

ON Semiconductor™



## Dual Schottky Barrier Diodes

Application circuit designs are moving toward the consolidation of device count and into smaller packages. The new SOT-363 package is a solution which simplifies circuit design, reduces device count, and reduces board space by putting two discrete devices in one small six-lead package. The SOT-363 is ideal for low-power surface mount applications where board space is at a premium, such as portable products.

**MBD110DWT1**  
**MBD330DWT1**  
**MBD770DWT1**

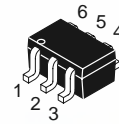
ON Semiconductor Preferred Devices

### Surface Mount Comparisons:

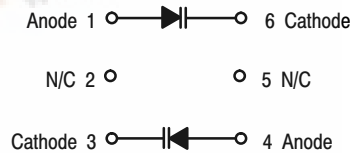
	SOT-363	SOT-23
Area (mm <sup>2</sup> )	4.6	7.6
Max Package P <sub>D</sub> (mW)	120	225
Device Count	2	1

### Space Savings:

Package	1 × SOT-23	2 × SOT-23
SOT-363	40%	70%



CASE 419B-01, STYLE 6  
SOT-363



The MBD110DW, MBD330DW, and MBD770DW devices are spin-offs of our popular MMBD101LT1, MMBD301LT1, and MMBD701LT1 SOT-23 devices. They are designed for high-efficiency UHF and VHF detector applications. Readily available to many other fast switching RF and digital applications.

- Extremely Low Minority Carrier Lifetime
- Very Low Capacitance
- Low Reverse Leakage

### MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Reverse Voltage	MBD110DWT1 MBD330DWT1 MBD770DWT1	V <sub>R</sub>	7.0 30 70	Vdc
Forward Power Dissipation T <sub>A</sub> = 25°C		P <sub>F</sub>	120	mW
Junction Temperature		T <sub>J</sub>	-55 to +125	°C
Storage Temperature Range		T <sub>stg</sub>	-55 to +150	°C

### DEVICE MARKING

MBD110DWT1 = M4  
MBD330DWT1 = T4  
MBD770DWT1 = H5

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## MBD110DWT1 MBD330DWT1 MBD770DWT1

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

Characteristic		Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R = 10 \mu\text{A}$ )	MBD110DWT1 MBD330DWT1 MBD770DWT1	$V_{(BR)R}$	7.0 30 70	10 — —	— — —	Volts
Diode Capacitance ( $V_R = 0$ , $f = 1.0 \text{ MHz}$ , Note 1)	MBD110DWT1	$C_T$	—	0.88	1.0	pF
Total Capacitance ( $V_R = 15 \text{ Volts}$ , $f = 1.0 \text{ MHz}$ ) ( $V_R = 20 \text{ Volts}$ , $f = 1.0 \text{ MHz}$ )	MBD330DWT1 MBD770DWT1	$C_T$	— —	0.9 0.5	1.5 1.0	pF
Reverse Leakage ( $V_R = 3.0 \text{ V}$ ) ( $V_R = 25 \text{ V}$ ) ( $V_R = 35 \text{ V}$ )	MBD110DWT1 MBD330DWT1 MBD770DWT1	$I_R$	— — —	0.02 13 9.0	0.25 200 200	$\mu\text{A}$ nAdc nAdc
Noise Figure ( $f = 1.0 \text{ GHz}$ , Note 2)	MBD110DWT1	NF	—	6.0	—	dB
Forward Voltage ( $I_F = 10 \text{ mA}$ ) ( $I_F = 1.0 \text{ mAdc}$ ) ( $I_F = 10 \text{ mA}$ ) ( $I_F = 1.0 \text{ mAdc}$ ) ( $I_F = 10 \text{ mA}$ )	MBD110DWT1 MBD330DWT1 MBD770DWT1	$V_F$	— — — — —	0.5 0.38 0.52 0.42 0.7	0.6 0.45 0.6 0.5 1.0	Vdc

