

# MV104

## Silicon Tuning Diode

### Dual Voltage Variable Capacitance Diode

This device is designed for FM tuning, general frequency control and tuning, or any top-of-the-line application requiring back-to-back diode configurations for minimum signal distortion and detuning.

#### Features

- High Figure of Merit -  
 $Q = 140$  (Typ) @  $V_R = 3.0$  Vdc,  $f = 100$  MHz
- Guaranteed Capacitance Range - 37-42 pF @  $V_R = 3.0$  Vdc
- Dual Diodes - Save Space and Reduce Cost
- Monolithic Chip Provides Near Perfect Matching -  
 Guaranteed  $\pm 1.0\%$  (Max) Over Specified Tuning Range
- This is a Pb-Free Device\*

#### MAXIMUM RATINGS (EACH DIODE)

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	32	Vdc
Forward Current	$I_F$	200	mAdc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	280 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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.

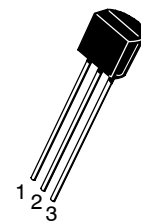
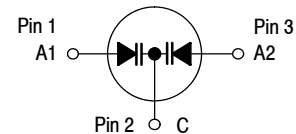
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Device	$C_T$ , Diode Capacitance $V_R = 3.0$ Vdc, $f = 1.0$ MHz pF		Q, Figure of Merit $V_R = 3.0$ Vdc $f = 100$ MHz		$C_R$ , Capacitance Ratio $C_3/C_{30}$ $f = 1.0$ MHz	
	Min	Max	Min	Typ	Min	Max
MV104	37	42	100	140	2.5	2.8



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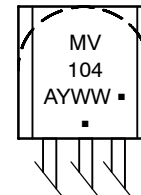
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 15

STRAIGHT LEAD  
BULK PACK

#### MARKING DIAGRAM



A = Assembly Location  
 Y = Year  
 WW = Work Week  
 ■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
MV104G	TO-92 (Pb-Free)	5000 Units / Bulk

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

# MV104

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (EACH DIODE)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R = 10 \mu\text{A dc}$ )	$V_{(BR)R}$	32	-	-	Vdc
Reverse Voltage Leakage Current ( $V_R = 30 \text{ Vdc}$ )	$I_R$	-	-	50 500	nA dc  nA dc
Diode Capacitance Temperature Coefficient ( $V_R = 4.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$TC_C$	-	280	-	ppm/ $^\circ\text{C}$

## TYPICAL CHARACTERISTICS (EACH DIODE)

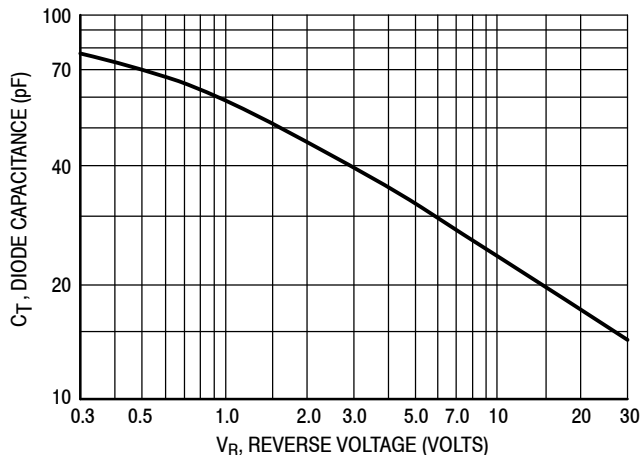


Figure 1. Diode Capacitance (Each Diode)

