

3.1 : 1 & 0

| | | | | | | | | | Ω | | Ω | |
|--|------------------|------|------|--------------|-------------------------------|----------|----------|----------|------|------|-------------|-------------|
| | | | | | | | | | | | | |
| | $\frac{1}{20}$ W | 25V | 50V | -200 +400 | ----- | 1 R 10 | 1 R 10 | 1 R 10 | 0.5A | 0.5A | 50m MAX. | 35m MAX. |
| | | | | ±200 | 47 R 1M | 10 R 10M | 10 R 10M | 10 R 10M | | | | |
| | $\frac{1}{16}$ W | 50V | 100V | ±100 | 100 R 1M | 10 R 1M | 10 R 22M | 10 R 22M | 1A | 1.5A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | ----- | 1 R 10 | 1 R 10 | | | | |
| | $\frac{1}{10}$ W | 75V | 150V | ±100 | 100 R 1M | 10 R 1M | 10 R 22M | 10 R 22M | 1A | 2A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | 1 R 10 | 1 R 10 | 1 R 10 | | | | |
| | $\frac{1}{8}$ W | 150V | 300V | ±100 | 100 R 1M | 10 R 10M | 10 R 27M | 10 R 27M | 2A | 2.5A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | 1 R 10 | 1 R 10 | 1 R 10 | | | | |
| | $\frac{1}{4}$ W | 200V | 400V | ±100 | 10 R 1M | 10 R 10M | 10 R 27M | 10 R 27M | 2A | 3.5A | 50m MAX. | 20m MAX. |
| | | | | ±200 | 3 R 10 | 1 R 10 | 1 R 10 | 1 R 10 | | | | |
| | $\frac{1}{2}$ W | 200V | 400V | ±100 | 100 R 1M | 10 R 10M | 10 R 27M | 10 R 27M | 2A | 4A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | ----- | 1 R 10 | 1 R 10 | | | | |
| | $\frac{3}{4}$ W | 200V | 400V | ±100 | 100 R 1M | 10 R 10M | 10 R 20M | 10 R 20M | 2A | 5A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | ----- | 1 R 10 | 1 R 10 | | | | |
| | 1W | 200V | 400V | ±100 | 100 R 1M | 10 R 10M | 10 R 20M | 10 R 20M | 2A | 7A | 50m MAX. | 20m MAX. |
| | | | | ±200 | ----- | ----- | 1 R 10 | 1 R 10 | | | | |
| | | | | | -55 ~ +155 (0201:-55 ~ +125) | | | | | | | |

DATA Center.

