

Precision Metal Film Resistors



FEATURES

- 0.063 W to 0.5 W at 70 °C
- Approved according to CECC 40101
- Wide ohmic range from 1 Ω to 4.7 MΩ
- Good initial precision up to ± 0.1 %
- Operating temperatures:
 - 55 °C to + 155 °C for TCR ≥ 25 ppm/°C
 - 25 °C to + 85 °C for TCR ≤ 15 ppm/°C
- Epoxy coating
- Termination: Pure matt tin
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DIMENSIONS in millimeters							
	TYPE	Ø D max.	L max.	A ± 1	Ø d	CC _e	WEIGHT in g
	N.. 3..	1.8	3.9	53	0.5	5.08	0.15
	N.. 4..	2.5	6.2	53	0.6	NA	0.3
	N.. 5..	3.3	8.7	53	0.6	NA	0.5

STANDARD ELECTRICAL SPECIFICATIONS					
MODEL	RESISTANCE RANGE Ω	RATED POWER P _{70 °C} W	LIMITING ELEMENT VOLTAGE V	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C
NT3S	10 to 200K	0.125	200	0.1, 0.25, 0.5, 1	15
NP3S	10 to 511K	0.250	200	0.1, 0.25, 0.5, 1	25
NY3	1 to 1.5M	0.250	200	0.5, 1	50
NK3	1 to 1.5M	0.250	200	2, 5	100
NT4S	10 to 499K	0.250	350	0.1, 0.25, 0.5, 1	15
NP4S	10 to 1M	0.500	350	0.1, 0.25, 0.5, 1	25
NY4	10 to 3.32M	0.500	350	0.1, 0.25, 0.5, 1	50
NK4	10 to 3.3M	0.500	350	2, 5	100
NT5S	10 to 499K	0.500	350	0.1, 0.25, 0.5, 1	15
NP5S	10 to 1M	0.500	350	0.1, 0.25, 0.5, 1	25
NY5	2.67 to 4.7M	0.500	350	0.1, 0.25, 0.5, 1	50
NK5	2.7 to 4.M	0.500	350	2, 5	100



TECHNICAL SPECIFICATIONS														
MODEL	NT3S	NP3S	NY3	NK3	NT4S	NP4S	NY4	NK4	NT5S	NP5S	NY5	NK5		
Power Rating, P_r at + 70 °C	0.125 W	0.25 W			0.25 W	0.5 W			0.5 W					
Stability Class	1 %			2 %	1 %			2 %	1 %			2 %		
Preferred Standard Ohmic Values Series	E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24	E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24	E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24		
Ohmic Value Range in Relation to: Temperature Coefficient, TCR/ Tolerance	± 15 ppm/°C ⁽¹⁾	± 0.1 %	100 Ω	-	-	-	49.9 Ω	-	-	-	100 Ω	-	-	
		± 0.25 %	200 kΩ	-	-	-	499 kΩ	-	-	-	499 kΩ	-	-	
		± 0.5 %	10 Ω	-	-	-	10 Ω	-	-	-	10 Ω	-	-	
		± 1 %	200 kΩ	-	-	-	499 kΩ	-	-	-	499 kΩ	-	-	
	± 25 ppm/°C ⁽²⁾	± 0.1 %	-	100 Ω	-	-	-	10 Ω	-	-	-	100 Ω	-	-
		± 0.25 %	-	511 kΩ	-	-	-	1 MΩ	-	-	-	1 MΩ	-	-
		± 0.5 %	-	10 Ω	-	-	-	10 Ω	-	-	-	10 Ω	-	-
		± 1 %	-	511 kΩ	-	-	-	1 MΩ	-	-	-	1 MΩ	-	-
	± 50 ppm/°C ⁽²⁾	± 0.1 %	-	-	-	-	-	-	10 Ω	-	-	-	10 Ω	-
		± 0.25 %	-	-	-	-	-	-	1 MΩ	-	-	-	1 MΩ	-
		± 0.5 %	-	-	10 Ω	-	-	-	10 Ω	-	-	-	10 Ω	-
					1.5 MΩ	-	-	-	3.32 MΩ	-	-	-	4.7 MΩ	-
	± 100 ppm/°C ⁽²⁾	± 1 %	-	-	1 Ω	-	-	-	10 Ω	-	-	-	2.67 Ω	-
					1.5 MΩ	-	-	-	3.32 MΩ	-	-	-	4.7 MΩ	-
± 2 %	-	-	-	1 Ω	-	-	-	10 Ω	-	-	-	2.7 Ω	-	
± 5 %	-	-	-	1.5 MΩ	-	-	-	3.3 MΩ	-	-	-	4.7 MΩ	-	
Limiting Element Voltage $U_{max. RMS}$	200 V				350 V				350 V					
Critical Resistance	-	-	160 kΩ		490 kΩ	245 kΩ			245 kΩ					
Thermal Resistance	170 °C/W				145 °C/W				110 °C/W					

