

### TU SERIES ■ HIGH TEMP., HIGH RIPPLE, AUTOMOTIVE 135°C TYPE

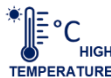
#### KEY FEATURES



AEC-Q200



HIGH RIPPLE



HIGH TEMPERATURE

- **ALUMINUM ELECTROLYTIC CAPACITOR • THT type**
- Endurance: 135°C ■ 2 000 hours up to 3 000 hours
- Especially for applications with high ambient temperatures
- 150°C short-term load for 100 hours guaranteed
- AEC-Q200 version available











































#### SPECIFICATIONS

Items		Performance Characteristics						
Operating Temperature Range		-40 ~ +135°C						
Rated Voltage Range	V <sub>R</sub>	25 ~ 100V DC						
Surge Voltage	V <sub>S</sub>	V <sub>S</sub> = 1.15·V <sub>R</sub>						
Capacitance Range	C <sub>R</sub>	160 ~ 12000μF						
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)						
Leakage Current (20°C ▪ V <sub>R</sub> applied)	I <sub>LEAK</sub>	≤ 0.03·C <sub>R</sub> ·V <sub>R</sub> or 4μA, 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)	25	35	50	63	80	100
		tanδ (%)	14	12	10	10	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)	25	35	50	63	80	100
		Z-25°C/Z+20°C	3	2	2	2	2	2
		Z-40°C/Z+20°C	4	4	4	4	4	4
		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 135°C & 125°C (V <sub>R</sub> & I <sub>R</sub> applied)	Test	135°C	3000 hours	25 ~ 50V DC				
			2000 hours	63 ~ 100V DC				
		125°C	3000 hours	25 ~ 100V DC				
	ΔC/C <sub>R</sub>	≤ ±30% of initial measured value						
	tanδ	≤ 300% of initial specified value						
	I <sub>Leak</sub>	≤ initial specified value						
High Temperature Endurance 135°C & 125°C (V <sub>R</sub> & I <sub>R</sub> applied)	Test	135°C	2500 hours	25 ~ 50V DC				
			1500 hours	63 ~ 100V DC				
		125°C	2500 hours	25 ~ 100V DC				
	ΔC/C <sub>R</sub>	≤ ±30% of initial measured value						
	tanδ	≤ 300% of initial specified value						
	I <sub>Leak</sub>	≤ initial specified value						
Shelf Life 135°C (V <sub>R</sub> = 0)	Test	1000 hours						
	ΔC/C <sub>R</sub>	≤ ±30% of initial measured value						
	tanδ	≤ 300% of initial specified value						
	I <sub>Leak</sub>	≤ 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 +125°C • 100kHz (mA rms)	I <sub>R</sub> • Max. Ripple Current +135°C • 100kHz (mA rms)	CapXon Part Number
25	2000	12.5	20	42	2760	1690	TU202M025Z200A 
	3000	12.5	25	34	3480	2010	TU302M025Z250A 
	3300	16	20	35	3040	1860	TU332M025J200A 
	3600	12.5	30	28	4490	2900	TU362M025Z300A 
	4300	18	20	34	3250	1870	TU432M025K200A 
	4700	12.5	35	26	5140	3190	TU472M025Z350A 
	4700	16	25	28	4260	2870	TU472M025J250A 
	5100	12.5	40	25	5810	3470	TU512M025Z400A 
	5600	16	30	24	5480	3400	TU562M025J300A 
	6200	18	25	27	4500	2900	TU622M025K250A 
	7500	16	35	20	6070	3630	TU752M025J350A 
	7500	18	30	22	5600	3470	TU752M025K300A 
	9100	16	40	19	6810	3930	TU912M025J400A 
	10000	18	35	19	6280	3750	TU103M025K350A 
	12000	18	40	18	7070	4080	TU123M025K400A 
35	1300	12.5	20	42	2760	1690	TU132M035Z200A 
	1800	12.5	25	33	3480	2010	TU182M035Z250A 
	2000	16	20	35	3040	1860	TU202M035J200A 
	2200	12.5	30	28	4490	2900	TU222M035Z300A 
	2400	18	20	34	3250	1870	TU242M035K200A 
	2700	12.5	35	30	5140	3190	TU272M035Z350A 
	3000	16	25	28	4260	2870	TU302M035J250A 
	3300	12.5	40	24	5810	3470	TU332M035Z400A 
	3600	16	30	23	5480	3400	TU362M035J300A 
	3900	18	25	27	4500	2900	TU392M035K250A 
	4300	16	35	20	6070	3630	TU432M035J350A 
	4700	18	30	22	5600	3470	TU472M035K300A 
	5600	16	40	21	6810	3930	TU562M035J400A 
	6200	18	35	21	6280	3750	TU622M035K350A 
	7500	18	40	20	7070	4080	TU752M035K400A 
50	620	12.5	20	73	2400	1470	TU621M050Z200A 
	820	12.5	25	58	3350	2260	TU821M050Z250A 
	1000	16	20	50	2960	1870	TU102M050J200A 
	1100	12.5	30	48	4220	2520	TU112M050Z300A 
	1300	12.5	35	42	4810	2780	TU132M050Z350A 
	1300	16	25	42	4040	2500	TU132M050J250A 
	1300	18	20	49	3130	2110	TU132M050K200A 
	1600	12.5	40	41	5240	3020	TU162M050Z400A 
	1600	16	30	38	5130	2960	TU162M050J300A 