Series No. **60**

3.2 : 1

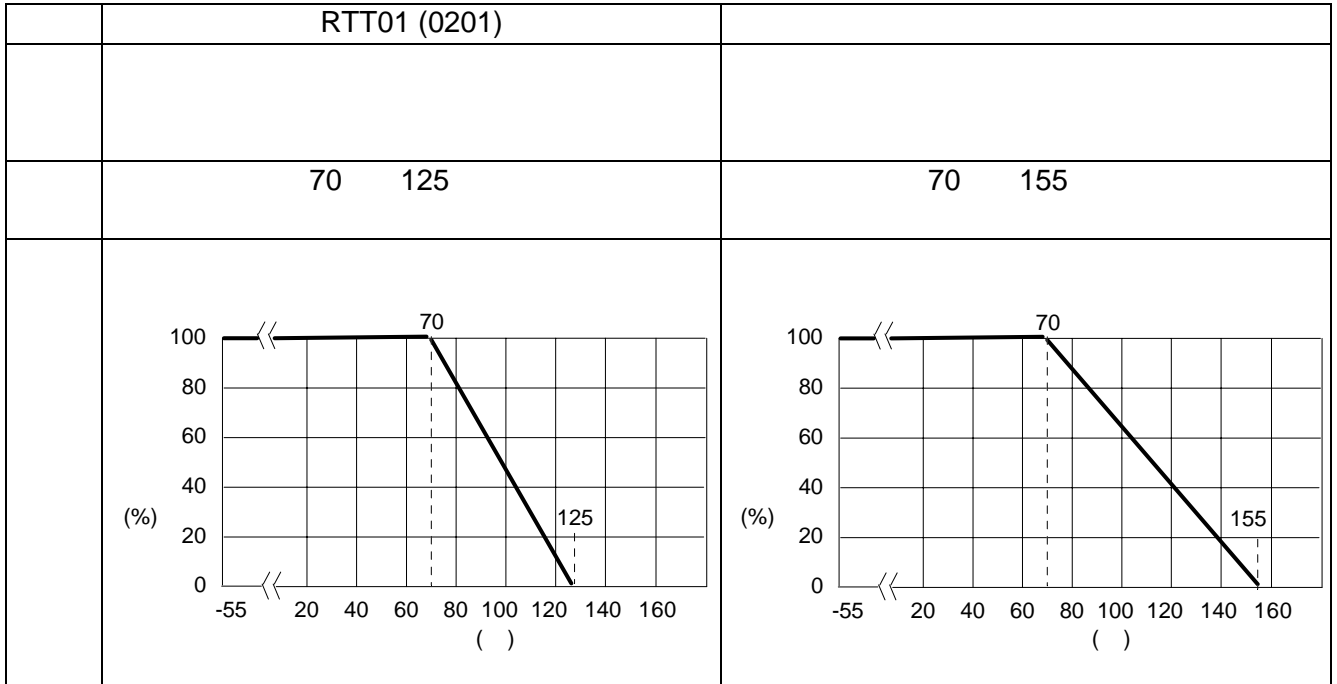
| 1/16W | 1.58A | 3.95A | ±1500 | 25 m | R 37 m |
|-------|-------|----------|-------|-------|----------|
| | | | ±1200 | 37 m | R 60 m |
| | | | ±600 | 60 m | R 200 m |
| | | | ±300 | 200 m | R 400 m |
| | | | ±250 | 400 m | R 600 m |
| | | | ±200 | 600 m | R 1000 m |
| 1/10W | 3.16A | 7.91A | ±1500 | 10 m | R 37 m |
| | | | ±1200 | 37 m | R 60 m |
| | | | ±600 | 60 m | R 100 m |
| | | | ±300 | 100 m | R 200 m |
| | | | ±600 | 200 m | R 500 m |
| | | | ±400 | 500 m | R 1000 m |
| 1/8W | 3.53A | 8.82A | ±1500 | 10 m | R 19 m |
| | | | ±1200 | 19 m | R 33 m |
| | | | ±800 | 33 m | R 50 m |
| | | | ±600 | 50 m | R 100 m |
| | | | ±200 | 100 m | R 1000 m |
| | | | 1/3W | 5.77A | 14.42A |
| ±1200 | 19 m | R 25 m | | | |
| ±1000 | 25 m | R 50 m | | | |
| ±600 | 50 m | R 100 m | | | |
| ±200 | 100 m | R 1000 m | | | |
| 1/2W | 7.07A | 17.67A | | | |
| | | | ±1000 | 19 m | R 25 m |
| | | | ±700 | 25 m | R 50 m |
| | | | ±400 | 50 m | R 100 m |
| | | | ±200 | 100 m | R 1000 m |
| | | | 3/4W | 8.66A | 21.65A |
| ±1200 | 19 m | R 25 m | | | |
| ±900 | 25 m | R 50 m | | | |
| ±500 | 50 m | R 100 m | | | |
| ±200 | 100 m | R 1000 m | | | |
| ±200 | 100 m | R 1000 m | | | |
| 3/4W | 8.66A | 21.65A | ±1500 | 10 m | R 19 m |
| | | | ±1200 | 19 m | R 25 m |
| | | | ±900 | 25 m | R 50 m |
| | | | ±500 | 50 m | R 100 m |
| | | | ±200 | 100 m | R 1000 m |
| | | | 1 W | 10A | 25A |
| ±1200 | 19 m | R 25 m | | | |
| ±900 | 25 m | R 50 m | | | |
| ±500 | 50 m | R 100 m | | | |
| ±200 | 100 m | R 1000 m | | | |
| | | | | | |

DATA Center.

