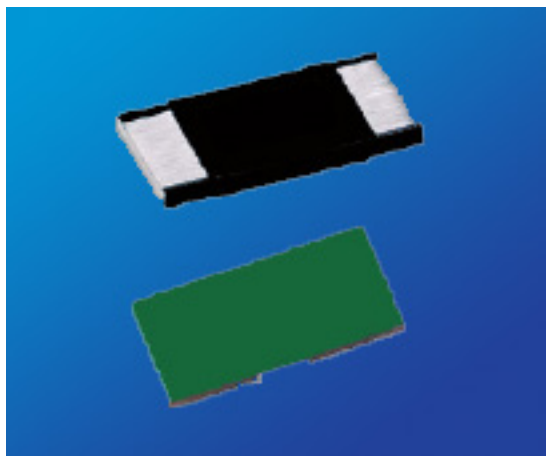


# RESISTOR METAL ELEMENT CURRENT SENSE SMT

## RNC SERIES



### KEY FEATURES

- Resistances from 0.5 mOhms to 15 mOhms
- Resistance Tolerances to  $\pm 1\%$
- Customized Resistance available
- Power Rating up to 3 Watts
- TCR's to  $\pm 50$  ppm/°C
- Available in sizes 1206 / 2010 / 2512

### APPLICATIONS

- Engine Sensors
- Surge Protection
- Data Recorders
- Temperature Sensors

### PRODUCT SUMMARY

| PRODUCT SERIES (RNC) | PACKAGE SIZE | POWER RATING (W) at 80°C | RESISTANCES (mΩ)                         | TCR (ppm/°C)                   | TOLERANCES     | TEMPERATURE RANGE |
|----------------------|--------------|--------------------------|------------------------------------------|--------------------------------|----------------|-------------------|
| RNC18A               | 1206         | 1                        | 0.5 - 10                                 | $\pm 50$<br>$\pm 200$ (0.5 mΩ) | 1%<br>3%<br>5% | -55°C to +170°C   |
| RNC19B               | 2010         | 1.5                      | 0.5 - 10                                 | $\pm 50$<br>$\pm 100$ (0.5 mΩ) |                |                   |
| RNC20A <sup>1</sup>  | 2512         | 1                        | 0.5, 0.75, 1, 1.5, 2, 11, 12, 13, 14, 15 | $\pm 50$                       |                |                   |
|                      |              |                          | 6, 6.5, 7                                | $\pm 75$                       |                |                   |
|                      |              |                          | 4, 5, 10                                 | $\pm 100$                      |                |                   |
|                      |              |                          | 2.5, 3                                   | $\pm 150$                      |                |                   |
| RNC20C <sup>2</sup>  | 2512         | 2                        | 0.5, 0.75, 1, 1.5, 2, 6.5, 7, 8, 9, 10   | $\pm 50$                       |                |                   |
|                      |              |                          | 6, 6.5, 7                                | $\pm 75$                       |                |                   |
|                      |              |                          | 4, 5, 10                                 | $\pm 100$                      |                |                   |
|                      |              |                          | 2.5, 3                                   | $\pm 150$                      |                |                   |
| RNC20D <sup>3</sup>  | 2512         | 2.5                      | 4, 4.5, 5, 6                             | $\pm 50$                       |                |                   |
| RNC20E <sup>3</sup>  | 2512         | 3                        | 0.5, 0.75                                | $\pm 100$                      |                |                   |
|                      |              |                          | 1, 1.5, 2, 2.5, 3, 3.5                   | $\pm 50$                       |                |                   |

