

Breaking arc characteristics in various power supply frequencies

Nozomi Miki Koichiro Sawa

Abstract:

The movement to the high frequency is strong in communication systems. But semiconductors used in such systems are known that they have various problems in high frequency. Therefore an electromechanical switch of supreme RF (Radio Frequency) characteristics in the insertion loss and isolation is expected. However, in RF range, the arc characteristics generated between electric contacts have not been clarified. In this research, we examine basic characteristics of the breaking arc in high frequency especially the arcing time and the V-I characteristic. According to the results, it turned out that the arcing time becomes shorter and the arc voltage becomes lower as the frequency rises that is expected to cause little damage to contact in high frequencies.

And so, it is investigated by the surface of contact observation whether the damage to the contact is smaller in the high frequency than in the low frequency. Now this experiment was conducted by interrupting the circuit current at the peak current value, where arcing duration is shorter than $T/4$ which is time of current zero. But after the arc extinction of current zero, reignition generates over 600kHz then arcing time is longer than $T/4$. The reignition behavior is examined by measuring arc waveform and contact damage in higher frequency.