

# DATA SHEET

## ARRAY CHIP RESISTORS

YC 158/358 (10Pin/8R)

5%

sizes 0612/1225

RoHS compliant



**SCOPE**

This specification describes YC158/358 series chip resistor network with lead-free terminations made by thick film process.

**APPLICATIONS**

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

**FEATURES**

- 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 INFORMATION - GLOBAL PART NUMBER & I2NC**

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 (PREFERRED)**

**YC 158/358** X X X X XX XXXX L  
 (1) (2) (3) (4) (5) (6) (7)

**(1) SCHEMATIC**

L = L-type (for YC358)  
 T = T-type (for YC158/358)

**(2) TOLERANCE**

J = ±5%

**(3) PACKAGING TYPE**

R = Paper taping reel (YC158)  
 K = Embossed taping reel (YC358)

**(4) TEMPERATURE COEFFICIENT OF RESISTANCE**

- = Base on spec

**(5) TAPING REEL**

07 = 7 inch dia. Reel  
 13 = 13 inch dia. Reel

**(6) RESISTANCE VALUE**

There are 2~4 digits indicated the resistor value. Letter R/K/M is decimal point, no need to mention the last zero after R/K/M, e.g.1K2, not 1K20.  
 Detailed resistance rules show in table of "Resistance rule of global part number".

**(7) OPTIONAL CODE**

L = optional symbol (Note)

Resistance rule of global part number	
Resistance code rule	Example
XRXX (1 to 9.76 Ω)	1R = 1 Ω 1R5 = 1.5 Ω 9R76 = 9.76 Ω
XXRX (10 to 97.6 Ω)	10R = 10 Ω 97R6 = 97.6 Ω
XXXR (100 to 976 Ω)	100R = 100 Ω
XKXX (1 to 9.76 KΩ)	1K = 1,000 Ω 9K76 = 9760 Ω
XMXX (1 to 9.76 MΩ)	1M = 1,000,000 Ω 9M76 = 9,760,000 Ω

**ORDERING EXAMPLE**

The ordering code of a YC158/358T T-type chip resistor network, value 1,000 Ω with ±5% tolerance, supplied in 7-inch tape reel is: YC158/358TJR-071K(L).

**NOTE**

1. All our RSMD products meet 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 / I2NC can be added (both are on customer request)

**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.

**I2NC CODE----**

**2350**      **XXX XXXXX L**  
 (1)            (2)      (3)      (4)

SIZE	TYPE	START IN <sup>(1)</sup>	TOL. (%)	RESISTANCE RANGE	PAPER / PE TAPE ON REEL (units) <sup>(2)</sup>		EMBOSSED TAPE ON REEL(units) <sup>(2)</sup>
					5,000	20,000	4,000
0612	RNA310	2350	±5%	10 to 100 KΩ	230 10xxx	230 12xxx	
1225	YC358L	2350	±5%	10 to 330 KΩ			200 10xxx
1225	YC358T	2350	±5%	10 to 330 KΩ			201 10xxx

- (1) The resistors have a 12-digit ordering code starting with 2350.
- (2) The subsequent 4 or 5 digits indicate the resistor tolerance and packaging.
- (3) The remaining 4 or 3 digits represent the resistance value with the last digit indicating the multiplier as shown in the table of "Last digit of I2NC".
- (4) "L" is optional symbol <sup>(Note)</sup>.

Resistance decade <sup>(3)</sup>	Last digit
0.01 to 0.0976 Ω	0
0.1 to 0.976 Ω	7
1 to 9.76 Ω	8
10 to 97.6 Ω	9
100 to 976 Ω	1
1 to 9.76 KΩ	2
10 to 97.6 KΩ	3
100 to 976 KΩ	4
1 to 9.76 MΩ	5
10 to 97.6 MΩ	6

**ORDERING EXAMPLE**

The ordering code of a RNA310/YC358T T-type chip resistor network, value 1,000 Ω with ±5% tolerance, supplied in tape of 10,000 units per reel is: 235023010102(L) / 235020110102(L) or YC158/358TJR-071K (L).

**NOTE**

- 1. 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 / I2NC can be added (both are on customer request)

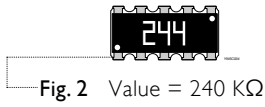
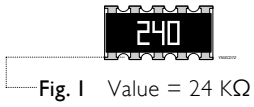
Example:

0.02 Ω	=	0200 or 200
0.3 Ω	=	3007 or 307
1 Ω	=	1008 or 108
33 KΩ	=	3303 or 333
10 MΩ	=	1006 or 106

