

## CMS-826X Series

## Surface Mount Microwave Schottky Detector Diodes

### Description:

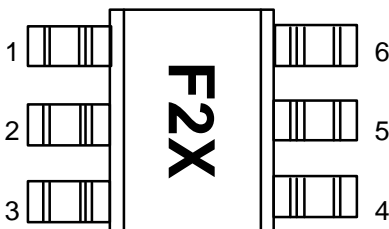
The Calmos CMS-826X series of DC biased detector diodes were designed and optimized for use from 915MHz to 5.8GHz. They are generally used in RF/ID and RF Tag applications as well as large signal detection , modulation, and RF to DC conversion or voltage doubling devices.

At Calmos Technology, our commitment to quality components gives our customers a reliable source of RF products. Manufacturing techniques assure that when two diodes are mounted into a single package they are taken from adjacent sites on the wafer. The various package configurations available provide a low cost solution to a wide variety of design problems.

### Features:

- **Low FIT (Failure in Time) Rate**
- **Low Turn-On Voltage (As Low as 0.33 V at 1 mA)**
- **Single, Dual and Quad Versions**
- **Unique Configurations in Surface Mount SOT-23/143 Package**
- **CMS-826K Grounded Center Leads Provide up to 10 dB Higher Isolation**
- **Matched Diodes for Consistent Performance**
- **High Thermal Conductivity for greater Power Dissipation**

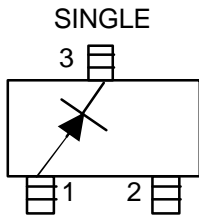
### Pin Connections and Package Marking



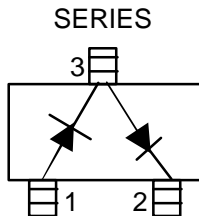
#### Notes:

1. Package marking provides orientation and identification
2. See "Electrical Specifications" for appropriate package marking

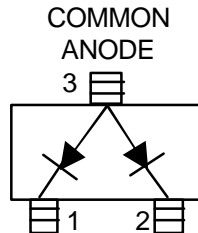
**SOT-23/SOT-143 Package  
Lead Code Identification (top view)**



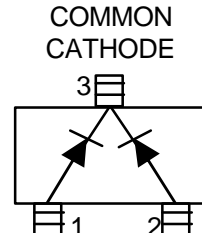
**CMS 8260**



**CMS 8262**

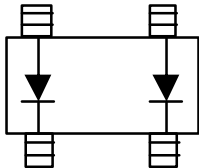


**CMS 8263**



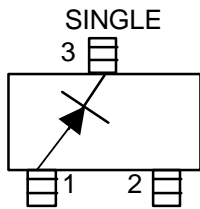
**CMS 8264**

UNCONNECTED PAIR

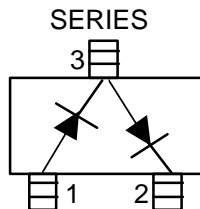


**CMS 8265**

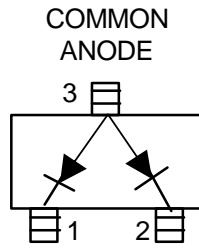
**SOT-323 Package Lead  
Code Identification (top view)**



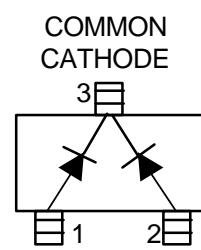
**CMS 8261**



**CMS 8266**



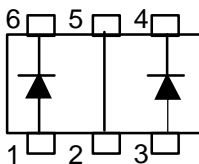
**CMS 8267**



**CMS 8268**

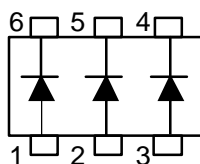
**SOT-363 Package 6 Lead  
Code Identification (top view)**

