



YC/TC 5%, 1% sizes YC:102/104/122/124/162/164/248/324/158T/358L/358T

ARRAY CHIP RESISTORS

TC: 102/104/122/124/162/164/248/324/1581/358L/3581 TC: 122/124/164 RoHS compliant

DATA SHEET





YAGEO Phícomp

Chip Resistor Surface Mount YC/TC SERIES 102 to 358

<u>SCOPE</u>

This specification describes YC (convex, flat) and TC (concave)

series chip resistor arrays with leadfree terminations made by thick film process.

APPLICATIONS

- Terminal for SDRAM and DDRAM
- Computer applications: laptop computer, desktop computer
- Consume electronic equipments: PDAs, PNDs
- Mobile phone, telecom...

FEATURES

- More efficient in pick & place application
- Low assembly costs
- RoHS compliant
- Products with lead free terminations meet RoHS requirements
- Pb-glass contained in electrodes
- Resistor element and glass are exempted by RoHS
- Reducing environmentally hazardous wastes
- High component and equipment reliability
- Saving of PCB space
- None forbidden-materials used in products/production
- Halogen Free Epoxy

ORDERING EXAMPLE

The ordering code of a YCl22 convex chip resistor array, value 1,000 Ω with ±5% tolerance, supplied in 7-inch tape reel is: YCl22-JR-071KL.

YCI58T network, value 100,000 Ω with 5% tolerance, supplied in 7-inch tape reel is: YCI58TJR-07100KL

NOTE

- All our RSMD products meet RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
- On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / I2NC can be added (both are on customer request)

ORDERING INFORMATION - GLOBAL PART NUMBER & 12NC

Both part numbers are identified by the series, size, tolerance, packing type, temperature coefficient, taping reel and resistance value.

YAGEO BRAND ordering code

GLOBAL PART NUMBER (PREFERSRED)

YC TC (1) (2) (3) (4) (5) (6) (7) (8)

(I) SIZE

YC:102/104/122/124/162/164/248/324/158T/358L/358T TC: 122/124/164

(2) ARRAYS OR NETWORKS

Array YC102/104/122/124/162/164/248/324: -

Network YCI 58T/YC358L/YC358T: NA

(3) TOLERANCE

 $F = \pm 1\%$

 $J = \pm 5\%$ (for Jumper ordering, use code of J)

(4) PACKAGING TYPE

R = Paper taping reel K = Embossed plastic tape reel

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

– = Base on spec

(6) TAPING REEL

07 = 7 inch dia. Reel

13 = 13 inch dia. Reel

(7) RESISTANCE VALUE

There are 2~4 digits indicated the resistor value. Letter R/K/M is decimal point. Detailed resistance rules show in table of "Resistance rule of global part number".

(8) DEFAULT CODE

Letter L is the system default code for ordering only. (Note)Letter T is the only default code for YC102.

Resistance rule of global part number Resistance code rule Example 0R 0R = Jumper $|R = |\Omega|$ XRXX $1R5 = 1.5 \Omega$ (1 to 9.76 Ω) 9R76 = 9.76 Ω XXRX $10R = 10 \Omega$ (10 to 97.6 Ω) $97R6 = 97.6 \Omega$ XXXR $100R = 100 \Omega$ (100 to 976 Ω) XKXX $IK = 1,000 \Omega$ (I to 9.76 KΩ) 9K76 = 9760 Ω ΧМ $IM = I,000,000 \Omega$ $(| M\Omega)$

PHYCOMP BRAND ordering codes

Both GLOBAL PART NUMBER (preferred) and I2NC (traditional) codes are acceptable to order Phycomp brand products.

GLOBAL PART NUMBER (PREFERRED)

For detailed information of GLOBAL PART NUMBER and ordering example, please refer to page 2. TC122 series is supplied and ordered by global part number only.

