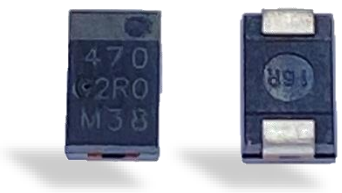


ACAH SERIES

2000 HOURS LOW HEIGHT TYPE

ALUMINUM SOLID ELECTROLYTIC CAPACITOR ▲ STACKED type
Very high ripple current up to 8.5A at 100kHz/45°C
Ultra-low ESR up to 4.5mΩ at 100kHz/20°C
Low drift and stable electrical characteristics over lifetime
No liquid electrolyte ▲ No dry-out effect
Moisture Sensitivity Level ▲ MSL 3
Low height with 1.9mm ideal for space critical applications

SPECIFICATION

Item		Characteristics	
Category Temperature Range		-55°C to +105°C	
Rated Voltage Range	V_R	2.5V_{DC} to 25V_{DC}	
Rated Capacitance Range	C_R	33µF to 470µF	
Capacitance Tolerance ▪ At 20°C; 120Hz	ΔC	±20% ▲ +10 to -35%	
Surge Voltage ▪ At 15 to 35°C	V_S	$V_S = 1.25 \times V_R$	V_R: 2V_{DC} to 16V_{DC}
		$V_S = 1.15 \times V_R$	V_R: 20V_{DC} to 25V_{DC}
Dissipation Factor ▪ At 20°C; 120Hz	tan δ	0.06 max.	
Leakage Current ▪ At 20°C; after 2min.	I_{LEAK}	$I_{LEAK} = 0.1 \times C_R \times V_R$	V_R: 2V_{DC} to 6.3V_{DC}
		$I_{LEAK} = 0.3 \times C_R \times V_R$	V_R: 10V_{DC} to 25V_{DC}
		With I_{LEAK} (µA) ▲ C_R (µF) ▲ V_R (V_{DC})	
Endurance	Test	105°C ▲ 2000hrs ▲ V_R applied	
	Appearance	No significant damage	
	$\Delta C/C_R$	≤ ±20% of the initial value	
	tan δ	≤ 200% of the initial specified value	
	I_{LEAK}	≤ 300% of the initial specified value	V_R: 2V_{DC} to 6.3V_{DC}
		≤ The initial specified value	V_R: 10V_{DC} to 25V_{DC}
Damp Heat (Steady State)	Test	60°C ▲ 90 to 95% RH ▲ 500hrs ▲ No voltage applied	
	Appearance	No significant damage	
	$\Delta C/C_R$	+70% / -20% of the initial value	V_R: 2V_{DC} to 6.3V_{DC}
		+60% / -20% of the initial value	V_R: 10V_{DC} to 25V_{DC}
	tan δ	≤ 200% of the initial specified value	
	I_{LEAK}	≤ The initial specified value	V_R: 2V_{DC} to 6.3V_{DC}
		≤ 300% of the initial specified value	V_R: 10V_{DC} to 25V_{DC}
Surge Voltage	Test	1000 cycles and each one includes charge with V_S specified at 15°C to 35°C for 0.5min through a protective resistor (R=1kΩ) and discharge for 5.5min.	
	Appearance	No significant damage	
	$\Delta C/C_R$	≤ ±10% of the initial value	
	tan δ	≤ The initial specified value	
	I_{LEAK}	≤ The initial specified value	

