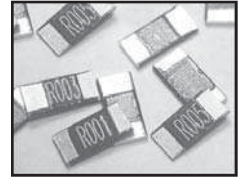


### FEATURES

- SURFACE MOUNTABLE 1206, 2010 AND 2512 CASE SIZE
- LOW RESISTANCE & LOW INDUCTANCE METAL STRIP CONSTRUCTION
- PRECISION TOLERANCE ( $\pm 1\%$ ) AND TCR ( $\pm 50\text{PPM}$ ) TO  $+170^\circ\text{C}$
- TAPED & REEL PACKAGING FOR EASY PICK AND PLACE
- REFLOW COMPATIBLE

**RoHS  
Compliant**

includes all homogeneous materials



### SPECIFICATIONS

See Part Number System for Details

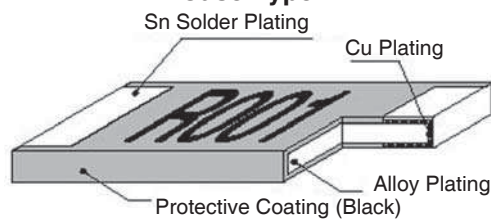
| Type     | EIA Size | Power Rating at 80°C | Case Type** | Resistance Tolerance (Code)                     | Temperature Coefficient (ppm/°C)                                                     | Resistance Range              | Operating Temperature Range (°C) |
|----------|----------|----------------------|-------------|-------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------|----------------------------------|
| NCSR100S | 1206     | 1 Watt               | 3           | $\pm 1\%$ (F)<br>$\pm 3\%$ (H)<br>$\pm 5\%$ (J) | $\pm 50$ (D)*<br>$\pm 75$ (W)*<br>$\pm 100$ (E)*<br>$\pm 150$ (K)*<br>$\pm 200$ (F)* | 0.5m $\Omega$ ~ 10m $\Omega$  | -55°C ~ +170°C                   |
| NCSR150  | 2010     | 1.5 Watt             | 3           |                                                 |                                                                                      | 0.5m $\Omega$ ~ 10m $\Omega$  |                                  |
| NCSR100  | 2512     | 1 Watt               | 1 & 2       |                                                 |                                                                                      | 0.5m $\Omega$ ~ 15m $\Omega$  |                                  |
| NCSR200  |          | 2 Watt               | 1 & 2       |                                                 |                                                                                      | 0.5m $\Omega$ ~ 10m $\Omega$  |                                  |
| NCSR250  |          | 2.5 Watt             | 2           |                                                 |                                                                                      | 4.0m $\Omega$ ~ 6.0m $\Omega$ |                                  |
| NCSR300  |          | 3 Watt               | 2           |                                                 |                                                                                      | 0.5m $\Omega$ ~ 3.0m $\Omega$ |                                  |

\*See Part Number Tables for Available Value/ TCR, \*\* See Part Number Tables for Case Type

