TSM971/72/73/82/84 Product Brief

Ultra Low-Power, Open-Drain Single/Dual-Supply Comparators

FEATURES

♦ Alternate source for:
   MAX971/MAX972/MAX973/MAX982/MAX984
♦ Ultra-Low Quiescent Current Over Temperature
   TSM971 Single+Reference: 4µA (max)
   TSM972: Dual Comparator Only: 4µA (max)
   TSM973/TSM982 Dual+Reference: 6µA (max)
   TSM984 Quad+Reference: 8.5µA (max)
♦ Single or Dual Power Supplies:
   Single: +2.5V to +11V
   Dual: ±1.25V to ±5.5V
♦ Input Voltage Range Includes Negative Supply
♦ 12µs Propagation Delay at 10mV Overdrive
♦ Open-drain Output Stages for Wired-OR
   Applications
♦ Internal 1.182V±1% Reference: TSM971/TSM973
♦ Internal 1.182V±2% Reference: TSM982/TSM984
♦ Adjustable Hysteresis: TSM971/TSM973/TSM982
♦ Separate Output GND Pin: TSM971/TSM984

APPLICATIONS

Threshold Detectors/Discriminators
Oscillator Circuits
Window Comparators
Level Translators
Battery-Powered Systems

DESCRIPTION

The TSM971/972/973/982/984 family of single/dual/quad, low-voltage, micropower analog comparators is electrically and form-factor identical to the MAX971/972/973/982/984 family of analog comparators. Ideal for 3V or 5V single-supply applications, this comparator family can operate from single +2.5V to +11V supplies or from ±1.25V to ±5V dual supplies. The single TSM971 and the dual TSM972 draw less than 4µA (max) supply current over temperature. The TSM973/TSM982 duals and the quad TSM984 draw less than 3µA per comparator over temperature.

All comparators in this family exhibit an input voltage range from the negative supply rail to within 1.3V of the positive supply. Wired-OR applications are enabled as the comparators' output stages are open-drain. A 1.182V reference is internal to the TSM971/TSM973 (±1%) and the TSM982/TSM984 (±2%). Without complicated feedback configurations and only requiring two additional resistors, adding external hysteresis via a separate pin is available on the TSM971, the TSM973, and the TSM982.

TYPICAL APPLICATION CIRCUIT

A 5V, Low-Parts-Count Window Detector
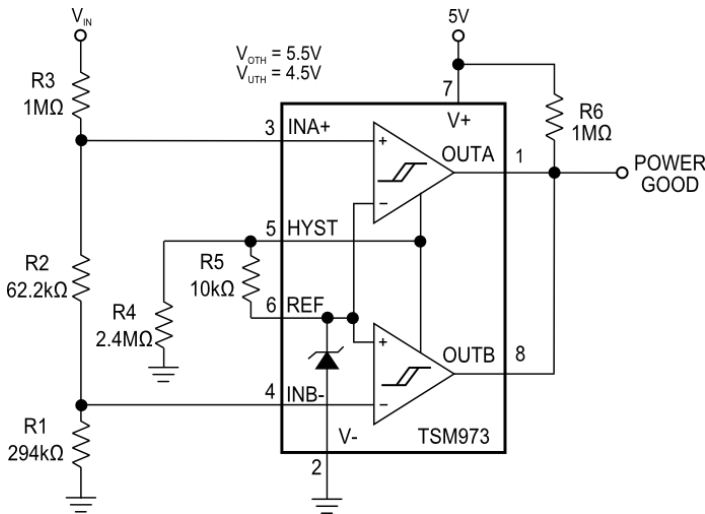
PART	INTERNAL REFERENCE	COMPARATORS PER PACKAGE	INTERNAL HYSTERESIS
TSM971	Yes, ±1%	1	Yes
TSM972	No	2	No
TSM973	Yes, ±1%	2	Yes
TSM982	Yes, ±2%	2	Yes
TSM984	Yes, ±2%	4	No

