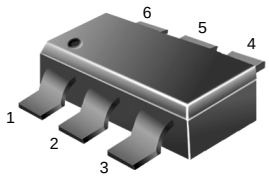
Dual SCHOTTKY Barrier Diodes

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.

MBD110DWT1
MBD330DWT1
MBD770DWT1



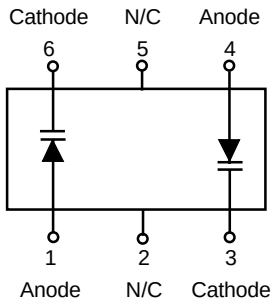
SOT–363
CASE 419B–01, STYLE 6

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 × 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.

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

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Reverse Voltage	MBD110DWT1	V_R	7.0	Vdc
	MBD330DWT1		30	
	MBD770DWT1		70	
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

DEVICE MARKING

MBD110DWT1 = M4 MBD330DWT1 = T4 MBD770DWT1 = H5

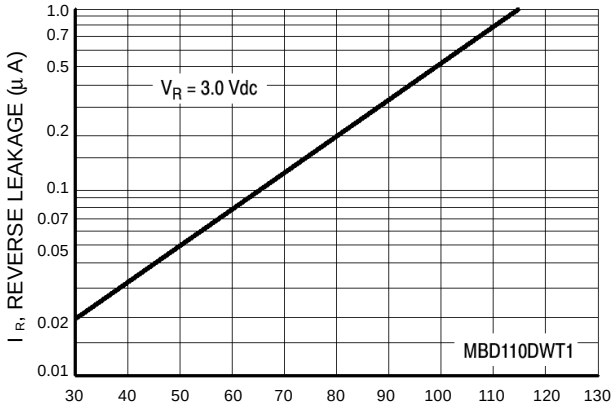
Thermal Clad is a trademark of the Bergquist Company.

MBD110DWT1 MBD330DWT1 MBD770DWT1

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

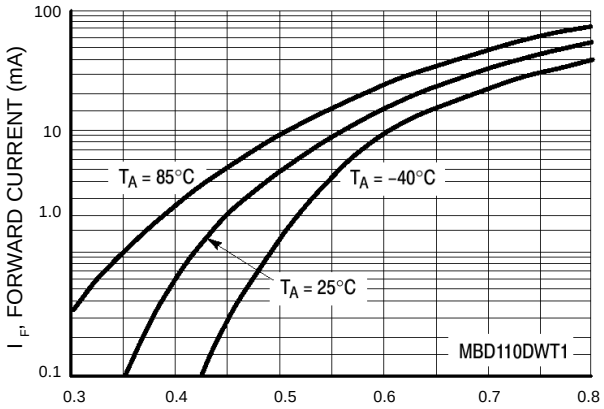
Characteristic		Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage		$V_{(BR)R}$				Volts
(I_R = 10 μA)	MBD110DWT1		7.0	10	—	
	MBD330DWT1		30	—	—	
	MBD770DWT1		70	—	—	
Diode Capacitance		C_T				pF
(V_R = 0, f = 1.0 MHz, Note 1)	MBD110DWT1		—	0.88	1.0	
Total Capacitance		C_T				pF
(V_R = 15 Volts, f = 1.0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

TYPICAL CHARACTERISTICS — MBD110DWT1



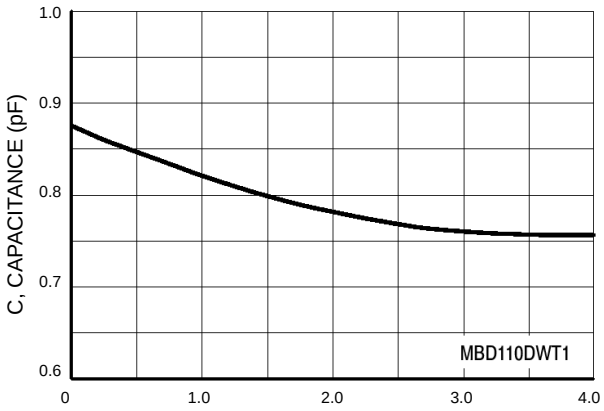
T A , AMBIENT TEMPERATURE (°C)

