MBD110DWT1G, MBD330DWT1G, MBD770DWT1G

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−leaded 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^2)	4.6	7.6
Max Package P_D (mW)	120	225
Device Count	2	1

Space Savings:

Package	1 x SOT−23	2 x 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
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Reverse Voltage	MBD110DWT1G MBD330DWT1G MBD770DWT1G	V_R	7.0 30 70	V
Forward Current (DC)	MBD330DWT1G	I_F	200 Max	mA
Forward Power Dissipation $T_A = 25°C$		P_F	120	mW
Junction Temperature		T_J	−55 to +125	°C
Storage Temperature Range		T_{stg}	−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.
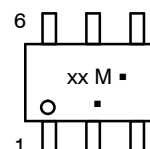
ON Semiconductor®

Anode 1 ○──▷|──○ 6 Cathode
N/C 2 ○   ○ 5 N/C
Cathode 3 ○──|◁──○ 4 Anode
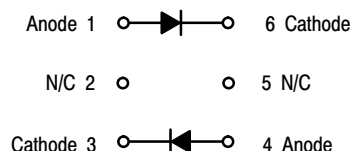
SC−88 / SOT−363
CASE 419B
STYLE 6

MARKING DIAGRAM

xx M ▪

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.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage		$V_{(BR)R}$				V
(I_R = 10 μA)	MBD110DWT1G		7.0	10	–	
	MBD330DWT1G		30	–	–	
	MBD770DWT1G		70	–	–	
Diode Capacitance		C_D				pF
(V_R = 0, f = 1.0 MHz, Note 1)	MBD110DWT1G		–	0.88	1.0	
Total Capacitance		C_T				pF
(V_R = 15 Volts, f = 1.0 MHz)	MBD330DWT1G		–	0.9	1.5	
(V_R = 20 Volts, f = 1.0 MHz)	MBD770DWT1G		–	0.5	1.0	
Reverse Leakage		I_R				
(V_R = 3.0 V)	MBD110DWT1G		–	0.02	0.25	μA
(V_R = 25 V)	MBD330DWT1G		–	13	200	nA
(V_R = 35 V)	MBD770DWT1G		–	9.0	200	nA
Noise Figure		NF				dB
(f = 1.0 GHz, Note 2)	MBD110DWT1G		–	6.0	–	
Forward Voltage		V_F				V
(I_F = 10 mA)	MBD110DWT1G		–	0.5	0.6	
(I_F = 1.0 mA)	MBD330DWT1G		–	0.38	0.45	
(I_F = 10 mA)			–	0.52	0.6	
(I_F = 1.0 mA)	MBD770DWT1G		–	0.42	0.5	
(I_F = 10 mA)			–	0.7	1.0	

ORDERING INFORMATION

Device	Marking	Package	Shipping[†]
MBD110DWT1G	M4	SC–88 / SOT–363 (Pb–Free)	
MBD330DWT1G	T4	SC–88 / SOT–363 (Pb–Free)	3000 Units / Tape & Reel
MBD770DWT1G	H5	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.