12NC CODE

2350 XXX XXXX L (1) (2) (3) (4)						Last di Resistance	git of 12NG decade ⁽³⁾		Last digit
TYPE/ START TOL. RESISTANCE			RESISTANCE	PAPER / PE TAPE	ON REEL (units) ⁽²⁾	0.01 to 0.0	976 Ω		0
2×0402	IN ⁽¹⁾	(%)	RANGE	10,000	50,000	0.1 to 0.97	76 Ω		7
ARV321	2350	±5%	l to I MΩ	013 1xxx	013 12xxx	l to 9.76 (2		8
ARV322	2350	±1%	10 to 1 MΩ	013 2xxxx	013 3xxxx	10 to 97.6	Ω		9
Jumper	2350		0 Ω	013 91001 - 100 to 976 Ω			I		
<u>.</u>		-				l to 9.76 l	<Ω		2
(I) The	resistor	rs have	e a 12-digit ord	ering code starting	with 2350.	10 to 97.6	ΚΩ		3
• •	•	uent 4	or 5 digits indi	cate the resistor to	olerance and	100 to 976	6 ΚΩ		4
pacl	kaging.					l to 9.76 l	40		5
. ,		-	• .	sent the resistance as shown in the ta		10 to 97.6			6
	st digit o	-	• •			Example:	0.02 Ω	=	0200 or 200
(4) "L"	is optior	nal sym	nbol ^(Note) .				0.3 Ω	=	3007 or 307
ORDER	ING EXA	MPLE					ΙΩ	=	1008 or 108
The or	dering co	ode of	a ARV321 resi	stor, value 1,000Ω	with ±5%		33 KΩ	=	3303 or 333
toleran	tolerance, supplied in tape of 10,000 units per reel is: 235001311102(L) or YC122-JR-071KL.						10 MΩ	=	1006 or 106

ΝΟΤΕ

- I. All our RSMD products are RoHS compliant. "LFP" of the internal 2D reel label mentions "Lead Free Process"
- 2. On customized label, "LFP" or specific symbol printed and the optional "L" at the end of GLOBAL PART NUMBER / 12NC can be added (both are on customer request)

				Product specification 4
Chip Resistor Surface Mount	YC/TC	SERIES	102 to 358	12
No marking				
	No marking	No marking	No marking	No marking

No marking

No marking

I-Digit marking

I-Digit marking

Fig. 6-1

No marking

No marking

E-24 series: 3 digits, 5%

E-24 series: 3 digits, 5%

Value=240K Ω

First two digits for significant figure and 3rd digit for number of zeros

First two digits for significant figure and 3rd digit for number of zeros

E-24 series: 3 digits

digit for number of zeros

First two digits for significant figure and 3rd

WSC108

TCI22

Fig. 7

Fig. 8

TCI24

YCI22

Fig. 2

Fig. 3

YC248

YCI24 / 162 / 164 / 324

Fig. 4 Jumper=0 Ω

Fig. 4-I Value=240KΩ

Fig. 5 Jumper=0 Ω

Fig. 5-Ι Value=240KΩ

YCI58T/358L/358T

Fig. 6 Value= 24Ω

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Chip Resistor Surface Mount YC/TC SERIES 102 to 358

TCI64

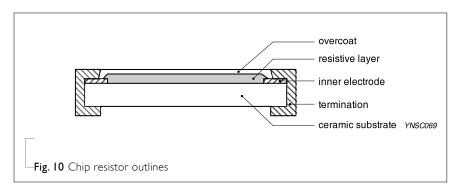
10164	
Fig. 9 Jumper=0Ω	I-Digit marking
Γ Fig. 9-1 Value=240KΩ	E-24 series: 3 digits, 5% First two digits for significant figure and 3rd digit for number of zeros

For further marking information, please refer to data sheet "Chip resistors marking".