HIGH ISOLATION  
UNCONNECTED PAIR



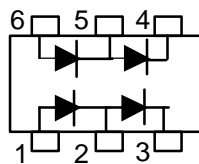
**CMS 826A**

UNCONNECTED TRIO



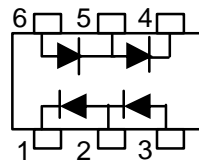
**CMS 826B**

BRIDGE  
QUAD



**CMS 826C**

RING  
QUAD



**CMS 826D**

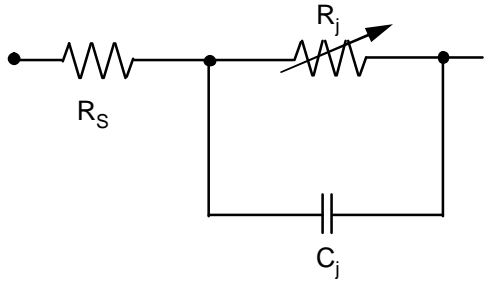
# Electrical Specifications, $T_C = +25^\circ\text{C}$ , Single Diode

Part Number CMS-	Typical Tangential Sensitivity TSS (dBm) @ f=			Typical Voltage Sensitivity (mV / $\mu\text{W}$ ) @ f=			Typical Video Resistance $R_V$ (KOhms)
	915Mhz	2.45GHz	5.8GHz	915Mhz	2.45GHz	5.8GHz	
8260	-57	-56	-55	50	35	25	5.0
8261							
8262							
8263							
8264							
8265							
8266							
8267							
8268							
826A							
826B							
826C							
826D							
Test Conditions							

Part Number CMS-	Package Marking Code	Configuration	Forward Voltage $V_F$ (mV)		Typical Capacitance $C_T$ (pF)
			250 Min	360 Max	
8260	F0	Single	250 Min	360 Max	0.25
8261	F1	Single			
8262	F2	Series			
8263	F3	Common Anode			
8264	F4	Common Cathode			
8265	F5	Unconnected Pair			
8266	F6	Series			
8267	F7	Common Anode			
8268	F8	Common Cathode			
826A	FA	High Isolation			
		Unconnected Pair			
826B	FB	Unconnected Trio			
826C	FC	Bridge Quad			
826D	FD	Ring Quad			
Test Conditions			$I_F=1.0 \text{ mA}$		$V_R=0 \text{ V}$ , $F=1 \text{ MHz}$

# Equivalent Linear Circuit Model

## CMS-826x chip



$R_S$  = series resistance (see Table of SPICE parameters)  
 $C_J$  = junction capacitance (see Table of SPICE parameters)  
 $R_J = \frac{8.33 \times 10^{-5} nT}{I_b + I_s}$

where

$I_b$  = externally applied bias current in amps  
 $I_s$  = saturation current (see table of SPICE parameters)  
 $T$  = temperature, °K  
 $n$  = ideality factor (see table of SPICE parameters)

## SPICE Parameters

Parameter	Units	CMS-822x
$B_V$	V	7
$C_{J0}$	pF	0.18
$E_G$	eV	0.69
$I_{BV}$	A	1 E-5
$I_S$	A	5 E-8
N		1.08
$R_S$	Ω	6
$P_B (V_J)$	V	0.65
$P_T (XTI)$		2
M		0.5

## Absolute Maximum Ratings, $T_C = +25^\circ\text{C}$ , Single Diode

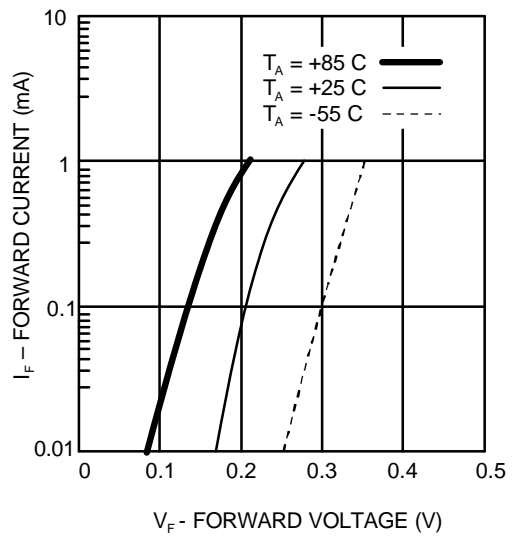
Symbol	Parameter	Unit	Absolute Maximum <sup>[1]</sup>	
			SOT-23/143	SOT-323
$P_{IV}$	Peak Inverse Voltage	V	4.0	4.0
$T_J$	Junction Temperature	°C	150	150
$T_{STG}$	Storage Temperature	°C	-65 to 150	-65 to 150
$T_{OP}$	Storage Temperature	°C	-65 to 150	-65 to 150
$\theta_{jc}$	Thermal Resistance <sup>[2]</sup>	°C/W	500	150

