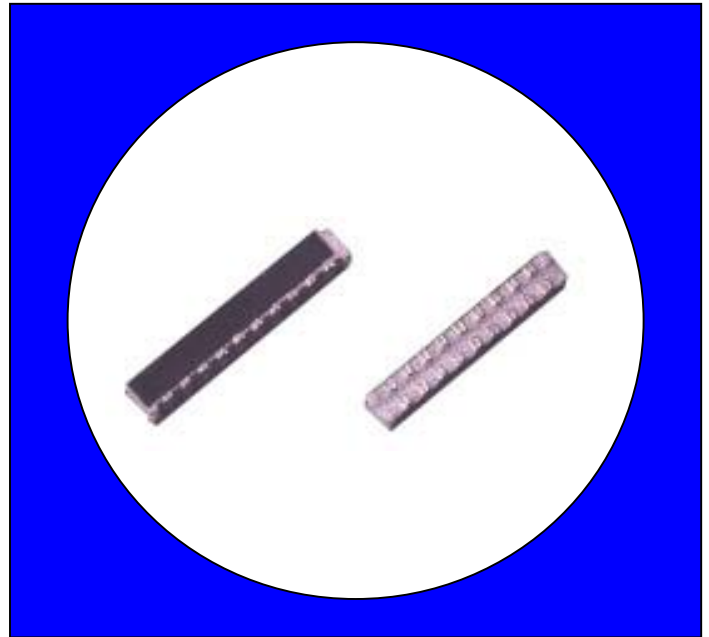


Features

- High Density Packaging
- Low profile
- Inputs/Outputs Available:
 - Single Row Terminations (SRT) – 8, 9, 10, 12
 - Dual Row Terminations (DRT) – 16, 18, 20, 24
- Nickel Barrier Solder-Coated Pads
- Designed For Visual Inspection of Solder Joints
- Designed For Board Cleaning
- Tape & Reel Packaging
- Application Specific Circuits Are Available
- Compatible With IR Reflow Solder Process
- RoHS Compliant Version Available



Resistance Tolerance:

Standard: $\pm 2\%$ or 0.5Ω (whichever is greater)
 Special: $\pm 1\%$ or 0.3Ω (whichever is greater)

Resistance Range:

Standard: 10Ω to 1 Meg Ω

Temperature Coefficient:

Standard: $\pm 200\text{PPM}/^\circ\text{C}$
 Special: $\pm 100\text{PPM}/^\circ\text{C}$
 (33Ω to 1 Meg Ω)

Maximum Operating Voltage:

25V not to exceed rated power

Operating Temperature Range:

-55°C to $+125^\circ\text{C}$

Dielectric Strength:

100 VAC

Power Rating (Total Network Power):

Number of inputs/outputs (watts)

