



AR5P SERIES

5 000 HOURS SURGE STABLE TYPE

ALUMINUM SOLID ELECTROLYTIC CAPACITOR ▪ THT type
 Ultra-high ripple current up to 8.1A at 100kHz/105°C
 Ultra-low ESR up to 7mΩ at 100kHz/20°C
 Low drift and stable electrical characteristics over lifetime
 No liquid electrolyte ▲ No dry-out effect
Ultra-long lifetime with 5 000 hours at 105°C

SPECIFICATION

Item		Characteristics
Category Temperature Range		-55°C to +105°C
Rated Voltage Range	V_R	6.3V _{DC} to 35V _{DC}
Rated Capacitance Range	C_R	330μF to 2500μF
Capacitance Tolerance ▪ At 20°C; 120Hz	ΔC	±20%
Surge Voltage ▪ At 105°C	V_S	$V_S = 1.15 \times V_R$
Dissipation Factor ▪ At 20°C; 120Hz	$\tan \delta$	0.1 max.
Leakage Current ▪ At 20°C; after 2min.	I_{LEAK}	Shall not exceed values in the electrical characteristics
Endurance	Test	105°C ▲ 5000hrs ▲ V_R applied
	Appearance	No significant damage
	$\Delta C/C_R$	≤ ±20% of the initial value
	$\tan \delta$	≤ 150% of the initial specified value
	ESR	≤ 150% of the initial specified value
Damp Heat (Steady State)	Test	60°C ▲ 90 ~ 95% RH ▲ 1000hrs ▲ No voltage applied
	Appearance	No significant damage
	$\Delta C/C_R$	≤ ±20% of the initial value
	$\tan \delta$	≤ 150% of the initial specified value
	ESR	≤ 150% of the initial specified value
Surge Voltage	Test	2000 cycles and each one includes charge with V_S specified at 105°C for 0.5min through a protective resistor ($R=1k\Omega$) and discharge for 5.5min.
	Appearance	No significant damage
	$\Delta C/C_R$	≤ ±20% of the initial value
	$\tan \delta$	≤ 150% of the initial specified value
	ESR	≤ 150% of the initial specified value
	I_{LEAK}	≤ The initial specified value

ELECTRICAL CHARACTERISTICS

V _{R DC} (V)	C _R (μF)	Size Code	Dimensions (mm)				I _{LEAK} 20°C 2min (μA)	ESR 20°C 100kHz (mΩ)	I _R 105°C 100kHz (mA)	Part Number ^{Note 1}
			D	L	P	Ød				
6.3	470	06X8	6.3	8	2.5	0.6	592	8	4700	6R3AR5P471M06X8T
	560	06X8	6.3	8	2.5	0.6	705	8	4700	6R3AR5P561M06X8T
	820	06X8	6.3	8	2.5	0.6	1033	8	4700	6R3AR5P821M06X8T
	1000	08A2	8	12	3.5	0.6	1260	7	6100	6R3AR5P102M08A2T
16	330	08X8	8	8	3.5	0.6	1056	10	5000	160AR5P331M08X8T
	470	08X8	8	8	3.5	0.6	1505	16	4000	160AR5P471M08X8T
	470	08A2	8	12	3.5	0.6	1505	10	5230	160AR5P471M08A2T
	470	10A2	10	12	5	0.6	1505	10	6100	160AR5P471M10A2T
	560	08A2	8	12	3.5	0.6	1792	14	4950	160AR5P561M08A2T
	680	08A2	8	12	3.5	0.6	544	10	5230	160AR5P681M08A2T
	820	08A2	8	12	3.5	0.6	2624	10	5230	160AR5P821M08A2T
	1000	08A6	8	16	3.5	0.6	3200	10	6100	160AR5P102M08A6T
	1000	10A2	10	12	5	0.6	3200	12	5400	160AR5P102M10A2T
	1500	10A6	10	16	5	0.6	4800	10	6600	160AR5P152M10A6T
	2200	10B0	10	20	5	0.6	7040	8	8100	160AR5P222M10B0T
	2500	10B0	10	20	5	0.6	8000	8	8100	160AR5P252M10B0T
20	390	08A0	8	10	3.5	0.6	1560	14	4970	200AR5P391M08A0T
	680	10A2	10	12	5	0.6	2720	14	5100	200AR5P681M10A2T
25	330	10A2	10	12	5	0.6	1650	16	5100	250AR5P331M10A2T
	470	08A2	8	12	3.5	0.6	2350	16	4650	250AR5P471M08A2T
	470	10A2	10	12	5	0.6	2350	17	4650	250AR5P471M10A2T
	560	08A6	8	16	3.5	0.6	2800	14	5000	250AR5P561M08A6T
	560	10A2	10	12	5	0.6	2800	14	5100	250AR5P561M10A2T
	680	08A6	8	16	3.5	0.6	3400	14	5000	250AR5P681M08A6T
	680	10A2	10	12	5	0.6	3400	14	5100	250AR5P681M10A2T
	820	08B0	8	20	3.5	0.6	4100	13	5100	250AR5P821M08B0T
	1000	10A6	10	16	5	0.6	5000	13	5200	250AR5P102M10A6T
	1500	10B0	10	20	5	0.6	7500	13	5300	250AR5P152M10B0T
35	330	10A2	10	12	5	0.6	2310	24	3400	350AR5P331M10A2T
	470	08B0	8	20	3.5	0.6	3290	20	4400	350AR5P471M08B0T
	470	10A6	10	16	5	0.6	3290	25	4000	350AR5P471M10A6T
	560	10A6	10	16	5	0.6	3920	23	4200	350AR5P561M10A6T
	680	10B0	10	20	5	0.6	4760	20	4800	350AR5P681M10B0T