**MARKING**

YC158

YC358



E-24 series: 3 digits

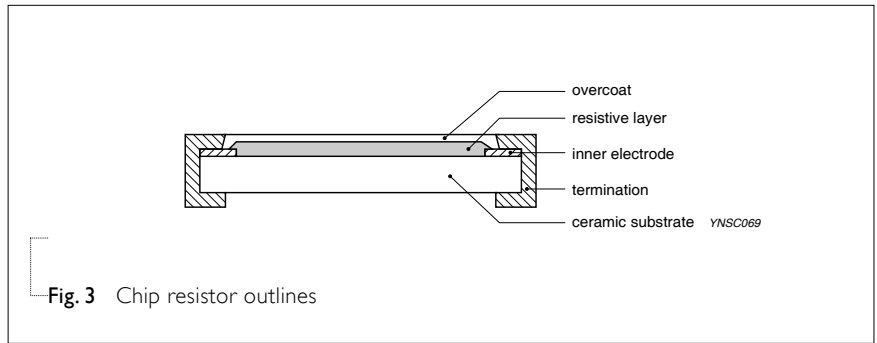
First two digits for significant figure and 3rd digit for number of zeros

For further marking information, please see special 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 Ni-barrier) are added. See fig.3

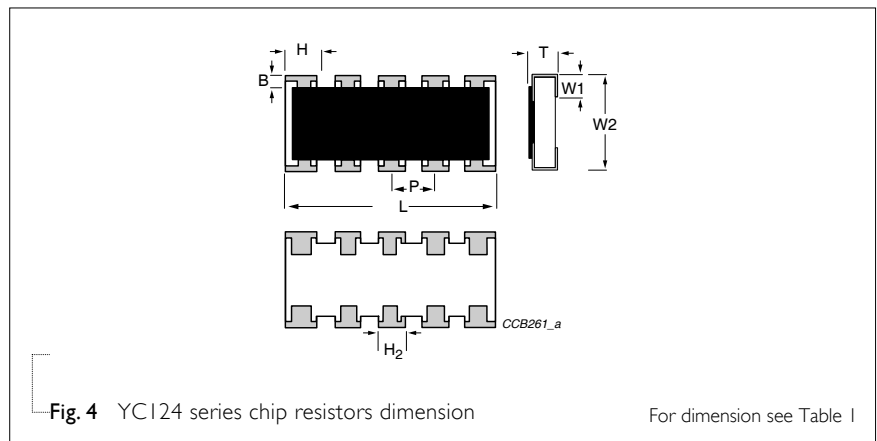
**OUTLINES**



**DIMENSIONS**

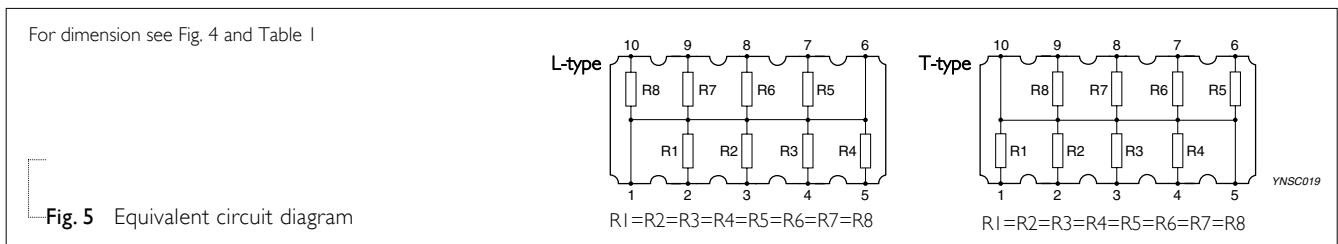
Table I

TYPE	YC158	YC358
B (mm)	0.30 ±0.15	0.50 ±0.15
H (mm)	0.45 ±0.05	1.10 ±0.15
P (mm)	0.64 ±0.05	1.27 ±0.05
L (mm)	3.20 ±0.20	6.40 ±0.20
T (mm)	0.60 ±0.10	0.60 ±0.10
W <sub>1</sub> (mm)	0.35 ±0.15	0.50 ±0.15
W <sub>2</sub> (mm)	1.60 ±0.15	3.20 ±0.20



**SCHEMATIC**

For dimension see Fig. 4 and Table I



**ELECTRICAL CHARACTERISTICS**

Table 2

CHARACTERISTICS	YC158 1/16 W	YC358 1/16 W
Operating Temperature Range	-55 °C to +155 °C	-55 °C to +155 °C
Maximum Working Voltage	25 V	50 V
Maximum Overload Voltage	50 V	100 V
Dielectric Withstanding Voltage	50 V	100 V
Resistance Range	5% (E24) 10 Ω to 100 KΩ	10 Ω to 330 KΩ
Temperature Coefficient	±200 ppm/°C	±200 ppm/°C

**FOOTPRINT AND SOLDERING PROFILES**

For recommended footprint and soldering profiles, please see the special data sheet “Chip resistors mounting”.

