



AVQC SERIES

AEC-Q200 ▲ HIGH RELIABLE 125°C TYPE

HYBRID ALUMINUM ELECTROLYTIC CAPACITOR ■ SMD type

Low leakage current

Self-healing of dielectric layer

Low drift and stable electrical characteristics over lifetime

Moisture Sensitivity Level ▲ MSL 1

AEC-Q200 ▲ Long lifetime with 4000 hours at 125°C

SPECIFICATION

Item		Characteristics					
Category Temperature Range		-55°C to +125°C					
Rated Voltage Range	V _R	25V _{DC} to 80V _{DC}					
Rated Capacitance Range	C _R	22μF to 470μF					
Capacitance Tolerance ▪ At 20°C; 120Hz	ΔC	±20%					
Surge Voltage ▪ At 125°C	V _S	V _S = 1.15 × V _R					
Dissipation Factor ▪ At 20°C; 120Hz	tan δ	V _R	25V _{DC}	35V _{DC}	50V _{DC}	63V _{DC}	80V _{DC}
		tan δ _{max}	0.14	0.12	0.10	0.08	0.08
Leakage Current ▪ At 20°C; after 2min.	I _{LEAK}	Shall not exceed values in the electrical characteristics					
Endurance	Test	125°C ▲ 4000hrs ▲ V _R and I _R applied, without exceeding the rated voltage					
	Appearance	No significant damage					
	ΔC/C _R	≤ ±30% of the initial value					
	tan δ	≤ 200% of the initial specified value					
	ESR	≤ 200% of the initial specified value					
	I _{LEAK}	≤ The initial specified value					
Damp Heat (Steady State)	Test	85°C ▲ 90 to 95% RH ▲ 1000hrs ▲ V _R applied					
	Appearance	No significant damage					
	ΔC/C _R	≤ ±20% of the initial value					
	tan δ	≤ 200% of the initial specified value					
	ESR	≤ 200% of the initial specified value					
	I _{LEAK}	≤ The initial specified value					
Surge Voltage	Test	1000hrs cycles and each one includes charge with surge voltage specified at 125°C for 0.5min through a protective 1kΩ resistor and discharge for 5.5min					
	Appearance	No significant damage					
	ΔC/C _R	≤ ±20% of the initial value					
	tan δ	≤ 150% of the initial specified value					
	ESR	≤ 150% of the initial specified value					
	I _{LEAK}	≤ The initial specified value					

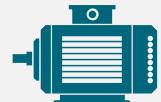
ELECTRICAL CHARACTERISTICS

V_{RDC} (V)	C_R (μF)	Size Code	Dimensions (mm)		I_{LEAK} 20°C 2min (μA)	ESR 20°C 100kHz (m Ω)	I_R 125°C 100kHz (mA)	Part Number ^{Note 1}
			D	L				
25	100	0608	6.3	7.5	25	30	1400	250AVQC101M0608
	150	0608	6.3	7.5	38	30	1800	250AVQC151M0608
	220	0810	8	9.7	55	27	2900	250AVQC221M0810
	270	0810	8	9.7	68	27	2900	250AVQC271M0810
	330	1010	10	10.2	83	20	3500	250AVQC331M1010
	470	1010	10	10.2	118	20	3500	250AVQC471M1010
35	68	0608	6.3	7.5	24	35	1400	350AVQC680M0608
	100	0810	8	9.7	35	30	1900	350AVQC101M0810
	150	0810	8	9.7	53	27	2900	350AVQC151M0810
	180	0810	8	9.7	63	27	2900	350AVQC181M0810
	220	1010	10	10.2	77	20	2800	350AVQC221M1010
	270	1010	10	10.2	95	20	3500	350AVQC271M1010
	330	1010	10	10.2	116	20	3500	350AVQC331M1010
	330	1012	10	12.3	116	14	3500	350AVQC331M1012
50	33	0608	6.3	7.5	17	40	1100	500AVQC330M0608
	68	0810	8	9.7	34	30	2700	500AVQC680M0810
	120	1010	10	10.2	60	25	2900	500AVQC121M1010
	180	1012	10	12.3	90	17	3200	500AVQC181M1012
63	22	0608	6.3	7.5	14	80	900	630AVQC220M0608
	47	0810	8	9.7	30	32	2400	630AVQC470M0810
	56	1010	10	10.2	35	30	2800	630AVQC560M1010
	82	1010	10	10.2	52	30	2800	630AVQC820M1010
	100	1010	10	10.2	63	30	2800	630AVQC101M1010
80	22	0810	8	9.7	18	45	1050	800AVQC220M0810
	47	1010	10	10.2	38	33	1360	800AVQC470M1010
	56	1010	10	10.2	45	33	1360	800AVQC560M1010