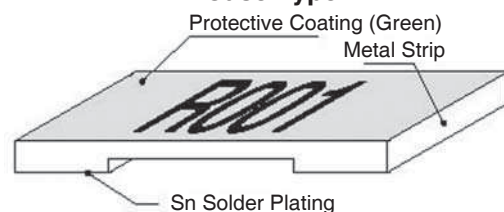
### ENVIRONMENTAL CHARACTERISTICS

| Item                                  | Specification     |           |           | Test Method                                                                                      |
|---------------------------------------|-------------------|-----------|-----------|--------------------------------------------------------------------------------------------------|
|                                       | Type 1            | Type 2    | Type 3    |                                                                                                  |
| Temperature Coefficient of Resistance | As Specified      |           |           | MIL-STD-202, Method 304<br>+25/-55/+25/+125/+25°C                                                |
| Thermal Shock                         | $\pm 0.5\%$       | $\pm 1\%$ | $\pm 1\%$ | MIL-STD-202, Method 107G<br>-55°C ~ +150°C, 100 cycles                                           |
| Short Time Overload                   | $\pm 0.5\%$       | $\pm 1\%$ | $\pm 1\%$ | JIS-C-5202-5.5<br>5x rated power for 5 seconds                                                   |
| Resistance to dry heat                | $\pm 1\%$         | $\pm 1\%$ | $\pm 1\%$ | JIS-C-5202-7.2<br>96 hrs @ 155°C without load                                                    |
| Load Life                             | $\pm 1\%$         | $\pm 1\%$ | $\pm 1\%$ | MIL-STD-202 Method 108<br>RCWV @ 70°C, cycles of 1.5 hours on, 0.5 hrs off for 1,000 ~ 1,048 hrs |
| Resistance to Soldering Heat          | $\pm 0.5\%$       | $\pm 1\%$ | $\pm 1\%$ | MIL-STD-202F Method 210E<br>260°C $\pm 5^\circ\text{C}$ for 10 sec. $\pm 1$ sec.                 |
| Solderability                         | 95% min. coverage |           |           | MIL-STD-202F Method 208H<br>245°C $\pm 5^\circ\text{C}$ for 5 sec. $\pm 0.5$ sec.                |

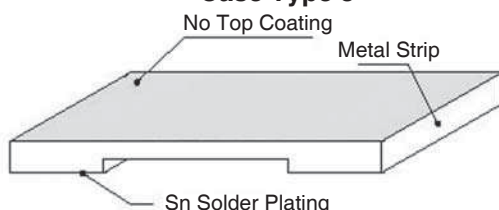
#### Case Type 1



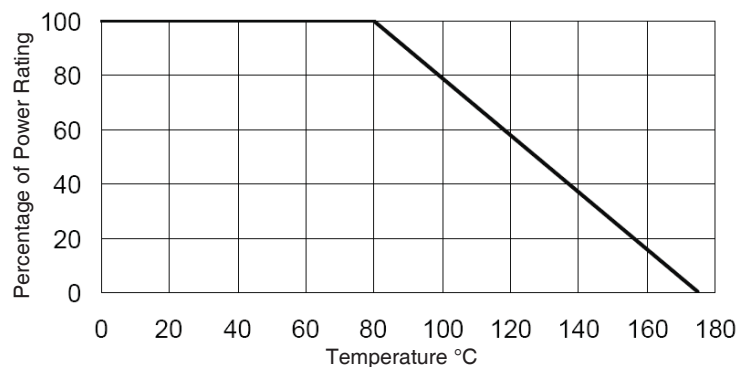
#### Case Type 2



#### Case Type 3



**Power Derating Curve:** For operation above 80°C, power rating must be derated according to the following chart:



### NCSR100S (1 WATT, 1206 CASE SIZE) AVAILABLE VALUES

| Part Number         | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L) | Width (W)  | Thickness (T) | Termination Width (P) | Case Type |
|---------------------|-----------------------|-------------------------------|---------------|------------|------------|---------------|-----------------------|-----------|
| NCSR100S*M50FTRT3F  | 0.5                   | ±1% (F)<br>±3% (H)<br>±5% (J) | ±200ppm (F)   | 3.20 ±0.25 | 1.60 ±0.10 | 0.60 ± 0.20   | 1.35 ±0.25            | 3         |
| NCSR100S*M75KTRT3F  | 0.75                  |                               | ±150ppm (K)   |            |            |               | 1.23 ± 0.25           |           |
| NCSR100S*R001DTRT3F | 1.0                   |                               | ±50ppm (D)    |            |            |               | 1.10 ±0.25            |           |
| NCSR100S*R002DTRT3F | 2.0                   |                               |               |            |            |               | 0.60 ±0.25            |           |
| NCSR100S*R003DTRT3F | 3.0                   |                               |               |            |            |               | 0.60 ±0.25            |           |
| NCSR100S*R004DTRT3F | 4.0                   |                               |               |            |            |               | 1.10 ±0.25            |           |
| NCSR100S*R005DTRT3F | 5.0                   |                               |               |            |            |               | 1.10 ±0.25            |           |
| NCSR100S*R006DTRT3F | 6.0                   |                               |               |            |            |               | 1.10 ±0.25            |           |
| NCSR100S*R007DTRT3F | 7.0                   |                               |               |            |            |               | 0.90 ±0.25            |           |
| NCSR100S*R008DTRT3F | 8.0                   |                               |               |            |            |               | 0.90 ±0.25            |           |
| NCSR100S*R009DTRT3F | 9.0                   |                               |               |            |            |               | 0.90 ±0.25            |           |
| NCSR100S*R010DTRT3F | 10                    |                               |               |            |            |               | 0.60 ±0.25            |           |