Figure 1. Reverse Leakage



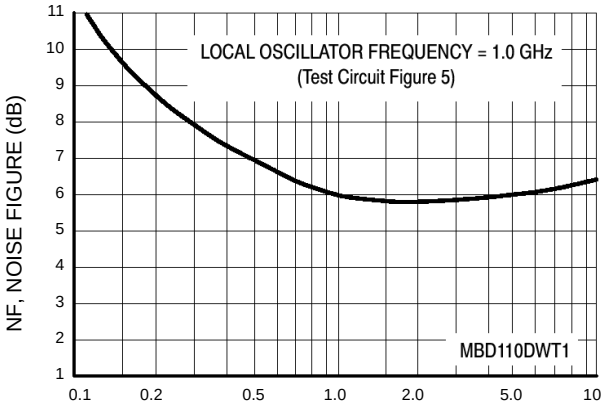
V F , FORWARD VOLTAGE (VOLTS)

Figure 2. Forward Voltage



V R , REVERSE VOLTAGE (VOLTS)

Figure 3. Capacitance



P LO , LOCAL OSCILLATOR POWER (mW)

Figure 4. Noise Figure

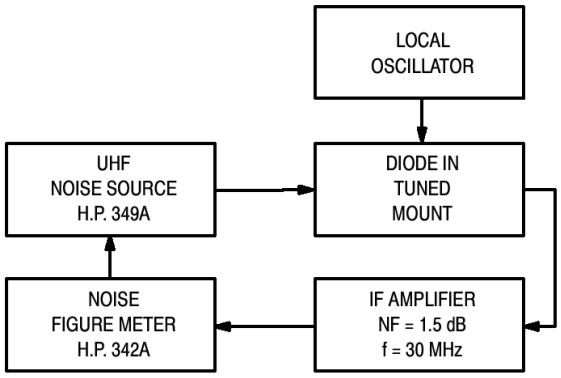


Figure 5. Noise Figure Test Circuit

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. I F 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