Notes

1 Part number shows the standard Tape/Reel version

APPLICATIONS

Automotive Electronics	DC Link in Motor Drives	Harsh Environmental Applications	Input/Output Filter in DC/DC Converter	Power and Battery decoupling
				

REFERENCE DATA ▲ 250AVQC101M0608 ▲ 100μF ▲ 25V ▲ 6.3 x 7.5mm

Fig. 1 • Frequency Characteristics of ESR & |Z|

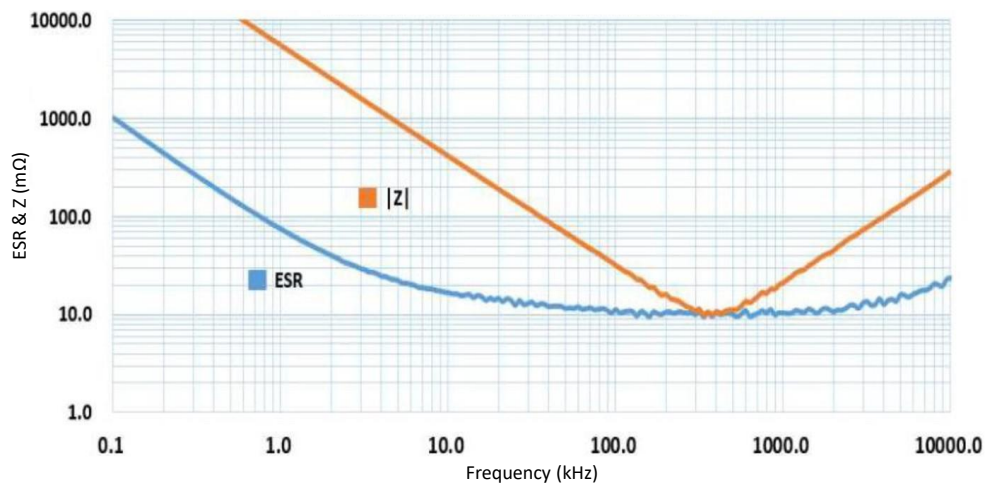


Fig. 2 • Frequency Characteristics of C (μF)