Notes

- ⁽¹⁾ TCR requirement for temperature between - 25 °C and + 85 °C
- ⁽²⁾ TCR requirement for temperature between - 55 °C and + 125 °C

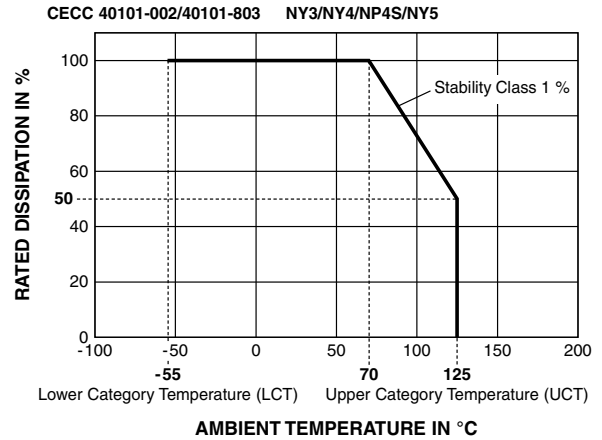
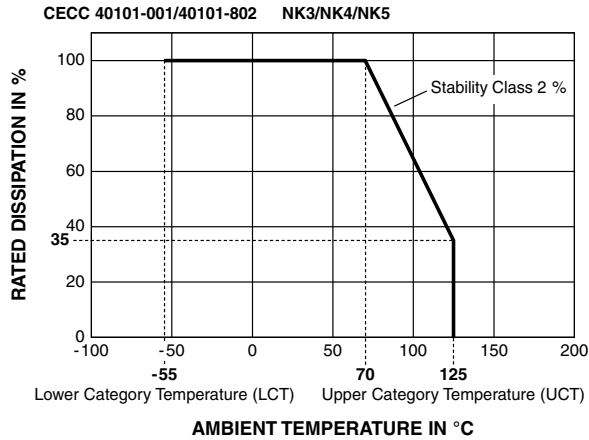
ENVIRONMENTAL SPECIFICATIONS													
MODEL	NT3S	NP3S	NY3	NK3	NT4S	NP4S	NY4	NK4	NT5S	NP5S	NY5	NK5	
Temperature Range	- 25 °C to + 85 °C	- 55 °C to + 155 °C			- 25 °C to + 85 °C	- 55 °C to + 155 °C			- 25 °C to + 85 °C	- 55 °C to + 155 °C			
Climatic Category (LCT/UCT/days)	-	55/125/56			-	55/125/56			-	55/125/56			



OFFICIAL APPROVAL LIST						
MODEL	SPECIFICATION	NATIONAL REFERENCE	CECC REFERENCE	QUALIFIED RANGE	TOLERANCE	P_r at 70 °C
NY3	CECC 40101-002	RS 59Y	EY	10 Ω 301 kΩ	± 1 %	0.125 W
	CECC 40101-002	RS 48Y	AY			0.063 W
	CECC 40101-803	-	AC			0.063 W
NK3	CECC 40101-001	RC 9	DU	10 Ω 510 kΩ	± 2 % ± 5 %	0.250 W
	CECC 40101-001	RC 8U	AU			0.125 W
	CECC 40101-802	-	AV			0.125 W
NP4S	CECC 40101-002	RS 64P	FP	100 Ω 1 MΩ	± 0.5 % ± 1 %	0.250 W
	CECC 40101-002	RS 58P	BP			0.125 W
NY4	CECC 40101-002	RS 71Y	GY	10 Ω 1 MΩ	± 0.5 % ± 1 %	0.500 W
	CECC 40101-002	RS 64Y	FY			0.250 W
	CECC 40101-002	RS 58Y	BY			0.125 W
	CECC 40101-803	-	BC			0.125 W
NK4	CECC 40101-001	RC 32	EU	10 Ω 1 MΩ	± 2 % ± 5 %	0.500 W
	CECC 40101-001	RC 21U	BU			0.250 W
	CECC 40101-802	-	BV			0.250 W
NY5	CECC 40101-002	RS 69Y	HY	10 Ω 1 MΩ	± 0.5 % ± 1 %	0.500 W
	CECC 40101-002	RS 63Y	CY			0.250 W
	CECC 40101-803	-	CC			0.250 W
NK5	CECC 40101-001	RC 31U	CU	10 Ω 1 MΩ	± 2 % ± 5 %	0.500 W
	CECC 40101-802	-	CV			

