

ARHA SERIES

5000 HOURS HIGH VOLTAGE TYPE

ALUMINUM SOLID ELECTROLYTIC CAPACITOR ▪ THT type

High ripple current up to 5.3A at 100kHz/105°C

High voltage series up to 100V_{DC}

Low drift and stable electrical characteristics over lifetime

No liquid electrolyte ▲ No dry-out effect

Ultra-long lifetime with 5000 hours at 105°C

SPECIFICATION

Item		Characteristics
Category Temperature Range		-55°C to +105°C
Rated Voltage Range	V _R	25V _{DC} to 100V _{DC}
Rated Capacitance Range	C _R	22μF to 1500μF
Capacitance Tolerance ▪ At 20°C; 120Hz	ΔC	±20%
Surge Voltage ▪ At 105°C	V _S	V _S = 1.15 × V _R
Dissipation Factor ▪ At 20°C; 120Hz	tan δ	0.12 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
	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
Damp Heat (Steady State)	Test	60°C ▲ 90 to 95% RH ▲ 1000hrs ▲ No voltage applied
	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
Surge Voltage	Test	1000 cycles and each one includes charge with V _S specified at 105°C for 0.5min through a protective resistor (R=1kΩ) 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 _{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				
25	82	06X8	6.3	8	2.5	0.6	410	28	2700	250ARHA820M06X8T
	100	08A2	8	12	3.5	0.6	500	22	3600	250ARHA101M08A2T
	220	08A2	8	12	3.5	0.6	1100	16	4650	250ARHA221M08A2T
	330	08A2	8	12	3.5	0.6	1650	16	4650	250ARHA331M08A2T
	470	08A2	8	12	3.5	0.6	2350	16	4650	250ARHA471M08A2T
	560	10A2	10	12	5	0.6	2800	14	5100	250ARHA561M10A2T
	680	08A6	8	16	3.5	0.6	3400	14	5000	250ARHA681M08A6T
	680	10A2	10	12	5	0.6	3400	14	5100	250ARHA681M10A2T
	820	08B0	8	20	3.5	0.6	4100	13	5100	250ARHA821M08B0T
	1000	10A6	10	16	5	0.6	5000	13	5200	250ARHA102M10A6T
	1500	10B0	10	20	5	0.6	7500	13	5300	250ARHA152M10B0T
35	47	06X5	6.3	5	2.5	0.45	329	35	2300	350ARHA470M06X5T
	68	06X8	6.3	8	2.5	0.6	476	25	2600	350ARHA680M06X8T
	100	06X8	6.3	8	2.5	0.6	700	35	2350	350ARHA101M06X8T
	100	08X8	8	8	3.5	0.6	700	23	2800	350ARHA101M08X8T
	220	08A2	8	12	3.5	0.6	1540	25	2890	350ARHA221M08A2T
	330	10A2	10	12	5	0.6	2310	24	3400	350ARHA331M10A2T
	470	08B0	8	20	3.5	0.6	3290	20	4400	350ARHA471M08B0T
	470	10A6	10	16	5	0.6	3290	25	4000	350ARHA471M10A6T
	560	10A6	10	16	5	0.6	3920	23	4200	350ARHA561M10A6T
	680	10B0	10	20	5	0.6	4760	20	4800	350ARHA681M10B0T
50	120	08A2	8	12	3.5	0.6	1200	28	2620	500ARHA121M08A2T
	180	10A2	10	12	5	0.6	1800	28	3100	500ARHA181M10A2T
	220	10A2	10	12	5	0.6	2200	28	3100	500ARHA221M10A2T
	390	10B0	10	20	5	0.6	3900	23	3800	500ARHA391M10B0T
63	22	08X8	8	8	3.5	0.6	277	35	2100	630ARHA220M08X8T
	47	08A2	8	12	3.5	0.6	592	30	2500	630ARHA470M08A2T
	68	10A2	10	12	5	0.6	857	25	2500	630ARHA680M10A2T
	100	10A2	10	12	5	0.6	1260	30	2700	630ARHA101M10A2T
	180	10A2	10	12	5	0.6	2268	30	2700	630ARHA181M10A2T
80	22	08X8	8	8	3.5	0.6	352	40	1700	800ARHA220M08X8T
	47	10A2	10	12	5	0.6	752	32	2100	800ARHA470M10A2T
	82	10A2	10	12	5	0.6	1312	32	2200	800ARHA820M10A2T
100	22	10A2	10	12	5	0.6	440	45	1600	101ARHA220M10A2T
	47	10A2	10	12	5	0.6	940	35	2100	101ARHA470M10A2T