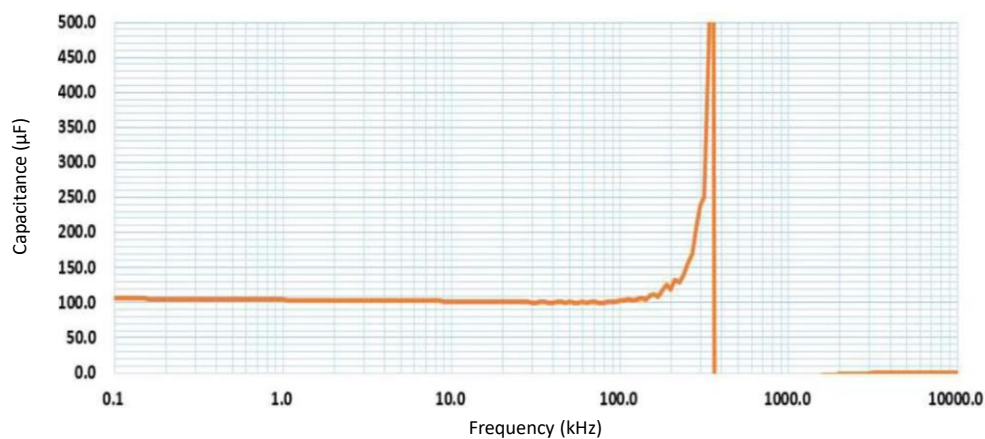
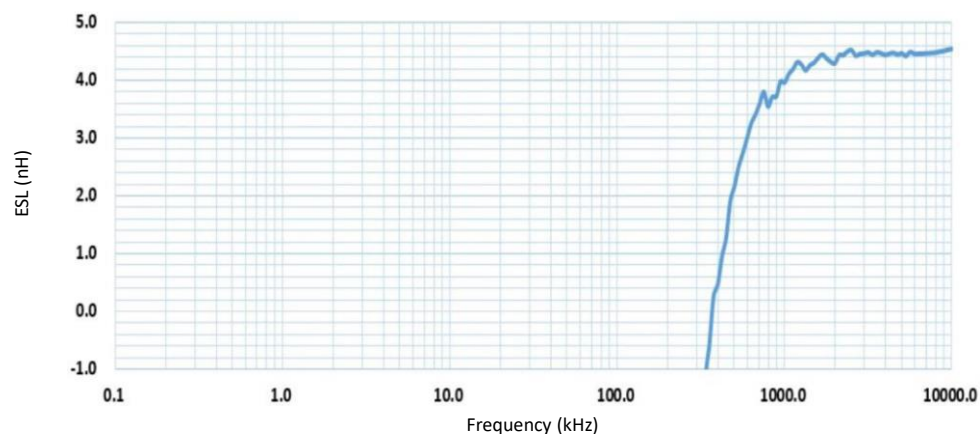


Fig. 3 • Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ 500AVQC680M0810 ▲ 68 μ F ▲ 50V ▲ 8.0 x 9.7mm

Fig. 4 • Frequency Characteristics of ESR & |Z|

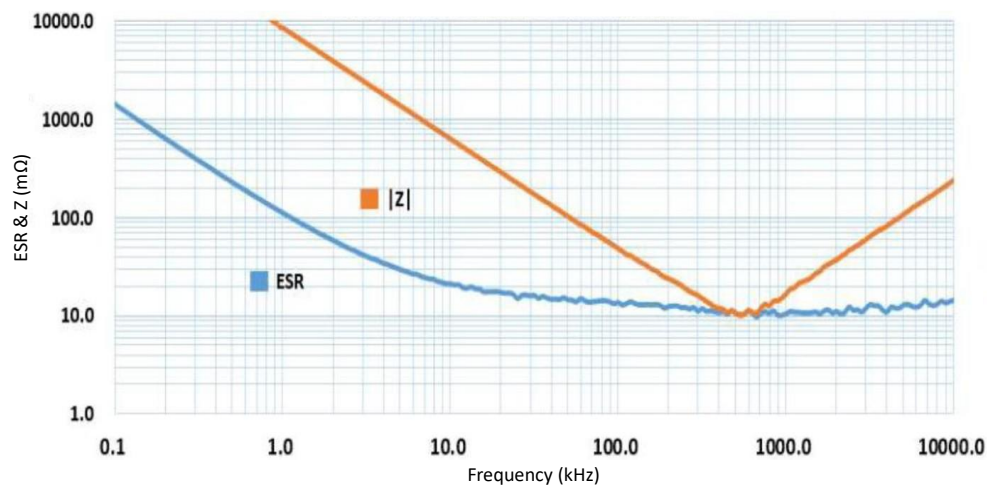


Fig. 5 • Frequency Characteristics of C (μ F)

