metelics
CORPORATION

MSS-40,000 Series Medium Barrier Schottky Diode

Features

- Low R_S — 5Ω
- Low NF
- Broad optimum L.O. power range
- Available in many configurations
- Tight batch matching available
- Hi-Rel available
- Optimum series Schottky for very tight matching

Applications

- Mixers: single diode, image reject, image enhancement, ring quad
- Doublers
- Modulators

Medium Barrier Specifications at 25°C

New Part Number Family-Spec #-Outline	Old Part Number	Description	V_F Typ. @ 1 mA (Volts)	V_{BR} Min. @ 10 μA (Volts)	R_D Typ. @ 5 mA (Ohms)	C_J Typ. @ 0V (pF)	C_T Typ. @ 0V (pF)	NF_{SSB} ** (dB)	R_s Typ. (Ohms)	F_{CO} Typ. *** (GHz)
MSS-40,045-C15	New	Chip	.42	3	12	.09	.09	6.5	7	253
MSS-40,045-P55	MSKM-723-44	Chip-P55	.42	3	12	.09	.21	6.5	7	253
MSS-40,045-P86	MSKM-773-49	Chip-P86	.42	3	12	.09	.24	6.5	7	253
MSS-40,048-C15	MSKM-001	Chip	.40	3	12	.12	.12	6.5	7	190
MSS-40,048-P55	MSKM-701	Chip-P55	.40	3	12	.12	.24	6.5	7	190
MSS-40,048-P86	MSKM-711	Chip-P86	.40	3	12	.12	.27	6.5	7	190
MSS-40,141-B10	MSKM-717	Beam Lead-Single	.42	3	15	.06	.06	6.5	10	265
MSS-40,141-E26	MSKM-717-U2	Beam Lead-E20	.42	3	15	.06	.16	6.5	10	265
MSS-40,141-H20	MSKM-717-Q2	Beam Lead-H20	.42	3	15	.06	.24	6.5	10	265
MSS-40,148-B10	MSKM-716	Beam Lead-Single	.40	3	12	.12	.12	6.5	7	190
MSS-40,148-E26	MSKM-716-U2	Beam Lead-E20	.40	3	12	.12	.22	6.5	7	190
MSS-40,148-H20	MSKM-716-Q2	Beam Lead-H20	.40	3	12	.12	.30	6.5	7	190
MSS-40,155-B10	MSKM-709	Beam Lead-Single	.38	3	10	.25	.25	6.5†	5	127
MSS-40,155-E26	MSKM-709-U2	Beam Lead-E20	.38	3	10	.25	.35	6.5†	5	127
MSS-40,155-H20	MSKM-709-Q2	Beam Lead-H20	.38	3	10	.25	.43	6.5†	5	127
MSS-40,244-B20	New	Series T-B20	.44	3	24	.08	.08	7.0	19	105
MSS-40,244-E30	New	Series T-E30	.44	3	24	.08	.18	7.0	19	105
MSS-40,248-B20	New	Series T-B20	.44	3	15	.12	.12	7.0	10	133
MSS-40,248-E30	New	Series T-E30	.44	3	15	.12	.22	7.0	10	133
MSS-40,255-B20	New	Series T-B20	.38	3	10	.25	.25	6.5†	5	127
MSS-40,255-E30	New	Series T-E30	.38	3	10	.25	.35	6.5†	5	127
MSS-40,448-B41	New	Beam Lead Ring Quad	.40	3	12	.12	.15	6.0	7	190
MSS-40,448-E40	New	Beam Lead Ring Quad-E40	.40	3	12	.12	.24	6.0	7	190
MSS-40,448-E45	New	Beam Lead Ring Quad-E45	.40	3	12	.12	.20	6.0	7	190
MSS-40,455-B40	MSKM-394	Beam Lead Ring Quad	.38	3	10	.25*	.25*	6.5†	5	127
MSS-40,455-E40	MSKM-394-Q4	Beam Lead Ring Quad-E40	.38	3	10	.25*	.32*	6.5†	5	127
MSS-40,455-H40	MSKM-394-Q3	Beam Lead Ring Quad-H40	.38	3	10	.25*	.42*	6.5†	5	127

