

# MBD110DWT1, MBD330DWT1, MBD770DWT1

Preferred Device

## 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.

### 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%

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.

### Features

- Extremely Low Minority Carrier Lifetime
- Very Low Capacitance
- Low Reverse Leakage
- Pb-Free Packages are Available

### MAXIMUM RATINGS

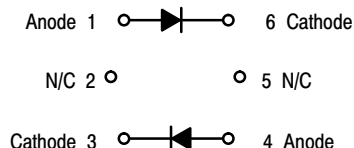
Rating	Symbol	Value	Unit
Reverse Voltage MBD110DWT1 MBD330DWT1 MBD770DWT1	V <sub>R</sub>	7.0 30 70	V
Forward Power Dissipation T <sub>A</sub> = 25°C	P <sub>F</sub>	120	mW
Junction Temperature	T <sub>J</sub>	-55 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



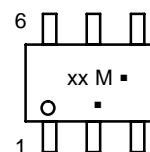
ON Semiconductor®

<http://onsemi.com>



SC-88 / SOT-363  
CASE 419B  
STYLE 6

### MARKING DIAGRAM



xx = Device Code  
Refer to Ordering Table,  
page 2  
M = Date Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

# MBD110DWT1, MBD330DWT1, MBD770DWT1

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage (I <sub>R</sub> = 10 μA)	MBD110DWT1 MBD330DWT1 MBD770DWT1	V <sub>(BR)R</sub>	7.0 30 70	10 – –	– – –	V
Diode Capacitance (V <sub>R</sub> = 0, f = 1.0 MHz, Note 1)	MBD110DWT1	C <sub>D</sub>	–	0.88	1.0	pF
Total Capacitance (V <sub>R</sub> = 15 Volts, f = 1.0 MHz) (V <sub>R</sub> = 20 Volts, f = 1.0 MHz)	MBD330DWT1 MBD770DWT1	C <sub>T</sub>	– –	0.9 0.5	1.5 1.0	pF
Reverse Leakage (V <sub>R</sub> = 3.0 V) (V <sub>R</sub> = 25 V) (V <sub>R</sub> = 35 V)	MBD110DWT1 MBD330DWT1 MBD770DWT1	I <sub>R</sub>	– – –	0.02 13 9.0	0.25 200 200	μA nA nA
Noise Figure (f = 1.0 GHz, Note 2)	MBD110DWT1	NF	–	6.0	–	dB
Forward Voltage (I <sub>F</sub> = 10 mA) (I <sub>F</sub> = 1.0 mA) (I <sub>F</sub> = 10 mA) (I <sub>F</sub> = 1.0 mA) (I <sub>F</sub> = 10 mA)	MBD110DWT1 MBD330DWT1 MBD770DWT1	V <sub>F</sub>	– – – – –	0.5 0.38 0.52 0.42 0.7	0.6 0.45 0.6 0.5 1.0	V

## ORDERING INFORMATION

Device	Marking	Package	Shipping†
MBD110DWT1	M4	SC-88 / SOT-363	3000 Units / Tape & Reel
MBD110DWT1G		SC-88 / SOT-363 (Pb-Free)	
MBD330DWT1	T4	SC-88 / SOT-363	
MBD330DWT1G		SC-88 / SOT-363 (Pb-Free)	
MBD770DWT1	H5	SC-88 / SOT-363	
MBD770DWT1G		SC-88 / SOT-363 (Pb-Free)	

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# MBD110DWT1, MBD330DWT1, MBD770DWT1