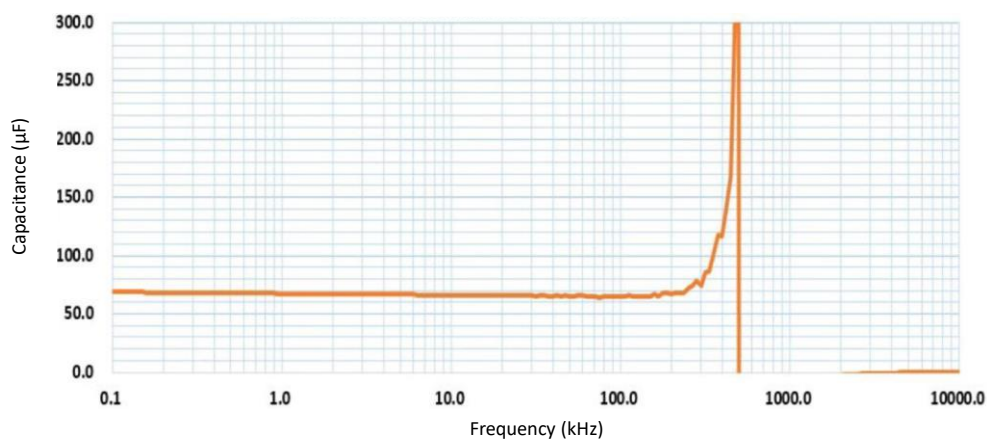
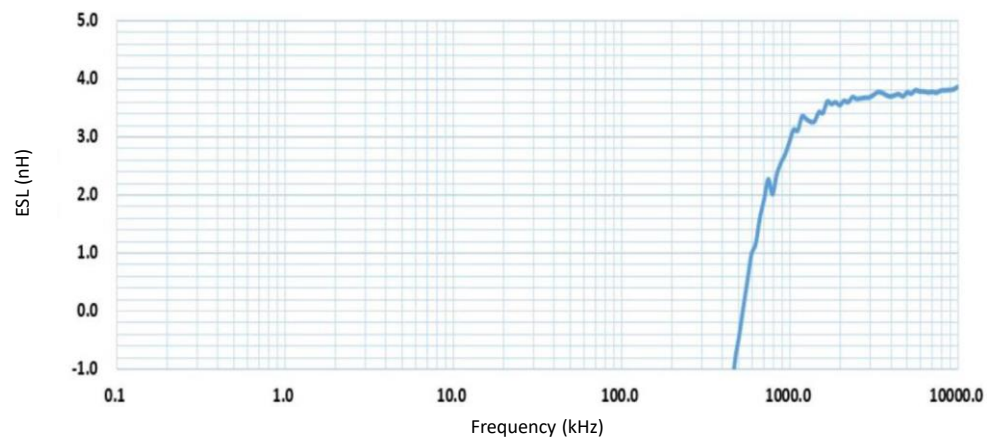