Notes:

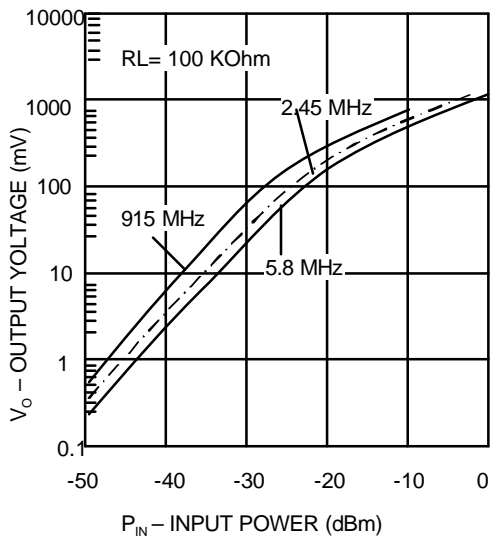
- Operation in excess of any one of these conditions may result in permanent damage to the device
- $T_C = +25^\circ\text{C}$ , where  $T_C$  is defined to be the temperature at the package pins where contact is made to the circuit board.

**ESD WARNING: Handling Precautions Should Be Taken To Avoid Static Discharge.**

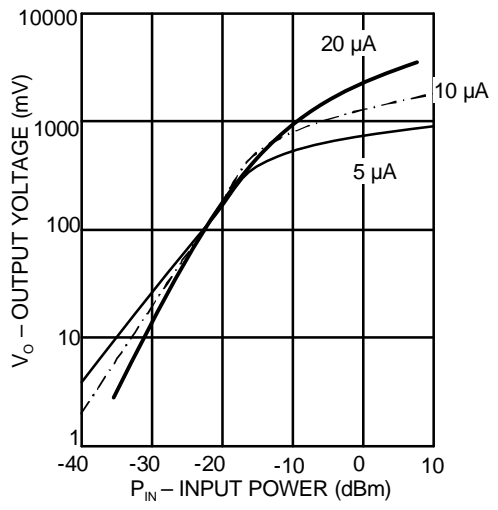
# Typical Parameters, Single Diode



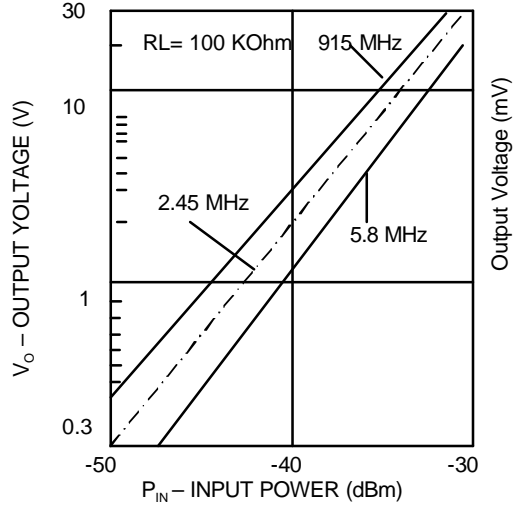
**Graph 1: Forward Current vs. Forward Voltage**



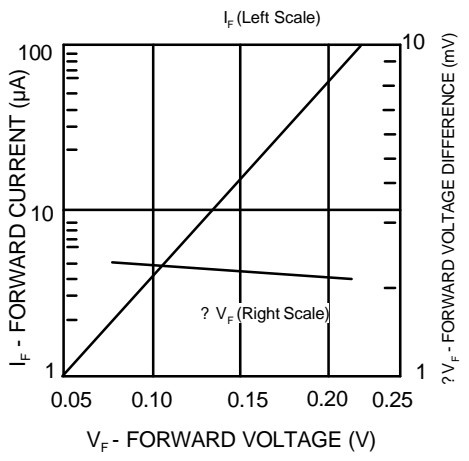
**Graph 2: +25 C Output Voltage vs. Input Power, 3  $\mu$ A Bias**