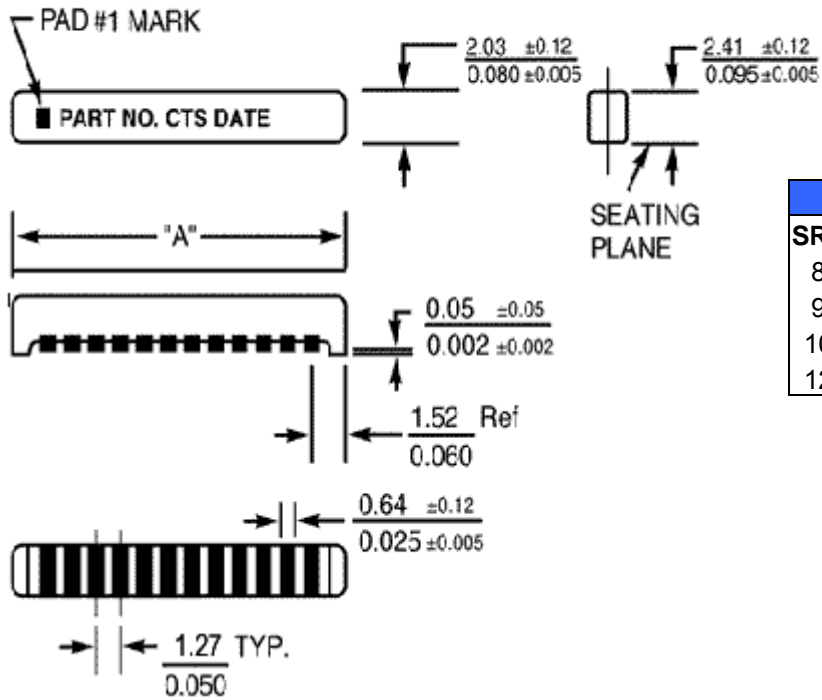
| SRT | 8 | 9 | 10 | 12 | | | | |
|-------|-----|------|-----|-----|-----|------|-----|-----|
| DRT | | | | | 16 | 18 | 20 | 24 |
| @25°C | 1.2 | 1.3 | 1.4 | 1.7 | 1.4 | 1.5 | 1.6 | 2 |
| @70°C | 0.8 | 0.85 | 0.9 | 1.1 | 0.9 | 0.95 | 1 | 1.3 |

Maximum Resistor Power:

(Not to Exceed Total Network Power)

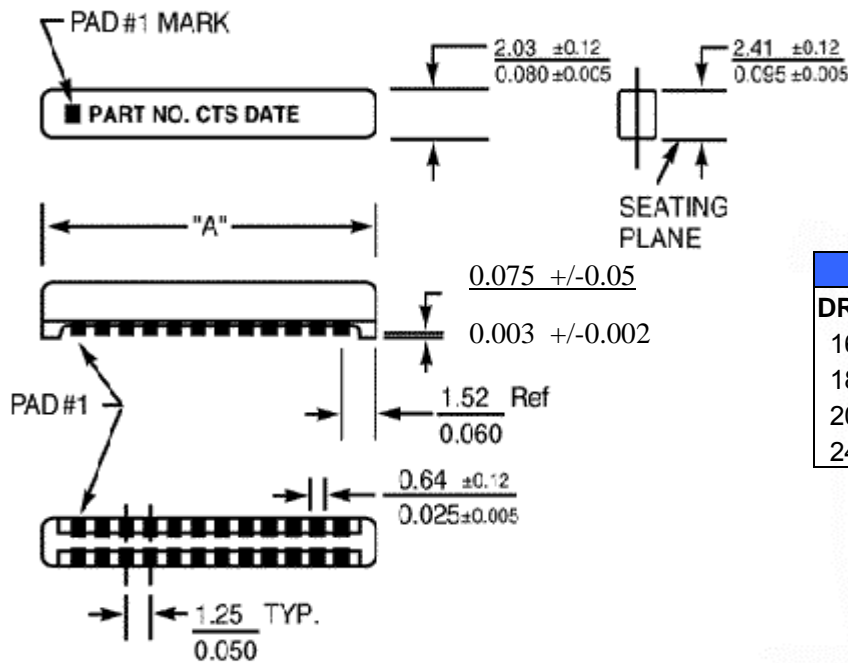
| | Bussed & Dual Terminator Schematic | Isolated Schematic |
|-------|------------------------------------|--------------------|
| @25°C | 0.12w | 0.24w |
| @70°C | 0.08w | 0.16w |

Single Row Termination (SRT)



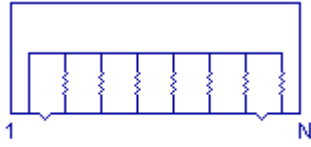
| Input/Outputs "A" Dim. | | |
|------------------------|-------------|--------------|
| SRT | mm | in. |
| 8 | 11.81 ±0.12 | 0.465 ±0.005 |
| 9 | 13.08 ±0.12 | 0.515 ±0.005 |
| 10 | 14.35 ±0.12 | 0.565 ±0.005 |
| 12 | 16.89 ±0.12 | 0.665 ±0.005 |