\* Insert appropriate tolerance code, Contact NIC regarding availability of other values

### NCSR100 (1 WATT, 2512 CASE SIZE) AVAILABLE VALUES

| Part Number       | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L)  | Width (W)   | Thickness (T) | Termination Width (P) | Case Type |  |
|-------------------|-----------------------|-------------------------------|---------------|-------------|-------------|---------------|-----------------------|-----------|--|
| NCSR100*M50DTRF   | 0.50                  | ±1% (F)<br>±3% (H)<br>±5% (J) | ±50ppm (D)    | 6.35±0.254  | 3.18 ±0.254 | 1.25 ± 0.20   | 1.30 ±0.38            | 1         |  |
| NCSR100*M75DTRF   | 0.75                  |                               |               |             |             | 0.75 ± 0.20   |                       |           |  |
| NCSR100*R001DTRF  | 1.0                   |                               |               |             |             | 0.65 ± 0.20   |                       |           |  |
| NCSR100*1M50DTRF  | 1.5                   |                               |               |             |             | 0.45 ± 0.20   |                       |           |  |
| NCSR100*R002DTRF  | 2.0                   |                               |               |             |             | 0.35 ± 0.20   |                       |           |  |
| NCSR100*2M50KTRF  | 2.5                   |                               | ±150ppm (K)   |             |             | 0.65 ± 0.20   |                       |           |  |
| NCSR100*R003KTRF  | 3.0                   |                               | 0.55 ± 0.20   |             |             |               |                       |           |  |
| NCSR100*R004ETRF  | 4.0                   |                               | ±100ppm (E)   |             |             | 0.45 ± 0.20   |                       |           |  |
| NCSR100*R005ETRF  | 5.0                   |                               | 0.35 ± 0.20   |             |             |               |                       |           |  |
| NCSR100*R006WTRF  | 6.0                   |                               | ±75ppm (W)    |             |             | 0.32 ± 0.20   |                       |           |  |
| NCSR100*6M50WTRF  | 6.5                   |                               | 0.30 ± 0.20   |             |             |               |                       |           |  |
| NCSR100*R007WTRF  | 7.0                   |                               | 0.27 ± 0.20   |             |             |               |                       |           |  |
| NCSR100*R010KTRF  | 10                    |                               | ±150ppm (K)   |             |             | 0.25 ± 0.20   |                       |           |  |
| NCSR100*R011DTRGF | 11                    |                               | ±50ppm (D)    | 6.35 ± 0.25 | 3.00 ± 0.20 | 0.60 ± 0.20   | 1.18 ± 0.25           | 2         |  |
| NCSR100*R012DTRGF | 12                    |                               |               |             |             |               |                       |           |  |
| NCSR100*R013DTRGF | 13                    |                               |               |             |             |               |                       |           |  |
| NCSR100*R014DTRGF | 14                    |                               |               |             |             |               |                       |           |  |
| NCSR100*R015DTRGF | 15                    |                               |               |             |             |               |                       |           |  |

