

CMP-839X Series

Surface Mount RF PIN Switch Diodes

Description:

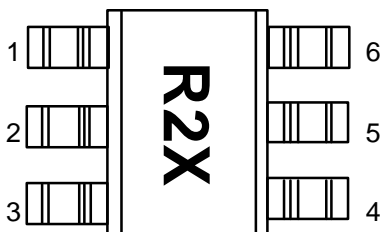
The CMP-839x series is optimized for switching applications where low resistance at low current and low capacitance are required. This diode is available in unique configurations which gives the designer flexibility by saving board space and reducing production cost.

At SiliconApps, 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**

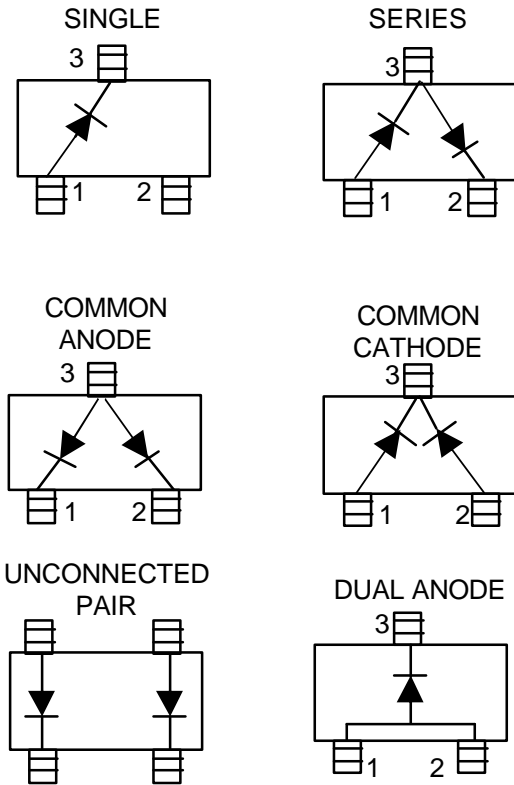
Pin Connections and Package Marking



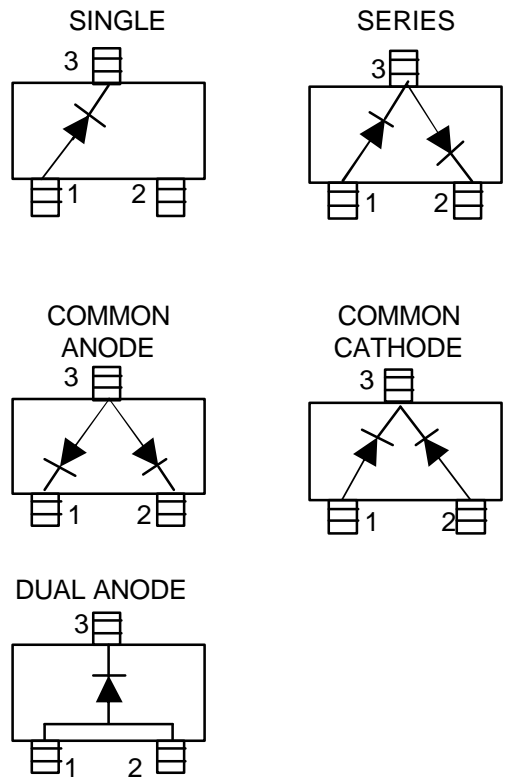
Notes:

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

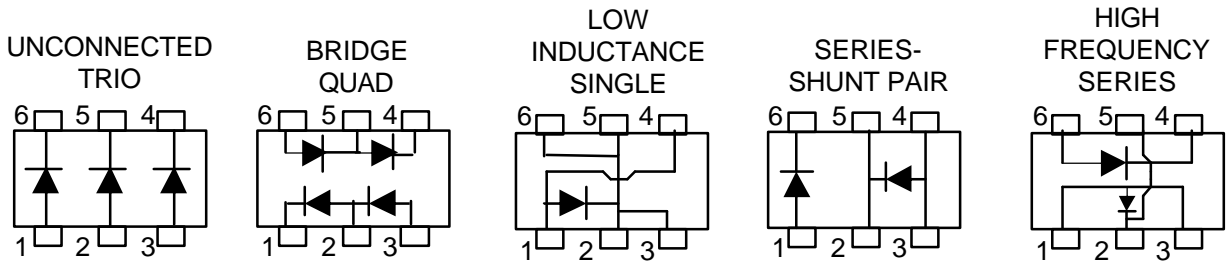
**SOT-23/SOT-143 Package
Lead Code Identification (top view)**