Notes 1 Part number shows the standard Tape/Ammo version

APPLICATIONS

Input/Output Filter in DC/DC Converter	High Frequency Applications	Equipment with High Expected Life	Server & Industrial PC	Voltage Stabilizing in LED Panels

REFERENCE DATA ▲ 160AR5P561M08A2T ▲ 560 μ F ▲ 16V ▲ 8.0 x 12.0mm

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

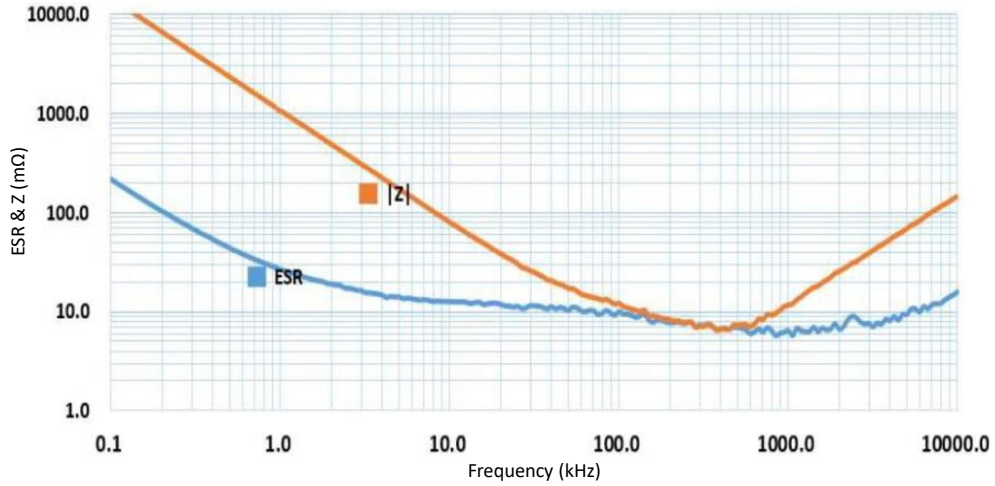


Fig. 2 • Frequency Characteristics of C (μF)

