



Features

- Ultra-tight tolerance
- Wide resistance range
- RoHS compliant*
- Four package sizes available
- Sulfur-resistant

Applications

- Current sense
- Precision circuits
- Medical equipment**
- Printers
- Automation equipment
- Navigation equipment

CRT-AS Series - Sulfur-Resistant Thin Film Precision Chip Resistors

Electrical Characteristics

Characteristic	Model CRT0402-AS	Model CRT0603-AS	Model CRT0805-AS	Model CRT1206-AS
Power Rating @ 70 °C	1/16 watt	1/10 watt	1/8 watt	1/4 watt
Operating Temperature Range	-55 to +155 °C			
Derated to Zero Load at	+155 °C			
Maximum Working Voltage	25 V	75 V	150 V	200 V
Maximum Overload Voltage	50 V	150 V	300 V	400 V
Resistance Range (E-96 + E-24 Values)	(See Standard Values Table)			
Temperature Coefficient of Resistance (TCR)	±10 PPM/°C, ±15 PPM/°C, ±25 PPM/°C, ±50 PPM/°C, (See Value - TCR Table on Page 2)			

Environmental Characteristics

Specification	Test Method	Limit (ΔR) (Tol. ≤ 0.05 %)	Limit (ΔR) (Tol. > 0.05 %)
Short Time Overload	JIS-C-5201-1 4.13 IEC 60115-1 4.13	±0.2 %	
Load Life	MIL-STD-202 Method 108	±0.5 %	
Humidity (Steady State)	MIL-STD-202 Method 103	±0.5 %	
Thermal Shock	JESD22 Method JA-104	±0.05 %	±0.2 %
Solderability	JIS-C-5201-1 4.17 IEC 60115-1 4.17	>95 % coverage	
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC 60115-1 4.18	±0.05 %	±0.2 %
Mechanical Shock	MIL-STD-202 Method 213	±0.05 %	±0.1 %
Vibration	MIL-STD-202 Method 204	±0.05 %	±0.1 %
ESD	AEC-Q200-002, 2 kV	±0.1 %	
Flammability	UL-94V0	--	
Sulfur Test	ASTM-B-809-95 3~5 PPM H ₂ S, 50 ± 2 °C, 91~93 % RH, no load for 1000 hrs.	±0.5 %	

How to Order

CRT 0603 - C V - 1003 E AS

Model _____
(CRT = Thin Film Precision Chip Resistor)

Size _____
• 0402 • 0603 • 0805 • 1206

Resistance Tolerance _____
F = ±1 % D = ±0.5 % C = ±0.25 % B = ±0.1 % A = ±0.05 %

TCR (PPM/°C) _____
W = ±10 X = ±15 Y = ±25 Z = ±50

Resistance Value _____
<100 ohms: "R" represents decimal point (example: 24R3 = 24.3 ohms)
≥100 ohms: First three digits are significant, fourth digit represents number of zeroes to follow (example: 8252 = 82.5K ohms)

Packaging _____
G = Paper tape (10K pcs.) on 7" plastic reel (CRT0402-AS)
E = Paper tape (5K pcs.) on 7" plastic reel (CRT0603-AS, CRT0805-AS, CRT1206-AS)

Special Design and Termination _____
AS = Sulfur-resistant version, Tin-plated (RoHS compliant)

* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

**Bourns® products have not been specifically designed and tested for FDA Class III applications (or equivalent foreign applications) and their use in such applications is neither recommended nor supported.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

CRT-AS Series - Sulfur-Resistant Thin Film Precision Chip Resistors

BOURNS®

Value - TCR Table

Model	TCR		Resistance Tolerance (Code)				
	(PPM/°C)	(Code)	±0.05 % (A)	±0.1 % (B)	±0.25 % (C)	±0.5 % (D)	±1 % (F)
CRT0402-AS	±10	(W)	49.9 to 10K Ω	49.9 to 10K Ω			
	±15	(X)		49.9 to 69.8K Ω			
	±25	(Y)		10 to 332K Ω			
	±50	(Z)					
CRT0603-AS	±10	(W)	49.9 to 10K Ω	10 to 332K Ω			
	±15	(X)					
	±25	(Y)					
	±50	(Z)					
CRT0805-AS	±10	(W)	10 to 100K Ω	10 to 511K Ω			
	±15	(X)		10 to 1M Ω			
	±25	(Y)					
	±50	(Z)					
CRT1206-AS	±10	(W)	10 to 200K Ω	10 to 1M Ω			
	±15	(X)					
	±25	(Y)					
	±50	(Z)					

Typical Part Marking

CRT0402-AS
No marking.