Series No. 60

3.3

:



3.4

:

3.4.1

: 1

:

(rms.)

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

E= (V)

P= (W)

R= ()

3.4.2

: 1

:

(rms.)

$$= \sqrt{I}$$

I= (A)

P= (W)

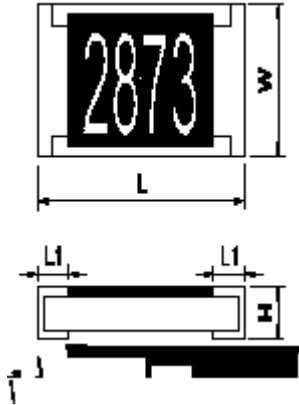
R= ()

DATA Center.

Series No. 60

4.1 : 1 & 0

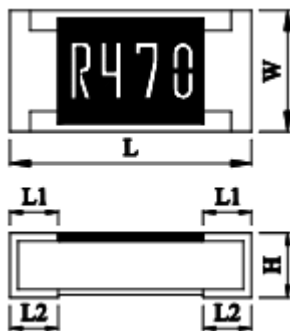
Unit:mm



| Dimension | | L | W | H | L1 | L2 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Type | Size Code | | | | | |
| | | 0.60±0.03 | 0.30±0.03 | 0.23±0.03 | 0.15±0.05 | 0.15±0.05 |
| | | 1.00±0.10 | 0.50±0.05 | 0.30±0.05 | 0.20±0.10 | 0.25±0.10 |
| | | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.15 | 0.30±0.15 |
| | | 2.00±0.10 | 1.25±0.10 | 0.50±0.10 | 0.35±0.20 | 0.35±0.15 |
| | | 3.05±0.10 | 1.55±0.10 | 0.50±0.10 | 0.45±0.20 | 0.35±0.15 |
| | | 4.40±0.20 | 3.15±0.20 | 0.47±0.20 | 0.60±0.20 | 0.60±0.01 |
| | | 3.05±0.10 | 2.55±0.10 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 |
| | | 5.00±0.20 | 2.50±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 |
| | | 6.30±0.20 | 3.20±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 |

4.2 : 1

Unit:mm

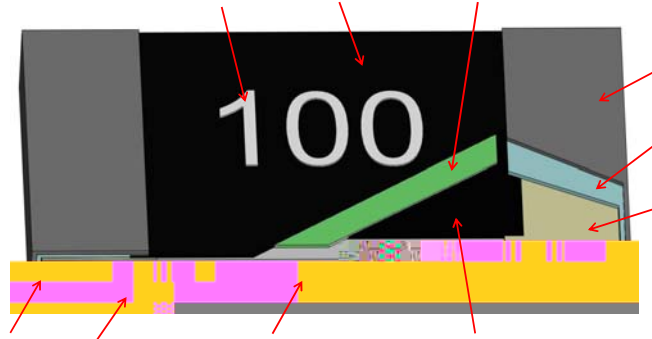


| Dimension | | L | W | H | L1 | L2 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Type | Size Code | | | | | |
| | | 1.00±0.10 | 0.50±0.05 | 0.30±0.10 | 0.25±0.10 | 0.20±0.15 |
| | | 1.60±0.10 | 0.80±0.10 | 0.45±0.10 | 0.25±0.15 | 0.35±0.15 |
| | | 2.00±0.10 | 1.25±0.10 | 0.50±0.10 | 0.35±0.20 | 0.35±0.20 |
| | | 3.05±0.10 | 1.55±0.10 | 0.50±0.10 | 0.45±0.20 | 0.55±0.25 |
| | | 3.05±0.10 | 2.55±0.10 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 |
| | | 4.40±0.20 | 3.15±0.20 | 0.47±0.20 | 0.60±0.20 | 0.60±0.01 |
| | | 5.00±0.20 | 2.50±0.20 | 0.60±0.10 | 0.65±0.20 | 0.65±0.20 |
| | | 6.30±0.20 | 3.20±0.20 | 0.60±0.10 | 0.65±0.20 | 0.65±0.20 |

DATA Center.

