

Current Sensing Chip Resistors

NCST Series

FEATURES

- SURFACE MOUNTABLE 0402 ~ 7520 CASE SIZE
- PRECISION TOLERANCE ($\pm 1\%$)
- POWER RATINGS UP TO 3 WATTS
- Pb-FREE REFLOW COMPATIBLE

**RoHS
Compliant**

includes all homogeneous materials

*See Part Number System for Details

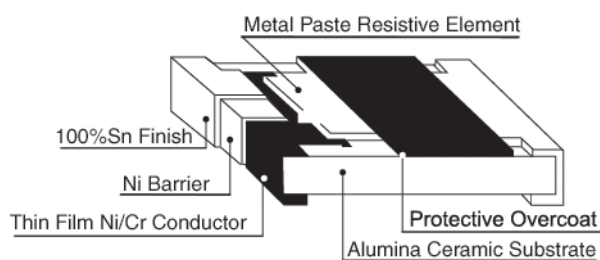
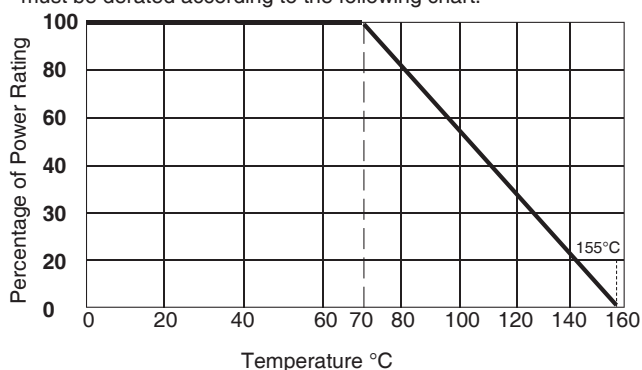


CHARACTERISTICS

Type	EIA Size	Power Rating at 70°C	Resistance Tolerance	Temperature Coefficient (°C)	Resistance Range	Resistance Range (Codes)	Operating Temp. Range (°C)
NCST04	0402	1/16W	1% (F) 2% (G) 5% (J)	±200ppm (F)	501mΩ ~ 1Ω	R501 ~ 1R00	-55°C ~ +155°C
				±300ppm (G)	101mΩ ~ 500mΩ	R101 ~ R500	
				±400ppm (H)	50mΩ ~ 100mΩ	R050 ~ R100	
NCST06	0603	1/10W	1% (F) 2% (G) 5% (J)	±200ppm (F)	501mΩ ~ 1Ω	R501 ~ 1R00	
NCST10	0805	1/8W		±300ppm (G)	101mΩ ~ 500mΩ	R101 ~ R500	
				±400ppm (H)	51mΩ ~ 100mΩ	R051 ~ R100	
				±600ppm (J)	20mΩ ~ 50mΩ	R020 ~ R050	
NCST12*	1206	1/4W	1% (F) 2% (G) 5% (J)	±200ppm (F)	501mΩ ~ 1Ω	R501 ~ 1R00	
NCST50*	2010	3/4W		±300ppm (G)	51mΩ ~ 500mΩ	R051 ~ R500	
				±400ppm (H)	21mΩ ~ 50mΩ	R021 ~ R050	
NCST100*	2512	1W		±600ppm (J)	10mΩ ~ 20mΩ	R010 ~ R020	
NCST200	0830	2W	2% (G) 5% (J)	±300ppm (G)	1mΩ ~ 4mΩ	R001 ~ R004	
				±150ppm (X)	11mΩ ~ 350mΩ	R011 ~ R350	
			1% (F) 2% (G) 5% (J)	±200ppm (F)	5mΩ ~ 10mΩ	R005 ~ R010	
NCST300	1225	3W	1% (F) 2% (G) 5% (J)	±100ppm (E)	31mΩ ~ 3.0Ω	R031 ~ 1R00	
				±150ppm (X)	21mΩ ~ 30mΩ	R021 ~ R030	
				±200ppm (F)	6mΩ ~ 20mΩ	R006 ~ R020	
				±300ppm (G)	3mΩ ~ 5mΩ	R003 ~ R005	

*Available with a $\pm 100\text{ppm}$ (E) TCR (100m Ω ~ 1 Ω)

Power Derating Curve: For operation above 70°C, power rating must be derated according to the following chart:



ENVIRONMENTAL CHARACTERISTICS

Item	Specification	Test Method
Temperature Coefficient of Resistance	As Specified	MIL-STD-202, Method 304 +25/-55/+25/+125/+25°C
Thermal Shock	±0.5%	MIL-STD-202, Method 107G -55°C ~ +150°C, 100 cycles
Short Time Overload	±0.5%	JIS-C-5202-5.5 RCWV x 2.5 or Max. Overloading Voltage for 5 sec.
Dielectric Withstanding Voltage	by Type	MIL-STD-202F Method 301 Apply Max. Overload Voltage for 1 minute
Insulation Resistance	>1000MΩ	MIL-STD-202F Method 302 Apply 100Vdc for 1 minute
Resistance to dry heat	±0.5%	JIS-C-5202-7.2 96 hrs @ 155°C without load
Load Life	±1%	MIL-STD-202 Method 108 RCWV @ 70°C, cycles of 1.5 hours ON, 0.5 hrs OFF for 1,000 ~ 1,048 hrs
Resistance to Soldering Heat	±0.5%	MIL-STD-202F Method 210E 260°C ±5°C for 10 sec. ±1 sec.
Humidity (Steady State)	±0.5%	MIL-STD-202 Method 103B 40°C, 90 ~ 95% RH, RCWV 1.5 hours ON, 0.5 hours OFF, total 1000 ~ 1048 hours
Low Temperature Operation	±0.5%	JIS-C-5202-7.1 1 hour -65°C followed by 45 minutes of RCWV
Solderability	95% min. coverage	MIL-STD-202F Method 208H 245°C ±5°C for 5 sec. ±0.5 sec.
Bending Strength	As Specified	JIS-C-5202-6.1.4 Bending Amplitude 3mm for 10 seconds

PART NUMBER SYSTEM

NCST10 F R501 F TR F

- RoHS compliant
- Packaging: TR = Tape & Reel
- TCR Code: E=100ppm, X=150ppm, F=200ppm, G=300ppm, H=400ppm, J=600ppm
- Resistance Code: See examples
- Tolerance Code: J=5%, G=2%, F=1%
- Series and Size

AVAILABLE VALUES AND PART NUMBERS

	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
0402 Size 1/16W	50mΩ ~ 100mΩ	NCST04 * R050HTRF	50	±400ppm (H)
		↓	↓	
		NCST04 * R050HTRF	100	
	101mΩ ~ 500mΩ	NCST04 * R101GTRF	101	±300ppm (G)
		↓	↓	
		NCST04 * R501FTRF	500	
	501mΩ ~ 1.0Ω	NCST04 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST04 * 1R00FTRF	1,000	
	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
0603 Size 1/10W	20mΩ ~ 50mΩ	NCST06 * R020JTRF	20	±600ppm (J)
		↓	↓	
		NCST06 * R050JTRF	50	
	51mΩ ~ 100mΩ	NCST06 * R051HTRF	51	±400ppm (H)
		↓	↓	
		NCST06 * R100HTRF	100	
	101mΩ ~ 500mΩ	NCST06 * R101GTRF	101	±300ppm (G)
		↓	↓	
		NCST06 * R500GTRF	500	
	501mΩ ~ 1.0Ω	NCST06 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST06 * 1R00FTRF	1,000	
	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
0805 Size 1/8W	20mΩ ~ 50mΩ	NCST10 * R020JTRF	20	±600ppm (J)
		↓	↓	
		NCST10 * R050JTRF	50	
	51mΩ ~ 100mΩ	NCST10 * R051HTRF	51	±400ppm (H)
		↓	↓	
		NCST10 * R100HTRF	100	
	101mΩ ~ 500mΩ	NCST10 * R101GTRF	101	±300ppm (G)
		↓	↓	
		NCST10 * R500GTRF	500	
	501mΩ ~ 1.0Ω	NCST10 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST10 * 1R00FTRF	1,000	
	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
1206 Size 1/4W	10mΩ ~ 20mΩ	NCST12 * R010JTRF	10	±600ppm (J)
		↓	↓	
		NCST12 * R020JTRF	20	
	21mΩ ~ 50mΩ	NCST12 * R021HTRF	21	±400ppm (H)
		↓	↓	
		NCST12 * R050HTRF	50	
	51mΩ ~ 500mΩ	NCST12 * R051GTRF	51	±300ppm (G)
		↓	↓	
		NCST12 * R500GTRF	500	
	501mΩ ~ 1.0Ω	NCST12 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST12 * 1R00FTRF	1,000	
	100mΩ ~ 1.0Ω	NCST12 * R100ETRF	100	±100ppm (E)
		↓	↓	
		NCST12 * 1R00ETRF	1,000	

*Tolerance Codes: 1% (F), 2% (G) or 5% (J)