**PACKING STYLE AND PACKAGING QUANTITY**

Table 3 Packing style and packaging quantity

PACKING STYLE	REEL DIMENSION	YC158	YC358
Paper/PE taping reel (R)	7" (178 mm)	5,000	---
	13" (330 mm)	20,000	---
Embossed taping reel (K)	7" (178 mm)	---	4,000

**NOTE**

I. For Paper/Embossed tape and reel specification/dimensions, please see the special data sheet “Chip resistors packing”.

**FUNCTIONAL DESCRIPTION**

**POWER RATING**

YC158/358 rated power at 70 °C is 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

$$V = \text{Continuous rated DC or AC (rms) working voltage (V)}$$

$$P = \text{Rated power (W)}$$

$$R = \text{Resistance value (}\Omega\text{)}$$

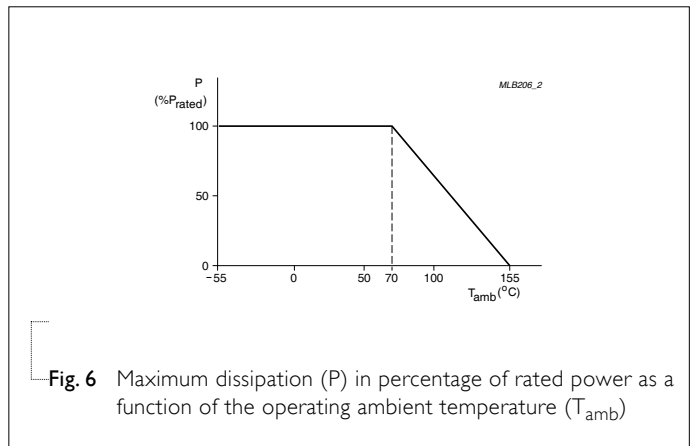


Fig. 6 Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature (T<sub>amb</sub>)

**TESTS AND REQUIREMENTS**
**Table 4** Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Life/ Operational Life/ Endurance	MIL-STD-202G-method 108A	1,000 hours at 70±5 °C applied RCWV	±(2%+0.05 Ω)
	IEC 60115-1 4.25.1	1.5 hours on, 0.5 hour off, still air required	
	JIS C 5202-7.10		
High Temperature Exposure/ Endurance at upper category temperature	MIL-STD-202G-method 108A	1,000 hours at maximum operating temperature	±(1%+0.05 Ω)
	IEC 60115-1 4.25.3	depending on specification, unpowered	
	JIS C 5202-7.11	No direct impingement of forced air to the parts Tolerances: 155±3 °C	
Moisture Resistance	MIL-STD-202G-method 106F	Each temperature / humidity cycle is defined at 8	±(2%+0.05 Ω)
	IEC 60115-1 4.24.2	hours (method 106F), 3 cycles / 24 hours 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±2 hours after test conclusion	
Thermal Shock	MIL-STD-202G-method 107G	-55/+155 °C	±(0.5%+0.05 Ω) for 10 KΩ to 10 MΩ
		Note: Number of cycles required is 300. Devices unmounted	±(1%+0.05 Ω) for others
		Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air – Air	
Short time overload	MIL-R-55342D-para 4.7.5	2.5 times RCWV or maximum overload voltage	±(2%+0.05 Ω)
	IEC60115-1 4.13	whichever is less for 5 sec at room temperature	No visible damage
Board Flex/ Bending	IEC60115-1 4.33	Device mounted on PCB test board as described, only 1 board bending required	±(1%+0.05 Ω) No visible damage
		3 mm bending	
		Bending time: 60±5 seconds	
		Ohmic value checked during bending	

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
<b>Solderability</b> - Wetting	IPC/JEDECJ-STD-002B test B IEC 60068-2-58	Electrical Test not required Magnification 50X SMD conditions: 1 <sup>st</sup> step: method B, aging 4 hours at 155 °C dry heat 2 <sup>nd</sup> 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, 270 °C, 10 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(1%+0.05 Ω) No visible damage

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 3	Nov 14, 2008	-	<ul style="list-style-type: none"> <li>- New datasheet for YC158 and YC358 thick film 5% with lead-free terminations</li> <li>- Replace the YC158 and YC358 part of pdf files: Pu-YC158_5_PbFree_L_2.pdf, Yu-YC158_5_PbFree_L_2.pdf, Pu-YC358_5_PbFree_L_0.pdf and Yu-YC358_5_PbFree_L_0.pdf</li> <li>- Description of "Halogen Free Epoxy" added</li> <li>- Define global part number</li> </ul>
Version 2	Feb 22, 2005	-	- Test method and procedure updated
Version 1	Apr. 22, 2004	-	- Added 13" taping and Jumper, deleted G in ordering code, and test & requirement (Pb free) update
Version 0	Nov. 10, 2003	-	- First issue of this specification

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