Dual Row Termination (DRT)

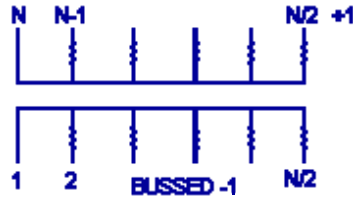


| Input/Outputs "A" Dim. | | |
|------------------------|-------------|--------------|
| DRT | mm | in. |
| 16 | 11.81 ±0.12 | 0.465 ±0.005 |
| 18 | 13.08 ±0.12 | 0.515 ±0.005 |
| 20 | 14.35 ±0.12 | 0.565 ±0.005 |
| 24 | 16.89 ±0.12 | 0.665 ±0.005 |

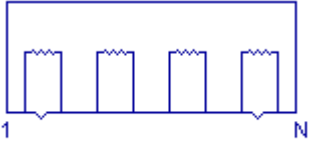
Types of Circuits



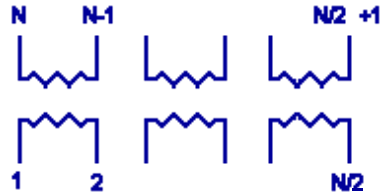
Bussed SRT Schematic 1



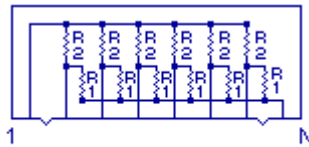
Bussed DRT Schematic 1



Isolated SRT Schematic 3
(Not Available in 9 Pad)



Isolated DRT Schematic 3
(Not Available in 18 Pad)



Dual Terminator SRT Schematic 5
(Not Available in DRT)

Dual Terminator Overview

Standard CTS Dual Terminator products contain $(2N-2)$ resistors of two different values with each resistor value connected to a common buss. The part number includes the EIA Code value of the Thevenin equivalent resistances of R_1 and R_2 . The Thevenin equivalent resistance is calculated in the following way: The suffix letter relates only to the sequence of variations that equal the same equivalent resistance. Reference chart.

$$R_{eq} = R_1 R_2 / (R_1 + R_2)$$

| Examples: | | | |
|------------|-------------|-------------|--------------|
| 752095131A | R1=220 Ohms | R2=330 Ohms | Req=132 Ohms |
| 752095191A | R1=330 Ohms | R2=470 Ohms | Req=194 Ohms |
| 752095131C | R1=180 Ohms | R2=470 Ohms | Req=130 Ohms |

Pin #1 is common to R_2 and Pin N is common to R_1 .

