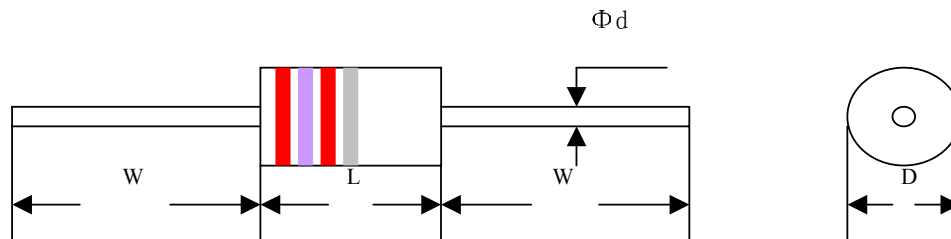


THE FIXED CARBON COMPOSITION RESISTORS

1. Dimensions:



2. Rating and Dimensions:

| Type | Rated Power (W) | Dimensions in mm | | | | Max Rated Voltage (v) | Max Overload Voltage (v) | Resistance range (Ω) |
|----------|-----------------|------------------|---------------|------------|-----------------|-----------------------|--------------------------|-------------------------------|
| | | L | D | W | d | | | |
| RS11-1/2 | 0.5 | 9.5 ± 0.8 | 3.5 ± 0.2 | 26 ± 2 | 0.69 ± 0.01 | 350 | 500 | 4.7 to 22M |

3. Sold Resistance in Packs

1/2WATT

| SHARMA Type # | Ω | SHARMA Type # | Ω | SHARMA Type # | Ω | SHARMA Type # | Ω |
|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| RS11-1/2W-4R7 | 4.7 | RS11-1/2W-18 | 18 | RS11-1/2W-75 | 75 | RS11-1/2W-300 | 300 |
| RS11-1/2W-5R1 | 5.1 | RS11-1/2W-20 | 20 | RS11-1/2W-82 | 82 | RS11-1/2W-330 | 330 |
| RS11-1/2W-5R6 | 5.6 | RS11-1/2W-22 | 22 | RS11-1/2W-91 | 91 | RS11-1/2W-360 | 360 |
| RS11-1/2W-6R2 | 6.2 | RS11-1/2W-24 | 24 | RS11-1/2W-100 | 100 | RS11-1/2W-390 | 390 |
| RS11-1/2W-6R8 | 6.8 | RS11-1/2W-27 | 27 | RS11-1/2W-110 | 110 | RS11-1/2W-430 | 430 |
| RS11-1/2W-7R5 | 7.5 | RS11-1/2W-30 | 30 | RS11-1/2W-120 | 120 | RS11-1/2W-470 | 470 |
| RS11-1/2W-8R2 | 8.2 | RS11-1/2W-33 | 33 | RS11-1/2W-130 | 130 | RS11-1/2W-510 | 510 |
| RS11-1/2W-9R1 | 9.1 | RS11-1/2W-36 | 36 | RS11-1/2W-150 | 150 | RS11-1/2W-560 | 560 |
| RS11-1/2W-10 | 10 | RS11-1/2W-39 | 39 | RS11-1/2W-160 | 160 | RS11-1/2W-620 | 620 |
| RS11-1/2W-11 | 11 | RS11-1/2W-43 | 43 | RS11-1/2W-180 | 180 | RS11-1/2W-680 | 680 |
| RS11-1/2W-12 | 12 | RS11-1/2W-47 | 47 | RS11-1/2W-200 | 200 | RS11-1/2W-750 | 750 |
| RS11-1/2W-13 | 13 | RS11-1/2W-51 | 51 | RS11-1/2W-220 | 220 | RS11-1/2W-820 | 820 |
| RS11-1/2W-15 | 15 | RS11-1/2W-62 | 62 | RS11-1/2W-240 | 240 | RS11-1/2W-910 | 910 |
| RS11-1/2W-16 | 16 | RS11-1/2W-68 | 68 | RS11-1/2W-270 | 270 | RS11-1/2W-1K | 1.0K |