ELECTRICAL CHARACTERISTICS

$V_{R\ DC}$ (V)	C_R (µF)	Dimensions (mm)			I_{LEAK} 20°C 2min (µA)	ESR 20°C 100kHz (mΩ)	I_R ≤ 45°C 100kHz (mA)	Part Number Note 1
		L	W	H				
2	470	7.3	4.3	1.9	94	9	6300	ACAH2R0S471E09
	470	7.3	4.3	1.9	94	9	6300	ACAH2R0S471E09Y
	470	7.3	4.3	1.9	94	6	7500	ACAH2R0S471E06
	470	7.3	4.3	1.9	94	4.5	8500	ACAH2R0S471E04
2.5	470	7.3	4.3	1.9	117.5	9	6300	ACAH2R5S471E09
	470	7.3	4.3	1.9	117.5	9	6300	ACAH2R5S471E09Y
	470	7.3	4.3	1.9	117.5	6	7500	ACAH2R5S471E06
	470	7.3	4.3	1.9	117.5	4.5	8500	ACAH2R5S471E04
10	100	7.3	4.3	1.9	300	40	3200	ACAH100S101E40
	100	7.3	4.3	1.9	300	40	3200	ACAH100S101E40Y
16	47	7.3	4.3	1.9	225.6	40	3200	ACAH160S470E40
	56	7.3	4.3	1.9	268.8	40	3200	ACAH160S560E40
	68	7.3	4.3	1.9	326.4	40	3200	ACAH160S680E40
20	33	7.3	4.3	1.9	198	40	3200	ACAH200S330E40
25	33	7.3	4.3	1.9	247.5	40	3200	ACAH250S330E40

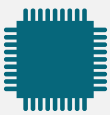
Notes

1 **Part number shows the standard Tape/Reel version**

TEMPERATURE CORRECTION FACTOR

Temperature Correction Factor of Permissible Ripple Current				
Rated Voltage V_R	Surface Temperature	≤ 45°C	45°C < T_S ≤ 85°C	85°C < T_S ≤ 105°C
$2V_{DC}$ to $6.3V_{DC}$	Coefficient	1	0.7	0.25
$10V_{DC}$ to $25V_{DC}$	Coefficient	1	0.8	0.5

APPLICATIONS

CPU, FPGA and IC Buffering	High Frequency Applications	Substitution of MLCC Banks	USB Power Supplies & Banks	Voltage Stabilizing in LED Panels
				

REFERENCE DATA ▲ ACAH2R0S471E04 ▲ 470µF ▲ 2V ▲ 4mΩ

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

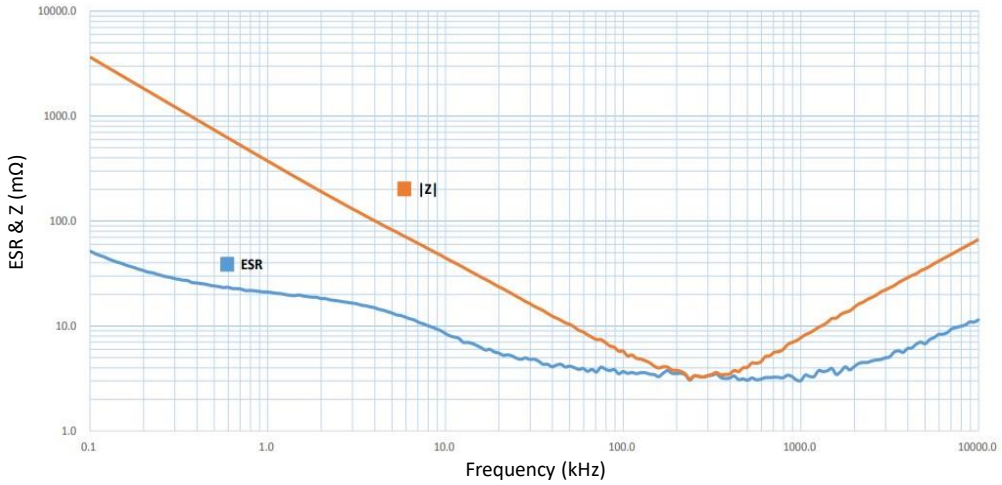


Fig. 2 ▪ Frequency Characteristics of C (µF)

