

# DATA SHEET

## MOLDED RESISTORS

High Power, TO-220

NPM Series

$\pm 0.5\%$ ,  $\pm 1\%$ ,  $\pm 5\%$

30W to 100W

RoHS compliant & Halogen Free



**YAGEO**

Product specification – December 8, 2023 V.3





## ORDERING INFORMATION

Part number of the high power, molded resistor is identified by the series, power rating, tolerance, packing, temperature coefficient and resistance value.

## PART NUMBER

<u>NPM</u>	<u>35A</u>	<u>F</u>	<u>T</u>	<u>F</u>	<u>100R</u>
(1)	(2)	(3)	(4)	(5)	(6)

### (1) SERIES NAME

NPM Series

### (2) POWER RATING

30A = 30W

50V = 50W

35A = 35W

10B= 100W

50A = 50W

### (3) TOLERANCE

D =  $\pm 0.5\%$

J =  $\pm 5\%$

F =  $\pm 1\%$

### (4) PACKAGING

T = Box Pack

### (5) TEMPERATURE COEFFICIENT OF RESISTANCE

E= $\pm 50$ ppm/ $^{\circ}$ C

- = Based on spec

F= $\pm 100$ ppm/ $^{\circ}$ C

### (6) RESISTANCE VALUE

E24 & E96 & E192 Series

Example:

10R = 10 $\Omega$ , 100R= 100 $\Omega$ , 10K = 10,000 $\Omega$

## APPLICATIONS

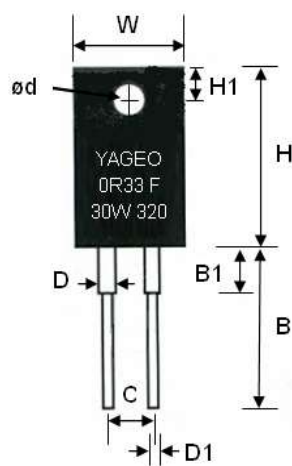
- RF Power Amplifier, snubber circuit
- Switching mode power supply
- Automation control equipment
- Industrial power equipment
- UPS, voltage regulator
- Low power impulse loading

## FEATURES

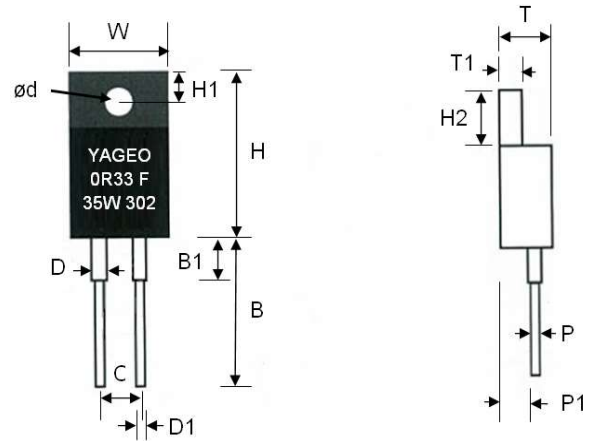
- Power rating up to 100W @ 25 $^{\circ}$ C while heatsink mounted
- TO-220 molded type
- Molded case provides protection and easily to mount.
- Non- inductive design
- RoHS compliant & halogen free