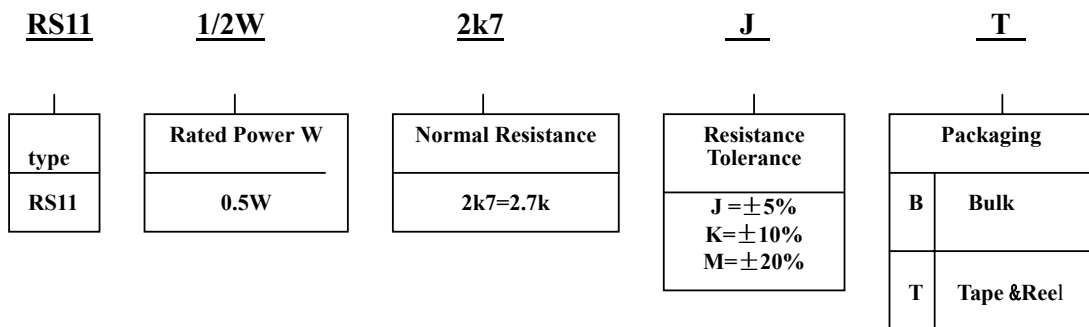
Sharma Resistors

1/2WATT (Cont.)

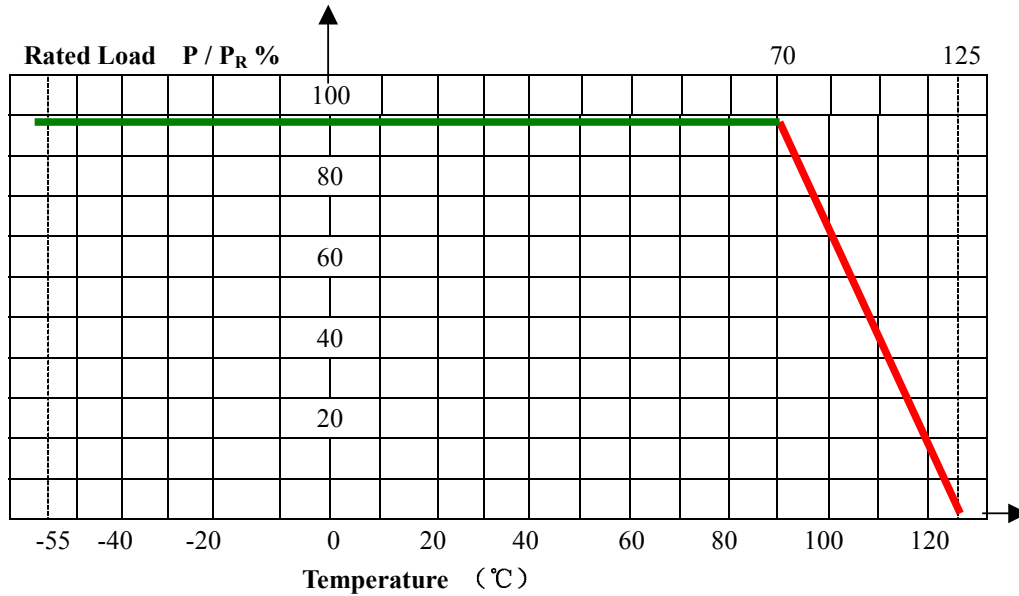
| SHARMA Type# | Ω | SHARMA Type # | Ω | SHARMA Type # | Ω | SHARMA Type # | Ω |
|---------------|------|----------------|------|----------------|------|---------------|------|
| RS11-1/2W-1K1 | 1.1K | RS11-1/2W-13K | 13K | RS11-1/2W-160K | 160K | RS11-1/2W-2M | 2.0M |
| RS11-1/2W-1K2 | 1.2K | RS11-1/2W-15K | 15K | RS11-1/2W-180K | 180K | RS11-1/2W-2M2 | 2.2M |
| RS11-1/2W-1K3 | 1.3K | RS11-1/2W-16K | 16K | RS11-1/2W-200K | 200K | RS11-1/2W-2M4 | 2.4M |
| RS11-1/2W-1K5 | 1.5K | RS11-1/2W-18K | 18K | RS11-1/2W-220K | 220K | RS11-1/2W-2M7 | 2.7M |
| RS11-1/2W-1K6 | 1.6K | RS11-1/2W-20K | 20K | RS11-1/2W-240K | 240K | RS11-1/2W-3M0 | 3.0M |
| RS11-1/2W-1K8 | 1.8K | RS11-1/2W-22K | 22K | RS11-1/2W-270K | 270K | RS11-1/2W-3M3 | 3.3M |
| RS11-1/2W-2K | 2.0K | RS11-1/2W-24K | 24K | RS11-1/2W-300K | 300K | RS11-1/2W-3M6 | 3.6M |
| RS11-1/2W-2K2 | 2.2K | RS11-1/2W-27K | 27K | RS11-1/2W-330K | 330K | RS11-1/2W-3M9 | 3.9M |
| RS11-1/2W-2K4 | 2.4K | RS11-1/2W-30K | 30K | RS11-1/2W-360K | 360K | RS11-1/2W-4M3 | 4.3M |
| RS11-1/2W-2K7 | 2.7K | RS11-1/2W-33K | 33K | RS11-1/2W-390K | 390K | RS11-1/2W-4M7 | 4.7M |
| RS11-1/2W-3K | 3.0K | RS11-1/2W-36K | 36K | RS11-1/2W-430K | 430K | RS11-1/2W-5M1 | 5.1M |