# MBD110DWT1 MBD330DWT1 MBD770DWT1

## TYPICAL CHARACTERISTICS MBD110DWT1

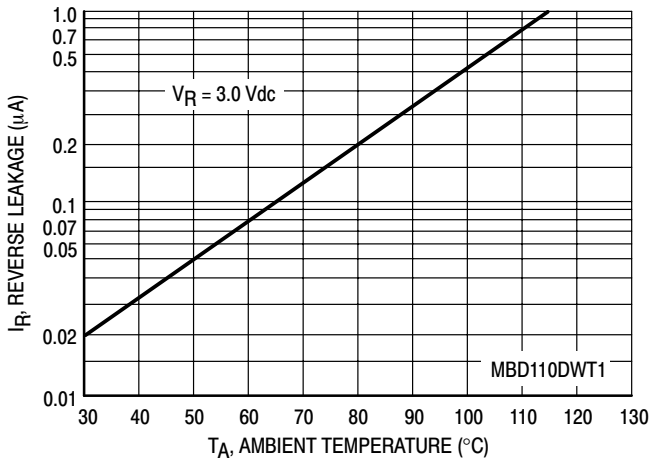


Figure 1. Reverse Leakage

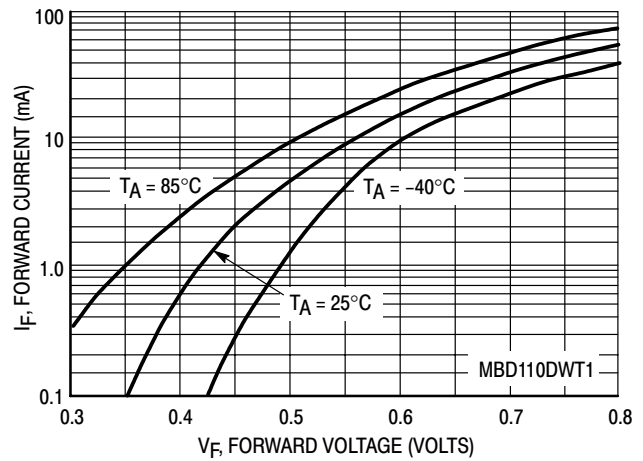


Figure 2. Forward Voltage

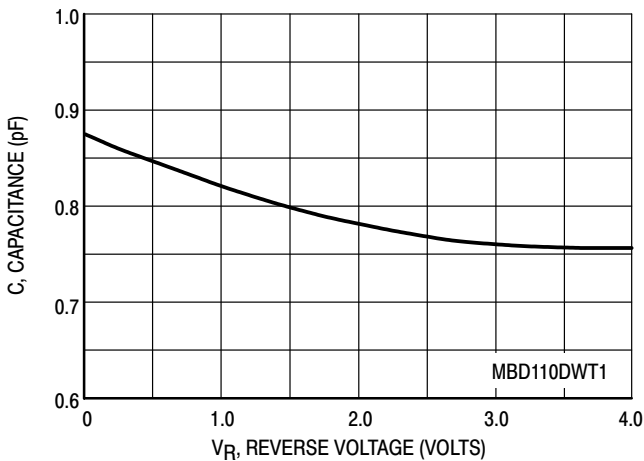


Figure 3. Capacitance

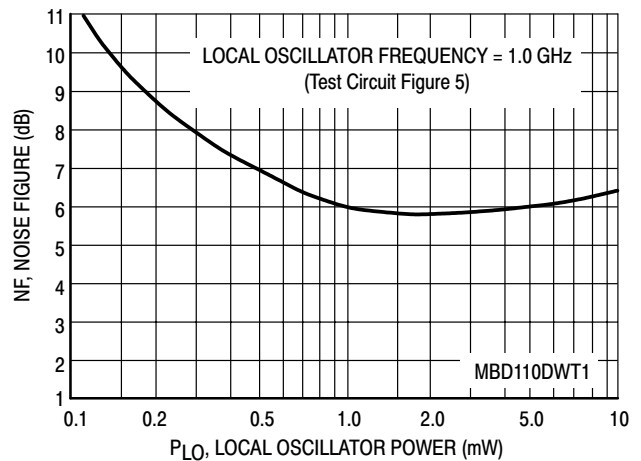


Figure 4. Noise Figure

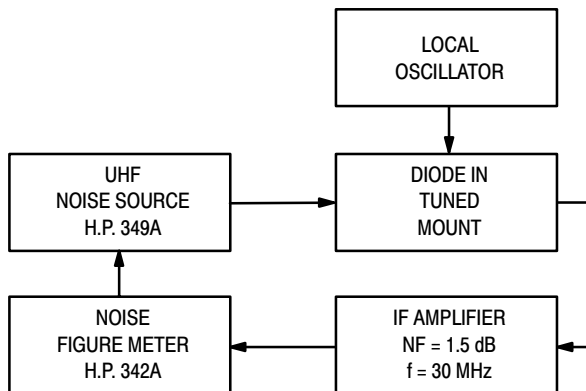


Figure 5. Noise Figure Test Circuit

### NOTES ON TESTING AND SPECIFICATIONS

- Note 1 –  $C_C$  and  $C_T$  are measured using a capacitance bridge (Boonton Electronics Model 75A or equivalent).
- Note 2 – Noise figure measured with diode under test in tuned diode mount using UHF noise source and local oscillator (LO) frequency of 1.0 GHz. The LO power is adjusted for 1.0 mW. IF amplifier NF = 1.5 dB,  $f = 30$  MHz, see Figure 5.
- Note 3 –  $L_S$  is measured on a package having a short instead of a die, using an impedance bridge (Boonton Radio Model 250A RX Meter).