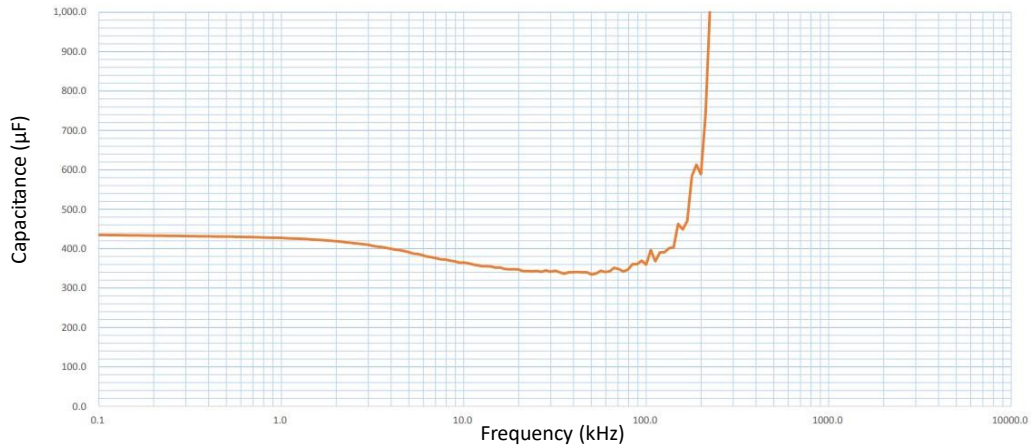
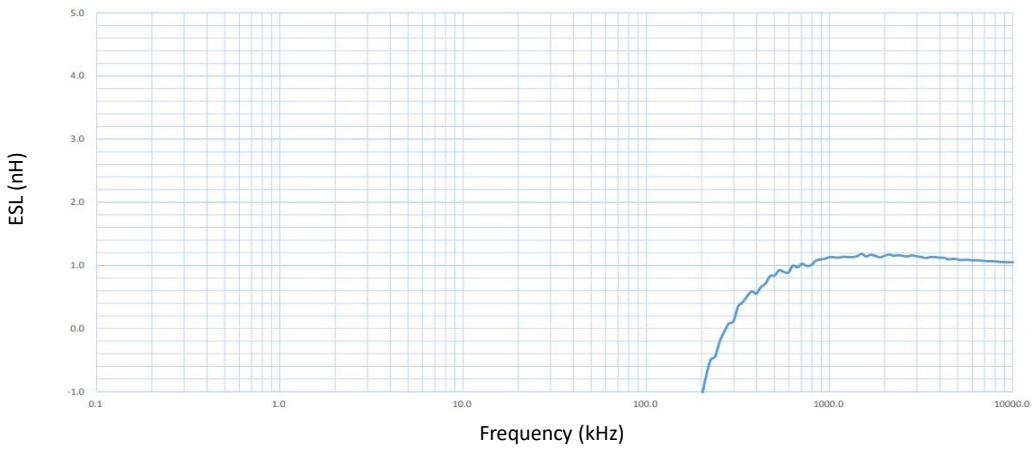


Fig. 3 ▪ Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ ACAH100S101E40 ▲ 100μF ▲ 10V ▲ 40mΩ

