

## GaAs Multiplier Varactors

M/A-COM Products  
V4

### Features

- High Cutoff Frequency
- Operating Temperatures From -65°C to +200°C

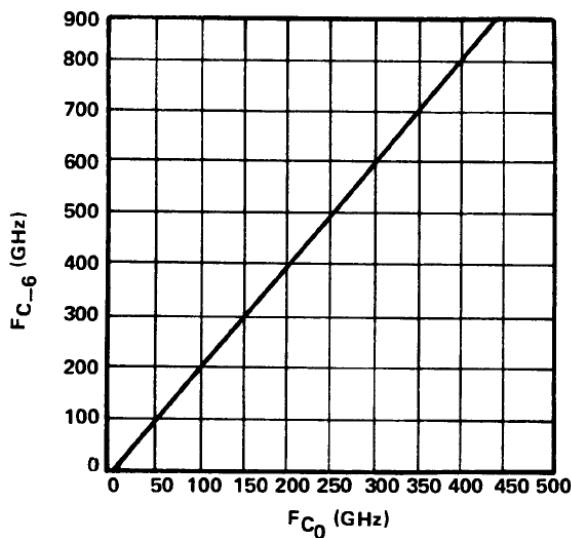
### Description

The MA48700 series of Gallium Arsenide Abrupt Junction Multiplier Varactors is specifically designed to provide single state, high order multiplication at output frequencies extending to approximately 100 GHz. All varactors in this series are available in either package or chip form. The cathode is the heat sink end of the package.

### Applications

This series of Gallium Arsenide Multiplier Varactors is intended for medium power harmonic generation with high conversion efficiency. These diodes may be used to double or triple the frequency output of a phase locked source for millimeter wave radar and communication systems for local oscillators and transmitters.

### RELATIONSHIP BETWEEN CUTOFF FREQUENCY AT ZERO AND SIX VOLTS IN GAAS VARACTOR DIODES

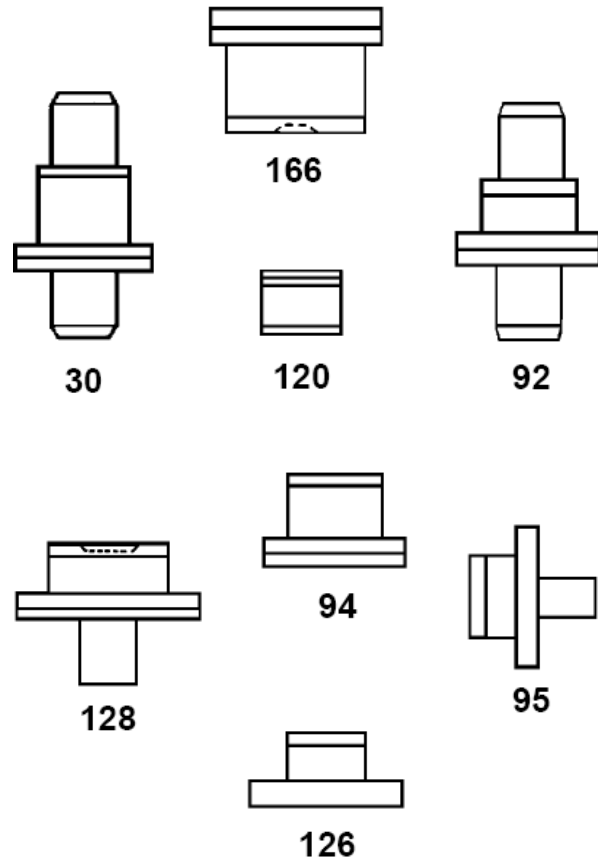


### Absolute Max Rating @ 25 °C

Parameter	Absolute Maximum
Temperature Storage	-65°C to +250°C
Operating	-65°C to +200°C
Voltage	Voltage Rating

1. Operation of this device above any one of these parameters may cause permanent damage

### CASE STYLES



\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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Electrical Specifications:  $T_A = 25^\circ\text{C}$

