Fabrication and Characteristics of 10 V Josephson Junction Array

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10 V Josephson junction array arranged in 8 parallel stripline paths was fabricated using self-aligning and reactive ion etching techniques. These techniques were introduced in detail with aim of obtaining high-quality junctions. The array has 18,184 Josephson junctions with the area of 12 ㎛×38 ㎛. The gap voltage and minimum critical current density were about 2.7 ㎷ and 23 A/㎠, respectively. And the critical current density and leakage current at 5 volt were about 27 A/㎠ and 5 ㎂, respectively. When operated in the frequency range of 76-88 ㎓, the array generated constant voltage steps up to 14-19 V. The step size near 10 V was more than 7 ㎂.

Keywords: Josephson junction array, voltage standard, constant voltage step