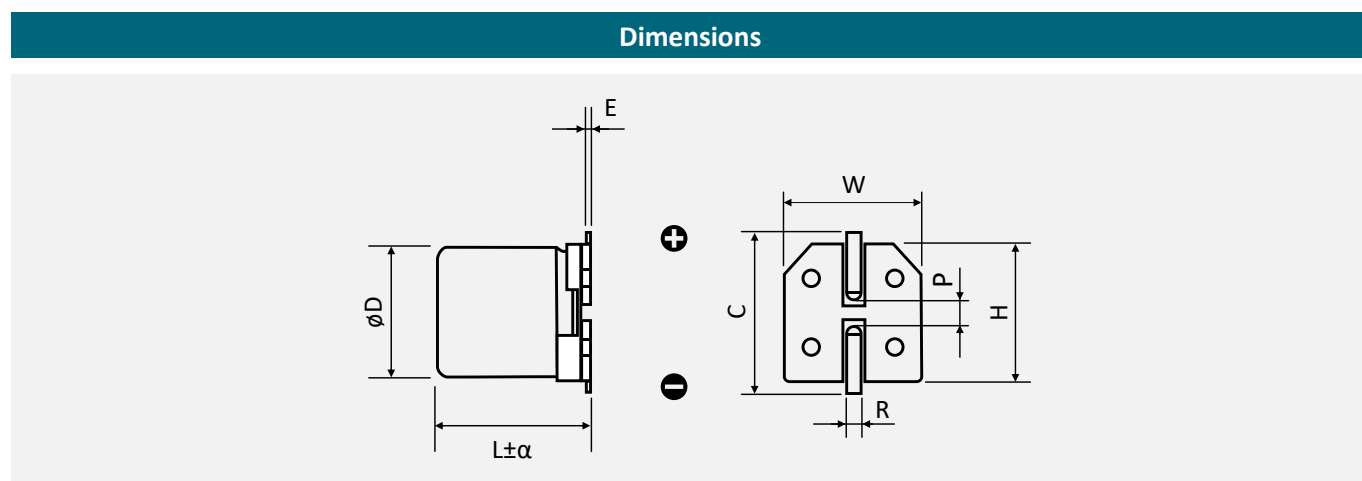
Fig. 6 • Frequency Characteristics of ESL (nH)



FREQUENCY CORRECTION FACTOR

Frequency Correction Factor of Permissible Ripple Current							
Frequency	$120\text{Hz} \leq f < 1\text{kHz}$	$1\text{kHz} \leq f < 5\text{kHz}$	$5\text{kHz} \leq f < 10\text{kHz}$	$10\text{kHz} \leq f < 20\text{kHz}$	$20\text{kHz} \leq f < 300\text{kHz}$	$30\text{kHz} \leq f < 100\text{kHz}$	$100\text{kHz} \leq f < 500\text{kHz}$
Coefficient	0.05	0.3	0.5	0.6	0.7	0.75	1

PACKAGE OUTLINE ▲ All dimensions in mm



Size Code	$\varnothing D$	L	α	E	W	H	C	R	P
Tolerance	$\pm 0.5 \text{ max.}$	-	-	-	± 0.2	± 0.2	± 0.2	-	± 0.3
0608	6.3	7.5	± 0.5	0.00 to 0.20	6.6	6.6	7.3	0.5 to 0.8	2.1
0810	8.0	9.7	± 0.3	0.00 to 0.20	8.3	8.3	9.0	0.8 to 1.1	2.9
1010	10.0	10.2	± 0.3	0.00 to 0.20	10.3	10.3	11.0	0.8 to 1.1	4.6
1012	10.0	12.3	± 0.2	0.00 to 0.20	10.3	10.3	11.0	0.8 to 1.1	4.6

PRODUCT CODE

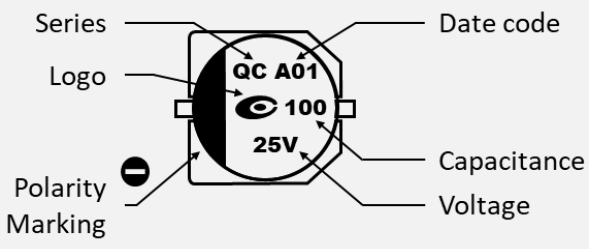
Example: AVQC series ▲ 100μF ▲ 25V_{DC} ▲ ±20% ▲ D=6.3mm ▲ L=7.5mm ▲ Tape/Reel

250		AVQC		101		M		0608	
Rated Voltage (V _{DC})		Series		Capacitance Code ^{Note 1} (μF)		Capacitance Tolerance (%)		Package Code	
Code	VDC	Code	Series	Code	μF	Code	Tol.	Code	D x L
250	25	AVQC	AVQC	220	22	M	±20	0608	6.3 x 7.5
350	35			560	56			0810	8.0 x 9.7
500	50			101	100			1010	10.0 x 10.2
630	63			331	330			1012	10.0 x 12.3
800	80			471	470				

Note:

- Capacitance code expressed in μF. The first two digits represent significant figures. The last digit specifies the total number of zeros to be added.

