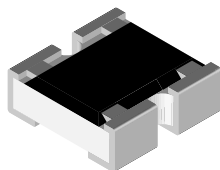




# Thick Film Chip Attenuator, Surface Mount, Unbalanced $\pi$ Type



## FEATURES

- Single component reduces board space and component counts - replaces 3 or more components
- Tolerance matching and temperature tracking superior to individual components
- Maximum power dissipation: 0.075 W for CZA06S; 0.040 W for CZA04S
- Consult factory for extended values, non-standard tolerances, impedance matching and other attenuation values
- Frequency range: DC to 3 GHz
- Surface mount chip attenuator in a resistor array package
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | POWER RATING $P_{70\text{ }^{\circ}\text{C}}$<br>W | IMPEDANCE<br>$\Omega$ | ATTENUATION RANGE AND TOLERANCE |                         |
|--------------|----------------------------------------------------|-----------------------|---------------------------------|-------------------------|
|              |                                                    |                       | $\pm 0.3\text{ dB (L)}$         | $\pm 0.5\text{ dB (H)}$ |
| CZA04S       | 0.040                                              | 50                    | 0 dB, 1 dB to 5 dB              | 6 dB to 20 dB           |
| CZA06S       | 0.075                                              | 50/75/100/300/600     | 0 dB, 1 dB to 5 dB              | 6 dB to 20 dB           |

## Note

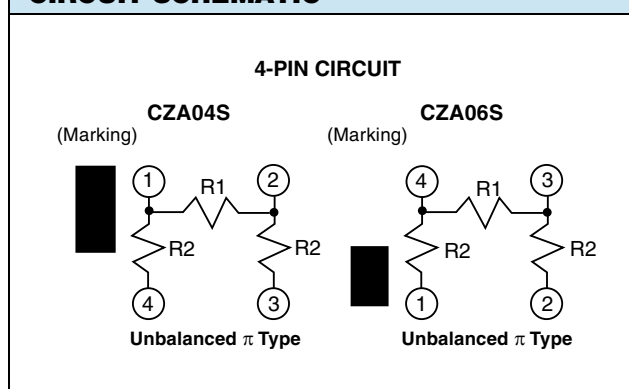
- Power rating depends on the maximum temperature at the solder point, the component placement density and the substrate material

| IMPEDANCE                           | 50 $\Omega$ | 75 $\Omega$ | 100 $\Omega$ | 300 $\Omega$ | 600 $\Omega$ |
|-------------------------------------|-------------|-------------|--------------|--------------|--------------|
| Attenuation<br>in dB <sup>(1)</sup> | 1           | 1           | 1            | 1            | 1            |
|                                     | 1.5         | 1.5         | 1.5          | 1.5          | 1.5          |
|                                     | 2           | 2           | 2            | 2            | 2            |
|                                     | 3           | 3           | 3            | 3            | 3            |
|                                     | 4           | 4           | 4            | 4            | 4            |
|                                     | 5           | 5           | 5            | 5            | 5            |
|                                     | 6           | 6           | 6            | 6            | 6            |
|                                     | 10          | 10          | 10           | 10           | 10           |
|                                     | 11          | 11          | 11           | 11           | 11           |
|                                     | 12          | 12          | 12           | 12           | 12           |
|                                     | 13          | 13          | 13           | 13           | 13           |
|                                     | 14          | 14          | 14           | 14           | 14           |
|                                     | 15          | 15          | 15           | 15           | 15           |
|                                     | 16          | 16          | 16           | 16           | 16           |
|                                     | 17          | 17          | 17           | 17           | 17           |
|                                     | 18          | 18          | 18           | 18           | 18           |
|                                     | 19          | 19          | 19           | 19           | 19           |
|                                     | 20          | 20          | 20           | 20           | 20           |

## Note

<sup>(1)</sup> Consult factory for other attenuations

## CIRCUIT SCHEMATIC



## TECHNICAL SPECIFICATIONS

| PARAMETER                                  | UNIT               | CZA04S      | CZA06S      |
|--------------------------------------------|--------------------|-------------|-------------|
| Rated dissipation at 70 $^{\circ}\text{C}$ | W                  | 0.040       | 0.075       |
| VSWR                                       |                    | 1.2 max.    | 1.2 max.    |
| Category temperature range                 | $^{\circ}\text{C}$ | -55 to +125 | -55 to +150 |
| Frequency range                            |                    | DC to 3 GHz | DC to 3 GHz |



## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CZA06S04015050LRT (preferred part numbering format)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| C | Z | A | 0 | 6 | S | 0 | 4 | 0 | 1 | 5 | 0 | 5 | 0 | L | R | T |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

| MODEL            | PIN COUNT  | ATTENUATION                                                                                         | IMPEDANCE                                                                               | TOLERANCE                                                     | PACKAGING                                                                                      | SPECIAL                                            |
|------------------|------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------|
| CZA04S<br>CZA06S | 04 = 4 pin | 010 = 1.0 dB<br>015 = 1.5 dB<br>020 = 2.0 dB<br>150 = 15.0 dB<br>000 = 0 dB or<br>0 $\Omega$ jumper | 050 = 50 $\Omega$<br>075 = 75 $\Omega$<br>100 = 100 $\Omega$<br>000 = 0 $\Omega$ jumper | H = $\pm 0.5$ dB<br>L = $\pm 0.3$ dB<br>Z = 0 $\Omega$ Jumper | EA = lead (Pb)-free, T/R (all)<br>TD = tin lead, T/R (04 only)<br>RT = tin lead, T/R (06 only) | (Dash number)<br>Up to 1 digit<br>Blank = standard |

Historical Part Number Example: CZA06S04015050LRT (will continue to be accepted)

|       |           |           |             |           |           |           |
|-------|-----------|-----------|-------------|-----------|-----------|-----------|
| CZA   | 06S       | 04        | 015         | 050       | L         | RT        |
| MODEL | CASE SIZE | PIN COUNT | ATTENUATION | IMPEDANCE | TOLERANCE | PACKAGING |

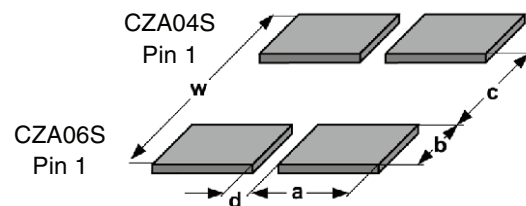
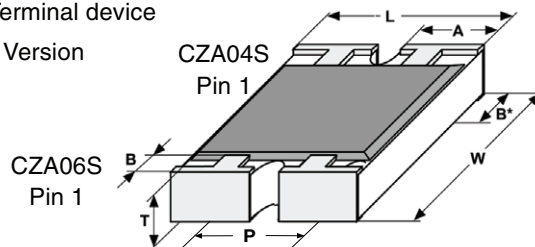
## Note

- For additional information on packaging, refer to the Surface Mount Network Packaging document ([www.vishay.com/doc?31540](http://www.vishay.com/doc?31540))

## DIMENSIONS

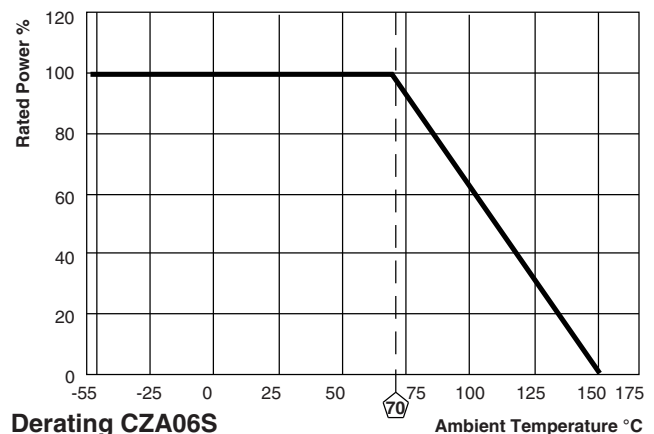
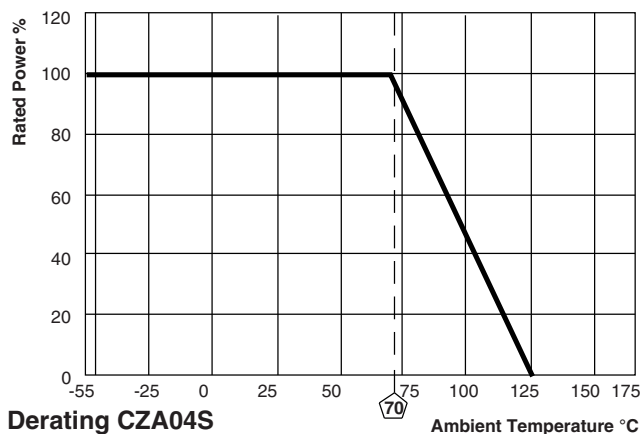
4-Terminal device