**DIMENSIONS**

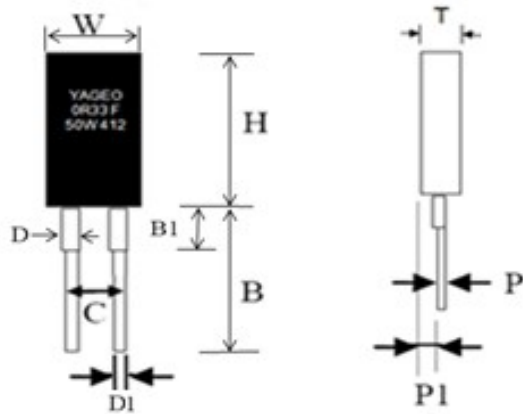
NPM30A



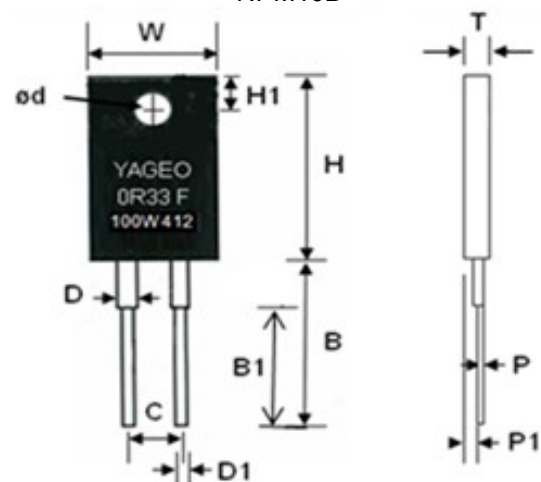
NPM35A



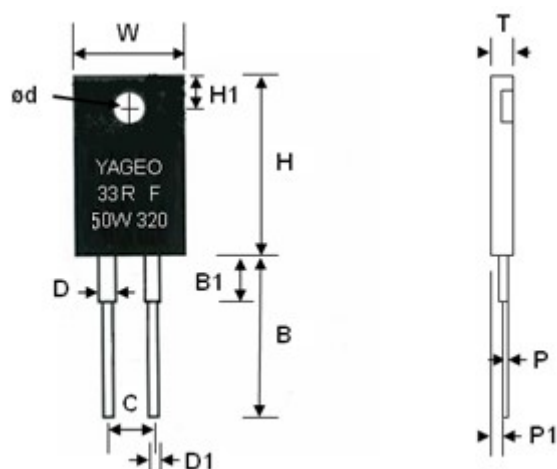
NPM50A



NPM10B



NPM50V



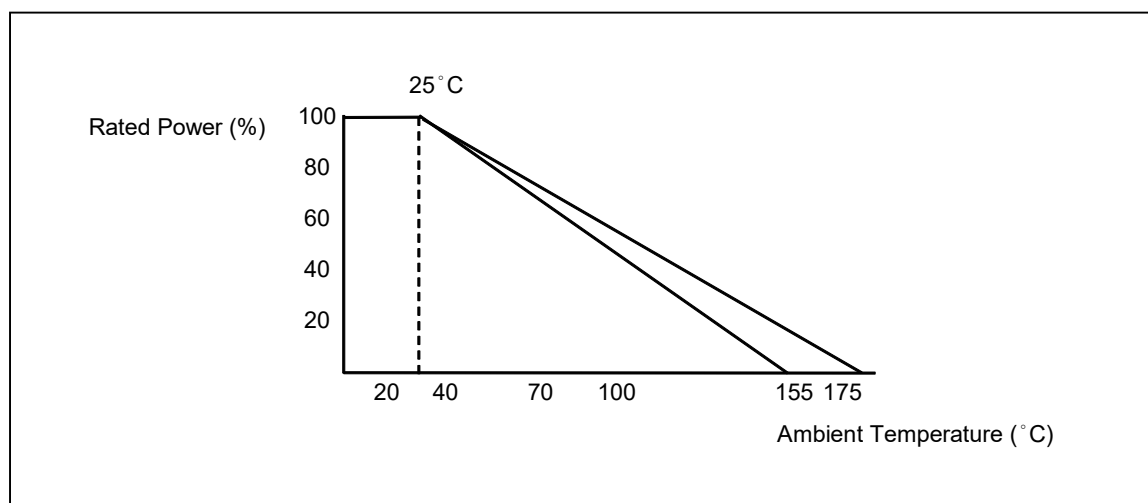
TYPE	DIMENSIONS												Unit: mm
Normal	W±0.5	H±0.5	H1±0.5	B±1.5	B1±1.0	D±0.3	D1±0.2	ψd±0.3	C±0.3	T±0.5	P±0.15	P1±0.3	
NPM30A	10.41	16.26	3.18	12.7	3.3	1.27	0.76	3.18	5.08	3.18	0.5	1.78	
NPM50A	10.41	16.26	-	12.7	3.3	1.27	0.76	-	5.08	3.18	0.5	1.78	

TYPE	DIMENSIONS												Unit: mm
Normal	W±0.5	H±0.5	H1±0.5	B±0.5	B1±0.5	D±0.3	D1±0.2	ψd±0.3	C±0.3	T±0.5	P±0.15	P1±0.3	
NPM10B	15.49	20.44	5.07	13.21	12.03	3.63	1.42	3.63	9.9	4.69	0.55	2.15	

TYPE	DIMENSIONS														Unit: mm
Normal	W±0.5	H±0.5	H1±0.5	B±1.0	B1	D±0.3	D1±0.2	ψd±0.35	C±0.3	T±0.5	T1±0.1	H2±0.5	P±0.2	P1±0.3	
NPM35A	10.16	15.23	2.9	13.5	4 Max	1.26	0.78	3.83	5.08	4.6	1.3	6.25	0.51	2.27	

