

MMVL409T1

Preferred Device

Silicon Tuning Diode

These devices are designed for general frequency control and tuning applications. They provide solid-state reliability in replacement of mechanical tuning methods.

- High Q with Guaranteed Minimum Values at VHF Frequencies
- Controlled and Uniform Tuning Ratio
- Surface Mount Package
- Device Marking: X5



ON Semiconductor™

<http://onsemi.com>

VOLTAGE VARIABLE CAPACITANCE DIODE

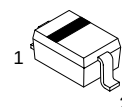
MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_R	Continuous Reverse Voltage	20	Vdc
I_F	Peak Forward Current	200	mAdc

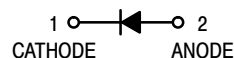
THERMAL CHARACTERISTICS

Symbol	Characteristic	Max	Unit
P_D	Total Device Dissipation FR-5 Board,*	200	mW
	$T_A = 25^\circ\text{C}$ Derate above 25°C	1.57	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	635	$^\circ\text{C}/\text{W}$
T_J, T_{stg}	Junction and Storage Temperature	150	$^\circ\text{C}$

*FR-4 Minimum Pad



PLASTIC
SOD-323
CASE 477



ORDERING INFORMATION

Device	Package	Shipping
MMVL409T1	SOD-323	3000 / Tape & Reel

Preferred devices are recommended choices for future use and best overall value.

MMVL409T1

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ($I_R = 10\ \mu\text{A}$)	$V_{(BR)R}$	20	—	—	Vdc
Reverse Voltage Leakage Current ($V_R = 15\ \text{Vdc}$)	I_R	—	—	0.1	μA
Diode Capacitance Temperature Coefficient ($V_R = 3.0\ \text{Vdc}$, $f = 1.0\ \text{MHz}$)	TC_C	—	300	—	ppm/ $^\circ\text{C}$

	C_T , Diode Capacitance $V_R = 3.0\ \text{Vdc}$, $f = 1.0\ \text{MHz}$ pF			Q , Figure of Merit $V_R = 3.0\ \text{Vdc}$ $f = 50\ \text{MHz}$	C_R , Capacitance Ratio C_3/C_8 $f = 1.0\ \text{MHz}$ (1)	
Device	Min	Nom	Max	Min	Min	Max
MMVL409T1	26	29	32	200	1.5	1.9

