47	5	11	500	355	ZH470M035C110A
	100	6.3	11	110	550	ZH101M035E110A
	220	8	11.5	62	955	ZH221M035F115A
	270	8	16	60	1260	ZH271M035F160A
	330	10	12.5	43	1340	ZH331M035G125A
	390	8	20	32	1510	ZH391M035F200A
	470	10	16	33	1770	ZH471M035G160A
	560	10	20	30	1970	ZH561M035G200A
	680	10	25	28	2260	ZH681M035G250A
	820	10	25	27	2360	ZH821M035G250A
	1000	10	30	25	2580	ZH102M035G300A
	1000	13	20	22	2490	ZH102M035I200A
	1200	13	25	18	2910	ZH122M035I250A
	1500	13	30	18	3460	ZH152M035I300A
	1500	16	20	23	3260	ZH152M035J200A
	1800	13	35	17	3580	ZH182M035I350A
	2200	16	25	18	3640	ZH222M035J250A
50	27	5	11	400	248	ZH270M050C110A
	56	6.3	11	150	395	ZH560M050E110A
	100	8	11.5	110	755	ZH101M050F115A
	120	8	16	65	960	ZH121M050F160A
	150	10	12.5	67	989	ZH151M050G125A
	180	8	20	51	1200	ZH181M050F200A
	220	10	16	46	1380	ZH221M050G160A
	270	10	20	33	1590	ZH271M050G200A
	330	10	20	33	1600	ZH331M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

## STANDARD RATINGS

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50	330	10	25	32	1880	ZH331M050G250A
	470	13	20	32	2060	ZH471M050I200A
	560	13	25	28	2420	ZH561M050I250A
	680	13	30	26	2870	ZH681M050I300A
	820	13	35	24	2970	ZH821M050I350A
	820	16	20	28	2740	ZH821M050J200A
	1000	16	25	26	3020	ZH102M050J250A
63	18	5	11	980	183	ZH180M063C110A
	47	6.3	11	600	288	ZH470M063E110A
	82	8	11.5	300	535	ZH820M063F115A
	100	8	16	200	698	ZH101M063F160A
	120	10	12.5	165	735	ZH121M063G125A
	150	8	20	140	871	ZH151M063F200A
	180	10	16	130	1008	ZH181M063G160A
	220	10	20	120	1110	ZH221M063G200A
	270	10	20	86	1210	ZH271M063G200A
	270	13	16	90	1210	ZH271M063I160A
	270	13	20	88	1330	ZH271M063I200A
	330	10	25	76	1420	ZH331M063G250A
	330	13	25	73	1610	ZH331M063I250A
	390	13	20	66	1580	ZH391M063I200A
	470	13	25	48	2000	ZH471M063I250A
	470	13	30	46	2170	ZH471M063I300A
	470	16	20	47	2090	ZH471M063J200A
	560	13	30	40	2420	ZH561M063I300A
	560	16	20	48	2110	ZH561M063J200A
	680	13	35	38	2630	ZH681M063I350A
	820	13	40	32	2950	ZH821M063I400A
	820	16	25	37	2740	ZH821M063J250A
	820	18	20	43	2510	ZH821M063K200A
	1200	16	31.5	29	3000	ZH122M063J315A
	1200	18	25	36	2810	ZH122M063K250A
	1500	16	35.5	26	3050	ZH152M063J355A
	1500	18	31.5	30	3310	ZH152M063K315A
	1800	16	40	24	3580	ZH182M063J400A
	1800	18	35.5	25	3580	ZH182M063K355A
	2200	18	40	23	3680	ZH222M063K400A
80	12	5	11	1540	173	ZH120M080C110A
	33	6.3	11	630	277	ZH330M080E110A
	56	8	11.5	400	472	ZH560M080F115A
	68	8	16	280	595	ZH680M080F160A
	82	10	12.5	250	634	ZH820M080G125A
	100	8	20	210	745	ZH101M080F200A