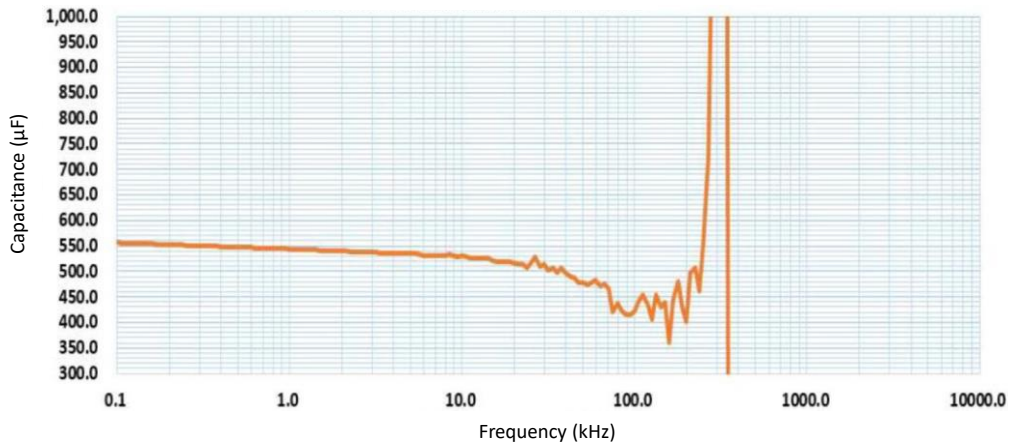
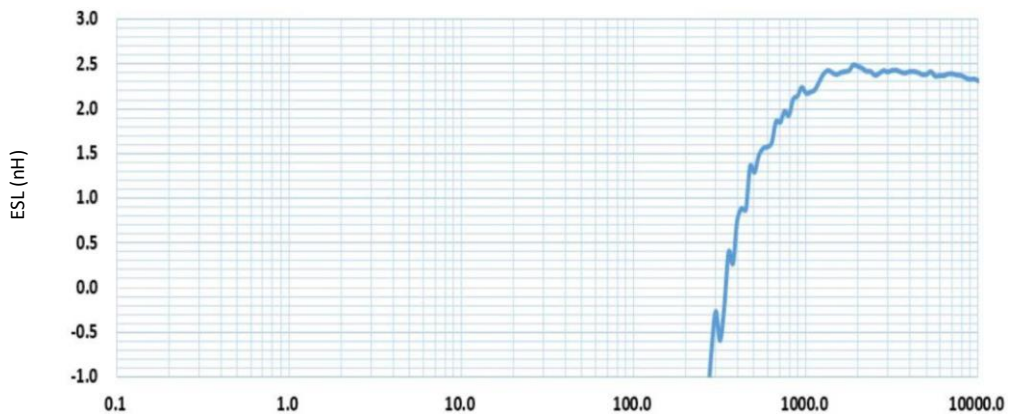


Fig. 3 • Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ 160AR5P122M08B0T ▲ 1200 μ F ▲ 16V ▲ 8.0 x 20.0mm

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

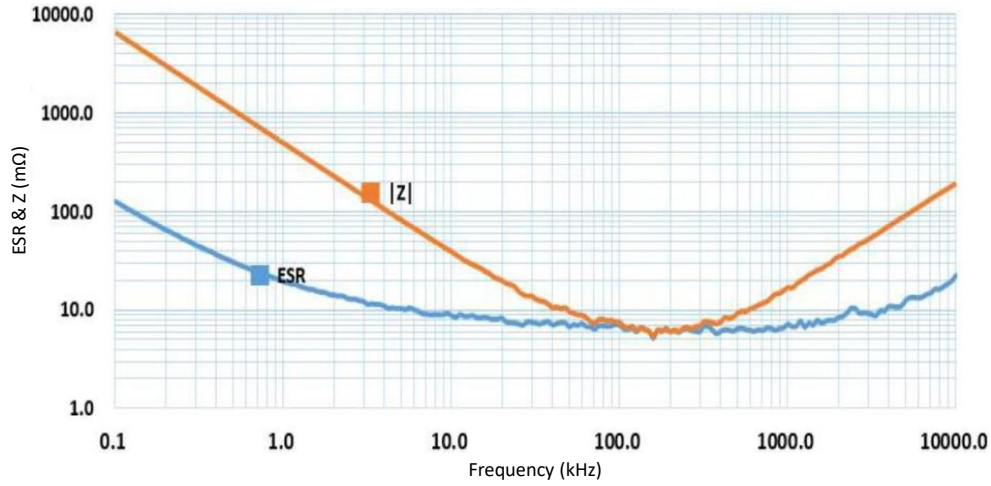


Fig. 5 • Frequency Characteristics of C (μF)