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

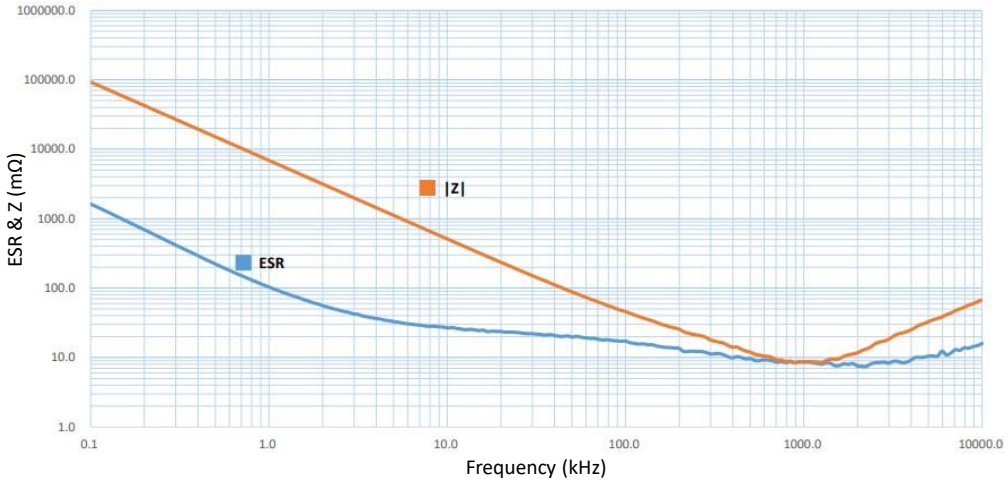


Fig. 5 ▪ Frequency Characteristics of C (μF)

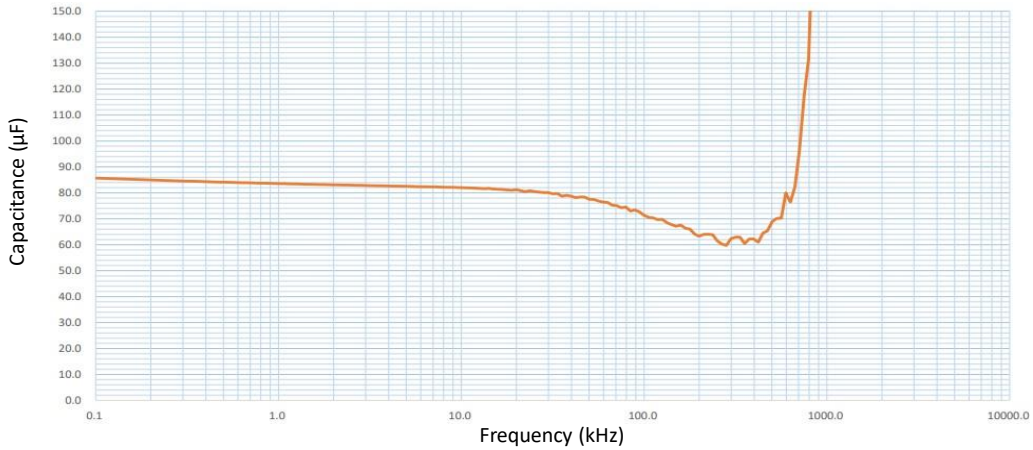
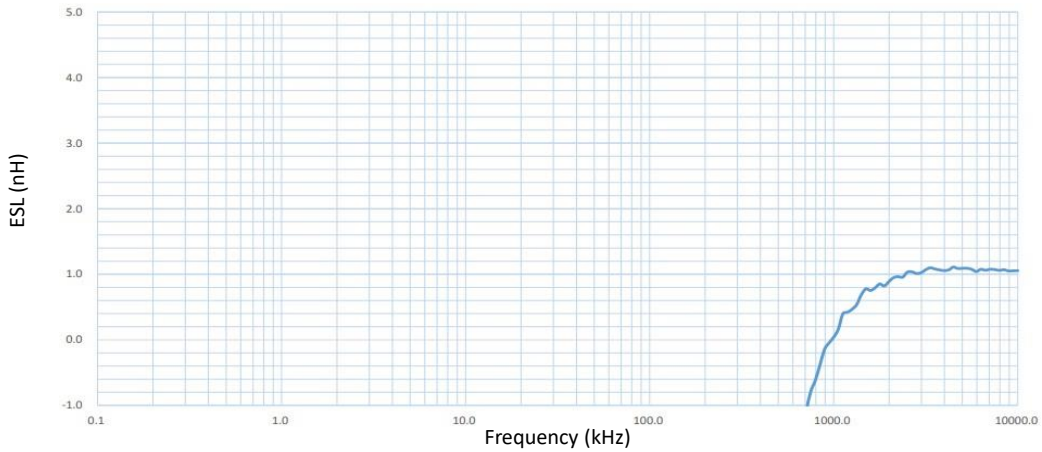