\* Insert appropriate tolerance code

**NCSR150 (1.5 WATT, 2010 CASE SIZE) AVAILABLE VALUES**

| Part Number        | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L) | Width (W)  | Thickness (T) | Termination Width (P) | Case Type |
|--------------------|-----------------------|-------------------------------|---------------|------------|------------|---------------|-----------------------|-----------|
| NCSR150*M50FTRT3F  | 0.50                  | ±1% (F)<br>±3% (H)<br>±5% (J) | ±200ppm (F)   | 5.08 ±0.25 | 2.54 ±0.15 | 0.6 ±0.20     | 2.17 ± 0.25           | 3         |
| NCSR150*M75KTRT3F  | 0.75                  |                               | ±150ppm (K)   |            |            |               | 2.04 ± 0.25           |           |
| NCSR150*R001DTRT3F | 1.0                   |                               | ±50ppm (D)    |            |            |               | 1.84 ± 0.25           |           |
| NCSR150*R002DTRT3F | 2.0                   |                               |               |            |            |               | 1.54 ± 0.25           |           |
| NCSR150*R003DTRT3F | 3.0                   |                               |               |            |            |               | 1.04 ± 0.25           |           |
| NCSR150*R004DTRT3F | 4.0                   |                               |               |            |            |               | 1.84 ± 0.25           |           |
| NCSR150*R005DTRT3F | 5.0                   |                               |               |            |            |               | 1.84 ± 0.25           |           |
| NCSR150*R006DTRT3F | 6.0                   |                               |               |            |            |               | 1.54 ± 0.25           |           |
| NCSR150*R007DTRT3F | 7.0                   |                               |               |            |            |               | 1.54 ± 0.25           |           |
| NCSR150*R008DTRT3F | 8.0                   |                               |               |            |            |               | 1.54 ± 0.25           |           |
| NCSR150*R009DTRT3F | 9.0                   |                               |               |            |            |               | 1.29 ± 0.25           |           |
| NCSR150*R010DTRT3F | 10                    |                               |               |            |            |               | 1.29 ± 0.25           |           |

\* Insert appropriate tolerance code

**NCSR200 (2 WATT, 2512 CASE SIZE) AVAILABLE VALUES**

| Part Number       | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L)  | Width (W)   | Thickness (T) | Termination Width (P) | Case Type |  |
|-------------------|-----------------------|-------------------------------|---------------|-------------|-------------|---------------|-----------------------|-----------|--|
| NCSR200*M50DTRF   | 0.50                  | ±1% (F)<br>±3% (H)<br>±5% (J) | ±50ppm (D)    | 6.35 ±0.254 | 3.18 ±0.254 | 1.25 ± 0.20   | 1.30 ± 0.38           | 1         |  |
| NCSR200*M75DTRF   | 0.75                  |                               |               |             |             | 0.75 ± 0.20   |                       |           |  |
| NCSR200*R001DTRF  | 1.0                   |                               |               |             |             | 0.65 ± 0.20   |                       |           |  |
| NCSR200*1M50DTRF  | 1.5                   |                               |               |             |             | 0.45 ± 0.20   |                       |           |  |
| NCSR200*R002DTRF  | 2.0                   |                               |               |             |             | 0.35 ± 0.20   |                       |           |  |
| NCSR200*6M50DTRGF | 6.5                   |                               |               | 6.35 ± 0.25 | 3.00 ± 0.20 | 0.60 ± 0.20   | 1.43 ± 0.25           | 2         |  |
| NCSR200*R007DTRGF | 7.0                   |                               |               |             |             |               | 1.18 ± 0.25           |           |  |
| NCSR200*R008DTRGF | 8.0                   |                               |               |             |             |               |                       |           |  |
| NCSR200*R009DTRGF | 9.0                   |                               |               |             |             |               |                       |           |  |
| NCSR200*R010DTRGF | 10                    |                               |               |             |             |               |                       |           |  |

