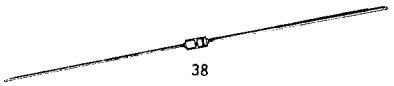
SILICON SIGNAL DIODES
100 MA TYPES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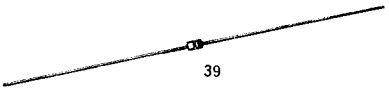
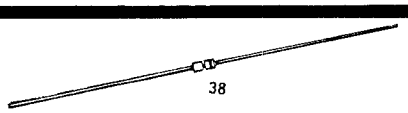

39

Part Number	BV @ 100μA Min. (V)	I_R @ 25°C Max. (ηA)	@ V_R (V)	V_F Max. (V)	@ I_F (mA)	C_O @ DV (pf)	t_{rr} (ηSEC)	Package Outline	Package Outline Number
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


38

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

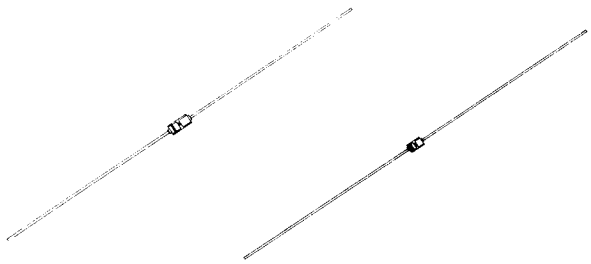
[1] Measured at 5μA

1N4154 SEE PAGE 205

Silicon Diodes

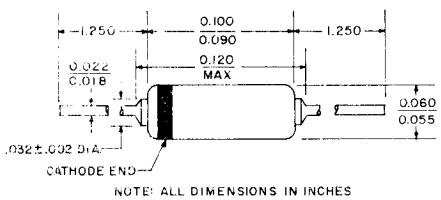
1N4151,2,3
1N4454
1N4532,3,4

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



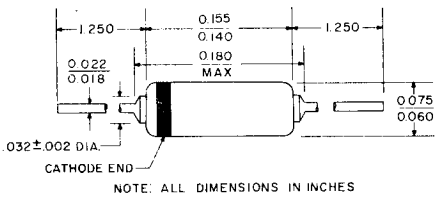
PLANAR EPITAXIAL PASSIVATED
with Controlled Conductance

MILLI-HEATSINK DIODE (MHD)
1N4532-1N4534



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

DOUBLE HEATSINK DIODE (DHD)
1N4151-1N4153
1N4454



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

FEATURES	1N4151 1N4454 MHD618 1N4532	1N4152 1N4153 1N4538 1N4534
Reverse Recovery Time of 4 nanoseconds maximum	●	●
Min.-Max. V_F specified at 6 Forward Current Levels		●
Capacitance of 2 pF maximum	●	●
Power Dissipation to 500 mW	●	●
Power Dissipation to 250 mW		
Meets all MIL-S-19500 requirements	●	●

Figure 1

HEATSINK SPACING FROM END OF DIODE BODY	STEADY STATE THERMAL RESISTANCE °C/mW*			POWER DISSIPATION AT 25°C mW†		
	MHD		DHD	MHD		DHD
.062″	.230		.250	760		700
.250″	.319		.319	550		550
.500″	.380		.380	460		460

*See Figure 5 for thermal resistance for short pulses.

†This power rating is based on a maximum junction temperature of 200°C.

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

	1N4454 1N4532	1N4151 MHD618	1N4152 1N4533	1N4153 1N4534	DHD MHD
Voltage					
Reverse	50	50	30	50	Volts
	MHD & DHD Units				
Current					
Average Rectified	150				mA
Recurrent Peak Forward	450				mA
Forward Steady State DC	200				mA
Peak Forward Surge (1 μsec. pulse)	2000				mA
Power					
Dissipation	500				
Temperature					
Operating	← −65 to +200 →				°C
Storage	← −65 to +200 →				°C