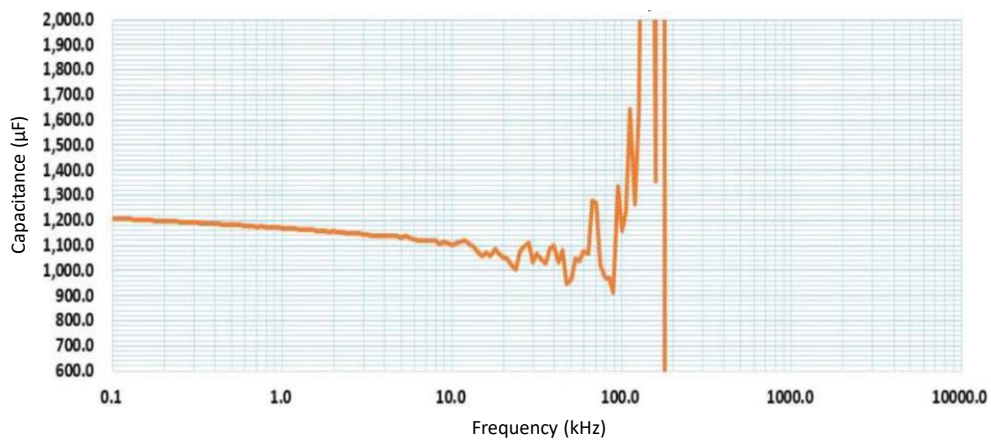
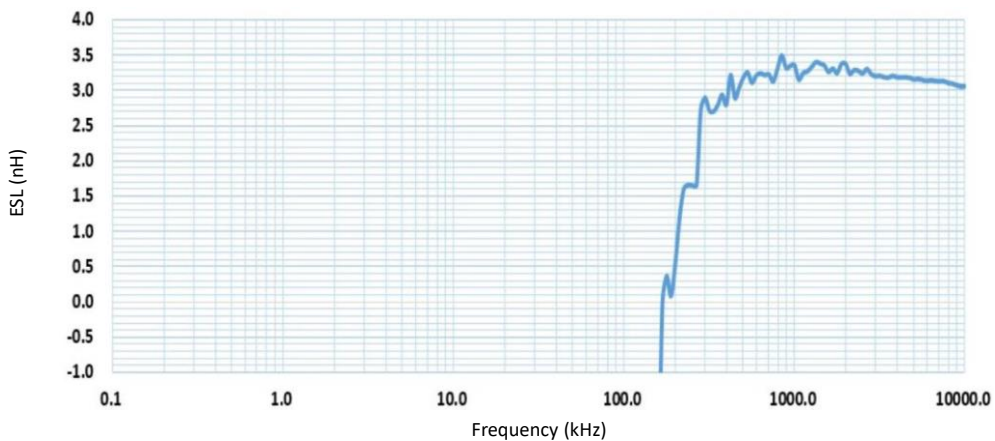


Fig. 6 • Frequency Characteristics of ESL (nH)

