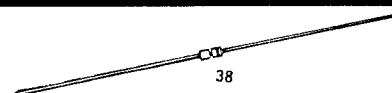


SILICON SIGNAL DIODES 100 MA TYPES



Part Number	BV @ 100 μ A Min. (V)	I_R @ 25°C Max.		V_F Max.		C_O @ DV (pf)	t_{rr} (η SEC)	Package Outline	Package Outline Number
		(η A)	@ V_R (V)	(V)	@ I_F (mA)				
1N914	100	25	30	1.00	10	4	4	D035	38
1N914A	100	25	20	1.00	20	4	4	D035	38
1N914B	100	25	20	1.00	100	4	4	D035	38
1N916	100	25	20	1.00	10	2	4	D035	38
1N916A	100	25	20	1.00	20	2	4	D035	38
1N916B	100	25	20	1.00	30	2	4	D035	38
1N4148*	100	25	20	1.00	10	4	4	D035	38
1N4149	100	25	20	1.00	10	2	4	D035	38
1N4151	75 ¹	50	50	1.00	50	2	2	D035	38
1N4152	40	50	30	.880	20	2	2	D035	38
1N4153*	75	50	50	.880	20	2	2	D035	38
1N4154	35	100	25	1.00	30	4	2	D035	38
1N4305	75	100	50	.850	10	2	2	D035	38
1N4444	70	50	50	1.00	100	2	7	D035	38
1N4446	100	25	20	1.00	20	4	4	D035	38
1N4447	100	25	20	1.00	20	2	4	D035	38
1N4448	100	25	20	1.00	100	4	4	D035	38
1N4449	100	25	20	1.00	30	2	4	D035	38
1N4454*	75	100	50	1.00	10	2	2	D035	38
1N4531*	100	25	20	1.00	10	4	4	D034	39
1N4532	75	100	50	1.00	10	2	2	D034	39
1N4533	40	50	30	.880	20	2	2	D034	39
1N4534	75	50	50	.880	20	2	2	D034	39
1N4536	35	100	25	1.00	30	4	2	D034	39
1N4727	30	100	20	.850	10	4	4	D035	38
1N4863	70	50	50	1.20	100	2	7	D035	38
DA1701	100	30	30	1.00	50	1	4	D035	38
DA1702	75	30	30	1.00	50	1	4	D035	38
DA1703	40	50	30	1.00	50	2	4	D035	38
DA1704	25	100	20	1.00	30	3	4	D035	38
MA1701	100	30	30	1.00	50	1	4	D034	39
MA1702	75	30	30	1.00	50	1	4	D034	39
MA1703	40	50	30	1.00	50	2	4	D034	39
MA1704	25	100	20	1.00	30	3	4	D034	39
DZ800	2	2000	2	.800	10	—	—	D035	38
DZ805	15	2000	12	.80	10	—	—	D035	38
DZ806	25	2000	22	.800	10	—	—	D035	38

LOW LEAKAGE DIODES



DE104	40	.02	20	.890	10	4	200	D035	38
DE110	40	2	30	.880	10	4	200	D035	38
DE111	40	.2	20	.880	10	4	200	D035	38
DE112	40	.1	20	1.0	50	6	200	D035	38
DE113	40	.25	20	1.0	50	6	200	D035	38
DE114	40	1	30	.880	10	4	200	D035	38
DE115	40	2	50	.880	10	4	200	D035	38

