



MBD201 MBD301



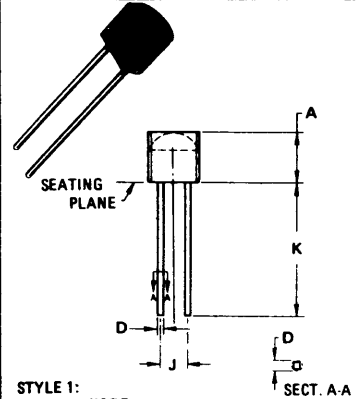
SILICON HOT-CARRIER DIODE (SCHOTTKY BARRIER DIODE)

... designed primarily for high-efficiency UHF and VHF detector applications. Readily adaptable to many other fast switching RF and digital applications. Supplied in an inexpensive plastic package for low-cost, high-volume consumer and industrial/commercial requirements.

- The Schottky Barrier Construction Provides Ultra-Stable Characteristics By Eliminating the "Cat-Whisker" or "S-Bend" Contact
- Extremely Low Minority Carrier Lifetime – 100 ps (Max)
- Very Low Capacitance – 1.5 pF (Max) @ $V_R = 20$ V
- Two Voltage Ranges – 20 V – MBD201
– 30 V – MBD301
- Low Reverse Leakage – $I_R = 10$ nAdc (Typ) MBD201
= 13 nAdc (Typ) MBD301

SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES 20-30 VOLTS

7.0



STYLE 1:
PIN 1. ANODE
PIN 2. CATHODE



MAXIMUM RATING ($T_J = 125^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Reverse Voltage	V_R	20 30	Volts
Forward Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate Above 25°C	P_F	500 5.0	mW mW/ $^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.45	4.70	0.175	0.185
D	0.41	0.48	0.016	0.019
J	2.29	2.79	0.090	0.110
K	12.70	–	0.500	–

CASE 182-03

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ($I_R = 10 \mu\text{Adc}$)	V_{BR}/I_R	20 30	–	–	Volts
Total Capacitance, Figure 1 ($V_R = 15$ Volts, $f = 1.0$ MHz)	C_T	–	0.9	1.5	pF
Minority Carrier Lifetime, Figure 2 ($I_F = 5.0$ mA, Krakauer Method)	τ	–	15	100	ps
Reverse Leakage, Figure 3 ($V_R = 15$ V) ($V_R = 25$ V)	I_R	–	10 13	200 200	nAdc
Forward Voltage, Figure 4 ($I_F = 10$ mAdc)	V_F	–	0.5	0.6	Vdc
Series Inductance ($f = 250$ MHz, Lead Length $\approx 1/16"$)	L_S	–	6.0	–	nH
Case Capacitance ($f = 1.0$ MHz, Lead Length $\approx 1/16"$)	C_C	–	0.18	–	pF