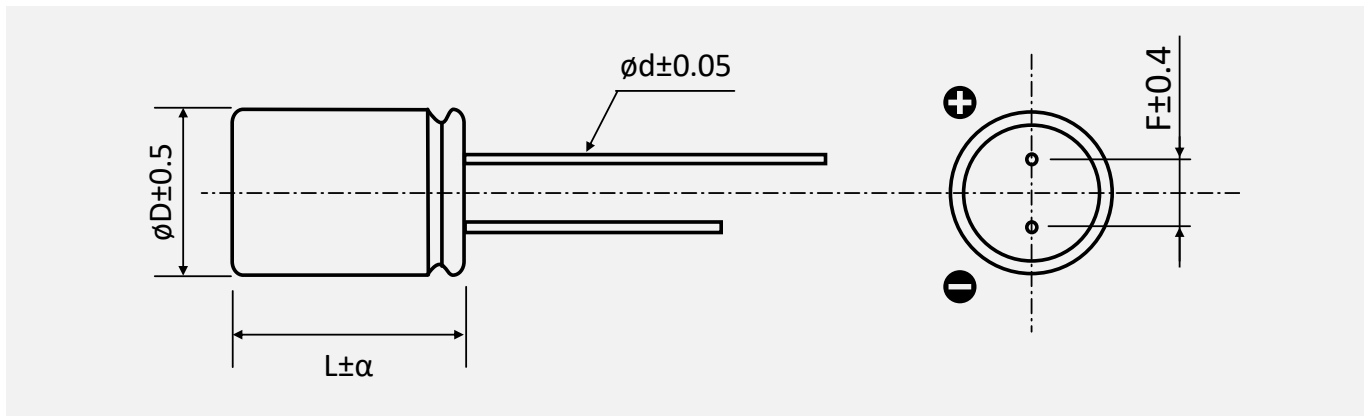


FREQUENCY CORRECTION FACTOR

Frequency Correction Factor of Permissible Ripple Current

Frequency	$120\text{Hz} \leq f < 1\text{kHz}$	$1\text{kHz} \leq f < 10\text{kHz}$	$10\text{kHz} \leq f < 50\text{kHz}$	$50\text{kHz} \leq f < 100\text{kHz}$	$100\text{kHz} \leq f < 500\text{kHz}$
Coefficient	0.05	0.3	0.7	0.85	1

PACKAGE OUTLINE ▲ All dimensions in mm

Dimensions


Size Code	$\varnothing D \pm 0.5 \text{ max.}$	L	α	$\varnothing d \pm 0.05$	$F \pm 0.4$
06X8	6.3	8.0	-0.5 to +1.0	0.60	2.5
08X8	8.0	8.0	-0.5 to +1.0	0.60	3.5
08A0	8.0	10.0	-0.5 to +1.0	0.60	3.5
08A2	8.0	12.0	-0.5 to +1.0	0.60	3.5
08A6	8.0	16.0	-0.5 to +1.0	0.60	3.5
08B0	8.0	20.0	-0.5 to +1.0	0.60	3.5
10A2	10.0	12.0	-0.5 to +1.0	0.60	5.0
10A6	10.0	16.0	-0.5 to +1.0	0.60	5.0
10B0	10.0	20.0	-0.5 to +1.0	0.60	5.0

PRODUCT CODE

Example: AR5P series ▲ 2500 μ F ▲ 16V_{DC} ▲ \pm 20% ▲ D=10mm ▲ L=20mm ▲ F=5mm ▲ Tape/Ammo

160		AR5P		252		M		10B0		T	
Rated Voltage (V _{DC})		Series		Capacitance Code ^{Note 1} (μ F)		Capacitance Tolerance (%)		Package Code		Packaging Type	
Code	VDC	Code	Series	Code	μ F	Code	Tol.	Code	D x L	Code	Type
6R3	6.3	AR5P	AR5P	331	330	M	\pm 20	06X8	6.3 x 8.0	Blank T	Bulk Tape/Ammo
160	16.0			471	470			08X8	8.0 x 8.0		
200	20.0			102	1000			08A0	8.0 x 10.0		
250	25.0			152	1500			08A2	8.0 x 12.0		
350	35.0			222	2200			08A6	8.0 x 16.0		
								08B0	8.0 x 20.0		
				10A2	10.0 x 12.0						
				10A6	10.0 x 16.0						
				10B0	10.0 x 20.0						

Note:

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

PRODUCT MARKING

Marking	Details														
	<table border="1"> <thead> <tr> <th>Marking</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Logo</td> <td>Manufacturer Logo</td> </tr> <tr> <td>Series</td> <td>5P = AR5P</td> </tr> <tr> <td>Date code</td> <td>See date code table</td> </tr> <tr> <td>Capacitance</td> <td>560 = 560μF</td> </tr> <tr> <td>Voltage</td> <td>6.3V = 6.3V</td> </tr> <tr> <td></td> <td>Polarity (-) marking</td> </tr> </tbody> </table>	Marking	Description	Logo	Manufacturer Logo	Series	5P = AR5P	Date code	See date code table	Capacitance	560 = 560 μ F	Voltage	6.3V = 6.3V		Polarity (-) marking
Marking	Description														
Logo	Manufacturer Logo														
Series	5P = AR5P														
Date code	See date code table														
Capacitance	560 = 560 μ F														
Voltage	6.3V = 6.3V														
	Polarity (-) marking														

DATE CODE

Example:

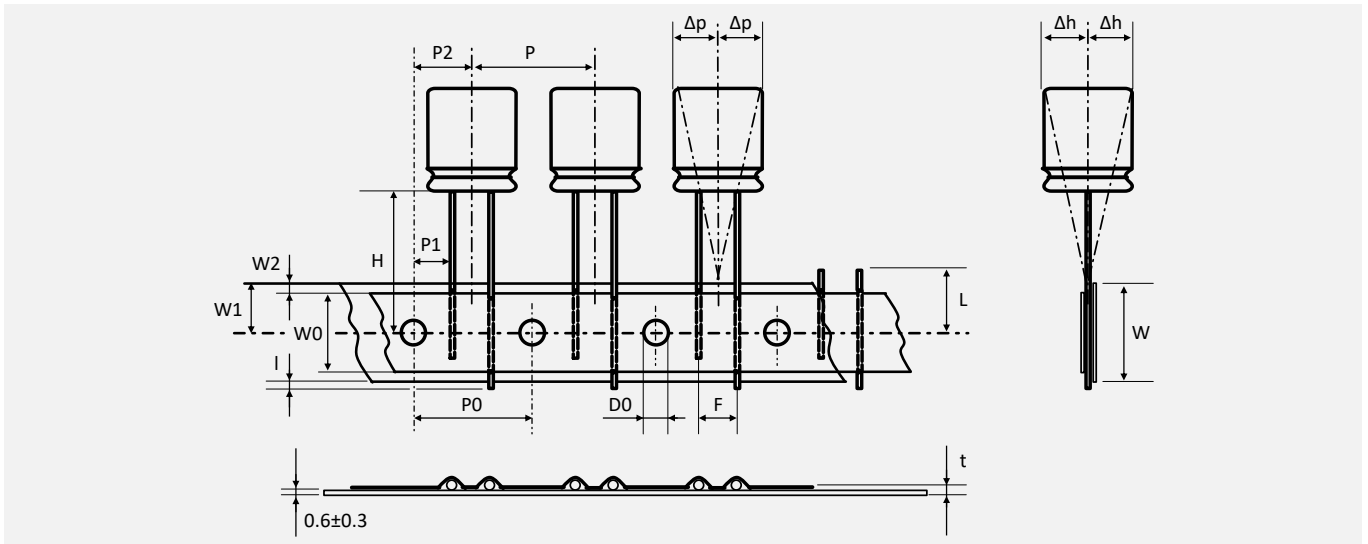
Date code

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 ▲ THT TYPE

Dimensions in mm



Size Code	F	P	P0	P1	P2	Δp	Δh	W	W0	W1	W2	H	ØD0	t	l	L
Tolerance	+0.8	±1.0	±0.2	±0.5	±1.0	±1.0	±1.0	±0.5	Min	±0.5	Max	±0.75	±0.2	±0.3	Max	max
	-0.2															
06X8	2.5	12.7	12.7	5.1	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08X8	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08A0	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08A2	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08A6	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08B0	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
10A2	5	12.7	12.7	3.85	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
10A6	5	12.7	12.7	3.85	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
10B0	5	12.7	12.7	3.85	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11

