NTRM Series

High Precision Metal Thin Film Chip Resistor

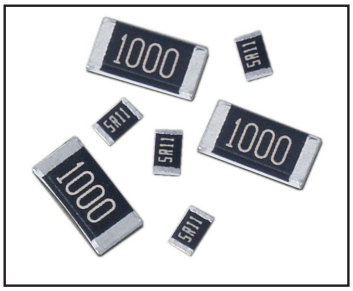
AEC-Q200 QUALIFIED

ROHS/REACH COMPLIANT HALOGEN FREE

NIC COMPONENTS Performance Passives By Design

FEATURES

- METAL THIN FILM RESISTOR
- 10Ω ~ 5.1MΩ RESISTANCE RANGE (E-24 & E-96 VALUES)
- HIGH PRECISION TOLERANCES DOWN TO ±0.02%
- LOW TCR OPTIONS DOWN TO ±5 PPM/°C
- AEC-Q200 QUALIFIED FOR AUTOMOTIVE APPLICATIONS
- ADVANCED SULFUR RESISTANCE VERIFIED ACCORDING TO ASTM B809



SPECIFICATIONS

Type	EIA Size	Standard Power	High Power	Ultra High Power	Max.*1 Working Voltage	Max.*2 Overload Voltage	Resistance Tolerance (Code)	Temperature Coefficient (ppm/°C)	Resistance Range (Ω)
NTRM04	0402	1/32W	1/16W	1/8W	75V	100V	±0.02% (Q), ±0.05% (A), ±0.1% (B), ±0.5%(D)	±5(S)	100Ω ~ 3KΩ
							±0.02% (Q)	±10(B), ±25(C)	100Ω ~ 3KΩ
							±0.05% (A), ±0.1% (B), ±0.5%(D)	±10(B)	47Ω ~ 100KΩ
							±0.05% (A), ±0.1% (B)	±25(C)	47Ω ~ 100KΩ
							±0.5%(D)	±25(C)	47Ω ~ 150KΩ
							±0.5%(D)	±100(E)	10Ω ~ 150KΩ
NTRM06	0603	1/16W	1/10W	1/6W	100V	200V	±0.02% (Q), ±0.05% (A), ±0.1% (B), ±0.5%(D)	±5(S)	100Ω ~ 5.1KΩ
							±0.02% (Q)	±10(B), ±25(C)	100Ω ~ 5.1KΩ
							±0.05% (A), ±0.1% (B), ±0.5%(D)	±10(B)	47Ω ~ 270KΩ
							±0.05% (A)	±25(C)	47Ω ~ 270KΩ
							±0.1% (B)	±25(C)	47Ω ~ 332KΩ
							±0.5%(D)	±25(C)	47Ω ~ 1MΩ
							±0.5%(D)	±50(D)	10Ω ~ 1MΩ
NTRM10	0805	1/10W	1/8W	1/4W	150V	300V	±0.02% (Q), ±0.05% (A), ±0.1% (B), ±0.5%(D)	±5(S)	100Ω ~ 10.2KΩ
							±0.02% (Q)	±10(B), ±25(C)	100Ω ~ 10.2KΩ
							±0.05% (A), ±0.1% (B), ±0.5%(D)	±10(B)	47Ω ~ 475KΩ
							±0.05% (A)	±25(C)	47Ω ~ 475KΩ
							±0.1% (B), ±0.5%(D)	±25(C)	47Ω ~ 2.7MΩ
							±0.5%(D)	±50(F)	10Ω ~ 2.7MΩ
NTRM12	1206	1/8W	1/4W	-	200V	400V	±0.02% (Q), ±0.05% (A) ±0.1% (B), ±0.5%(D)	±5(S)	100Ω ~ 33.2KΩ
							±0.02% (Q)	±10(B) ±25(C)	100Ω ~ 33.2KΩ
							±0.05% (A), ±0.1% (B), ±0.5%(D)	±10(B)	47Ω ~ 1MΩ
							±0.05% (A)	±25(C)	47Ω ~ 1MΩ
							±0.1% (B),±0.5%(D)	±25(C)	47Ω ~ 5.1MΩ
							±0.5%(D)	±50(F)	10Ω ~ 5.1MΩ

OPERATING TEMPERATURE RANGE -55°C ~ +155°C

*Please refer to page 3 for information regarding max working and overload voltage ratings

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Last Updated 3/6/2026. Specification subject to change without notice. Please check web site for latest information.