Dual Terminator Resistor Values

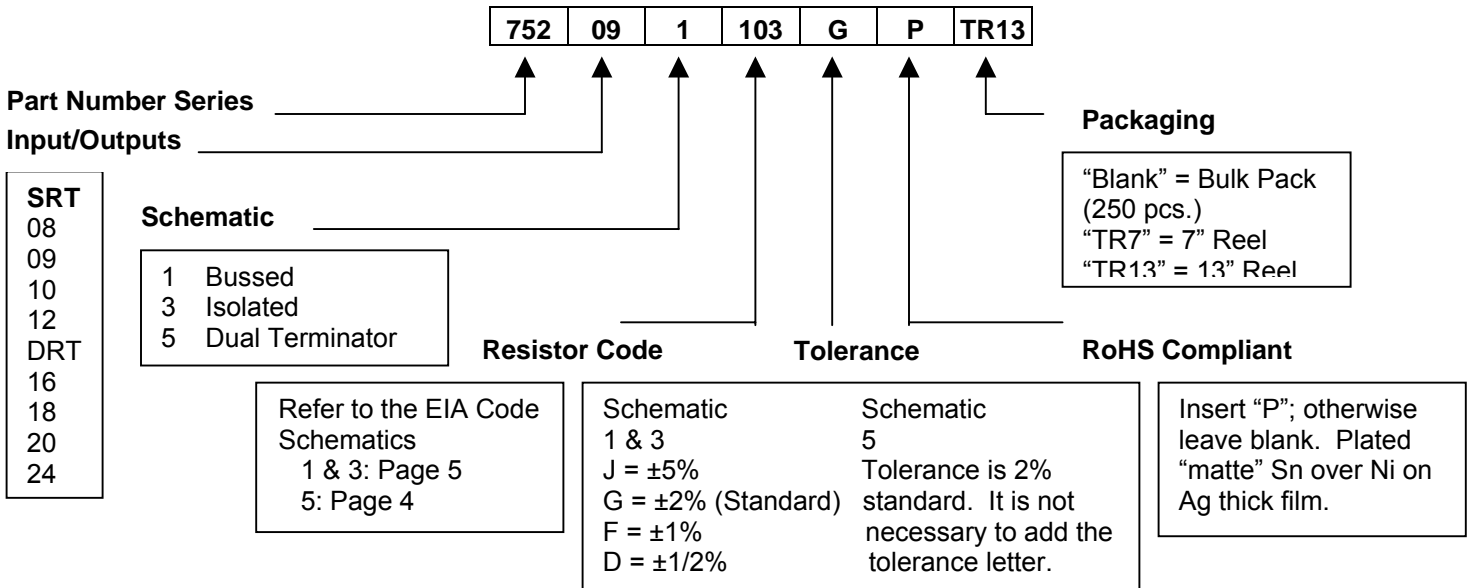
| R1 | R2 | Thevenin Equivalent | CTS Code | R1 | R2 | Thevenin Equivalent | CTS Code |
|------|------|---------------------|----------|------|------|---------------------|----------|
| Ohms | | | | Ohms | | | |
| 25 | 50 | 17 ohm | 150A | 270 | 180 | 108 ohm | 111C |
| 30 | 50 | 19 ohm | 190A | 271 | 131 | 88 ohm | 880A |
| 30 | 620 | 29 ohm | 290A | 330 | 470 | 194 ohm | 191A |
| 33 | 4.7K | 33 ohm | 330A | 330 | 680 | 222 ohm | 221A |
| 36 | 620 | 34 ohm | 340A | 330 | 390 | 179 ohm | 181A |
| 43 | 620 | 40 ohm | 400A | 330 | 220 | 132 ohm | 131D |
| 68 | 189 | 50 ohm | 500B | 330 | 330 | 165 ohm | 171B |
| 75 | 620 | 67 ohm | 670A | 360 | 720 | 240 ohm | 241B |
| 80 | 220 | 59 ohm | 590A | 360 | 600 | 225 ohm | 231A |
| 81 | 130 | 50 ohm | 500A | 390 | 620 | 239 ohm | 241A |
| 81 | 2.2K | 78 ohm | 780A | 470 | 1K | 320 ohm | 321A |
| 100 | 200 | 67 ohm | 670B | 470 | 680 | 278 ohm | 281A |
| 100 | 430 | 81 ohm | 810A | 470 | 940 | 313 ohm | 311A |
| 100 | 150 | 60 ohm | 600A | 500 | 500 | 250 ohm | 251A |
| 106 | 169 | 65 ohm | 650A | 560 | 910 | 347 ohm | 351A |
| 110 | 220 | 73 ohm | 730A | 560 | 1K | 359 ohm | 361A |
| 118 | 178 | 71 ohm | 710A | 680 | 1K | 405 ohm | 401A |
| 120 | 200 | 75 ohm | 750B | 750 | 750 | 375 ohm | 381A |
| 120 | 180 | 72 ohm | 720A | 750 | 2.3K | 566 ohm | 571A |
| 120 | 120 | 60 ohm | 600B | 1K | 3.3K | 767 ohm | 771A |
| 150 | 150 | 75 ohm | 750A | 1K | 2K | 667 ohm | 671A |
| 160 | 260 | 99 ohm | 990A | 1.1K | 2.2K | 733 ohm | 731A |
| 160 | 240 | 96 ohm | 960A | 1.2K | 1.2K | 600 ohm | 601A |
| 160 | 270 | 100 ohm | 101D | 1.5K | 1.5K | 750 ohm | 751A |
| 162 | 260 | 100 ohm | 101B | 1.5K | 3.3K | 1031 ohm | 102A |
| 180 | 300 | 113 ohm | 111B | 2K | 2K | 1000 ohm | 102B |
| 180 | 470 | 130 ohm | 131C | 2.2K | 5.6K | 1579 ohm | 162A |
| 180 | 390 | 123 ohm | 121A | 2.2K | 4.4K | 1467 ohm | 152A |
| 180 | 270 | 108 ohm | 111A | 2.2K | 3.3K | 1320 ohm | 132A |
| 180 | 220 | 99 ohm | 101A | 3K | 6.2K | 2022 ohm | 202A |
| 200 | 1.5K | 176 ohm | 171D | 3K | 2K | 1200 ohm | 122A |
| 220 | 330 | 132 ohm | 131A | 3.3K | 4.7K | 1939 ohm | 192A |
| 220 | 270 | 121 ohm | 121B | 3.9K | 3.3K | 1788 ohm | 182A |
| 220 | 220 | 110 ohm | 111D | 4.7K | 22K | 3873 ohm | 392A |
| 240 | 170 | 100 ohm | 101C | 5K | 5K | 2500 ohm | 252A |
| 240 | 620 | 173 ohm | 171C | 6.8K | 22K | 5194 ohm | 522A |
| 250 | 250 | 125 ohm | 131B | 10K | 51K | 8361 ohm | 842A |
| 270 | 470 | 171 ohm | 171A | 50K | 100K | 33,333 ohm | 333A |