TYPICAL CHARACTERISTICS
MBD110DWT1G
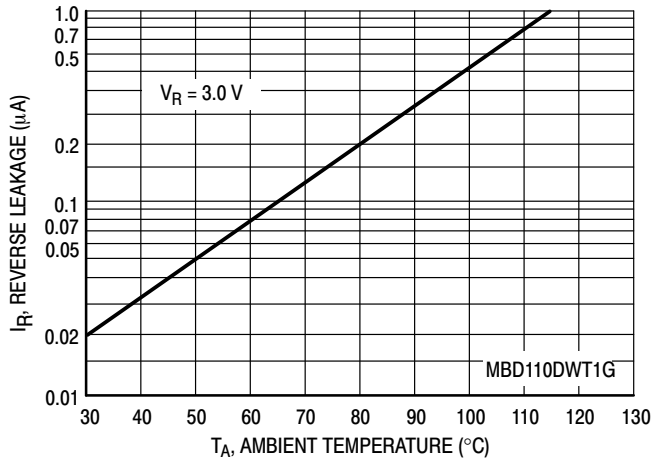
Figure 1. Reverse Leakage
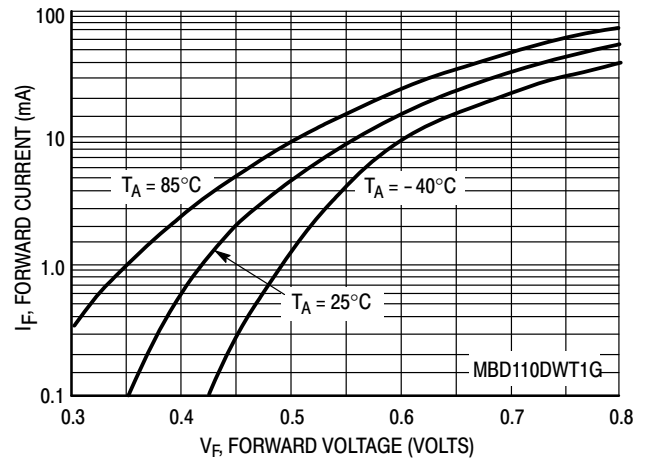
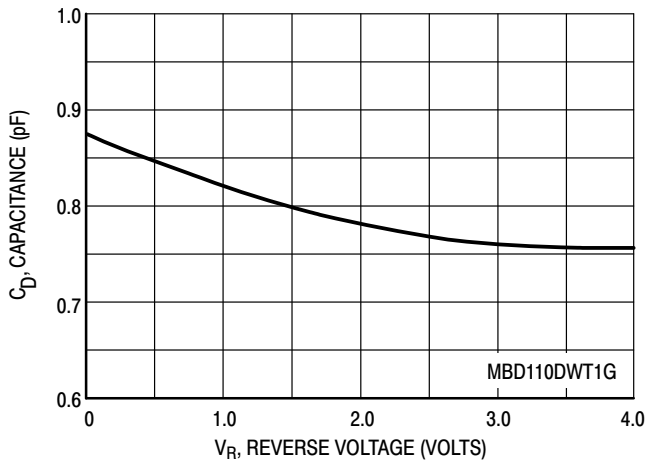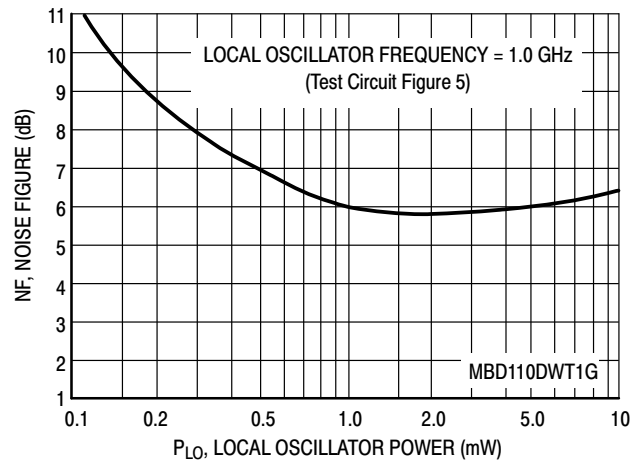**Figure 2. Forward Voltage**

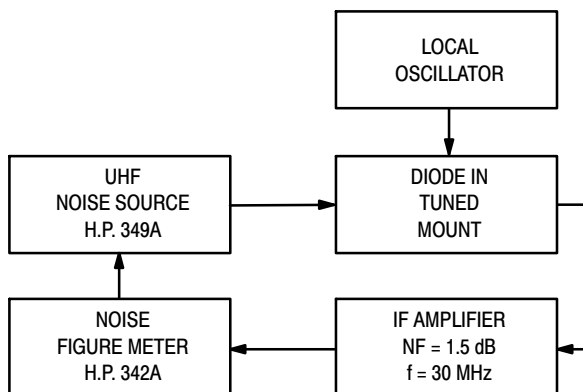**Figure 3. Capacitance**

Figure 4. Noise Figure

Figure 5. Noise Figure Test Circuit

NOTES ON TESTING AND SPECIFICATIONS

Note 1 – C_D 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).