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 ▲ 350ARHA471M08B0T ▲ 470 μ F ▲ 35V ▲ 8.0 x 20.0mm

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

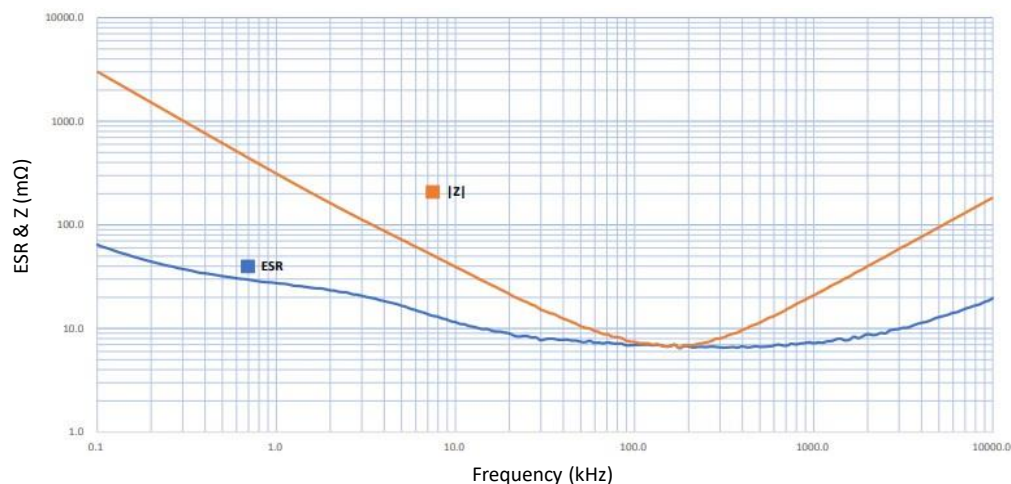


Fig. 2 • Frequency Characteristics of C (μ F)