Fig. 6 ▪ Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ ACAH200S330E40 ▲ 33μF ▲ 20V ▲ 40mΩ

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

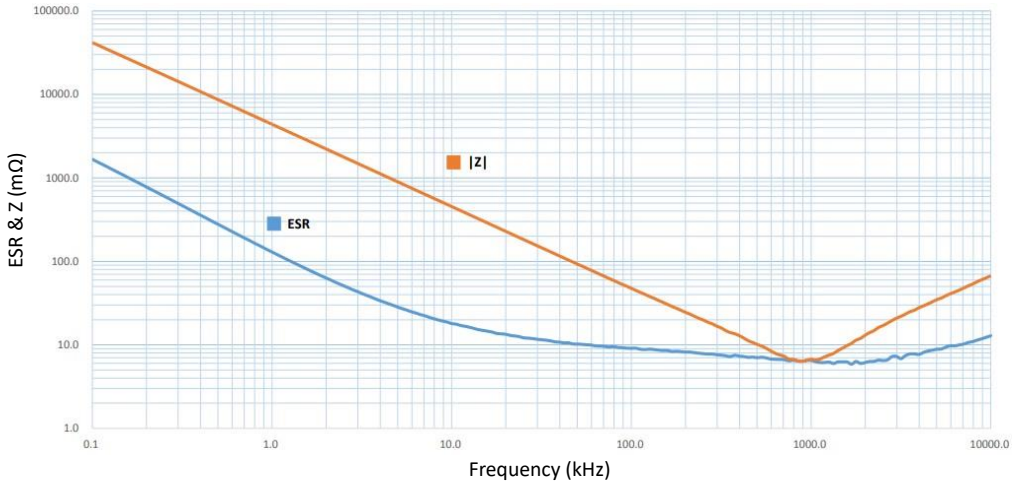


Fig. 8 ▪ Frequency Characteristics of C (μF)

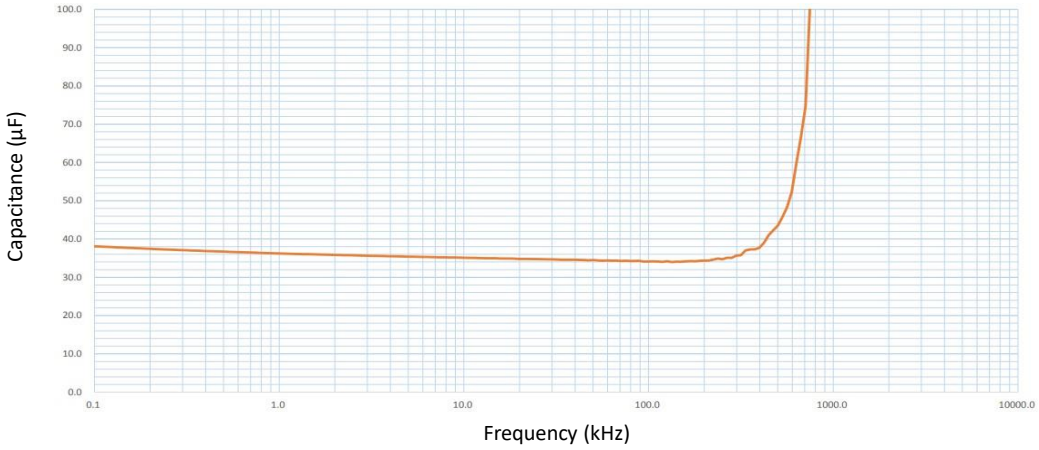
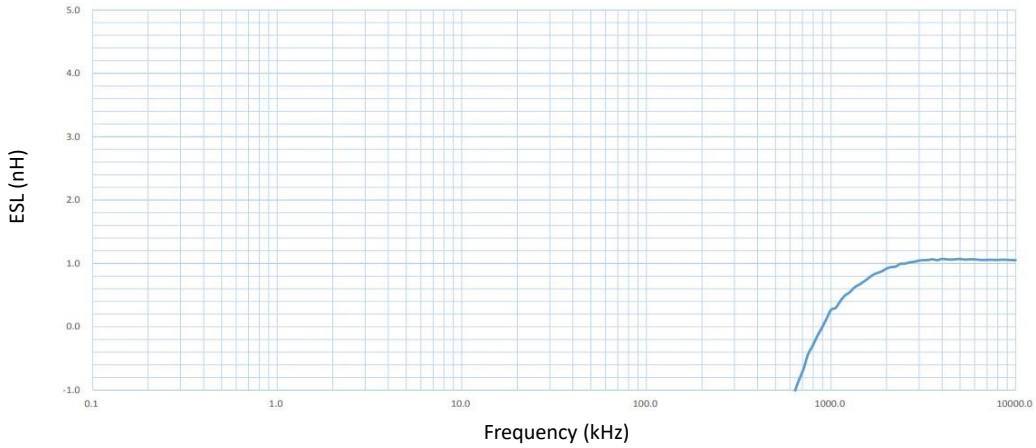
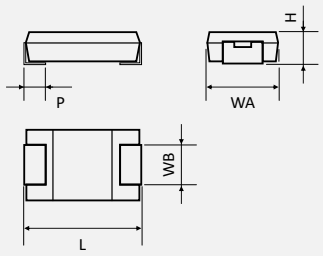