## TYPICAL CHARACTERISTICS MBD110DWT1

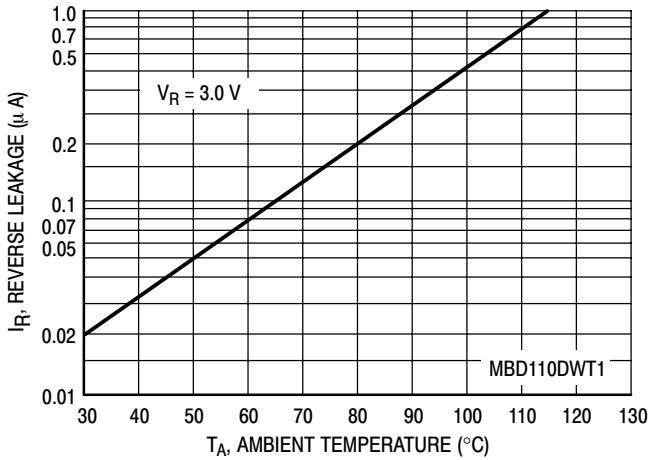


Figure 1. Reverse Leakage

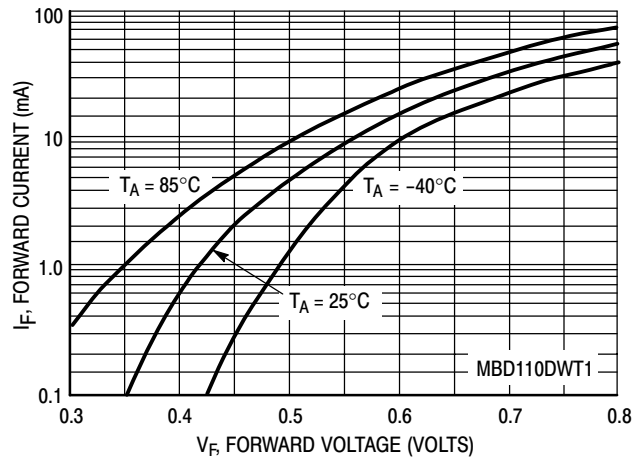


Figure 2. Forward Voltage

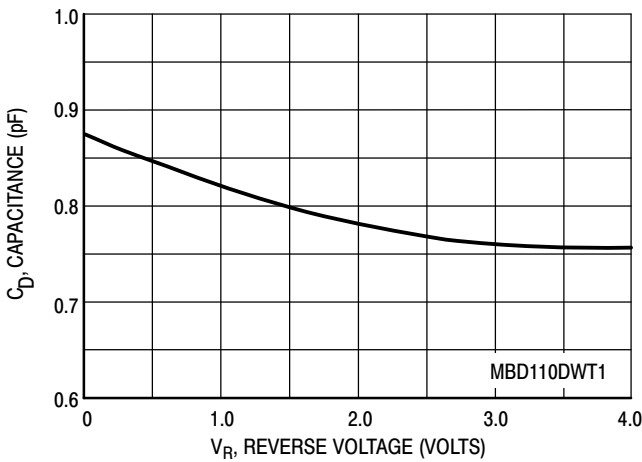


Figure 3. Capacitance

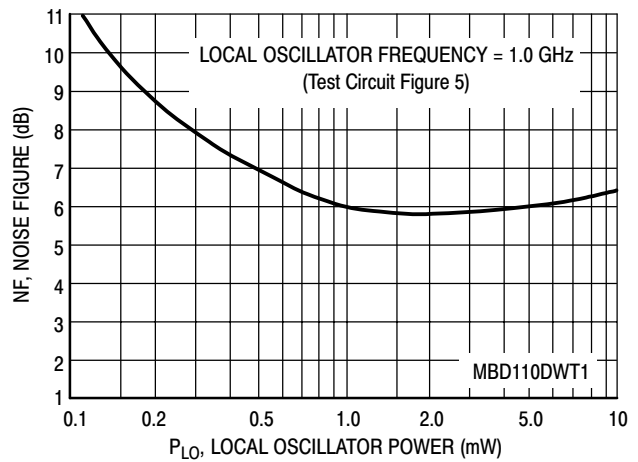


Figure 4. Noise Figure

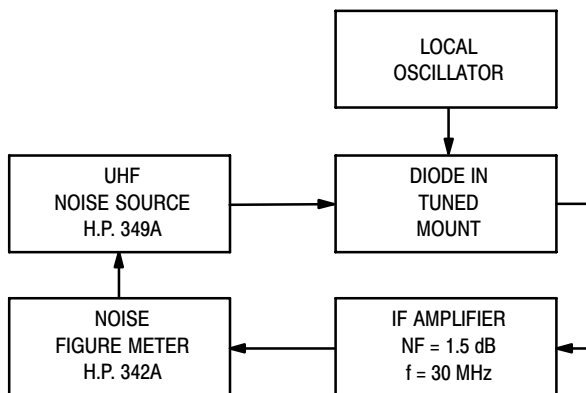


Figure 5. Noise Figure Test Circuit

### NOTES ON TESTING AND SPECIFICATIONS

- Note 1 – C<sub>D</sub> and C<sub>T</sub> 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<sub>S</sub> 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

