



ACTH SERIES

125°C WIDE TEMPERATURE TYPE

ALUMINUM SOLID ELECTROLYTIC CAPACITOR ▲ STACKED type

Very high ripple current up to 7.5A at 100kHz/45°C

Ultra-low ESR up to 6mΩ 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 +125°C	
Rated Voltage Range	V_R	2.5V _{DC} to 25V _{DC}	
Rated Capacitance Range	C_R	15μF to 330μF	
Capacitance Tolerance	ΔC	±20% ▲ +10 to -35%	
Surge Voltage ▪ At 15 to 35°C	V_S	$V_S = 1.25 \times V_R$	$V_R: 2V_{DC} \text{ to } 2.5V_{DC}$
		$V_S = 1.15 \times V_R$	$V_R: 16V_{DC} \text{ to } 25V_{DC}$
Dissipation Factor ▪ At 20°C; 120Hz	$\tan \delta$	0.1 max.	
Leakage Current ▪ At 20°C; after 2min.	I_{LEAK}	$I_{LEAK} = 0.1 \times C_R \times V_R$	$V_R: 2V_{DC} \text{ to } 2.5V_{DC}$
		$I_{LEAK} = 0.3 \times C_R \times V_R$	$V_R: 16V_{DC} \text{ to } 25V_{DC}$
		With I_{LEAK} (μA) ▲ C_R (μF) ▲ V_R (V _{DC})	
Endurance	Test	125°C ▲ 1000hrs ▲ V_R applied	
	Appearance	No significant damage	
	$\Delta C/C_R$	≤ ±20% of the initial value	
	$\tan \delta$	≤ 200% of the initial specified value	
	I_{LEAK}	≤ 300% of the initial specified value	$V_R: 2V_{DC} \text{ to } 2.5V_{DC}$
		≤ The initial specified value	$V_R: 16V_{DC} \text{ to } 25V_{DC}$
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	$V_R: 2V_{DC} \text{ to } 2.5V_{DC}$
		+60% / -20% of the initial value	$V_R: 16V_{DC} \text{ to } 25V_{DC}$
	$\tan \delta$	≤ 200% of the initial specified value	
	I_{LEAK}	≤ The initial specified value	$V_R: 2V_{DC} \text{ to } 2.5V_{DC}$
		≤ 300% of the initial specified value	$V_R: 16V_{DC} \text{ to } 25V_{DC}$
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 ($R=1k\Omega$) and discharge for 5.5min.	
	Appearance	No significant damage	
	$\Delta C/C_R$	≤ ±10% of the initial value	
	$\tan \delta$	≤ The initial specified value	
	I_{LEAK}	≤ The initial specified value	

ELECTRICAL CHARACTERISTICS

V_{RDC} (V)	C_R (μF)	Dimensions (mm)			I_{LEAK} 20°C 2min (μA)	ESR 20°C 100kHz (m Ω)	I_R $\leq 45^\circ C$ 100kHz (mA)	Part Number ^{Note 1}
		L	W	H				
2	330	7.3	4.3	1.9	66	9	6300	ACTH2R0S331E09
	330	7.3	4.3	1.9	66	9	6300	ACTH2R0S331E09Y
	330	7.3	4.3	1.9	66	6	7500	ACTH2R0S331E06
2.5	330	7.3	4.3	1.9	82.5	9	6300	ACTH2R5S331E09
	330	7.3	4.3	1.9	82.5	9	6300	ACTH2R5S331E09Y
	330	7.3	4.3	1.9	82.5	6	7500	ACTH2R5S331E06
16	47	7.3	4.3	1.9	225.6	40	3200	ACTH160S470E40
	56	7.3	4.3	1.9	268.8	40	3200	ACTH160S560E40
25	15	7.3	4.3	1.9	112.5	40	3200	ACTH250S150E40
	33	7.3	4.3	1.9	247.5	40	3200	ACTH250S330E40