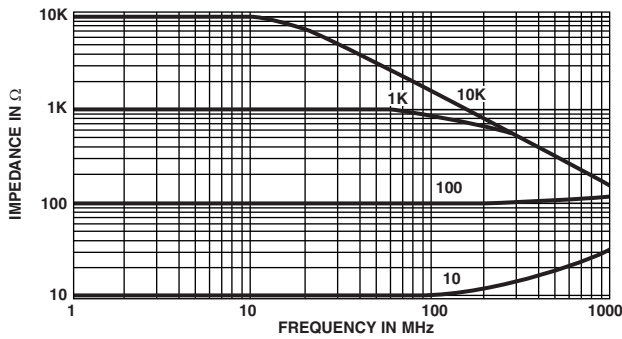
PERFORMANCE					
TEST	CONDITIONS	REQUIREMENTS		TYPICAL DRIFT	
		STABILITY CLASS 1 CECC 40101-002/803	STABILITY CLASS 2 CECC 40101-001/802		
Short Time Overload	IEC 60115-1 6.25 P_r or 2 U_{max} , 1 s for 0.063 W/5 s for ≥ 0.125 W	± (0.25 % + 0.05 Ω)	± (0.5 % + 0.05 Ω)	≤ ± 0.05 %	
Load Life	IEC 60115-1 90'/30' cycles, 1000 h at $P_r/70$ °C	± (1 % + 0.05 Ω)	± (2 % + 0.1 Ω)	≤ ± 0.25 %	
Load Life at Maximum Category Temperature	IEC 60115-1 90'/30' cycles, 1000 h at derated $P_r/125$ °C	± (1 % + 0.05 Ω)	± (2 % + 0.1 Ω)	≤ ± 0.25 %	
	IEC 60115-1 1000 h at 155 °C	-	-		
Sheft Life	1 year at ambient temperature	-	-	≤ ± 0.1 %	
Seq. A1	Robustness of Terminations IEC 60115-1, IEC 60068-2-21 Test Ua1: Traction 10 N/10 s Test U _b : Bending + 90° → - 90° → 0° with 5 N Test U _c : Twisting 2 times at 180°	± (0.25 % + 0.05 Ω)	± (0.5 % + 0.05 Ω)	≤ ± 0.1 %	
Seq. A2	Resistance to Soldering Heat IEC 60115-1 IEC 60068-2-20 Test Tb Method 1: Solder bath 260 °C/10 s	± (0.25 % + 0.05 Ω)	± (0.5 % + 0.05 Ω)	≤ ± 0.05 %	
Seq. B1	Rapid Change of Temperature IEC 60115-1, IEC 60068-2-14 Test Na 5 cycles (30' at LCT/30' at UCT), - 55 °C/125 °C	± (0.25 % + 0.05 Ω)	± (0.5 % + 0.05 Ω)	≤ ± 0.05 %	
Seq. B2	Vibration IEC 60115-1, IEC 60068-2-6 Test Fc 10 Hz/500 Hz	± (0.25 % + 0.05 Ω)	± (0.5 % + 0.05 Ω)	≤ ± 0.1 %	
Seq. A + B	Climatic Sequence IEC 60115-1 1. Dry heat at 125 °C/16 h (IEC 60068-2-2) 2. Damp heat 55 °C/24 h (IEC 60068-2-30 Test Db) 3. Cold at - 55 °C/2 h (IEC 60068-2-1 Test Aa) 4. Low pressure 25 °C/1 h (IEC 60068-2-13) 5. Damp heat 55 °C/120 h (IEC 60068-2-30 Test Db)	± (1 % + 0.05 Ω)	± (2 % + 0.1 Ω)	≤ ± 0.25 %	
Damp Heat, Steady State	IEC 60115-1, IEC 60068-2-78 40 °C/93 % RH/56 days	± (1 % + 0.05 Ω)	± (2 % + 0.1 Ω)	≤ ± 0.5 %	