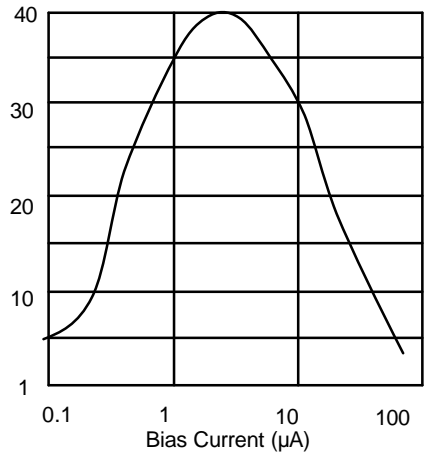
**Graph 3: Dynamic Transfer Characteristic as a function of DC Bias**



**Graph 4: +25 C Expanded Output Voltage vs. Input Power, 3  $\mu$ A Bias**



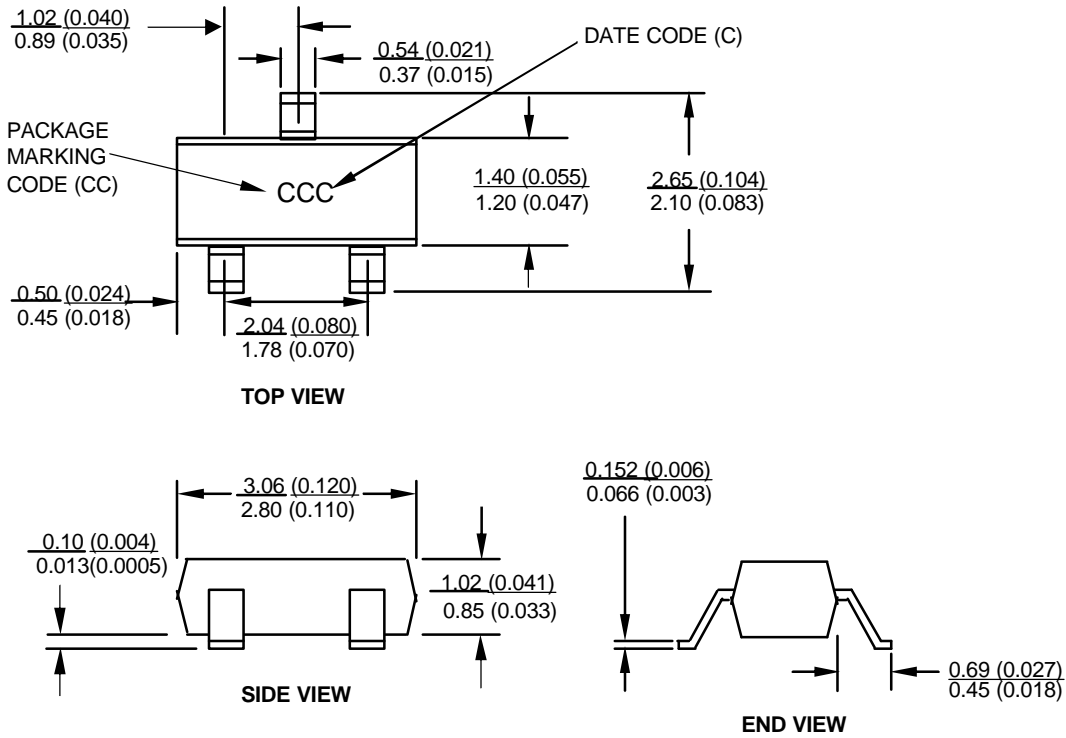