* JAN and JANTX types available

¹ Measured at 5 μ A

Silicon Diodes



1N914, A, B

1N916, A, B

1N4148, 49

1N4154

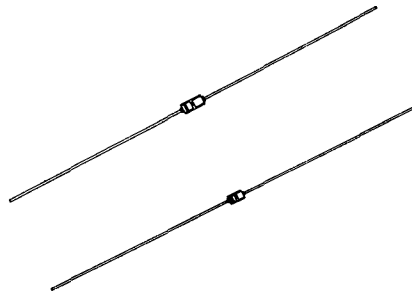
1N4446-49

1N4531

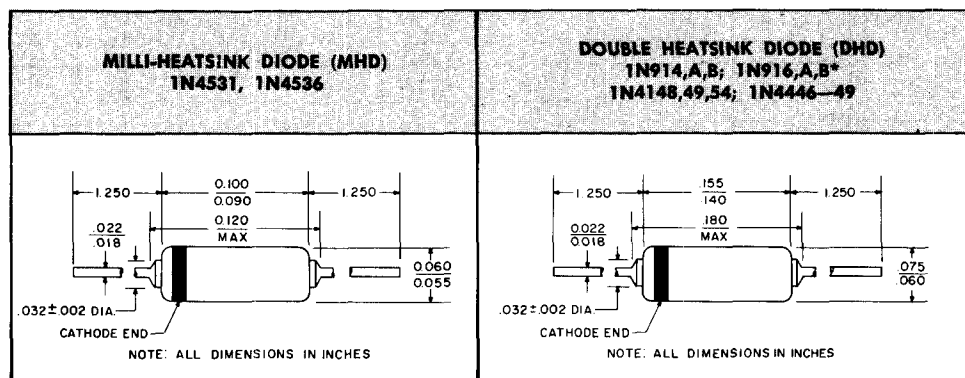
1N4536

This family of General Electric silicon signal diodes are very high speed switching diodes for computer circuits and general purpose applications. These diodes incorporate an oxide passivated planar structure. This structure makes possible a diode having high conductance, fast recovery time, low leakage, and low capacitance combined with improved uniformity and reliability. These diodes are contained in two different packages; double heat sink miniature package, and milli-heat sink package.

They are electrically the same as their equivalent types in each of the two different packages (see page two for groupings of electrically equivalent types in each of the two packages).



PLANAR EPITAXIAL PASSIVATED with Controlled Conductance



Dissipation: 500mW @ 25°C free air
Derate: 2.85mW/°C for temp. above 25°C
amb. based on max. T_J = 200°C

Dissipation: 500mW @ 25°C free air
Derate: 2.85mW/°C for temp. above 25°C
amb. based on max. T_J = 200°C

FEATURES	1N914	1N4148	1N916	1N4149	1N4536
	1N914A 1N914B	1N4446 1N4448 1N4531	1N916A 1N916B	1N4447 1N4449	1N4154
Reverse Recovery Time of 2 nanoseconds maximum					●
Reverse Recovery Time of 4 nanoseconds maximum	●	●	●	●	
Capacitance of 2 pF maximum			●	●	
Capacitance of 4 pF maximum	●	●			●
Power Dissipation to 500 mW		●		●	●
Power Dissipation to 250 mW					
Meets all MIL-S-19500C requirements	●	●	●	●	●

HEATSINK SPACING FROM END OF DIODE BODY	STEADY STATE THERMAL RESISTANCE °C/mW (NOTE 1)		POWER DISSIPATION AT 25°C mW (NOTE 2)	
	MHD	DHD	MHD	DHD
.062"	.230	.250	760	700
.250"	.319	.319	550	550
.500"	.438	.438	400	400

NOTE 1 See Figure 7 for thermal resistance for short pulses.
NOTE 2 This power rating is based on a maximum junction temperature of 200°C.

Figure 1

1N914, A, B	1N4154	1N4536
1N916, A, B	1N4446-49	
1N4148, 49	1N4531	

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

	MHD & DHD	MHD & DHD	
Voltage			
Reverse	75	25	Volts
Current			
Average Rectified	150	150	mA
Recurrent Peak Forward	450	450	mA
Forward Steady-State DC	200	200	mA
Peak Forward Surge (1μsec. pulse)	2000	2000	mA
Power			
Dissipation	500	500	mW
Temperature			
Operating	← -65 to +200 →		°C
Storage	← -65 to +200 →		°C