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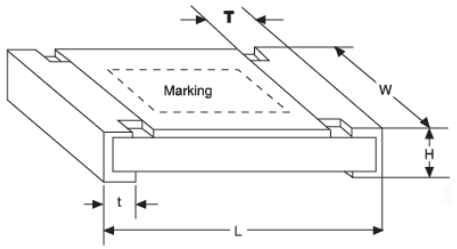
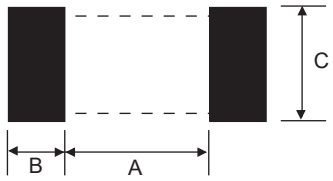
COMPONENT AND LAND PATTERN DIMENSIONS (mm)

Type	L	W	H	T	t	A	B	C
NTRM04	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10	0.50	0.50	0.60 ±0.20
NTRM06	1.55±0.10	0.80±0.10	0.45±0.15	0.30±0.20	0.30±0.20	1.00	1.00	1.20 ±0.20
NTRM10	2.00±0.15	1.25±0.15	0.55±0.15	0.30±0.20	0.40±0.20	1.20	1.40	1.65 ±0.20
NTRM12	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25	2.20	1.40	2.00 ±0.20



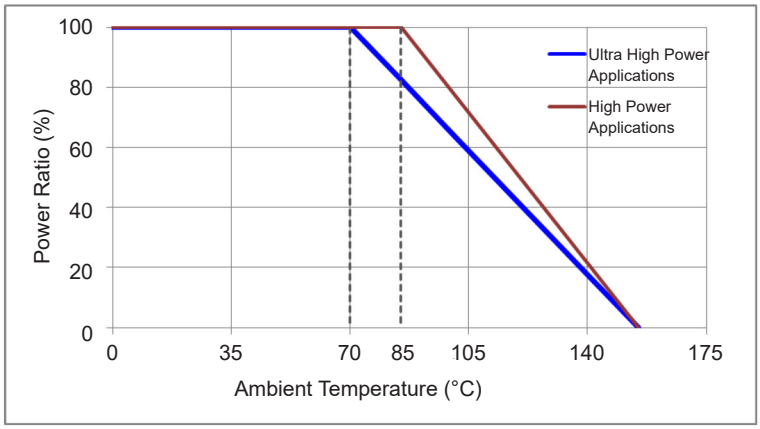


PART NUMBER SYSTEM

NTRM 10 B H 4750 C TR Q Y F

- F — RoHS compliant
- Y — "Y" denotes suitable for automotive equipment, sourced to special production and inspection at IATF-16949 certified production site
- Q — AEC-Q200 Qualified
- TR — Tape & Reel Packaging: TR = Standard Tape & Reel, TR1K = Optional 1,000 quantity
- C — Temperature Coefficient Code: S = ±5ppm, B = ±10ppm C = ±25ppm, D = ±50ppm, E = ±100ppm
- 4750 — Resistance Code: First 3 digits are significant figures (both E-24 and E-96 values), 4th digit is the multiplier, "R" indicates a decimal point.
- H — Power Rating: Blank = Standard, H = High, U = Ultra High
- B — Tolerance Code: Q = ± 0.02%, A = ± 0.05%, B = ± 0.1%, D = ± 0.5%
- 10 — Size Code: 04=0402, 06=0603, 10=0805, 12=1206
- NTRM — Series

POWER DERATING CURVE



RCWV (Rated Continuous Working Voltage) = √(P*R) or Max. Operating voltage whichever is lower

Note *1 - Maximum allowable continuous Working Voltage for all resistors is the lower of the two values:

"Maximum Working Voltage" as specified above or:

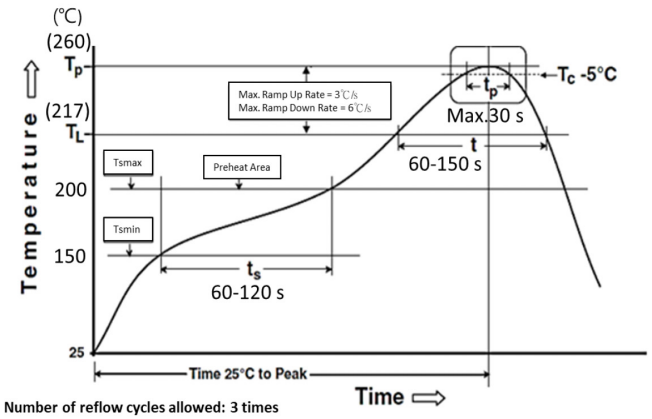
$\sqrt{\text{Power rating (Watts) x Resistance (Ohms)}}$

Note *2 - Maximum Overload Voltage for all resistors is the lower of the two values:

Maximum Overload Voltage" as specified above or

$2.5x\sqrt{\text{Power rating (Watts) x Resistance (Ohms)}}$

SOLDERING CONDITIONS (IPC/JEDEC J-STD-020)



Number of reflow cycles allowed: 3 times

Pb-Free Assembly	Time
Preheat Temp min (Tsmin)	150°C
Preheat Temp max (Tsmax)	200°C
Preheat time (ts)	60 - 120 seconds
Ramp-up rate (TL to TP)	3°C/second max.
Liquidous temperature (TL)	217°C
Time (tL) maintained above TL	60 - 150 seconds
Peak Temperature min (TP min)	235°C
Peak Temperature max (TP max)	260°C
Time (TP) within 5°C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (TP to TL)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

STORAGE CONDITIONS

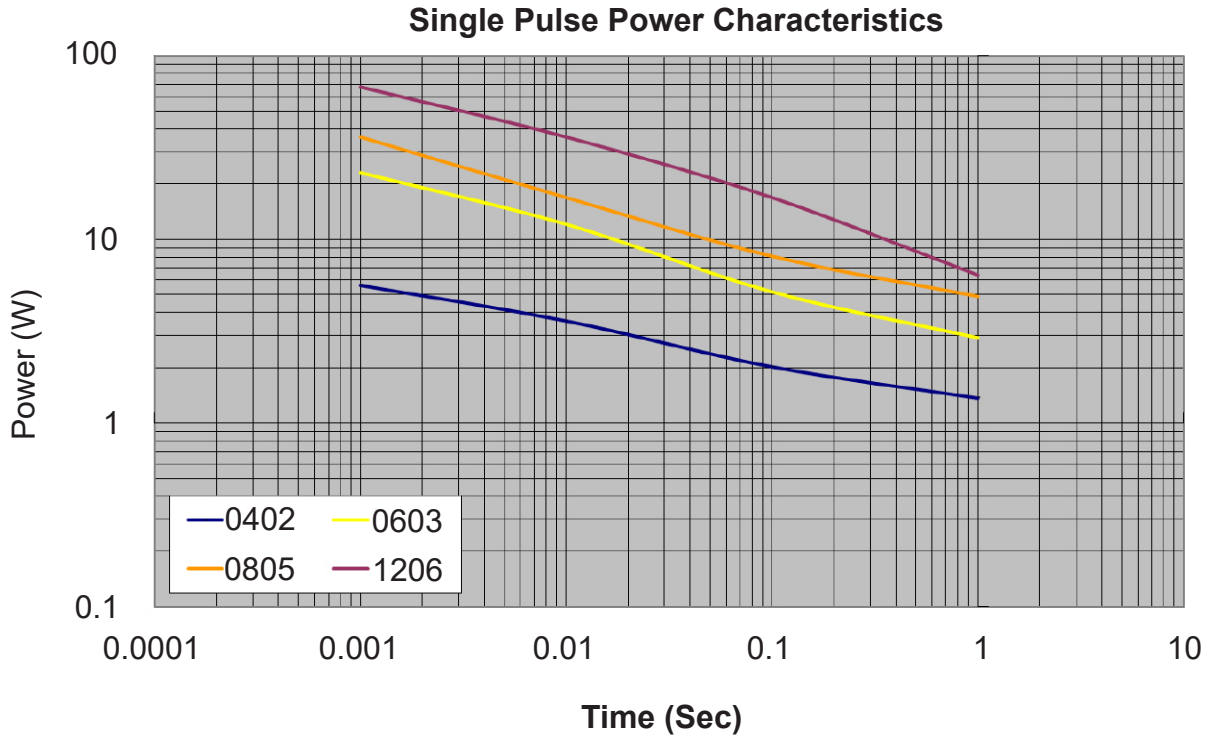
Storage Temperature: 15 ~28 °C; Humidity < 80%RH