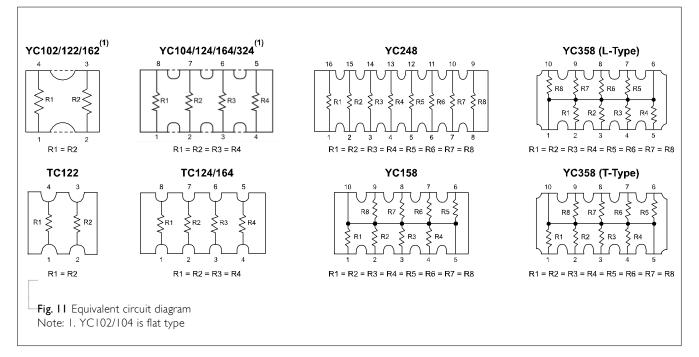
CONSTRUCTION

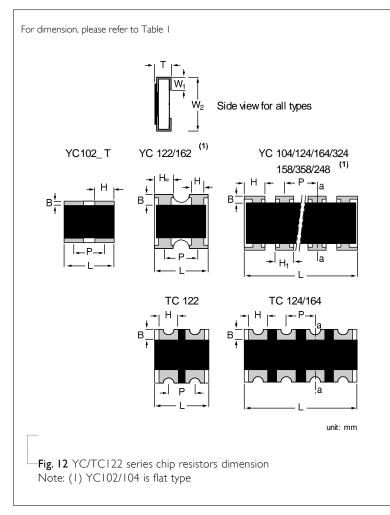
The resistor is constructed on top of a high-grade ceramic body. Internal metal electrodes are added on each end to make the contacts to the thick film resistive element. The composition of the resistive element is a noble metal imbedded into a glass and covered by a second glass to prevent environment influences. The resistor is laser trimmed to the rated resistance value. The resistor is covered with a protective epoxy coat, finally the two external terminations (matte tin on Nibarrier) are added as shown in Fig.9.

OUTLINES



SCHEMATIC







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Chip Resistor Surface Mount YC/TC SERIES 102 to 358

DIMENSIONS

Table I							
TYPE	$H/H_{\rm I}/H_{\rm W}$	В	Р	L	Т	WI	W2
YC102	H:0.25 ± 0.10	0.15 ±0.10	0.55 ±0.10	0.80 ±0.10	0.35 ±0.10	0.15 ±0.10	0.60 ±0.10
YC104	H:0.20 ± 0.10	0.15 ±0.05	0.40 ±0.10	1.40 ±0.10	0.35 ±0.10	0.15 ±0.10	0.60 ±0.10
YCI22	H : 0.21+0.10 / -0.05 H _w : 0.35 ±0.10	0.20 ±0.10	0.67 ±0.05	1.00 ±0.10	0.30 ±0.10	0.25 ±0.10	1.00 ±0.10
YCI24	H: 0.45 ± 0.05 H ₁ : 0.30 ± 0.05	0.20 ± 0.15	0.50 ±0.05	2.00 ±0.10	0.45 ±0.10	0.30 ±0.15	1.00 ±0.10
YC162	H:0.30 ±0.10 H _W :0.65 ±0.15	0.30 ±0.10	0.80 ±0.05	1.60 ± 0.10	0.40 ±0.10	0.30 ±0.10	1.60 ±0.10
YC164	H : 0.65 ± 0.05 H ₁ : 0.50 ± 0.15	0.30 ±0.15	0.80 ±0.05	3.20 ±0.15	0.60 ±0.10	0.30 ±0.15	1.60 ± 0.15
YC248	H : 0.45 ± 0.05 H ₁ : 0.30 ± 0.05	0.30 ± 0.15	0.50 ±0.05	4.00 ±0.20	0.45 ±0.10	0.40 ±0.15	1.60 ± 0.15
YC324	H : 1.10 ± 0.15 H ₁ : 0.90 ± 0.15	0.50 ±0.20	1.27 ± 0.05	5.08 ±0.20	0.60 ±0.10	0.50 ± 0.15	3.20 ±0.20
TCI22	H : 0.30 ±0.05	0.25 ±0.15	0.50 ±0.05	1.00 ±0.10	0.30 ±0.10	0.25 ±0.15	1.00 ±0.10
TCI24	H:0.30 ±0.10	0.20 ±0.10	0.50 ±0.05	2.00 ±0.10	0.40 ±0.10	0.25 ±0.10	1.00 ±0.10
TCI64	H:0.50 ±0.15	0.30 ±0.15	0.80 ±0.05	3.20 ±0.15	0.60 ±0.10	0.30 ±0.15	1.60 ± 0.15
YCI58T	H : 0.45 ± 0.05 H ₁ : 0.32± 0.05	0.30 ±0.15	0.64 ± 0.05	3.20 ±0.20	0.60 ±0.10	0.35 ± 0.15	1.60 ± 0.15
YC358L YC358T	H : 1.10 ± 0.15 H ₁ : 0.90 ± 0.15	0.50 ±0.15	1.27 ± 0.05	6.40 ±0.20	0.60 ±0.10	0.50 ± 0.15	3.20 ±0.20

