

### LE SERIES ▀ ULTRA LONG LIFE 105°C TYPE

#### KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR • THT type
- Endurance: 105°C ▀ 12 000 hours up to 20 000 hours
- High voltage up to 450V
- High reliability
- Ideal for applications with very long-life expectancies



#### SPECIFICATIONS

Items		Performance Characteristics					
Operating Temperature Range		-40 ~ +105°C					
Rated Voltage Range	$V_R$	160 ~ 450V DC					
Surge Voltage	$V_S$	$(V_R \leq 315V): V_S = 1.15 \cdot V_R$			$(V_R > 315V): V_S = 1.10 \cdot V_R$		
Capacitance Range	$C_R$	1 ~ 68 $\mu$ F					
Cap. Tolerance	$\Delta C$	$\pm 20\%$ (120Hz ▀ 20°C)					
Leakage Current (20°C ▀ $V_R$ applied)	$I_{LEAK}$	$C_R \cdot V_R \leq 1000$			$\leq 0.1 \cdot C_R \cdot V_R + 40\mu A$ (After 1 minute)		
		$C_R \cdot V_R > 1000$			$\leq 0.04 \cdot C_R \cdot V_R + 100\mu A$ (After 1 minute)		
		[ $I_{LEAK}$ ( $\mu A$ ) ; $C_R$ ( $\mu F$ ) ; $V_R$ (V) ]					
Dissipation Factor % (20°C ▀ 120Hz)	$\tan \delta$	$V_R$ (V DC)	160	200	250	400	450
		$\tan \delta$ (%)	24	24	24	24	24
Low Temperature Characteristics at 120Hz	Z ratio max.	$V_R$ (V DC)	160	200	250	400	450
		Z-25°C/Z+20°C	3	3	6	6	8
		Z-40°C/Z+20°C	8	8	10	10	12
Lifetime Test							
Endurance 105°C ( $V_R$ & $I_R$ applied)	Test	12 000 hours	$\phi$ D 6.3 x L 11 mm				
		12 000 hours	$\phi$ D 8 x L 9 mm				
		12 000 hours	$\phi$ D 10 x L 9 mm				
		15 000 hours	$\phi$ D 8 x L 11.5 mm				
		15 000 hours	$\phi$ D 10 x L 12.5 mm				
		20 000 hours	$\phi$ D $\geq$ 10 x L 16 mm				
		$\Delta C/C_R$	$\leq \pm 30\%$ of initial measured value				
		$\tan \delta$	$\leq 300\%$ of initial specified value				
		$I_{Leak}$	$\leq$ the initial specified value				
Shelf Life 105°C ( $V_R = 0$ )	Test	1 000 hours					
	$\Delta C/C_R$	$\leq \pm 30\%$ of initial measured value					
	$\tan \delta$	$\leq 300\%$ of initial specified value					
	$I_{Leak}$	$\leq$ the initial specified value					
		Before measurement: Restore capacitor to 20°C, apply $V_R$ 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)	∅ D (mm)	L (mm)	I <sub>R</sub> • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
160	5.6	6.3	11	53	LE5R6M160E110A
	10	8	9	71	LE100M160F090A
	15	8	11.5	93	LE150M160F115A
	15	10	9	96	LE150M160G090A
	22	10	12.5	122	LE220M160G125A
	33	10	16	159	LE330M160G160A
200	2.2	6.3	11	37	LE2R2M200E110A
	3.3	6.3	11	43	LE3R3M200E110A
	4.7	6.3	11	50	LE4R7M200E110A
	5.6	8	9	57	LE5R6M200F090A
	6.8	8	9	63	LE6R8M200F090A
	8.2	8	9	67	LE8R2M200F090A
	10	8	11.5	81	LE100M200F115A
	12	10	9	89	LE120M200G090A
	18	10	12.5	114	LE180M200G125A
	27	10	16	150	LE270M200G160A
250	1.8	6.3	11	34	LE1R8M250E110A
	2.2	6.3	11	37	LE2R2M250E110A
	3.3	6.3	11	43	LE3R3M250E110A
	4.7	8	9	54	LE4R7M250F090A
	5.6	8	11.5	63	LE5R6M250F115A
	6.8	8	11.5	69	LE6R8M250F115A
	8.2	10	9	77	LE8R2M250G090A
	10	10	12.5	91	LE100M250G125A
	12	10	12.5	98	LE120M250G125A
	18	10	16	128	LE180M250G160A
400	1	6.3	11	25	LE010M400E110A
	1.2	8	9	29	LE1R2M400F090A
	1.5	8	9	31	LE1R5M400F090A
	1.8	8	9	34	LE1R8M400F090A
	2.2	8	9	37	LE2R2M400F090A
	2.2	8	11.5	41	LE2R2M400F115A
	2.7	8	11.5	44	LE2R7M400F115A
	3.3	8	11.5	48	LE3R3M400F115A
	3.3	10	9	49	LE3R3M400G090A
	3.9	10	12.5	58	LE3R9M400G125A
	4.7	10	12.5	62	LE4R7M400G125A
	6.8	10	16	86	LE6R8M400G160A

