

# ARHT SERIES

## 2000 HOURS 125°C TYPE

### ALUMINUM SOLID ELECTROLYTIC CAPACITOR • THT type

Wide voltage range, up to 63V<sub>DC</sub>

Low ESR up to 16mΩ at 100kHz/20°C

Low drift and stable electrical characteristics over lifetime

No liquid electrolyte ▲ No dry-out effect

High temperature approved with 2000 hours at 125°C

## SPECIFICATION

Item		Characteristics
Category Temperature Range		-55°C to +125°C
Rated Voltage Range	V <sub>R</sub>	25V <sub>DC</sub> to 63V <sub>DC</sub>
Rated Capacitance Range	C <sub>R</sub>	100μF to 680μF
Capacitance Tolerance • At 20°C; 120Hz	ΔC	±20%
Surge Voltage • At 125°C	V <sub>S</sub>	V <sub>S</sub> = 1.15 × V <sub>R</sub>
Dissipation Factor • At 20°C; 120Hz	tan δ	0.12 max.
Leakage Current • At 20°C; after 2min.	I <sub>LEAK</sub>	Shall not exceed values in the electrical characteristics
Endurance	Test	125°C ▲ 2000hrs ▲ V <sub>R</sub> applied
	Appearance	No significant damage
	ΔC/C <sub>R</sub>	≤ ±20% of the initial value
	tan δ	≤ 200% of the initial specified value
	ESR	≤ 200% of the initial specified value
	I <sub>LEAK</sub>	≤ 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 <sub>R</sub>	≤ ±20% of the initial value
	tan δ	≤ 200% of the initial specified value
	ESR	≤ 200% of the initial specified value
	I <sub>LEAK</sub>	≤ The initial specified value
Surge Voltage	Test	1000 cycles and each one includes charge with V <sub>S</sub> specified at 125°C for 0.5min through a protective resistor (R=1kΩ) and discharge for 5.5min.
	Appearance	No significant damage
	ΔC/C <sub>R</sub>	≤ ±20% of the initial value
	tan δ	≤ 200% of the initial specified value
	ESR	≤ 200% of the initial specified value
	I <sub>LEAK</sub>	≤ The initial specified value

## ELECTRICAL CHARACTERISTICS

$V_{RDC}$ (V)	$C_R$ ( $\mu F$ )	Size Code	Dimensions (mm)				$I_{LEAK}$ 20°C 2min ( $\mu A$ )	ESR 20°C 100kHz (m $\Omega$ )	$I_R$ 125°C 100kHz (mA)	Part Number <sup>Note 1</sup>
			D	L	P	$\phi d$				
25	100	08X8	8	8	3.5	0.6	500	24	1160	250ARHT101M08X8T
	220	08A2	8	12	3.5	0.6	1100	18	1700	250ARHT221M08A2T
	330	08A2	8	12	3.5	0.6	1650	18	1700	250ARHT331M08A2T
	470	08A2	8	12	3.5	0.6	2350	18	1700	250ARHT471M08A2T
	560	10A2	10	12	5	0.6	2800	16	1880	250ARHT561M10A2T
	680	10A2	10	12	5	0.6	3400	16	1880	250ARHT681M10A2T
35	100	08A2	8	12	3.5	0.6	700	26	1180	350ARHT101M08A2T
	150	08A2	8	12	3.5	0.6	1050	26	1180	350ARHT151M08A2T
	180	08A2	8	12	3.5	0.6	1260	26	1180	350ARHT181M08A2T
	220	08A2	8	12	3.5	0.6	1540	26	1180	350ARHT221M08A2T
	330	10A2	10	12	5	0.6	2310	24	1360	350ARHT331M10A2T
	390	10A2	10	12	5	0.6	2730	24	1360	350ARHT391M10A2T
50	180	10A2	10	12	5	0.6	1800	28	1048	500ARHT181M10A2T
	220	10A2	10	12	5	0.6	2200	28	1048	500ARHT221M10A2T
63	100	10A2	10	12	5	0.6	1260	32	1020	630ARHT101M10A2T
	150	10A2	10	12	5	0.6	1890	28	1020	630ARHT151M10A2T
	180	10A2	10	12	5	0.6	2268	28	1020	630ARHT181M10A2T