Fig. 9 ▪ Frequency Characteristics of ESL (nH)



PACKAGE OUTLINE ▲ All dimensions in mm

Dimensions



Case Size: S	Dimension (mm)	Tolerance (mm)
L	7.3	± 0.3
WA	4.3	± 0.3
WB	2.4	± 0.2
H	1.9	± 0.2
P	1.3	± 0.2

PRODUCT CODE

Example: ACAH series ▲ 470µF ▲ 2.5V_{DC} ▲ +10 to -35% ▲ 9mΩ ▲ Tape/Reel

ACAH	2R5	S	471	E09	Y

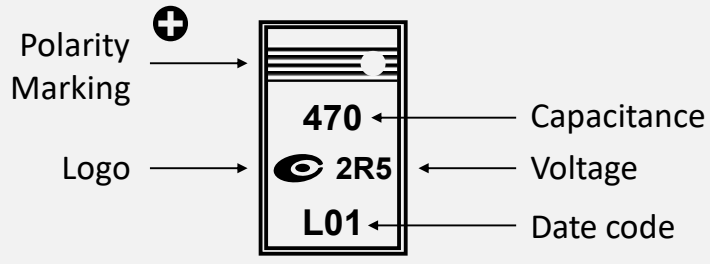
Series		Rated Voltage (V_{DC})		Package Code		Capacitance Code Note 1 (µF)		ESR		Suffix for Capacitance Tolerance	
Code	Series	Code	VDC	Code	L x W x H mm	Code	µF	Code	mΩ	Code	Tol. in %
ACAH	ACAH	2R0 2R5 100 160 200 250	2.0 2.5 10 16 20 25	S	7.3x4.3x1.9	330 560 101 471	33 56 100 470	E04 E06 E09 E40	4.5 6 9 40	Blank Y	±20 +10 to -35

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

Marking	Description
Capacitance	470 = 470µF
Voltage	2R5 = 2.5V
Date code	See date code table
Logo	Manufacturer Logo
⊕	Polarity (+) marking

DATE CODE

Example:

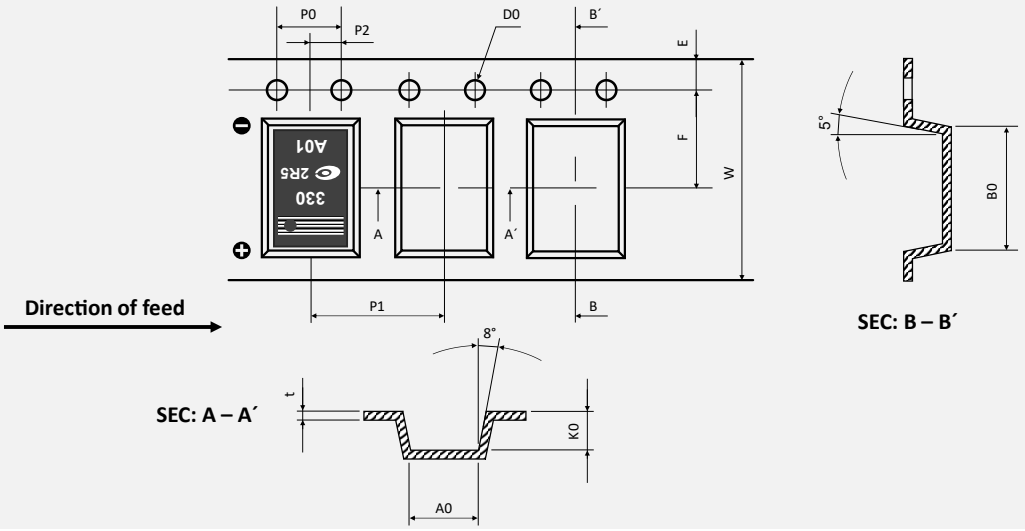
Date code

L01: L01 = 1st week of 2020

A		01	
Year		Week	
L	2020	01	1st
M	2021	02	2nd
...	...	...	...
V	2030	53	53rd

TAPING SPECIFICATION ▲ STACKED TYPE

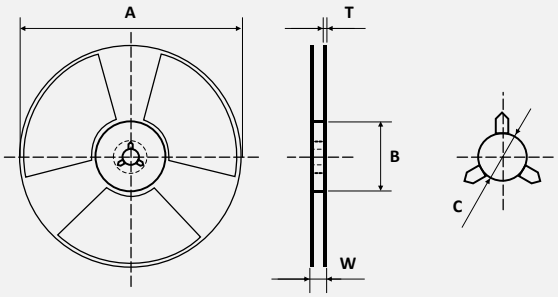
Dimensions in mm



	W	P1	E	F	D0	P0	P2	A0	B0	K0	t
Tolerance	± 0.1	± 0.1	± 0.1	± 0.1	+ 0.1 - 0.0	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1
Dimension	12	8	1.75	5.5	1.5	4	2	5	7.6	2.3	0.24

REEL DIMENSION AND PACKAGING QUANTITY ▲ STACKED TYPE

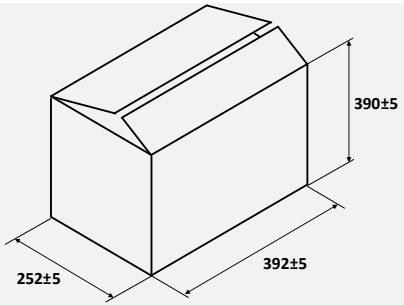
Reel



Label on the reel
Size L x W = 70mm x 35mm

1. **P/N:** Customer part number
2. **DESC:** Customer specification
3. **SPEC:** Manufacturer part number
4. **COO:** Country of origin
5. **QTY:** Quantity (pcs)
6. **MAKER:** Manufacturer
7. **VENDOR:** Manufacturer
8. **DC:** Date code
9. **LOT/NO:** Production lot

Carton (Dimensions in mm)