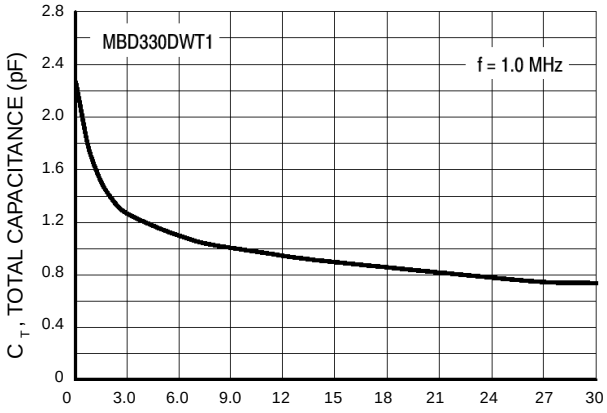


Figure 6. Total Capacitance

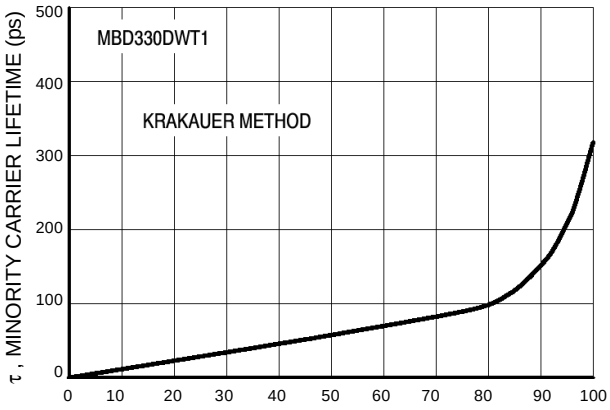


Figure 7. Minority Carrier Lifetime

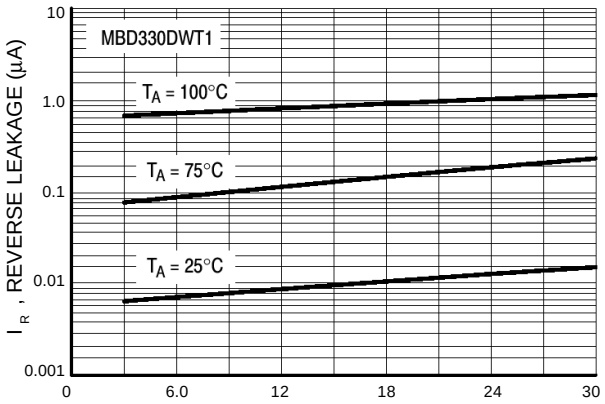


Figure 8. Reverse Leakage

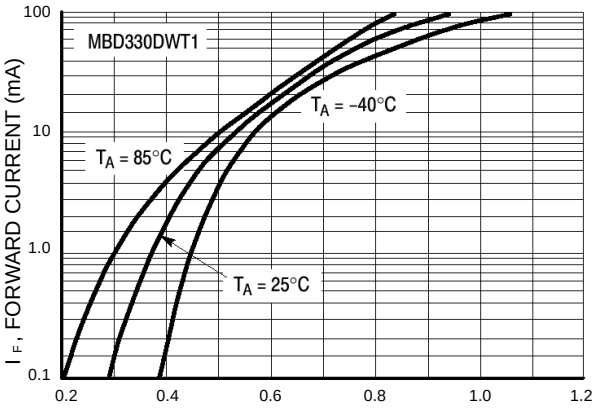


Figure 9. Forward Voltage

MBD110DWT1 MBD330DWT1 MBD770DWT1

TYPICAL CHARACTERISTICS MBD770DWT1

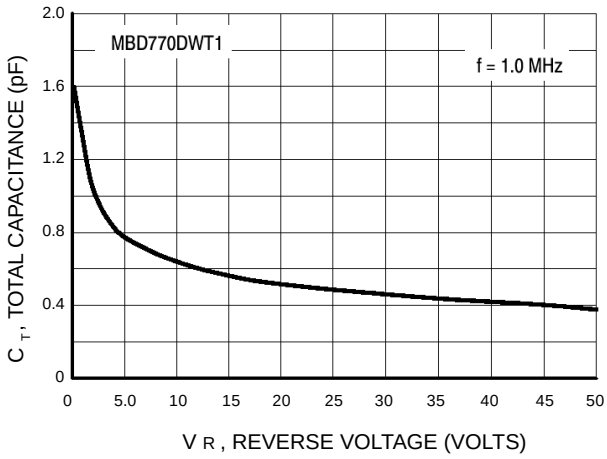


Figure 10 . Total Capacitance

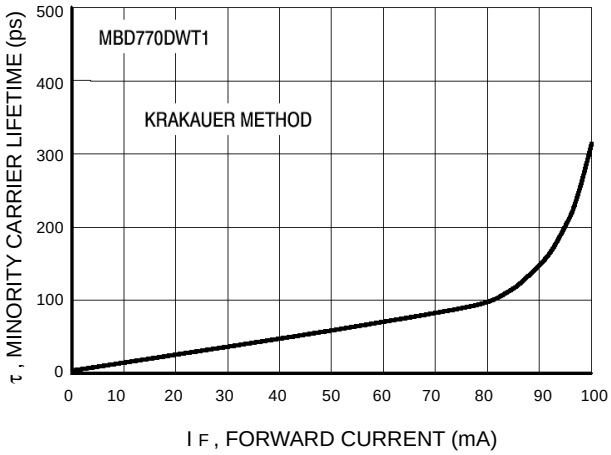


Figure 11. Minority Carrier Lifetime

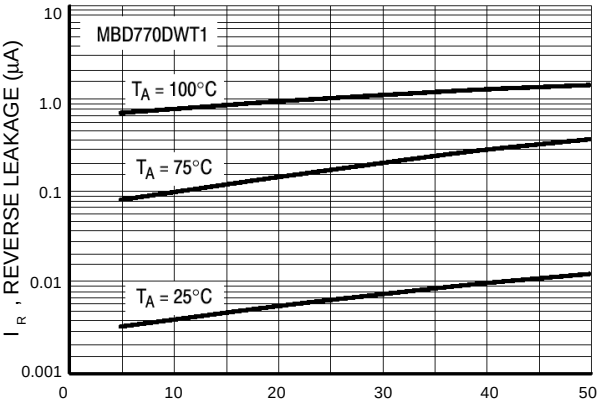


Figure 12. Reverse Leakage

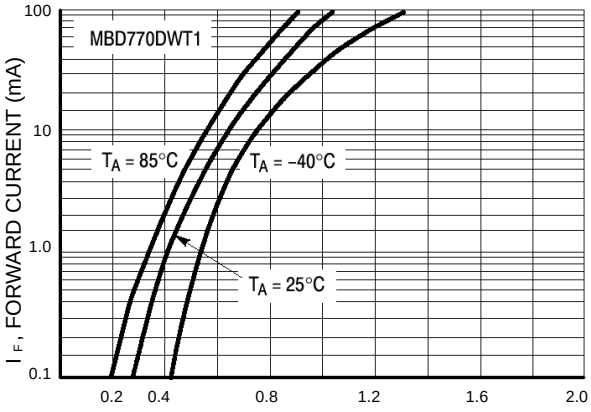


Figure 13. Forward Voltage