TYPICAL CHARACTERISTICS
MBD330DWT1G
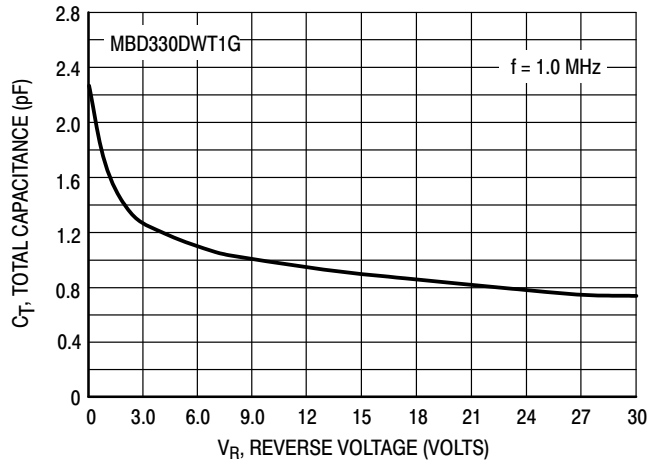
Figure 6. Total Capacitance
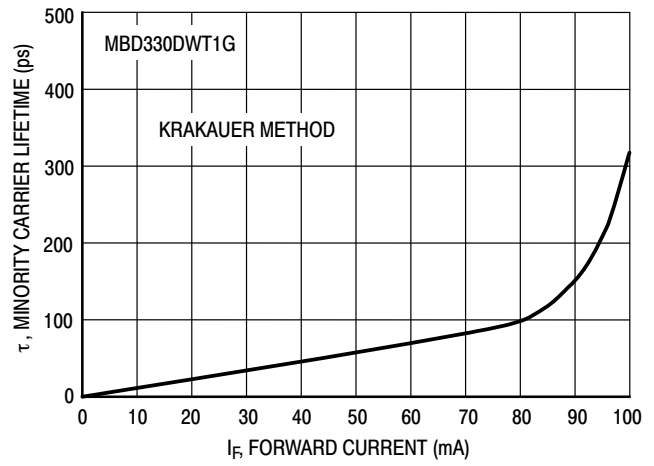
Figure 7. Minority Carrier Lifetime
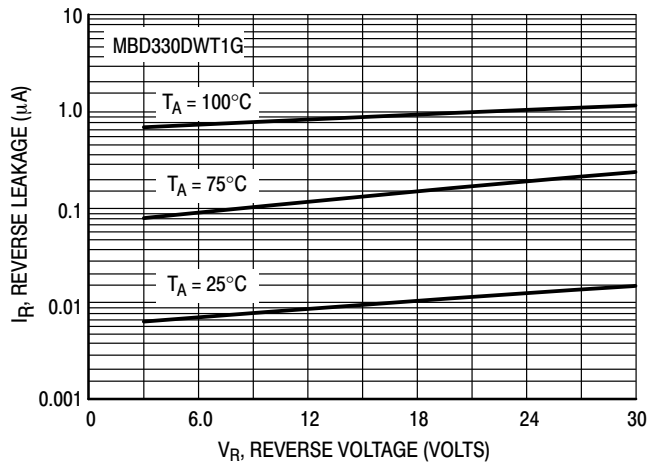
Figure 8. Reverse Leakage
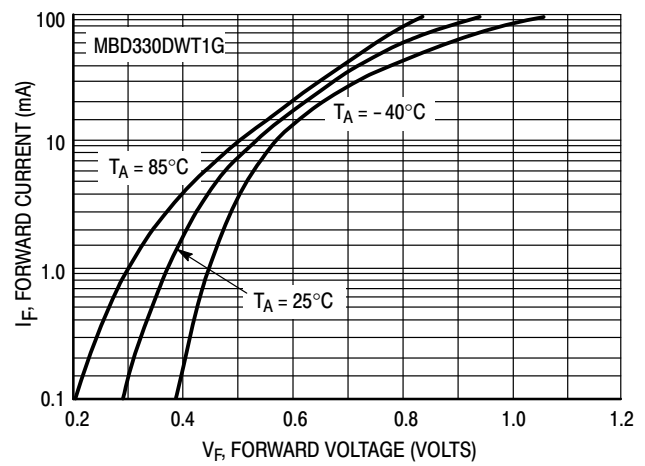
Figure 9. Forward Voltage