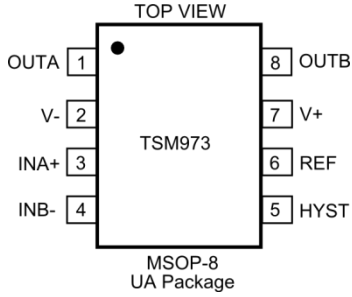| PART	TEMPERATURE RANGE	PACKAGE
TSM971C	0ºC to 70ºC	8-Pin MSOP/SOIC
TSM971E	-40ºC to 85ºC	
TSM972C	0ºC to 70ºC	8-Pin MSOP/SOIC
TSM972E	-40ºC to 85ºC	
TSM973C	0ºC to 70ºC	8-Pin MSOP/SOIC
TSM973E	-40ºC to 85ºC	
TSM982C	0ºC to 70ºC	8-Pin MSOP/SOIC
TSM982E	-40ºC to 85ºC	
TSM984C	0ºC to 70ºC	16-Pin SOIC
TSM984E	-40ºC to 85ºC	
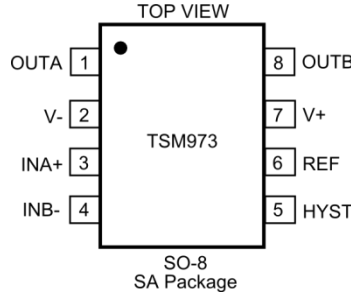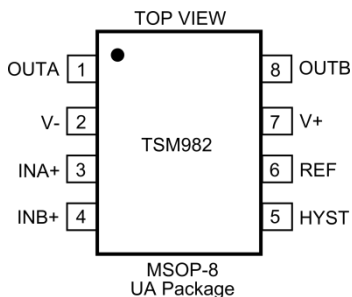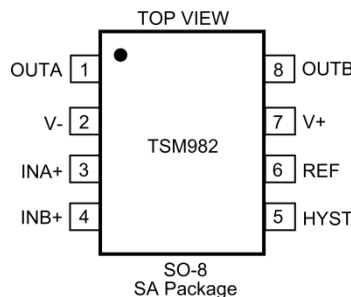
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PACKAGE/ORDERING INFORMATION

TSM971 — MSOP-8 UA Package (TOP VIEW)

```
GND  1        8  OUT
V-   2  TSM971 7  V+
IN+  3        6  REF
IN-  4        5  HYST
```
MSOP-8
UA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM971CUA+	TAAZ	Tube	50
TSM971CUA+T		Tape & Reel	2500

TSM971 — SO-8 SA Package (TOP VIEW)

```
GND  1        8  OUT
V-   2  TSM971 7  V+
IN+  3        6  REF
IN-  4        5  HYST
```
SO-8
SA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM971CSA+	TS971	Tube	97
TSM971CSA+T		Tape & Reel	2500
TSM971ESA+	TS971E	Tube	97
TSM971ESA+T		Tape & Reel	2500

TSM972 — MSOP-8 UA Package (TOP VIEW)

```
OUTA 1        8  OUTB
V-   2  TSM972 7  V+
INA+ 3        6  INB+
INA- 4        5  INB-
```
MSOP-8
UA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM972CUA+	TABJ	Tube	50
TSM972CUA+T		Tape & Reel	2500

TSM972 — SO-8 SA Package (TOP VIEW)

```
OUTA 1        8  OUTB
V-   2  TSM972 7  V+
INA+ 3        6  INB+
INA- 4        5  INB-
```
SO-8
SA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM972CSA+	TS972	Tube	97
TSM972CSA+T		Tape & Reel	2500
TSM972ESA+	TS972E	Tube	97
TSM972ESA+T		Tape & Reel	2500

TSM971_73_82_84PB r1p0
RTFDS

TOUCHSTONE SEMICONDUCTOR

PACKAGE/ORDERING INFORMATION

TOP VIEW

```
OUTA  1          8  OUTB
V-    2  TSM973  7  V+
INA+  3          6  REF
INB-  4          5  HYST
```

MSOP-8
UA Package

TOP VIEW

```
OUTA  1          8  OUTB
V-    2  TSM973  7  V+
INA+  3          6  REF
INB-  4          5  HYST
```

SO-8
SA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM973CUA+	TABE	Tube	50
TSM973CUA+T		Tape & Reel	2500

