Absolute Maximum Ratings

Supply Voltage ($V_{V+} – V_{V–}$) ..... 36V or ±18V
Differential Input Voltage ($V_{IN+} – V_{IN–}$). ..... ±36V
Input Voltage ..... –0.3V to +36V
Input Current (V_{IN} <–0.3V) 50mA
Output Short-Circuit to GND, **Note 1** ..... ∞
Storage Temperature (T_s) ..... –65°C to +150°C
Lead Temperature (soldering, 10sec.) ..... 260°C

Operating Ratings(2)

Supply Voltage ..... 2V to +36V
Ambient Temperature (T_A) ..... –40°C to +85°C
Thermal Resistance
SOT-23-5 (θ_{JA}) ..... 220°C/W
(mounted to printed circuit board)

Electrical Characteristics

V+ = 5V; T_A = 25°C, **bold** values indicate –40°C≤ T_A ≤ +85°C, T_A = T_J; unless noted.

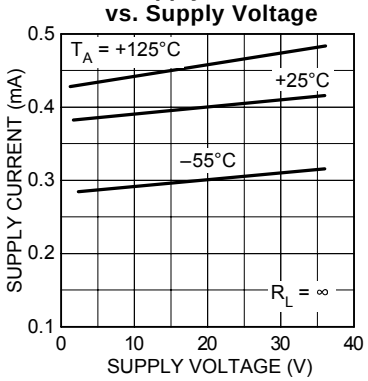
Symbol	Parameter	Condition	Min	Typ	Max	Units
V_{OS}	Input Offset Voltage	**Note 2**		2	5 **9**	mV mV
I_B	Input Bias Current	$I_{IN(+)}$ or $I_{IN(–)}$ with output in linear range, V_{CM} = 0V, **Note 3**		25	250 **400**	nA nA
I_{OS}	Input Offset Current	$I_{IN(+} – I_{IN(–)}$, VCM = 0V		5	50 **150**	nA nA
V_{CM}	Input Voltage Range	V+ = 30V, **Note 4**	0		V+ – 1.5 **V+ – 2**	V V
I_S	Supply Current	R_L = ∞ R_L = ∞, V+ = 36V		0.3 0.4	0.9 1.2	mA mA
	Voltage Gain	R_L ≥ 15kΩ, V+ = 15V V_O = 1V to 11V	50	200		V/mV
	Large Signal Response Time	V_{IN} = TTL logic swing, V_{REF} = 1.4V V_{RL} = 5V, R_L = 5.1kΩ		300		ns
	Response Time	V_{RL} = 5V, R_L = 5.1kΩ, **Note 5**		0.6		µs
	Output Sink Current	$V_{IN(–)}$ = 1V, $V_{IN(+)}$ = 0, V_O ≤ 1.5V	10	20		mA
	Output Pull-Up Current			15	50	µA
	Saturation Voltage	$V_{IN(–)}$ = 1V, $V_{IN(+)}$ = 0, I_{SINK} ≤ 4mA		250	400 **700**	mV mV
	Differential Input Voltage	$V_{IN(+)}$, $V_{IN(–)}$ ≥ 0V (or V–, if used), **Note 6**			36	V

General Note: Devices are ESD protected; however, handling precautions are recommended.

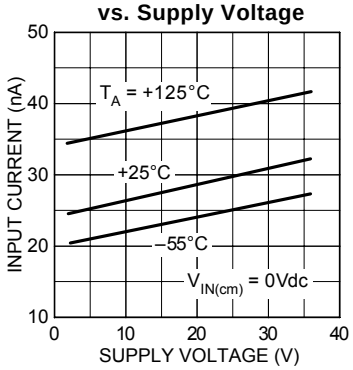
1. A short circuit from OUT to V+ can cause excessive heating and damage the device. The maximum short circuit output current (OUT to V–) is approximately 20mA, independent of V_{V+}.
2. Measured at the output switch point where $V_{OUT} \cong$ 1.4Vdc with R_S = 0Ω, V+ = 5Vdc to 30Vdc, and over the full input common-mode range (0Vdc to V+ – 1.5Vdc).
3. The direction of input current is out of the device due to its PNP input.
4. The input common-mode voltage, V_{IN+}, or $V_{IN–}$ must not go below –0.3V. The upper end of the common-mode voltage range is V+ – 1.5V at 25°C, but either or both inputs can go to +36Vdc without damage, independent of V_{V+}.
5. The response time measured using a 100mV input step with 5mV overdrive. With greater overdrive, 300ns can be obtained. See "Typical Characteristics."
6. Positive excursions of input voltage may exceed the power supply level. As long as the other voltage remains within the common-mode range, the comparator will provide a proper output state. The low input voltage state must not be below –0.3Vdc (or 0.3Vdc below $V_{V–}$).

