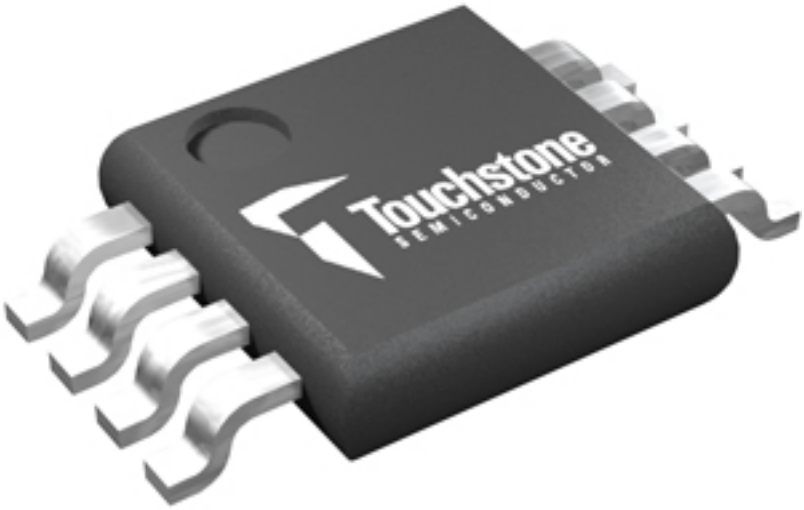
# Comparators Ideal for 3V or 5V Single-Supply Applications




Touchstone Semiconductor [1] announced the TSM921-TSM924, TSM931-TSM934, TSM971-TSM973 and the TSM982/TSM984 series of low voltage, low-power analog comparators [2]. Eleven of the 13 analog comparators feature an integrated 1.182V voltage reference with either ±1% (TSM92x/TSM97x) or ±2% (TSM93x/TSM98x) initial accuracy. Also, all 13 analog comparators are offered in both commercial and industrial temperature ranges.

Touchstone's alternate-source parts are drop-in replacements that can be used instead of the original manufacturer's ICs. No other changes to an existing design are required. All Touchstone semiconductor integrated circuits (ICs) are in stock at and ready to ship from Digi-Key [3], Touchstone's authorized distributor.

Ideal for 3V or 5V single-supply applications, these comparators can operate from a single +2.5V to +11V supply or a ±1.25V to ±5V dual supply. Other common features include: a) an input voltage range from the negative supply rail to within 1.3V of the positive supply and b) 4-µs propagation delay. Single and dual comparators in these series also offer the board-level design engineer the ability to use two resistors to add hysteresis without feedback and without having to navigate complicated equations.

The 13 new Touchstone analog comparators include:

·TSM921–TSM924 [4] analog comparators are part-for-part drop-in replacements for the MAX921-MAX924 comparators. The TSM921 single comparator with an internal 1.182V ±1% reference and the dual-comparator-only TSM922 draw 2.5µA supply current. Including an internal 1.182V ±1% voltage reference, the TSM923 draws 3.1µA supply current and the quad TSM924 draws 5.5µA. All analog comparators in this series feature push-pull TTL/CMOS-compatible output stages that sink and source current. The TSM921 and TSM923 feature user-programmable hysteresis via a separate pin.

·TSM931–TSM934 [5] analog comparators are part-for-part drop-in replacements for the MAX931-MAX934 comparators. Including an internal 1.182V ±2% voltage reference, the TSM931 single comparator draws 2.5µA, the TSM932 and the TSM933 both draw 3.1µA supply current and the quad TSM934 draws 5.5µA. All analog comparators in this series feature push-pull TTL/CMOS-compatible output stages that sink and source current. The TSM931, the TSM932 and the TSM933 all feature user-programmable hysteresis via a separate pin.

·TSM971, TSM972, and TSM973 [6] analog comparators are drop-in replacements for the MAX971, the MAX972 and the MAX973 comparators, respectively. In addition, the TSM971, the TSM972 and the TSM973 are open-drain output-stage versions of the TSM921, the TSM922 and the TSM923, respectively. The TSM971 single comparator with an internal 1.182V ±1% reference and the dual-comparator-only TSM972 draw 2.5µA supply current. The dual TSM973 analog comparator draws 3.1µA supply current, including its internal 1.182V ±1% voltage reference. The TSM971 and TSM973 feature user-programmable hysteresis via a separate pin.

· The dual TSM982 [6] and quad TSM984 [6] analog comparators are drop-in replacements for the MAX982 and the MAX984 comparators, respectively. The TSM982 and TSM984 are open-drain-output stage versions of the TSM932 and the TSM934, respectively. Including an internal 1.182V ±2% voltage reference, the TSM982 draws 3.1µA supply current and the TSM984 draws 5.5µA. The TSM982 offers user-programmable hysteresis via a separate pin. The TSM984 features a separate output GND pin, making it an ideal choice for level translator circuits or in mixed-voltage system designs.

All these new comparators are ideally designed for low-voltage, power-sensitive applications, including threshold detectors/discriminator, oscillator circuits, window comparators, level translators and other battery-powered systems.

All single and dual comparators are available in either MSOP-8 or SOIC-8 packaging while the quad comparators are available in 150-mil wide SOIC-16 packaging. Analog comparators available in the ‘C’ temperature-grade are fully-specified over the 0ºC to +70ºC temperature range. Analog comparators available in the ‘E’ temperature grade are fully specified over the -40ºC to +85ºC temperature range. In 1,000-piece quantities, pricing for dual-only comparators and single comparators with references start at $0.45; pricing for dual comparators with voltage references start at $0.75; and pricing for quad comparators with references start at $1.15.

For more information on these products or to download product briefs and data

sheets, visit: http://www.touchstonesemi.com/products/comparators [2].

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