### 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 ▲ 500ARHT221M10A2 ▲ 220 $\mu$ F ▲ 50V ▲ 10.0 x 12.0mm

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

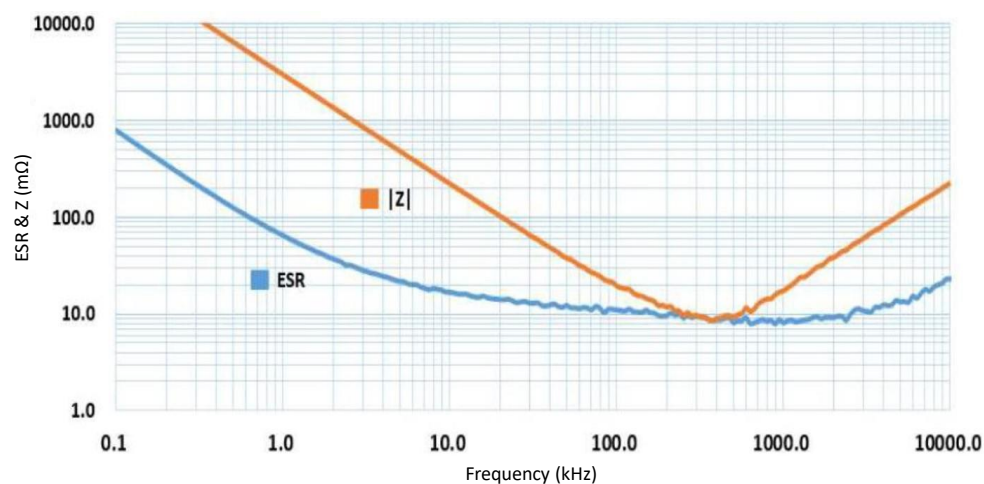


Fig. 2 • Frequency Characteristics of C ( $\mu$ F)

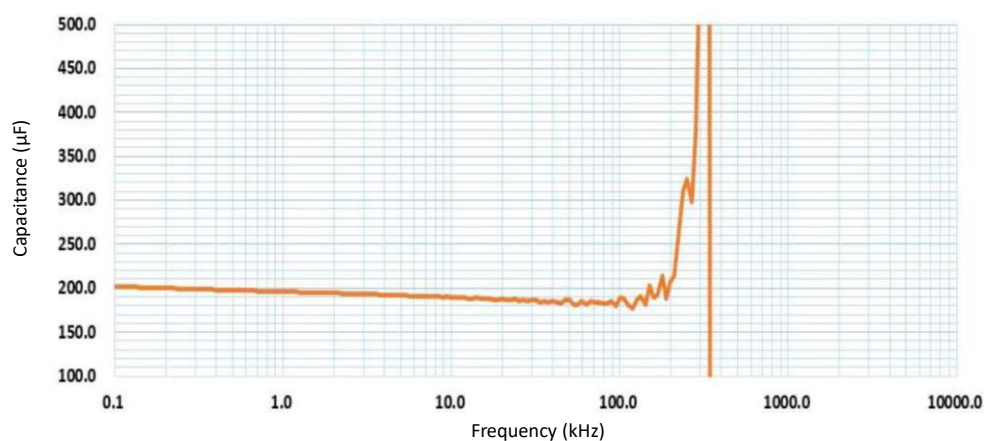
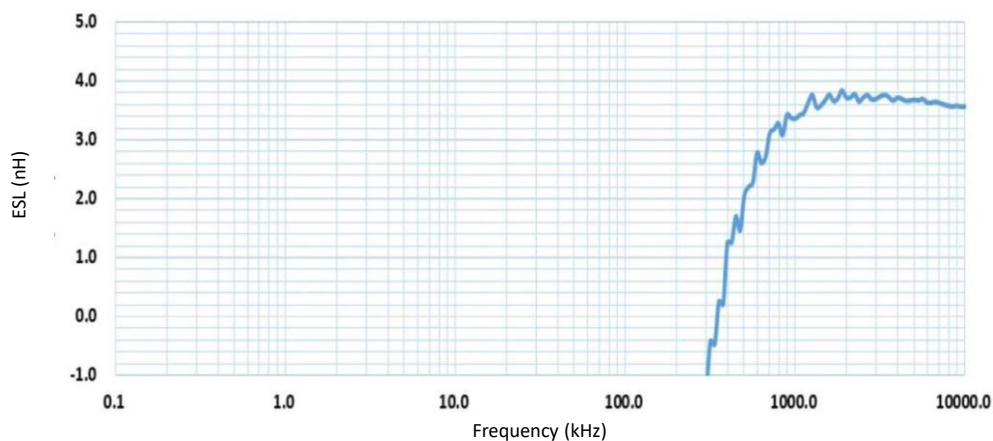