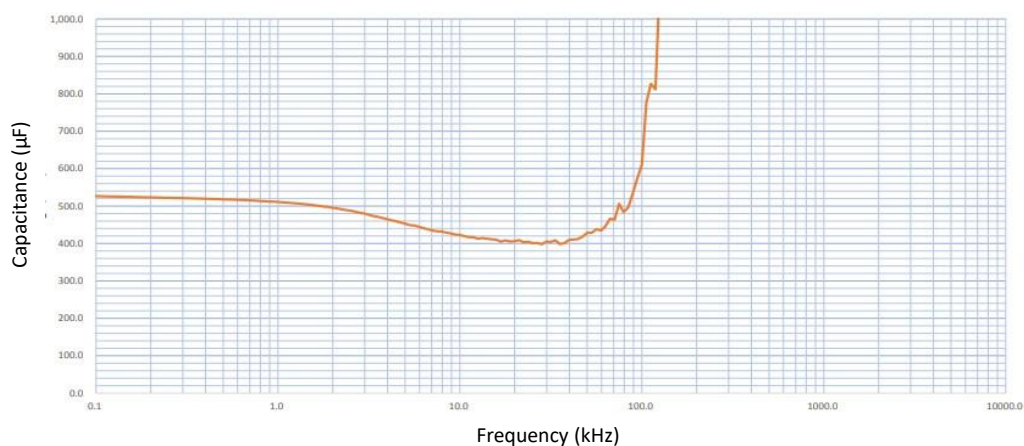
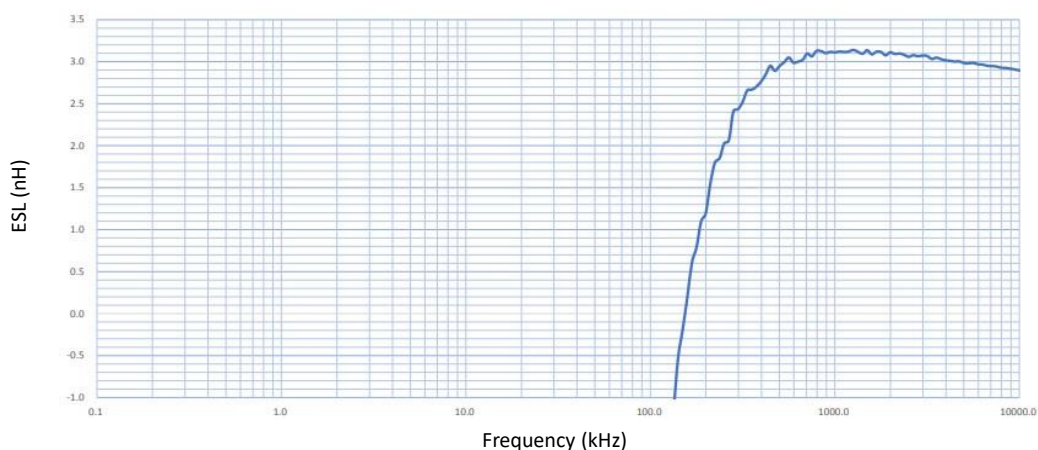


Fig. 3 • Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ 630ARHA101M10A2T ▲ 100 μ F ▲ 63V ▲ 10.0 x 12.0mm

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

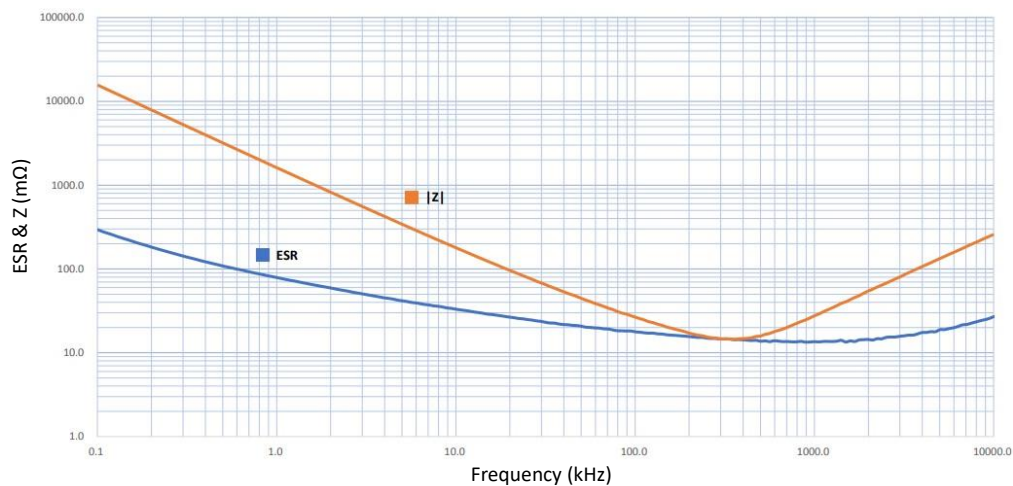


Fig. 5 • Frequency Characteristics of C (μ F)

