

## CMP-839X Series

## Surface Mount RF PIN Switch Diodes

### Description:

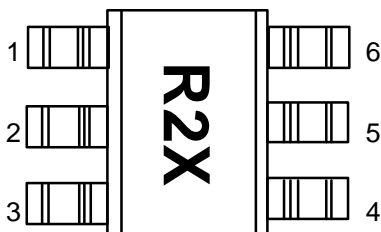
The CMP-839x series is optimized for switching applications where low resistance at low current and low capacitance are required. This diode is available in unique configurations which gives the designer flexibility by saving board space and reducing production cost.

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:

- **Unique Configurations in Surface Mount Packages**
  - Add Flexibility
  - Save Board Space
  - Reduce Cost
- **Switching**
  - Low Capacitance
  - Low Resistance at Low Current
- **Low Failure in Time (FIT) Rate**
- **Matched Diodes**
- **High Thermal Conductivity for greater Power Dissipation**

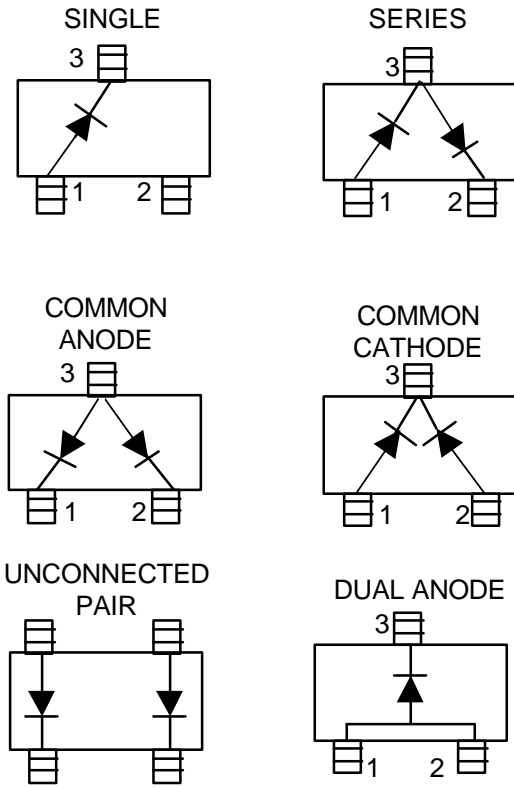
### Pin Connections and Package Marking



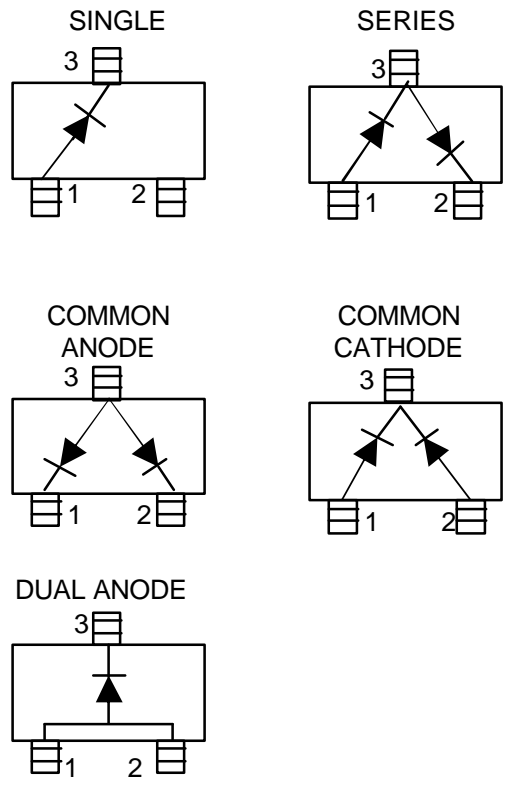
#### Notes:

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

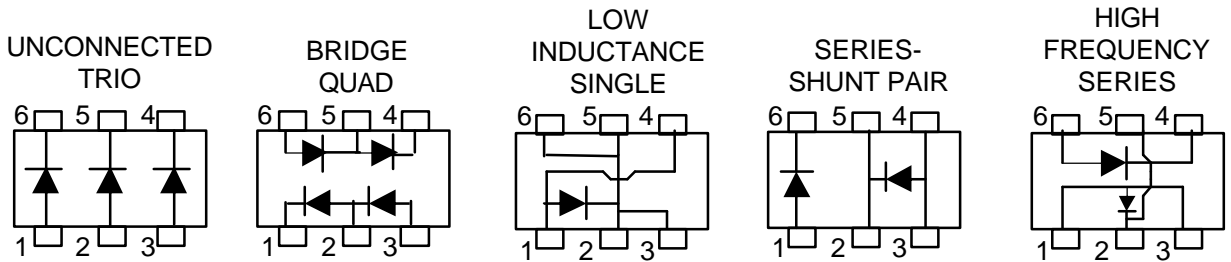
**SOT-23/SOT-143 Package  
Lead Code Identification (top view)**



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



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



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

Part Number CMP-	Package Marking Code [1]	Configuration	Typical Breakdown Voltage $V_{BR}$ (V)	Maximum Series Resistance $R_s$	Maximum Total Capacitance $C_T$ (pF)			
8390	0	Single	100	2.5	0.30			
8392	2	Series						
8393	3	Common Anode						
8394	4	Common Cathode						
8395	5	Unconnected Pair						
8391	1	Single						
8396	6	Series						
8397	7	Common Anode						
8398	8	Common Cathode						
839A	A	Unconnected Trio						
839B	B	Dual Switch Mode						
839C	C	Low Inductance Single						
839D	D	Series Shunt Pair						
839E	E	High Frequency Series						
Test Conditions						$V_R = V_{BR}$ Measure $I_R < 10\mu\text{A}$	$I_F = 5\text{mA}$ $f = 100\text{ MHz}$	$V_R = 5\text{V}$ $f = 1\text{ MHz}$

## Typical Parameters, $T_C = +25^\circ\text{C}$

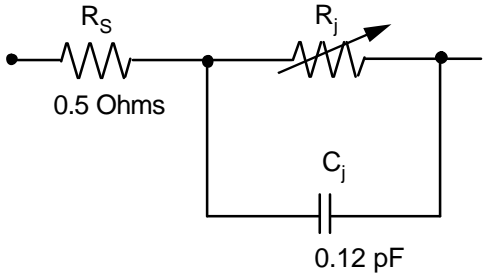
Part Number CMS-	Series Resistance $R_s$	Carrier Lifetime $t$ (ns)	Total Capacitance $C_T$ (pF)
839x	3.8	200	0.2 @ 5V
Test Conditions	$I_F = 1.0\text{ mA}$ $f = 100\text{ MHz}$	$I_F = 10\text{ mA}$ $I_R = 6\text{ mA}$	

## High Frequency (Low Inductance, 500 MHz – 3GHz) PIN Diodes

Part Number CMP-	Configuration	Minimum Breakdown Voltage $V_{BR}$ (V)	Maximum Series Resistance $R_s$	Typical Capacitance $C_T$ (pF)	Maximum Capacitance $C_T$ (pF)	Typical Inductance $L_T$ (pF)
849x	Dual Anode	100	2.5	0.33	0.375	1.0
Test Conditions		$V_R = V_{BR}$ Measure $I_R < 10\mu\text{A}$	$I_F = 5\text{mA}$	$V_R = 5\text{V}$ $f = 1\text{ MHz}$	$V_R = 5\text{V}$ $f = 1\text{ MHz}$	$f = 500\text{ MHz}$ 3GHz

