

Approval Sheet

**Thick Film Chip Array Resistors
Convex type
YC162
(RoHS Compliant)**

**YAGEO CORPORATION
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SCOPE

This specification describes YC162 series with lead-free terminal made by thick film process.

ORDERING INFORMATION

Part number is identified by the series, size, tolerance, packing style, , taping reel.

YC162 - J R - 07 XXXX L
 (1) (2) (3) (4) (5) (6)

(1) TOLERANCE

J = ±5%

(2) PACKAGING STYLE

R = Paper taping reel

(3) TEMPERATURE COEFFICIENT OF RESISTANCE

- = Base on spec

(4) TAPING REEL

07 = 7 inch dia. Reel

(5) RESISTANCE VALUE

- 1R=1Ω
- 10R=10Ω
- 100R=100Ω
- 1K=1,000Ω
- 1M=1,000,000Ω

6) OPTIONAL CODE

L = optional

MARKING

E-24 series:

For values up to 91Ω the R is used as a decimal point. For values of 120 or greater the first 2 digits apply to the resistance value and the third indicates the number of zeros to follow.



Example

Marking	123	391	47R
Resistance	12KΩ	390Ω	47Ω

Fig.1 Value = 390 Ω

CONSTRUCTION

The resistors are constructed out of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive paste. The composition of the paste is adjusted to give the approximate required resistance and laser cutting of this resistive layer that achieves tolerance trims the value. The resistive layer is covered with a protective coat. Finally, the two external terminations are added. See fig.1

DIMENSION

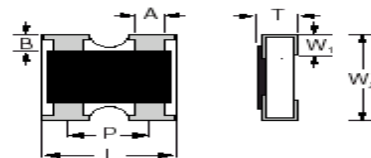


Table 1

TYPE	YC162
L (mm)	1.60±0.10
W1 (mm)	0.30±0.10
W2 (mm)	1.60±0.10
T (mm)	0.60±0.10
A (mm)	0.50±0.10
B (mm)	(0.30±0.10) () for reference only
P (mm)	0.80±0.05



POWER RATING

**RATED POWER AT 70°C,
YC162 1/16 W**

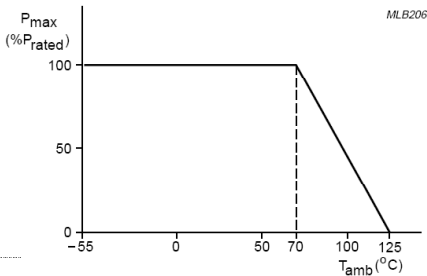


Fig. 3 Maximum dissipation (P_{max}) in percentage of rated power as a function of the operating ambient temperature (T_{amb})

ELECTRICAL CHARACTERISTICS

**Table 2
CHARACTERISTICS**

Operating Temperature Range	-55°C to +125°C	
Maximum Working Voltage	50V	
Maximum Overload Voltage	100V	
Dielectric Withstanding Voltage	100V	
Resistance Range	10Ω to 1MΩ (E24) Zero Ohm Jumper <50mΩ	
Temperature Coefficient	10Ω ≤ R ≤ 1 MΩ	±200 ppm/°C
Jumper Criteria	Rated Current	1A
	Maximum Current	2A

RATED VOLTAGE:

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{(P * R)}$$

Where

V=Continuous rated DC

or AC (rms) working voltage

P=Rated power

R=Resistance value

TAPING REEL

Table 3

DIMENSION	YC162
Tape Width(mm)	8
ØA (mm)	180+0/-3
ØB (mm)	60+1/-0
ØC (mm)	13.0±0.2
W (mm)	9.0±0.3
T (mm)	11.4±1