TYPICAL ELECTRICAL CHARACTERISTICS

FIGURE 1 – TOTAL CAPACITANCE

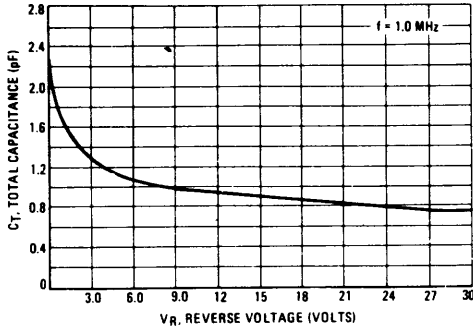


FIGURE 2 – MINORITY CARRIER LIFETIME

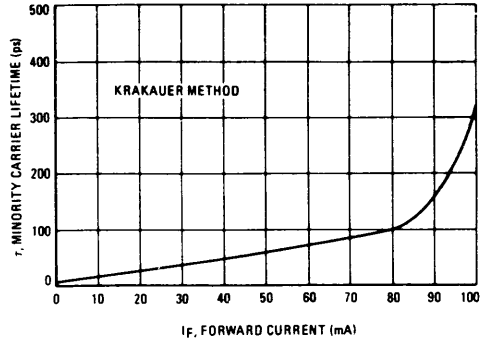


FIGURE 3 – REVERSE LEAKAGE

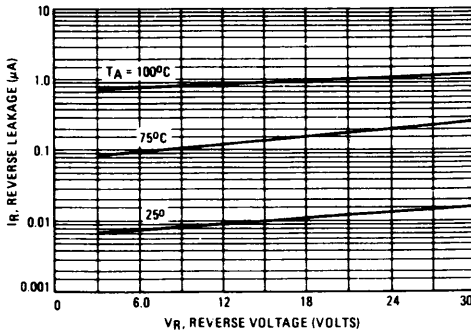
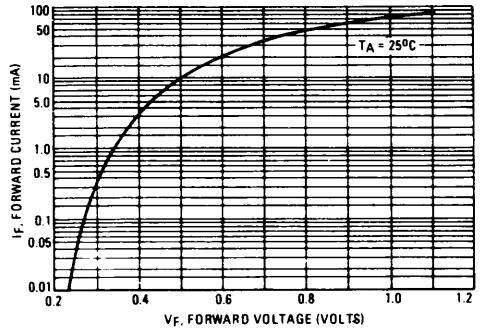
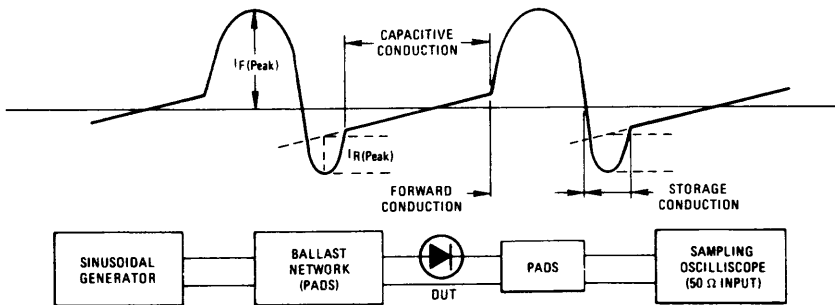


FIGURE 4 – FORWARD VOLTAGE



KRAUER METHOD OF MEASURING LIFE TIME



7.0

1N5817 MBR115P
1N5818 MBR120P
1N5819 MBR130P
MBR140P

AXIAL LEAD RECTIFIERS

... employing the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlap contact. Ideally suited for use as rectifiers in low-voltage, high-frequency inverters, free wheeling diodes, and polarity protection diodes.

- Extremely Low v_f
- Low Stored Charge, Majority Carrier Conduction
- Low Power Loss/High Efficiency

SCHOTTKY BARRIER RECTIFIERS

1 AMPERE
15, 20, 30, 40 VOLTS

***MAXIMUM RATINGS**

Rating	Symbol	MBR115P	1N5817 MBR120P	1N5818 MBR130P	1N5819 MBR140P	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	15	20	30	40	V
Working Peak Reverse Voltage	V_{RWM}					
DC Blocking Voltage	V_R					
Non-Repetitive Peak Reverse Voltage	V_{RSM}	15	24	36	48	V
RMS Reverse Voltage	$V_{R(RMS)}$	10	14	21	28	V
Average Rectified Forward Current (2) ($V_R(\text{equiv}) < 0.2 V_R(\text{dc})$, $T_L = 90^\circ\text{C}$, $R_{\theta JA} = 80^\circ\text{C/W}$, P.C. Board Mounting, see Note 2, $T_A = 55^\circ\text{C}$)	I_O	1.0				A
Ambient Temperature (Rated $V_R(\text{dc})$, $P_F(\text{AV}) = 0$, $R_{\theta JA} = 80^\circ\text{C/W}$)	T_A	90	85	80	75	$^\circ\text{C}$
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, half-wave, single phase 60 Hz, $T_L = 70^\circ\text{C}$)	I_{FSM}	25 (for one cycle)				A
Operating and Storage Temperature Range (Reverse Voltage applied)	T_J, T_{stg}	-65 to +125				$^\circ\text{C}$
Peak Operating Junction Temperature (Forward Current applied)	$T_J(\text{pk})$	150				$^\circ\text{C}$

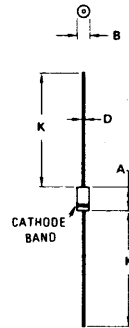
***THERMAL CHARACTERISTICS (Note 2)**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	80	$^\circ\text{C/W}$

***ELECTRICAL CHARACTERISTICS ($T_L = 25^\circ\text{C}$ unless otherwise noted) (2)**

Characteristic	Symbol	1N5817	1N5818	1N5819	MBR115P MBR120P MBR130P	MBR140P	Unit
Maximum Instantaneous Forward Forward Voltage (1) ($i_F = 0.1 \text{ A}$) ($i_F = 1.0 \text{ A}$) ($i_F = 3.0 \text{ A}$)	v_f	0.320 0.450 0.750	0.330 0.550 0.875	0.340 0.600 0.900	0.350 0.550 0.850	0.350 0.600 0.900	V
Maximum Instantaneous Reverse Current @ Rated dc Voltage (1) ($T_L = 25^\circ\text{C}$) ($T_L = 100^\circ\text{C}$)	i_R	1.0 10	1.0 10	1.0 10	1.0 10	1.0 10	mA

(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.
 (2) Lead Temperature reference is cathode lead 1/32" from case.
 *Indicates JEDEC Registered Data for 1N5817-19.



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.97	6.60	0.235	0.260
B	2.79	3.05	0.110	0.120
D	0.76	0.86	0.030	0.034
K	27.94	-	1.100	-

CASE 59-04

MECHANICAL CHARACTERISTICS

CASE Void free, transfer molded
FINISH All external surfaces
 corrosion-resistant and the terminal
 leads are readily solderable
POLARITY Cathode indicated by
 polarity band
MOUNTING POSITIONS Any
SOLDERING 220°C 1/16" from
 case for ten seconds