

GENERAL PURPOSE CHIP RESISTORS ARRAY

- CNA SERIES -

SCOPE

- CNA24, CNA34
- ±1%, ±5%, Convex Type
- Size 0402 x 4, 0603 x 4 (8p4R)
- Automotive & Anti Sulfur

FEATURES

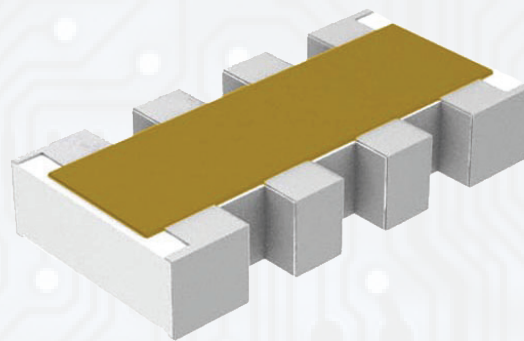
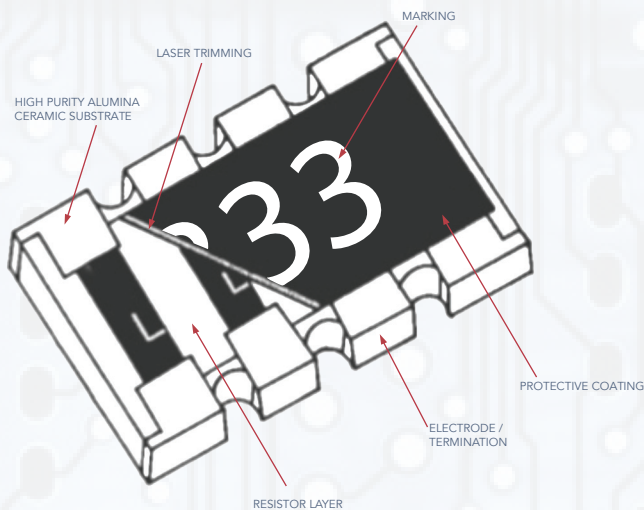
- High reliability and stability
- Sulfuration resistant
- Automotive grade with AEC Q-200 compliant
- Higher component and equipment reliability
- EU RoHS compliant and Lead free products

DESCRIPTION

The resistors array is constructed in a high grade ceramic body (aluminum oxide). Internal metal electrodes are added at each end and connected by a resistive paste that is applied to the top surface of the substrate. The composition of the paste is adjusted to give the

approximate resistance required and the value is trimmed to within tolerance by laser cutting of this resistive layer. The resistive layer is covered with a protective coat. Finally, the two external end terminations are added. For ease of soldering the outer layer of these end terminations is a Tin (Pb free) solder alloy.

CONSTRUCTION



APPLICATIONS

- Consumer electrical equipment
- EDP, Computer application
- Telecom
- Automotive Application

QUICK REFERENCE DATA

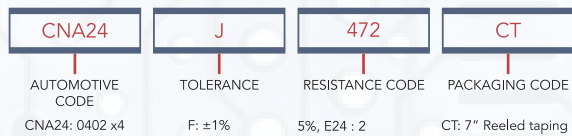
ITEM	GENERAL SPECIFICATION	
SERIES NO.	CNA24	CNA34
SIZE CODE	0402x4 (1005 x 4)	0603x4 (1608 x 4)
TERMINATION CONSTRUCTION	Convex	Convex
RESISTANCE TOLERANCE	±5%, ±1%	±5%, ±1%
RESISTANCE RANGE	10Ω ~ 1MΩ, Jumper	10Ω ~ 1MΩ, Jumper
TCR (ppm/°C)	≤±300	≤±200
MAX. DISSIPATION @ T _{amb} = 70°C	1/16 W	1/10 W
MAX OPERATION VOLTAGE (DC OR RMS)	25V	50V
MAX OVERLOAD VOLTAGE	50V	100V
CLIMATIC CATEGORY	55/125/56	

NOTE:

- Climatic category refer to IEC 60068
- This is the maximum voltage that may be continuously supplied to the resistor element, see "IEC publication 60115-8"
- Max. Operation Voltage" So called RCWW (Rated Continuous Working Voltage) is determined by

RCWW = $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$ or Max. RCWW listed above, whichever or lower.