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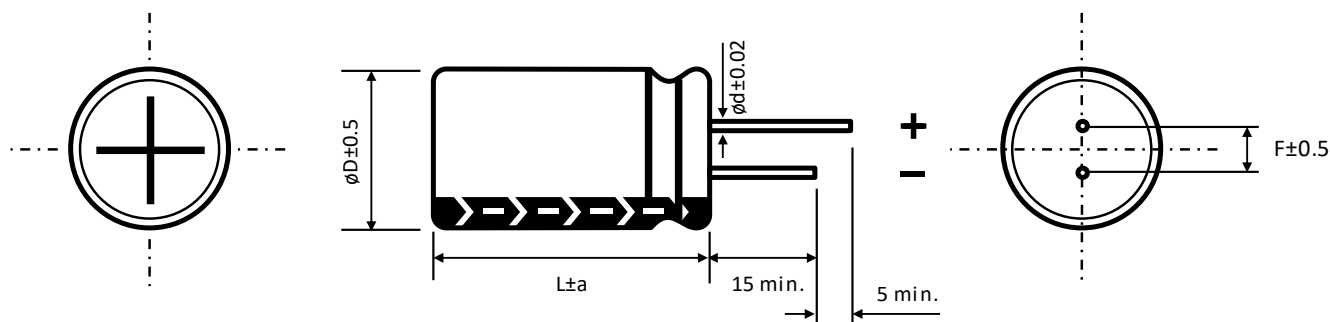
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80	120	10	16	187	790	ZH121M080G160A
	180	10	20	130	1050	ZH181M080G200A
	180	13	16	140	985	ZH181M080I160A
	220	10	25	120	1180	ZH221M080G250A
	270	13	20	94	1440	ZH271M080I200A
	330	13	25	66	1630	ZH331M080I250A
	390	13	30	56	1960	ZH391M080I300A
	390	16	20	64	1760	ZH391M080J200A
	470	13	35	47	2150	ZH471M080I350A
	560	13	40	45	2350	ZH561M080I400A
	560	16	25	49	2220	ZH561M080J250A
	560	18	20	59	1960	ZH561M080K200A
	680	16	31.5	38	2410	ZH681M080J315A
	820	16	35.5	32	2610	ZH821M080J355A
	820	18	25	42	2280	ZH821M080K250A
	1000	16	40	33	2870	ZH102M080J400A
	1000	18	31.5	36	2480	ZH102M080K315A
	1200	18	35.5	33	2870	ZH122M080K355A
	1500	18	40	32	3520	ZH152M080K400A
100	8.2	5	11	1540	173	ZH8R2M100C110A
	18	6.3	11	627	277	ZH180M100E110A
	33	8	11.5	420	472	ZH330M100F115A
	47	8	16	400	595	ZH470M100F160A
	56	10	12.5	350	634	ZH560M100G125A
	68	8	20	300	745	ZH680M100F200A
	82	10	16	220	790	ZH820M100G160A
	100	10	20	150	1050	ZH101M100G200A
	100	13	16	160	985	ZH101M100I160A
	120	10	25	140	1180	ZH121M100G250A
	150	13	20	94	1440	ZH151M100I200A
	220	13	25	66	1660	ZH221M100I250A
	270	13	30	56	1960	ZH271M100I300A
	270	16	20	64	1760	ZH271M100J200A
	330	13	35	47	2150	ZH331M100I350A
	390	13	40	40	2350	ZH391M100I400A
	390	16	25	49	2220	ZH391M100J250A
	390	18	20	59	1960	ZH391M100K200A
	470	16	31.5	36	2410	ZH471M100J315A
	470	18	25	42	2280	ZH471M100K250A
	560	16	35.5	32	2610	ZH561M100J355A
	560	18	31.5	34	2480	ZH561M100K315A
	680	16	40	30	2870	ZH681M100J400A
	680	18	35.5	30	2870	ZH681M100K355A
	820	18	40	29	3520	ZH821M100K400A

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### DIMENSIONS ▪ All dimensions in mm



$\phi D$	5	6.3	8		10	13	16	18
F	2	2.5	3.5		5	5	7.5	7.5
$\phi d$	0.5		L < 20	L ≥ 20	0.6		0.8	
			0.5	0.6				

a	$\phi D < 16$	$\phi D = 16$		$\phi D = 18$	
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5
		1.5	2	1.5	2