Model <sup>3</sup> Number	Minimum Voltage Rating (Volts)	Zero Bias <sup>1</sup> Junction Capacitance (pF)	Cut-off Frequency <sup>2</sup> (fc) at -6 Volts (GHz)	Suggested Output Frequency Range (GHz)
MA48701E	15	0.150 - 0.250	550	20 - 50
MA48702E	15	0.250 - 0.350	500	20 - 40
MA48703E	15	0.350 - 0.450	450	15 - 30
MA48704E	15	0.450 - 0.550	400	15 - 30
MA48705E	15	0.550 - 0.650	400	10 - 20
MA48706C	25	0.150 - 0.250	400	20 - 40
MA48707C	25	0.250 - 0.350	350	15 - 35
MA48708C	25	0.350 - 0.450	300	15 - 30

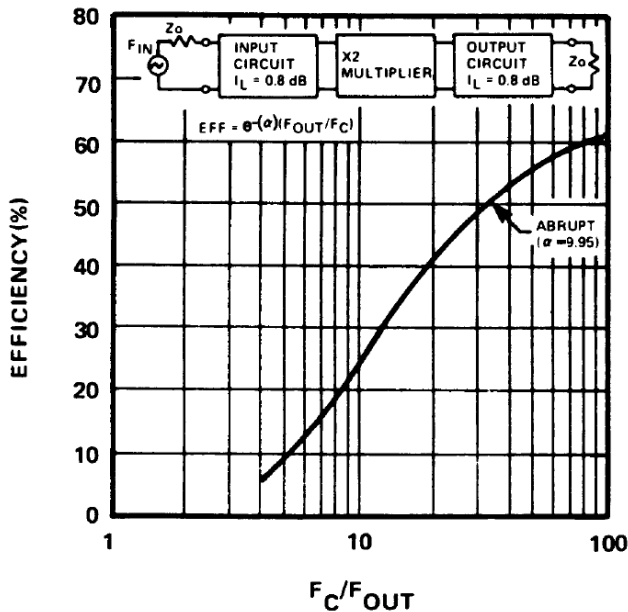
Notes:

1. Junction capacitance ( $C_{j0}$ ) is measured at 1 MHz and 0 volts on a bridge which has been balanced with a shielded test holder connected in place, but open circuited.
2. Cutoff frequency measurements ( $FC_0$ ) are made at 0 volts and then extrapolated to -6 volts. See curve of Figure 1 showing typical  $FC - 6$  (cutoff at -6 volts) versus  $FC_0$  (cutoff at 0 volts) performance curve.
3. Available in the case styles 30, 92, 94, 95, 120, 126, 128 and 166. When ordering, specify the case style by adding the case style number as a suffix to the basic part number.
4. Nominal package parasitics ( $C_p$  and  $L_s$ ) are given for each case style with the outline drawing in the appendix section.

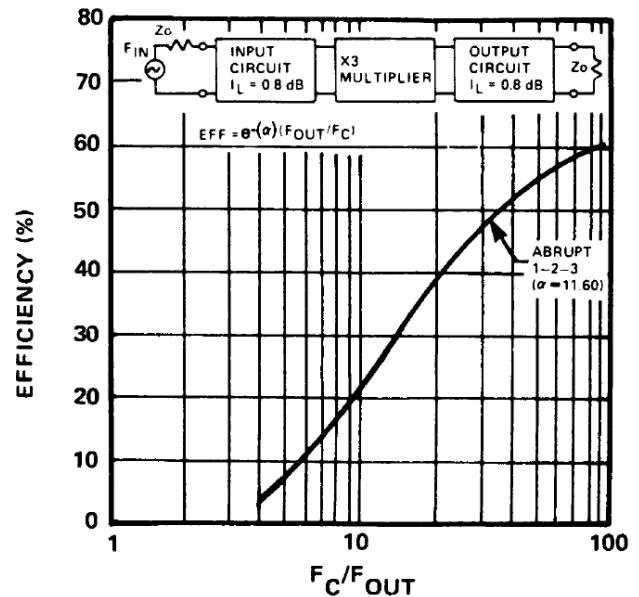
† Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

### Typical Performance Curves

**THEORETICAL EFFICIENCY OF X2 GAAS VARACTOR MULTIPLIERS**



**THEORETICAL EFFICIENCY OF X3 GAAS VARACTOR MULTIPLIERS**



**THEORETICAL EFFICIENCY OF X4 GAAS VARACTOR MULTIPLIERS**