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

		1N4454* 1N4532		1N4151 MHD618		1N4152 1N4533		1N4153 1N4534		
Breakdown Voltage		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
($I_R = 5\mu A$)	B_V	75		75		40		75		Volts
Forward Voltage										
($I_F = 100\mu A$)	V_F					0.490	0.550	0.490	0.550	Volts
($I_F = 250\mu A$)	V_F					0.530	0.590	0.530	0.590	Volts
($I_F = 1mA$)	V_F					0.590	0.670	0.590	0.670	Volts
($I_F = 2mA$)	V_F					0.620	0.700	0.620	0.700	Volts
($I_F = 10mA$)	V_F		1.00			0.700	0.810	0.700	0.810	Volts
($I_F = 20mA$)	V_F					0.740	0.880	0.740	0.880	Volts
($I_F = 50mA$)	V_F				1.00					Volts
Reverse Current										
($V_R = 30V$)	I_R						50			nA
($V_R = 30V$, $T_A = +150°C$)	I_R						50			μA
($V_R = 50V$)	I_R		100		50				50	nA
($V_R = 50V$, $T_A = +150°C$)	I_R		100		50				50	μA
Reverse Recovery Time										
($I_F = I_R = 10mA$, $I_{rr} = 1mA$, Figs. 9 & 10)	t_{rr}		4		4		4		4	nsec.
($I_F = 10mA$, $V_R = 6V$, $I_{rr} = 1mA$, $R_L = 100$ ohms, Figs. 9 & 10)	t_{rr}		2		2		2		2	nsec.
Peak Forward Voltage†	V_{peak}		3.0							Volts
Capacitance										
($V_R = 0V$)‡	C_o		2		2		2		2	pF
Stored Charge (Note 1)										
($I_F = 10mA$)§ (See Figures 9 and 10)	Q_S		32		32		32		32	pC

*MIL type available
†50mV peak square wave, 0.1 usec. pulse width, 5 to 100 kHz repetitive rate, generator t_r = 30 nsec.
‡Capacitance as measured on Boonton Model 75A capacitance bridge at a signal level of 50 mV and a frequency of 1 MHz at V_R = 0 volts.
§Stored Charge as measured on B-Line Electronics Model QS-3 stored charge meter. Pulse amplitude = 5 volts, pulse width = 50 nsec., rise time = 0.4 nsec., source impedance = 10 ohms.