ENVIRONMENTAL CHARACTERISTICS

Item	Requirement		Test Method*
Temperature Coefficient of Resistance	As specified		JISC 5201 14.8 IEC60115 14.8 -55°C ~ +125°C, 25°C is the reference temperature
Short Time Overload	≤47Ω Δ R±0.1% ≥47Ω Δ R±0.05% for Standard and High power rating		JISC 5201 14.13 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
	ΔR±0.1 for Ultra high power rating		
Endurance	Standard power rating at 85°C	ΔR±0.1%	MIL-STD 202 Method 108 RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs "OFF"
	High power rating at 85°C	ΔR±0.25%	
	Ultra high power rating at 70°C	ΔR±0.5%	
Biased Humidity	Standard power rating	ΔR±0.1%	MIL-STD-202 Method 108 1000 hrs +85°C/85%RH 10% of operating power
	High power rating	ΔR±0.25%	
	Ultra high power rating	ΔR±0.5%	
High Temperature Exposure	≤47Ω Δ R±0.25% ≥47Ω Δ R±0.1% for 0603, 0805 & 1206		MIL-STD-202 Method 108 +155°C for 1000 hrs.
	≤47Ω Δ R±0.25% ≥47Ω Δ R±0.2% for 0402		
Temperature Cycling	≤47Ω Δ R±0.25% ≥47Ω Δ R±0.1%		JESD22 Method JA-104 -55 to +125°C, 1000 cycles
Resistance to Soldering Heat	ΔR ± 0.1%		JISC 5201 14.18 IEC60115 14.18 260°C ± 5°C for 10 seconds
Insulation Resistance	> 1000MΩ		JISC 5201 14.6 IEC60115 14.6 Apply 100VDC for 1 minute
Bending Strength (Board Flex)	ΔR ± 0.1%		JISC 5201 4.33 Bending once for 60 seconds Bending displacement: 0402 ~ 1206 sizes : 3 mm
Solderability	95 min. coverage		JISC 5201 14.17 IEC60115 14.17 245°C ± 5°C for 3 seconds
Terminal strength	None broken		AEC-Q200-006 Force of 1.8kg for 60 seconds.
Mechanical Shock	ΔR ± 0.1%		MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g’s. Normal duration (D) is 6.
Vibration	ΔR ± 0.1%		MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10 2000 Hz
ESD	ΔR ±0.5%		AEC-Q200-002 Human body model 0402 & 0603: 0.2KV 0805 & 1206: 1KV

ENVIRONMENTAL CHARACTERISTICS

Item	Requirement	Test Method*
Resistance to solvents	Marking Unsmeared	MIL-STD-202 Method 215 Add Aqueous wash chemical OKEM Clean or equivalent. Do not use banned solvents.
Sulfur Test	ΔR ± 1%	ASTM B 809 95 Modified 105°C ± 2°C no power rating for 1,000 hrs.
Flammability	No ignition of the tissue paper or scorching or the pinewood board.	UL-94V0 or V1 are acceptable. Electrical test not required.



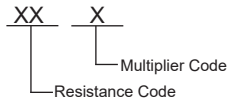
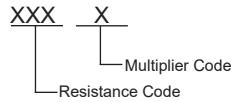
STANDARD E-24 AND E-96 VALUES AND RESISTANCE CODES

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

MULTIPLIER CODE

Code	A	B, b	C	D, 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}

MARKING IDENTIFIERS

0402 Size	0603 Size	0805 and 1206 Size
No Marking	3 Digit Marking System: 2 digit value code + 1 digit multiplier code  E24 0603 Multiplier Code: 10e multiplier E96 0603 Multiplier Code: Per table 0603 Marking Examples: 101 = 100 Ω (E24) 13C = 13.3 KΩ (E96) 68B = 4.99 KΩ (E96) 103 = 10 KΩ (E24)	4 Digit Marking System: 3 digit value code + 1 digit multiplier code where "R" denotes a decimal  Value Multiplier Code: 10e multiplier Marking Examples: 10R0 = 10 Ω 1332 = 13.3 KΩ 4992 = 49.9 KΩ 1003 = 100 KΩ