Chip Resistor Surface Mount YC/TC SERIES 102 to 358

ELECTRICAL CHARACTERISTICS

Table 2	2									
TYPE	POWER P70	OPERATING TEMP. RANGE	MWV	RCOV	DWV	RESISTANCE TOLERA		T. C. R.	Jumper crit (unit	
YC102	1/32W	-55°C to +125°C	15V	30V	30V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		1200 190	Rated current Max. current	0.5 1.0
YC104	1/32W	-55°C to +125°C	12.5V	25V	25V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		±200 ppm/°C-	Rated current Max. current	0.5 1.0
YCI22	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1 E24/E96 ±1% 1 Jumper <			Rated current Max. current	0.5 1.0
YCI24	1/16W	-55°C to +155°C	25V	50V	100V	E24 ±5% 1 E24/E96 ±1% 1 Jumper <		$ \Omega \le R \le 0\Omega^{-1}]$ ±250 ppm/°C $ 0\Omega \le R \le M\Omega]$ ±200 ppm/°C-	Rated current Max. current	1.0 2.0
YC162	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1 E/24/E96 ±1% 1 Jumper <		±200 ppm/ C-	Rated current Max. current	
YC164	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 1 E24/E96 ±1% 1 Jumper <			Rated current Max. current	1.0 2.0
YC248	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		-	Rated current Max. current	
YC324	1/8W	-55°C to +155°C	200V	500V	500V	E24 ±5% 10 E24/E96 ±1% 10	$0\Omega \le R \le IM\Omega$ $0\Omega \le R \le IM\Omega$	-		
TCI22	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		- ±200 ppm/°C_	Rated current Max. current	1.0 1.5
TCI24	1/16W	-55°C to +125°C	50V	100V	100V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		1200 ppm/ C-	Rated current Max. current	1.0 1.5
TCI64	1/16W	-55°C to +155°C	50V	100V	100V	E24 ±5% 10 E24/E96 ±1% 10 Jumper <		-	Rated current Max. current	
YCI58T	1/16W	-55°C to +155°C	25V	50V	50V		$0\Omega \le R \le 00K\Omega$	-		
YC358L YC358T	1/16W	-55°C to +155°C	50V	100V	100V	F14 +5%	0 Ω ≤ R ≤ 30K Ω	-		

FOOTPRINT AND SOLDERING PROFILES

For recommended footprint and soldering profiles, please refer to data sheet "Chip resistors mounting".

PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style	and packaging quanti	ty								
PACKING STYLE	PACKING STYLE	YC102/ 104	YC/TC 122	YC/TC 124	YC162	YC/TC 164	YC248	YC324	YC158T	YC358L YC358T
Paper taping reel (R)	7" (178mm)	10,000	10,000	10,000	5,000	5,000	5,000		5,000	
	13" (254mm)	50,000	50,000	40,000		20,000			20,000	
Embossed taping reel (K) 7" (178mm)						4,000	4,000		4,000

NOTE

1. For tape and reel specification/dimensions, please refer to data sheet "Chip resistors packing".



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Chip Resistor Surface Mount YC/TC SERIES 102 to 358

FUNCTIONAL DESCRIPTION

OPERATING TEMPERATURE RANGE YC102/104/122/162, TC122/124 Range:

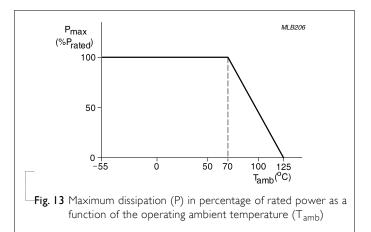
-55°C to +125°C (Fig.13)

YCI24/164/248/324/158T/358L/358T, TCI64 Range:

-55°C to +155°C(Fig.14)

POWER RATING

Each type rated power at 70°C YC102/104 = 1/32 W YC122/124/162/164/248/158T/358L/358T = 1/16 W YC324 = 1/8 W TC122/124/164 = 1/16 W



