

TOSHIBA VARIABLE CAPACITANCE DIODE SILICON EPITAXIAL PLANAR TYPE

# 1SV280

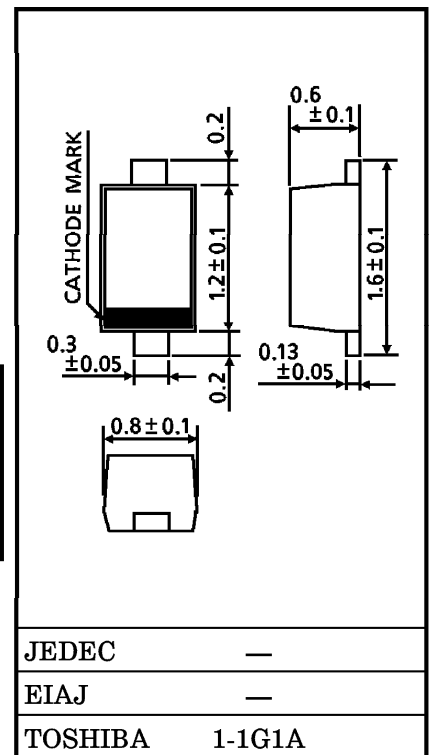
VCO FOR UHF BAND RADIO

Unit in mm

- High Capacitance Ratio :  $C_{2V} / C_{10V} = 2.4$  (TYP.)
- Low Series Resistance :  $r_s = 0.44 \Omega$  (TYP.)
- Useful for Small Size Tuner.

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Reverse Voltage	$V_R$	15	V
Junction Temperature	$T_j$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~125	$^\circ\text{C}$



Weight : 0.0014g

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reverse Voltage	$V_R$	$I_R = 1 \mu\text{A}$	15	—	—	V
Reverse Current	$I_R$	$V_R = 15\text{V}$	—	—	3	nA
Capacitance	$C_{2V}$	$V_R = 2\text{V}, f = 1\text{MHz}$	3.8	—	4.7	pF
Capacitance	$C_{10V}$	$V_R = 10\text{V}, f = 1\text{MHz}$	1.5	—	2.0	pF
Capacitance Ratio	$C_{2V} / C_{10V}$	—	2.0	2.4	—	—
Series Resistance	$r_s$	$V_R = 1\text{V}, f = 470\text{MHz}$	—	0.44	0.6	$\Omega$

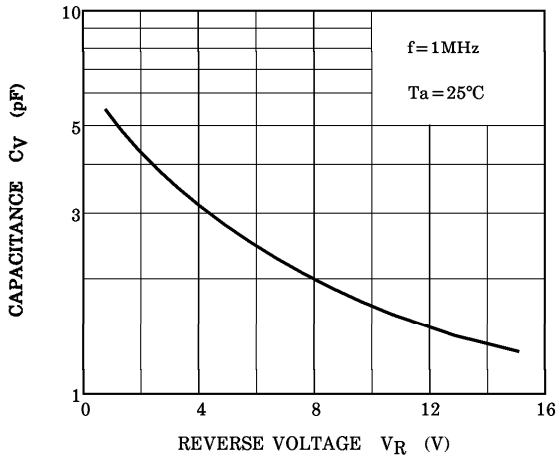
MARKING



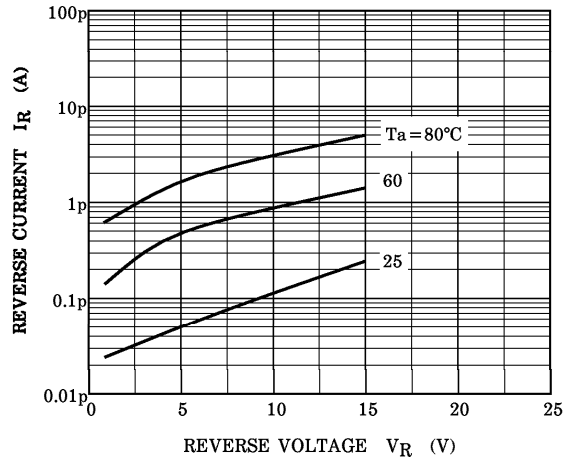
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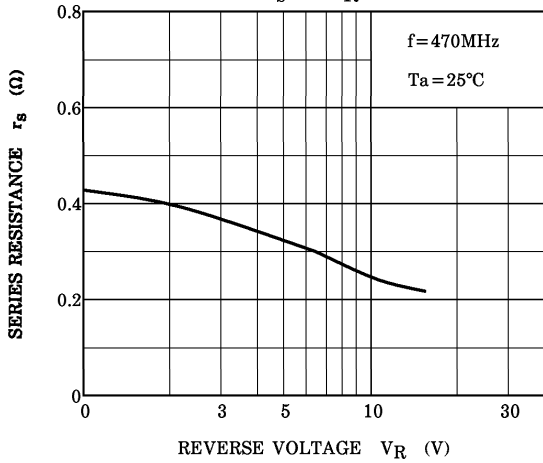
$C_V - V_R$



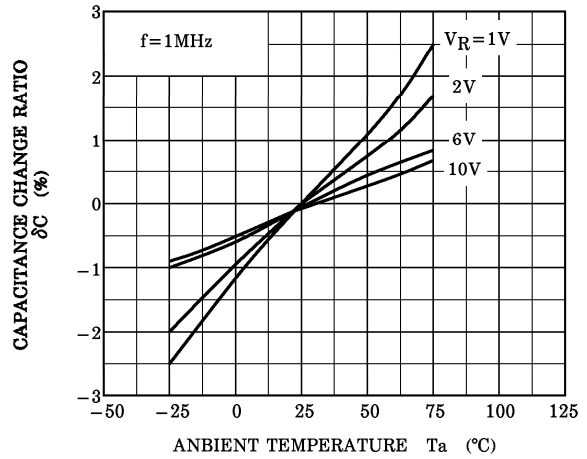
$I_R - V_R$



$r_s - V_R$



$\delta C - T_a$



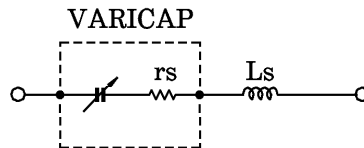
$$\text{NOTE : } \delta C = \frac{C(T_a) - C(25)}{C(25)} \times 100$$

SPICE PARAMETER

SPICE MODEL : BERKLEY SPICE.2G.6 DIODE MODEL  
 DATA FORMAT : MODEL FORMAT  
 SPICE SYMBOL :  $I_S$  (A),  $R_S$  ( $\Omega$ ),  $N$  (-),  $CJ0$  (F),  $V_J$  (V),  $M$  (-),  $B_V$  (V),  $I_{BV}$  (A)  
 FREQUENCY RANGE :  $f = 0.1 \sim 3$  GHz  
 REVERSE VOLTAGE RANGE :  $V_R = 2 \sim 10$  V

PARAMETER

$I_S = 5.381E - 16$   
 $N = 1.037$   
 $B_V = 15$   
 $I_{BV} = 1.00E - 06$   
 $R_S = 0.44$   
 $CJ0 = 6.890E - 12$   
 $V_J = 3.272$   
 $M = 0.9812$   
 -----  
 $L_s = 5.00E - 10$



- (Note 1) : These parameters from  $I_S$  to  $M$  mean die characteristic.  
 Actually device has lead inductance so  $L_s$  is necessary for simulation.  
 And please use default value except above parameters.
- (Note 2) :  $R_S$  shows the value at the condition of  $V_R = 1$  V and  $f = 470$  MHz.  
 If another value is needed, please refer to  $R_S - V_R$  curve in this data sheets.