Typical Characteristics

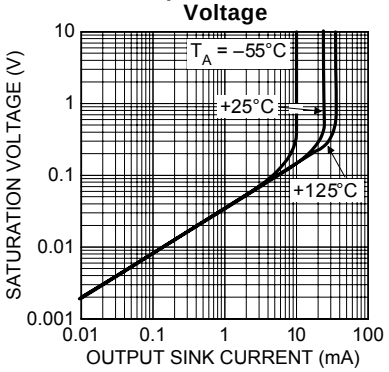
Supply Current vs. Supply Voltage



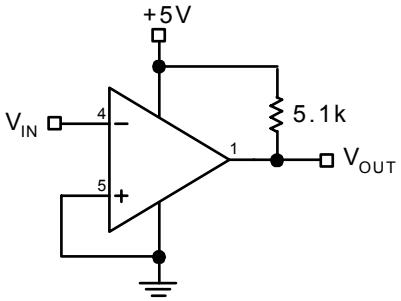
Input Current vs. Supply Voltage



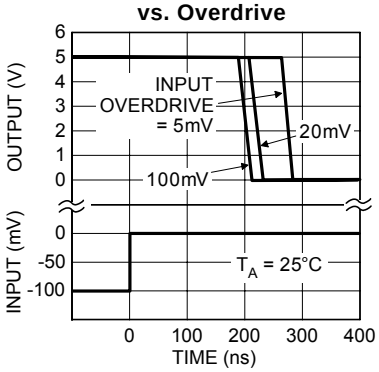
Output Saturation Voltage



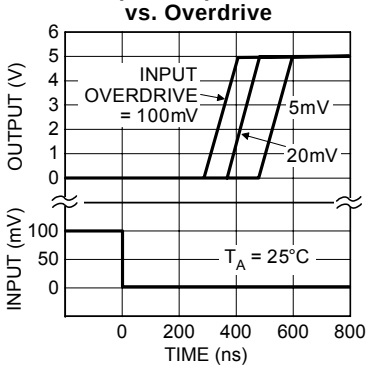
Output Response Time vs. Overdrive (Test Circuit)



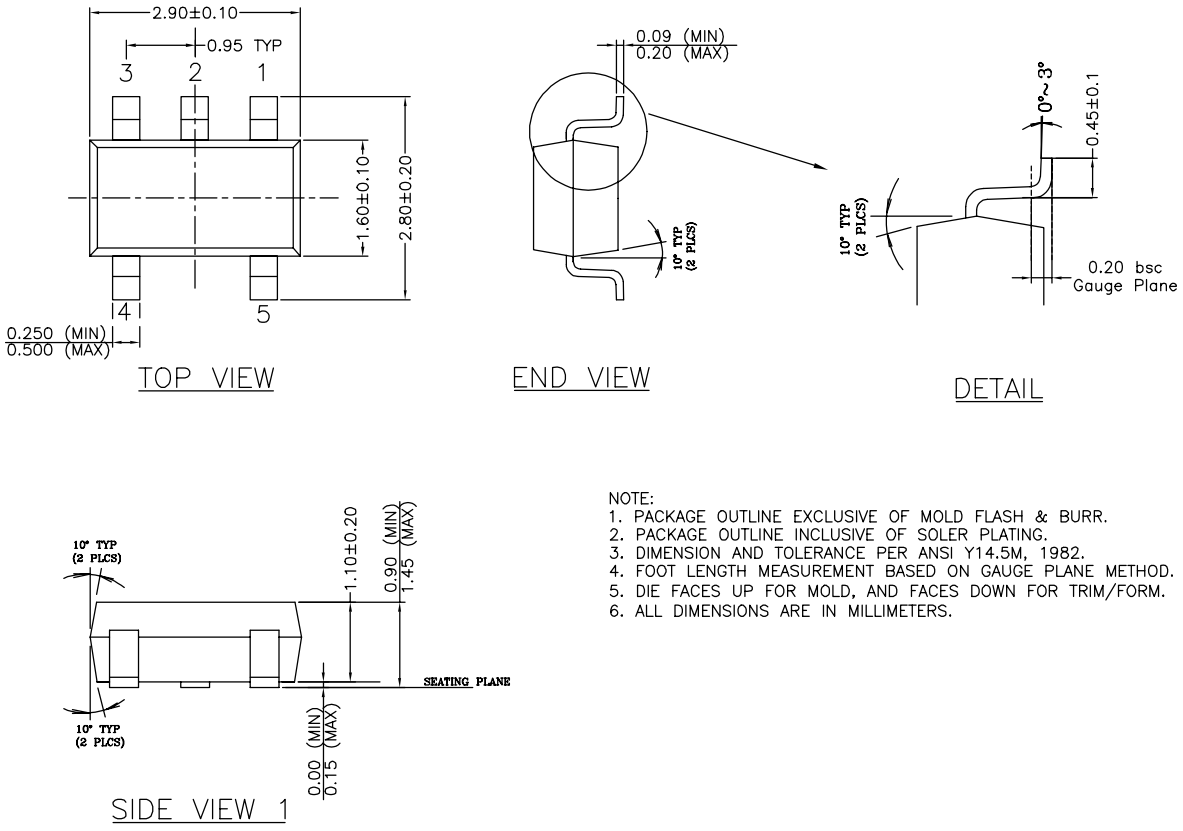
Output Response Time vs. Overdrive



Output Response Time vs. Overdrive



Package Information



NOTE:
1. PACKAGE OUTLINE EXCLUSIVE OF MOLD FLASH & BURR.
2. PACKAGE OUTLINE INCLUSIVE OF SOLER PLATING.
3. DIMENSION AND TOLERANCE PER ANSI Y14.5M, 1982.
4. FOOT LENGTH MEASUREMENT BASED ON GAUGE PLANE METHOD.
5. DIE FACES UP FOR MOLD, AND FACES DOWN FOR TRIM/FORM.
6. ALL DIMENSIONS ARE IN MILLIMETERS.

5-Pin SOT-23 (M5)

MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA
TEL +1 (408) 944-0800 FAX +1 (408) 474-1000 WEB http:/www.micrel.com