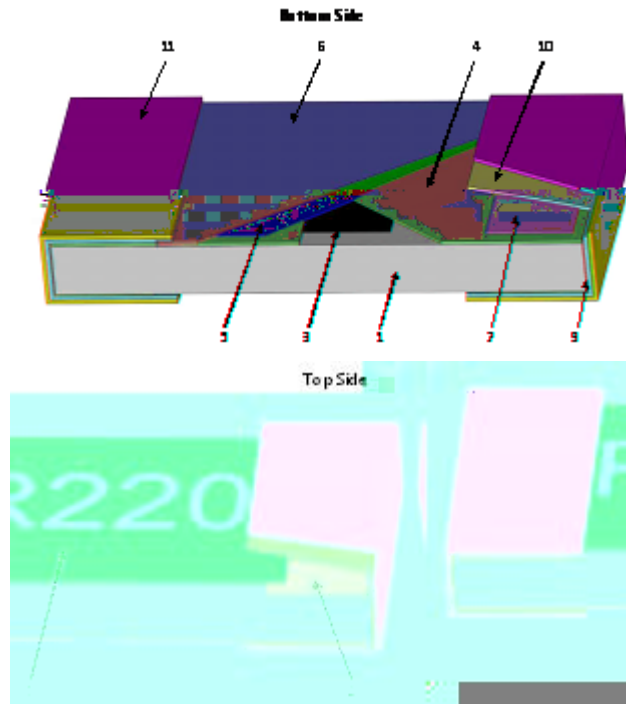
Series No. 60

5.1 : 1 & 0



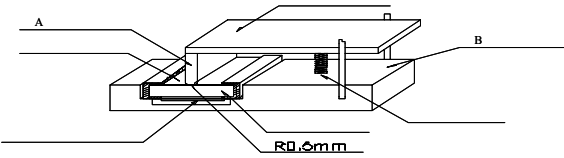
| | | | | | |
|---|-----|------------------------|----|-----|--------------------------|
| 1 | | Ceramic substrate | 6 | 2nd | 2nd Protective coating |
| 2 | | Bottom inner electrode | 7 | | Marking |
| 3 | | Top inner electrode | 8 | | Terminal inner electrode |
| 4 | | Resistive layer | 9 | Ni | Ni plating |
| 5 | 1st | 1st Protective coating | 10 | Sn | Sn plating |

5.2 : 1



| | | | | | |
|---|-----|-------------------------|----|-------|--------------------------|
| 1 | | Ceramic substrate | 7 | 2nd | 2nd Top inner electrode |
| 2 | 1st | 1st Top inner electrode | 8 | G2+MK | G2 layer+Marking |
| 3 | | Resistive layer | 9 | | Terminal inner electrode |
| 4 | | Bottom inner electrode | 10 | Ni | Ni plating |
| 5 | 1st | 1st Protective coating | 11 | Sn | Sn plating |
| 6 | 2nd | 2nd Protective coating | | | |

6.1 (Electrical Performance Test)