# MBD110DWT1 MBD330DWT1 MBD770DWT1

## TYPICAL CHARACTERISTICS MBD330DWT1

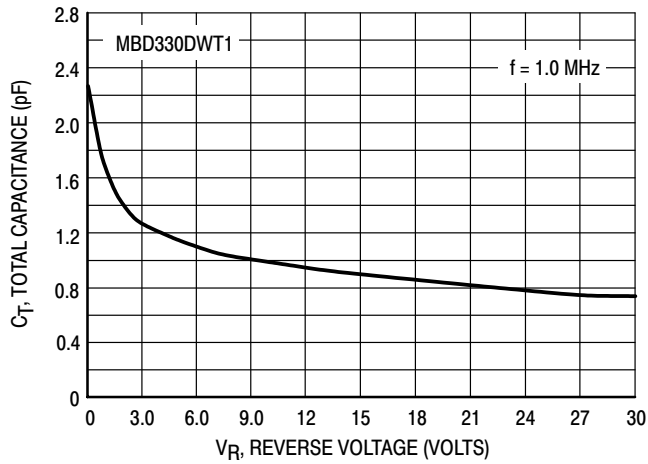


Figure 6. Total Capacitance

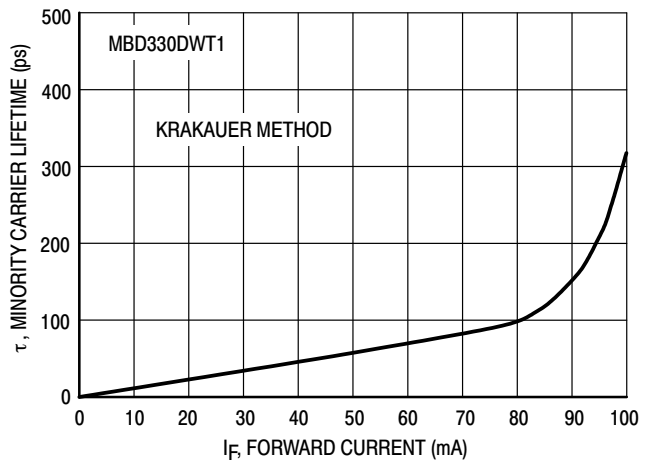


Figure 7. Minority Carrier Lifetime

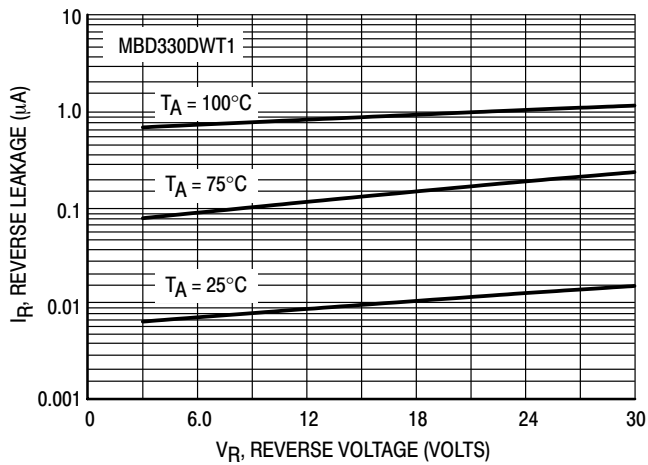


Figure 8. Reverse Leakage

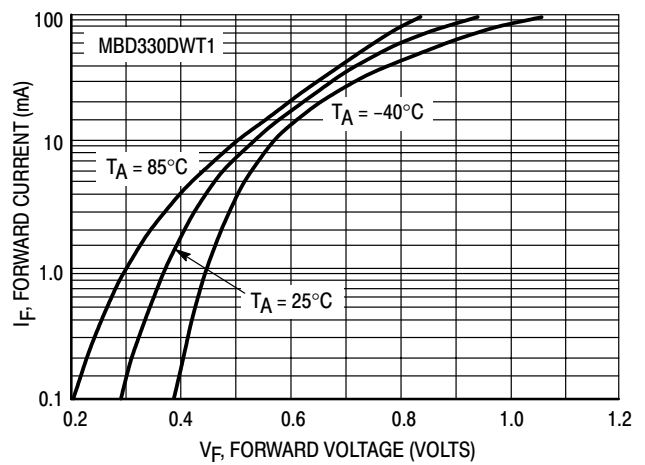


Figure 9. Forward Voltage