\* Insert appropriate tolerance code

**NCSR250 (2.5 WATT, 2512 CASE SIZE) AVAILABLE VALUES**

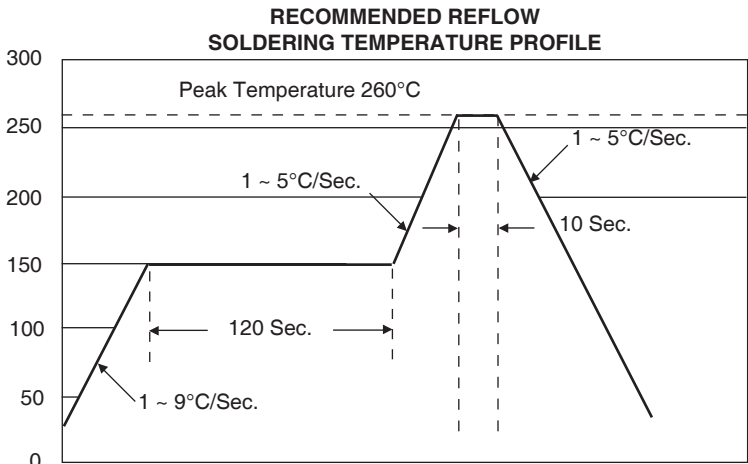
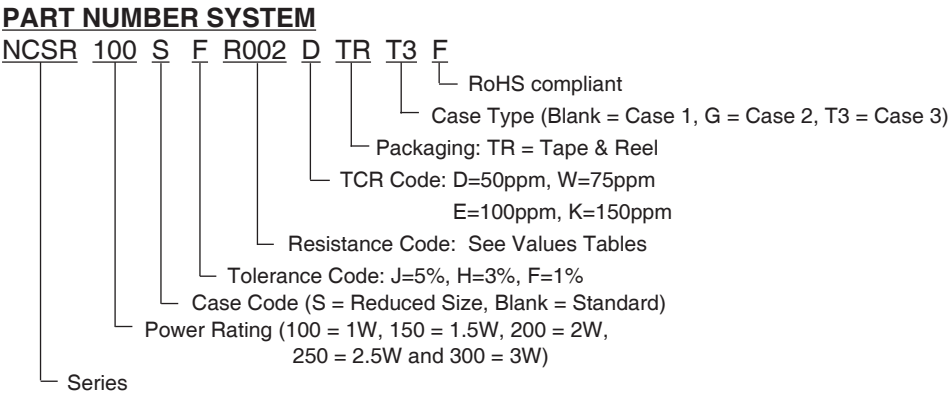
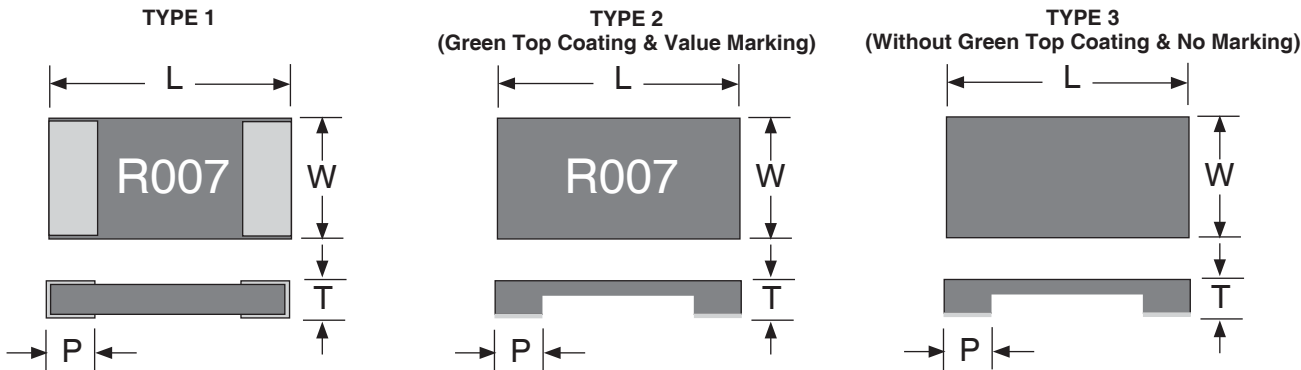
| Part Number       | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L) | Width (W)  | Thickness (T) | Termination Width (P) | Case Type |
|-------------------|-----------------------|-------------------------------|---------------|------------|------------|---------------|-----------------------|-----------|
| NCSR250_R004DTRGF | 4.0                   | ±1% (F)<br>±3% (H)<br>±5% (J) | ±50ppm (D)    | 6.35 ±0.25 | 3.00 ±0.20 | 0.60 ±0.20    | 2.18 ±0.25            | 2         |
| NCSR250*4M50DTRGF | 4.5                   |                               |               |            |            |               | 1.93 ±0.25            |           |
| NCSR250*R005DTRGF | 5.0                   |                               |               |            |            |               |                       |           |
| NCSR250*R006DTRGF | 6.0                   |                               |               |            |            |               |                       |           |