1N4151, 2, 3
1N4454
1N4532, 3, 4

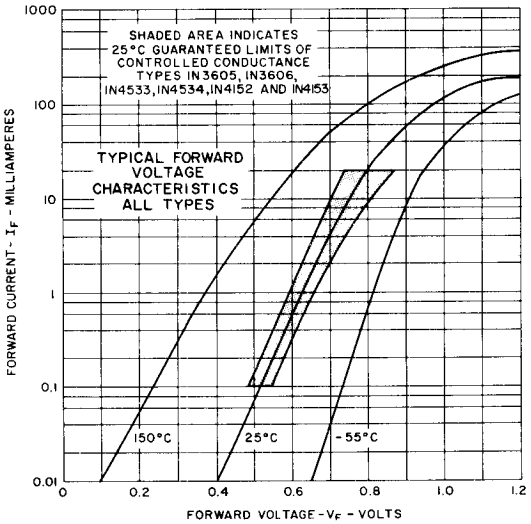


Figure 2

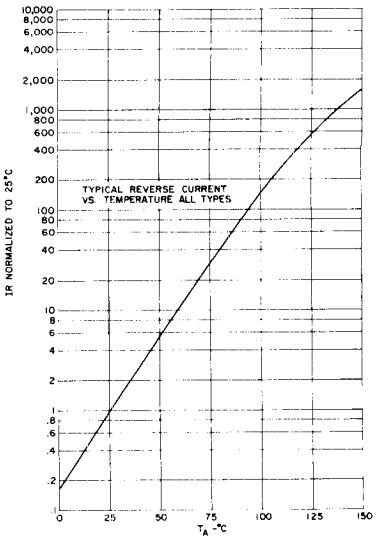


Figure 3

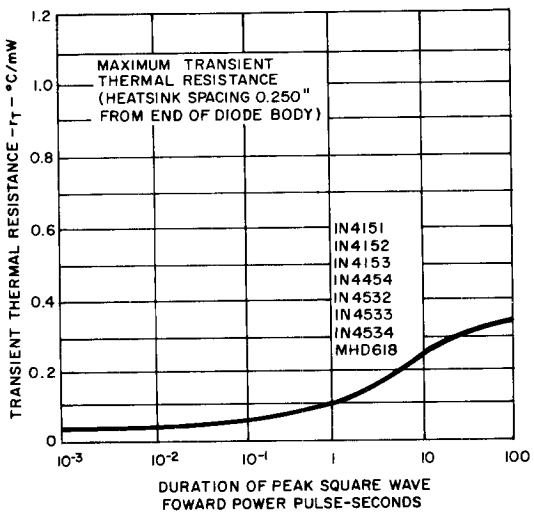


Figure 4

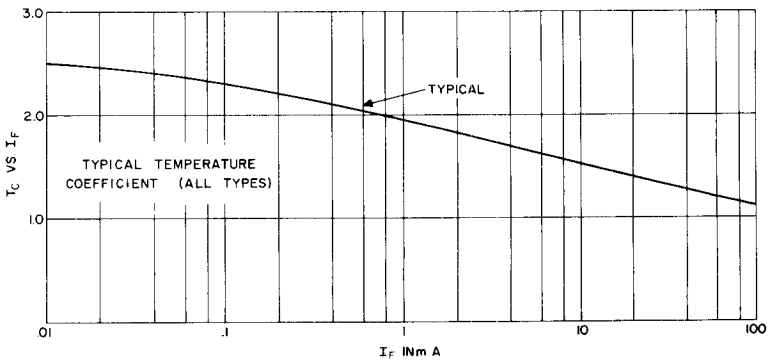


Figure 5

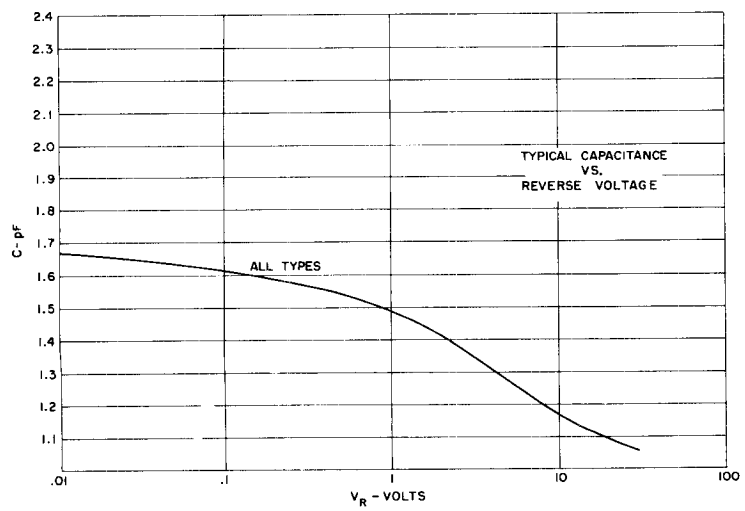


Figure 6

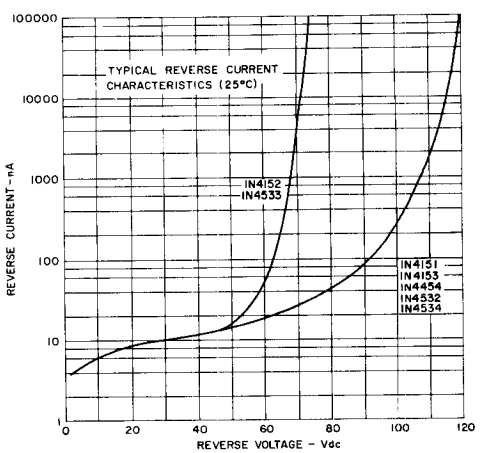


Figure 7

1N4151, 2, 3
1N4454
1N4532, 3, 4

NOTE 1: STORED CHARGE

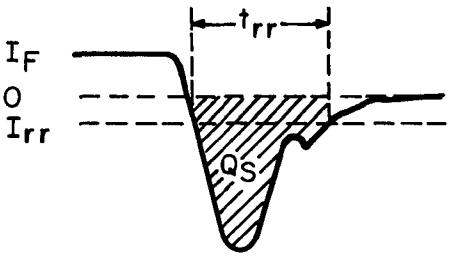
When a forward biased diode is subjected to a reverse voltage step a reverse current will flow for a short time as a result of the stored charge consisting of minority carriers in the vicinity of the junction. The typical waveform of reverse current vs time for a diode subjected to a large reverse voltage is shown in Figure 8. The time required for the diode to recover its reverse blocking condition will depend on the quantity of charge stored and the rate at which the charge is removed by recombination inside the diode and by current flowing in the external circuit. Conventionally, the speed of a diode is characterized by the reverse recovery time, t_{rr}, measured to some arbitrary current level as in Figure 8. However, for higher speed diodes reverse recovery time is not