*Diagonal **See page 2 ***$FCO = 1/(2*\pi*R_S*C_J)$; FCO = Hz, R_S = Ohms; C_T = Farads

Medium Barrier Schottky Description

The Metelics MSS-40,000 series silicon Schottky barrier diodes are constructed using advanced technology, materials and processes, resulting in a lower series resistance (R_S) than is produced with conventional methods. This N-type mixer diode is well-suited for applications where −3 dBm to +6 dBm per diode is available. The broad usable range of the required L.O. source makes these diodes ideal for many general purpose applications. Because of the wide variety of applications, this diode is offered in a variety of configurations.

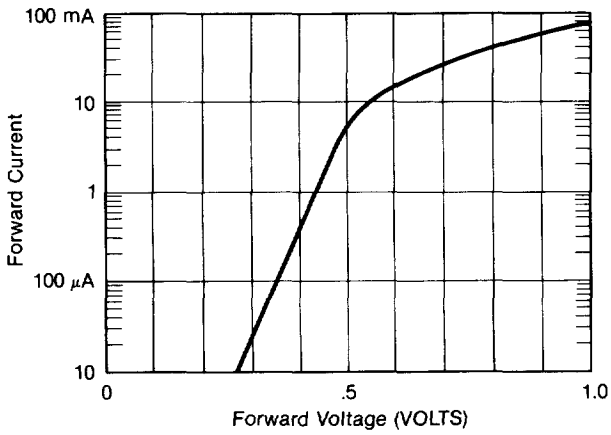
Maximum Ratings

Storage Temperature	−65 to +150°C
Operating Temperature	−65 to +150°C
Soldering Temperature—Chips	230°C for 30 sec.
Soldering Temperature—B.L.	230°C for 10 sec.
DC Power Dissipation	100 mW max. derate linearly to 0 mW at +150°C
Beam Lead Pull Strength	6 grams

CAUTION: Static Sensitive Device

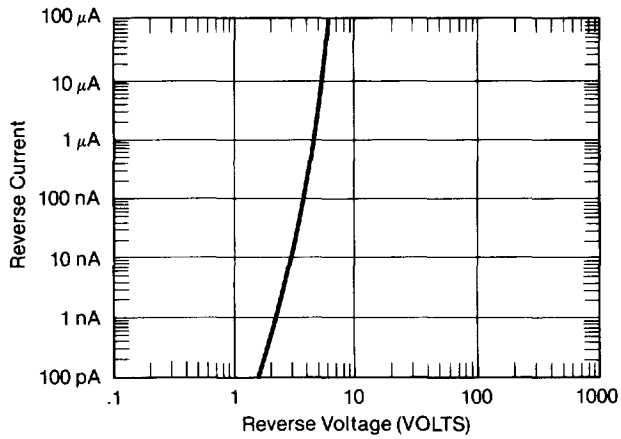
Typical Data

I-V Forward Curve

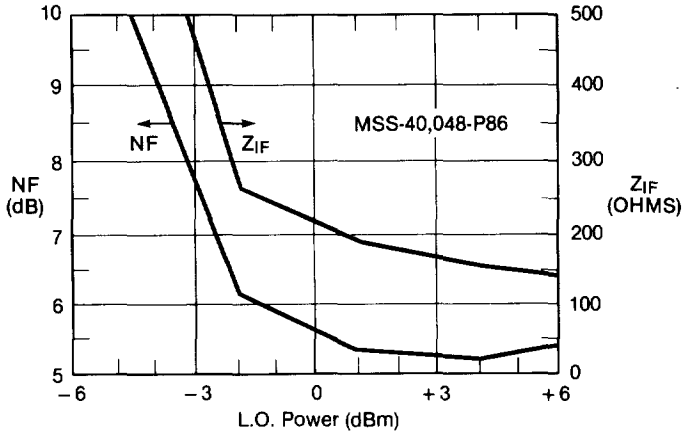


The I-V curve on the 40,000 series diodes is very well behaved making this series the optimum for very tight matching.