| RS11-1/2W-3K3 | 3.3K | RS11-1/2W-39K | 39K | RS11-1/2W-470K | 470K | RS11-1/2W-5M6 | 5.6M |
| RS11-1/2W-3K6 | 3.6K | RS11-1/2W-43K | 43K | RS11-1/2W-510K | 510K | RS11-1/2W-6M2 | 6.2M |
| RS11-1/2W-3K9 | 3.9K | RS11-1/2W-47K | 47K | RS11-1/2W-560K | 560K | RS11-1/2W-6M8 | 6.8M |
| RS11-1/2W-4K3 | 4.3K | RS11-1/2W-51K | 51K | RS11-1/2W-620K | 620K | RS11-1/2W-7M5 | 7.5M |
| RS11-1/2W-4K7 | 4.7K | RS11-1/2W-56K | 56K | RS11-1/2W-680K | 680K | RS11-1/2W-8M2 | 8.2M |
| RS11-1/2W-5K1 | 5.1K | RS11-1/2W-62K | 62K | RS11-1/2W-750K | 750K | RS11-1/2W-9M1 | 9.1M |
| RS11-1/2W-5K6 | 5.6K | RS11-1/2W-68K | 68K | RS11-1/2W-820K | 820K | RS11-1/2W-10M | 10M |
| RS11-1/2W-6K2 | 6.2K | RS11-1/2W-75K | 75K | RS11-1/2W-910K | 910K | RS11-1/2W-11M | 11M |
| RS11-1/2W-6K8 | 6.8K | RS11-1/2W-82K | 82K | RS11-1/2W-1M | 1.0M | RS11-1/2W-12M | 12M |
| RS11-1/2W-7K5 | 7.5K | RS11-1/2W-91K | 91K | RS11-1/2W-1M1 | 1.1M | RS11-1/2W-13M | 13M |
| RS11-1/2W-8K2 | 8.2K | RS11-1/2W-100K | 100K | RS11-1/2W-1M2 | 1.2M | RS11-1/2W-15M | 15M |
| RS11-1/2W-9K1 | 9.1K | RS11-1/2W-110K | 110K | RS11-1/2W-1M3 | 1.3M | RS11-1/2W-16M | 16M |
| RS11-1/2W-10K | 10K | RS11-1/2W-120K | 120K | RS11-1/2W-1M5 | 1.5M | RS11-1/2W-18M | 18M |
| RS11-1/2W-11K | 11K | RS11-1/2W-130K | 130K | RS11-1/2W-1M6 | 1.6M | RS11-1/2W-20M | 20M |
| RS11-1/2W-12K | 12K | RS11-1/2W-150K | 150K | RS11-1/2W-1M8 | 1.8M | RS11-1/2W-22M | 22M |

