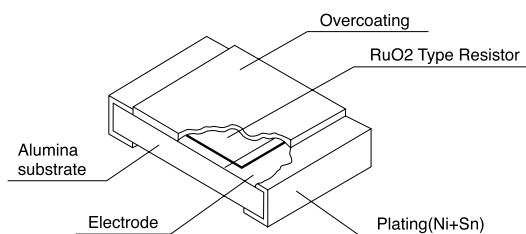
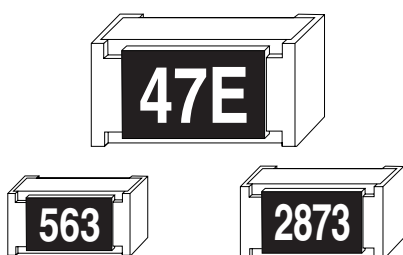


# THICK FILM CHIP RESISTORS

## CONSTRUCTION

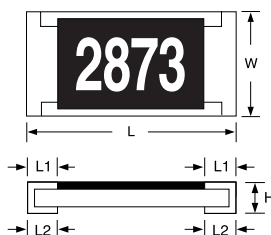


### OPERATING TEMPERATURE RANGE

-55°C ~ +155°C

## DIMENSIONS

Unit: mm



Type	Dimensions	L	W	H	L1	L2
ATR 0402		1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.25 ± 0.10
ATR 0603		1.55 ± 0.10	0.80 ± $\begin{smallmatrix} 0.10 \\ 0.05 \end{smallmatrix}$	0.45 ± 0.10	0.30 ± 0.15	0.30 ± 0.15
ATR 0805		2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.10	0.35 ± 0.20	0.35 ± 0.15
ATR 1206		3.05 ± 0.10	1.55 ± 0.10	0.55 ± $\begin{smallmatrix} 0.10 \\ 0.05 \end{smallmatrix}$	0.45 ± 0.20	0.35 ± 0.15
ATR 1210		3.05 ± 0.10	2.55 ± 0.10	0.55 ± 0.10	0.50 ± 0.20	0.50 ± 0.20
ATR 2010		5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
ATR 2512		6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20

## General Specifications

Type	Rated Power at 70°C	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/°C)	Resistance Range $\geq 1\Omega$				Jumper Rated Current	Jumper Resistance Value	
					D(±0.5%) E-96	F(±1%) E-96	G(±2%) E-24	J(±5%) E-24			
ATR 0402	$\frac{1}{16}$ W	50V	100V	$\begin{smallmatrix} +500 \\ -200 \end{smallmatrix}$	-	1Ω~9.9Ω	1Ω~9.9Ω	1Ω~9.9Ω	1A	50mΩMAX	
					± 200	100Ω~990Ω	10Ω~990Ω	10Ω~990Ω			
ATR 0603	$\frac{1}{10}$ W	50V	100V	± 100	± 200	100Ω~1MΩ	33Ω~1MΩ	-	1A	50mΩMAX	
					± 400	-	1Ω~9.9Ω	1Ω~9.9Ω			1Ω~9.9Ω
					± 100	100Ω~1MΩ	33Ω~1MΩ	-			-
ATR 0805	$\frac{1}{8}$ W	150V	300V	± 200	-	10Ω~32Ω	10Ω~10MΩ	10Ω~10MΩ	2A	50mΩMAX	
					± 400	-	1Ω~9.9Ω	1Ω~9.9Ω			1Ω~9.9Ω
					± 100	100Ω~1MΩ	33Ω~1MΩ	-			-
ATR 1206	$\frac{1}{4}$ W	200V	400V	± 200	-	10Ω~32Ω	10Ω~10MΩ	10Ω~10MΩ	2A	50mΩMAX	
					± 400	-	1Ω~9.9Ω	1Ω~9.9Ω			1Ω~9.9Ω
					± 100	100Ω~1MΩ	33Ω~1MΩ	-			-
ATR 1210	$\frac{1}{3}$ W	200V	400V	± 200	-	10Ω~32Ω	10Ω~10MΩ	10Ω~20MΩ	2A	50mΩMAX	
					± 400	-	1Ω~9.9Ω	1Ω~9.9Ω			1Ω~9.9Ω
					± 100	100Ω~1MΩ	33Ω~1MΩ	-			-
ATR 2010	$\frac{3}{4}$ W	200V	400V	± 100	-	10Ω~1MΩ	-	-	2A	50mΩMAX	
					± 200	-	-	10Ω~1MΩ			10Ω~1MΩ
					± 400	-	-	-			1Ω~9.9Ω
ATR 2521	1W	200V	400V	± 100	-	10Ω~1MΩ	-	-	2A	50mΩMAX	
					± 200	-	-	10Ω~1MΩ			10Ω~1MΩ
					± 400	-	-	-			1Ω~9.9Ω