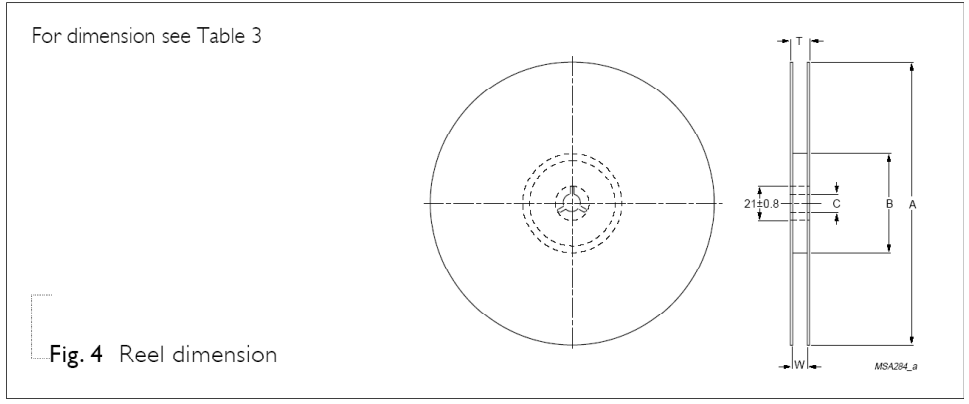


Fig. 4 Reel dimension

PAPER TAPE SPECIFICATION

Table 4

DIMENSION	YC162
A (mm)	2.0±0.05
B (mm)	2.0±0.05
W (mm)	8.0±0.2
E (mm)	1.75±0.1
F (mm)	3.5±0.05
P ₀ (mm)	4.0±0.1
P ₁ (mm)	4.0±0.1
P ₂ (mm)	2.0±0.05
ØD ₀ (mm)	1.5+0.1/-0
T (mm)	0.85±0.05