I-V Reverse Curve



NF & ZIF VS LO Power



Note**

NF measured at 9.375 (3 GHzt)
50Ω source impedance
50Ω load at 30 MHz, 1.5 dB NF amplifier
< 1Ω load at DC
Z_{IF} measured using a 10 kHz signal in same set-up
$NF_{ssb} = NF_{dsb} + 3$ dB

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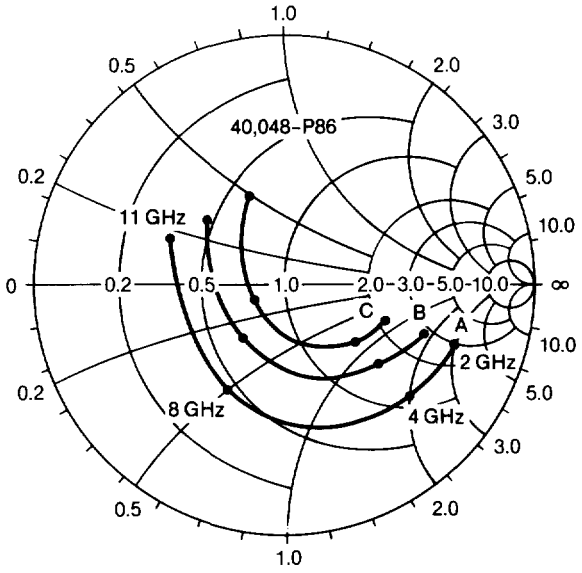
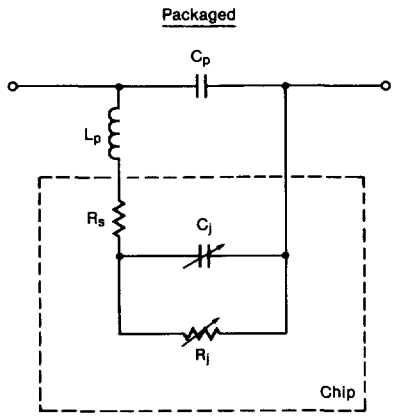
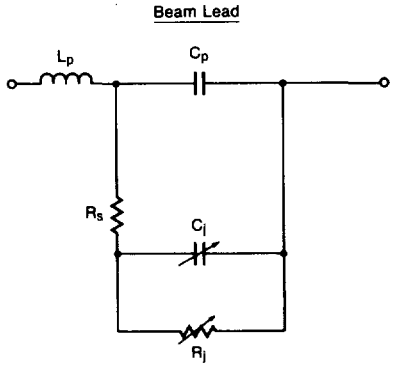
Smith Impedance Chart
50Ω Reference



A—I_{RECT} = 1 mA, +½ dBm
B—I_{RECT} = 2 mA, +3 dBm
C—I_{RECT} = 4 mA, +6 dBm

Equivalent Circuits





Notes: Consult factory for special versions, configurations, packages, high reliability screening, or custom designs.

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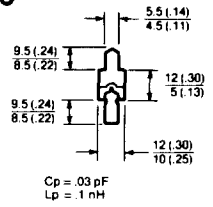
POLARITY:

CATHODE	ANODE
DOT	CAP
CUT LEAD	PAD
POINTED BEAM	

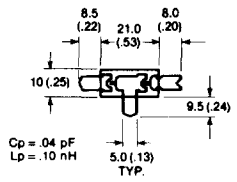
Package Outlines

Dimensions are in Mils (mm).