POWER RATING CHARTS

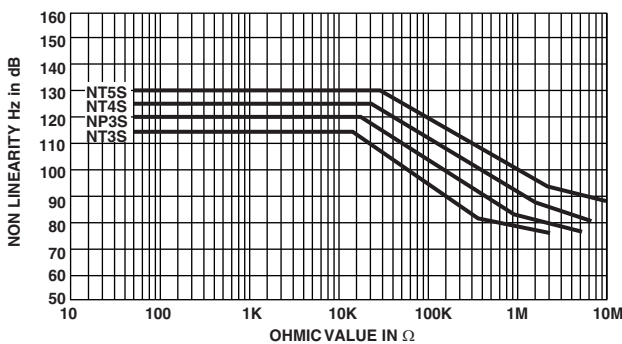


HIGH FREQUENCY

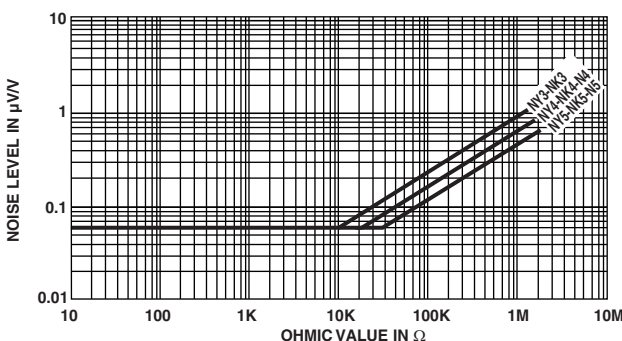
Typical behavior for NK4



THIRD HARMONIC

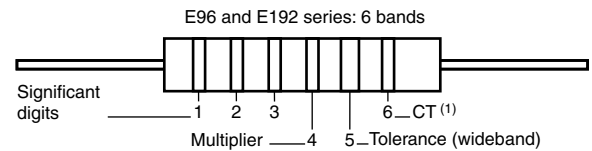


NOISE



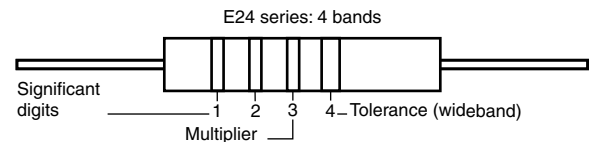
MARKING

Resistor color code chart 6, 5, or 4 bands.



Note

(1) Only for TCR ≤ 25 ppm/°C

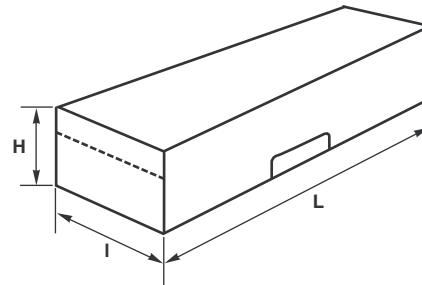
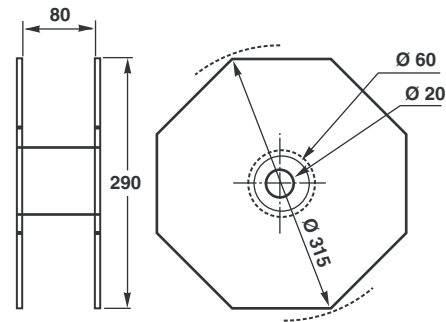
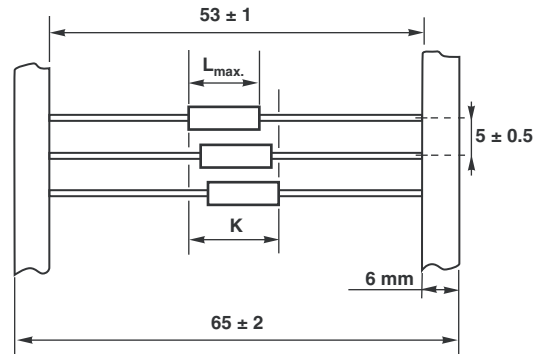