AMMO PACKAGING QUANTITIES ▲ THT TYPE

Carton	Diameter (mm)	Length (mm)	Size Code	L max. (mm)	W max. (mm)	H max. (mm)	Qty per carton (pcs)
	Ø 6.3	8.0	06X8	335	42	260	2000
	Ø 8.0	8.0	08X8	335	42	260	1200
	Ø 8.0	10.0	08A0	335	45	260	1200
	Ø 8.0	12.0	08A2	335	45	260	1200
	Ø 8.0	16.0	08A6	335	53	260	1200
	Ø 8.0	20.0	08B0	335	53	260	1200
	Ø 10.0	12.0	10A2	335	45	260	650
	Ø 10.0	16.0	10A6	335	45	260	650
	Ø 10.0	20.0	10B0	335	55	260	650

BULK PACKAGING ▲ THT TYPE

Code	Capacitor Dimensions		Quantity / Bag	Quantity / Inner Box		Quantity outer box	
	ØD	L					
06X8	6.3	8.0	500 pcs	6 bags	3 000 pcs	5 inner boxes	15 000 pcs
08X8	8.0	8.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
08A0	8.0	10.0	400 pcs	4 bags	1 600 pcs	5 inner boxes	8 000 pcs
08A2	8.0	12.0	400 pcs	4 bags	1 600 pcs	5 inner boxes	8 000 pcs
08A6	8.0	16.0	300 pcs	4 bags	1 200 pcs	5 inner boxes	6 000 pcs
08B0	8.0	20.0	300 pcs	4 bags	1 200 pcs	5 inner boxes	6 000 pcs
10A2	10.0	12.0	300 pcs	4 bags	1 200 pcs	5 inner boxes	6 000 pcs
10A6	10.0	16.0	200 pcs	4 bags	800 pcs	5 inner boxes	4 000 pcs
10B0	10.0	20.0	200 pcs	4 bags	800 pcs	5 inner boxes	4 000 pcs

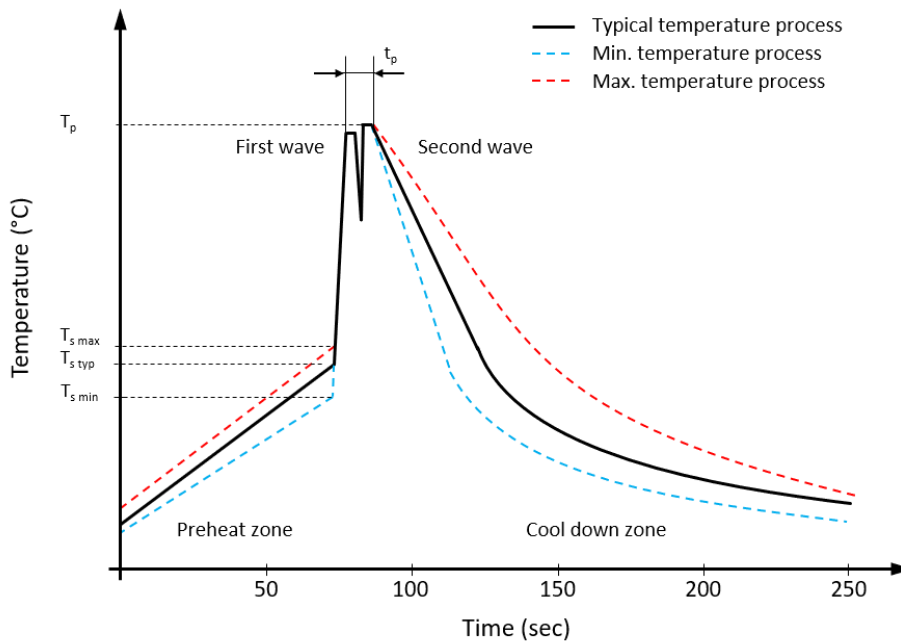
Bag	Inner Box	Outer Carton
<p>Label content Size L x W = 70mm x 50mm</p> <ol style="list-style-type: none"> P/N: Customer part number R-ID: CCF1001290001 CCF: Fix 10: e.g., 2010 01: e.g., January 29: e.g., Day 29th 0001: Running number DESC: Customer specification SPEC: Manufacturer part number COO: Country of origin MAKER: Manufacturer VENDOR: Manufacturer DC: Date code LOT/NO: Production lot 	<p>Label on the inner box Size L x W = 70mm x 35mm</p> <ol style="list-style-type: none"> 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 	<p>Label on the outer carton Size L x W = 100mm x 90mm</p> <ol style="list-style-type: none"> 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