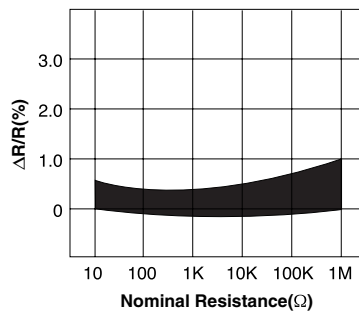
## ■ CHARACTERISTICS

Item	0.5% · 1% (R ≥ 1Ω)	2% · 5% (R ≥ 1Ω)	Test Method
Temperature Cycling	± (0.5% + 0.05Ω)	± (1.0% + 0.05Ω)	JIS-C5202-7.4 Cycle between -55°C and +125°C for 5 cycles
Low Temperature Operation	± (0.5% + 0.05Ω)	± (1.0% + 0.05Ω)	MIL-R-55342-D 4.7.4 Followed by 45 Minutes of RCWV.
Short Time Overload	± (1.0% + 0.05Ω)	± (2.0% + 0.10Ω)	JIS-C5202-5.5 Apply rated voltage 2.5 times for 5 seconds
Resistance to Soldering Heat	± (1.0% + 0.05Ω)	± (1.0% + 0.05Ω)	JIS-C5202-6.10 Immerse for 10 sec. in solder at 260 ± 5°C
Loading Life in Moisture	± (1% + 0.05Ω)	± (2.0% + 0.1Ω)	JIS-C5202-7.9 40°C, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Resistance to dry heat	± (1.0% + 0.05Ω)	± (2.0% + 0.10Ω)	JIS-C5202-7.2 96Hrs at 125°C
Load Life	± (1.0% + 0.05Ω)	± (3.0% + 0.10Ω)	JIS-C5202-7.10 70°C, 1000Hrs at RCWV, 1.5Hr ON, 0.5Hr OFF
Solderability	Coverage ≥ 95%	Coverage ≥ 95%	JIS-C5202-6.11 Immerse for 3 sec. in solder at 245 ± 3°C
Bending Strength	± (1.0% + 0.05Ω)	± (1.0% + 0.05Ω)	JIS-C5202-6.1.4 Amount of band: ATR0402, ATR0603, ATR0805=5mm, ATR1206, ATR1210=3mm, ATR2010, ATR2521=2mm
Intermittent Overload	± (5.0% + 0.10Ω)	± (5.0% + 0.10Ω)	JIS-C5202-5.8 Apply rated voltage 1sec ON, 25sec OFF, 10000 cycles
Dielectric Withstanding Voltage	No short or burned on the appearance		JIS-C5202-5.7 Apply 500VAC for 1min(ATR0402 300VAC, ATR0603 300VAC/1Min)
Terminal Strength	No evidence of mechanical damage		JIS-C5202-6.1.4 Apply 5N pushing force for 10sec.

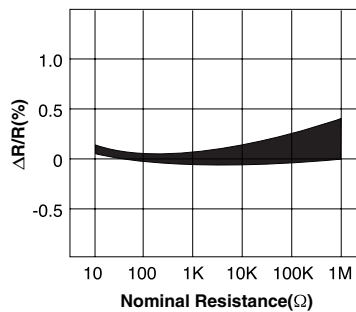
\*RCWV=Rated Continuous Working Voltage

## ■ CHARACTERISTIC DATA

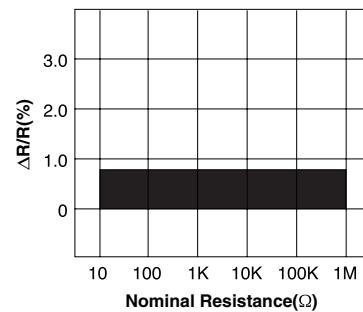
Load Life 1000Hr



Short Time Overload

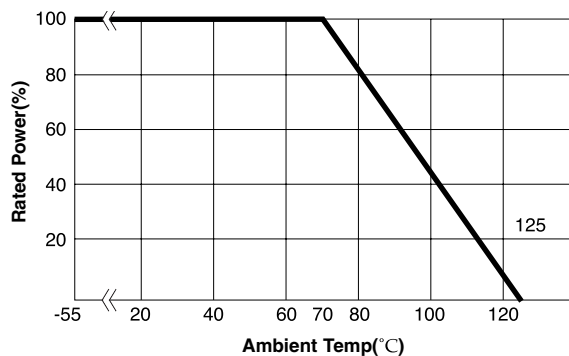


Loading Life in Moisture 1000Hr



CHIP RESISTORS

## ■ POWER DERATING CURVE



## ■ MARKING

FOR E-24 & E-96

• 2%, 5% 3 digits indication  
first 2 digits are significant figures  
3rd digit is multiplier(10<sup>-1</sup>)

EX. Marking -> 563

56 × 10<sup>3</sup> = 56000Ω = 56KΩ

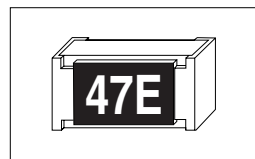
• 1% 4 digits indication

first 3 digits are significant figures  
4th digit is multiplier(10<sup>-1</sup>)

EX. Marking -> 3922

392 × 10<sup>2</sup> = 39200Ω = 39.2KΩ

TYPE ATR0402: No marking Code



FOR ATR0603 1%(E-96)

• 3 digit indication

first 2 significant for E-96 Part marking scheme.

3rd digit is multiplier:

Y = 10<sup>-2</sup> X = 10<sup>-1</sup> A = 10<sup>0</sup> B = 10<sup>1</sup>

C = 10<sup>2</sup> D = 10<sup>3</sup> E = 10<sup>4</sup> F = 10<sup>5</sup>