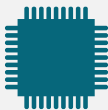




Notes

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	$\leq 45^\circ C$	$45^\circ C < T_S \leq 85^\circ C$	$85^\circ C < T_S \leq 105^\circ C$	$125^\circ C < T_S$
2V _{DC} to 2.5V _{DC}	Coefficient	1	0.7	0.25	0.25
16V _{DC} to 25V _{DC}	Coefficient	1	0.8	0.5	0.25

APPLICATIONS

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

REFERENCE DATA ▲ ACTH2R5S331E06 ▲ 330 μ F ▲ 2.5V ▲ 6m Ω

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

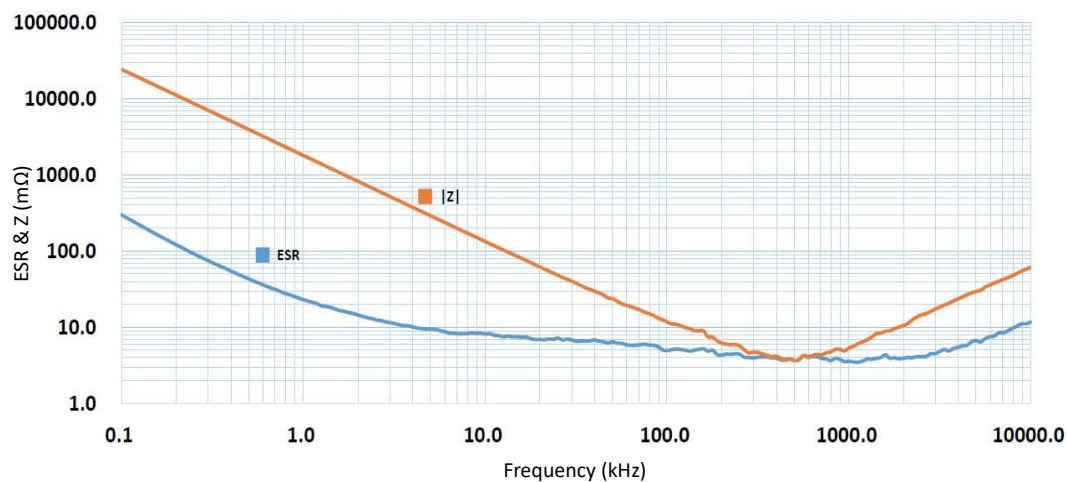


Fig. 2 • Frequency Characteristics of C (μ F)