RATED VOLTAGE

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

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

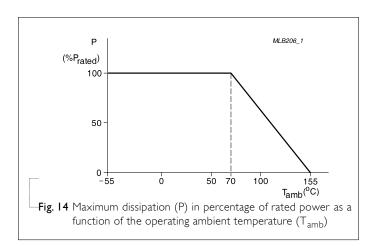
or max. working voltage whichever is less

Where

V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)



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TESTS AND REQUIREMENTS

Table 4 Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Life/	MIL-STD-202G-method 108A	1,000 hours at 70±5 °C applied RCWV	±(2%+0.05 Ω)
Operational Life/ Endurance	IEC 60115-1 4.25.1	1.5 hours on, 0.5 hour off, still air required	<100 m Ω for Jumper
Endurance	JIS C 5202-7.10		
High Temperature	MIL-STD-202G-method 108A	1,000 hours at maximum operating	±(1%+0.05 Ω)
Exposure/ Endurance at	IEC 60115-1 4.25.3 JIS C 5202-7.11	temperature depending on specification, unpowered	$<\!50~{ m m}\Omega$ for Jumper
Upper Category Temperature		No direct impingement of forced air to the parts	
		Tolerances: 125±3 °C	
Moisture	MIL-STD-202G-method 106F	Each temperature / humidity cycle is defined at	
Resistance	IEC 60115-1 4.24.2	8 hours (method 106F), 3 cycles / 24 hours for 10d with 25 °C / 65 °C 95% R.H, without	\sim <100 m Ω for Jumper
		steps 7a & 7b, unpowered Parts mounted on test-boards, without	
		condensation on parts	
		Measurement at 24±2 hours after test conclusion	
Thermal Shock	MIL-STD-202G-method 107G	-55/+125 °C	±(1%+0.05 Ω)
		Note: Number of cycles required is 300. Devices mounted	$<$ 50 m Ω for Jumper
		Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	
Short Time	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload	±(2%+0.05 Ω)
Overload	IEC60115-14.13	voltage whichever is less for 5 sec at room	<50 m Ω for Jumper
		temperature	No visible damage
Board Flex/	IEC60115-1 4.33	Device mounted on PCB test board as	±(1%+0.05 Ω)
Bending		described, only I board bending required	<50 m Ω for Jumper
		3 mm bending	No visible damage
		Bending time: 60±5 seconds	
		Ohmic value checked during bending	

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Chip Resistor Surface Mount YC/TC SERIES 102 to 358

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Solderability - Wetting	IPC/JEDECJ-STD-002B test B IEC 60068-2-58	Electrical Test not required Magnification 50X SMD conditions: I st step: method B, aging 4 hours at 155 °C dry heat 2 nd step: leadfree solder bath at 245±3 °C Dipping time: 3±0.5 seconds	Well tinned (≥95% covered) No visible damage
- Leaching	IPC/JEDECJ-STD-002B test D IEC 60068-2-58	Leadfree solder, 260 °C, 30 seconds immersion time	No visible damage
- Resistance to Soldering Heat	MIL-STD-202G-method 210F IEC 60068-2-58	Condition B, no pre-heat of samples Leadfree solder, 260 °C, 10 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(1%+0.05 Ω) <50 mΩ for Jumper No visible damage

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Chip Resistor Surface Mount YC/TC SERIES 102 to 358

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 7	Aug. 22, 2017	-	- Correct the typo for YCI58T/358L/358T, Marking, "240" is 240hm
Version 6	Jun. I, 2017	-	- Update ordering information for networks YCI58T/YC358L/YC358T
Version 5	Feb. 14, 2017	-	- Update YCI58 and 358 part number to YCI58T , YC358L and YC358T
Version 4	Dec. 22, 2016	-	- Delete YCI02 default code L type
Version 3	Apr. 29, 2016	-	- Update YC series and TCI 64 dimension
Version 2	Dec. 11, 2015	-	- Update Operating Temperature
Version I	Feb. 04, 2015	-	- Update YCI02 to flat type
Version 0	Nov. 14, 2014	-	- First issue of this specification

"Yageo reserves all the rights for revising the content of this datasheet without further notification, as long as the products itself are unchanged. Any product change will be announced by PCN."