PART NUMBERING



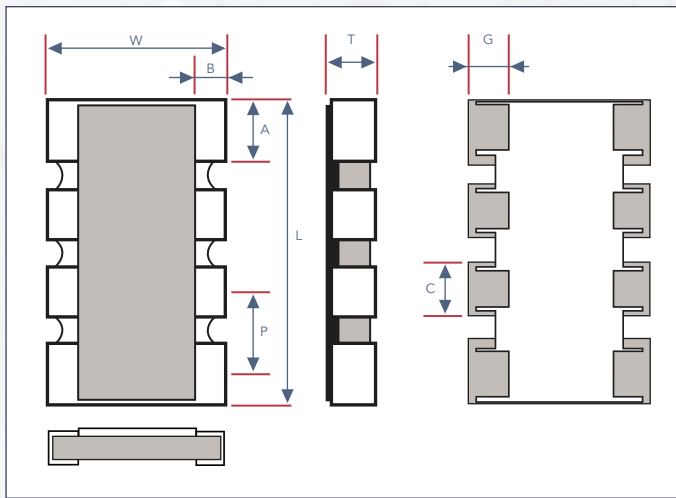
*Anti-sulfur test conditions: H2S 3ppm, 40°C, 90% RH, 1000 hrs, criteria: within ±1%

*100% CCD visual inspection to guarantee visual quality

CNA34, Reeled tape packaging: 8mm width paper taping 5000pcs per reel.

CNA24, Reeled tape packaging: 8mm width paper taping 10,000pcs per reel

DIMENSIONS (UNIT:MM)



	CNA24	CNA34
L	2.00 ± 0.10	3.20 ± 0.10
W	1.00 ± 0.10	1.60 ± 0.10
T	0.45 ± 0.10	0.50 ± 0.10
P	0.50 ± 0.05	0.80 ± 0.10
A	0.40 ± 0.10	0.60 ± 0.10
B	0.20 ± 0.10	0.30 ± 0.10
C	0.30 ± 0.05	0.40 ± 0.10
G	0.25 ± 0.10	0.30 ± 0.20

MARKING

- 3-Digits marking for E24 series ±1%, ±5% products.
- No marking for chip resistors array E96 series resistance
- Each resistor is marked with a three digits code on the protective coating to designate the nominal resistance value.

EXAMPLE

RESISTANCE	10Ω	100Ω	6800Ω	47000Ω
MARKING CODE	100	101	682	473

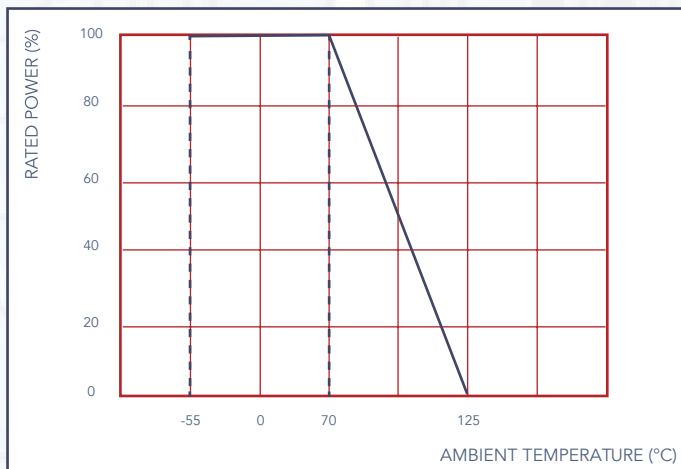
PRODUCT CHARACTERIZATION

Standard values of nominal resistance are taken from the E24 series for resistors with a tolerance of ±5%, The values of the E24 series are in accordance with "IEC publication 60063"

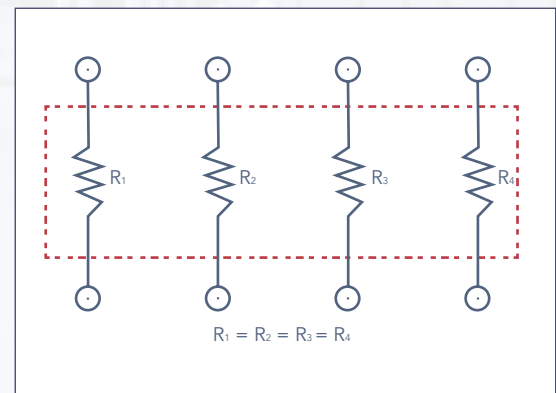
Standard values of nominal resistance are taken from the E24/E96 series for resistors with a tolerance of ±1%, The values of the E24/E96 series are in accordance with "IEC publication 60063"