# Equivalent Linear Circuit Model

## CMP-839x chip



$$R_T = 0.5 + R_J$$

$$C_T = C_P + C_J$$

$$R_J = 20 / 1.0^{0.9} \text{ Ohms}$$

where

$I$  = Forward Bias Current in mA

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

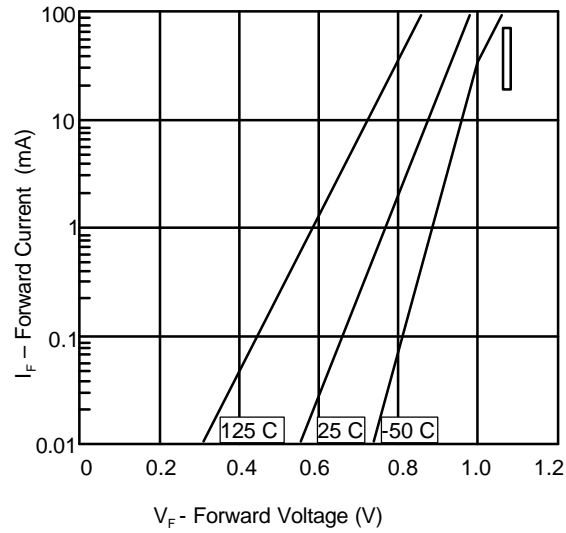
Symbol	Parameter	Unit	Absolute Maximum <sup>[1]</sup>	
			SOT-23/143	SOT-323/363
$P_{IV}$	Peak Inverse Voltage	V	100	100
$T_J$	Junction Temperature	$^\circ\text{C}$	150	150
$T_{STG}$	Storage Temperature	$^\circ\text{C}$	-65 to 150	-65 to 150
$I_F$	Forward Current (1us pulse)	Amp	1	1
$\theta_{jc}$	Thermal Resistance <sup>[2]</sup>	$^\circ\text{C}/\text{W}$	500	150

Notes:

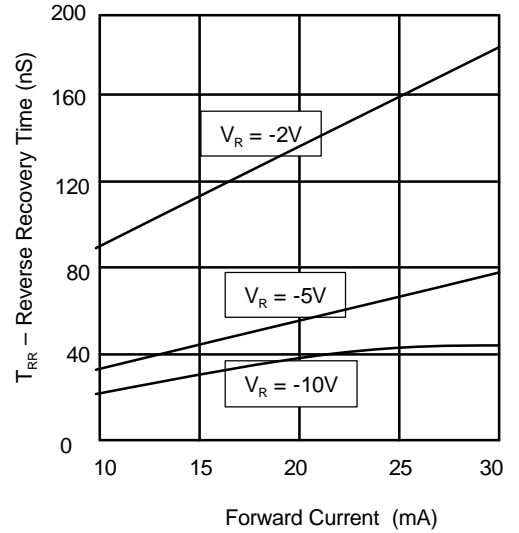
1. Operation in excess of any one of these conditions may result in permanent damage to the device
2.  $T_C = +25^\circ\text{C}$ , where  $T_C$  is defined to be the temperature at the package pins where contact is made to the circuit board.