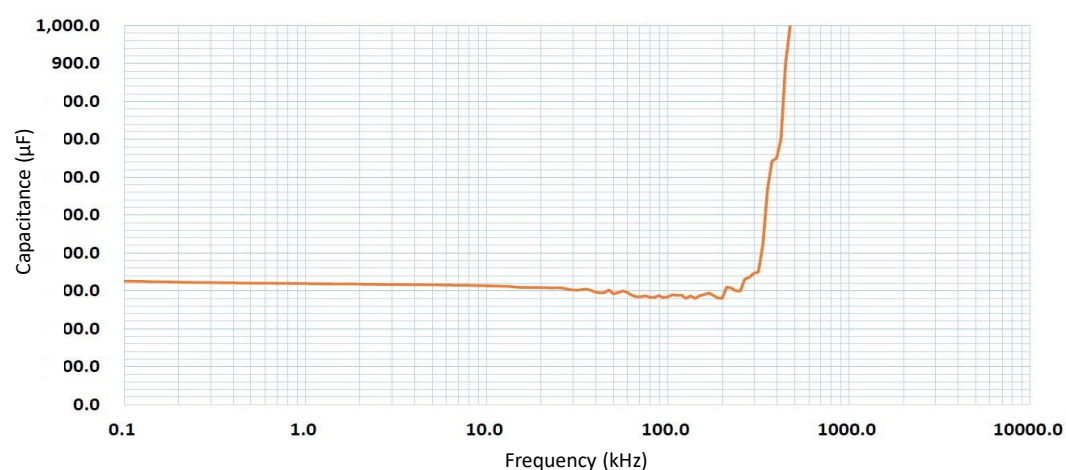
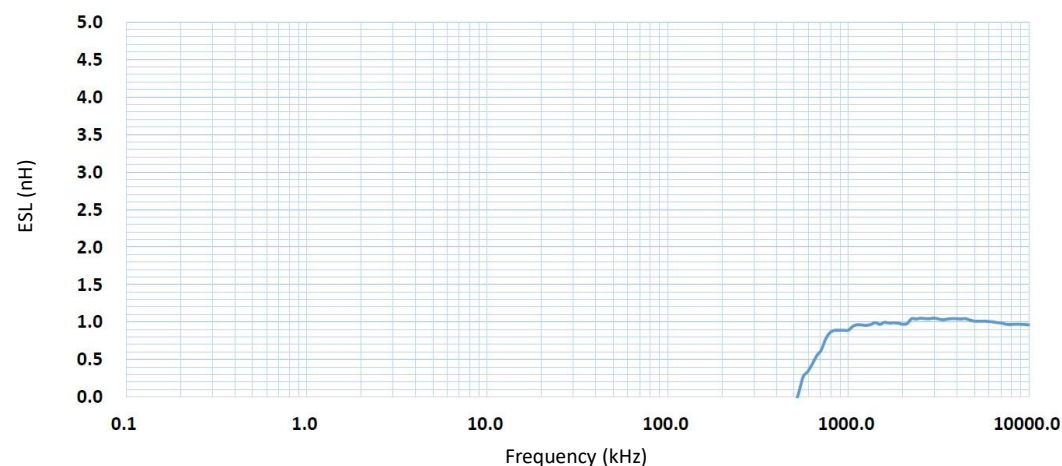


Fig. 3 • Frequency Characteristics of ESL (nH)



REFERENCE DATA ▲ ACTH160S560E40 ▲ 56 μ F ▲ 16V ▲ 40m Ω

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

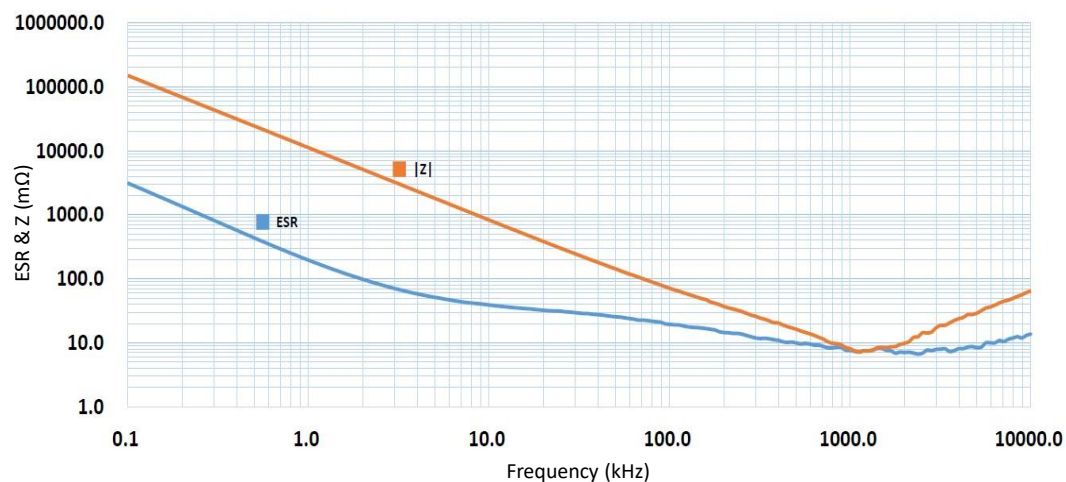


Fig. 5 • Frequency Characteristics of C (μ F)