DERATING CURVE

- The power that the resistor can dissipate depends on the operating temperature



CONSTRUCTION



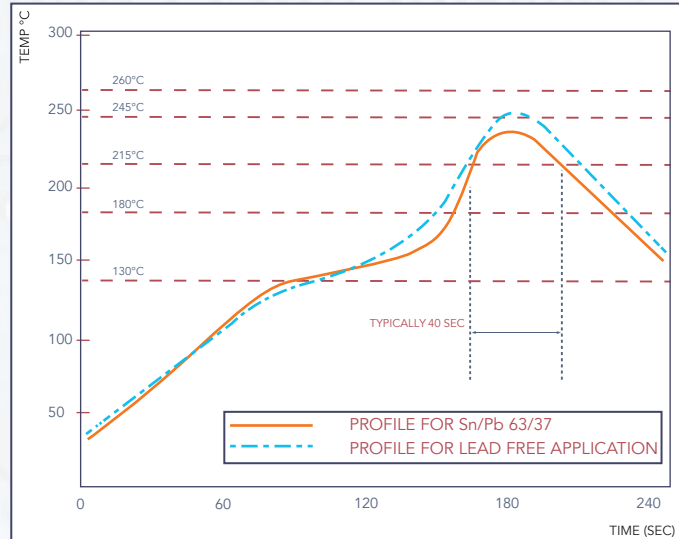
■ MOUNTING

- Due to their rectangular shapes and small tolerances, Surface Mountable Resistors are suitable for handling by automatic placement systems.
- Chip placement can be on ceramic substrates and printed-circuit boards (PCBs).
- Electrical connection to the circuit is by individual soldering condition.
- The end terminations guarantee a reliable contact.

■ SOLDERING CONDITION

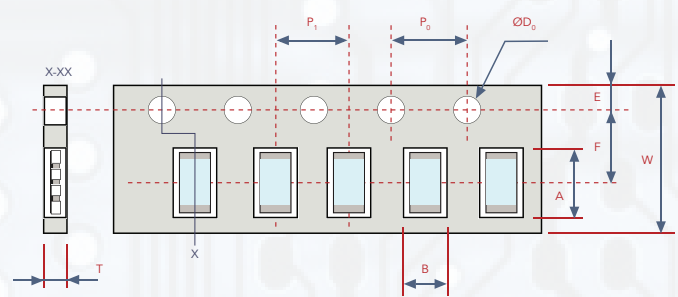
The robust construction of chip resistors allows them to be completely immersed in a solder bath of 260°C for 10 seconds. Therefore, it is possible to mount Surface Mount Resistors on one side of a PCB and other discrete components on the reverse (mixed PCBs).

Surface Mount Resistors are tested for solderability at 235°C during 2 seconds. The test condition for no leaching is 260°C for 30 seconds.



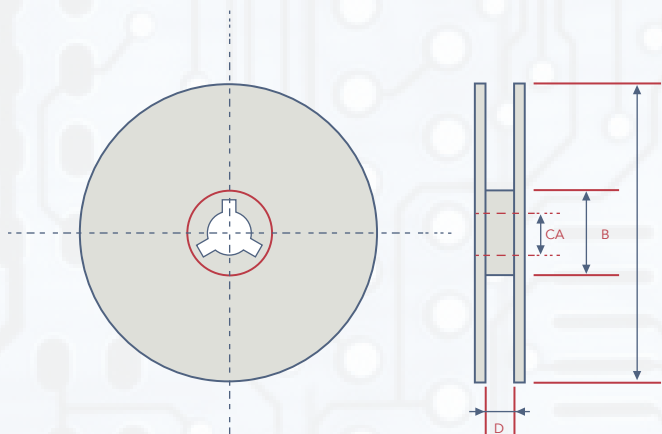
■ PACKAGING

Paper Tape Specification (unit:mm)