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

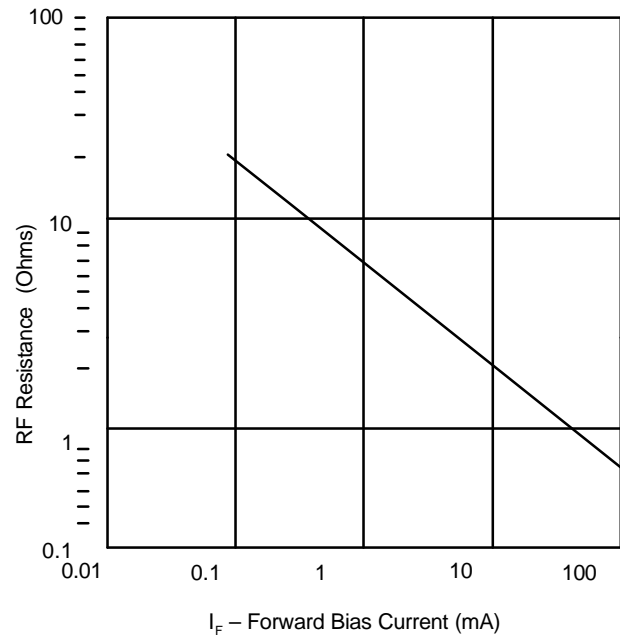
# Typical Parameters, Single Diode



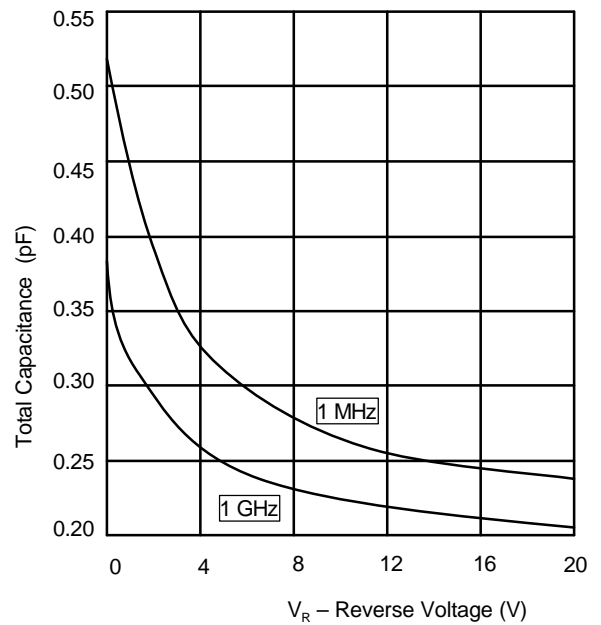
**Graph 1: Typical Forward Current vs. Forward Voltage**



**Graph 2: Typical Reverse Recovery Time vs. Recovery Voltage**



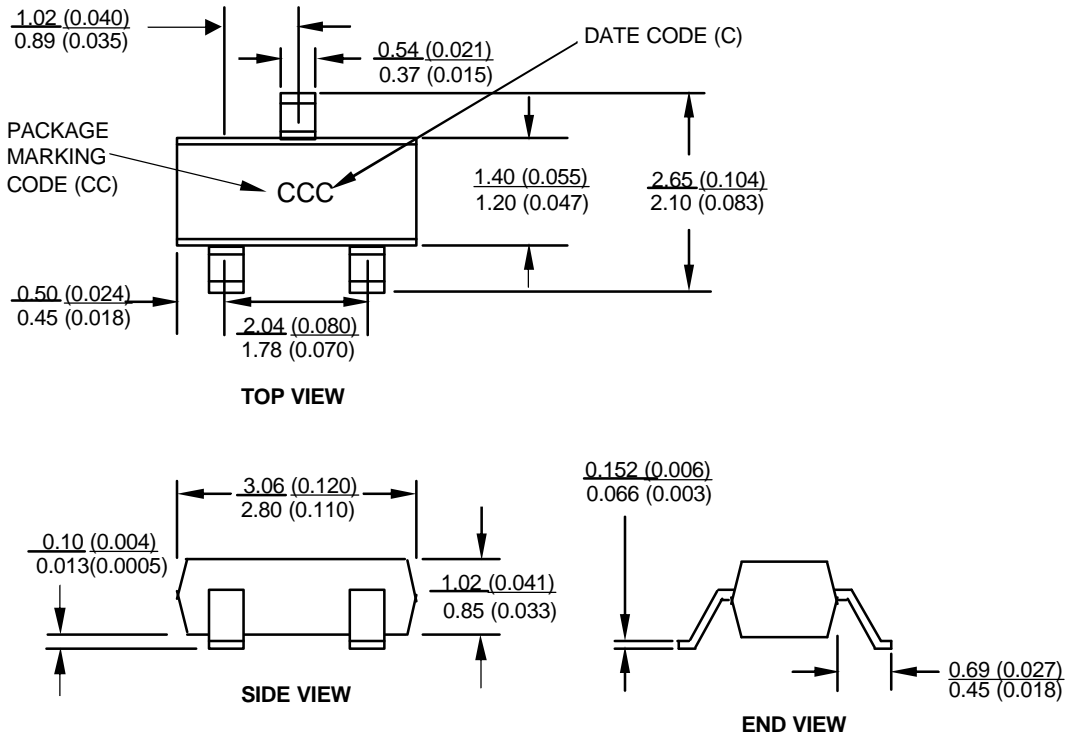
**Graph 3: Total RF Resistance at 25 C vs. Forward Bias Current.**