AVAILABLE VALUES AND PART NUMBERS

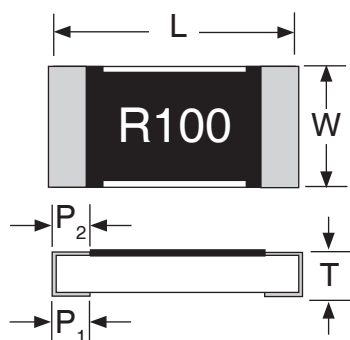
	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
2010 Size 3/4W	10mΩ ~ 20mΩ	NCST50 * R010JTRF	10	±600ppm (J)
		↓	↓	
		NCST50 * R020JTRF	20	
	21mΩ ~ 50mΩ	NCST50 * R021HTRF	21	±400ppm (H)
		↓	↓	
		NCST50 * R050HTRF	50	
	51mΩ ~ 500mΩ	NCST50 * R051GTRF	51	±300ppm (G)
		↓	↓	
		NCST50 * R500GTRF	500	
	501mΩ ~ 1.0Ω	NCST50 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST50 * 1R00FTRF	1,000	
2512 Size 1W	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
	10mΩ ~ 20mΩ	NCST100 * R010JTRF	10	±600ppm (J)
		↓	↓	
		NCST100 * R020JTRF	20	
	21mΩ ~ 50mΩ	NCST100 * R021HTRF	21	±400ppm (H)
		↓	↓	
		NCST100 * R050HTRF	50	
	51mΩ ~ 500mΩ	NCST100 * R051GTRF	51	±300ppm (G)
		↓	↓	
		NCST100 * R500GTRF	500	
	501mΩ ~ 1.0Ω	NCST100 * R501FTRF	501	±200ppm (F)
		↓	↓	
		NCST100 * 1R00FTRF	1,000	
0830 Size 2W	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
	1mΩ ~ 4mΩ	NCST200 * R001GTRF	1	±300ppm (G)
		↓	↓	
		NCST200 * R004GTRF	4	
	5mΩ ~ 10mΩ	NCST200 * R005FTRF	5	±200ppm (F)
		↓	↓	
		NCST200 * R010FTRF	10	
	11mΩ ~ 350mΩ	NCST200 * R011XTRF	51	±150ppm (X)
		↓	↓	
		NCST200 * R350XTRF	500	
1225 Size 3W	Available Value Range	Part Number	Resistance Value (mΩ)	Available TCR
	3mΩ ~ 5mΩ	NCST300 * R003GTRF	3	±300ppm (G)
		↓	↓	
		NCST300 * R005GTRF	5	
	6mΩ ~ 20mΩ	NCST300 * R006FTRF	6	±200ppm (F)
		↓	↓	
		NCST300 * R020FTRF	20	
	21mΩ ~ 30mΩ	NCST300 * R021XTRF	21	±150ppm (X)
		↓	↓	
		NCST300 * R030XTRF	30	
	31mΩ ~ 3.0Ω	NCST300 * R031ETRF	31	±100ppm (E)
		↓	↓	
		NCST300 * 3R00ETRF	3,000	

*Tolerance Codes: 1% (F), 2% (G) or 5% (J)

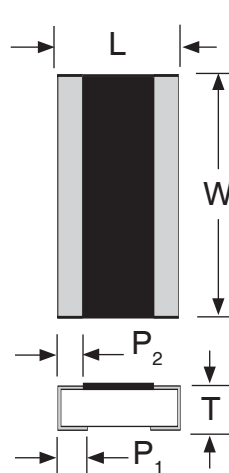
DIMENSIONS (mm)

Type	Case Size	Length (L)	Width (W)	Thickness (T)	Termination Width (P ₁)	Termination Width (P ₂)
NCST04	0402	1.00 ±0.05	0.50 ±0.05	0.32 ±0.05	0.25 ±0.10	0.20 ±0.10
NCST06	0603	1.60 ±0.10	0.80 ±0.10	0.45 ±0.10	0.30 ±0.20	0.30 ±0.20
NCST10	0805	2.00 ±0.10	1.25 ±0.10	0.50 ±0.10	0.30 ±0.20	0.30 ±0.20
NCST12	1206	3.05 ±0.15	1.55 ±0.15	0.60 ±0.10	0.50 ±0.20	0.40 ±0.20
NCST50	2010	5.00 ±0.20	2.45 ±0.15	0.60 ±0.10	0.60 ±0.30	0.50 ±0.25
NCST100	2512	6.35 ±0.20	3.15 ±0.15	0.60 ±0.10	0.60 ±0.30	0.50 ±0.25
NCST200	0830	2.00 ±0.20	7.50 ±0.30	0.60 ±0.10	0.40 ±0.20	0.40 ±0.20
NCST300	1225	3.10 ±0.15	6.30 ±0.15	0.90 ±0.15	0.60 ±0.30	0.55 ±0.25