\* Insert appropriate tolerance code

NCSR300 (3 WATT, 2512 CASE SIZE) AVAILABLE VALUES

| Part Number       | Resistance Value (mΩ) | Available Tolerance           | Available TCR | Length (L) | Width (W)  | Thickness (T) | Termination Width (P) | Case Type |
|-------------------|-----------------------|-------------------------------|---------------|------------|------------|---------------|-----------------------|-----------|
| NCSR300*M50ETRGF  | 0.50                  | ±1% (F)<br>±3% (H)<br>±5% (J) | ±100ppm (E)   | 6.35 ±0.25 | 3.00 ±0.20 | 0.60 ±0.20    | 2.68 ±0.25            | 2         |
| NCSR300*M75ETRGF  | 0.75                  |                               |               |            |            |               | 2.48 ±0.25            |           |
| NCSR300*R001DTRGF | 1.0                   |                               | ±50ppm (D)    |            |            |               | 1.93 ±0.25            |           |
| NCSR300*1M50DTRGF | 1.5                   |                               |               |            |            |               | 1.43 ±0.25            |           |
| NCSR300*R002DTRGF | 2.0                   |                               |               |            |            |               | 1.18 ± 0.25           |           |
| NCSR300*2M50DTRGF | 2.5                   |                               |               |            |            |               |                       |           |
| NCSR300*R003DTRGF | 3.0                   |                               |               |            |            |               |                       |           |

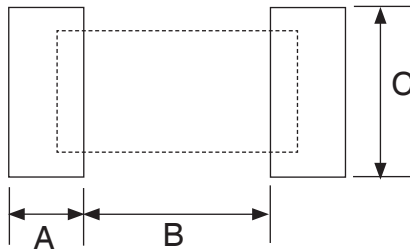
\* Insert appropriate tolerance code



### 2-WIRE LAND PATTERN DIM. (mm)

(no traces between pads to avoid short circuit)

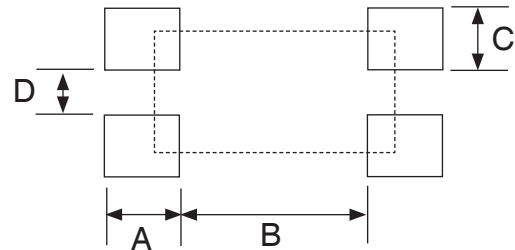
| Case Size | A    | B    | C    |
|-----------|------|------|------|
| 1206      | 1.90 | 1.40 | 1.80 |
| 2010      | 1.44 | 3.80 | 3.12 |
| 2512      | 1.80 | 4.75 | 3.6  |



### 4-WIRE LAND PATTERN DIM. (mm)

Recommended for precision current sensing  
(no traces between pads to avoid short circuit)

