New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
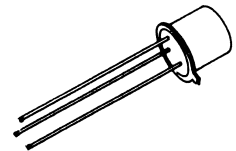SPRINGFIELD, NEW JERSEY 07081
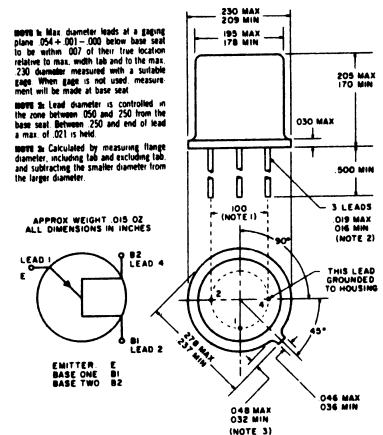U.S.A.

Silicon Unijunction Transistors

2N2646,7

The General Electric 2N2646 and 2N2647 Silicon Unijunction Transistors have an entirely new structure resulting in lower saturation voltage, peak-point current and valley current as well as a much higher base-one peak pulse boltage. In addition, these devices are much faster switches.

The 2N2646 is intended for general purpose industrial applications where circuit economy is of primary importance, and is ideal for use in firing circuits for Silicon Controlled Rectifiers and other applications where a guaranteed minimum pulse amplitude is required. The 2N2647 is intended for applications where a low emitter leakage current and a low peak point emitter current (trigger current) are required (i.e. long timing applications), and also for triggering high power SCR's.

absolute maximum ratings: (25°C) (unless otherwise specified)

Power Dissipation (Note 1)	300 mw
RMS Emitter Current	50 ma
Peak Emitter Current (Note 2)	2 amperes
Emitter Reverse Voltage	30 volts
Interbase Voltage	35 volts
Operating Temperature Range	−65°C to +125°C
Storage Temperature Range	−65°C to +150°C

electrical characteristics: (25°C) (unless otherwise specified)

PARAMETER	2N2646			2N2647			
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Intrinsic Standoff Ratio ($V_{BB} = 10V$) η	0.56	0.69	0.75	0.68	0.77	0.82	
Interbase Resistance ($V_{BB} = 3V$, $I_E = 0$) R_{BBO}	4.7	6.7	9.1	4.7	6.7	9.1	KΩ
Emitter Saturation Voltage ($V_{BB} = 10V$, $I_E = 50$ ma) $V_{E(SAT)}$		2			2		volts
Modulated Interbase Current ($V_{BB} = 10V$, $I_E = 50$ ma) $I_{B2(MOD)}$		24			27		ma
Emitter Reverse Current ($V_{B2E} = 30V$, $I_{B1} = 0$) I_{EO}		.001	12		.001	.200	μa
Peak Point Emitter Current ($V_{BB} = 25V$) I_P		0.8	5		1.0	2	μa
Valley Point Current ($V_{BB} = 20V$, $R_{B2} = 100Ω$) I_V	4	5		8	9	18	ma
Base-One Peak Pulse Voltage (Note 3) V_{OB1}	3.0	8.5		6.0	9.5		volts
SCR Firing Conditions (See Figure 26, back page)							

1. Derate 3.0 MW/°C increase in ambient temperature. The total power dissipation (available power to Emitter and Base-Two) must be limited by the external circuitry.
2. Capacitor discharge—10μfd or less, 30 volts or less.
3. The Base-One Peak Pulse Voltage is measured in the circuit below. This specification on the 2N2646 and 2N2647 is used to ensure a minimum pulse amplitude for applications in SCR firing circuits and other types of pulse circuits.

4. The intrinsic standoff ratio, η, is essentially constant with temperature and interbase voltage. η is defined by the equation:

$$V_P = \eta V_{BB} + V_D$$

Where V_P = Peak Point Emitter Voltage
V_{BB} = Interbase Voltage

V_D = Junction Diode Drop (Approx. .5V)