

0.7 μ A RAIL-TO-RAIL CMOS COMPARATOR

1 Circuit S-89530A/89531A
2 Circuits S-89530B/89531B

The mini analog series is a family of ICs that integrate general-purpose analog circuits in ultra-small chip packages. The S-89530/89531 is a CMOS comparator with Rail-to-Rail*1 I/O. Since this series features low voltage drive and low current consumption compared with the conventional comparator, it is ideal for small battery-powered portable applications.

*1. Rail-to-Rail is a registered trademark of Motorola, Inc.

PRODUCT LIST

Package	SC-88A (1 circuit is mounted)	8-pin SON(A) (2 circuits are mounted)
Offset voltage		
$V_{IO} = 10\text{mV max.}$	S-89530ACNC-HCB-TF	S-89530BCPN-HFB-TF
$V_{IO} = 5\text{mV max.}$	S-89531ACNC-HCC-TF	S-89531BCPN-HFC-TF

SPECIFICATIONS

$T_a = 25^\circ\text{C}$ (typ. value)

Product name	S-89531ANC		
Absolute maximum rating	7 V		
Operating temperature range	-40 to +85°C		
Package	SC-88A		
Operating voltage	0.9 to 5.5 V		
Power supply voltage V_{DD}	At 0.9 V	At 1.8 V	At 3.0 V
Current consumption	1.3 μ A max.	1.4 μ A max.	1.4 μ A max.
Input offset voltage	5 mV max.	5 mV max.	5 mV max.
Input offset current	1 pA	1 pA	1 pA
Input bias current	1 pA	1 pA	1 pA
Common-mode input voltage range	0 to 0.9 V	0 to 1.8 V	0 to 3.0 V
Voltage gain (open loop)	74 dB	80 dB	86 dB
Maximum output voltage swing*1	V_{OH}	0.88 V min.	1.78 V min.
	V_{OL}	0.02 V max.	0.02 V max.
Source current ($V_{OUT} = V_{SS}$)	12 μ A min.	1.0 mA min.	4.0 mA min.
Sink current ($V_{OUT} = V_{DD}$)	12 μ A min.	1.2 mA min.	4.8 mA min.
Rise propagation delay time	65 μ s	90 μ s	110 μ s
Fall propagation delay time	65 μ s	160 μ s	280 μ s
Output rise time	5 μ s	8 μ s	10 μ s
Output fall time	20 μ s	25 μ s	30 μ s

*1. $R_L = 100\text{ k}\Omega$

FEATURES

- Compared with the conventional general-purpose comparator, low voltage operation is possible: $V_{DD} = 0.9$ to 5.5 V
- Low current consumption: $I_{DD} = 0.7\ \mu\text{A typ.}$
- Wide I/O voltage range: $V_{CMR} = V_{SS}$ to V_{DD}
- Small input offset voltage: 5.0 mV max.
- Small package: SC-88A
8-pin SON(A)

APPLICATIONS

- Cellular phones, digital still cameras, PDAs, notebook PCs, digital camcorders

PIN CONFIGURATION