1. All tolerances +/-2%. 2. Other values available on request. 3. Suffix letter has no significance - assigned in sequential order.

Standard Resistor Values & EIA Code

| Ohms | Code | Ohms | Code | Ohms | Code | Ohms | Code | Ohms | Code | Ohms | Code |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 0 | 000X | 68 | 680 | 470 | 471 | 3.9K | 392 | 33K | 333 | 270K | 274 |
| 10 | 100 | 75 | 750 | 510 | 511 | 4.7K | 472 | 39K | 393 | 330K | 334 |
| 12 | 120 | 82 | 820 | 560 | 561 | 5.1K | 512 | 47K | 473 | 390K | 394 |
| 15 | 150 | 100 | 101 | 680 | 681 | 5.6K | 562 | 51K | 513 | 470K | 474 |
| 18 | 180 | 110 | 111 | 820 | 821 | 6.8K | 682 | 56K | 563 | 510K | 514 |
| 22 | 220 | 120 | 121 | 1K | 102 | 8.2K | 822 | 68K | 683 | 560K | 564 |
| 27 | 270 | 150 | 151 | 1.2K | 122 | 10K | 103 | 82K | 823 | 680K | 684 |
| 33 | 330 | 180 | 181 | 1.5K | 152 | 12K | 123 | 100K | 104 | 820K | 824 |
| 39 | 390 | 220 | 221 | 1.8K | 182 | 15K | 153 | 120K | 124 | 1M | 105 |
| 47 | 470 | 270 | 271 | 2.2K | 222 | 18K | 183 | 150K | 154 | | |
| 51 | 510 | 330 | 331 | 2.7K | 272 | 22K | 223 | 180K | 184 | | |
| 56 | 560 | 390 | 391 | 3.3K | 332 | 27K | 273 | 220K | 224 | | |

How to Order

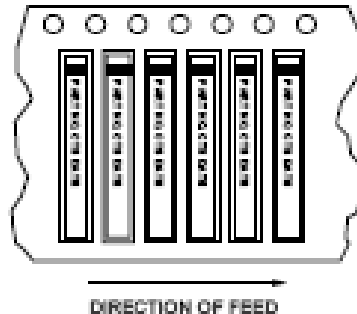


NOTE: No dashes or spaces to appear in part number.