TYPE	DIMENSIONS												Unit: mm
Normal	W±0.5	H±0.5	H1±0.5	B±1.5	B1±1.0	D±0.3	D1±0.2	ψd±0.3	C±0.3	T±0.5	P±0.15	P1±0.3	
NPM50V	10.41	16.26	3.18	12.7	3.3	1.27	0.86	3.18	5.08	3.18	0.55	1.78	

## DERATING CURVE



**ELECTRICAL CHARACTERISTICS**

CHARACTERISTICS	NPM30A	NPM35A	NPM50A	NPM50V	NPM10B
Power Rating at 25°C on heat sink	30W	35W	50W	50W	100W
Power Rating at 25°C without heat sink	2.25W	2.5W	3W	3W	3.5W
Maximum Working Voltage	350V	350V	350V	420V	350V
Voltage Proof on Insulation	1800Vrms				
Inductance	≤0.1μH				
Operating Temp. Rang	-65°C to +150°C			-55°C to +150°C	-65°C to +175°C
Temperature Coefficient	±50ppm/°C , ±100ppm/°C, ±200ppm/°C, ±300ppm/°C				

Note: For resistance value out of above range is by request.

**RESISTANCE RANGE AND TEMPERATURE COEFFICIENT**

Series	Resistance range		T.C.R (ppm/°C)
	±1%	±5%	
NPM	-0.1Ω~1Ω	0.1Ω~1Ω	No Specified
	>1Ω~3Ω	>1Ω~3Ω	±300
	>3Ω~10Ω	>3Ω~10Ω	±100, ±200
	>10Ω~10KΩ	>10Ω~10KΩ	±50, ±100, ±200

Series	Resistance range			T.C.R (ppm/°C)
	±0.5%	±1%	±5%	
NPM50V	-	-	0.05Ω~1Ω	No Specified
	-	>1Ω~3Ω	>1Ω~3Ω	±300
	-	>3Ω~10Ω	>3Ω~10Ω	±100, ±200
	>10Ω~10KΩ	>10Ω~10KΩ	>10Ω~10KΩ	±50, ±100, ±200

**TEST AND REQUIREMENTS**

TEST	TEST METHOD	PROCEDURE	APPRAISE
Short Time Overload	IEC 60115-1 4.13	2 times of the rated power not to exceed 1.5 times maximum continuous. working voltage for 5 seconds.	±0.5%
Voltage Proof on Insulation	IEC 60115-1 4.7	In V-Block for 60 sec. test voltage as above table	No Breakdown
Temperature Coefficient	IEC 60115-1 4.8	Between -55°C to +155°C	By Type
Insulation Resistance	IEC 60115-1 4.6	In V-Block for 60 sec.	>10,000MΩ
Solderability	IEC 60115-1 4.17	245±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-1 4.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 10 Sec. the load of weight is 2.4N	±0.2%
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C, 90-95% RH at RCWV (or U <sub>max.</sub> , whichever less) for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	±0.5%
Endurance at 25°C	IEC 60115-1 4.25	25±2°C at RCWV (or U <sub>max.</sub> , whichever less) for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	±1.0%
Temperature Cycling	IEC 60115-1 4.19	➔ -65°C ➔ Room Temp. ➔ +150°C Room Temp. (5 cycles)	±0.5%
Resistance to Soldering Heat	IEC 60115-1 4.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±1.0%

Note:

**RCWV (Rated Continuous Working Voltage):**

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{P \times R}$$

or max. working voltage whichever is less

Where

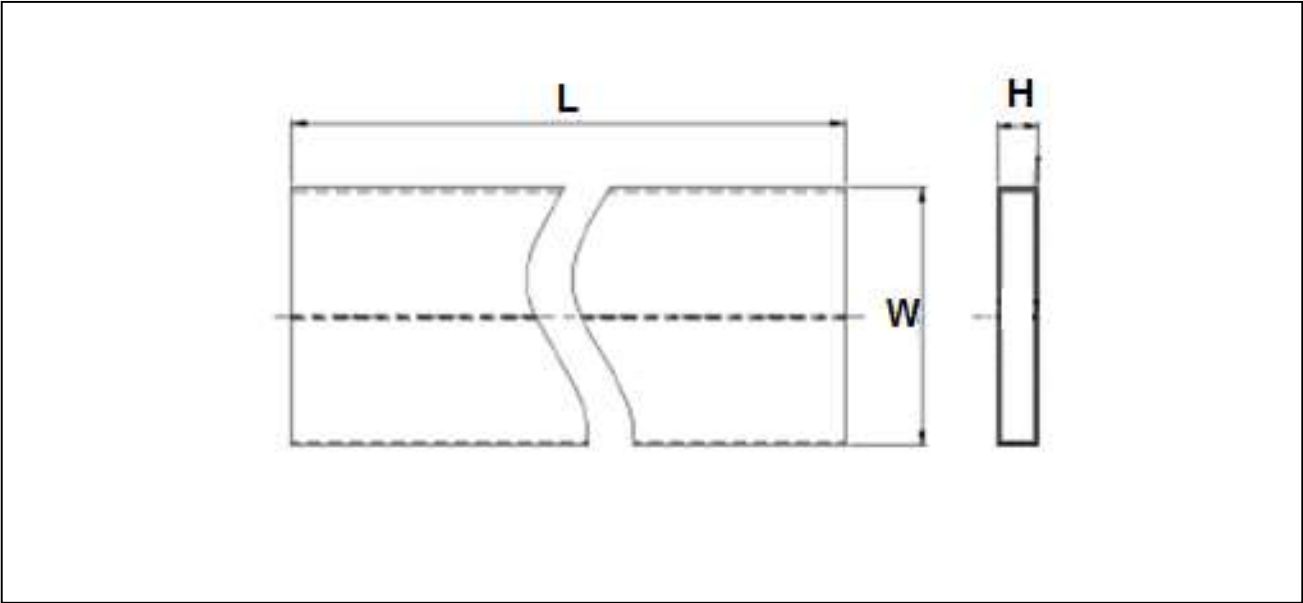
V=Continuous rated DC or

AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)

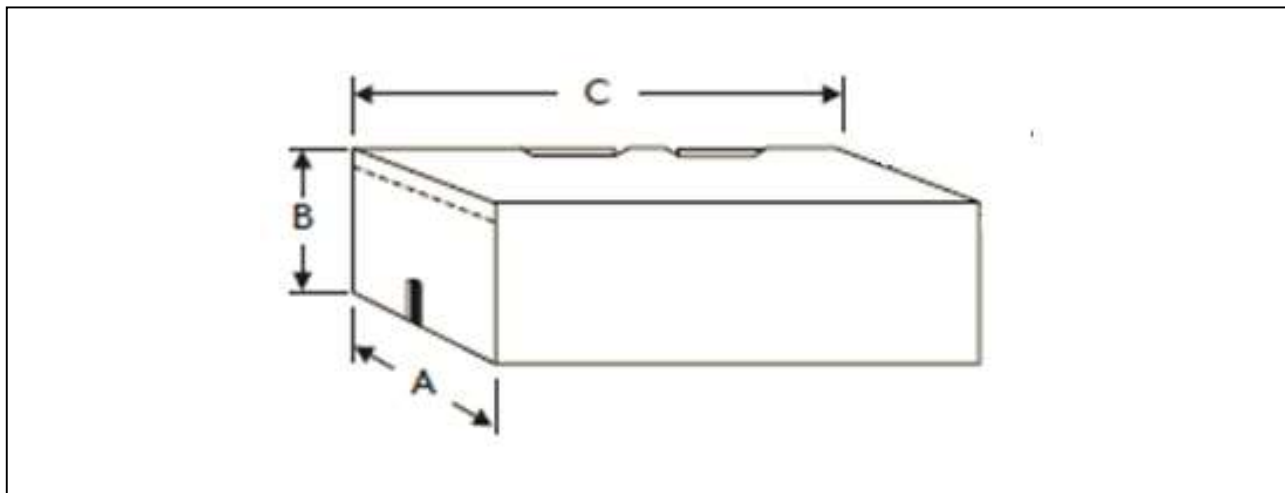
TAPE SPECIFICATION



Unit: mm

Normal	L	W	H	Qty per Tube (Max.)
NPM30A	529	32.6	7.2	50
NPM35A	529	32.6	7.2	50
NPM50A	529	32.6	7.2	50
NPM50V	529	32.6	7.2	50
NPM10B	590	45.5	8.5	35

## TAPE ON BOX PACKING



TYPE	DIMENSIONS			Unit: mm/piece
Normal	A	B	C	Quantity Per Box (Max.)
NPM30A	80	90	540	1,000
NPM35A	80	90	540	1,000
NPM50A	80	90	540	1,000
NPM50V	80	90	540	1,000
NPM10B	100	95	600	700

## MARKING



### Example:

YAGEO	= Brand
302	= Date code
35W	= Power rating
0R33	= Resistance
F	= Tolerance



**REVISION HISTORY**

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 3	Dec.08, 2023	-	- NPM50V type is included.
Version 2	Sep.6, 2023	-	- Updated legal disclaimer and footer versions numbers
Version 1	May 16, 2022	-	- Deleted NPM20A type.
Version 0	Aug.2, 2021	-	- First issue of this specification

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