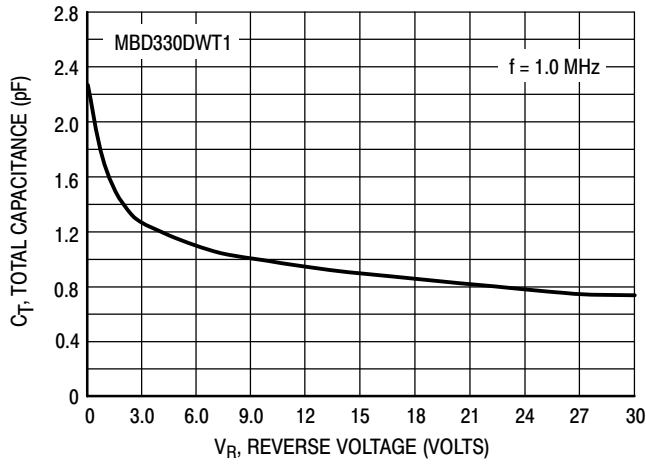


Figure 6. Total Capacitance

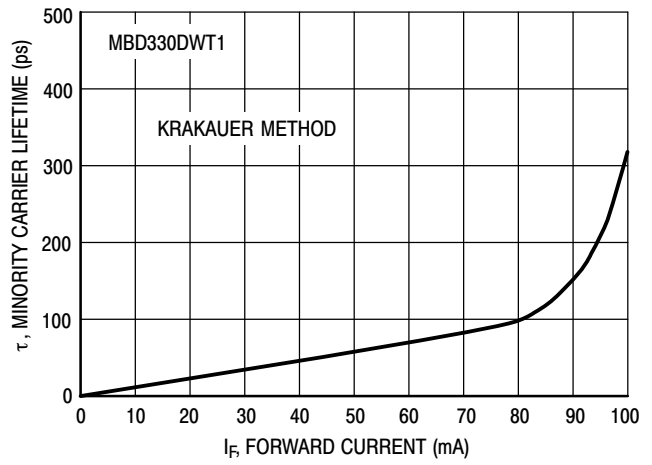


Figure 7. Minority Carrier Lifetime

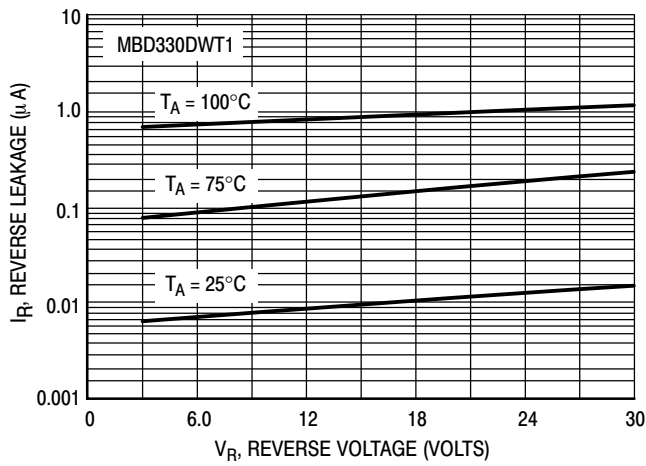


Figure 8. Reverse Leakage

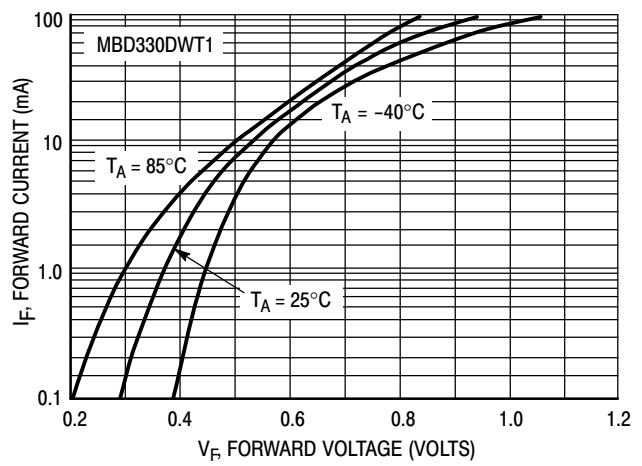


Figure 9. Forward Voltage

# MBD110DWT1, MBD330DWT1, MBD770DWT1

## TYPICAL CHARACTERISTICS MBD770DWT1

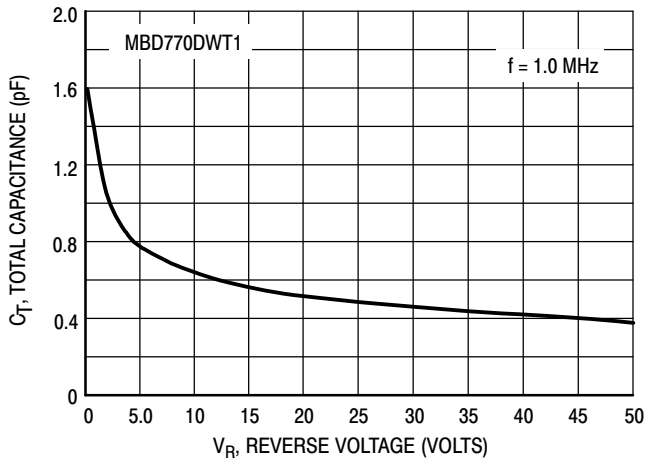


Figure 10. Total Capacitance

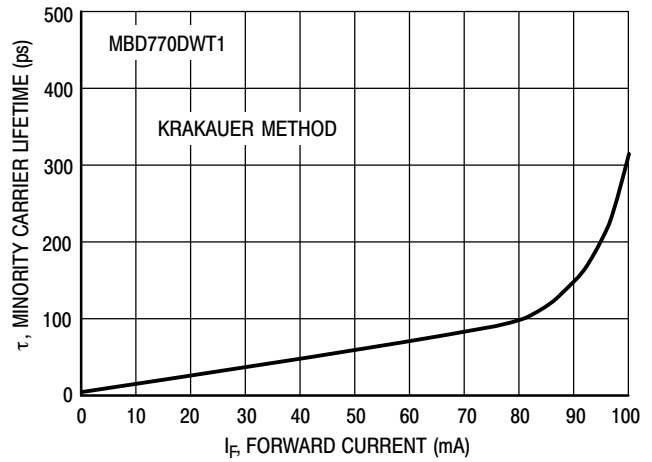