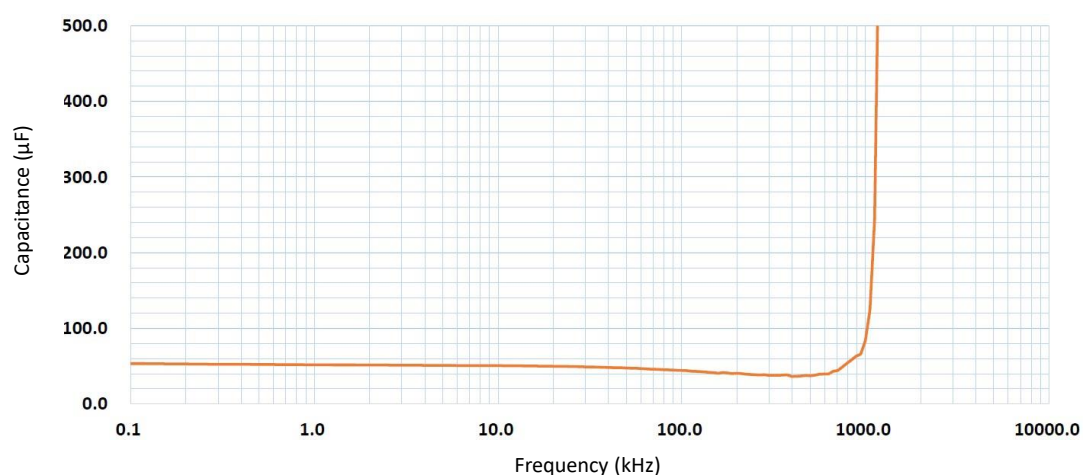
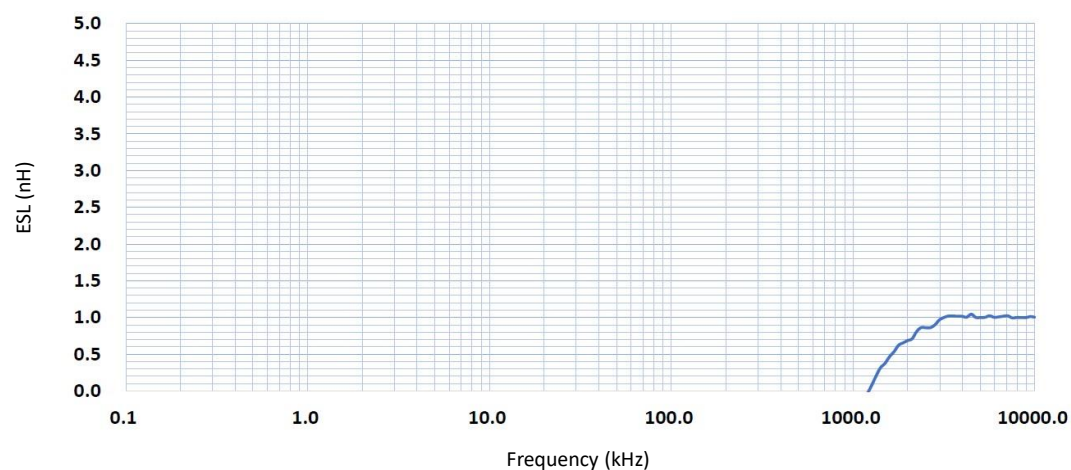
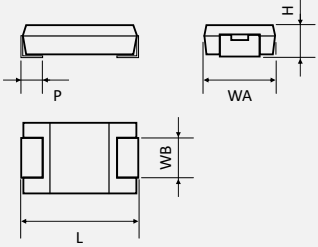


Fig. 6 • Frequency Characteristics of ESL (nH)



PACKAGE OUTLINE ▲ All dimensions in mm

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

PRODUCT CODE

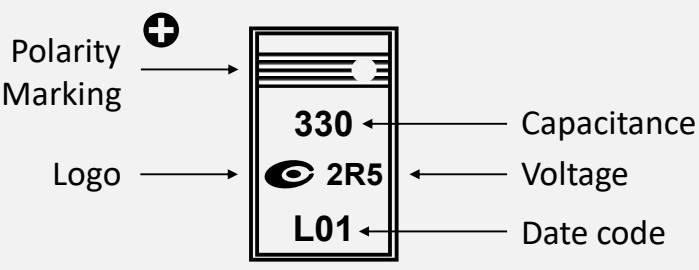
Example: ACTH series ▲ 330μF ▲ 2.5V_{DC} ▲ +10 to -35% ▲ 9mΩ ▲ Tape/Reel

