US 20230230766A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2023/0230766 A1

ZENZAI (43) Pub. Date: Jul. 20, 2023

(54) **CERAMIC ELECTRONIC CHIP COMPONENT AND METHOD FOR MANUFACTURING THE SAME**

(71) Applicant: **Murata Manufacturing Co., Ltd.**, Nagaokakyo-shi (JP)

(72) Inventor: **Kota ZENZAI**, Nagaokakyo-shi (JP)

(21) Appl. No.: **18/122,154**

(22) Filed: **Mar. 16, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2021/032563, filed on Sep. 4, 2021.

(30) **Foreign Application Priority Data**

Sep. 25, 2020 (JP) 2020-160733

Publication Classification

(51) **Int. Cl.**
H01G 4/12 (2006.01)
H01G 4/008 (2006.01)

(52) **U.S. Cl.**
CPC ***H01G 4/1209*** (2013.01); ***H01G 4/008*** (2013.01); *H01B 1/16* (2013.01)

(57) **ABSTRACT**

An outer electrode includes a glass-free sintered layer containing no glass. A glass-free conductive paste is provided and includes a conductive metal powder and a thermosetting resin, the conductive metal powder including an alloy of tin and at least one of copper and nickel, and the glass-free conductive paste containing no glass. This composition is applied to cover a portion of a surface of a ceramic body. Then the ceramic body to which the glass-free conductive paste has been applied is subjected to heat treatment at a temperature of about 600° C., higher than or equal to a temperature about 400° C. higher than the curing temperature of the thermosetting resin. By the heat treatment, the thermosetting resin is subjected to thermal decomposition or combustion and thus little of the thermosetting resin remains, and the conductive metal powder is sintered to form a unified sintered metal body.