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

Type	Minimum Breakdown Voltage @ 100μA	Forward Voltage		Maximum Reverse Current, I _R			C _o ⁽¹⁾	t _{rr} ⁽²⁾	V _r ⁽³⁾
		I _F	V _F	20V		75V			
				25°C	150°C	25°C			
		Volts	mA	V	nA	μA			
1N914 1N4148 1N4531	100	10	1.0	25	50	5	4	4	
1N914A 1N4446	100	20	1.0	25	50	5	4	4	
1N914B 1N4448	100	5 100	0.62-0.72 1.0	25 ⁽⁴⁾	50	5	4	4	2.5
1N916 1N4149	100	10	1.0	25	50	5	2	4	
1N916A 1N4447	100	20	1.0	25	50	5	2	4	
1N916B 1N4449	100	5 30	0.63-0.73 1.0	25	50	5	2	4	2.5
1N4154 1N4536	35 @ 5μA	30	1.0	100 @ 25V	100 @ 25V		4	2	

*Except as noted.

- NOTES (1) Maximum Capacitance is measured on Boonton model 75A capacitance bridge at a signal level of 50 mV at V_R = 0
- (2) Maximum Reverse Recovery Time, I_F = 10mA, V_R = -6V, R_L = 100Ω, Recovery to 1.0mA (Figure 6)
- (3) Maximum Forward Recovery Voltage, -50mA peak square wave, 0.1 μsec. pulse width, 5 to 100 kHz repetition rate, generator rise time (t_r) ≤ 30nsec.
- (4) Also 3μA at 20 V at 100°C