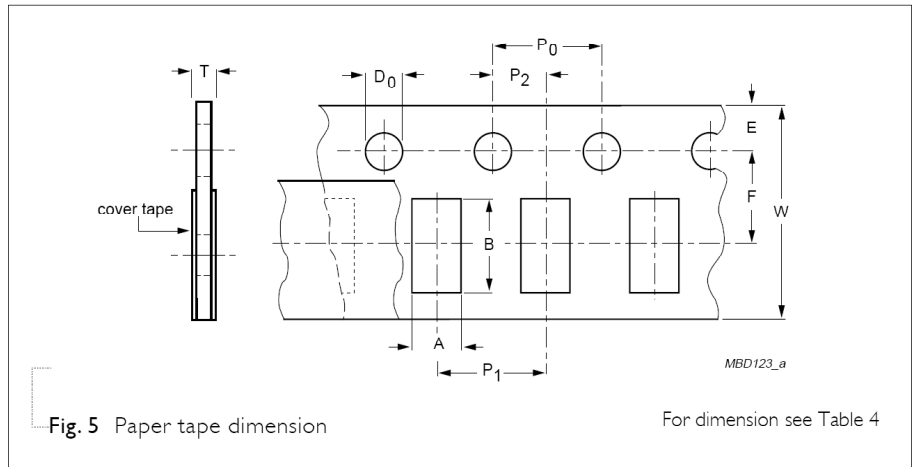


Fig. 5 Paper tape dimension

For dimension see Table 4

PACKING METHOD

LEADER/TRAILER TAPE SPECIFICATION

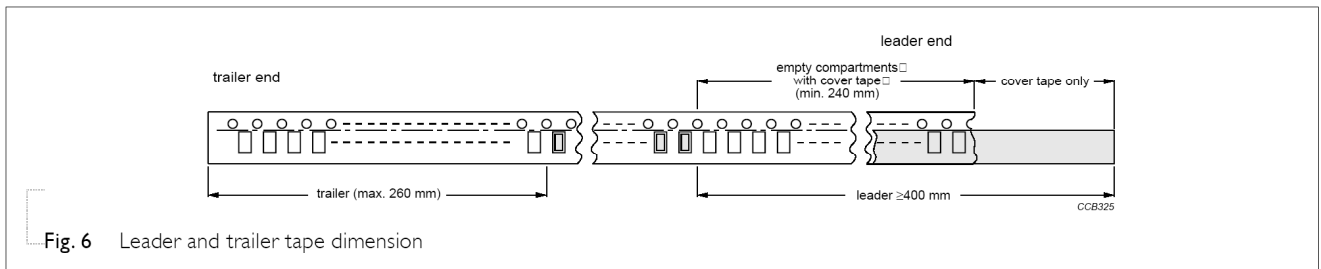


Fig. 6 Leader and trailer tape dimension

Table 5 Packing style and packaging quantity.

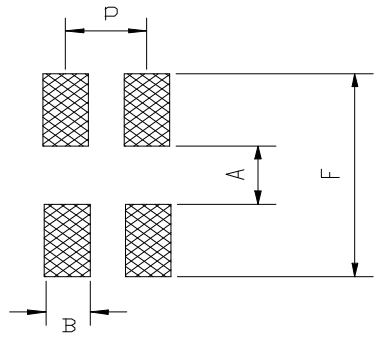
PACKING STYLE	REEL	DIMENSION	YC162
Paper Taping Reel (R)	7" (178 mm)		5,000

TYPE	TEST METHOD	PROCEDURE	REQUIREMENTS ΔR within
Life Operational Life Endurance	MIL-STD-202F-method 108A IEC 60115- 4.25.1 JIS C 5202-7.10	1000 hours at spec. temperature applied RCWV 1.5h on, 0.5h off, still air required 1) test with Pn at @70°C $\pm 5^\circ\text{C}$. 2) test with reduced load Px for power mode at extended temperature (hot-spot temp 155°C) Test with Px at @125°C $\pm 5^\circ\text{C}$.	$\pm(3\% + 0.05\Omega)$ for 01005 $\pm(2\% + 0.05\Omega)$ for others
High Temperature Exposure Endurance at upper category temperature	MIL-STD-202F-method 108A IEC 60115- 4.25.3 JIS C 5202-7.11	1000 hours at maximum operating temperature depending on spec. Unpowered. No direct impingement of forced air to the parts. Tolerances: 85°C $\pm 2^\circ\text{C}$; 125°C $\pm 3^\circ\text{C}$; 155°C $\pm 3^\circ\text{C}$. Temperature measurement between the parts.	$\pm(1\% + 0.05\Omega)$
Moisture Resistance	MIL-STD-202F-method 106F IEC 60115- 4.24.2	Each temp. / humidity cycle is defined at 8h (method 106F) ! 3 cycles / 24h for 10d with 25°C / 65°C 95% r.h. without steps 7a & 7b, Unpowered. Parts mounted on test-boards, without condensation on parts. Measurement at 24 \pm 2 hours after test conclusion.	$\pm(3\% + 0.05\Omega)$ for 01005 $\pm(2\% + 0.05\Omega)$ for others
Thermal Shock	MIL-STD-202 Method 107	-55°C/+125°C. Note: Number of cycles required is 300. Devices unmounted. Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	$\pm(0.5\% + 0.05\Omega)$ for 10K to 10M $\pm(1\% + 0.05\Omega)$ for others
Solderability			
- Wetting	J-STD-002	Electrical Test not required. Magnification 50X. Conditions: SMD: a) Method B, aging 4 hrs. @ 155°C dry heat b) Method B @ 215°C 8h steam aging c) Method D @ 260°C 8h steam aging	Well tinned ($\geq 95\%$ covered) No visible damage
- Leaching	EIA/IS 4.13B IEC 60115-8 4.18	Solder Sn/Pb 63/37, 260 °C, 30s immersion time	No visible damage
- Resistance to Soldering Heat	MIL-STD-202 Method 210	Condition B, no pre-heat of samples. Solder Sn/Pb 63/37, 260°C, 10s immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	$\pm(1\% + 0.05\Omega)$ No visible damage
Short time overload	MIL-R-55342D-para 4.7.5 IEC60155-1 4.6.1.1	2.5 times RCWV or maximum overload voltage whichever is less for 5 sec at room temp	$\pm(2\% + 0.05\Omega)$ No visible damage
Board Flex Bending	AEC-Q200-005 IEC60115-1 4.33 IEC60068-2-21 Ue1	device mounted on PCBoard as described , only 1 board bending required styles 1206 and smaller: 3mm bending styles bigger: 2 mm bending time of bending 60s \pm 5s ohmic value checked during bending!	$\pm(1\% + 0.05\Omega)$ No visible damage