Fig. 3 • Frequency Characteristics of ESL (nH)



# REFERENCE DATA ▲ 630ARHT181M10A2 ▲ 180 $\mu$ F ▲ 63V ▲ 10.0 x 12.0mm

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

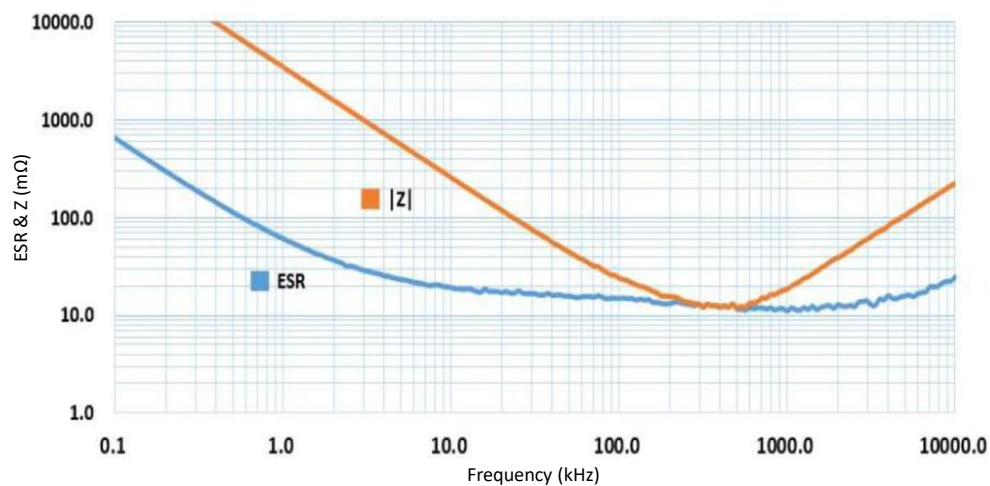


Fig. 5 • Frequency Characteristics of C ( $\mu$ F)

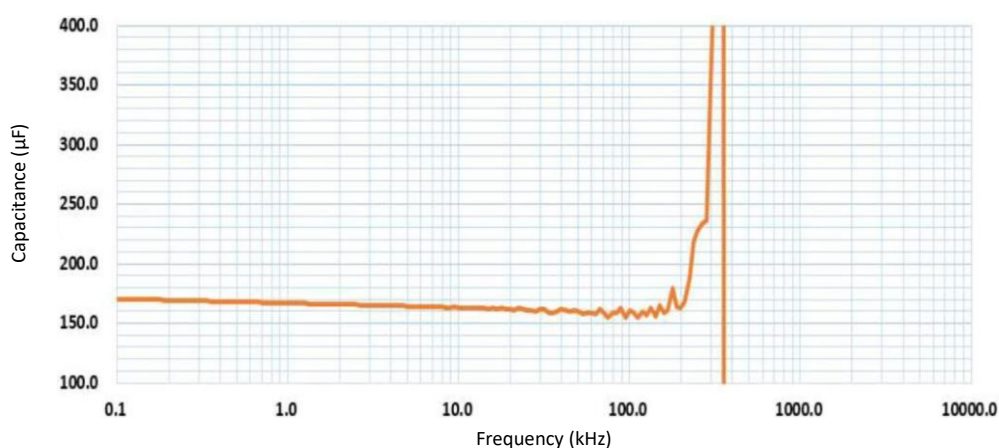
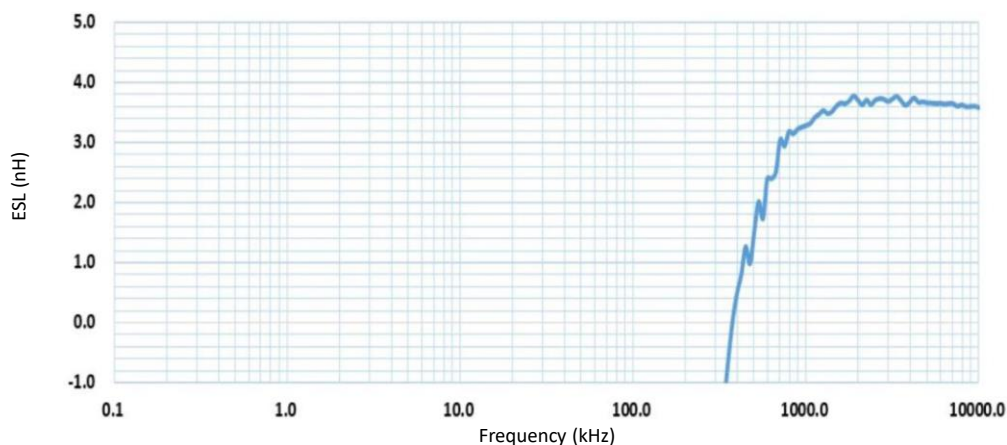