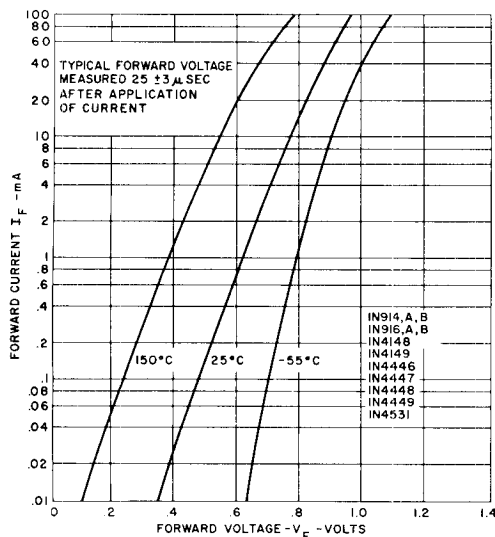


Figure 2

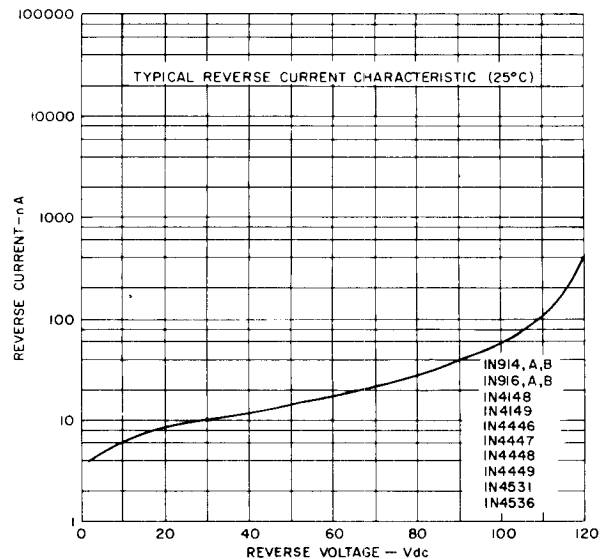


Figure 3

1N914, A, B	1N4154	1N4536
1N916, A, B	1N4446-49	
1N4148, 49	1N4531	

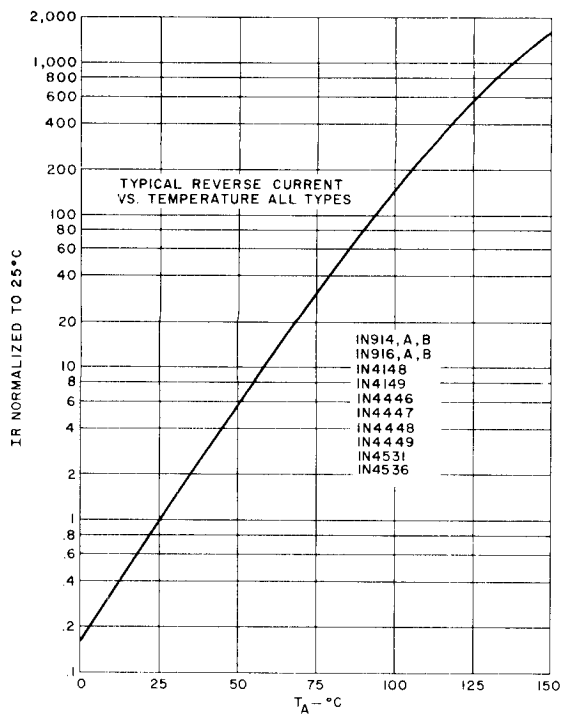


Figure 4

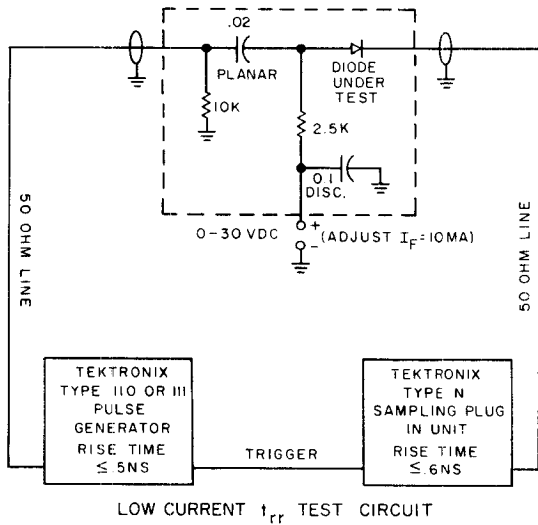


Figure 6

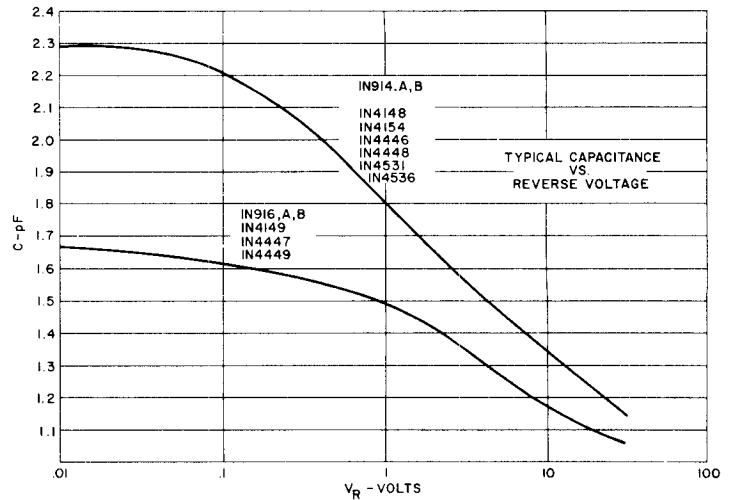


Figure 5

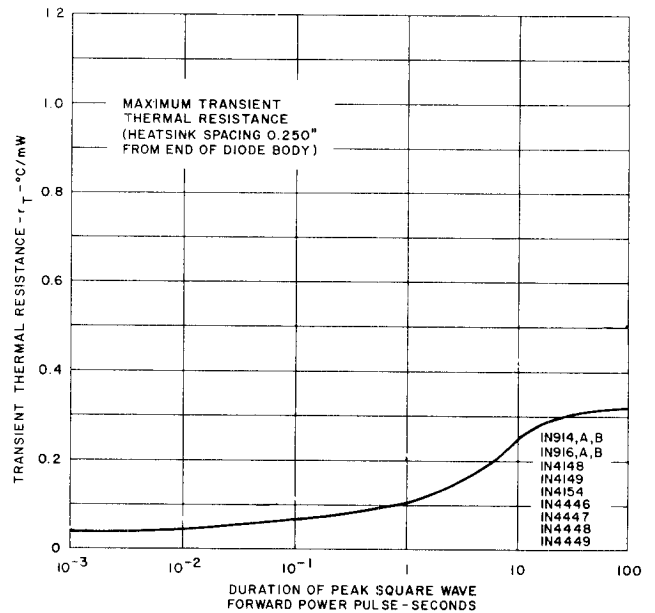


Figure 7

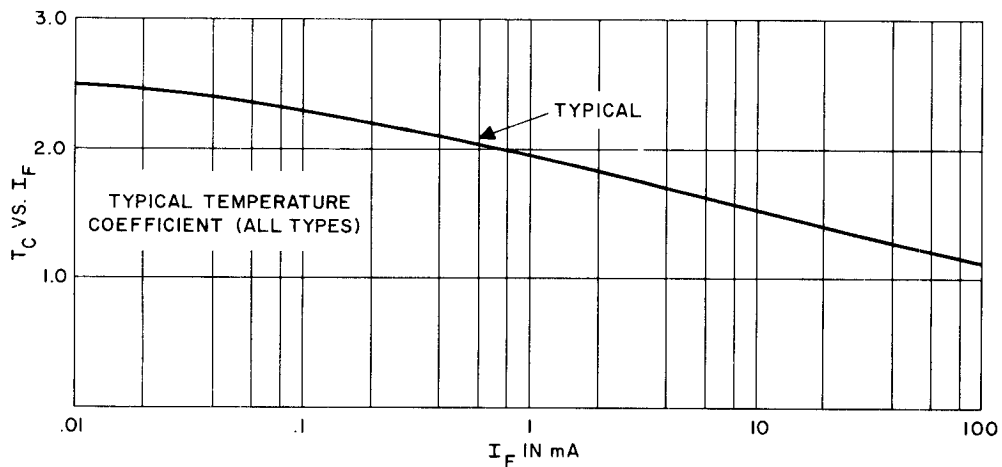


Figure 8

1N914, A, B	1N4154	1N4536
1N916, A, B	1N446-49	
1N4148, 49	1N4531	

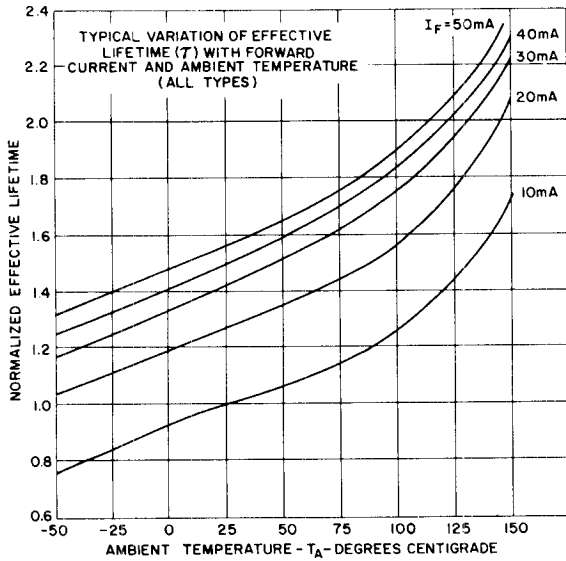


Figure 9

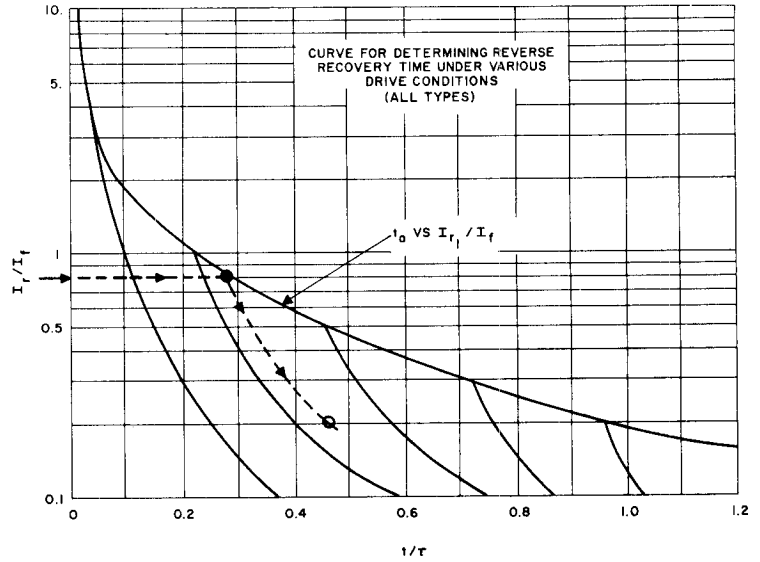
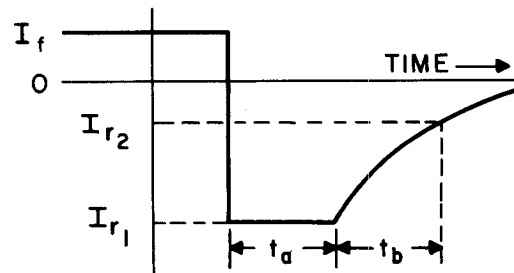


Figure 10

ESTIMATION OF REVERSE RECOVERY TIME UNDER VARIOUS DRIVE CONDITIONS

The reverse recovery time of a silicon signal diode has been shown* to be determined by a quantity called the effective lifetime, τ , and the ratio of forward and reverse