**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, $T_C = +25^\circ\text{C}$

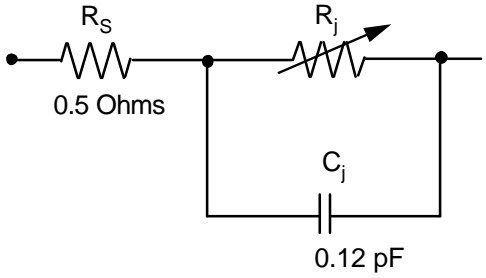
Part Number CMS-	Series Resistance R_s	Carrier Lifetime t (ns)	Total Capacitance C_T (pF)
839x	3.8	200	0.2 @ 5V
Test Conditions	$I_F = 1.0\text{ mA}$ $f = 100\text{ MHz}$	$I_F = 10\text{ mA}$ $I_R = 6\text{ mA}$	

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

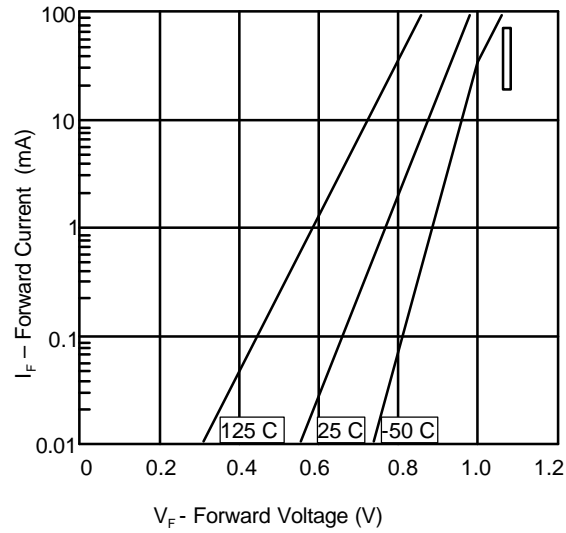
Symbol	Parameter	Unit	Absolute Maximum ^[1]	
			SOT-23/143	SOT-323/363
P_{IV}	Peak Inverse Voltage	V	100	100
T_J	Junction Temperature	$^\circ\text{C}$	150	150
T_{STG}	Storage Temperature	$^\circ\text{C}$	-65 to 150	-65 to 150
I_F	Forward Current (1us pulse)	Amp	1	1
θ_{jc}	Thermal Resistance ^[2]	$^\circ\text{C}/\text{W}$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

Notes:

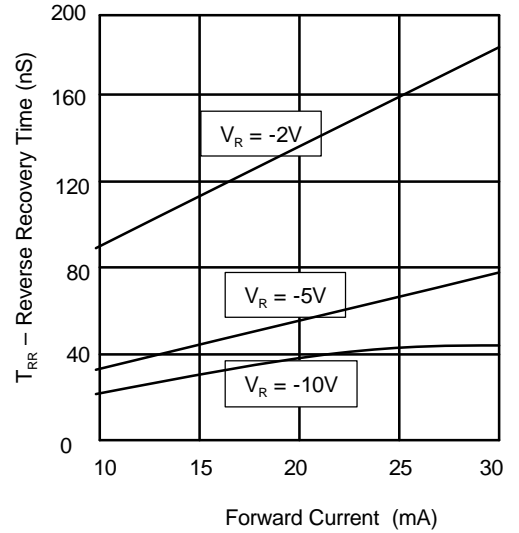
1. Operation in excess of any one of these conditions may result in permanent damage to the device
2. $T_C = +25^\circ\text{C}$, where T_C is defined to be the temperature at the package pins where contact is made to the circuit board.