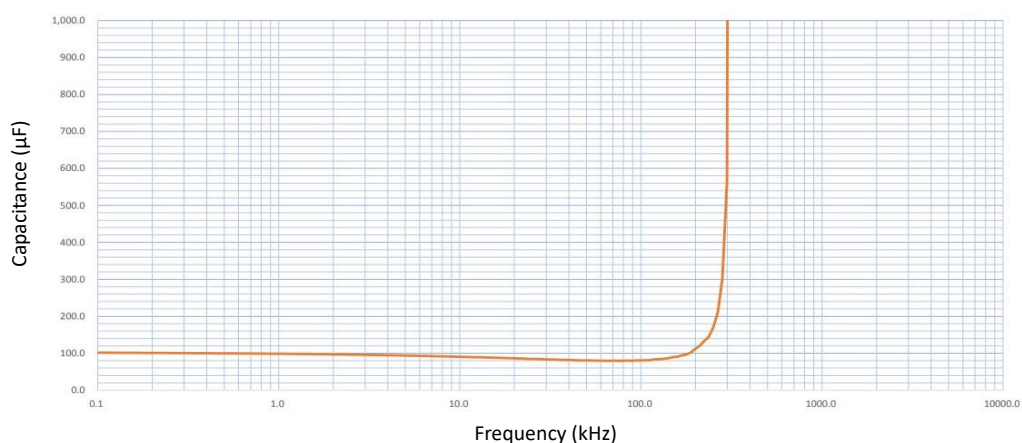
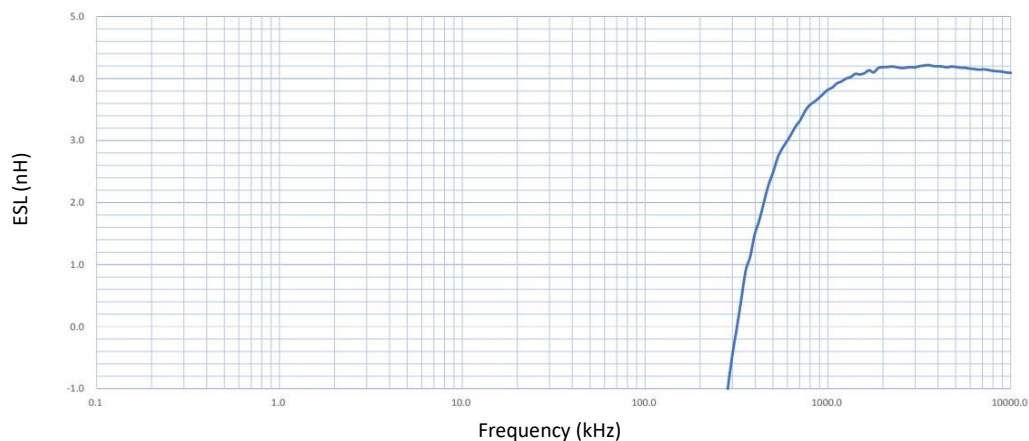


Fig. 6 • Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ 101ARHA470M10A2T ▲ 47 μ F ▲ 100V ▲ 10.0 x 12.0mm

Fig. 7 • Frequency Characteristics of ESR & |Z|

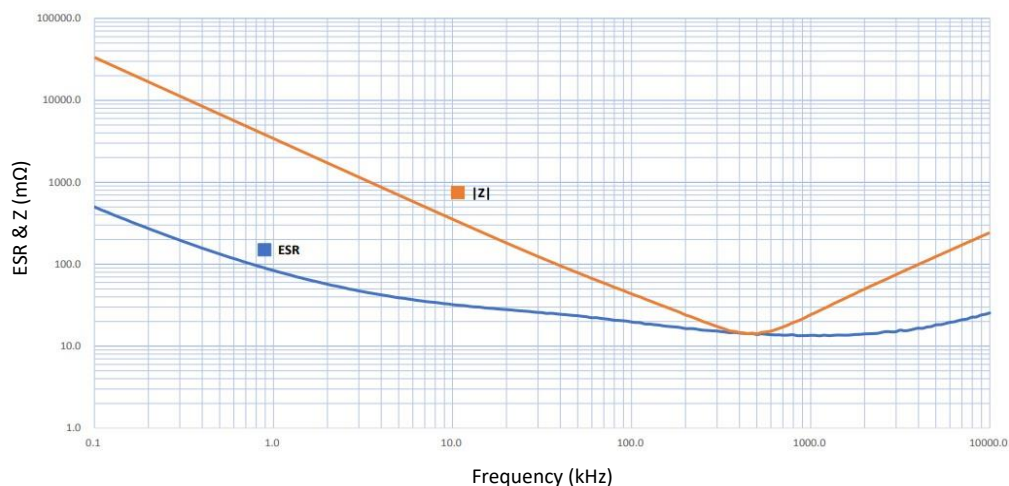


Fig. 8 • Frequency Characteristics of C (μ F)