TYPE	PROCEDURE	SIZE	FOOTPRINT	DIMENSION	REQUIREMENTS
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RECOMMENDED FOOTPRINT DIMENSIONS

Size Footprint	Dimensions		Code	unit :mm
YC162 (mm)	A	B	P	F
	0.8	0.45	0.8	2.6



RECOMMENDED SOLDERING PROFILE (PbSn)

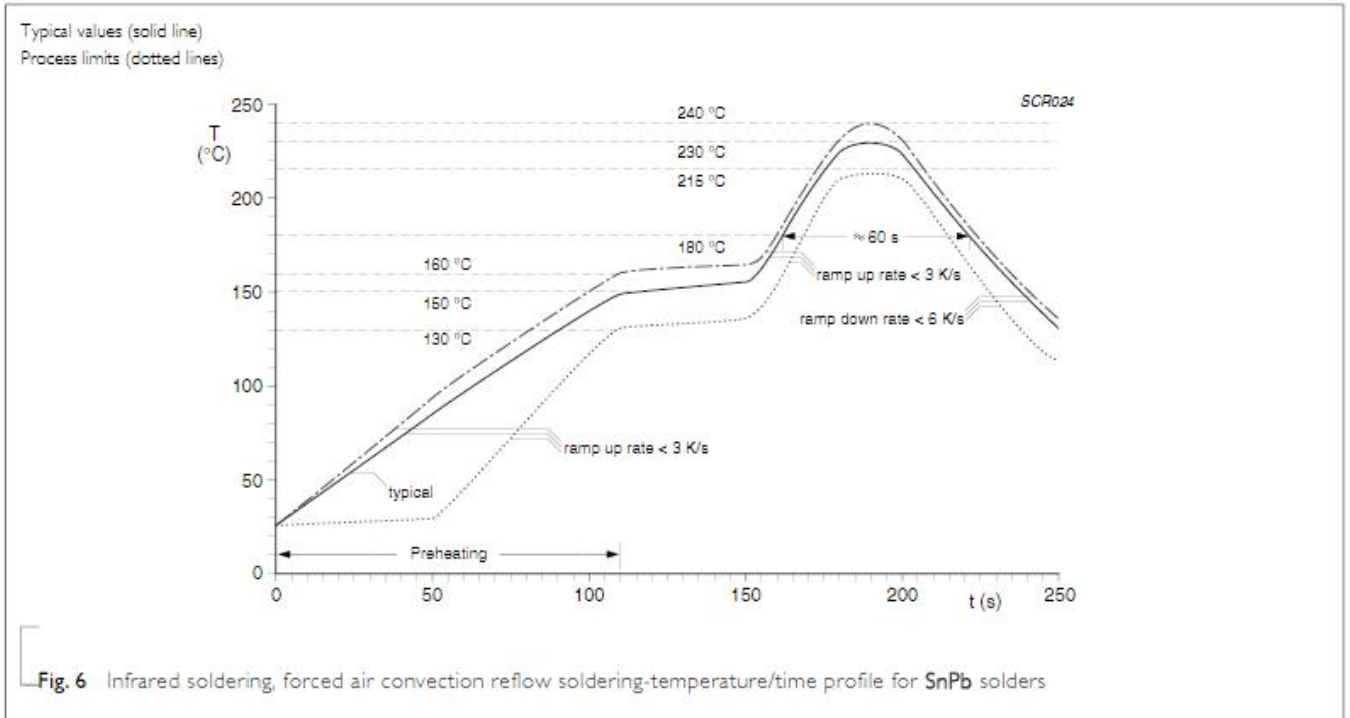