| Item | Conditions | | Specifications | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|--------------|--|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----|-------------------|------|------|----|----|----------------|----|----|-----|-----|-----------------|-------|----|-------|-------|-----------------|-------|-------|-------|---|----------------|----|---|--|--|----------------|----|
| | | | Resistors | Jumper | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Coefficient of Resistance | $TCR \text{ ppm/} \frac{R_2}{R_1} \frac{R_1}{T_2} \frac{R_1}{T_1} \times 10^6$ R1: () R2:-55 +125 () T1: () T2:-55 +125 () JIS-C5201-1 4.8 | | 3. | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Short Time Overload | 2.5 5 30 (3.) Jumper: : <table border="1"> <tr> <th>Jumper</th> <th>RTT01 (0201)</th> <th>RTT02 (0402)</th> <th>RTT03 (0603)</th> <th>RTT05 (0805)</th> <th>RTT06 (1206)</th> <th>RTT12 (1210)</th> <th>RTT18 (1812)</th> <th>RTT20 (2010)</th> <th>RTT25 (2512)</th> </tr> <tr> <td>±5%</td> <td>1.25A</td> <td>2.5A</td> <td>2.5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> </tr> <tr> <td>±1%</td> <td>1.25A</td> <td>3.75A</td> <td>5A</td> <td>6.25A</td> <td>8.75A</td> <td>10A</td> <td>12.5A</td> <td>12.5A</td> <td>17.5A</td> </tr> </table> JIS-C5201-1 4.13 | | Jumper | RTT01 (0201) | RTT02 (0402) | RTT03 (0603) | RTT05 (0805) | RTT06 (1206) | RTT12 (1210) | RTT18 (1812) | RTT20 (2010) | RTT25 (2512) | ±5% | 1.25A | 2.5A | 2.5A | 5A | 5A | 5A | 5A | 5A | 5A | ±1% | 1.25A | 3.75A | 5A | 6.25A | 8.75A | 10A | 12.5A | 12.5A | 17.5A | 1. : 1 0.1% 0.5% 1%:±(1.0%+0.05) 2% 5%:±(2.0%+0.10) 2. : 1 1% 2% 5% :±(2.0%+0.001) | 3. | | | | | | |
| Jumper | RTT01 (0201) | RTT02 (0402) | RTT03 (0603) | RTT05 (0805) | RTT06 (1206) | RTT12 (1210) | RTT18 (1812) | RTT20 (2010) | RTT25 (2512) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ±5% | 1.25A | 2.5A | 2.5A | 5A | 5A | 5A | 5A | 5A | 5A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ±1% | 1.25A | 3.75A | 5A | 6.25A | 8.75A | 10A | 12.5A | 12.5A | 17.5A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insulation Resistance | 100 VDC () JIS-C5201-1 4.6  | | 10 ⁹ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dielectric Withstand Voltage | VAC () RTT05 06 12 18 20 25 500 VAC RTT01 02 03 300 VAC JIS-C5201-1 4.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intermittent Overload | 2.5 1 ON 25 OFF 10000+400/-0 60 Jumper: <table border="1"> <tr> <th>Jumper</th> <th>RTT01 (0201)</th> <th>RTT02 (0402)</th> <th>RTT03 (0603)</th> <th>RTT05 (0805)</th> <th>RTT06 (1206)</th> <th>RTT12 (1210)</th> <th>RTT18 (1812)</th> <th>RTT20 (2010)</th> <th>RTT25 (2512)</th> </tr> <tr> <td>±5%</td> <td>1.25A</td> <td>2.5A</td> <td>2.5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> <td>5A</td> </tr> <tr> <td>±1%</td> <td>1.25A</td> <td>3.75A</td> <td>5A</td> <td>6.25A</td> <td>8.75A</td> <td>10A</td> <td>12.5A</td> <td>12.5A</td> <td>17.5A</td> </tr> </table> JIS-C5201-1 4.13 | | Jumper | RTT01 (0201) | RTT02 (0402) | RTT03 (0603) | RTT05 (0805) | RTT06 (1206) | RTT12 (1210) | RTT18 (1812) | RTT20 (2010) | RTT25 (2512) | ±5% | 1.25A | 2.5A | 2.5A | 5A | 5A | 5A | 5A | 5A | 5A | ±1% | 1.25A | 3.75A | 5A | 6.25A | 8.75A | 10A | 12.5A | 12.5A | 17.5A | 1. : 1 ±(5.0%+0.10) 2. : 1 ±(5.0%+0.001) | 3. | | | | | | |
| Jumper | RTT01 (0201) | RTT02 (0402) | RTT03 (0603) | RTT05 (0805) | RTT06 (1206) | RTT12 (1210) | RTT18 (1812) | RTT20 (2010) | RTT25 (2512) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ±5% | 1.25A | 2.5A | 2.5A | 5A | 5A | 5A | 5A | 5A | 5A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ±1% | 1.25A | 3.75A | 5A | 6.25A | 8.75A | 10A | 12.5A | 12.5A | 17.5A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Noise Level | JIS-C5201-1 4.12 | | <table border="1"> <thead> <tr> <th colspan="4"></th> <th>(Noise)</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>100</td> <td></td> <td></td> <td>-10db (0.32 uV/V)</td> </tr> <tr> <td>100</td> <td>R</td> <td>1K</td> <td></td> <td>0db (1.0 uV/V)</td> </tr> <tr> <td>1K</td> <td>R</td> <td>10K</td> <td></td> <td>10db (3.2 uV/V)</td> </tr> <tr> <td>10K</td> <td>R</td> <td>100K</td> <td></td> <td>15db (5.6 uV/V)</td> </tr> <tr> <td>100K</td> <td>R</td> <td>1M</td> <td></td> <td>20db (10 uV/V)</td> </tr> <tr> <td>1M</td> <td>R</td> <td></td> <td></td> <td>30db (32 uV/V)</td> </tr> </tbody> </table> | | | | | | (Noise) | R | 100 | | | -10db (0.32 uV/V) | 100 | R | 1K | | 0db (1.0 uV/V) | 1K | R | 10K | | 10db (3.2 uV/V) | 10K | R | 100K | | 15db (5.6 uV/V) | 100K | R | 1M | | 20db (10 uV/V) | 1M | R | | | 30db (32 uV/V) | NA |
| | | | | (Noise) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R | 100 | | | -10db (0.32 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | R | 1K | | 0db (1.0 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1K | R | 10K | | 10db (3.2 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10K | R | 100K | | 15db (5.6 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100K | R | 1M | | 20db (10 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1M | R | | | 30db (32 uV/V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