Fig. 6 • Frequency Characteristics of ESL (nH)



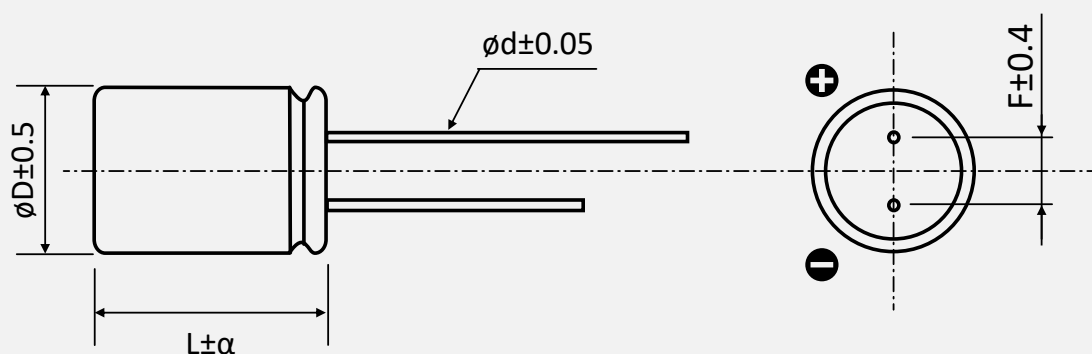
## FREQUENCY CORRECTION FACTOR

Frequency Correction Factor of Permissible Ripple Current

Frequency	$120\text{Hz} \leq f < 1\text{kHz}$	$1\text{kHz} \leq f < 10\text{kHz}$	$10\text{kHz} \leq f < 50\text{kHz}$	$50\text{kHz} \leq f < 100\text{kHz}$	$100\text{kHz} \leq f < 500\text{kHz}$
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	$\alpha$	$\varnothing d \pm 0.05$	$F \pm 0.4$
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
10A2	10.0	12.0	-0.5 to +1.0	0.60	5.0

## PRODUCT CODE

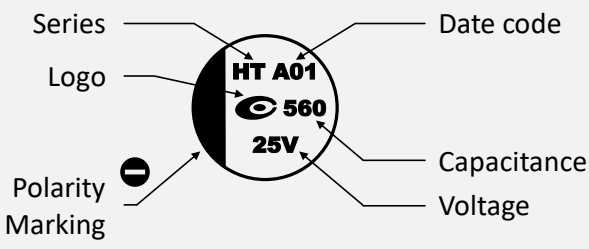

Example: ARHT series ▲ 560μF ▲ 25V<sub>DC</sub> ▲ ±20% ▲ D=10.0mm ▲ L=12.0mm ▲ F=5.0mm ▲ Tape/Ammo

250		ARHT		561		M		10A2		T	
Rated Voltage (V <sub>DC</sub> )		Series		Capacitance Code <sup>Note 1</sup> (μF)		Capacitance Tolerance (%)		Package Code		Packaging Type	
Code	VDC	Code	Series	Code	μF	Code	Tol.	Code	D x L	Code	Type
250	25	ARHT	ARHT	101	100	M	±20	08X8	8.0 x 8.0	Blank T	Bulk Tape/Ammo
350	35			221	220			08A2	8.0 x 12.0		
500	50			471	470			10A2	10.0 x 12.0		
630	63			561	560						
				681	680						

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	
 <p>Series</p> <p>Logo</p> <p>Polarity Marking</p> <p>Date code</p> <p>Capacitance</p> <p>Voltage</p>	Marking	Description
	Logo	Manufacturer Logo
	Series	HT = ARHT
	Date code	See date code table
	Capacitance	560 = 560μF
	Voltage	25V = 25V
		Polarity (-) marking

## DATE CODE

Example:

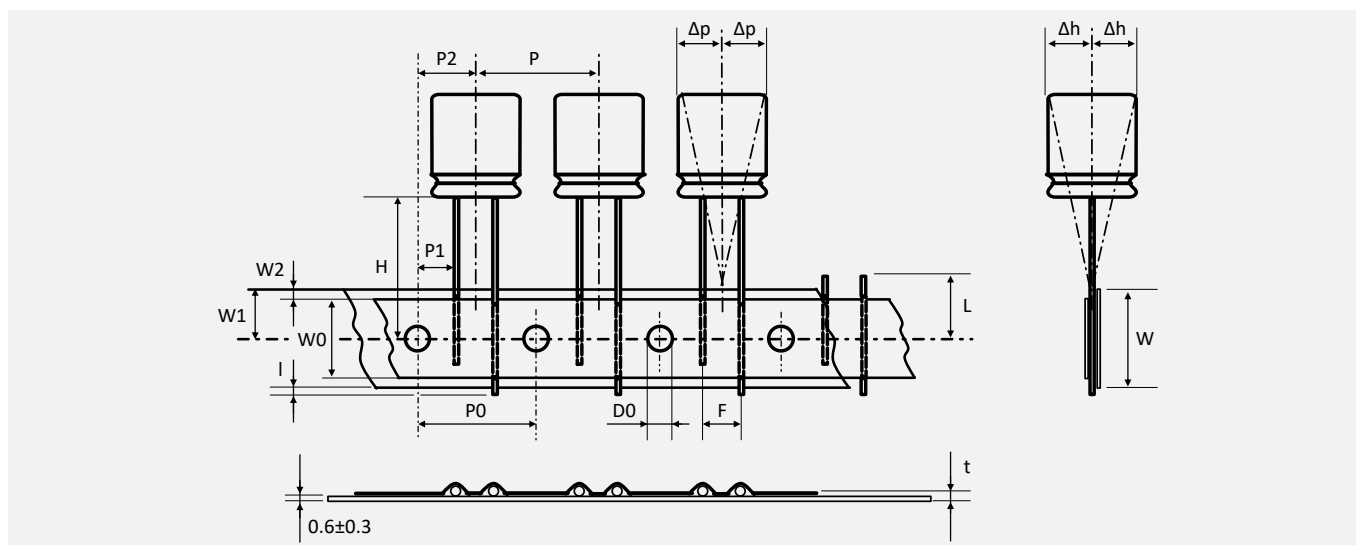
Date code

A01: A01 = 1<sup>st</sup> week of 2020

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

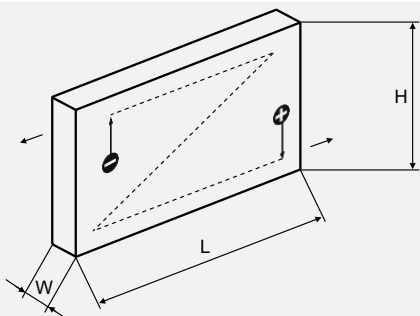
## TAPING SPECIFICATION ▲ THT TYPE

Dimensions in mm



Size Code	F	P	P0	P1	P2	Δp	Δh	W	W0	W1	W2	H	ØD0	t	l	L
Tolerance	$\begin{matrix} +0.8 \\ -0.2 \end{matrix}$	±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
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
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

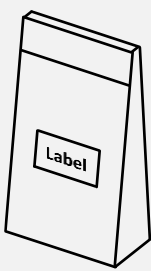
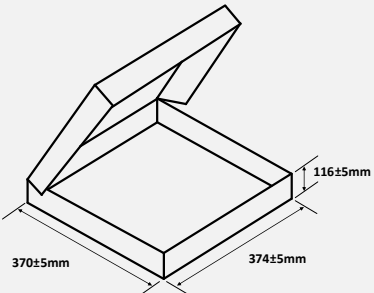
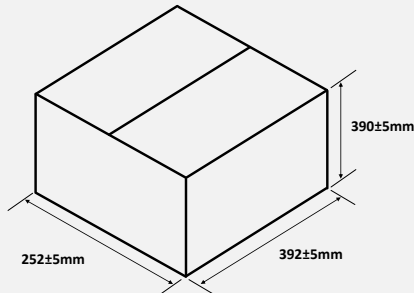
## AMMO PACKAGING QUANTITIES ▲ THT TYPE

Carton	Diameter (mm)	Length (mm)	Size Code	L max. (mm)	W max. (mm)	H max. (mm)	Qty per carton (pcs)
	Ø 8.0	8.0	08X8	335	42	260	1 200
	Ø 8.0	11.5	08A2	335	45	260	1 200
	Ø 10.0	11.5	10A2	335	45	260	650