Example: 752091103GPTR13

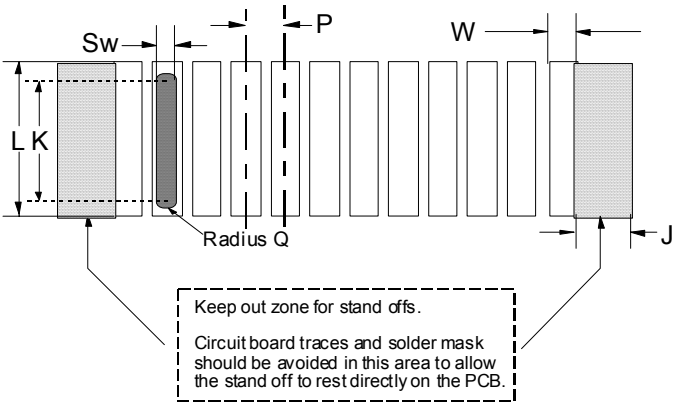
Packaging

| Tape & Reel | | |
|-----------------|------|------|
| Reel Diameter | 7" | 13" |
| Tape Width | 24mm | |
| Tape Pitch | 4mm | |
| # of Parts/Reel | 1000 | 5000 |



Recommended Land Patterns

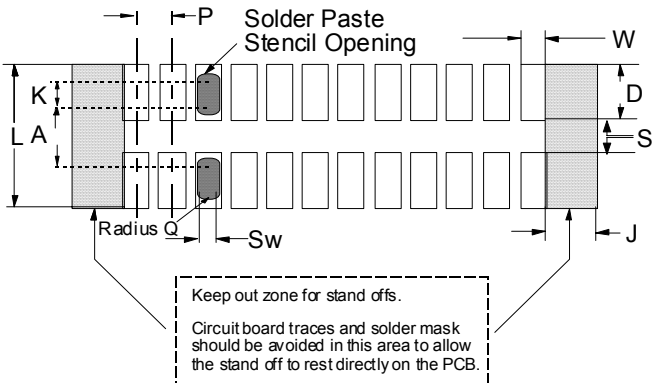
Single Row Termination



| Recommended Land Pattern | | | | | | |
|--------------------------|------|------|-------|------|------|-------|
| mm/in. | D | P | L | W | J | S |
| 752 | 1.27 | 1.27 | 3.18 | 0.76 | 1.27 | 0.64 |
| | 0.05 | 0.05 | 0.125 | 0.03 | 0.05 | 0.025 |

| SRT Solder Paste Stencil Opening | | | | |
|----------------------------------|-------|-------|----|-------|
| mm/in. | K | Sw | A | Q |
| 4 mil 752 | 2.4 | 0.76 | NA | 0.38 |
| | 0.095 | 0.03 | | 0.015 |
| 6 mil 752 | 1.9 | 0.63 | NA | 0.33 |
| | 0.075 | 0.025 | | 0.013 |

Dual Row Termination



| DRT Solder Paste Stencil Opening | | | | |
|----------------------------------|-------|-------|-------|-------|
| mm/in. | K | Sw | A | Q |
| 4 mil 752 | 0.66 | 0.76 | 1.52 | 0.38 |
| | 0.026 | 0.03 | 0.06 | 0.015 |
| 6 mil 752 | 0.51 | 0.64 | 1.4 | 0.3 |
| | 0.02 | 0.025 | 0.055 | 0.012 |