DATA Center.

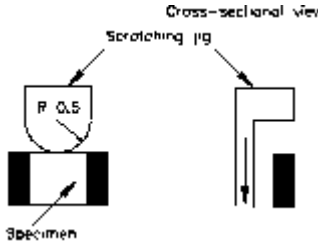
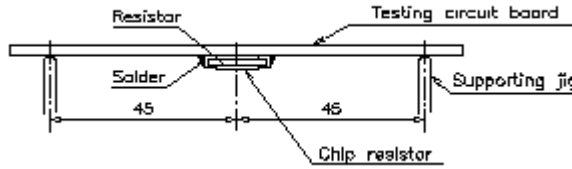
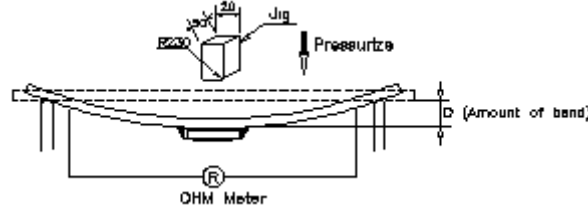
Series No. 60

6.2 (Mechanical Performance Test)

| Item | Conditions | Specifications | | | | | | | |
|------------------------------|--|--|--------|-------|--|--------------|-------------------|-------------------|----|
| | | Resistors | Jumper | | | | | | |
| Core Body Strength | R0.5 10N 1.02 kgf 10 sec. 1.RTT02 RTT03 R0.2 2.RTT05 06 12 18 20 25 R0.5 JIS-C5201-1 4.15 | 1. : 1 $\pm(1.0\%+0.05)$ 2. : 1 $\pm(1.0\%+0.001)$ | 3. | | | | | | |
| Terminal Strength | : 5N 10 sec (RTT01:3N) : JIS-C5201-1 4.16 | : : RTT01 3N 5N | | | | | | | |
| Resistance to Solvent | 20~25 5 \pm 0.5 48 hr JIS-C5201-1 4.29 | 1. : 1 <table border="1" data-bbox="1002 831 1394 898"> <tr> <td></td> <td>RTT01</td> <td></td> </tr> <tr> <td>$\Delta R\%$</td> <td>$\pm(1.0\%+0.05)$</td> <td>$\pm(0.5\%+0.05)$</td> </tr> </table> 2. : 1 $\pm(1.0\%+0.001)$ G2 Leaching | | RTT01 | | $\Delta R\%$ | $\pm(1.0\%+0.05)$ | $\pm(0.5\%+0.05)$ | 3. |
| | RTT01 | | | | | | | | |
| $\Delta R\%$ | $\pm(1.0\%+0.05)$ | $\pm(0.5\%+0.05)$ | | | | | | | |
| Solderability | : PCT 105 100% 1.22 \times 10 ⁵ pa 4 2 235 \pm 5 2 JIS-C5201-1 4.17 | 95% | | | | | | | |
