

MSS20-xxx-x Series



Zero Bias Schottky Diodes

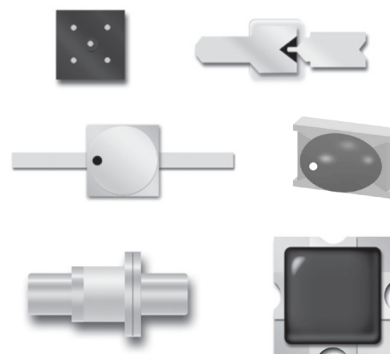
Rev. V4

Features

- Very Low 1/f Noise
- Detector Applications up to 40 GHz
- Chip Beam Lead and Packaged Devices

Description

The MSS20-xxx-x Series of Schottky diodes is fabricated on P-Type epitaxial substrates for superior 1/f noise performance in microwave 0-bias detector applications up to 40 GHz.



Chip & Beam Lead Electrical Specifications: $T_A = 25^\circ\text{C}$

Model	Outline	Frequency	Junction Capacitance (C_J)	Tangential Signal Sensitivity (T_{SS})	Video Resistance (R_V)		Voltage Sensitivity (γ)
		GHz	pF	dBm	Ω		mV / mW
		Max.	Max.	Typ.	Min.	Max.	Typ.
Chip							
MSS20-046-	C15	18	0.10	-58	1000	2000	5000
MSS20-047-		18	0.10	-59	2000	6000	8000
MSS20-050-		12	0.15	-58	1000	2000	5000
MSS20-051-		12	0.15	-59	2000	6000	8000
MSS20-054-		8	0.20	-58	1000	2000	5000
MSS20-055-		8	0.20	-59	2000	6000	8000
Beam Lead							
MSS20-140-	B10D	40	0.08	-58	1000	2000	5000
MSS20-141-		40	0.08	-59	2000	6000	8000
MSS20-142-		26	0.10	-58	1000	2000	5000
MSS20-143-		26	0.10	-59	2000	6000	8000
MSS20-145-		18	0.12	-58	1000	2000	5000
MSS20-146-		18	0.12	-59	2000	6000	8000
Test Conditions			$f = 1 \text{ MHz,}$ $V_R = 0 \text{ V}$	$f = 10 \text{ GHz,}$ $NF = 3 \text{ dB}$	$P_{IN} = -30 \text{ dBm}$ Video BW = 500 KHz		$R_L = 1 \text{ M}\Omega$

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Packaged Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_{BR} = 0.8\text{ V min @ } 100\ \mu\text{A}$

Model	Outline	Frequency	Total Capacitance (C_T)		Tangential Signal Sensitivity (T_{SS})	Video Resistance (R_V)		Voltage Sensitivity (Υ)
			pF		dBm	Ω		mV / mW
			Typ.	Max.	Typ.	Typ.	Max.	Typ.
MSS20-046-	0805-2	20	0.14	0.20	-58	1500	2000	5000
	E25	18	0.15	0.20				
	E28 / E28X	18	0.16	0.20				
	H27	18	0.20	0.25				
	T86	12	0.26	0.31				
MSS20-047-	0805-2	20	0.14	0.20	-59	4000	6000	8000
	E25	18	0.15	0.20				
	E28 / E28X	18	0.16	0.20				
	H27	18	0.20	0.25				
	T86	12	0.26	0.31				
MSS20-050-	0805-2	18	0.18	0.25	-58	1500	2000	5000
	E25	12	0.20	0.25				
	E28 / E28X	12	0.21	0.25				
	H27	12	0.24	0.30				
	T86	12	0.30	0.36				
MSS20-051-	0805-2	18	0.18	0.25	-59	4000	6000	8000
	E25	12	0.20	0.25				
	E28 / E28X	12	0.21	0.25				
	H27	12	0.24	0.30				
	T86	12	0.30	0.36				
MSS20-054-	0805-2	12	0.24	0.30	-58	1500	2000	5000
	E25	8	0.25	0.30				
	E28 / E28X	8	0.26	0.30				
	H27	8	0.30	0.35				
	T86	8	0.36	0.41				
MSS20-055-	0805-2	12	0.24	0.30	-59	4000	6000	8000
	E25	8	0.25	0.30				
	E28 / E28X	8	0.26	0.30				
	H27	8	0.30	0.35				
	T86	8	0.36	0.41				
Test Conditions			f = 1 MHz, $V_R = 0.5\text{ V}$		f = 10 GHz, $P_{IN} = -30\text{ dBm}$, $R_L = 1\text{ m}\Omega$, Video BW = 500 KHz, NF = 3 dB			