# MBD110DWT1 MBD330DWT1 MBD770DWT1

## TYPICAL CHARACTERISTICS MBD770DWT1

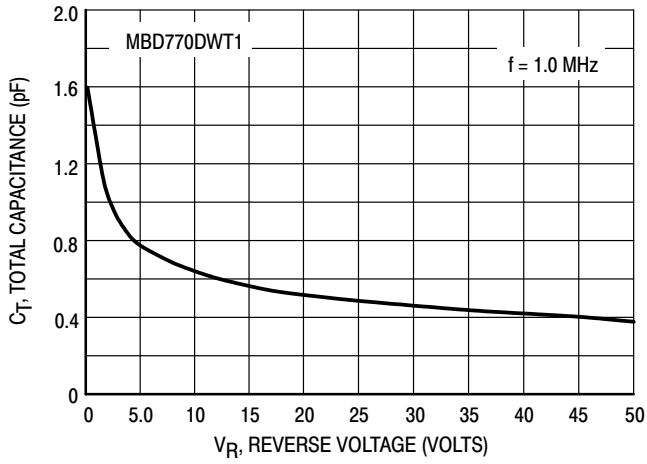


Figure 10. Total Capacitance

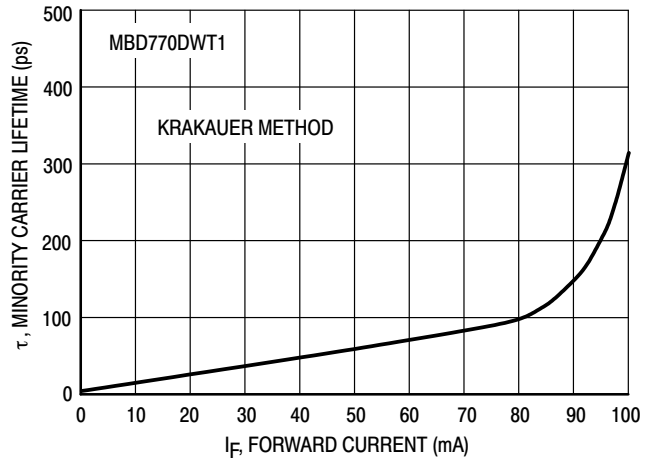


Figure 11. Minority Carrier Lifetime

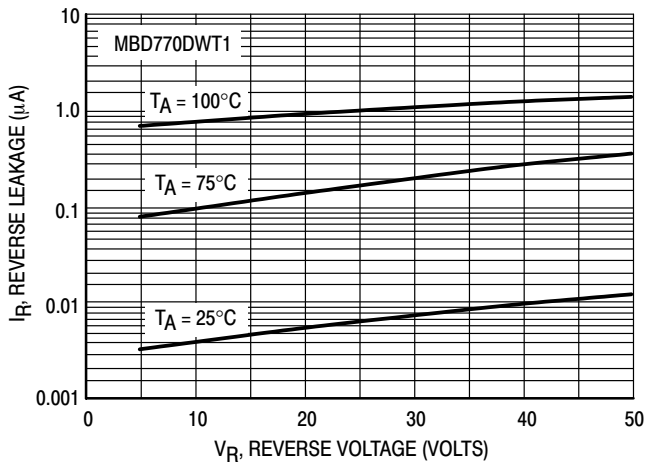


Figure 12. Reverse Leakage

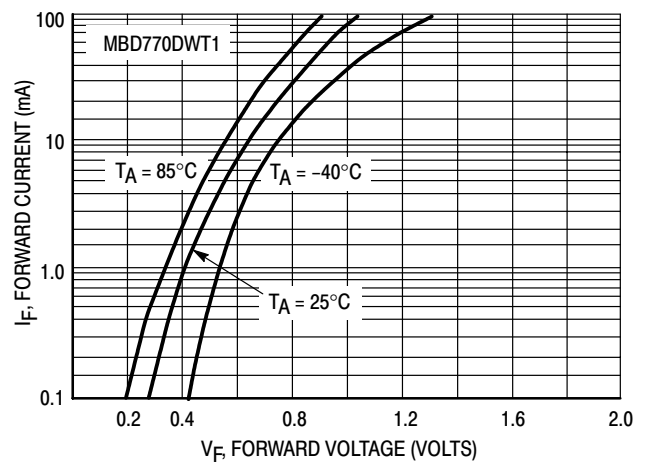


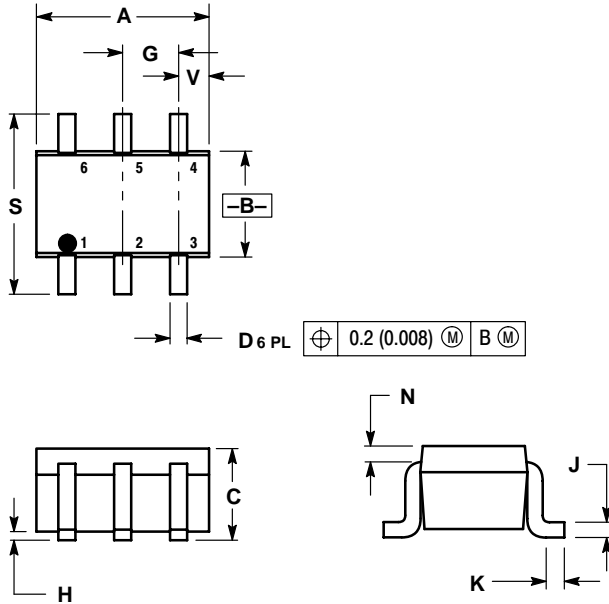
Figure 13. Forward Voltage



# MBD110DWT1 MBD330DWT1 MBD770DWT1

## PACKAGE DIMENSIONS

SC-88 (SOT-363)  
CASE 419B-01  
ISSUE G



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20
V	0.012	0.016	0.30	0.40

STYLE 6:

1. ANODE 2
2. N/C
3. CATHODE 1
4. ANODE 1
5. N/C
6. CATHODE 2

# MBD110DWT1 MBD330DWT1 MBD770DWT1

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