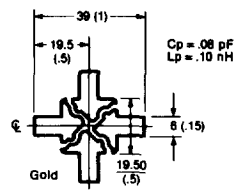
B10



B20



B40



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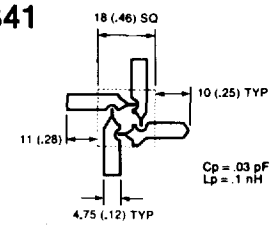
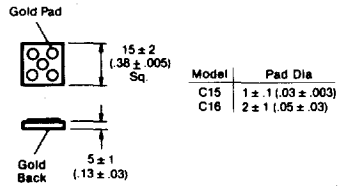
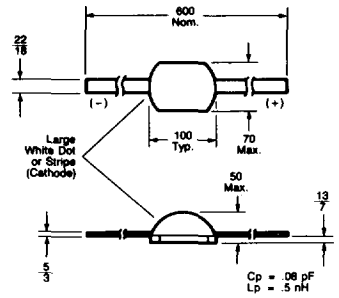


C15,C16

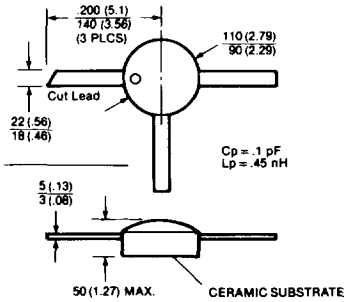


Model	Pad Dia
C15	1 ± .1 (.03 ± .003)
C16	2 ± 1 (.05 ± .03)

E26



E30



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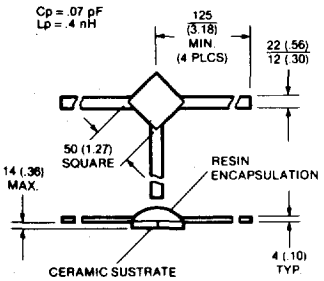

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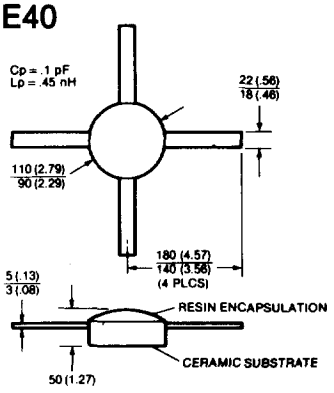

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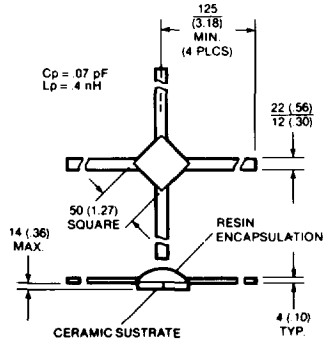

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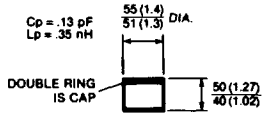
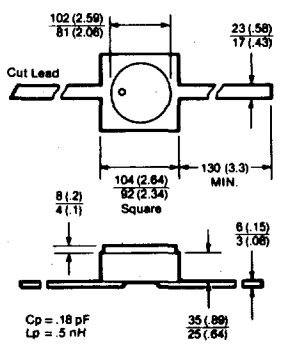


H20



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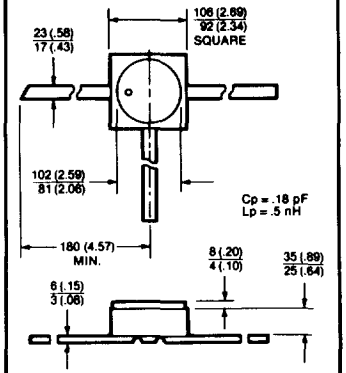

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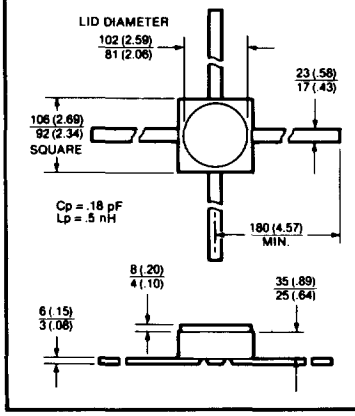

P86