**Graph 5: Forward Voltage Match.**



**Graph 6: Voltage Sensitivity as a Function of DC Bias Current**

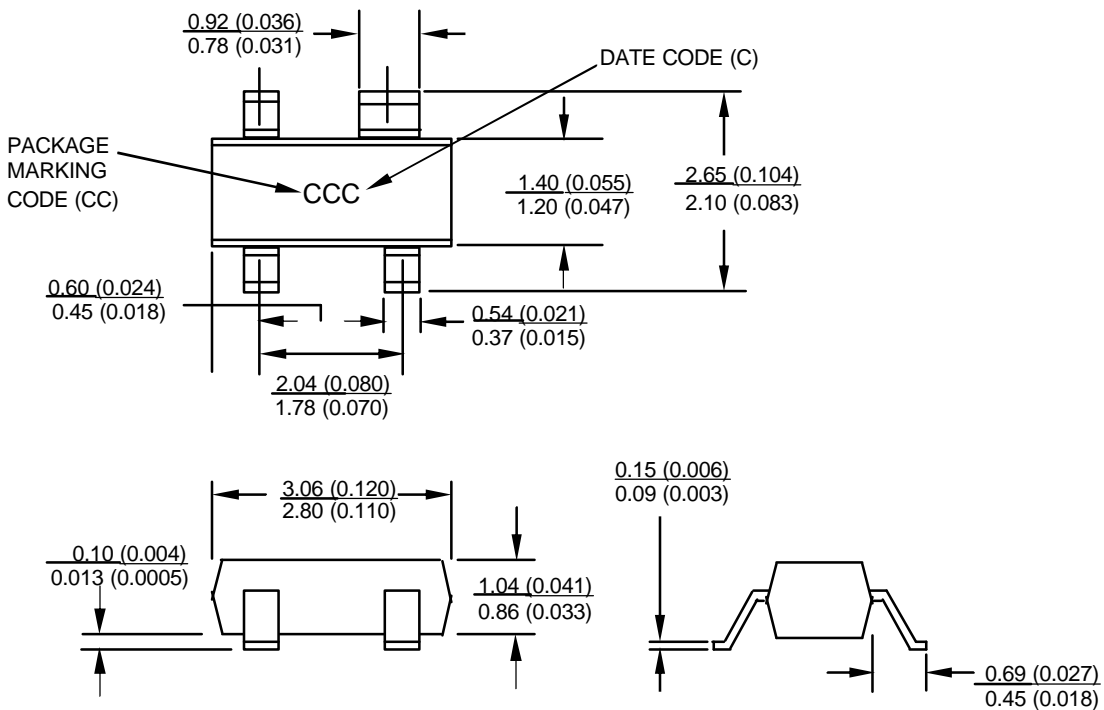
# Package Dimensions

## Outline 23 (SOT-23)

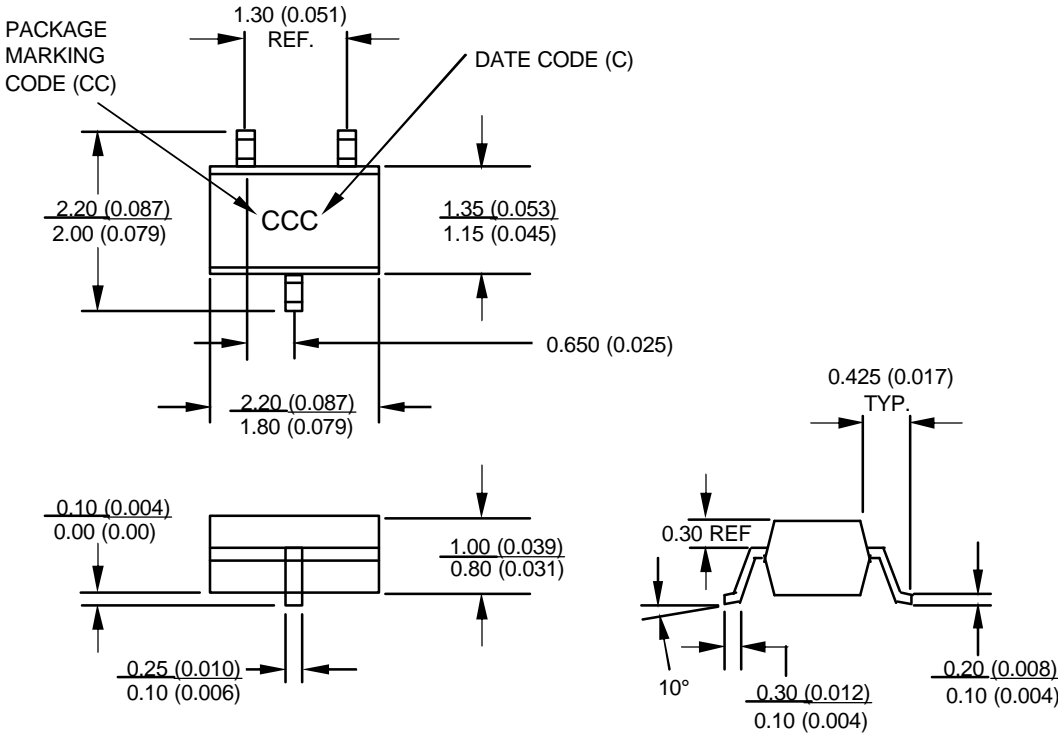


DIMENSIONS ARE IN MILLIMETERS (INCHES)

