

Precision Nickel Thermosensitive Resistor (Flip-Chip)



COMPOSITION OF TYPE NUMBER

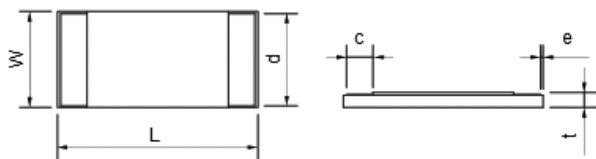
Example:

NBA 100R0 F L

Tape and Reel Package
Resistance Tolerance
Resistance Value
Type

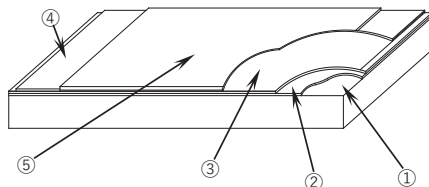
Resistance value is expressed by 4 numbers and 1 alphabet. R or K is a dual-purpose letter that designates both the value range (R for ohmic, K for kilohm) and the location of decimal point.

CONFIGURATION — DIMENSIONS IN mm



Type	NBA	NBB	NBC
L	1.6±0.2	2.0±0.2	3.2±0.2
W	0.8±0.2	1.2±0.2	1.6±0.2
t	0.5±0.1	0.5±0.1	0.5±0.1
c	0.23±0.2	0.33±0.2	0.42±0.2
d	0.65±0.2	1.1±0.2	1.4±0.2
e	0.07±0.2	0.07±0.2	0.07±0.2

CONSTRUCTION



- ① Ceramic Substrate (High-Purity Alumina)
- ② Heat-Resistant Bonding Layer
- ③ Bulk Metal® Foil
- ④ Metal Plating
- ⑤ Top Coat

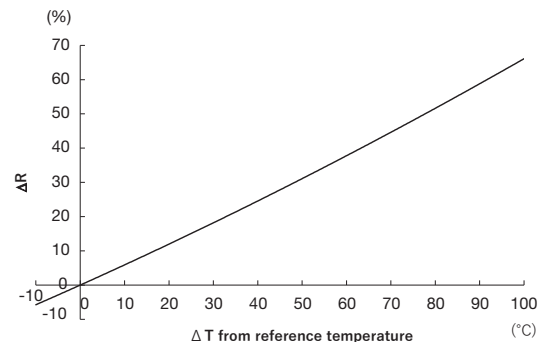
FEATURES

- Precision thermosensitive resistor with 0603, 0805 and 1206 package
- Excellent long-term stability and linear TCR of Nickel Bulk Metal® Foil
- Excellent response time
- Working Temperature Range: -25°C to +200°C

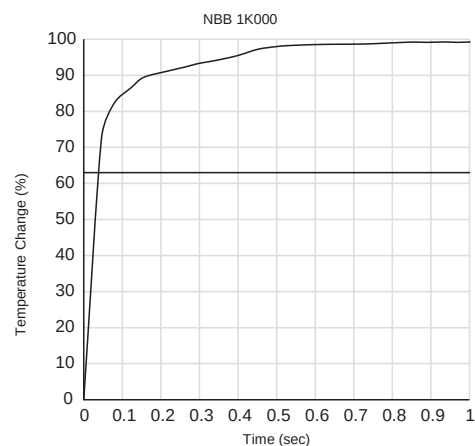
TCR, RESISTANCE VALUE, TOLERANCE, MAX CURRENT

Type	Resistance Value (Ω)	TCR (ppm/°C)	Resistance Tolerance (%) at 0°C	Max Current (mA)
NBA	100	+6,060±2% (0 to 25°C)	±0.5 (D)	0.3
NBB	1000	+6,260±2% (0 to 50°C)	±1.0 (F)	0.3
NBC	1000	+6,660±2% (0 to 100°C)	±2.0 (G) ±5.0 (J)	0.5

TEMPERATURE CHARACTERISTICS OF RESISTANCE (NBB)



RESPONSE TIME TO TEMPERATURE CHANGE



*Available customized high response version with 0.2t substate
Please contact sales-alpha@alpha-elec.co.jp

PERFORMANCE			
Parameters	Test Condition	ALPHA Specification	ALPHA Typical Test Data
Max. Rated Operating Temp.		125°C*	
Working Temperature Range		-25°C to +200°C	
Thermal Shock	-25°C/30 min., Room Temperature/5 min., +125°C/30 min., 5 cycles	±0.2%	±0.03%
Dielectric Withstanding Voltage	Atmospheric: AC 200V, 1 min.	±0.2%	±0.03%
Insulation Resistance	DC100V, 1 min	over 10,000MΩ	over 10,000MΩ
Resistance to Soldering Heat	Recommended reflow temperature, 3 cycles	±0.2%	±0.03%
Moisture Resistance	+65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	±0.2%	±0.03%
Life (Moisture Load)	40°C, 90% RH to 95% RH, Rated Power, 1.5 hr. – ON, 0.5 hr. – OFF, 1,000 hrs.	±0.2%	±0.03%
Storage Life	15°C to 35°C, 15% RH to 75% RH, No Load, 10,000 hrs.	±0.1%	±0.05%
High Temperature Exposure	150°C, No Load, 2,000 hrs.	±0.2%	±0.03%
	200°C, No Load, 2,000 hrs.	±0.2%	±0.03%
Life (Rated Load)	125°C, Rated Power, 1.5 hr. – ON, 0.5 hr. – OFF, 2,000 hrs.	±0.2%	±0.03%