PRODUCT MARKING

Marking	Details	
	Marking	Description
	Logo	Manufacturer Logo
	Series	QC = AVQC
	Date code	See date code table
	Capacitance	100 = 100μF
	Voltage	25V = 25V
		Polarity (-) marking

DATE CODE

Example:

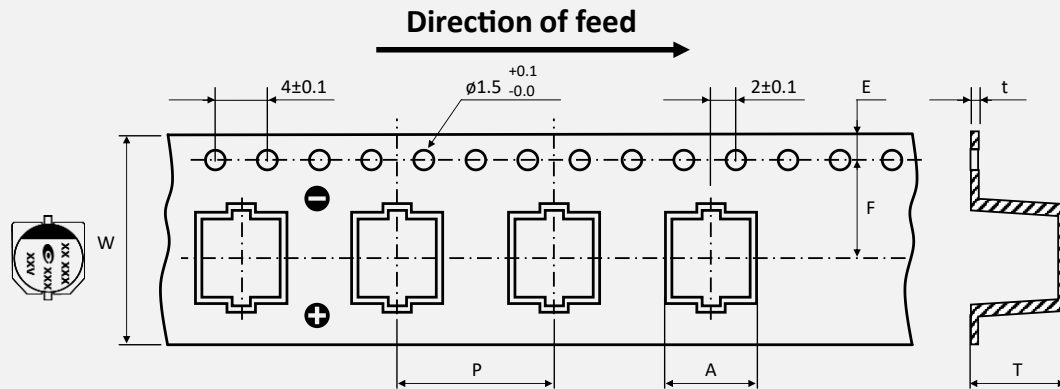
Date code

A01: A01 = 1st week of 2020

A		01	
Year		Week	
A	2019	01	1 st
B	2020	02	2 nd
...	...	...	...
Z	2030	53	53 rd

TAPING SPECIFICATION ▲ SMD TYPE

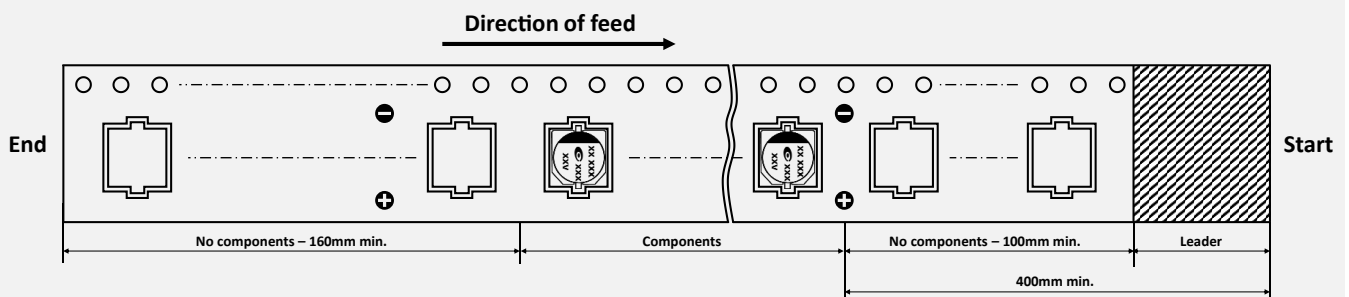
Dimensions in mm