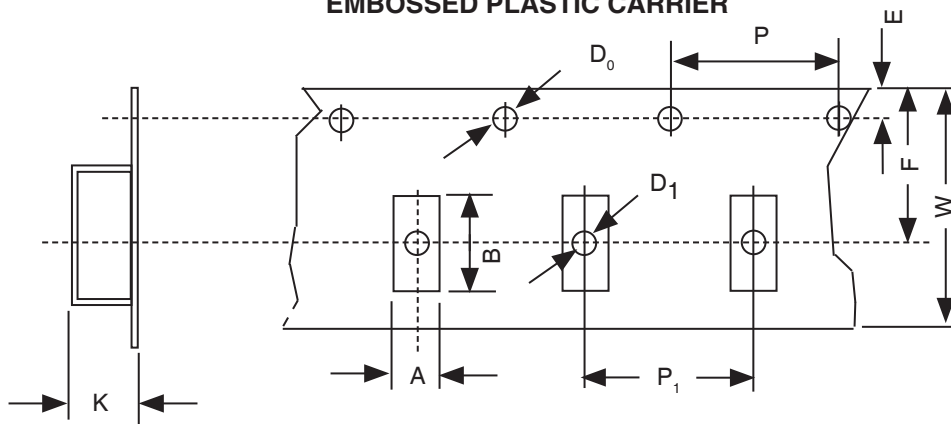
| Case Size | A    | B    | C    | D    |
|-----------|------|------|------|------|
| 2010      | 1.44 | 3.80 | 1.16 | 0.80 |
| 2512      | 1.80 | 4.75 | 1.45 | 1.00 |



### TAPE DIMENSIONS (mm)

| Case Size | Resistance Values | A         | B         | K         |           | P        | P <sub>1</sub> | E         | F          | D <sub>0</sub>        | W         | Quantity per Reel |
|-----------|-------------------|-----------|-----------|-----------|-----------|----------|----------------|-----------|------------|-----------------------|-----------|-------------------|
|           |                   |           |           | Case 1    | Case 2    |          |                |           |            |                       |           |                   |
| 1206      | All               | 2.0 ±0.15 | 3.60 ±0.2 | 0.87 ±0.1 | n/a       | 4.0 ±0.1 | 4.0 ±0.1       | 1.75 ±0.1 | 3.50 ±0.05 | 1.55 <sup>+1/-0</sup> | 8.0 ±0.2  | 2,000             |
| 2010      | All               | 2.85 ±0.1 | 5.55 ±0.1 | n/a       | 0.85 ±0.2 | 4.0 ±0.1 | 4.0 ±0.1       | 1.75 ±0.1 | 5.50 ±0.05 | 1.55 ±0.05            | 12.0 ±0.3 |                   |
| 2512      | 0.50              | 3.40 ±0.1 | 6.70 ±0.1 | 1.45 ±0.2 | 0.87 ±0.2 | 4.0 ±0.1 | 4.0 ±0.1       | 1.75 ±0.1 | 5.50 ±0.05 | 1.55 ±0.05            | 12.0 ±0.3 |                   |
|           | 0.75              | 3.50 ±0.1 | 6.80 ±0.1 | 0.87 ±0.2 |           | 4.0 ±0.1 | 4.0 ±0.1       | 1.75 ±0.1 | 5.50 ±0.05 | 1.55 ±0.05            | 12.0 ±0.3 |                   |
|           | 1 ~ 22            | 3.40 ±0.1 | 6.70 ±0.1 | 0.87 ±0.2 |           | 4.0 ±0.1 | 4.0 ±0.1       | 1.75 ±0.1 | 5.50 ±0.05 | 1.55 ±0.05            | 12.0 ±0.3 |                   |

### EMBOSSED PLASTIC CARRIER



#### Notice:

1. The cumulative tolerance of 10 sprocket hole pitch is ±0.2mm.
2. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
3. A & B measured 0.3mm from the inside bottom of the pocket
4. K measured at a point on the inside bottom of the pocket to the top surface of the carrier.
5. Pocket position relative to sprocket hole is measured as the true position of the pocket and not the pocket hole.