CRT0603-AS
3-Digit Marking
E-96



Examples:
• 52C = 34K Ω,
• 11C = 12.7K Ω

Code	E96		Code	E96		Code	E96		Code	E96	
01	100		25	178		49	316		73	562	
02	102		26	182		50	324		74	576	
03	105		27	187		51	332		75	590	
04	107		28	191		52	340		76	604	
05	110		29	196		53	348		77	619	
06	113		30	200		54	357		78	634	
07	115		31	205		55	365		79	649	
08	118		32	210		56	374		80	665	
09	121		33	215		57	383		81	681	
10	124		34	221		58	392		82	698	
11	127		35	226		59	402		83	715	
12	130		36	232		60	412		84	732	
13	133		37	237		61	422		85	750	
14	137		38	243		62	432		86	768	
15	140		39	249		63	442		87	787	
16	143		40	255		64	453		88	806	
17	147		41	261		65	464		89	825	
18	150		42	267		66	475		90	845	
19	154		43	274		67	487		91	866	
20	158		44	280		68	499		92	887	
21	162		45	287		69	511		93	909	
22	165		46	294		70	523		94	931	
23	169		47	301		71	536		95	953	
24	174		48	309		72	549		96	976	
Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁻¹	10 ⁻²	10 ⁻³

Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
Users should verify actual device performance in their specific applications.

CRT-AS Series - Sulfur-Resistant Thin Film Precision Chip Resistors

BOURNS®

Typical Part Marking (Continued)

CRT0603-AS
3-Digit Marking
E-24



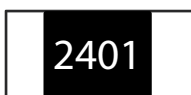
First two digits are significant;
third digit represents number of
zeroes to follow.

Examples:

- 102 = 1K Ω ,
- 181 = 180 Ω

Code			
10	18	33	56
11	20	36	62
12	22	39	68
13	24	43	75
15	27	47	82
16	30	51	91

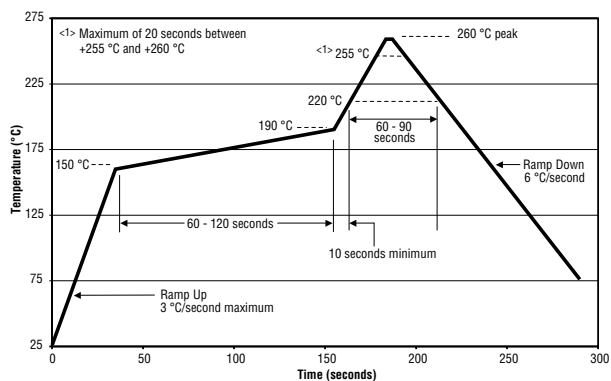
CRT0805-AS
CRT1206-AS
4-Digit Marking



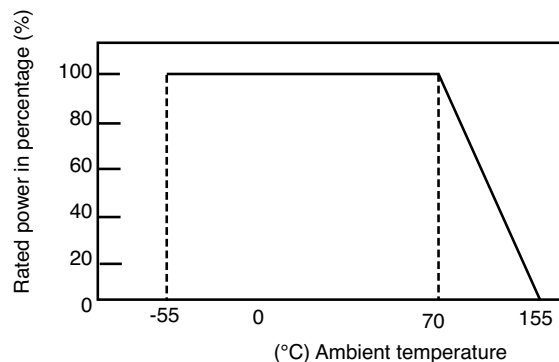
First three digits are significant;
fourth digit represents number of
zeroes to follow.

Examples	
Resistance	Marking
200 Ω	2000
2.4K Ω	2401
5.36K Ω	5361

Soldering Profile



Derating Curve

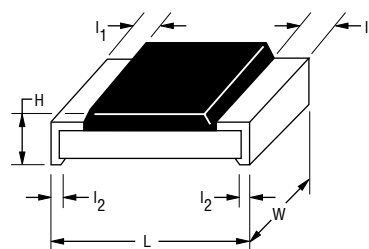


CRT-AS Series - Sulfur-Resistant Thin Film Precision Chip Resistors

BOURNS®

Chip Dimensions

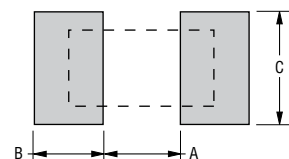
Dimension	Model CRT0402-AS	Model CRT0603-AS	Model CRT0805-AS	Model CRT1206-AS
L	$\frac{1.00 \pm 0.10}{(0.040 \pm 0.004)}$	$\frac{1.55 \pm 0.10}{(0.061 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.05 \pm 0.15}{(0.120 \pm 0.006)}$
W	$\frac{0.50 \pm 0.05}{(0.020 \pm 0.002)}$	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{1.25 \pm 0.15}{(0.049 \pm 0.006)}$	$\frac{1.55 \pm 0.15}{(0.061 \pm 0.006)}$
H	$\frac{0.30 \pm 0.05}{(0.012 \pm 0.002)}$	$\frac{0.45 \pm 0.15}{(0.018 \pm 0.006)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$
l_1	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.42 \pm 0.20}{(0.017 \pm 0.008)}$
l_2	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.40 \pm 0.25}{(0.016 \pm 0.010)}$	$\frac{0.35 \pm 0.25}{(0.014 \pm 0.010)}$



DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

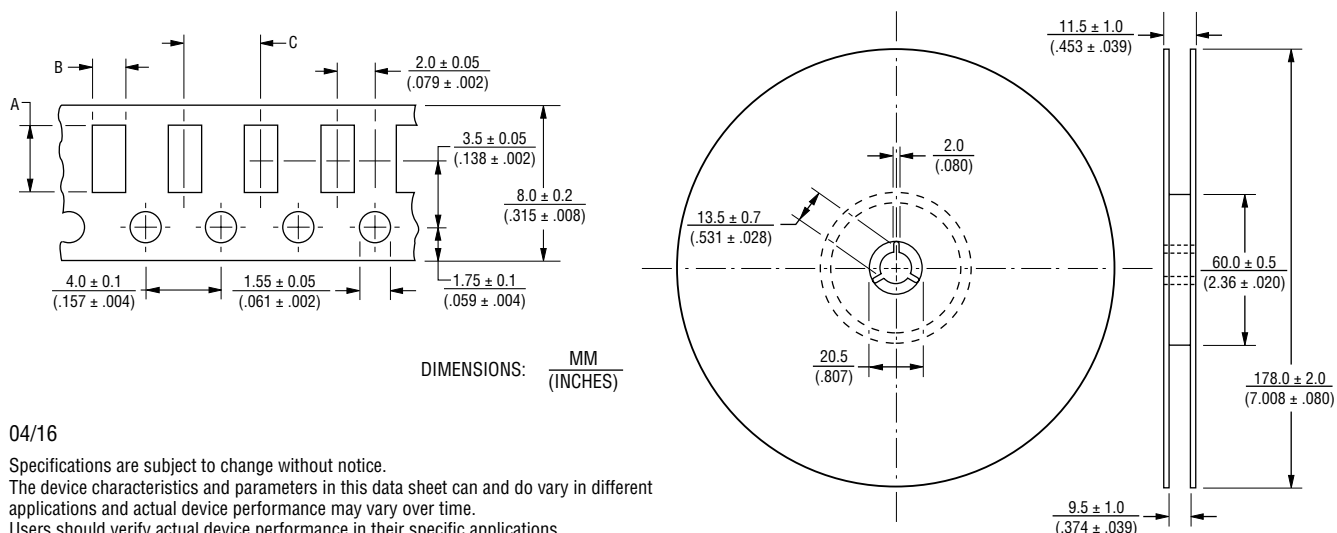
Recommended Land Pattern

Dimension	Model CRT0402-AS	Model CRT0603-AS	Model CRT0805-AS	Model CRT1206-AS
A	$\frac{0.50}{(0.020)}$	$\frac{0.80}{(0.031)}$	$\frac{1.00}{(0.039)}$	$\frac{2.00}{(0.079)}$
B	$\frac{0.50}{(0.020)}$	$\frac{1.00}{(0.039)}$	$\frac{1.00}{(0.039)}$	$\frac{1.15}{(0.045)}$
C	$\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$	$\frac{0.90 \pm 0.20}{(0.035 \pm 0.008)}$	$\frac{1.35 \pm 0.20}{(0.053 \pm 0.008)}$	$\frac{1.70 \pm 0.20}{(0.067 \pm 0.008)}$



Packaging Dimensions - Tape

Dimension	Model CRT0402-AS	Model CRT0603-AS	Model CRT0805-AS	Model CRT1206-AS
A	$\frac{1.16 \pm 0.05}{(0.046 \pm 0.002)}$	$\frac{1.90 \pm 0.05}{(0.075 \pm 0.002)}$	$\frac{2.37 \pm 0.05}{(0.094 \pm 0.002)}$	$\frac{3.55 \pm 0.05}{(0.140 \pm 0.002)}$
B	$\frac{0.70 \pm 0.05}{(0.028 \pm 0.002)}$	$\frac{1.10 \pm 0.05}{(0.043 \pm 0.002)}$	$\frac{1.60 \pm 0.05}{(0.063 \pm 0.002)}$	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
C	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$



DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

04/16

Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
Users should verify actual device performance in their specific applications.