ACTH		2R5		S		331		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 %
ACTH	ACTH	2R0	2.0	S	7.3x4.3x1.9	150	15	E06	6	Blank Y	±20 +10 to -35
		2R5	2.5			330	33	E09	9		
		160	16			560	56	E40	40		
		250	25			331	330				

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
	Capacitance
	Voltage
	Date code
	Logo
	Polarity (+) marking
Description	
330 = 330μF	
2R5 = 2.5V	
See date code table	
Manufacturer Logo	

DATE CODE

Example:

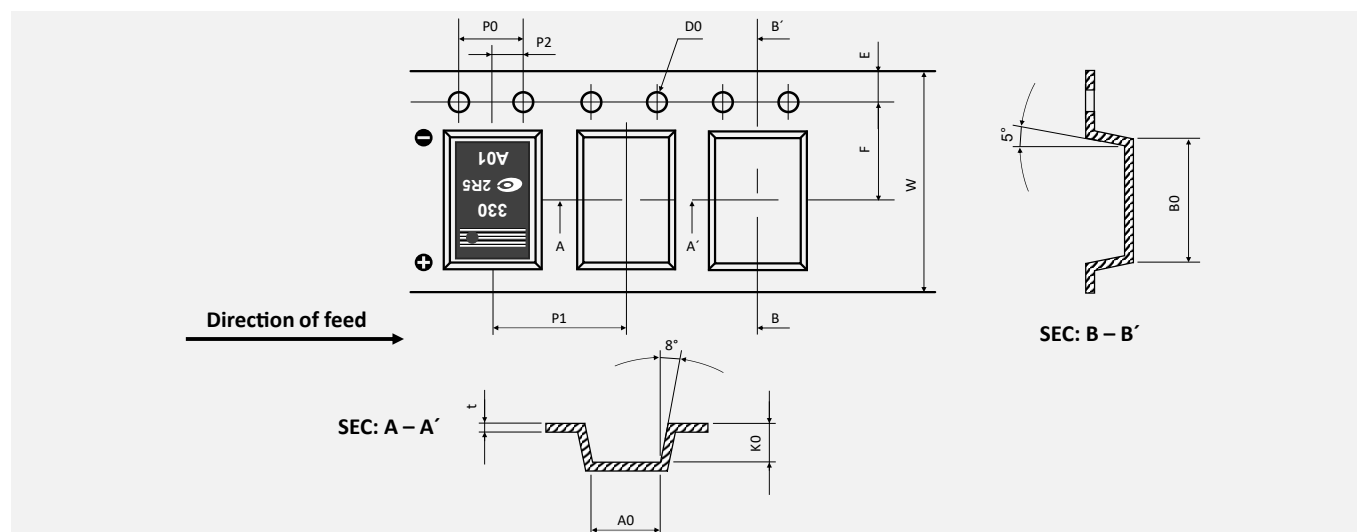
Date code

L01: L01 = 1st week of 2020

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

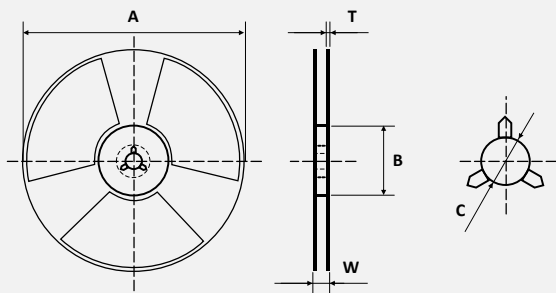
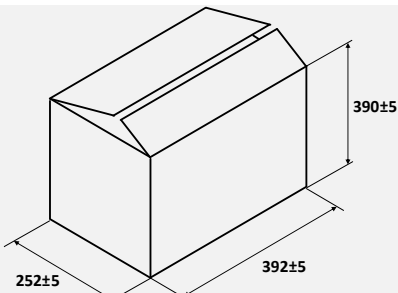
TAPING SPECIFICATION ▲ STACKED TYPE