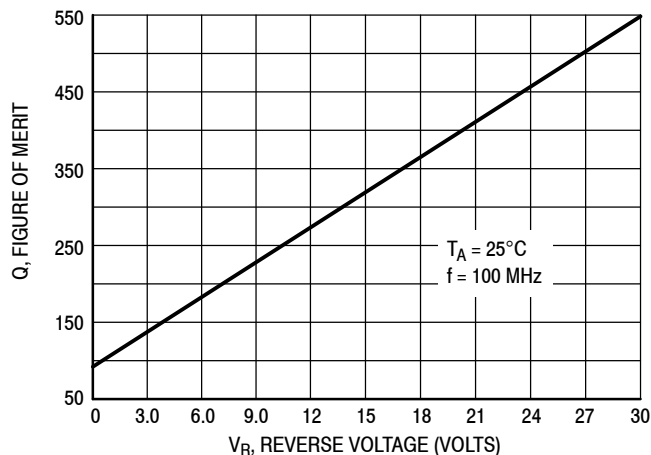


Figure 2. Figure of Merit versus Voltage

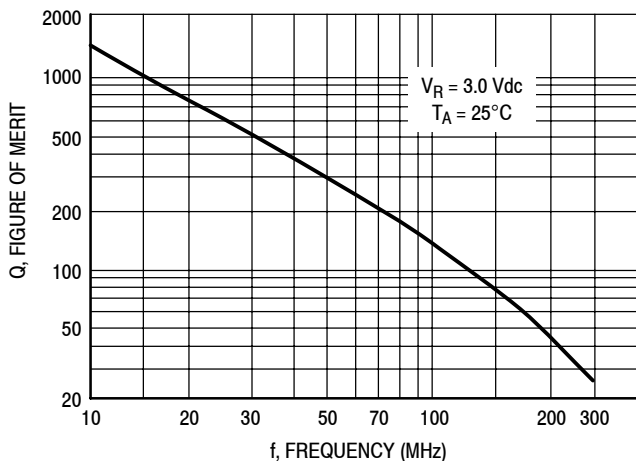


Figure 3. Figure of Merit versus Frequency

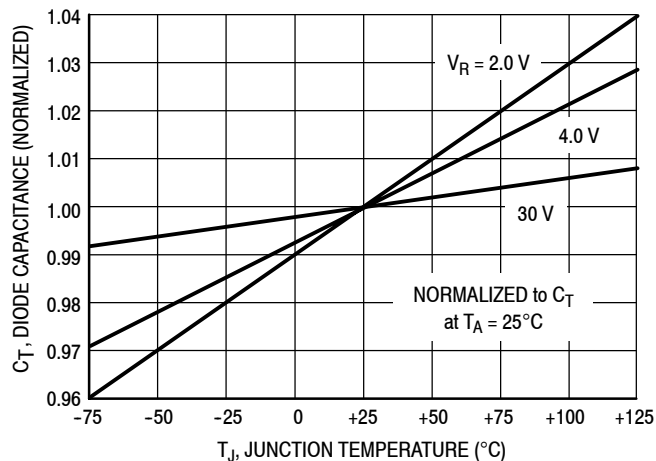


Figure 4. Diode Capacitance versus Temperature

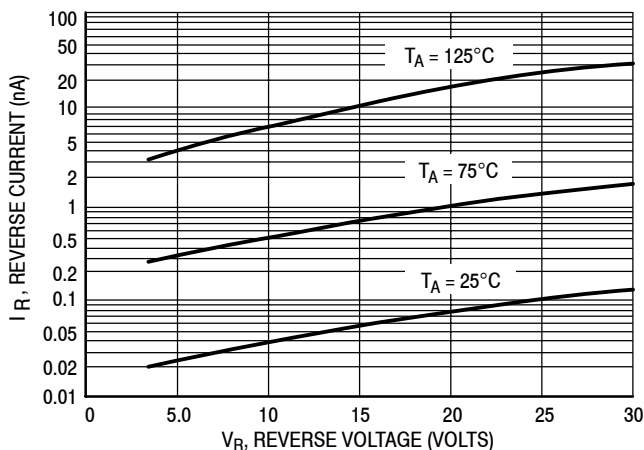
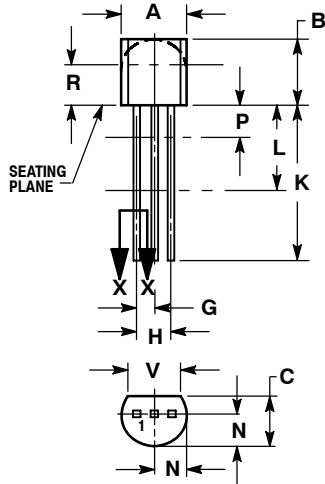


Figure 5. Reverse Current versus Reverse Voltage

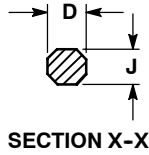
# MV104

## PACKAGE DIMENSIONS

### TO-92 (TO-226) CASE 29-11 ISSUE AM



STRAIGHT LEAD  
BULK PACK

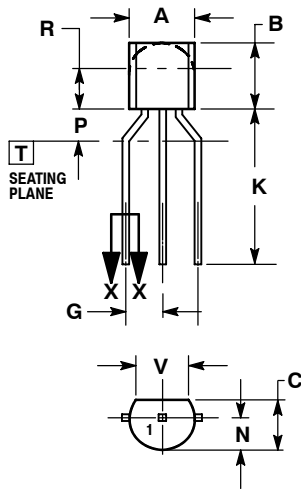


SECTION X-X

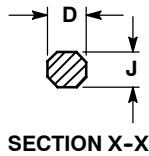
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 15:

1. ANODE 1
2. CATHODE
3. ANODE 2

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