Case Sizes
0402, 0603, 0805, 1206, 2010 & 2512

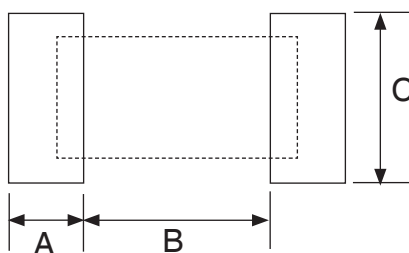


Case Sizes
1225 & 0830



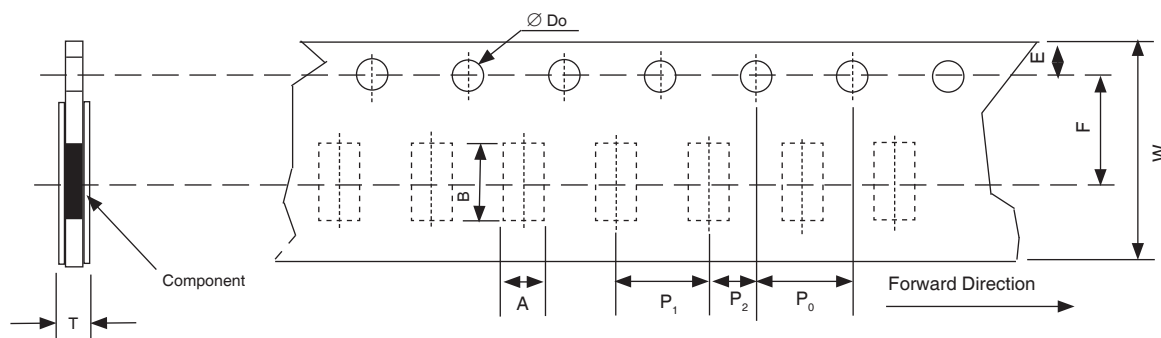
LAND PATTERN DIM. (mm)

	A	B	C
NCST04	0.50	0.50	0.60 ±0.2
NCST06	0.70	0.80	0.90 ±0.2
NCST10	1.00	1.00	1.35 ±0.2
NCST12	1.15	2.00	1.70 ±0.2
NCST50	1.40	3.60	2.40 ±0.2
NCST100	1.60	4.90	3.00 ±0.2
NCST200	2.00	1.20	7.60 ±0.2
NCST300	2.00	2.00	7.60 ±0.2



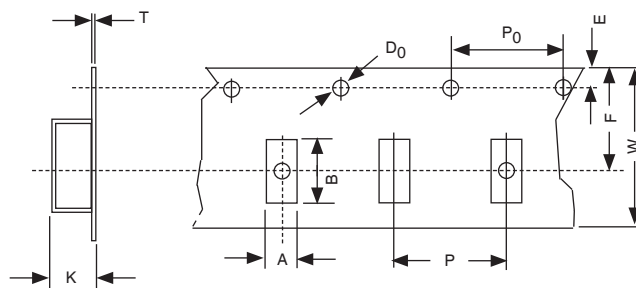
PAPER CARRIER TAPE DIMENSIONS (mm)

Type	A	B	W	F	E	P ₁	P ₂	P ₀	φD	T			
NCST04	0.67 ±0.03	1.15 ±0.03	8.00 ±0.10	3.50 ±0.05	1.75 ±0.05	2.00 ±0.05	2.00 ±0.05	4.00 ±0.10	1.55 ±0.05	0.40 ±0.03			
NCST06	1.10 ±0.05	1.90 ±0.05				4.00 ±0.10				0.60 ±0.03			
NCST10	1.60 ±0.05	2.37 ±0.05								0.75 ±0.05			
NCST12	2.00 ±0.05	3.55 ±0.05											



EMBOSSED PLASTIC CARRIER DIMENSIONS (mm)

Type	A	B	W	F	K	E	P ₁	P ₂	P ₀	φD ₀	T
NCST50	2.85 ±0.10	5.45 ±0.10	12.0 ±0.10	5.50 ±0.05	1.00 ±0.20	1.75 ±0.10	4.00 ±0.05	2.00 ±0.05	4.00 ±0.05	1.50 ±0.05	0.80 ±0.10
NCST100	3.40 ±0.20	6.65 ±0.10									
NCST200	2.50 ±0.20	8.30 ±0.20	16.0 ±0.30	7.80 ±0.05	1.50 ±0.10						
NCST300	3.38 ±0.10	6.68 ±0.10	12.0 ±0.10	5.50 ±0.05	1.45 ±0.20						



REEL DIMENSIONS (mm) AND QUANTITY

Type	A	B	C	W	Quantity
NCST04	178 ±1.0	60 ±0.5	13 ±0.20	9.0 ±0.50	10,000
NCST06					5,000
NCST10					
NCST12					
NCST50				13.2 ±1.50	4,000
NCST100				17 ±0.50	2,000
NCST200					
NCST300				13.2 ±1.50	2,000