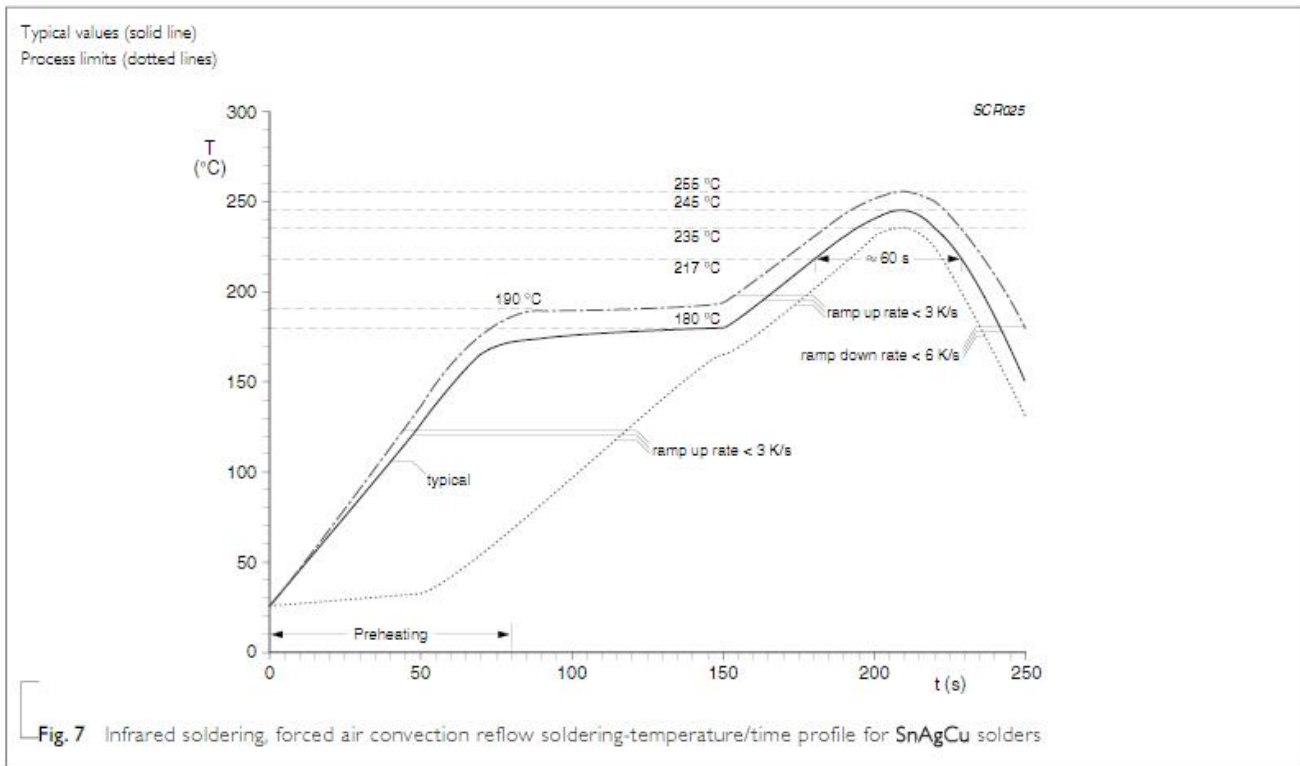


Fig. 6 Infrared soldering, forced air convection reflow soldering-temperature/time profile for SnPb solders

RECOMMENDED SOLDERING PROFILE (SnAgCu)



REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
v.0	2007/01/17	-	New specification release