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

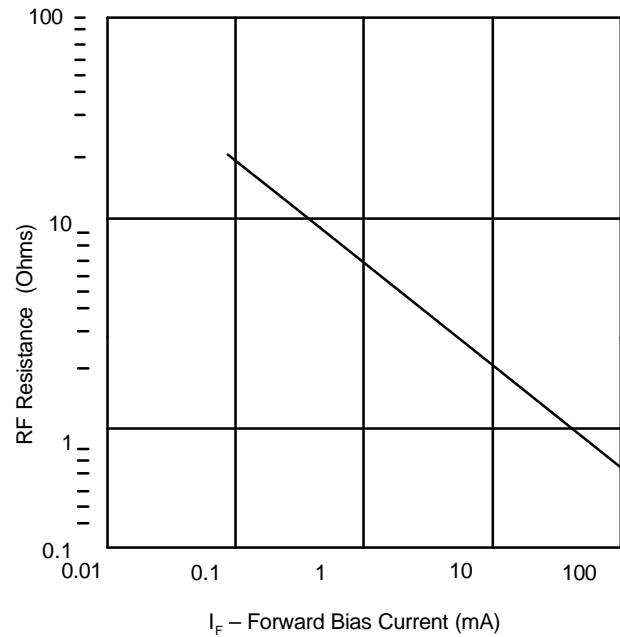
Typical Parameters, Single Diode



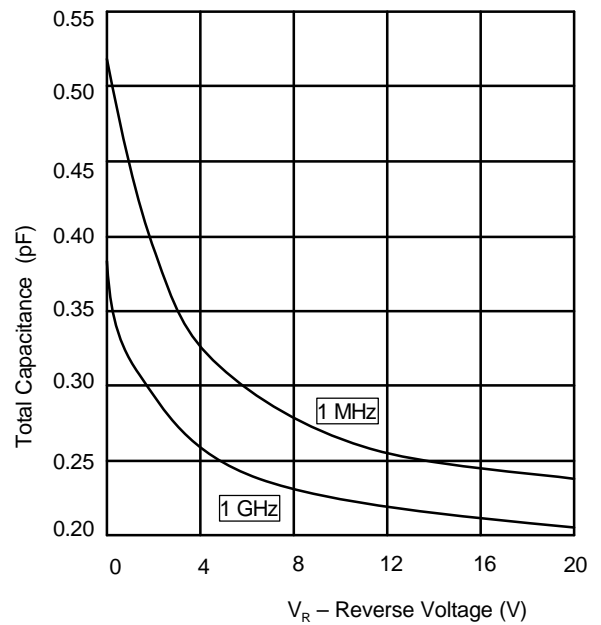
Graph 1: Typical Forward Current vs. Forward Voltage



Graph 2: Typical Reverse Recovery Time vs. Recovery Voltage



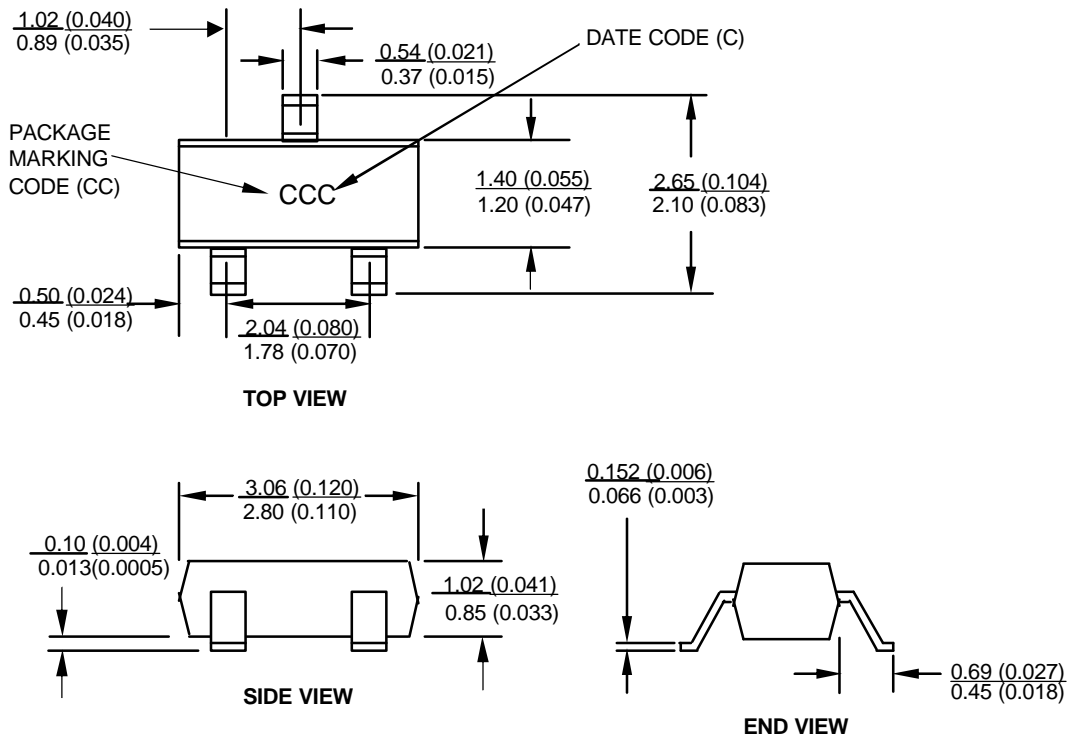
Graph 3: Total RF Resistance at 25 C vs. Forward Bias Current.



