

ABSTRACT OF THE DISCLOSURE

VOLTAGE-DEPENDENT NONLINEAR RESISTOR CERAMIC, VOLTAGE-DEPENDENT RESISTOR WITH THE CERAMIC, AND METHOD OF MANUFACTURING VOLTAGE-DEPENDENT NON-LINEAR RESISTOR CERAMIC

A composite perovskite-based semiconductor varistor ceramic and a varistor may contain a first component consisting of oxides of Sr, Ba, Ca and Ti, at least one component of a second component consisting of at least one kind of oxide selected from oxides of R (Y and lanthanoids) and a third component consisting of at least one kind of oxide selected from oxides of M (Nb and Ta), and a fourth component consisting of an oxide of Si. The ceramic substantially containing no Mg.

A composition of the ceramic is $0.10 \leq a/(a + b + c) \leq 0.40$, $0.30 \leq b/(a + b + c) \leq 0.50$, $0.20 < c/(a + b + c) \leq 0.50$, $0.84 \leq (a + b + c + e)/(d + f) \leq 1.16$, $1.0 \leq (e + f)/d \times 100 \leq 10.0$, and $g/d \times 100 \leq 0.6$, where a is the number of moles calculated for Sr of the first component as SrO, b is the number of moles calculated for Ba of the first component as BaO, c is the number of moles calculated for Ca of the first component as CaO, d is the number of moles calculated for Ti of the first component as TiO₂, e is the number of moles calculated for R of the second component as YO_{3/2}, CeO₂, PrO_{11/6}, TbO_{7/4} and RO_{3/2} (other lanthanoids) respectively, f is the number of moles calculated for M of the third component as NbO_{5/2} and TaO_{5/2} respectively, and g is the number of moles calculated for Si of the fourth component as SiO₂. A composite perovskite-based semiconductor varistor ceramic and a varistor may consist of at least one kind of Sr, Ba and Ca, and Ti, and have a surface provided with a compressive stress.

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