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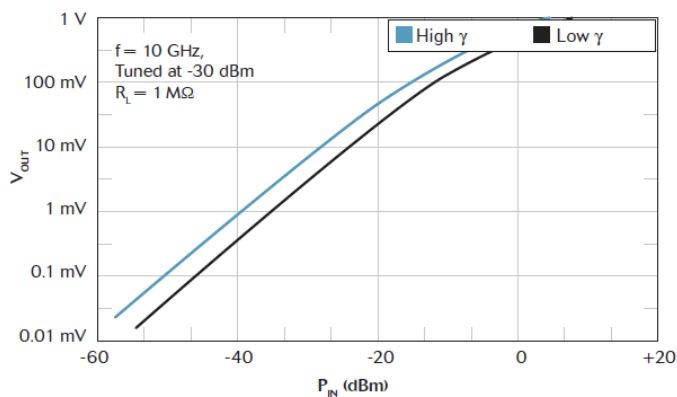
Model	Outline	Frequency	Total Capacitance (C_T)		Tangential Signal Sensitivity (T_{SS})	Video Resistance (R_V)		Voltage Sensitivity (γ)
		GHz	pF		dBm	Ω		mV / mW
		Max.	Typ.	Max.	Typ.	Typ.	Max.	Typ.
MSS20-140-	0402	26	0.12	0.15	-58	1500	2000	5000
MSS20-141-		26	0.12	0.15	-59	4000	6000	8000
MSS20-142-		20	0.15	0.18	-58	1500	2000	5000
MSS20-143-		20	0.15	0.18	-59	4000	6000	8000
MSS20-144-		18	0.18	0.20	-58	1500	2000	5000
MSS20-145-		18	0.18	0.20	-59	4000	6000	8000
Test Conditions				f = 1 MHz, $V_R = 0.5\text{ V}$		f = 10 GHz, $P_{IN} = -30\text{ dBm}$, $R_L = 1\text{ m}\Omega$, Video BW = 500 KHz, NF = 3 dB		

Absolute Maximum Ratings

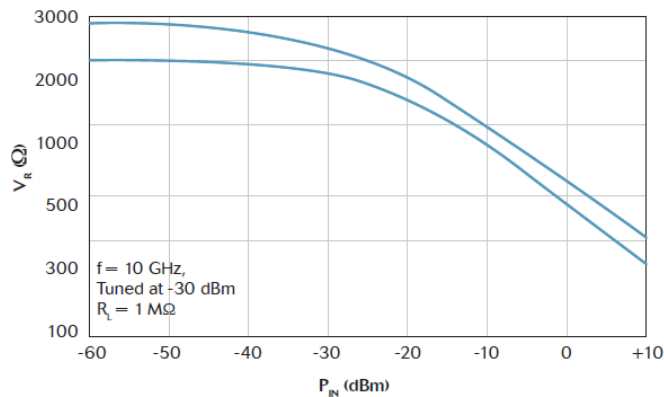
Parameters	Rating
Reverse Voltage	1 V
Forward Current	35 mA
CW Power Dissipation	100 mW, derate linearly to 0 @ $T_A = +150^\circ\text{C}$
Operating Temperature	-65°C to $+150^\circ\text{C}$
Storage Temperature	-65°C to $+150^\circ\text{C}$
Soldering Temperature (packaged)	$+230^\circ\text{C}$ for 5 seconds