SYMBOL	A	B	W	F	E
CNA34	3.60 ± 0.20	2.00 ± 0.20	8.00 ± 0.30	3.50 ± 0.20	1.75 ± 0.10
CNA24	22.0 ± 0.20	1.20 ± 0.20			

SYMBOL	P ₁	P ₀	ØD	T
CNA34	4.00 ± 0.10	4.00 ± 0.10	Ø1.50 ^{+0.1} _{-0.0}	Max. 1.0
CNA24	2.00 ± 0.05			Max. 0.6



SYMBOL	A	B	C	D
CNA34, CNA24	Ø178.0 ± 2.0	Ø60.0 ± 1.0	13.0 ± 0.2	9.0 ± 0.5

TEST AND REQUIREMENTS

Essentially all tests are carried out according to the schedule of IEC publication 115-8, category LCT/UCT/56 (rated temperature range : Lower Category Temperature, Upper Category Temperature; damp heat, long term, 56 days). The testing also meets the requirements specified by EIA, EIAJ and JIS.

The tests are carried out in accordance with IEC publication 68, "Recommended basic climatic and mechanical robustness testing procedure for electronic components" and under standard atmospheric conditions according to IEC 60068-1, subclause 5.3. Unless otherwise specified, the following value supplied:

- Temperature: 15°C to 35°C.
- Air pressure: 86kPa to 106 kPa (860 mbar to 1060 mbar).
- Relative humidity: 45% to 75%.
- All soldering tests are performed with midly activated flux.

TEST	PROCEDURE / TEST METHOD	REQUIREMENT	
		RESISTOR	Ω
Electrical Characteristics JISC5201-1: 1998 Clause 4.8	DC resistance values measurement Temperature Coefficient of Resistance (T.C.R.) Natural resistance change per change in degree centigrade. $\frac{R_2 - R_1}{R_1 (t_2 - t_1)} \times 10^6$ (ppm / °C) $t_1: 20^\circ\text{C} + 5^\circ\text{C} - 1^\circ\text{C}$ R_1 : Resistance at reference temperature R_2 : Resistance at test temperature	Within the specified tolerance Refer to "QUICK REFERENCE DATA"	
Resistance to soldering heat (R.S.H.) MIL-STD-202 Method 201	Un-mounted chips completely immersed for 10±1 seconds in a SAC solder bath at 270°C ±5°C	ΔR/R max. ±(0.5% + 0.05Ω)	<50mΩ
Solderability J-STD-202	a) Bake the sample for 155°C dwell time 4 hrs / solder dipping 235°C / 5°C b) Steam the sample dwell time 1 hour / solder dipping 260°C / 7°C	95% coverage min., good tinning and no visible damage	
Temperature Cycling JESD22 Method JA-104	1000 cycles, -55°C ~ +155°C, dwell time 5~10 min	ΔR/R max. ±(0.5% + 0.05Ω)	<50mΩ
Moisture Resistance MIL-STD-202 Method 106	65 ± 2°C, 80~100% RH, 10 cycles, 24 hours / cycles	ΔR/R max. ±(0.5% + 0.10Ω)	<50mΩ
Bias Humidity MIL-STD-202 Method 103	1000 +48/-0; 85°C, 85% RH, 10% of operation power	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ
Operational Life MIL-STD-202 Method 108	1000 +48/-0 hours; 35% of operation power, 125±2°C	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ
High Temperature Exposure MIL-STD-202 Method 108	1000 +48/-0 hours; without load in a temperature chamber controlled 125±3°C	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ
Board Flex AEC-Q200-005	Resistors mounted on a 90mm glass epoxy resin PCB (FR4) bending once 2mm for 10 sec	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ
Terminal Strength AEC-Q200-006	Pressurixing force: 1Kg, Test time: 60±1sec.	No remarkable damage or removal of the terminations	
Vibration MIL-STD-202 Method 204	Test 5g's for 20 min., 12 cycles each of 3 orientations	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ
Thermal Shock MIL-STD-202 Method 107	Test -55 to 125°C / dwell time 15 min / Max transfer time 20 sec, 300 cycles	ΔR/R max. ±(0.5% + 0.05Ω)	<50mΩ
ESD AEC-Q200-002	Test contact 1.0KV	ΔR/R max. ±(1.0% + 0.05Ω) No visible damage	<50mΩ

TEST AND REQUIREMENTS (0Ω)

ITEM	CNA24	CNA34
POWER RATING AT 70°C	1/16W	1/10W
RESISTANCE	MAX. 50MΩ	
RATED CURRENT	1A	1A
PEAK CURRENT	1.5A	3A
OPERATING TEMPERATURE	-55 ~ 155°C	