S - Version



| GLOBAL MODEL | DIMENSIONS in inches (millimeters)     |                                        |                                        |                                        |                 |                                        |                                        |
|--------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|-----------------|----------------------------------------|----------------------------------------|
|              | L                                      | W                                      | T                                      | A                                      | P               | B                                      | B*                                     |
| CZA04S       | 0.039 $\pm$ 0.004<br>(1.00 $\pm$ 0.10) | 0.039 $\pm$ 0.006<br>(1.00 $\pm$ 0.15) | 0.014 $\pm$ 0.004<br>(0.36 $\pm$ 0.10) | 0.013 $\pm$ 0.006<br>(0.33 $\pm$ 0.15) | 0.026<br>(0.65) | 0.006 $\pm$ 0.004<br>(0.15 $\pm$ 0.10) | 0.010 $\pm$ 0.004<br>(0.25 $\pm$ 0.10) |
| CZA06S       | 0.063 $\pm$ 0.006<br>(1.60 $\pm$ 0.15) | 0.059 $\pm$ 0.006<br>(1.50 $\pm$ 0.15) | 0.020 $\pm$ 0.004<br>(0.51 $\pm$ 0.10) | 0.024 $\pm$ 0.006<br>(0.61 $\pm$ 0.15) | 0.031<br>(0.80) | 0.012 $\pm$ 0.006<br>(0.30 $\pm$ 0.15) | 0.012 $\pm$ 0.006<br>(0.30 $\pm$ 0.15) |

| GLOBAL MODEL | SOLDER PAD DIMENSIONS in inches (millimeters) |              |              |              |              |
|--------------|-----------------------------------------------|--------------|--------------|--------------|--------------|
|              | c                                             | w            | d            | a            | b            |
| CZA04S       | 0.018 (0.45)                                  | 0.083 (2.10) | 0.008 (0.20) | 0.018 (0.45) | 0.032 (0.82) |
| CZA06S       | 0.031 (0.80)                                  | 0.122 (3.10) | 0.014 (0.36) | 0.025 (0.63) | 0.045 (1.15) |





| PERFORMANCE                                 |                                                       |                                  |               |
|---------------------------------------------|-------------------------------------------------------|----------------------------------|---------------|
| TEST                                        | CONDITIONS OF TEST                                    | TEST RESULTS (TYPICAL TEST LOTS) |               |
|                                             |                                                       | 0.5 dB to 5 dB                   | 6 dB to 20 dB |
| Endurance test at 70 °C<br>per EIA 575-3.14 | 1000 h at 70 °C, 1.5 h "ON", 0.5 h "OFF"              | ± 0.2 dB                         | ± 0.3 dB      |
| Overload<br>per EIA 575-3.6                 | Short time overload                                   | ± 0.2 dB                         | ± 0.3 dB      |
| Thermal shock                               | Per EIA 575-3.5                                       | ± 0.2 dB                         | ± 0.3 dB      |
| Moisture resistance                         | Per EIA 575-3.10                                      | ± 0.2 dB                         | ± 0.3 dB      |
| Resistance to soldering heat                | 10 s at 260 °C solder bath temperature<br>EIA 575 3.8 | ± 0.2 dB                         | ± 0.3 dB      |
| High temperature exposure                   | Per EIA 575-3.7                                       | ± 0.2 dB                         | ± 0.3 dB      |
| Low temperature operations                  | Per EIA-575-3.6                                       | ± 0.2 dB                         | ± 0.3 dB      |
| Solderability and leaching                  | EIA 575-3.12                                          | 95 % coverage                    |               |



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