| Resistance to Soldering Heat | (): 60 260+5/-0 10 +1/-0 (): 260+5/-0 30+1/-0 (): :350 \pm 10 :3+1/-0 sec. 60 JIS-C5201-1 4.18 | : (1). : 1 $\Delta R\%=\pm(1.0\%+0.05)$ 2. : 1 $\Delta R\%=\pm(1.0\%+0.001)$ (2). : (1). : 95% (2). () : (1). : 1 $\Delta R\%=\pm(1.0\%+0.05)$ 2. : 1 $\Delta R\%=\pm(1.0\%+0.001)$ (2). | 3. | | | | | | |

DATA Center.

Series No. **60**

| Item | Conditions | Specifications | |
|--------------------------|---|--|--------|
| | | Resistors | Jumper |
| Joint Strength of Solder | <p>: PCT 105 100%</p> <p>$1.22 \times 10^5 \text{ pa}$ 2 (): 4</p> <p>R0.5 (0201:R0.1) sec 10</p> <p>: 1.RTT01=5N 2.RTT02=10N 3. =20N</p>  <p>JIS-C5201-1 4.32 (): (D): RTT02 03 05=5mm RTT01 06 12=3mm RTT18 20 25=2mm</p>   <p>JIS-C5201-1 4.33</p> | <p>(1). : 1 $\Delta R\% = \pm(1.0\% + 0.05)$</p> <p>2. : 1 $\Delta R\% = \pm(1.0\% + 0.001)$</p> <p>(2). : (1). : 1 $\Delta R\% = \pm(1.0\% + 0.05)$</p> <p>2. : 1 $\Delta R\% = \pm(1.0\% + 0.001)$</p> <p>(2).</p> | 3. |
| Vibration | <p>: 10 Hz ~ 55 Hz ~ 10 Hz/ : 1.5 mm : 6 hr (X.Y.Z3 2 hr) JIS-C5201-1 4.22</p> | <p>1. : 1 0.1% 0.5% 1%: $\pm(0.5\% + 0.05)$ 2% 5%: $\pm(1.0\% + 0.05)$</p> <p>2. : <1 1% 2% 5%: $\pm(1.0\% + 0.001)$</p> | 3. |

DATA Center.

Series No. 60

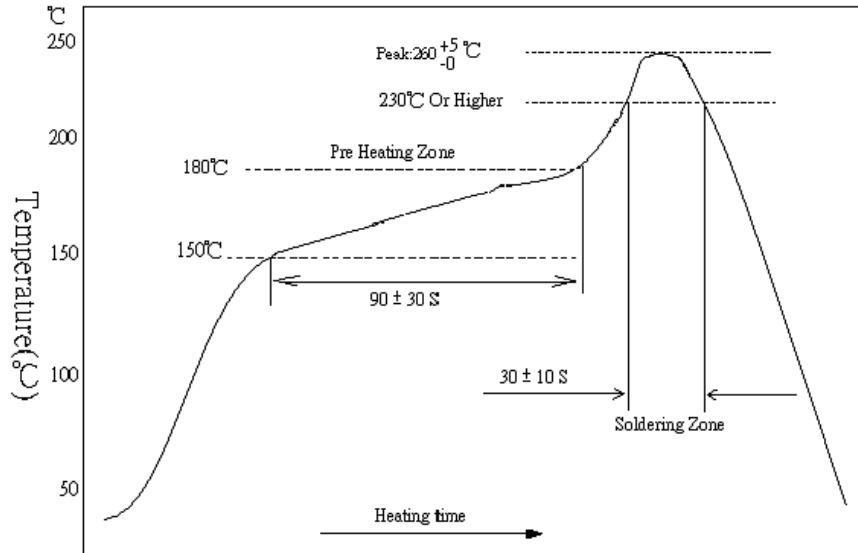
| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