Maximum Operating Voltage =  $\sqrt{\text{Power} \times \text{Resistance}}$

### HOW TO ORDER

<sup>1</sup> 11, 12, 13, 14, 15 mΩ - coating is green

<sup>2</sup> 6.5, 7, 8, 9, 10 mΩ at 50ppm - coating is green

<sup>3</sup> All values contain green coating

| RNC                                         | 20                                  | E                                                        | N                                                                                                                  | R00075                                                                                                                                                                                                                                                           | F                                                     | E                           |
|---------------------------------------------|-------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------|
| Resistor Metal Element<br>Current Sense SMT | PACKAGE<br>CODE                     | POWER RATING,<br>WATTS                                   | TEMPERATURE<br>COEFFICIENT OF<br>RESISTANCE (TCR)                                                                  | RESISTANCE                                                                                                                                                                                                                                                       | TOLERANCE                                             | PACKING                     |
|                                             | 18 = 1206<br>19 = 2010<br>20 = 2512 | A = 1.0W<br>B = 1.5W<br>C = 2.0W<br>D = 2.5W<br>E = 3.0W | Q = $\pm 50$ ppm/°C<br>P = $\pm 75$ ppm/°C<br>N = $\pm 100$ ppm/°C<br>M = $\pm 150$ ppm/°C<br>L = $\pm 200$ ppm/°C | R00075 = 0.00075Ω (0.75mΩ)<br>0R0005 = 0.0005Ω (0.5mΩ)<br>00R001 = 0.001Ω (1mΩ)<br>0R0015 = 0.0015Ω (1.5mΩ)<br>Letter denotes decimal place.<br>R = decimal, "K" 10 <sup>3</sup> , "M" 10 <sup>6</sup><br>Remaining 5 digits are<br>significant or placeholders. | F = $\pm 1.0\%$<br>H = $\pm 3.0\%$<br>J = $\pm 5.0\%$ | E = Embossed<br>Tape & Reel |

Standard Termination Finish: Nickel Tin Alloy

Example P/N: RNC20ENR00075FT is Resistor Metal Element Current Sense SMT, size 2512, 3.0W,  $\pm 100$ ppm/°C, 0.00075Ω (0.75mΩ),  $\pm 1.0\%$ , embossed tape & reel



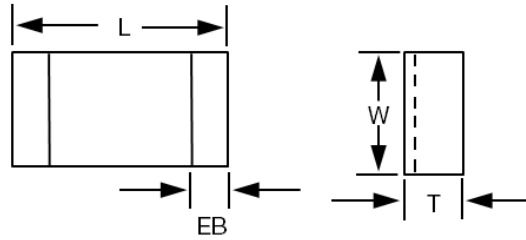
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# RESISTOR METAL ELEMENT CURRENT SENSE SMT

## RNC SERIES



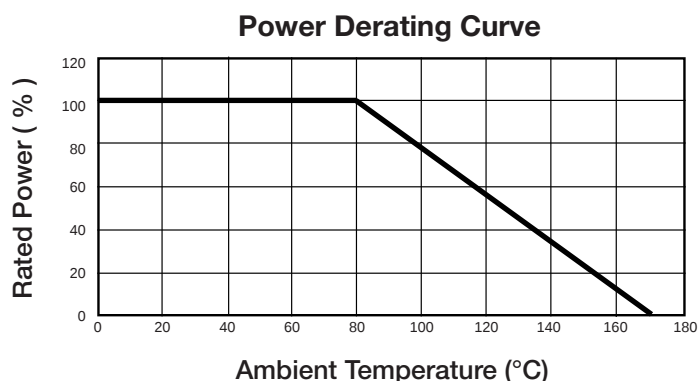
### ELECTRICAL & MECHANICAL CHARACTERISTICS