Graph 4: Capacitance vs. Reverse Voltage

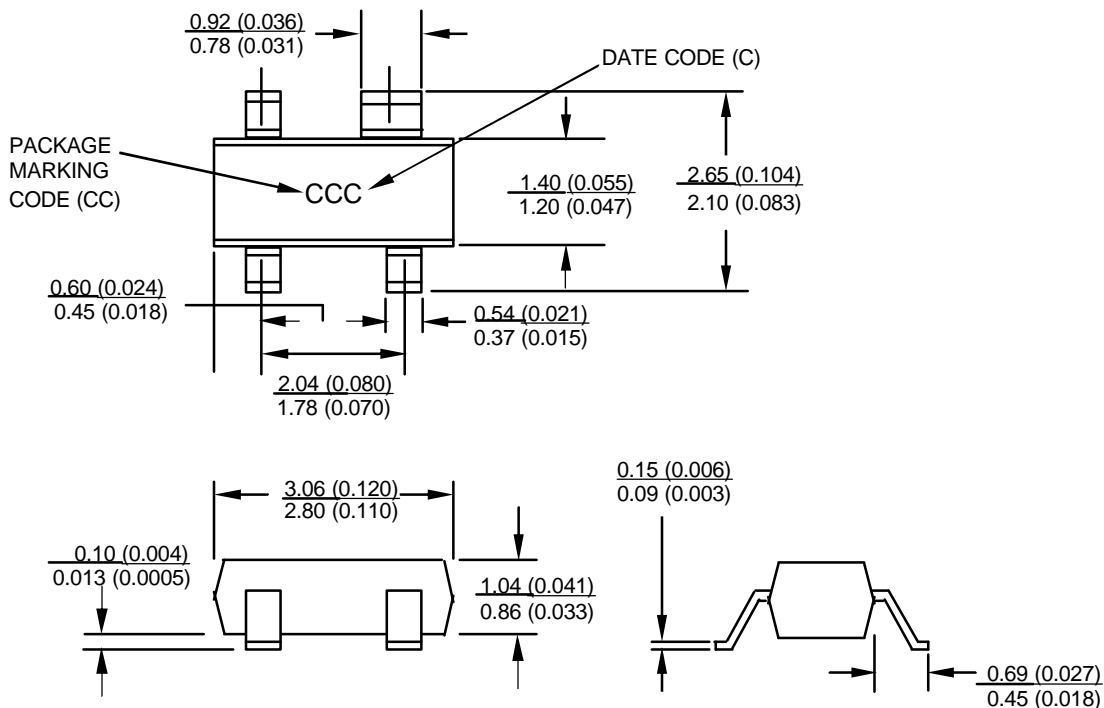
Package Dimensions

Outline 23 (SOT-23)