1. C_R is the ratio of C_T measured at 3 Vdc divided by C_T measured at 8 Vdc.

TYPICAL CHARACTERISTICS

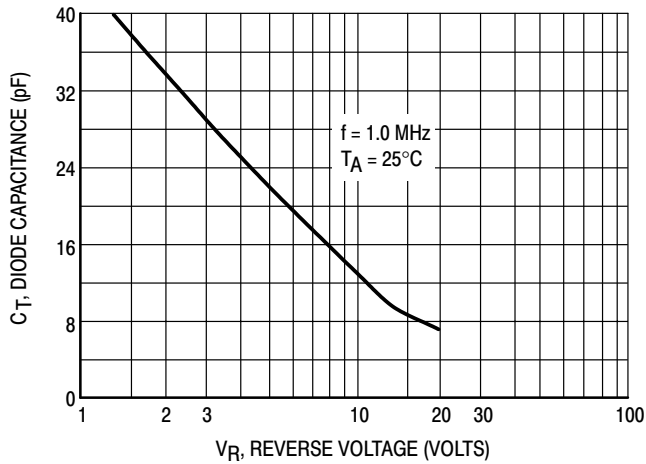


Figure 1. Diode Capacitance

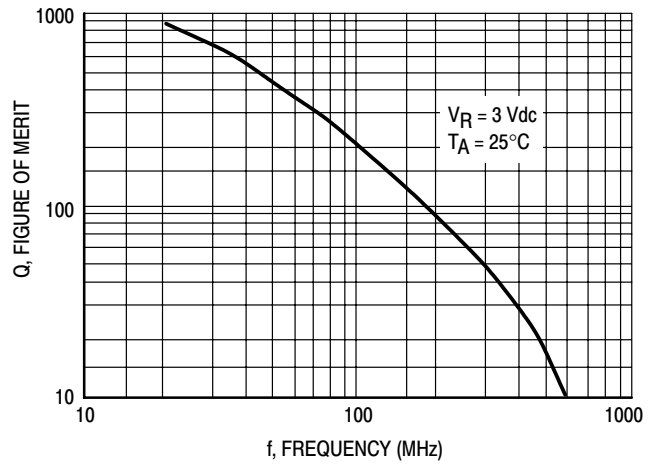


Figure 2. Figure of Merit

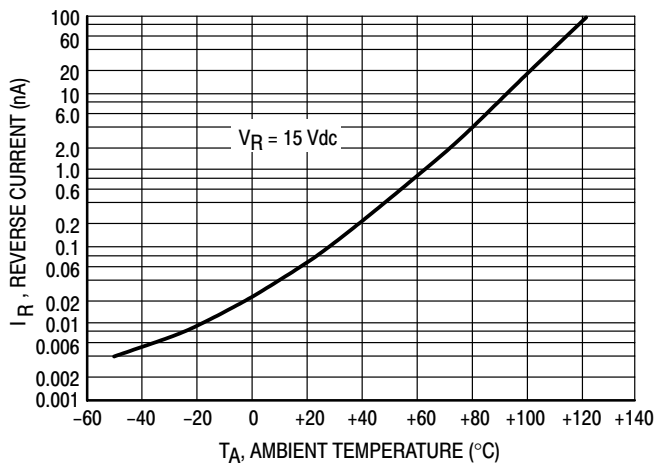


Figure 3. Leakage Current

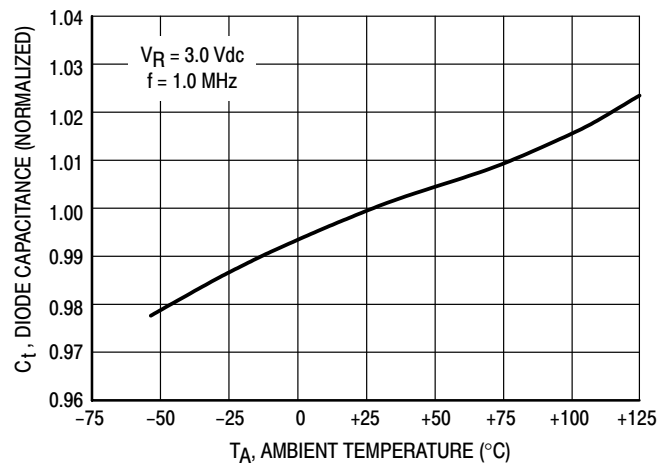
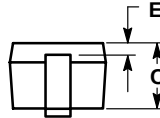
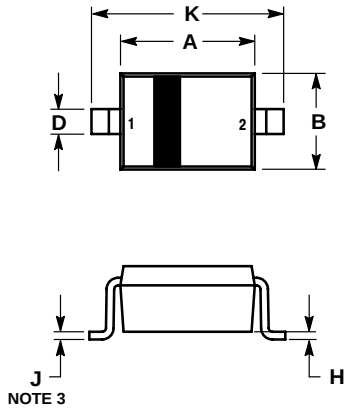


Figure 4. Diode Capacitance

MMVL409T1

PACKAGE DIMENSIONS

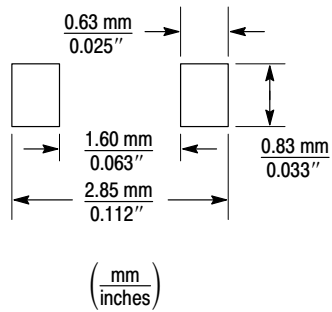
SOD-323 PLASTIC PACKAGE CASE 477-02 ISSUE A



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.60	1.80	0.063	0.071
B	1.15	1.35	0.045	0.053
C	0.80	1.00	0.031	0.039
D	0.25	0.40	0.010	0.016
E	0.15 REF		0.006 REF	
H	0.00	0.10	0.000	0.004
J	0.089	0.177	0.0035	0.0070
K	2.30	2.70	0.091	0.106

STYLE 1:
PIN 1. CATHODE
2. ANODE



SOD-323 Soldering Footprint

Thermal Clad is a trademark of the Bergquist Company.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada

JAPAN: ON Semiconductor, Japan Customer Focus Center
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-0031
Phone: 81-3-5740-2700
Email: r14525@onsemi.com

ON Semiconductor Website: <http://onsemi.com>

For additional information, please contact your local Sales Representative.