a satisfactory parameter for characterizing the speed of the diode since it is dependent on arbitrary circuit conditions and is very dependent on the construction of the test circuit. Stored charge, on the other hand, is measured by integrating the reverse current of the diode (as shown by the shaded area in Figure 8), and is consequently much less dependent on the construction of the test circuit and on arbitrary circuit conditions. Stored charge is a more ideal parameter for characterizing the speed of a diode since it represents an intrinsic characteristic of the diode and can be measured with good reproducibility on low cost instruments which have direct meter readout.

Stored charge can be correlated with reverse recovery time measurements on a specific t_{rr} test jig. Typical correlation curves are shown on the graph below.

References:

(1) JEDEC Proposed Method for Direct Measurement of Diode Stored Charge, JS-2-65-11

(2) "Measurement of Stored Charge in High Speed Diodes," T. P. Sylvan Application Note #90.30 (available on request)



TYPICAL REVERSE RECOVERY WAVEFORM FOR A HIGH SPEED DIODE

Figure 8

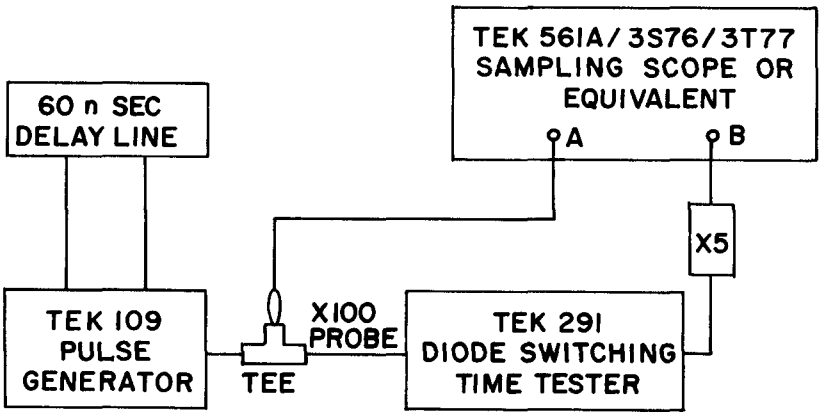


Figure 9

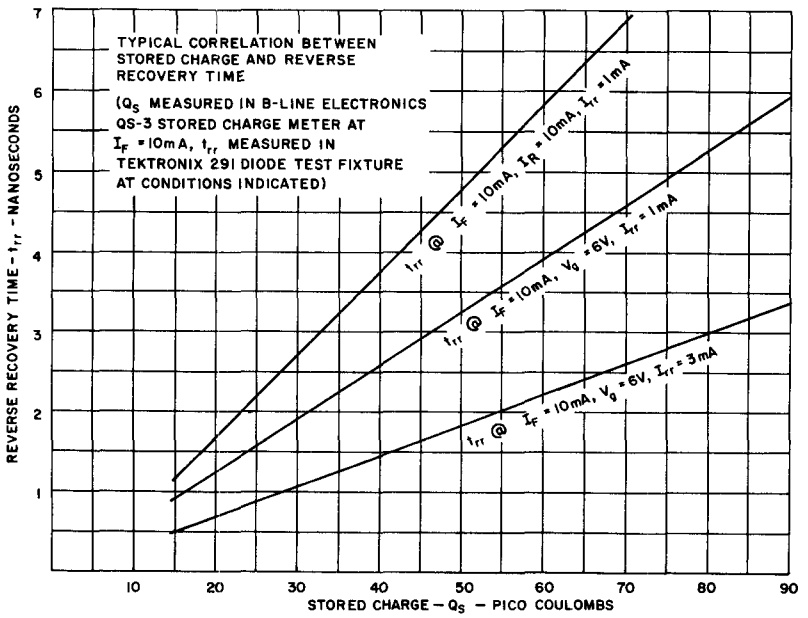


Figure 10