COLOR	DIGIT.	MULTIP.	TOL %	CT ppm/°C
Black	0	1		
Brown	1	10	1	
Red	2	10 ²	2	
Orange	3	10 ³		± 15
Yellow	4	10 ⁴		± 25
Green	5	10 ⁵	0.5	
Blue	6	10 ⁶	0.25	± 10
Purple	7	10 ⁷	0.1	± 5
Grey	8	10 ⁸		
White	9	10 ⁹		
Silver		10 ⁻²		
Gold		10 ⁻¹	5	

TAPE IN REEL	
SERIES AND MODEL	QUANTITY PER REEL
NT4S/NP4S	5000
NK4/NY4	5000
SL3	5000
SL4	5000

TAPED IN AMMOPACK		
SERIES AND MODEL	QUANTITY PER BOX	BOX DIMENSIONS L x l x H (mm)
NT3S/NP3S	500	260 x 80 x 26
NY3	500	
NK3/SL3	1000	
NT4S/NP4S	500	
NY4	500	260 x 80 x 37
NK4/SL4	1000	260 x 85 x 28
NT5S/NP5S	500	
NK5	500	

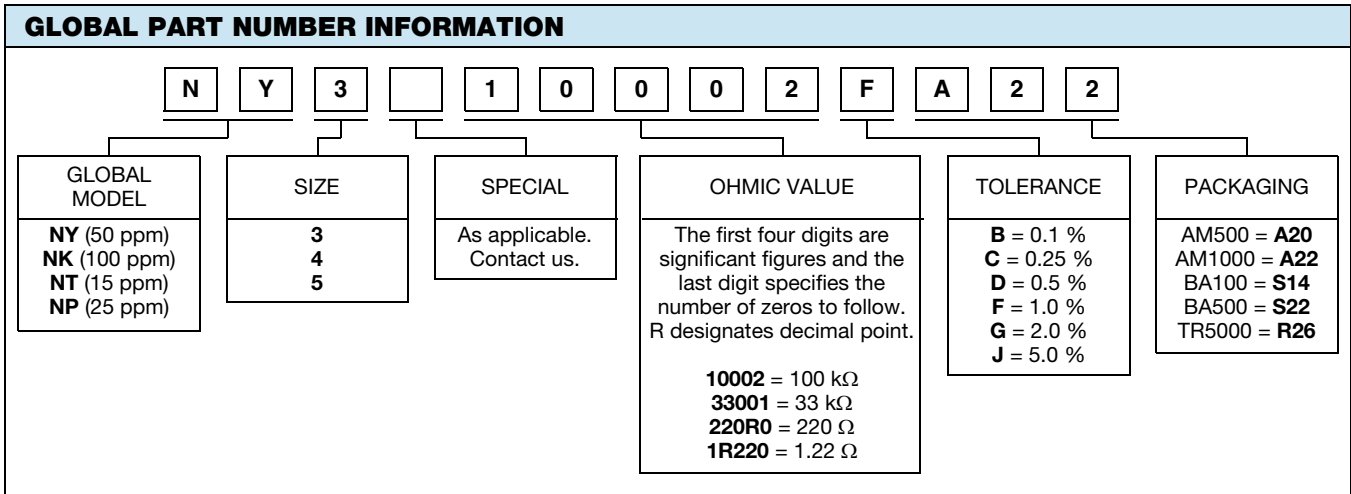
TAPED IN BAG		
SERIES AND MODEL	QUANTITY PER BAG	BOX DIMENSIONS (mm)
NP3S/NT3S	100	85 x 140
NP4S/NT4S		
NP5S/NT5S		
NY3 CC/NK3 CC	500	

PACKAGING


The resistors are required to be inside a window which is the K dimension.

K being equal to the maximum body length of the resistor + 1.4 mm and being centered as per IEC 60286-1 and EIA-296 specification to the tape edges.

ORDERING INFORMATION					
T3	XXX	100 kΩ	1 %	AM1000	e3
MODEL	CUSTOM DESIGN	OHMIC VALUE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE





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