

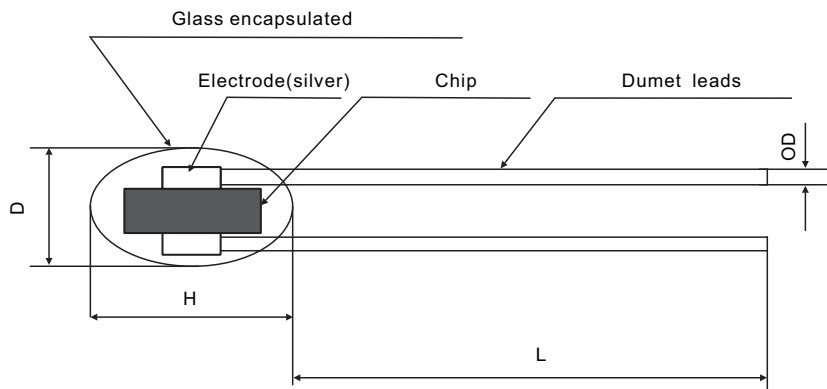
Temperature Compensation/Sensing KNM Series (Glass Encapsulated Radial Type)

- Features
 1. Body size ϕ 1.8mm, ϕ 2.5mm
 2. Radial lead glass-sealed
 3. Long leads for easy sensor placement
 4. -40 ~ +300 °C operating temperature range

- Recommended applications
 1. Home appliances (air conditioner, refrigerator, electric fan, electric cooker, washing machine, microwave oven, drinking machine, CTV, radio.)
 2. Automotive electronics
 3. Heaters



- Dimensions



(Unit:mm)

Part no.	Dmax.	OD	Hmax.	Lmin.
KNM1	1.8	0.2 or 0.3	3.5	67±2
KNM2	2.5	0.2 or 0.3	5	67±2

- Part number code

K	N	M	1	A	1	0	3	F	3	0	J	F	S	
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Product Code

KNM	NTC Thermistor KNM Type
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Body Size

1	ϕ 1.8max xL3.5max
2	ϕ 2.5max xL5max

Zero Power Resistance at 25 °C (R₂₅)

102	1K Ω
103	10K Ω
473	47K Ω

Tolerance of R₂₅

F	±1%
G	±2%
H	±3%
J	±5%
K	±10%

Beta Value First Two Digits

30	30
31	31
32	32
:	:
40	40
41	41
:	:
:	:

Tolerance of Beta Value

F	±1%
G	±2%
H	±3%

Custom Spec. Controlling Number

Do not use reserved for factory only

Define of Beta Value

A	B _{25/85}
B	B _{25/50}

Appearance

S	ϕ 0.15mm Sn Plated DumetWire
N	ϕ 0.15mm Ni Plated DumetWire
R	ϕ 0.2mm Sn Plated DumetWire
M	ϕ 0.2mm Ni Plated DumetWire
P	ϕ 0.3mm Sn Plated DumetWire
Q	ϕ 0.3mm Ni Plated DumetWire
D	ϕ 0.3mm Dumet Wire

Beta Value Code For Last Two Digits

Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits	Code	Beta Value Last Two Digits
0	98	2	18	4	38	6	58	8	78
	99		19		39		59		79
	00		20		40		60		80
	01		21		41		61		81
	02		22		42		62		82
A	03	C	23	E	43	G	63	J	83
	04		24		44		64		84
	05		25		45		65		85
	06		26		46		66		86
	07		27		47		67		87
1	08	3	28	5	48	7	68	9	88
	09		29		49		69		89
	10		30		50		70		90
	11		31		51		71		91
	12		32		52		72		92
B	13	D	33	F	53	H	73	K	93
	14		34		54		74		94
	15		35		55		75		95
	16		36		56		76		96
	17		37		57		77		97