Figure 11. Minority Carrier Lifetime

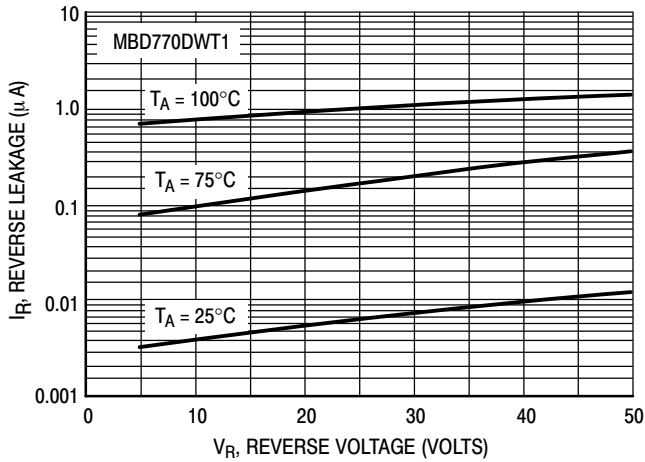


Figure 12. Reverse Leakage

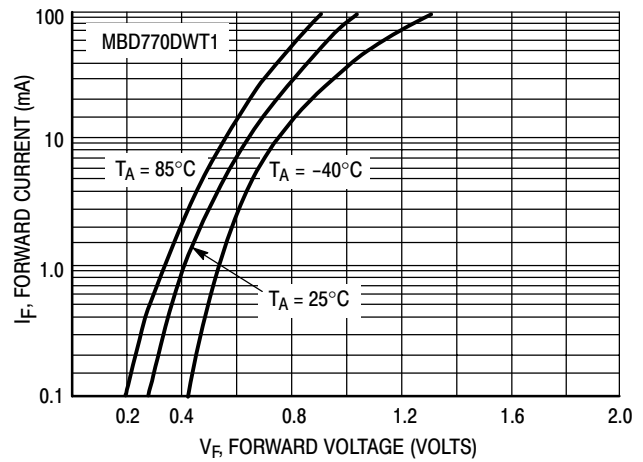
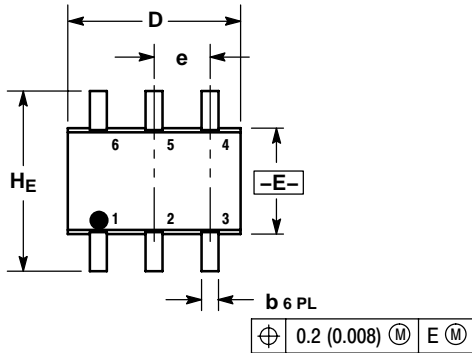


Figure 13. Forward Voltage

# MBD110DWT1, MBD330DWT1, MBD770DWT1

## PACKAGE DIMENSIONS

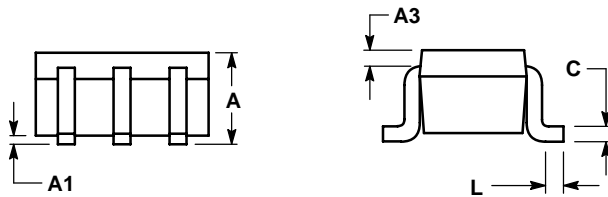
SC-88 / SC-70 / SOT-363  
CASE 419B-02  
ISSUE W



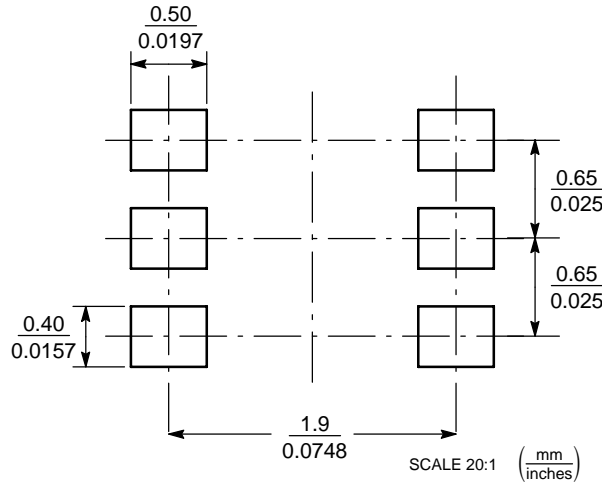
- NOTES:
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  - CONTROLLING DIMENSION: INCH.
  - 419B-01 OBSOLETE, NEW STANDARD 419B-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.20 REF			0.008 REF		
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
HE	2.00	2.10	2.20	0.078	0.082	0.086

- STYLE 6:  
PIN 1. ANODE 2  
2. N/C  
3. CATHODE 1  
4. ANODE 1  
5. N/C  
6. CATHODE 2



## SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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