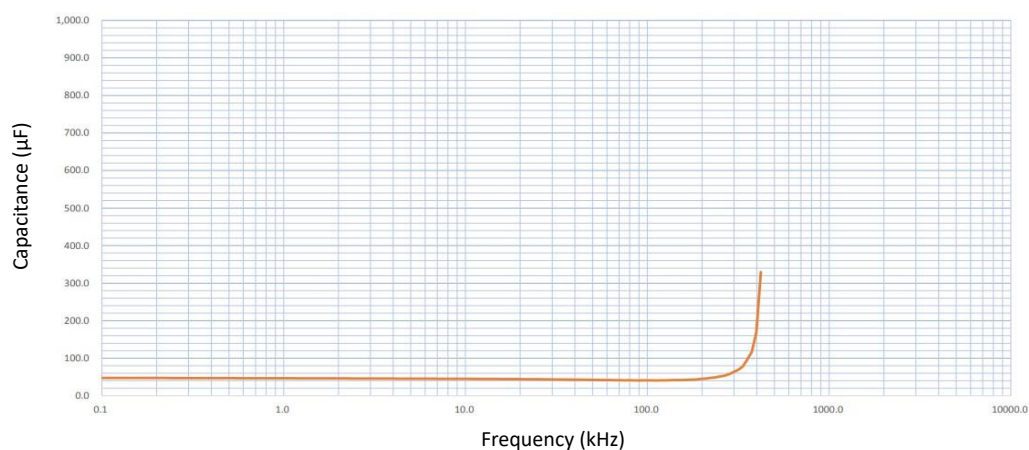
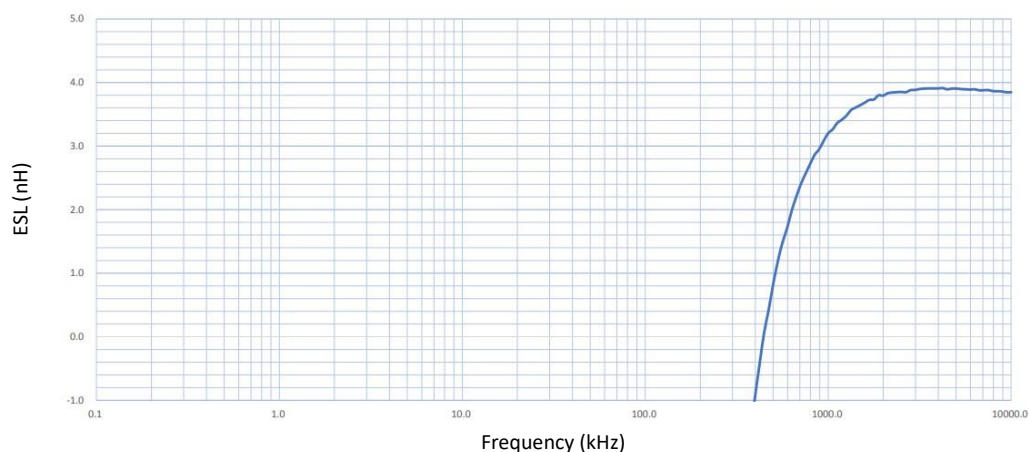


Fig. 9 • Frequency Characteristics of ESL (nH)