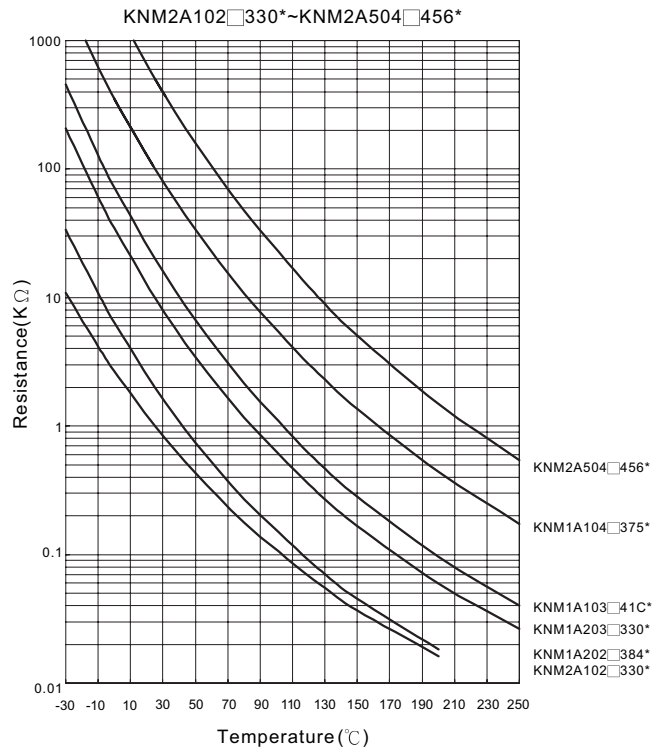
● Characteristics

Part no.	Zero power resistance at 25°C (KΩ)	Tolerance of resistance (±%)	B value (K)	Max. power rating at 25°C (mW)	Tolerance of B value (±%)	Thermal dissipation constant (mW/°C)	Thermal time constant (Sec.)	Operating temperature range (°C)
KNM1A202□384*	2	1 · 2 · 3 · 5 · 10	25/85	24	1 · 2 · 3	≥0.4	≤3	-40 ~ +300
KNM1A502□345*	5							
KNM1A103□41C*	10							
KNM1A203□330*	20							
KNM1A303□345*	30							
KNM1A503□429*	50							
KNM1A104□375*	100			45				
KNM1A204□430*	200							
KNM2A102□330*	1							
KNM2A502□39G*	5							
KNM2A303□345*	30							
KNM2A204□430*	200							
KNM2A404□405*	400			45				
KNM2A504□456*	500							
KNM2A105□460*	1000							
KNM2A135□438*	1300							

Note 1: □ = Tolerance of resistance

Note 2: * = Tolerance of B value

● R-T characteristic curve (representative)



- Reliability test

Item	Test Conditions/Methods	Specifications															
Tensile Strength of Terminations	<p>Gradually applying the force specified below to each terminal and keeping the unit fixed for 10 ± 1 sec.</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td style="border-bottom: 1px solid black;">Terminal diameter (mm)</td> <td style="border-bottom: 1px solid black;">Force (Kg)</td> </tr> <tr> <td>$0.3 < d \leq 0.5$</td> <td>0.5</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	$0.3 < d \leq 0.5$	0.5	No visible damage											
Terminal diameter (mm)	Force (Kg)																
$0.3 < d \leq 0.5$	0.5																
Bending Strength of Terminations	<p>Hanging the force specified below to each terminal and gradually bending each terminal by 90° in one direction, then 90° in the opposite direction, and again back to the origin.</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td style="border-bottom: 1px solid black;">Terminal diameter (mm)</td> <td style="border-bottom: 1px solid black;">Force (Kg)</td> </tr> <tr> <td>$0.3 < d \leq 0.5$</td> <td>0.25</td> </tr> </table>	Terminal diameter (mm)	Force (Kg)	$0.3 < d \leq 0.5$	0.25	No visible damage											
Terminal diameter (mm)	Force (Kg)																
$0.3 < d \leq 0.5$	0.25																
Solderability	$235 \pm 5^\circ\text{C}$, 2 ± 0.5 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	$260 \pm 5^\circ\text{C}$, 10 ± 1 sec	No visible damage $ \Delta R/R \leq 3\%$															
High Temperature Storage	$125 \pm 5^\circ\text{C} \times 1000$ HRS	No visible damage $ \Delta R/R \leq 5\%$															
Damp Heat	$40 \pm 2^\circ\text{C}$, 90~95%RH, 1000 ± 24 HRS	No visible damage $ \Delta R/R \leq 3\%$															
Thermal Shock	<p>The thermal shock conditions shown below shall be repeated 5 cycles</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Step</th> <th>Temperature ($^\circ\text{C}$)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 5</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> <tr> <td>3</td> <td>150 ± 5</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> </tbody> </table>	Step	Temperature ($^\circ\text{C}$)	Period (minutes)	1	-40 ± 5	30 ± 3	2	Room temperature	5 ± 3	3	150 ± 5	30 ± 3	4	Room temperature	5 ± 3	No visible damage $ \Delta R/R \leq 3\%$
Step	Temperature ($^\circ\text{C}$)	Period (minutes)															
1	-40 ± 5	30 ± 3															
2	Room temperature	5 ± 3															
3	150 ± 5	30 ± 3															
4	Room temperature	5 ± 3															
Life Test	$25 \pm 5^\circ\text{C}$, Pmax X 1000 HRS	No visible damage $ \Delta R/R \leq 5\%$															