| Package Code                                | Power Rating (W) | Resistance Value ( $\Omega$ ) | L (Length) [mm]  | W (Width) [mm]   | T (Thickness) [mm] | EB (End Band) [mm] |
|---------------------------------------------|------------------|-------------------------------|------------------|------------------|--------------------|--------------------|
| <b>RNC18</b><br>(Size 1206)                 | 1                | 0.5                           | 3.20 $\pm$ 0.25  | 1.60 $\pm$ 0.10  | 0.60 $\pm$ 0.20    | 1.35 $\pm$ 0.25    |
|                                             |                  | 0.75                          | 3.20 $\pm$ 0.25  | 1.60 $\pm$ 0.10  | 0.60 $\pm$ 0.20    | 1.23 $\pm$ 0.25    |
|                                             |                  | 1, 4, 5, 6                    | 3.20 $\pm$ 0.25  | 1.60 $\pm$ 0.10  | 0.60 $\pm$ 0.20    | 1.10 $\pm$ 0.25    |
|                                             |                  | 2, 3, 10                      | 3.20 $\pm$ 0.25  | 1.60 $\pm$ 0.10  | 0.60 $\pm$ 0.20    | 0.60 $\pm$ 0.25    |
|                                             |                  | 7, 8, 9                       | 3.20 $\pm$ 0.25  | 1.60 $\pm$ 0.10  | 0.60 $\pm$ 0.20    | 0.90 $\pm$ 0.25    |
| <b>RNC19</b><br>(Size 2010)                 | 1.5              | 0.5                           | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 2.17 $\pm$ 0.25    |
|                                             |                  | 0.75                          | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 2.04 $\pm$ 0.25    |
|                                             |                  | 1                             | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 1.84 $\pm$ 0.25    |
|                                             |                  | 2, 6, 7, 8                    | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 1.54 $\pm$ 0.25    |
|                                             |                  | 3                             | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 1.04 $\pm$ 0.25    |
|                                             |                  | 4, 5                          | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 1.84 $\pm$ 0.25    |
| <b>RNC20</b><br>(Size 2512)                 | 1                | 9, 10                         | 5.08 $\pm$ 0.25  | 2.54 $\pm$ 0.15  | 0.60 $\pm$ 0.20    | 1.29 $\pm$ 0.25    |
|                                             |                  | 0.5                           | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 1.25 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 0.75                          | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.75 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 1                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.65 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 1.5                           | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.45 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 2                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.35 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 2.5                           | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.65 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 3                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.55 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 4                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.45 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 5                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.35 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 6                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.32 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 6.5                           | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.30 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 7                             | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.27 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
|                                             |                  | 10                            | 6.35 $\pm$ 0.254 | 3.18 $\pm$ 0.254 | 0.25 $\pm$ 0.20    | 1.30 $\pm$ 0.38    |
| <b>RNC20 w/Green Coating</b><br>(Size 2512) | 1 to 3           | 0.5                           | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 2.68 $\pm$ 0.25    |
|                                             |                  | 0.75                          | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 2.48 $\pm$ 0.25    |
|                                             |                  | 1, 5, 6                       | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 1.93 $\pm$ 0.25    |
|                                             |                  | 1.5, 6.5, 7                   | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 1.43 $\pm$ 0.25    |
|                                             |                  | 2, 3                          | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 1.18 $\pm$ 0.25    |
|                                             |                  | 4, 4.5                        | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 2.18 $\pm$ 0.25    |
|                                             |                  | 8 to 15                       | 6.35 $\pm$ 0.25  | 3.00 $\pm$ 0.20  | 0.60 $\pm$ 0.20    | 1.18 $\pm$ 0.25    |

# RESISTOR METAL ELEMENT CURRENT SENSE SMT

## RNC SERIES



### SPECIFICATIONS

| Test                                         | Specification     |                  | Test Method                                                                    |
|----------------------------------------------|-------------------|------------------|--------------------------------------------------------------------------------|
|                                              | Black Coating     | Green Coating    |                                                                                |
| <b>Solderability</b>                         | 95% min. coverage |                  | 245 ±5°C for 3 seconds                                                         |
| <b>Temperature Coefficient of Resistance</b> | As Spec.          |                  | +25/-55/+25/+125/+25°C                                                         |
| <b>Dry Heat</b>                              | ± 1.0%            | ± 1.0%           | at +170°C for 1000 hrs                                                         |
| <b>Load Life</b>                             | ± 1.0%            | ± 1.0%           | 70 ±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| <b>Short Time Overload</b>                   | ± 0.5%            | ± 1.0%           | 5x rated power for 5 seconds                                                   |
| <b>Resistance to Soldering Heat</b>          | ± 0.5%            | ± 1.0%           | 260 ±5°C for 10 seconds                                                        |
| <b>Thermal Shock</b>                         | ± 0.5%            | ± (0.5% + 0.05Ω) | -55°C ~ 150°C, 100 cycles                                                      |

**Note:** Green coating cannot be used in solder bath

### PACKAGING INFORMATION

| Package Code    | RNC18<br>(Reel Size 1206) | RNC19<br>(Reel Size 2010) | RNC20<br>(Reel Size 2512) |
|-----------------|---------------------------|---------------------------|---------------------------|
| <b>Quantity</b> | 2000                      |                           |                           |
| <b>Type</b>     | Embossed Tape             |                           |                           |

Moisture Sensitivity Level: MSL-1

### AVAILABLE OPTIONS (Consult Factory)

- Special Testing Requirements

This datasheet is subject to change without notice.