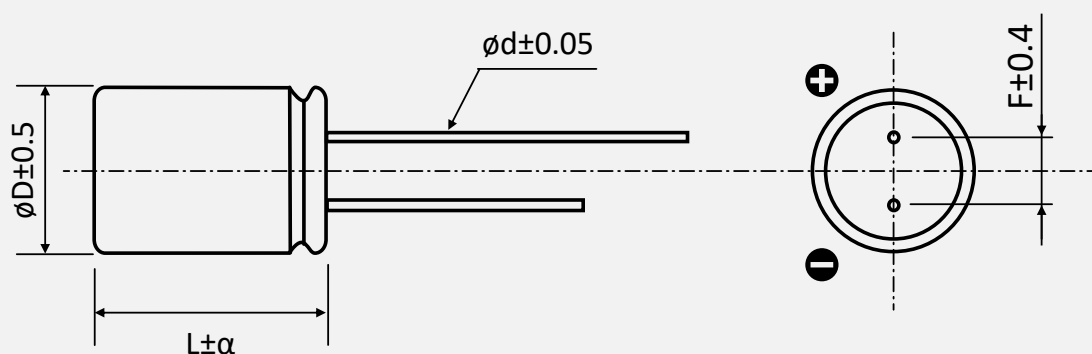
FREQUENCY CORRECTION FACTOR

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	$\varnothing d \pm 0.05$	$F \pm 0.4$
06X5	6.3	5.0	-0.5 to +1.0	0.45	2.5
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
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

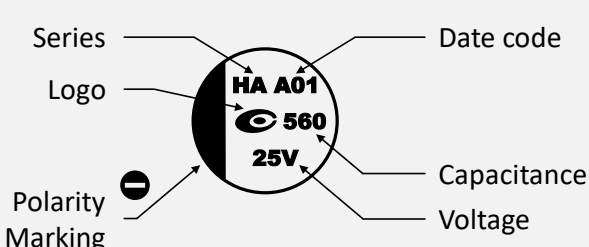
Example: ARHA series ▲ 560μF ▲ 25V_{DC} ▲ ±20% ▲ D=10.0mm ▲ L=12.0mm ▲ F=5.0mm ▲ Tape/Ammo

250		ARHA		561		M		10A2		T	
Rated Voltage (V _{DC})		Series		Capacitance Code ^{Note 1} (μF)		Capacitance Tolerance (%)		Package Code		Packaging Type	
Code	VDC	Code	Series	Code	μF	Code	Tol.	Code	D x L	Code	Type
250	25	ARHA	ARHA	220	22	M	±20	06X5	6.3 x 5.0	Blank T	Bulk Tape/Ammo
350	35			101	100			06X8	6.3 x 8.0		
500	50			471	470			08X8	8.0 x 8.0		
630	63			102	1000			08A2	8.0 x 12.0		
800	80			152	1500			08A6	8.0 x 16.0		
101	100							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 μF. The first two digits represent significant figures. The last digit specifies the total number of zeros to be added.

PRODUCT MARKING

Marking	Details														
 Series Logo Polarity Marking Date code Capacitance Voltage	<table> <tr> <th>Marking</th><th>Description</th></tr> <tr> <td>Logo</td><td>Manufacturer Logo</td></tr> <tr> <td>Series</td><td>HA = ARHA</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>25V = 25V</td></tr> <tr> <td></td><td>Polarity (-) marking</td></tr> </table>	Marking	Description	Logo	Manufacturer Logo	Series	HA = ARHA	Date code	See date code table	Capacitance	560 = 560μF	Voltage	25V = 25V		Polarity (-) marking
Marking	Description														
Logo	Manufacturer Logo														
Series	HA = ARHA														
Date code	See date code table														
Capacitance	560 = 560μF														
Voltage	25V = 25V														
	Polarity (-) marking														

DATE CODE

Example:

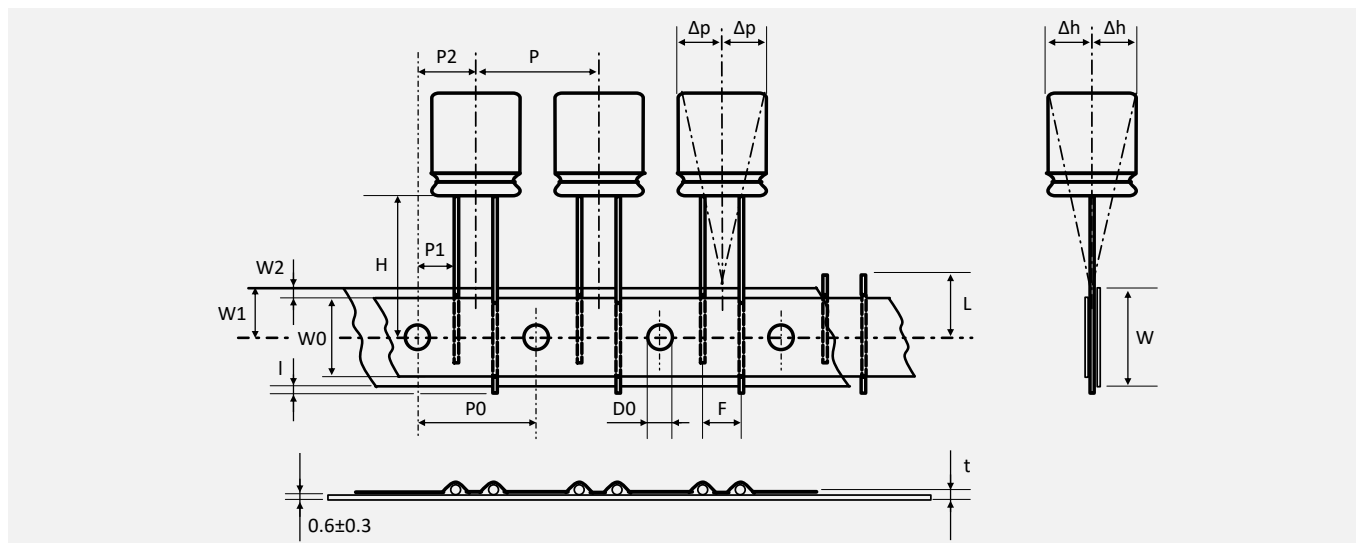
Date code

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

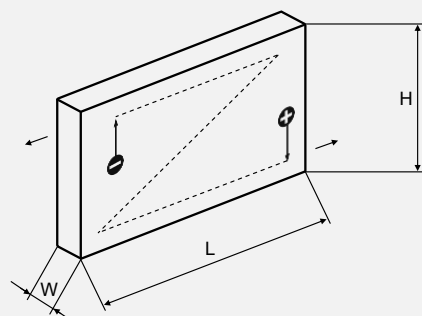
TAPING SPECIFICATION ▲ THT TYPE

Dimensions in mm



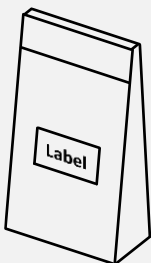
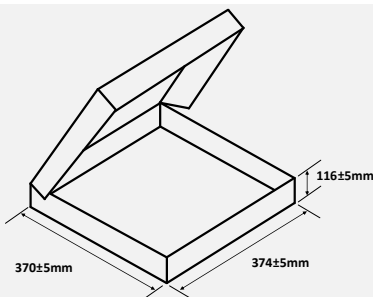
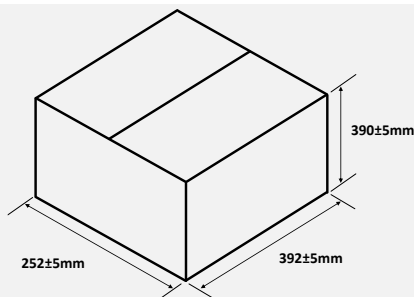
Size Code	F	P	P0	P1	P2	Δp	Δh	W	W0	W1	W2	H	ØD0	t	I	L
Tolerance	+0.8 -0.2	±1.0	±0.2	±0.5	±1.0	±1.0	±1.0	±0.5	Min	±0.5	Max	±0.75	±0.2	±0.3	Max	max
06X5	2.5	12.7	12.7	5.1	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
06X8	2.5	12.7	12.7	5.1	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
08X8	3.5	12.7	12.7	4.6	6.35	0	0	18	9.5	9	2.5	18.5	4	0.6	0	11
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	5.0	06X5	335	39	260	2 000
	Ø 6.3	8.0	06X8	335	42	260	2 000
	Ø 8.0	8.0	08X8	335	42	260	1 200
	Ø 8.0	12.0	08A2	335	45	260	1 200
	Ø 8.0	16.0	08A6	335	53	260	1 200
	Ø 8.0	20.0	08B0	335	53	260	1 200
	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					
06X5	6.3	5.0	500 pcs	6 bags	3 000 pcs	5 inner boxes	15 000 pcs
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
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