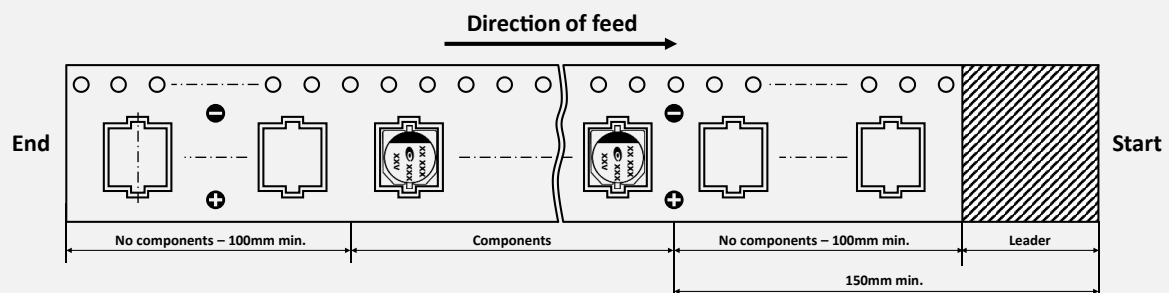
Size Code	W (mm)	A (mm)	B (mm)	F (mm)	E (mm)	P (mm)	T (mm)	t (mm)
Tolerance	± 0.3	± 0.2	± 0.2	± 0.1	± 0.1	± 0.1	± 0.2	± 0.05
0608	16	7	7	7.5	1.75	12	8.2	0.5
0810	24	8.7	8.7	11.5	1.75	16	10	0.5
1010	24	10.7	10.7	11.5	1.75	16	13	0.5
1012	24	10.7	10.7	11.5	1.75	16	13	0.5

START AND END OF TAPE ▲ SMD TYPE

Diameter 5mm / 6mm and 8mm

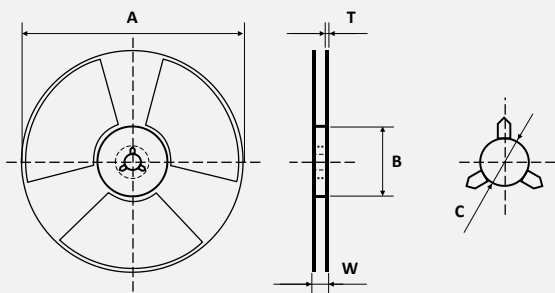
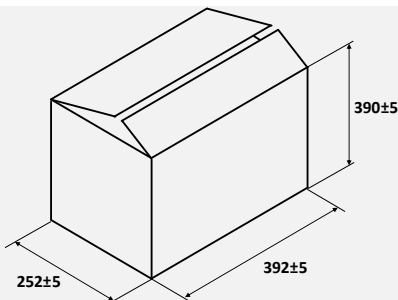