Dimensions in mm

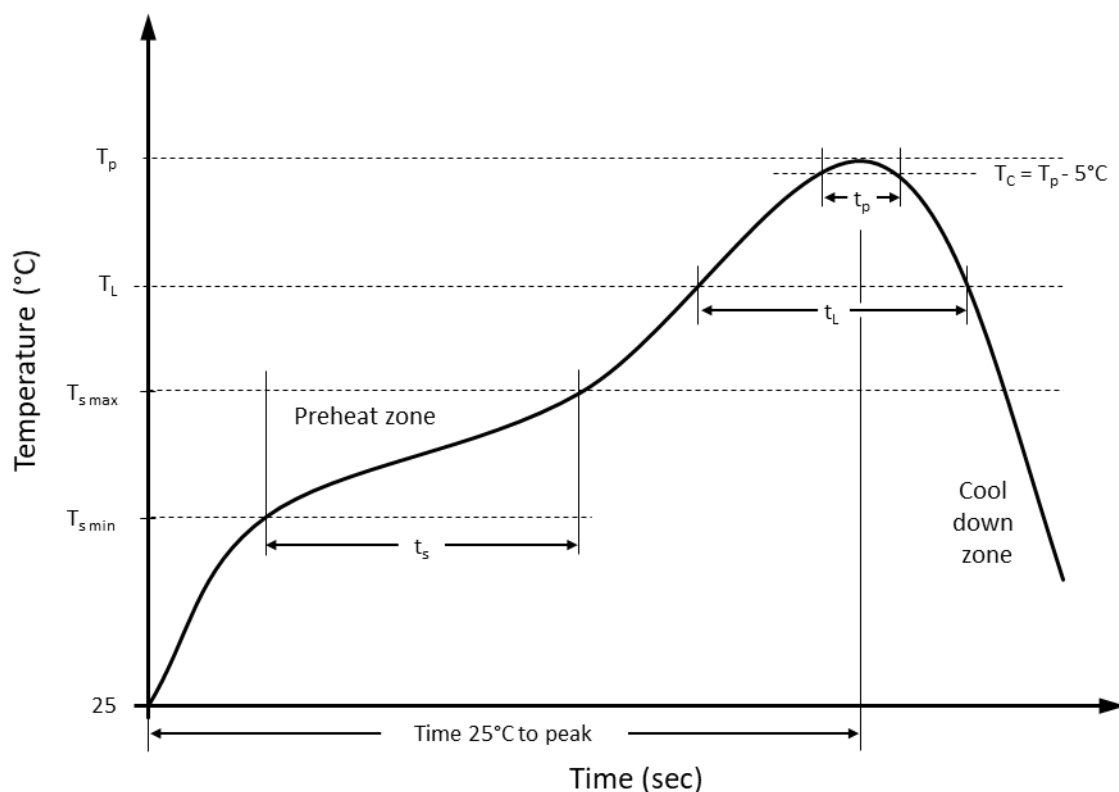


	W	P1	E	F	D0	P0	P2	A0	B0	K0	t
Tolerance	± 0.1	± 0.1	± 0.1	± 0.1	+ 0.1 - 0.0	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1
Dimension	12	8	1.75	5.5	1.5	4	2	5	7.6	2.3	0.24

REEL DIMENSION AND PACKAGING QUANTITY ▲ STACKED TYPE

Reel					Carton (Dimensions in mm)		
 <p>Label on the reel Size L x W = 70mm x 35mm</p> <ol style="list-style-type: none"> 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 					 <p>Label on the outer carton Size L x W = 100mm x 90mm</p> <ol style="list-style-type: none"> 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	2800	16800	33600

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

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