## Outline 143 (SOT-143)

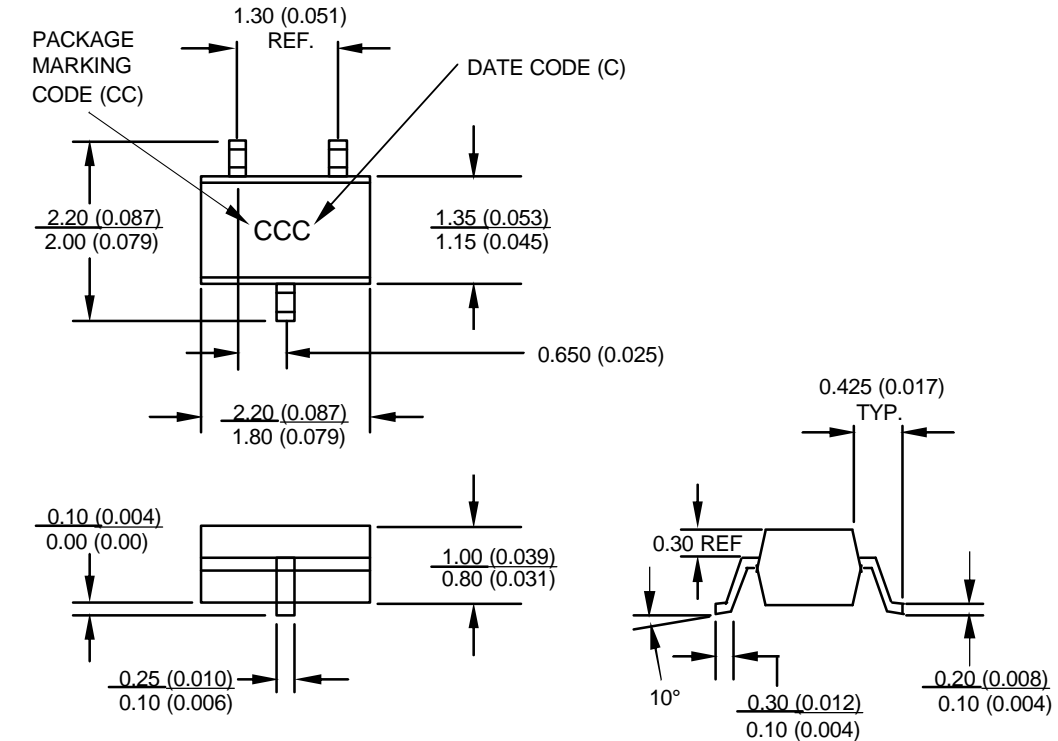


# Outline SOT-323 (SC-70)



DIMENSIONS ARE IN MILLIMETERS (INCHES)

# Outline SOT-363 (SC70, 6 Lead)



## Cross Reference Guide

<b>CALMOS PART NUMBER</b>	<b>AGILENT PART NUMBER</b>
CMS8260	HSMS2860
CMS8261	HSMS286B
CMS8262	HSMS2862
CMS8263	HSMS2863
CMS8264	HSMS2864
CMS8265	HSMS2865
CMS8266	HSMS286C
CMS8267	HSMS2867
CMS8268	HSMS2868
CMS826A	HSMS2869
CMS826B	HSMS286E
CMS826C	HSMS286F
CMS826D	HSMS286K

## Part Number Ordering Information

<b>PART NUMBER</b>	<b>NO. OF DEVICES</b>	<b>CONTAINER</b>
CMS-826X-TR2	10,000	13" Reel
CMS-826X-TR1	2500	7" Reel
CMS-826X-BLK	100	Antistatic bag

[www.calmotech.com](http://www.calmotech.com)

Revised 05/28/03

Data subject to change

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