TYPICAL CHARACTERISTICS
MBD770DWT1G
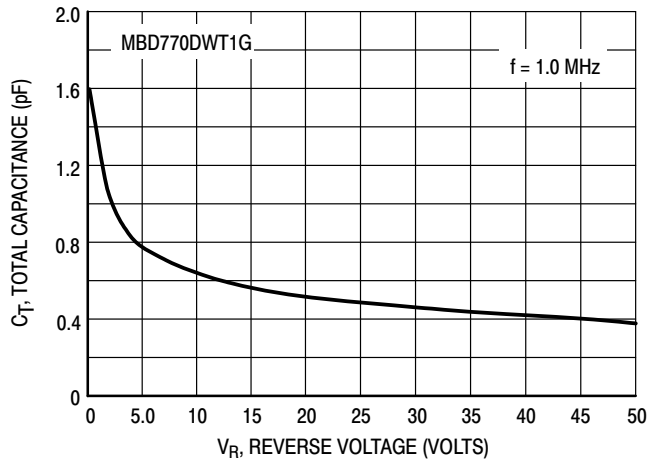
Figure 10. Total Capacitance
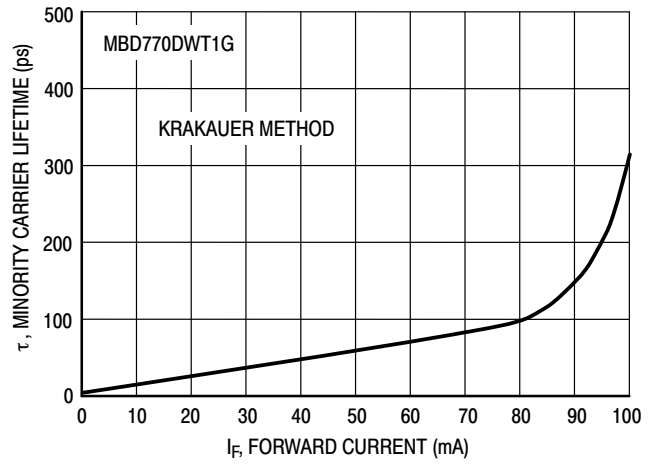
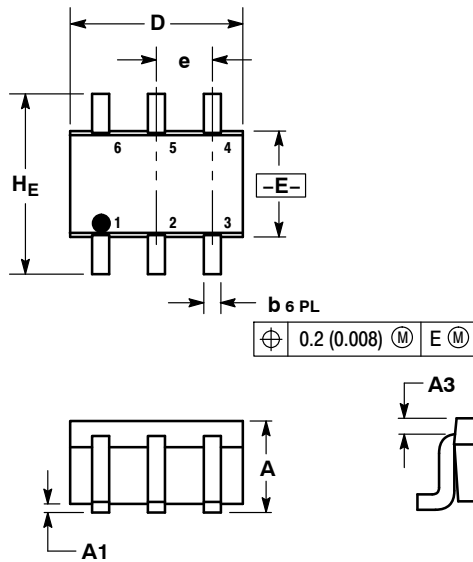**Figure 11. Minority Carrier Lifetime**
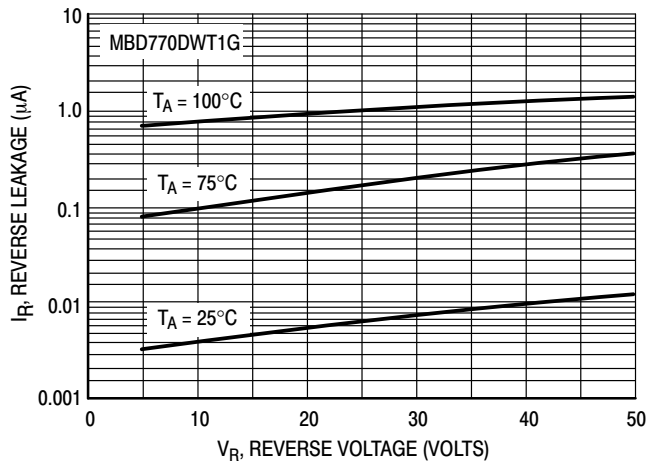
Figure 12. Reverse Leakage
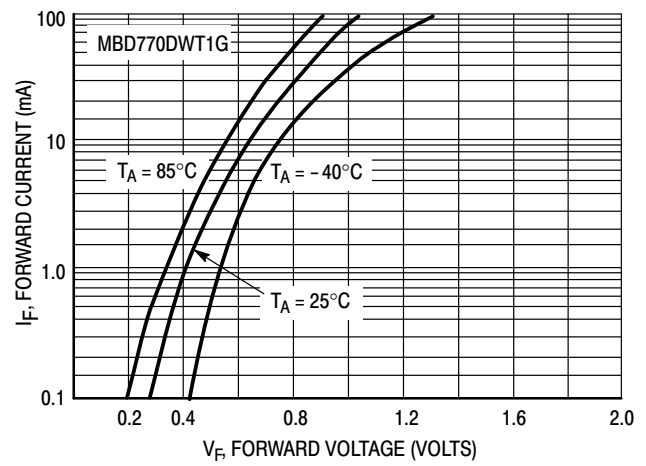
Figure 13. Forward Voltage

PACKAGE DIMENSIONS

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

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 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
H_E	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*

SCALE 20:1 $\left(\dfrac{mm}{inches}\right)$
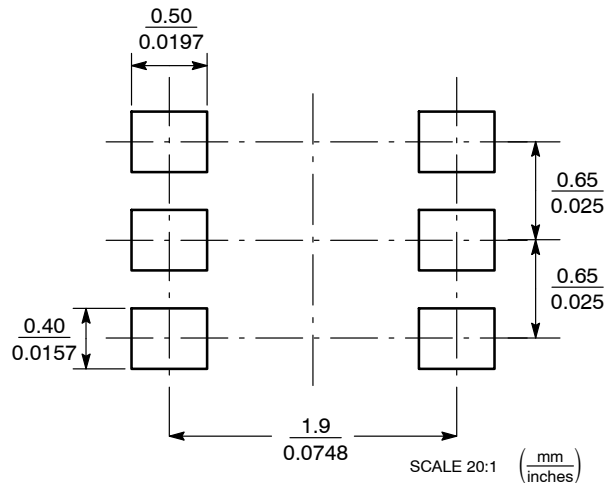
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.