BULK PACKAGING ▲ THT TYPE WITH CUTTED LEADS NOTE 1

Code	Capacitor Dimensions		Quantity / Bag	Quantity / Inner Box		Quantity outer box	
	ØD	L					
06X8	6.3	8.0	500 pcs	8 bags	4 000 pcs	5 inner boxes	20 000 pcs
08X8	8.0	8.0	500 pcs	6 bags	3 000 pcs	5 inner boxes	15 000 pcs
08A0	8.0	10.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
08A2	8.0	12.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
08A6	8.0	16.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
08B0	8.0	20.0	400 pcs	4 bags	1 600 pcs	5 inner boxes	8 000 pcs
10A2	10.0	12.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
10A6	10.0	16.0	400 pcs	4 bags	1 600 pcs	5 inner boxes	8 000 pcs
10B0	10.0	20.0	350 pcs	4 bags	1 400 pcs	5 inner boxes	7 000 pcs

Note: 1 Please consult MGT for possible lead length, drawing and ordering code.

RECOMMENDED WAVE SOLDERING PROFILE ▲ THT PACKAGE



Profile Features		Value - Sn-Pb Assembly	Value - Pb-free Assembly
Preheat temperature min.	$T_{s \text{ min}}$	100 °C	100 °C
Preheat temperature typical	$T_{s \text{ typ}}$	120 °C	120 °C
Preheat temperature max.	$T_{s \text{ max}}$	130 °C	130 °C
Preheat time t_s from $T_{s \text{ min}}$ to $T_{s \text{ max}}$	t_s	70 seconds	70 seconds
Peak temperature	T_p	235 °C to 260 °C	245 °C to 260 °C
Time of actual peak temperature	t_p	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down rate min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second
Time 25°C to 25°C		4 minutes	4 minutes

SOLDERING SUGGESTIONS

When solder a capacitor, heat in soldering is conducted to the element of the capacitor from wire lead and an enclosure, and hence it should be noted that soldering under high temperature and a long period may cause deterioration of breakdown of capacitors. Be sure to solder within the recommended temperature condition range.

HAND SOLDERING

- Soldering iron top temperature: $\leq 350^\circ\text{C}$
- Soldering time: $\leq 3\text{sec}$

If re-work or dipping twice is necessary, it should be done after the capacitor returned to the normal temperature.

Suggestion time is 24 hours.

THT capacitors are not suitable for reflow soldering.

When SMD components are used together with film capacitor, the film capacitor should not pass into the SMD adhesive curing oven. The film capacitor should be assembled after the SMD process.

REVISION TABLE

Revision	Date	Status	Notes
001	01/10/2021	Initial release	Initial publication

DISCLAIMER

Except for the written expressed warranties, MGT does not implicitly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any MGT product.

All information and technical specifications made available by MGT are for guidance only and we reserve the right to change or modify them without prior notice. Unless expressly stated in writing by MGT, we reject any guarantees, obligations, or warranties.

All MGT products with the technical specifications described are suitable for use in certain applications. Operating, production, storage and environmental conditions can have a massive influence on the parameters mentioned in the data sheets, which cause the performance to vary over time.

It is subject to the user's duty of care to design and validate his products in such a way that appropriate measures are taken, such as protective circuits or redundant systems to ensure the safety standards required in the application.

MGT components are not designed or rated for use in life support, rescue, safety critical, military, or aerospace applications where failure or malfunction could result in property or environmental damage, serious injury or death. In the aforementioned cases, please contact us before using MGT products.

In principle, we reserve all rights and MGT's general terms and conditions apply. You can find them on our website www.mgt.co.com.