Typical Performance Curves: $T_A = 25^\circ\text{C}$

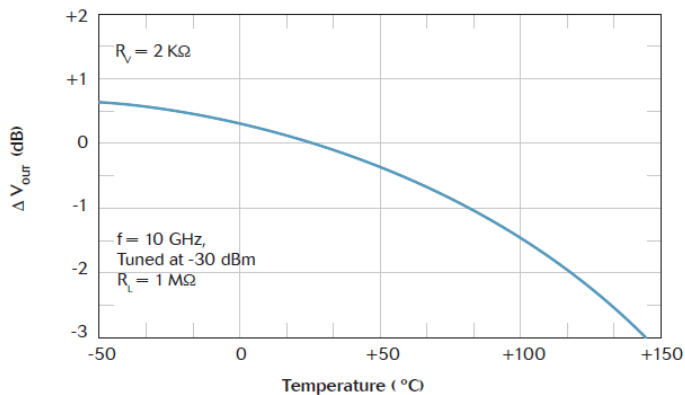
Detected Output vs. RF Input Power



Video Resistance vs. RF Input Power



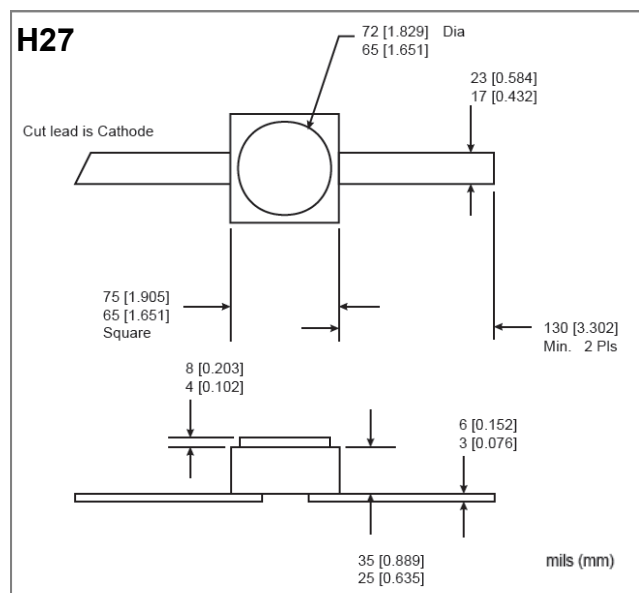
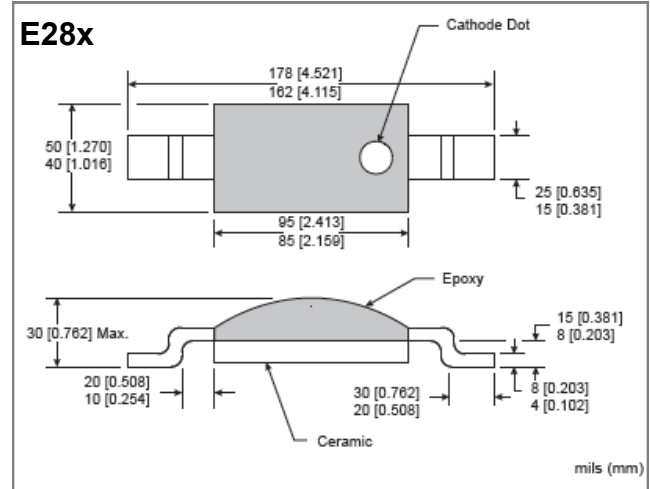
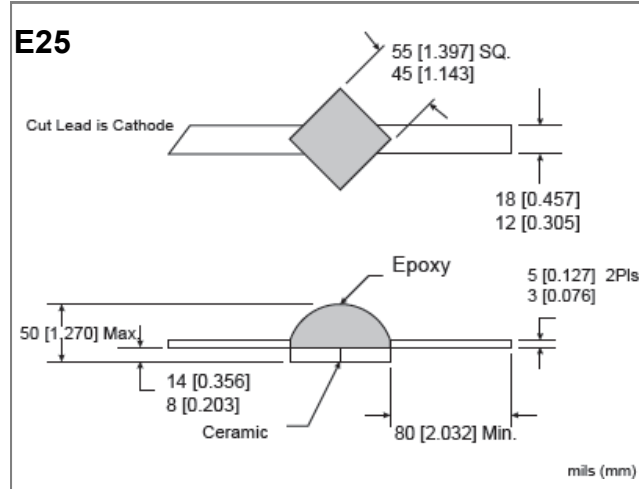
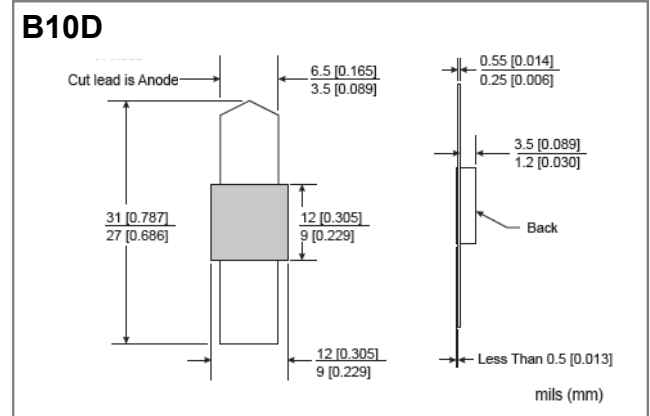
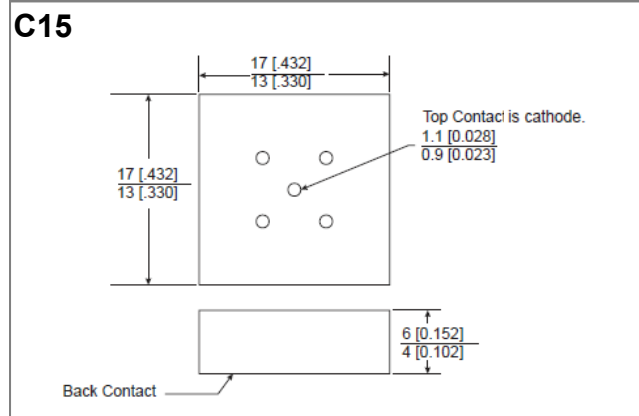
Detector Output vs. Temperature