6.3 (Environmental Test)

| Item | Conditions | Specifications | |
|------------------------|------------|----------------|--------|
| | | Resistors | Jumper |
| Resistance to Dry Heat | | | |

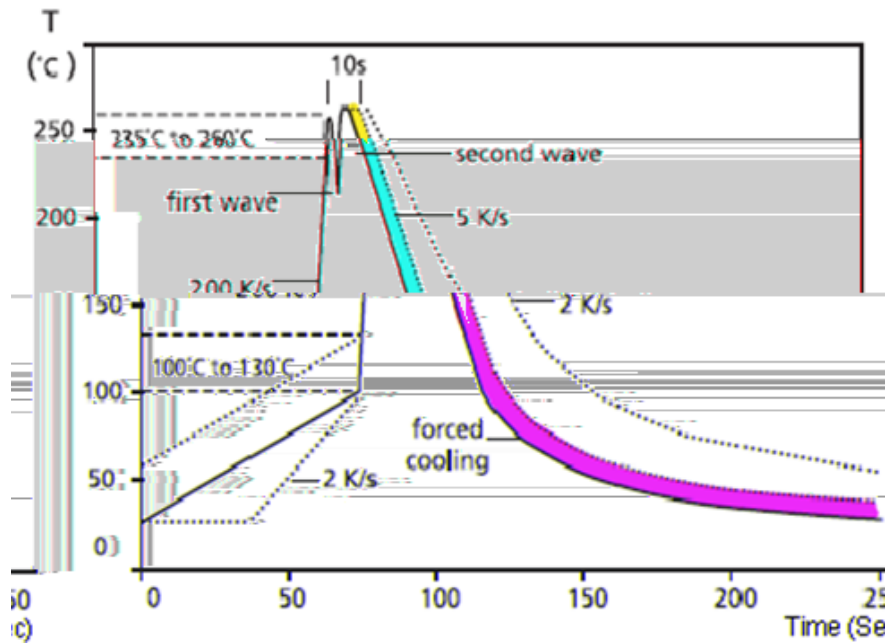
| | | |
|--|--|----------------------|
| | | DATA Center. |
| | | Series No. 60 |

7.1 Lead Free IR Reflow Soldering Profile



: $260^{+5/-0}$,10

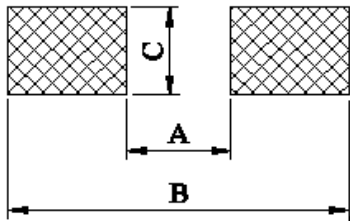
7.2 Lead Free Double-Wave Soldering Profile(0603())



7.3 : 350 ± 10 3

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

Unit:mm



| | A | B | C |
|--|-----|-----|-----|
| | 0.3 | 1.0 | 0.4 |
| | 0.5 | 1.5 | 0.6 |
| | 0.8 | 2.1 | 0.9 |
| | 1.2 | 3.0 | 1.3 |
| | 2.2 | 4.2 | 1.6 |
| | 2.2 | 4.2 | 2.8 |
| | 3.1 | 5.9 | 3.0 |
| | 3.5 | 6.1 | 2.8 |
| | 3.8 | 8.0 | 3.5 |

9.1 : 2 μ

9.2 : 3 μ

9.3

| | | Unit : mm | |
|--|--|-----------|-------|
| | | | |
| | | \pm | \pm |
| | | \pm | \pm |
| | | \pm | \pm |
| | | \pm | \pm |
| | | \pm | \pm |

⊙ **Current Terminal**

⊖ **Voltage Terminal**

2.90 \pm

DATA Center.

Series No. **60**

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| | | DATA Center. |
| | | Series No. 60 |