Diameter 10mm

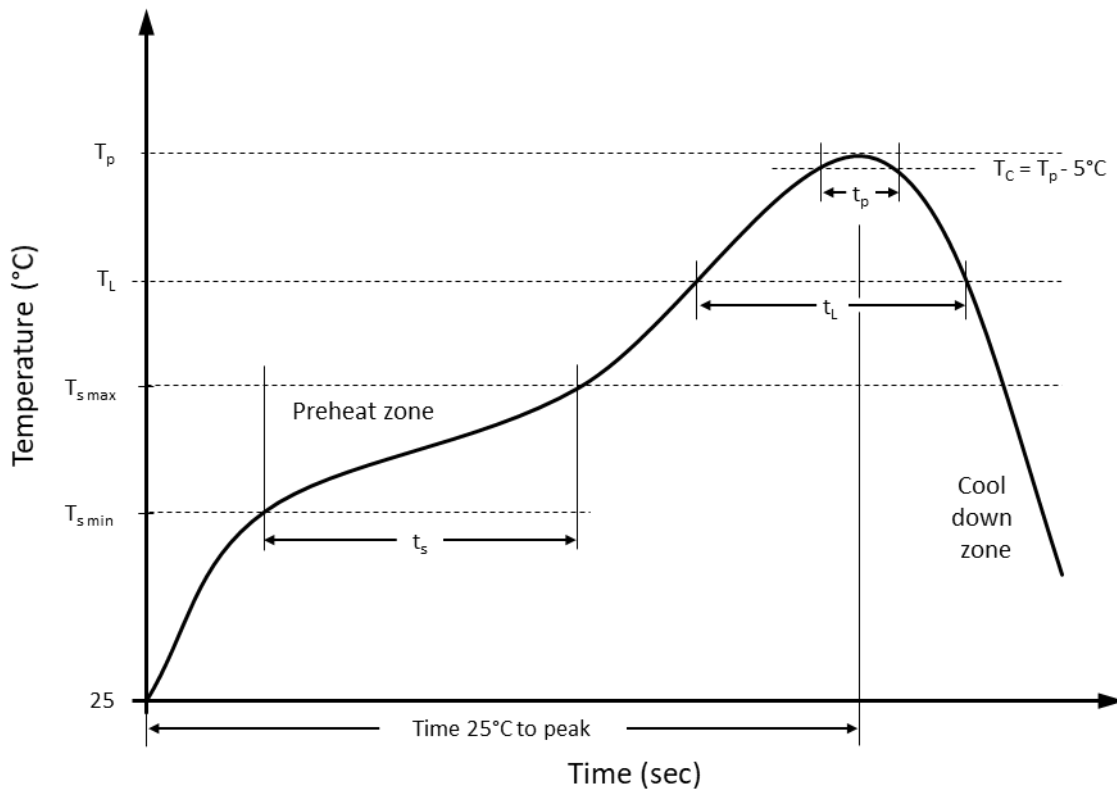


REEL DIMENSION AND PACKAGING QUANTITY ▲ SMD TYPE

Code	Capacitor Dimensions		A ± 2	B ± 0.5	C ± 0.5	W ± 0.8	T ± 0.3	1 Reel	1 Box	
	ØD (mm)	L (mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(pcs)	(pcs)	(reel)
0608	6.3	7.5	381	100	13	16.5	2.5	900	5 400	6
0810	8.0	9.7	381	100	13	25.9	2.5	500	2 500	5
1010	10.0	10.2	381	100	13	25.9	2.5	450	2 250	5
1012	10.0	12.3	381	100	13	25.9	2.5	450	2 250	5

Reel	Box (Dimensions in mm)
 Label on the reel Size L x W = 70mm x 35mm P/N: Customer part number DESC: Customer specification SPEC: Manufacturer part number COO: Country of origin QTY: Quantity (pcs) MAKER: Manufacturer VENDOR: Manufacturer DC: Date code LOT/NO: Production lot	 Label on the outer carton Size L x W = 100mm x 90mm CUSTOMER: Customer name P/O: Customer order number P/N: Customer part number DESCRIPTION: Manufacturer part number QTY: Quantity (pcs) and shipping date COO: Country of origin

RECOMMENDED REFLOW SOLDERING PROFILE ▲ SMD PACKAGE



Recommended reflow soldering conditions ▲ Refer to JEDEC J-STD-020E

Profile Features		Pb-Free Assembly
Preheat temperature min.	$T_{s\ min}$	150 °C
Preheat temperature max.	$T_{s\ max}$	200 °C
Preheat time t_s from $T_{s\ min}$ to $T_{s\ max}$	t_s	120 seconds
Ramp-up rate (T_L to T_p)		max. 3 °C/second
Liquidous temperature	T_L	217 °C
Time t_L maintained above T_L	t_L	See table below
Peak package body temperature	T_p	See table below
Timeframe of within 5°C below and up to max actual peak body temperature	t_p	See table below
Ramp-down rate (T_L to T_p)		max. 6 °C/second
Time 25°C to peak temperature		max. 8 minutes

Size Code	Time > 200°C	t_L Time > 217°C	Time > 230°C	T_p Peak Temperature	t_p Timeframe	Allowed Reflow Runs
≤ 6.3 mm	70 sec. max.	70 sec. max.	70 sec. max.	260 °C	5 sec	Max. twice
≥ 8mm	70 sec. max.	70 sec. max.	70 sec. max.	245 °C	10 sec	Max. twice
				260 °C	5 sec	Only once

REVISION TABLE

Revision	Date	Status	Notes
001	29/11/2022	Initial release	Initial publication

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