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: Enter **X** for AEC-Q200 version

See “PACKAGING INFORMATION” to taped or formed product

## 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 +125°C • 100kHz (mA rms)	I <sub>R</sub> • Max. Ripple Current +135°C • 100kHz (mA rms)	CapXon Part Number
50	1800	18	25	38	4230	2530	TU182M050K250A <input type="checkbox"/>
	2200	16	35	29	5480	3160	TU222M050J350A <input type="checkbox"/>
	2400	18	30	28	5240	3020	TU242M050K300A <input type="checkbox"/>
	2700	16	40	25	5930	3420	TU272M050J400A <input type="checkbox"/>
	3000	18	35	24	5870	3390	TU302M050K350A <input type="checkbox"/>
	3600	18	40	23	6420	3700	TU362M050K400A <input type="checkbox"/>
63	390	12.5	20	74	1640	1420	TU391M063Z200A <input type="checkbox"/>
	560	12.5	25	54	2520	2050	TU561M063Z250A <input type="checkbox"/>
	680	16	20	53	2140	1910	TU681M063J200A <input type="checkbox"/>
	750	12.5	30	53	3110	2630	TU751M063Z300A <input type="checkbox"/>
	910	12.5	35	38	3760	2970	TU911M063Z350A <input type="checkbox"/>
	910	18	20	48	2350	2100	TU911M063K200A <input type="checkbox"/>
	1000	16	25	38	2940	2680	TU102M063J250A <input type="checkbox"/>
	1100	12.5	40	31	4610	3260	TU112M063Z400A <input type="checkbox"/>
	1200	16	30	34	3860	3050	TU122M063J300A <input type="checkbox"/>
	1300	18	25	35	3080	2810	TU132M063K250A <input type="checkbox"/>
	1600	16	35	27	4590	3420	TU162M063J350A <input type="checkbox"/>
	1600	18	30	28	4080	3220	TU162M063K300A <input type="checkbox"/>
	1800	16	40	25	5190	3670	TU182M063J400A <input type="checkbox"/>
	2200	18	35	23	5220	3690	TU222M063K350A <input type="checkbox"/>
	2400	18	40	21	5660	3820	TU242M063K400A <input type="checkbox"/>
80	270	12.5	20	74	1610	1400	TU271M080Z200A <input type="checkbox"/>
	390	12.5	25	52	2520	2050	TU391M080Z250A <input type="checkbox"/>
	470	16	20	53	2140	1910	TU471M080J200A <input type="checkbox"/>
	510	12.5	30	42	3110	2630	TU511M080Z300A <input type="checkbox"/>
	620	12.5	35	38	3745	2960	TU621M080Z350A <input type="checkbox"/>
	620	18	20	44	2350	2100	TU621M080K200A <input type="checkbox"/>
	680	16	25	46	2900	2650	TU681M080J250A <input type="checkbox"/>
	750	12.5	40	35	4610	3260	TU751M080Z400A <input type="checkbox"/>
	750	16	30	38	3860	3050	TU751M080J300A <input type="checkbox"/>
	820	18	25	33	3080	2810	TU821M080K250A <input type="checkbox"/>
	1000	16	35	32	4570	3410	TU102M080J350A <input type="checkbox"/>
	1100	18	30	34	4080	3220	TU112M080K300A <input type="checkbox"/>
	1300	16	40	33	5190	3670	TU132M080J400A <input type="checkbox"/>
	1300	18	35	28	5190	3670	TU132M080K350A <input type="checkbox"/>
	1600	18	40	26	5640	3810	TU162M080K400A <input type="checkbox"/>

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## STANDARD RATINGS

Part number shows bulk version with straight leads

$V_R$ (V)	$C_R$ ( $\mu F$ )	$\phi D$ (mm)	L (mm)	Z • Max. Impedance +20°C • 100kHz (m $\Omega$ )	$I_R$ • Max. Ripple Current +125°C • 100kHz (mA rms)	$I_R$ • Max. Ripple Current +135°C • 100kHz (mA rms)	CapXon Part Number
100	160	12.5	20	90	1580	1410	TU161M100Z200A
	220	12.5	25	68	2120	1950	TU221M100Z250A
	270	16	20	67	2050	1670	TU271M100J200A
	300	12.5	30	52	2950	2330	TU301M100Z300A
	360	12.5	35	45	3530	2630	TU361M100Z350A
	360	18	20	61	2270	1860	TU361M100K200A
	390	16	25	48	2790	2340	TU391M100J250A
	430	12.5	40	38	4140	2920	TU431M100Z400A
	470	16	30	41	3440	2720	TU471M100J300A
	510	18	25	45	2920	2470	TU511M100K250A
	560	16	35	36	4150	2930	TU561M100J350A
	620	18	30	37	3920	2920	TU621M100K300A
	750	16	40	29	5020	3380	TU751M100J400A
	820	18	35	30	4710	3330	TU821M100K350A
	910	18	40	28	5260	3550	TU911M100K400A