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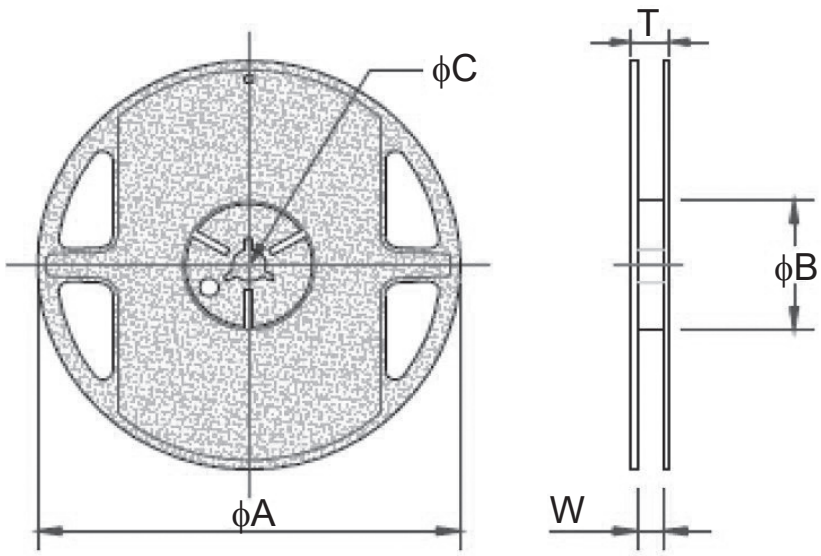
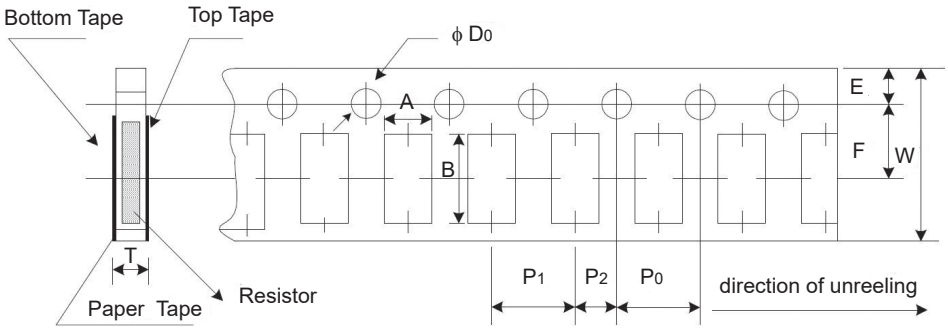
TAPING SPECIFICATIONS

Type	EIA Size	A	B	C	W	T	Paper Tape (EA)
NTRM04	0402	178 ±1.0	60.0±1.0	13.5 ±0.7	9.5 ± 1.0	11.5 ±1.0	10,000
NTRM06	0603						5,000
NTRM10	0805						5,000
NTRM12	1206						5,000

REEL DIMENSIONS (mm)



PAPER TAPE DIMENSIONS (mm)

Type	EIA Size	A	B	D	E	F	P_0	P_1	P_2	W	T
NTRM04	0402	0.70 ± 0.05	1.16 ± 0.05	1.55 ± 0.05	1.75 ± 0.05	3.5 ±0.05	4.00 ± 0.10	2.00 ± 0.05	2.00 ±0.05	8.00 ± 0.10	0.40 ± 0.03
NTRM06	0603	1.10 ± 0.05	1.90 ± 0.05	1.55 ± 0.05	1.75 ± 0.05	3.5 ±0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ±0.05	8.00 ± 0.10	0.60 ± 0.03
NTRM10	0805	1.60 ± 0.05	2.37 ± 0.05	1.55 ± 0.05	1.75 ± 0.05	3.5 ±0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ±0.05	8.00 ± 0.10	0.75 ± 0.05
NTRM12	1206	2.00 ± 0.05	3.55 ± 0.05	1.55 ± 0.05	1.75 ± 0.05	3.5 ±0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 ± 0.10	0.75 ± 0.05