### MULTIPLIER $K_f$ for RIPPLE CURRENT vs. FREQUENCY

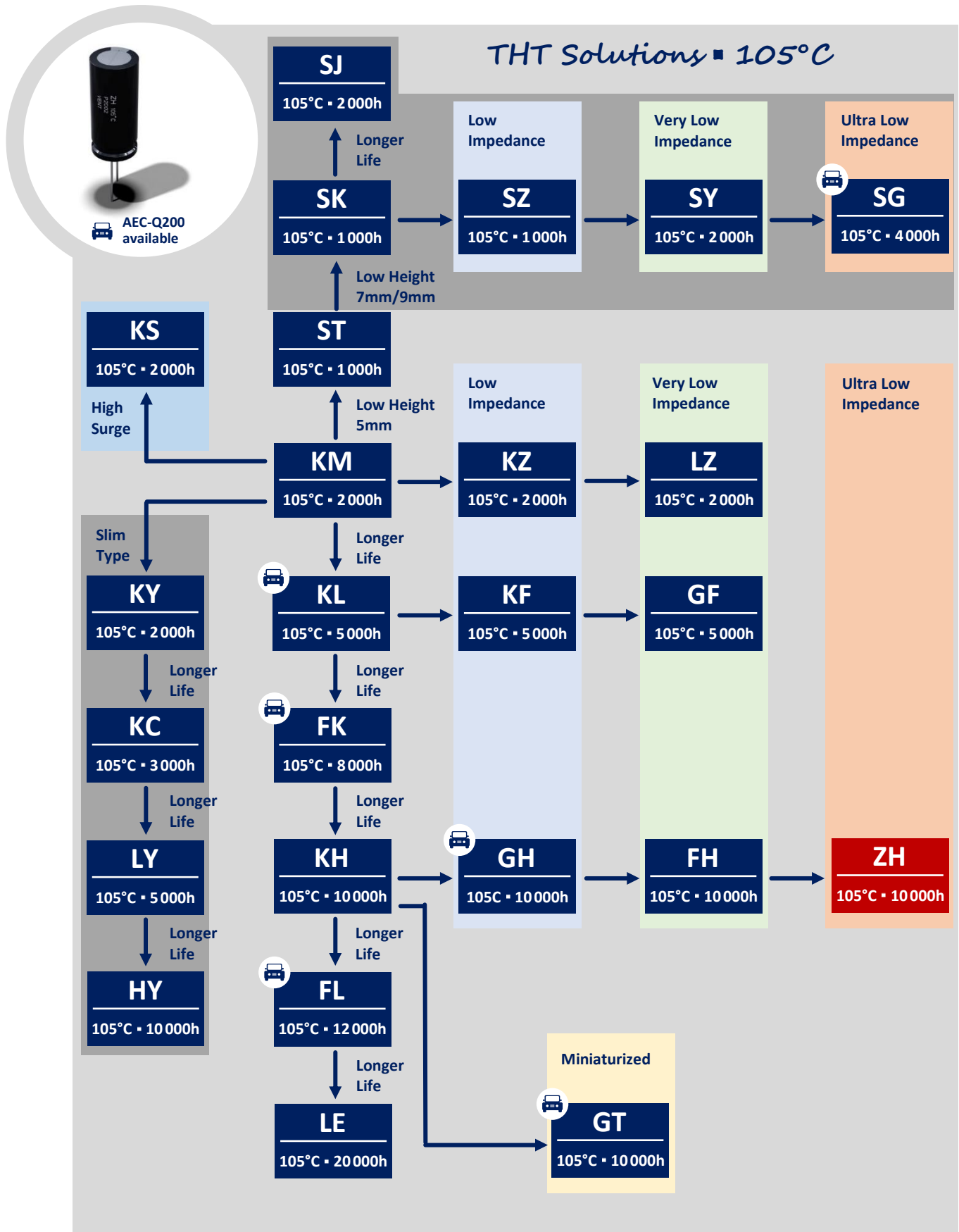
$C_R$ (μF) / Frequency (Hz)	100/120	1k	10k	50k - 100k
8.2 ~ 33	0.42	0.7	0.9	1
47 ~ 270	0.5	0.73	0.92	1
330 ~ 680	0.55	0.77	0.94	1
820 ~ 1800	0.6	0.8	0.96	1
2200 ~ 8200	0.7	0.85	0.98	1

### PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following links in the table.

<a href="#">General Precautions &amp; Guidelines</a>	<a href="#">Packaging Information</a>	<a href="#">3D Models</a>	<a href="#">Reliability Tests</a>

### GROUP CHART



### DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

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