current. The exact equations expressing times t_a and t_b (as defined in the sketch at right) are somewhat inconvenient for numerical evaluation, but in many cases an estimation of response time is sufficient. Figure 10 is a graphical solution to the response time equations and its use can best be illustrated by the following example:



FIND: Recovery time to 5 mA reverse current when the forward current is 25 mA and the maximum reverse current is 20 mA.

SOLUTION: Enter the left side of Figure 10 at $I_{r1}/I_f = 20/25 = 0.8$ and follow horizontally until the t_a vs. I_{r1}/I_f line is reached (see dotted line). From the t/τ scale of the horizontal axis, it is seen that t_a is 0.28τ . The t_b portion of the recovery curve is estimated by moving downward parallel to the general contour lines until the $I_{r2}/I_f = 5/25 = 0.2$ line is reached. The total switching time is thus 0.46τ . The delay time, t_b , is $0.46\tau - 0.28\tau$ or 0.18τ .

The value of τ on the spec sheet should be corrected for current level. Figure 9 shows the typical variation of effective lifetime with forward current. Since the current level of the example is 25 mA, the maximum effective lifetime is approximately (6.8) (1.35) or 9.3 nsec., therefore:

$$t_a \approx (9.3) (.28) \approx 2.6 \text{ nsec. maximum}$$

$$t_b \approx (9.3) (.18) \approx 1.7 \text{ nsec. maximum}$$

Total reverse recovery time ≈ 4.3 nsec. maximum

Additional information on this method of diode recovery time calculation is contained in a paper entitled "Predicting Reverse Recovery Time of High Speed Semiconductor Junction Diodes" by C. H. Chen, (Publication #90.36) available on request.

*Ko, W. H., "The Reverse Transient Behavior of Semiconductor Junction Diodes," IRE Trans. ED-8, March 1961, pp. 123-131.