4. Part Numbering System:

Example:



5. Derating Curve :



6. Resistance Temperature Characteristics:

| Resistance range | Max. Resistance Characteristics $\pm(\Delta R^*/R)\%$ | |
|-------------------------------|--|---|
| | Temperature range | Temperature range |
| | -55°C to $+20^{\circ}\text{C}$ | $+20^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ |
| 1k Ω and under | ± 6.5 | ± 6.5 |
| 1.1k Ω to 10k Ω | ± 10 | ± 8 |
| 11k Ω to 100k Ω | ± 13 | ± 10 |
| 110k Ω to 1M Ω | ± 15 | ± 13 |
| 1.1M Ω to 10M Ω | ± 20 | ± 19.5 |
| 11M Ω and over | ± 25 | ± 19.5 |

* $\Delta R = R_2 - R_1$
R₁: Resistance value at reference temperature
R₂: Resistance value at test temperature

7. Mechanical and Electronic Performance

| Description | Test method | Performance Requirements |
|-------------|--|---|
| (Vibration) | Frequency range: 10HZ ~ 500Hz Amplitude: 0.75mm Total last time: 6h | No visible damage $(R \leq \pm (2\%R + 0.1 \Omega))$. |

Sharma Resistors

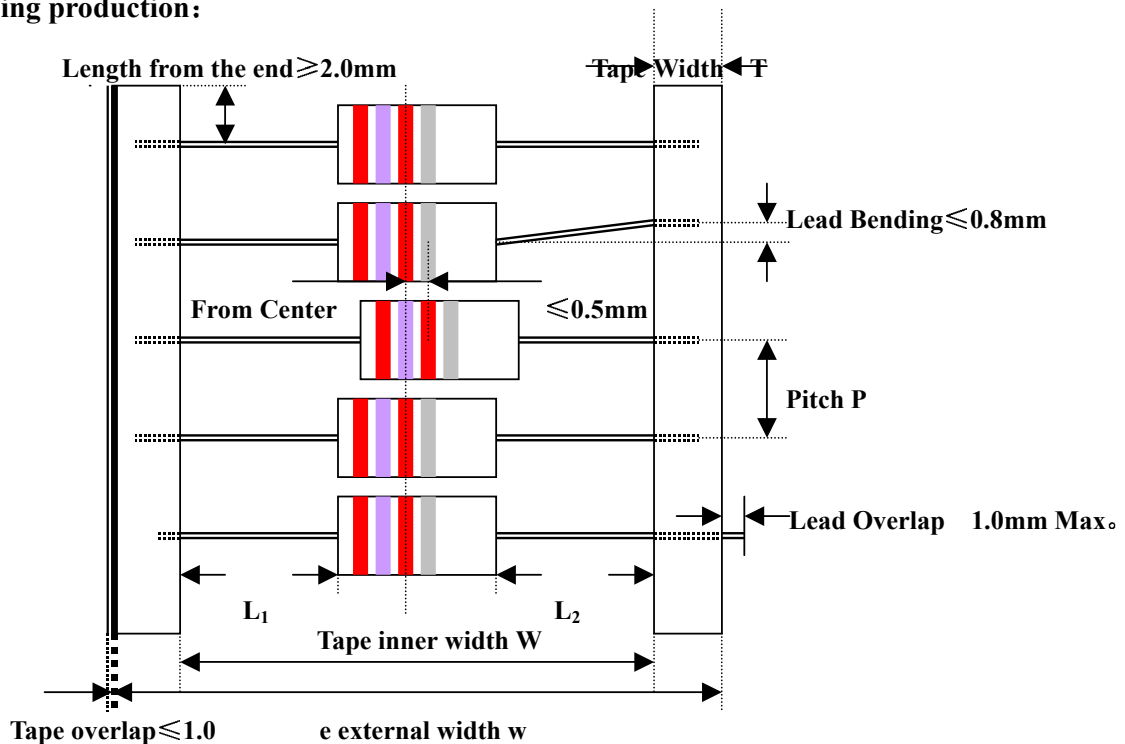
8. Mechanical and Electronic Performance Cont. :