See "PACKAGING INFORMATION" to taped or formed products.

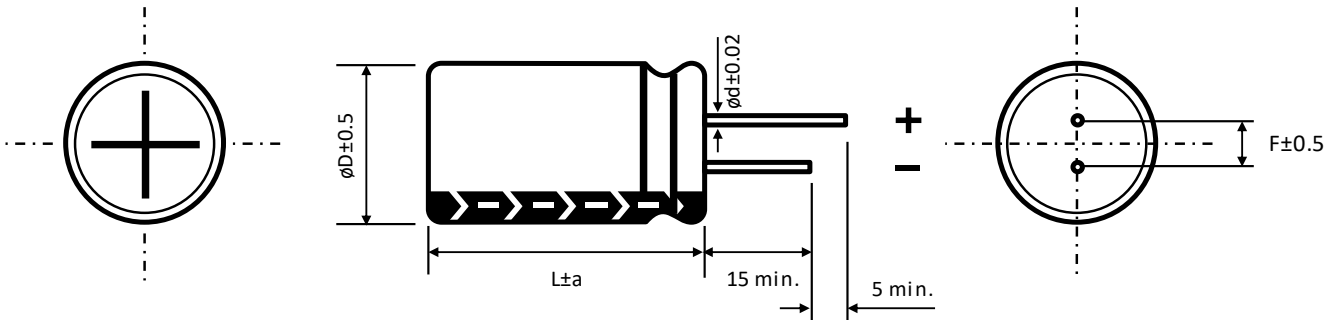
## STANDARD RATINGS

Part number shows bulk version with straight leads

$V_R$ (V)	$C_R$ ( $\mu F$ )	$\phi D$ (mm)	L (mm)	$I_R$ • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	4.7	10	16	55	LE4R7M450G160A
	4.7	10	20	67	LE4R7M450G200A
	6.8	10	20	85	LE6R8M450G200A
	8.2	10	20	85	LE8R2M450G200A
	10	13	20	136	LE100M450I200A
	15	13	25	181	LE150M450I250A
	22	13	25	241	LE220M450I250A
	22	16	20	293	LE220M450J200A
	33	16	25	321	LE330M450J250A
	33	18	20	313	LE330M450K200A
	47	18	25	481	LE470M450K250A
	68	18	31.5	521	LE680M450K315A

See "PACKAGING INFORMATION" to taped or formed products.

## DIMENSIONS - All dimensions in mm



$\phi D$	6.3	8		10	13	16	18
F	2.5	3.5		5	5	7.5	7.5
$\phi d$	0.5	L < 20	L $\geq$ 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 $\geq$ 40	L = 25 to 31.5	L < 25 and L $\geq$ 35.5
		1.5	2	1.5	2

**MULTIPLIER for RIPPLE CURRENT vs. FREQUENCY**
**160 ~ 400V**

$C_R$ ( $\mu$ F) / Frequency (Hz)	100/120	1k	10k	100k
1 ~ 5.6	1	1.6	1.8	2
6.8 ~ 18	1	1.5	1.7	1.9
22 ~ 33	1	1.4	1.6	1.8