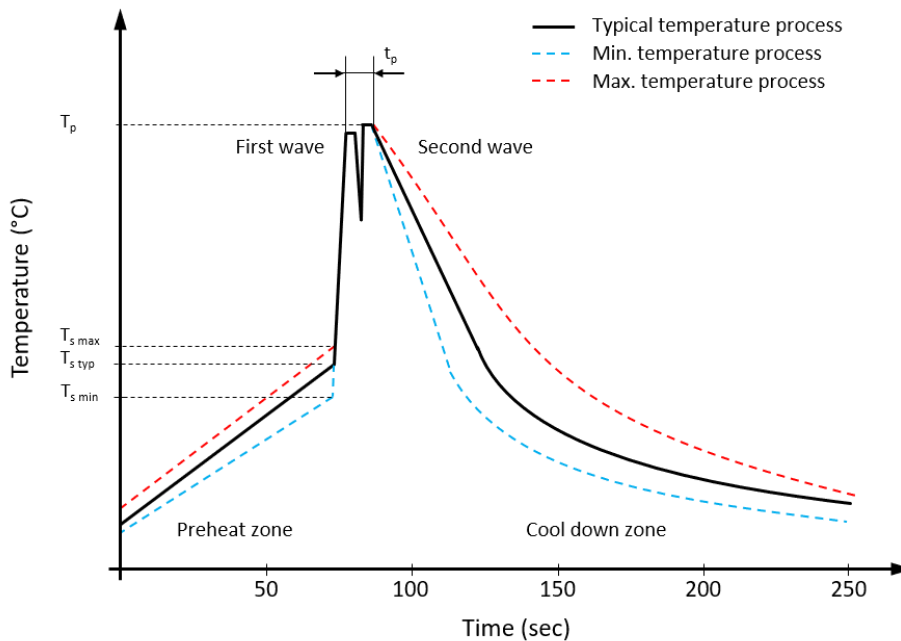
Bag	Inner Box	Outer Carton
		
Label content Size L x W = 70mm x 50mm P/N: Customer part number R-ID: CCF1001290001 CCF: Fix 10: e.g., 2010 01: e.g., January 29: e.g., Day 29th 0001: Running number DESC: Customer specification SPEC: Manufacturer part number COO: Country of origin MAKER: Manufacturer VENDOR: Manufacturer DC: Date code LOT/NO: Production lot	Label on the inner box 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

BULK PACKAGING ▲ THT TYPE WITH CUTTED LEADS NOTE 1

Code	Capacitor Dimensions		Quantity / Bag	Quantity / Inner Box		Quantity outer box	
	ØD	L					
06X5	6.3	5.0	500 pcs	12 bags	6 000 pcs	5 inner boxes	30 000 pcs
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
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.	$T_{s \min}$	100 °C	100 °C
Preheat temperature typical	$T_{s \text{ typ}}$	120 °C	120 °C
Preheat temperature max.	$T_{s \max}$	130 °C	130 °C
Preheat time t_s from $T_{s \min}$ to $T_{s \max}$	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 in 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.

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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.

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