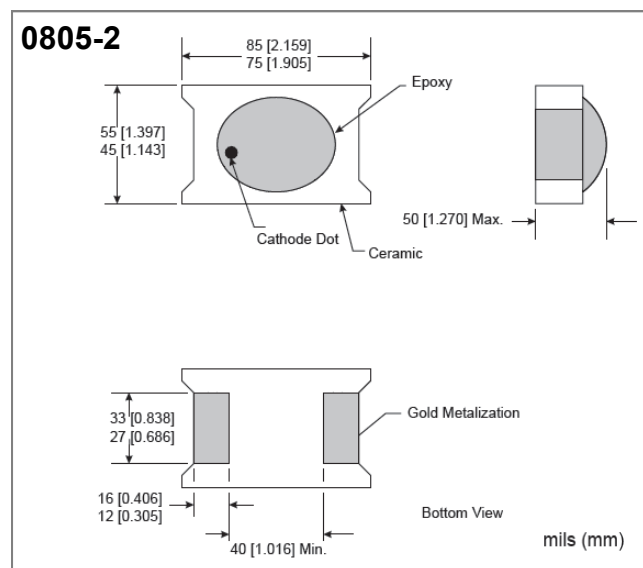
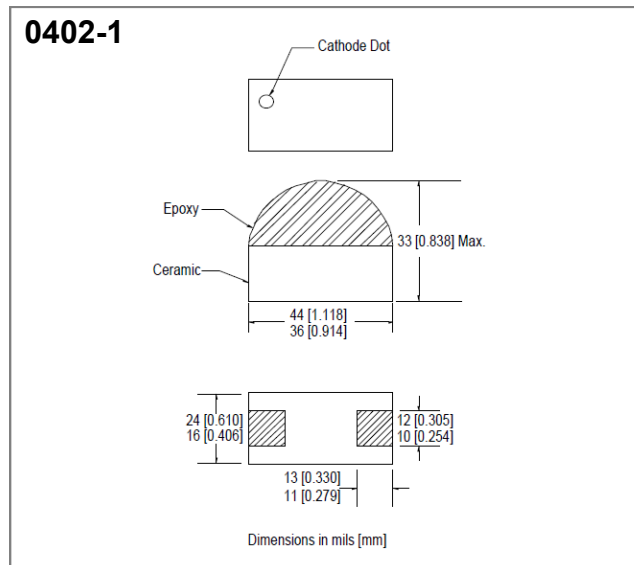
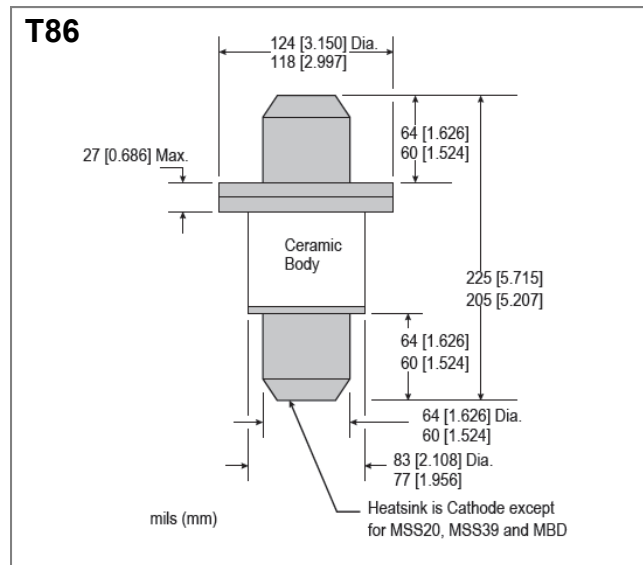
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Outline Drawings



Outline Drawings



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