 **$\geq$  450V**

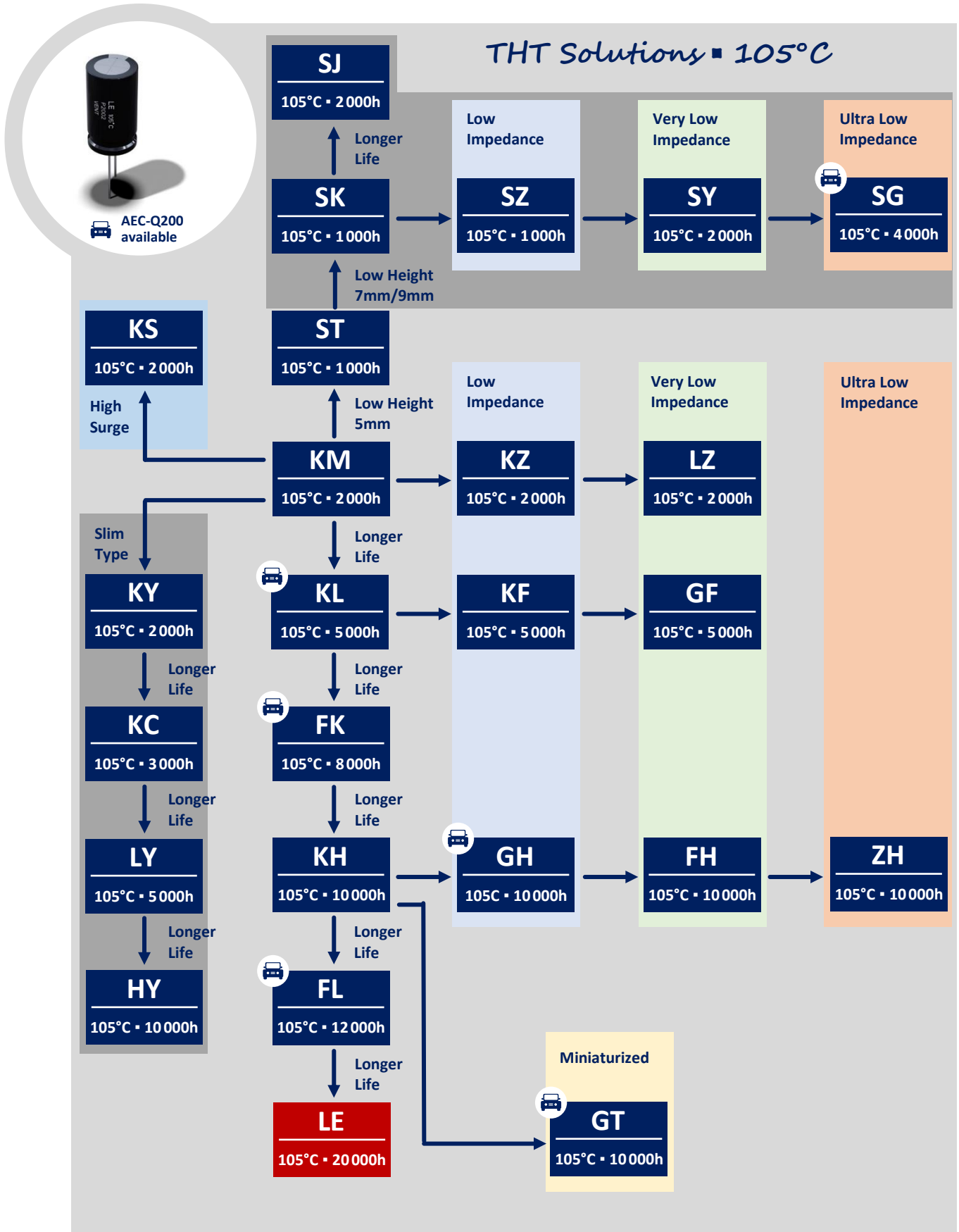
$C_R$ ( $\mu$ F) / Frequency (Hz)	100/120	1k	10k	100k
4.7 ~ 15	0.3	0.6	0.9	1
22 ~ 68	0.4	0.7	0.9	1

**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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