Capacitor ceramic laser drilling accuracy

How to predict the removal of ceramics in laser drilling?
Combined melt expulsion and evaporation,the removal of ceramics can be predicted in the laser drilling. The pulse ON and OFF times during operation time (Fig. 31),the saturation pressure ,the recoil pressure and the effective laser beam radius have a great influence on the simulation results.

How laser drilling is used in structural ceramics?
Modelling and simulation techniques of laser drilling is indispensable for the desired quality of holes. In laser drilling of structural ceramics, series of physical phenomena are included in the machining process, such as melting and sublimation, vaporization and dissociation, plasma formation, laser ablation .

How is laser drilling used in alumina ceramic crater drilling?
For studies related to laser drilling of alumina ceramic,Jia et al. used a similar two-step CPL drilling method,in which a nanosecond laser is used to ablatea crater on the alumina ceramic surface and then a millisecond laser is used to drill a through hole,and the schematic diagram of the nanosecond-millisecond CPL is shown in Fig. 10 (b).

How can ps laser drilling improve the quality of C/SiC hole?
Zhang et al. have optimized the processing parameters of ps laser drilling of C/SiC. It indicated that better quality of hole can be achieved with smaller helical line spacing and helical line width. The machining time is crucial to through hole processing since the laser energy can be impeded by debris and plasma in the laser process.

What are the advantages of fiber lasers in alumina ceramic drilling?
With the rapid development of fiber lasers,CW and QCW fiber lasers have shown great advantages in alumina ceramic drilling because of their high beam qualitywhich makes the laser beam can be tightly focused to the diffraction limit.

What is the difference between laser drilling alumina ceramic?
The heating,melting,vaporization and sputtering processes of materials are mostly similar,while the difference is that the high peak power of nanosecond laser will induce obvious plasma shielding. So,the plasma absorption must be considered when laser drilling of alumina ceramic.

Absorbed photons give a cinetic energy that brake links of matter"s molecules ; particles are ejected with a very high speed = photochemical ablation. LASER energy emitted in UV spectra is absorbed by metallic materials (copper, steel, aluminium...) as well as by insulating materials (polymers, ceramics, industrial diamond...)

A variety of LDMs such as long pulsed laser drilling, short pulsed laser drilling, ultrafast pulsed laser drilling,

liquid-assisted laser drilling, combined pulse laser drilling...

In most cases, we can hold flex circuit accuracy to +/- .001" or better. This document provides general guidelines and considerations for the laser drilling and machining of fired ceramic ...

Laser drilling is an effective way to drill holes in structural ceramics since the focused laser beam with extremely high-energy density is able to ablate the ceramics; however, it usually causes defects such as cracks and a recast layer. The hole quality is the key issue that should be carefully and comprehensively considered when different ...

In the ceramic thick-film process, there are several operations that have dimensional tolerances associated with them, which are listed in Table 3. Table 3 - Primary Operations in the Ceramic Thick-film Process Not as well established Mfg. Tol. (+/- µm) CAD inputs and conversion 6 Laser plotter accuracy 25 Mylar film stability 75

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The low processing efficiency and quality of the conventional millisecond laser prevents the broad applications of laser drilling technology in ceramic. In this paper, a novel combined pulse laser (CPL) that consisting of an initial nanosecond pulse train followed by a millisecond pulse train was proposed for drilling the alumina ...

This document provides general guidelines and considerations for the laser drilling and machining of fired ceramic substrates typically used in the manufacture of microelectronic circuits and ...

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Multilayer Ceramic Capacitors (MLCC) have a major role in modern electronic devices due to their small price and size, large range of capacitance, small ESL and ESR, and good frequency response.

This paper provides a review on laser drilling of structural ceramics with millisecond (ms), nanosecond (ns), picosecond (ps) and femtosecond (fs) lasers in order to predict the significant factors and effects on the quality characteristics. Heat and liquid-assisted laser drilling techniques are discussed. Computational approaches

with ANSYS ...

LASERtrim® capacitors are laser adjustable monolithic ceramic surface mount devices designed for precise functional tuning of RF circuits. With superior reliability compared to conventional multi-layer chip capacitors, LASERtrim® capacitors eliminate concerns such as capacitance drift and flux entrapment associated with mechanical trimmers. Features: Superior Performance: ...

Laser drilling produces précised and accurate quality with shorter pulse width and higher peak intensity due to the change in parameters in machining. Reduced pulse laser is helpful to improve the effectiveness of machining even at higher cost.

Picosecond laser drilling on born ceramic utilizes a highly focused laser beam with high energy density to act on the born ceramic. This laser beam has an extremely high peak power,...

The low processing efficiency and quality of the conventional millisecond laser prevents the broad applications of laser drilling technology in ceramic. In this paper, a novel ...

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