## BULK PACKAGING ▲ THT TYPE

Code	Capacitor Dimensions		Quantity / Bag	Quantity / Inner Box		Quantity outer box	
	ØD	L					
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
10A2	10.0	12.0	300 pcs	4 bags	1 200 pcs	5 inner boxes	6 000 pcs

Bag	Inner Box	Outer Carton
		
<b>Label content</b> <b>Size L x W = 70mm x 50mm</b> <b>1. P/N:</b> Customer part number <b>2. R-ID:</b> CCF1001290001 CCF: Fix 10: e.g., 2010 01: e.g., January 29: e.g., Day 29 <sup>th</sup> 0001: Running number <b>3. DESC:</b> Customer specification <b>4. SPEC:</b> Manufacturer part number <b>5. COO:</b> Country of origin <b>6. MAKER:</b> Manufacturer <b>7. VENDOR:</b> Manufacturer <b>8. DC:</b> Date code <b>9. LOT/NO:</b> Production lot	<b>Label on the inner box</b> <b>Size L x W = 70mm x 35mm</b> <b>1. P/N:</b> Customer part number <b>2. DESC:</b> Customer specification <b>3. SPEC:</b> Manufacturer part number <b>4. COO:</b> Country of origin <b>5. QTY:</b> Quantity (pcs) <b>6. MAKER:</b> Manufacturer <b>7. VENDOR:</b> Manufacturer <b>8. DC:</b> Date code <b>9. LOT/NO:</b> Production lot	<b>Label on the outer carton</b> <b>Size L x W = 100mm x 90mm</b> <b>1. CUSTOMER:</b> Customer name <b>2. P/O:</b> Customer order number <b>3. P/N:</b> Customer part number <b>4. DESCRIPTION:</b> Manufacturer part number <b>5. QTY:</b> Quantity (pcs) and shipping date <b>6. COO:</b> Country of origin

## BULK PACKAGING ▲ THT TYPE WITH CUTTED LEADS <sup>NOTE 1</sup>

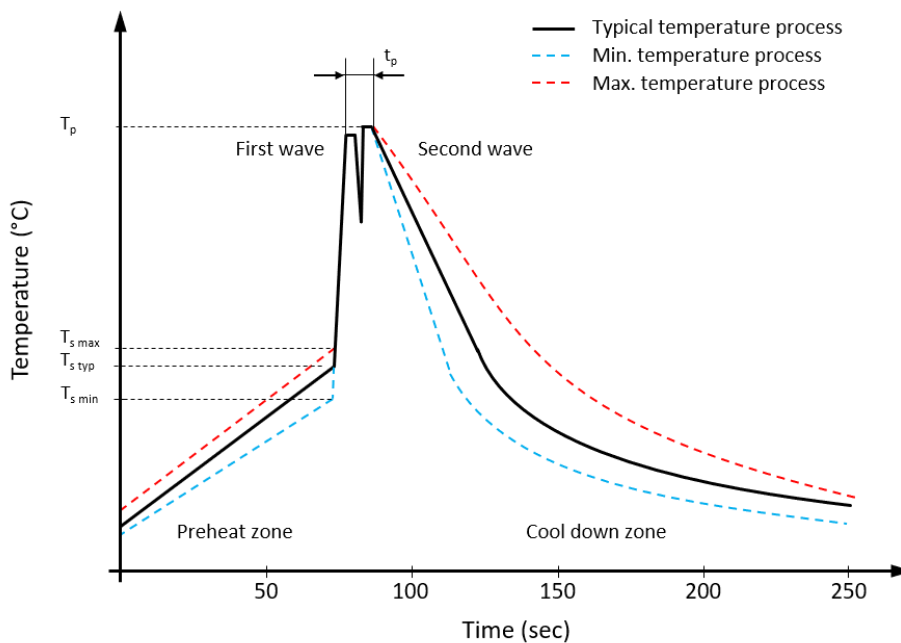
Code	Capacitor Dimensions		Quantity / Bag	Quantity / Inner Box		Quantity outer box	
	ØD	L					
08X8	8.0	8.0	500 pcs	6 bags	3 000 pcs	5 inner boxes	15 000 pcs
08A2	8.0	12.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs
10A2	10.0	12.0	500 pcs	4 bags	2 000 pcs	5 inner boxes	10 000 pcs

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

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