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM973CSA+	TS973	Tube	97
TSM973CSA+T		Tape & Reel	2500
TSM973ESA+	TS973E	Tube	97
TSM973ESA+T		Tape & Reel	2500

TOP VIEW

```
OUTA  1          8  OUTB
V-    2  TSM982  7  V+
INA+  3          6  REF
INB+  4          5  HYST
```

MSOP-8
UA Package

TOP VIEW

```
OUTA  1          8  OUTB
V-    2  TSM982  7  V+
INA+  3          6  REF
INB+  4          5  HYST
```

SO-8
SA Package

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM982CUA+	TABK	Tube	50
TSM982CUA+T		Tape & Reel	2500

ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM982CSA+	TS982	Tube	97
TSM982CSA+T		Tape & Reel	2500
TSM982ESA+	TS982E	Tube	97
TSM982ESA+T		Tape & Reel	2500

PACKAGE/ORDERING INFORMATION

```
                        TOP VIEW

        OUTB  1  ●          16  OUTC
        OUTA  2              15  OUTD
          V+  3              14  GND
         INA- 4    TSM984    13  IND+
         INA+ 5              12  IND-
         INB- 6              11  INC+
         INB+ 7              10  INC-
          REF 8               9  V-

                        SO-16
                      SE Package
```
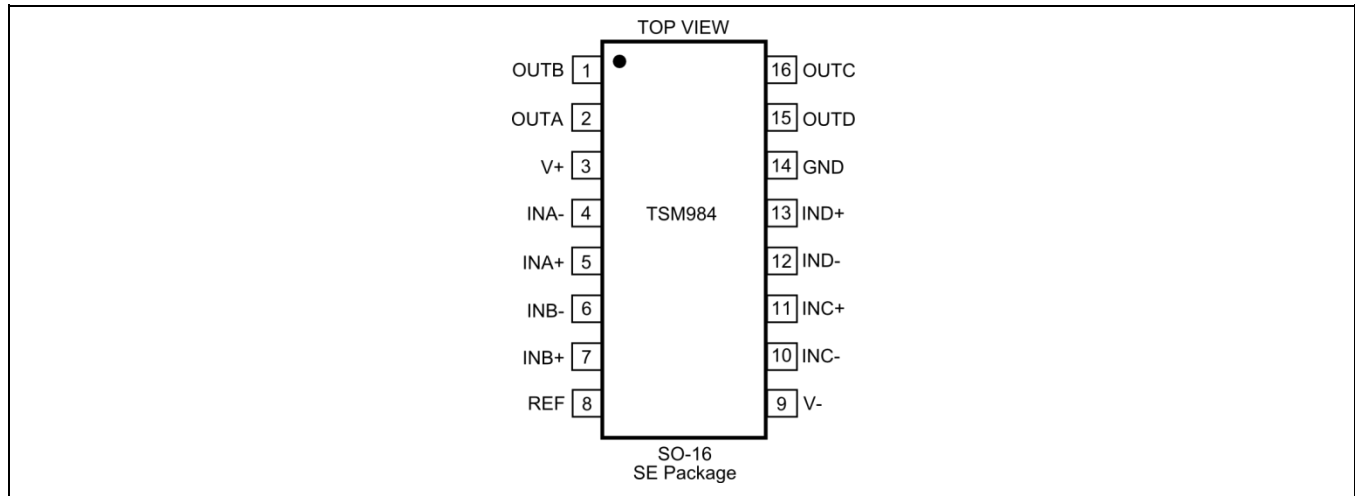
ORDER NUMBER	PART MARKING	CARRIER	QUANTITY	ORDER NUMBER	PART MARKING	CARRIER	QUANTITY
TSM984CSE+	TS984	Tube	48	TSM984ESE+	TS984E	Tube	48
TSM984CSE+T		Tape & Reel	2500	TSM984ESE+T		Tape & Reel	2500

Lead-free Program: Touchstone Semiconductor supplies only lead-free packaging.

Consult Touchstone Semiconductor for products specified with wider operating temperature ranges.