**Graph 4: Capacitance vs. Reverse Voltage**

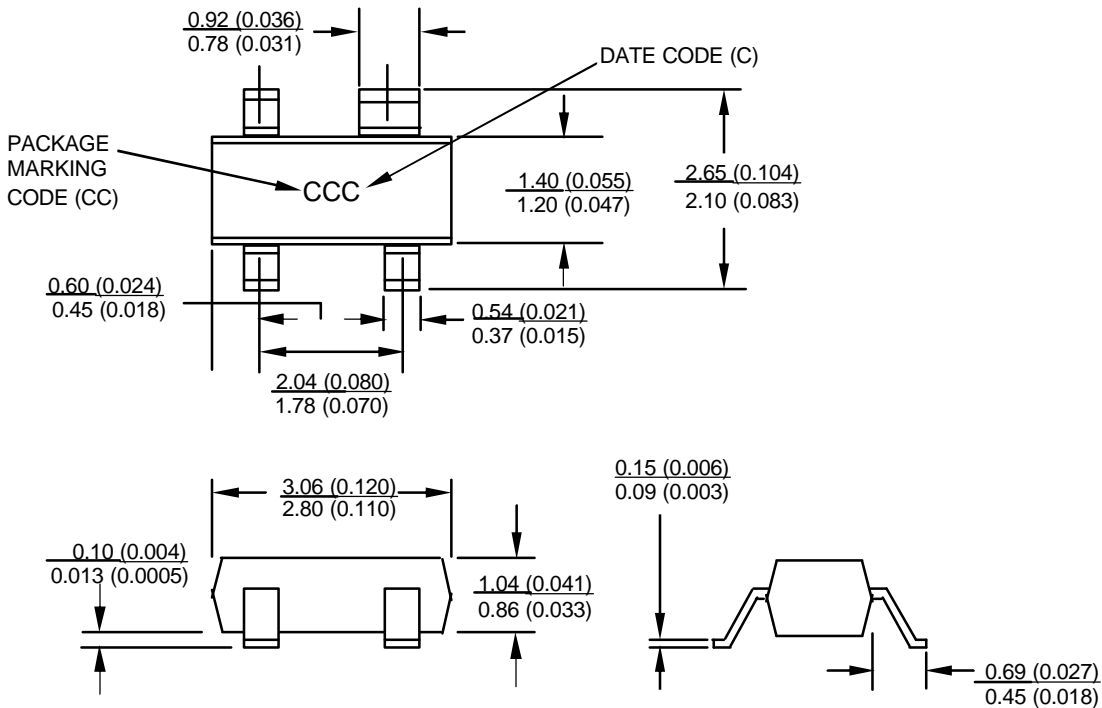
# Package Dimensions

## Outline 23 (SOT-23)

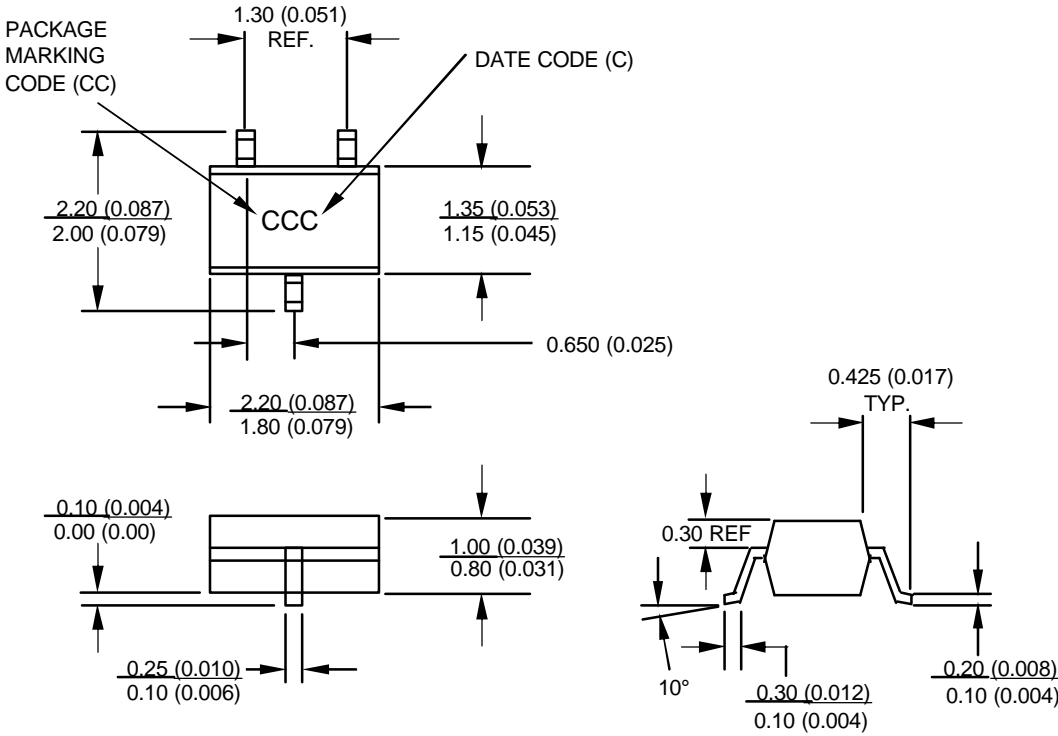


DIMENSIONS ARE IN MILLIMETERS (INCHES)