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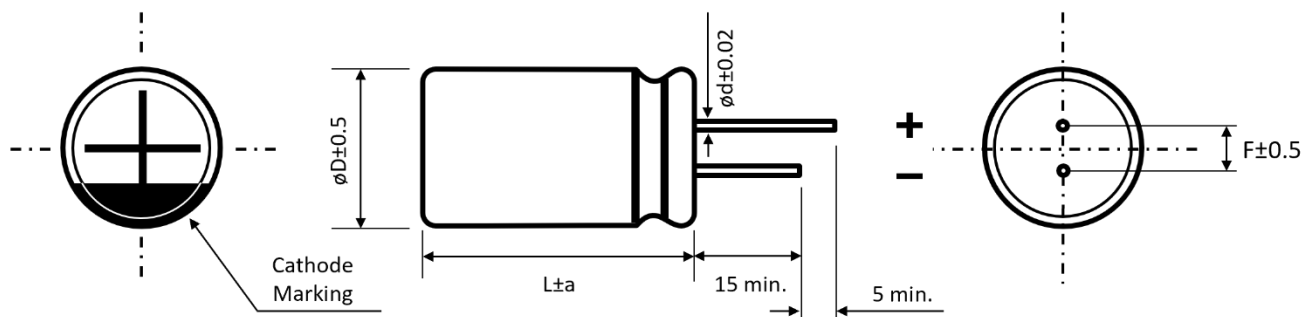
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## MULTIPLIER $K_f$ for RIPPLE CURRENT vs. FREQUENCY

$C_R$ ( $\mu F$ ) / Frequency (Hz)	100/120	1k	10k	50k ~ 100k
$C_R \leq 160$	0.4	0.75	0.90	1
$160 < C_R \leq 680$	0.5	0.85	0.94	1
$680 < C_R \leq 2000$	0.6	0.87	0.95	1
$2200 < C_R \leq 4300$	0.75	0.9	0.95	1
$4300 < C_R$	0.85	0.95	0.98	1

## DIMENSIONS ▪ All dimensions in mm



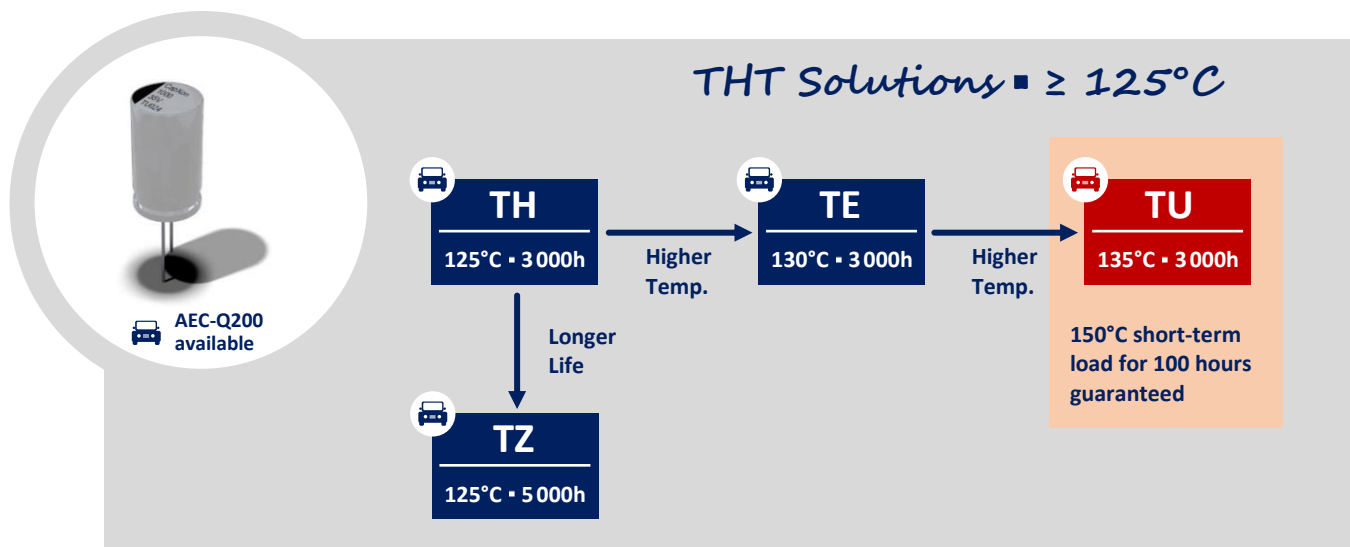
ø D	12.5	16		18	
F	5.0	7.5		7.5	
ø d	0.6	0.8			
a	1.5	L = 25 to 35	L < 25 and L ≥ 40	L = 25 to 30	L < 25 and L ≥ 35
		1.5	2	1.5	2

## 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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