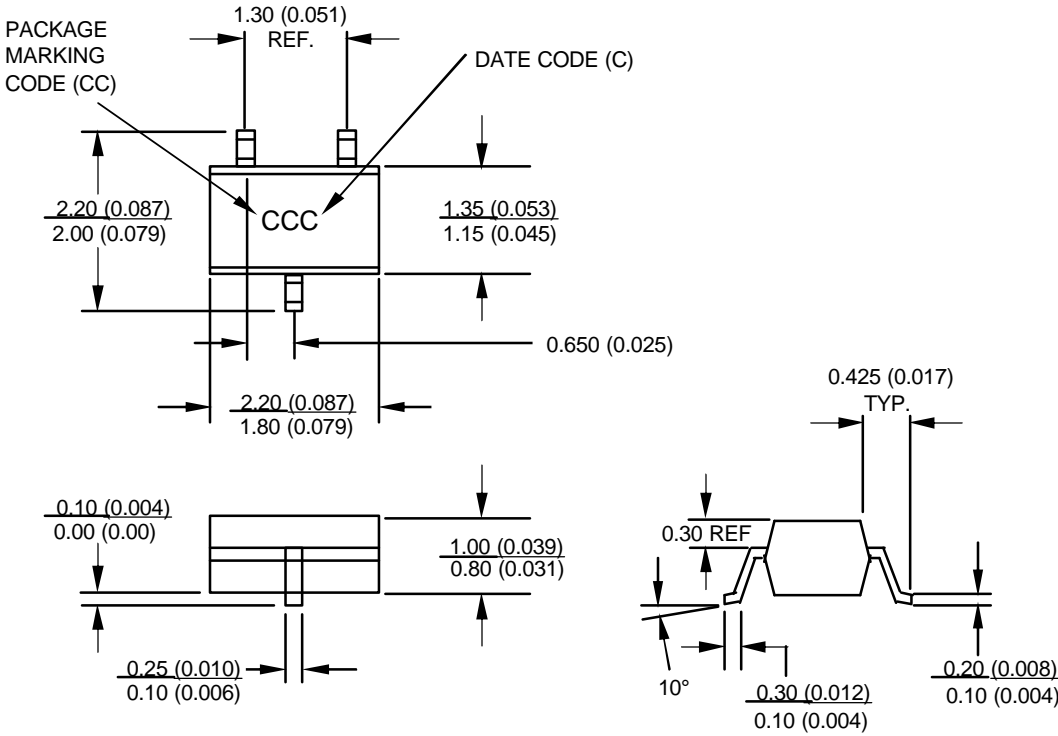


DIMENSIONS ARE IN MILLIMETERS (INCHES)

Outline 143 (SOT-143)

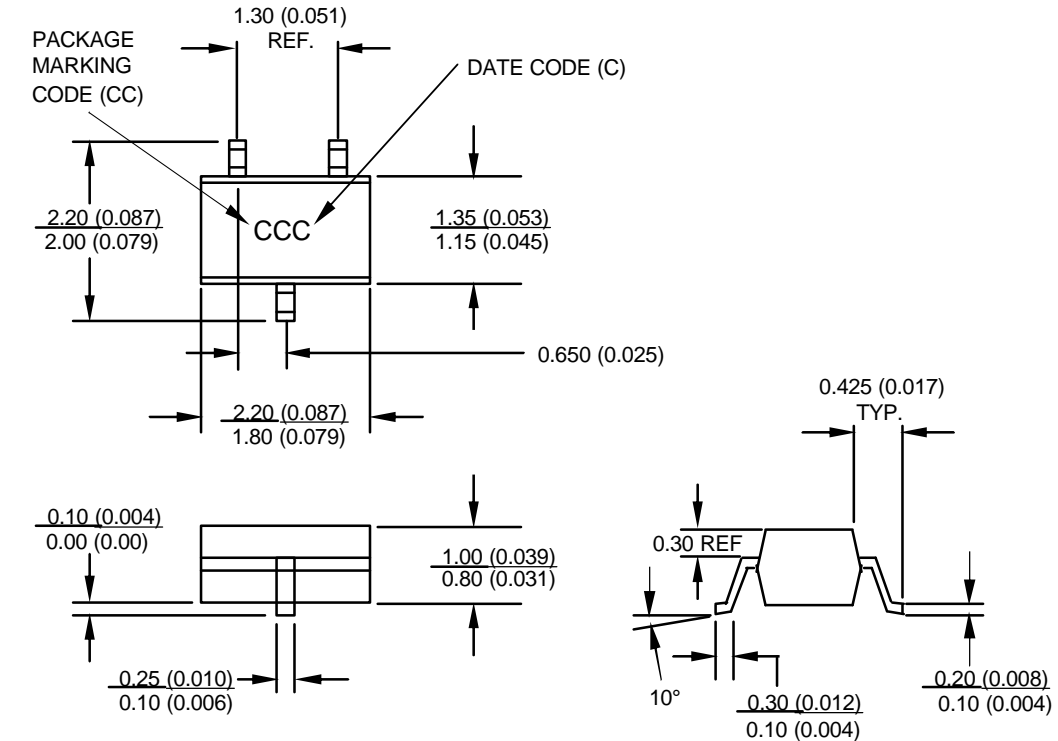


Outline SOT-323 (SC-70)



DIMENSIONS ARE IN MILLIMETERS (INCHES)

Outline SOT-363 (SC70, 6 Lead)



Cross Reference Guide

SiliconApps Part Number	Agilent Part Number
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

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

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Revised 05/28/03

Data subject to change

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