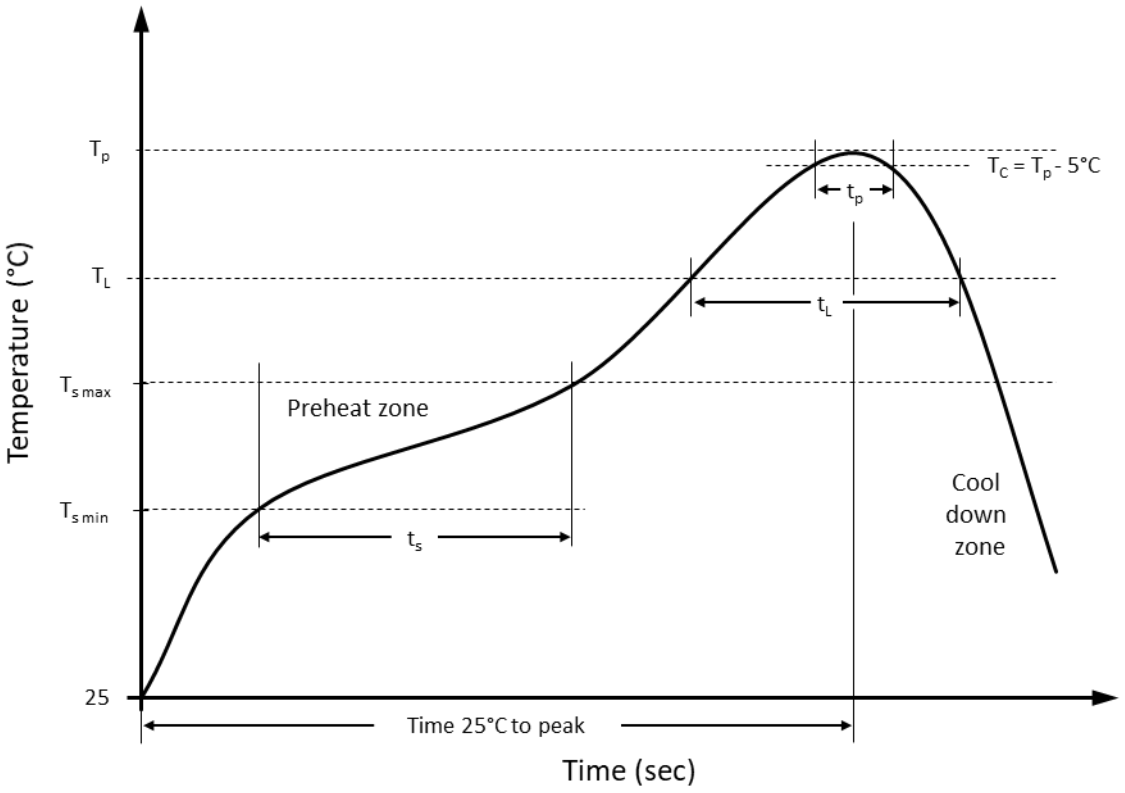


Label on the outer carton
Size L x W = 100mm x 90mm

1. **CUSTOMER:** Customer name
2. **P/O:** Customer order number
3. **P/N:** Customer part number
4. **DESCRIPTION:** Manufacturer part number
5. **QTY:** Quantity (pcs) and shipping date
6. **COO:** Country of origin

A (mm)	B (mm)	C (mm)	T (mm)	W (mm)	1 Reel (pcs)	Inner Box (pcs)	Outer Box (pcs)
330 ± 1.0	100 ± 2.0	13.2 ± 0.3	2.0 ± 0.3	13.5 ± 0.5	2 800	16 800	33 600

RECOMMENDED REFLOW SOLDERING PROFILE ▲ STACKED PACKAGE



Recommended reflow soldering conditions

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	60 to 150 seconds
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

Rated Voltage (V_{DC})	Time > 200°C	Time > 230°C	T_P Peak Temperature	t_p Timeframe	Allowed Reflow Runs
2 to 25	90 sec. max.	40 sec. max.	260 °C	Max. 5 sec	Max. twice
			250 °C	Max. 10 sec	Max. three times

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.