| Description | | Test method | Performance Requirements |
|---|----------------|--|--|
| Terminal Strength | Pull | Along the longitudinal axis of the terminal leads 20N, 5S | No visible damage ($R \leq \pm (2\%R + 0.1 \Omega)$). |
| | Bending | Bending two times, Once in each direction | |
| | Twist | Twist 180° two times | |
| Resistance to Soldering Heat | | Solder temperature: $350 \pm 10^\circ\text{C}$ Immerge time : $3.5 \pm 0.5\text{S}$ Depth from the body of the resistor: $2^{+0.5}$ mm | No visible damage ($R \leq \pm (2\%R + 0.1 \Omega)$). |
| Solderability | | Solder temperature : $235 \pm 5^\circ\text{C}$ Dwell time in solder: $3 \pm 0.5\text{S}$ Depth from the body of the resistor: 2 ± 0.5 mm | At least 95% of the dipping surface must be covered by new solder, no flaws gathered |
| Voltage Coefficient (Application in 1KΩ to 10MΩ) | | Use 10%Resistance rated voltage and 100%Resistance rated voltage to test resistance value | A total resistance change of $\pm 2\%$ max. or $\pm 0.035\%/V$ |
| Short time overload | | 2.5 times of rated voltage or times of Max. rated voltage (selecting lower) 5S. | No visible damage ($R \leq \pm (2\%R + 0.1 \Omega)$) |
| Dielectric withstanding voltage | | Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively Specified in the above list for $60 \pm 5\text{s}$, | No evidence of arcing or insulation breakdown |

9. Mechanical and Electronic Performance Cont. :

| Description | Test method | Performance Requirements |
|-------------------------|--|---|
| Temperature fast change | $\theta_A: -55^\circ\text{C}$ $\theta_B: +125^\circ\text{C}$ Shape check Resistance | No visible damage $(R \leq \pm (2\%R + 0.1 \Omega))$. |
| 70°C endurance | Last out time : 1000h When 48h, 500h and 1000h check: Shape check resistance When 1000h check: Insulation Resistance | No visible damage, Mark clarity $\Delta R \leq \pm (10\%R + 0.5 \Omega)$ $R \geq 1G \Omega$ |
| Fixing state Damp heat | Shape check Resistance Insulation Resistance | No visible damage, Mark clarity $\Delta R \leq \pm (10\%R + 0.5 \Omega)$ $R \geq 100M \Omega$ |

10. Taping production:



Sharma Resistors

| Tape Style | Taping Dimensions mm | | | | |
|------------|----------------------|----------|---------|---------|--------------------------------|
| | W | A | T | P | L ₁ -L ₂ |
| T-52 | 52±1.0 | 64.5±0.5 | 6.0±1.0 | 5.0±0.3 | 0±1.0 |

11. Products Package:

a. In bulk

| Description | Specification | Quantity | Dimension (mm) | | | |
|---|---------------|---------------|--------------------|--------------------|--------------------|-------------|
| | | | Length | Width | Height | Thickness |
| Small-size plastic bag | 1/2 W | 100 pieces | 115 | 75 | — | 0.075±0.005 |
| Big-size plastic bag | 1/2 W | 5 bags | 175 | 115 | — | 0.025±0.005 |
| Paper box | 1/2 W | 20 boxes | 310 | 200 | 120 | 3 |
| Outside package | 1/2 W | 3 Paper boxes | 410 ⁺¹⁰ | 330 ⁺¹⁰ | 220 ⁺¹⁰ | 4 |
| Note: Outside package weight 15±1 kg | | | | | | |

b. Taping Products

| Description | Specification | Quantity | Dimension (mm) | | | |
|---|---------------|----------------|--------------------|--------------------|--------------------|-----------|
| | | | Length | Width | Height | Thickness |
| Paper box | 1/2 W | 2000 pieces | 445 | 80 | 65 | 2 |
| Outside package | 1/2 W | 10 Paper boxes | 460 ⁺¹⁰ | 420 ⁺¹⁰ | 150 ⁺¹⁰ | 4 |
| Note: Outside package weight 10±1 kg | | | | | | |