* Can be used >125°C when the unit is mounted on thermostable material.
Please contact sales-alpha@alpha-elec.co.jp

NBB 1K000 RESISTANCE TABLE (REFERENCE DATA)													
Temp[°C]	0	1	2	3	4	5	6	7	8	9	10	Temp[°C]	
-20						914.4	920.0	925.6	931.2	936.9	942.6	-20	
-10	942.6	948.2	953.9	959.6	965.3	971.1	976.8	982.6	988.4	994.2	1000.0	-10	
0	1000.0	1005.8	1011.7	1017.6	1023.4	1029.3	1035.2	1041.2	1047.1	1053.1	1059.1	0	
10	1059.1	1065.0	1071.1	1077.1	1083.1	1089.2	1095.2	1101.3	1107.4	1113.5	1119.7	10	
20	1119.7	1125.8	1132.0	1138.2	1144.4	1150.6	1156.8	1163.0	1169.3	1175.6	1181.9	20	
30	1181.9	1188.2	1194.5	1200.8	1207.2	1213.6	1220.0	1226.4	1232.8	1239.2	1245.7	30	
40	1245.7	1252.1	1258.6	1265.1	1271.6	1278.1	1284.7	1291.2	1297.8	1304.4	1311.0	40	
50	1311.0	1317.6	1324.3	1330.9	1337.6	1344.3	1351.0	1357.7	1364.4	1371.2	1378.0	50	
60	1378.0	1384.7	1391.5	1398.3	1405.2	1412.0	1418.9	1425.8	1432.6	1439.6	1446.5	60	
70	1446.5	1453.4	1460.4	1467.3	1474.3	1481.3	1488.3	1495.4	1502.4	1509.5	1516.6	70	
80	1516.6	1523.7	1530.8	1537.9	1545.1	1552.2	1559.4	1566.6	1573.8	1581.0	1588.3	80	
90	1588.3	1595.5	1602.8	1610.1	1617.4	1624.7	1632.0	1639.4	1646.7	1654.1	1661.5	90	
100	1661.5	1668.9	1676.4	1683.8	1691.3	1698.7	1706.2	1713.7	1721.3	1728.8	1736.4	100	
110	1736.4	1743.9	1751.5	1759.1	1766.7	1774.4	1782.0	1789.7	1797.4	1805.1	1812.8	110	
120	1812.8	1820.5	1828.3	1836.0	1843.8	1851.6	1859.4	1867.2	1875.1	1882.9	1890.8	120	
130	1890.8	1898.7	1906.6	1914.5	1922.4	1930.4	1938.3	1946.3	1954.3	1962.3	1970.4	130	
140	1970.4	1978.4	1986.5	1994.5	2002.6	2010.7	2018.9	2027.0	2035.2	2043.3	2051.5	140	
150	2051.5	2059.7	2067.9	2076.2	2084.4	2092.7	2101.0	2109.3	2117.6	2125.9	2134.3	150	
160	2134.3	2142.6	2151.0	2159.4	2167.8	2176.2	2184.7	2193.1	2201.6	2210.1	2218.6	160	
170	2218.6	2227.1	2235.6	2244.2	2252.8	2261.3	2269.9	2278.6	2287.2	2295.8	2304.5	170	
180	2304.5	2313.2	2321.9	2330.6	2339.3	2348.0	2356.8	2365.6	2374.3	2383.2	2392.0	180	
190	2392.0	2400.8	2409.7	2418.5	2427.4	2436.3	2445.2	2454.1	2463.1	2472.1	2481.0	190	
200	2481.0											200	
Temp[°C]	0	1	2	3	4	5	6	7	8	9	10	Temp[°C]	

PRECAUTION IN USING FLIP CHIP RESISTORS

1. Storage

Storage conditions or environment may adversely affect solderability of the exterior terminals. Do not store in high temperature and humidity. The recommended storage environment is lower than 40°C, has less than 70% RH humidity and is free from harmful gases such as sulphur and chlorine.

2. Caution in Soldering

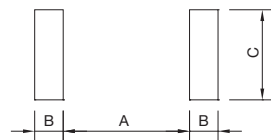
- Solder Reflow in Furnace
 - Recommended • Peak Temperature: 250+0/-5°C
 - Holding time: 10 sec. max.
 - To cool gradually at room temperature.
- Vacuum pick up is recommended for handling.

3. Cleaning

Use volatile cleaner such as methylalcohol or propylalcohol.

4. Recommended Land Pattern

The dimensions of solder land must be determined in conformity with the size of resistors and with the soldering method. They are also subject to the mounting machine and the material of the substrate.



Type	A	B	C
NBA	1.0	0.3	0.8
NBB	1.2	0.4	1.2
NBC	2.2	0.5	1.6

(mm)