## Outline 143 (SOT-143)

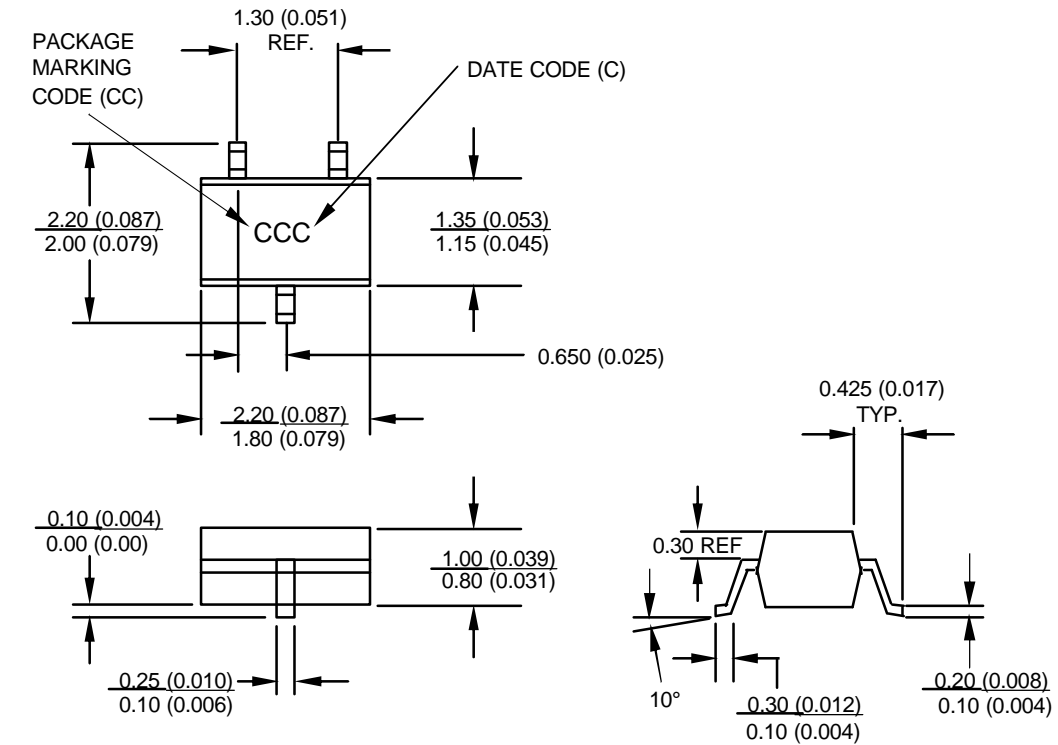


# Outline SOT-323 (SC-70)



DIMENSIONS ARE IN MILLIMETERS (INCHES)

# Outline SOT-363 (SC70, 6 Lead)



## Cross Reference Guide

<b>CALMOS PART NUMBER</b>	<b>AGILENT PART NUMBER</b>
CMP8390	HSMP3890
CMP8391	HSMP389B
CMP8392	HSMP3892
CMP8393	HSMP3893
CMP8394	HSMP3894
CMP8395	HSMP3895
CMP8396	HSMP389C
CMP8397	HSMP389E
CMP8398	HSMP389F
CMP839A	HSMP389L
CMP839B	HSMP389R
CMP839C	HSMP389T
CMP839D	HSMP389U
CMP839E	HSMP389V

## Part Number Ordering Information

<b>PART NUMBER</b>	<b>NO. OF DEVICES</b>	<b>CONTAINER</b>
CMP-839X	10,000	13" Reel
CMP-839X	2500	7" Reel
CMP-839X-BLK	100	Antistatic bag

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

Revised 05/28/03

Data subject to change

Copyright © 2002 Calmos Technology, Inc.