# RICO

## **R3116x Series**

## 0.8% Accuracy, 0.5V Operating Voltage Detector with Delay Function

The R3116x Series are CMOS-based voltage detector ICs with the built-in output delay circuit. The Series can operate at low voltage from 0.5V and the detector threshold can be specified from 0.7V. The detector threshold accuracy as high as ± 0.8% helps to increase stable operating area coupled with lower voltage. Additionally, the high accuracy output delay time at ±15% allows easy control of the start-up sequence. In addition to SOT-23-5 and SC-82AB packages, a 1mm square DFN(PLP)1010-4 package is also available.

## **FEATURES**

- Supply Current (Iss1) ......Typ. 0.35µA (VDD=-VDET+1V, R3116x151x)
- Operating Voltage Range (VDD) ...... 0.5V to 6.0V (Topt=25°C)
- Detector Threshold Range (-VDET) 0.7V to 5.0V (internally fixed)
- Temp. coeff. of Detector Threshold ... Typ. ± 30ppm/°C

R3116xxx1C

(CMOS output)

Delay

Circuit

- Two Output Types ..... Nch. Open Drain Output and
  - CMOS
- capacitor
- Reset Signal ....."L"
- Detector Threshold Accuracy .....± 0.8%

Ιουτ

GND

SC-82AB. SOT-23-5

(The above shows specification at Topt=25°C. Design assurance value at -40°C  $\leq$  Topt  $\leq$  85°C is also available. For details, please refer to the datasheet.)

#### **BLOCK DIAGRAMS**



## **SELECTION GUIDES**

Package	Quantity per Reel	Part No.
DFN(PLP)1010-4	10,000 pcs	R3116Kxx1*-TR
SC-82AB	3,000 pcs	R3116Qxx1*-TR-F
SOT-23-5	3,000 pcs	R3116Nxx1*-TR-F

xx : Specify the detector threshold within the range 0.7V (07) to 5.0V (50) in 0.1V steps.

: Select the output type from (A) Nch. open drain or (C) CMOS.

## **PACKAGES (Top View)**



\*) The tab is substrate level (GND).

### **APPLICATIONS**

- Microcontroller and logic circuit reset
- · Wave shaping circuit

- Battery checker
- · Battery back-up circuit

- Window comparator
- Power failure detector

#### TIMING CHART

Vref



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#### **COMPARISON OF VOLTAGE DETECTORS**

	R3116x Series	R3112x Series
Supply Current (at released)	Тур. 0.35μА	Тур. 0.5μА
Operating Voltage Range	0.5V to 6.0V	0.7V to 6.0V
Detector Threshold Range	0.7V to 5.0V	0.9V to 5.0V
Detector Threshold Accuracy	±0.8%	±2%
Output Delay	Typ. 100ms delay set with a 0.022µF external capacitor	
Output Delay Time Accuracy	±15%	-
Temp. coeff. of Detector Threshold	Typ. ±30ppm/°C	Typ. ±100ppm/°C
Packages	DFN(PLP)1010-4 (1.0mm×1.0mm) SC-82AB (2.0mm×2.1mm) SOT-23-5 (2.9mm×2.8mm)	SON1612-6 (1.6mm×1.6mm) SC-82AB (2.0mm×2.1mm) SC-88A (2.0mm×2.1mm) SOT-23-5 (2.9mm×2.8mm)

## HIGHER ACCURACY OUTPUT DELAY TIME



The high-accuracy output delay time allows easy control of the start-up sequence.

## WHAT IS DFN(PLP)1010-4?



The DFN(PLP)package is a leadless package using an electroforming sheet in place of lead frame. This extremely compact package features increased power dissipation and conversion to thinner type. The name is representing by a combination of the body size and the number of pins, i.e., DFN(PLP)1010-4 stands for the body size of 1.0mm×1.0mm and 4pins. An environment-friendly, leadfree package with gold plated contacts complies with the RoHS Directive.

## Ricoh Co., LTD. Electronic Devices Company

Ricoh presented with the Japan Management Quality Award for 1999. Ricoh continually strives to promote customer satisfaction, and shares the achievements of its management quality improvement program with people and society.



#### Ricoh awarded ISO 14001 certification.

The Ricoh Group was awarded ISO 14001 certification, which is an international standard for environmental management systems, at both its domestic and overseas production facilities. Our current aim is to obtain ISO 14001 certification for all of our business offices.



Ricoh completed the organization of the Lead-free production for all of our products. After Apr. 1, 2006, we will ship out the lead free products only. Thus, all products that will be shipped from now on comply with RoHS Directive.

## http://www.ricoh.com/LSI/

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