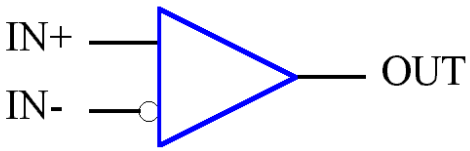
GENERAL DESCRIPTION

This device consists of four independent precision voltage comparators with an offset voltage specification as low as 2mV max for CM339. All these comparators were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible. These Comparators also have a unique characteristic in that the input common mode voltage range includes ground even though operated from a single power supply voltage.

FEATURES

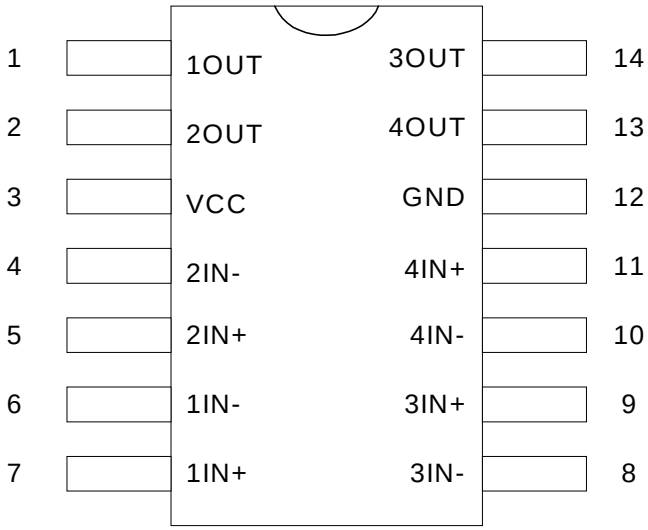
- Wide single supply voltage range or dual supplies for all devices: +2V to +36V or ± 1V to ± 18V
- Very low supply current（1.1mA）independent of supply voltage（1.4mW/comparator +5V）
- Low input bias current: 25nA typ
- Low input offset current: ±5nA typ
- Low input offset voltage: ±1mV typ
- Input common-mode voltage range includes ground
- Low output saturation voltage : 250mV typ,（Io = 4mA）
- Differential input voltage range equal to the supply voltage
- TTL, DTL, ECL, MOS, CMOS compatible output

SYMBOL

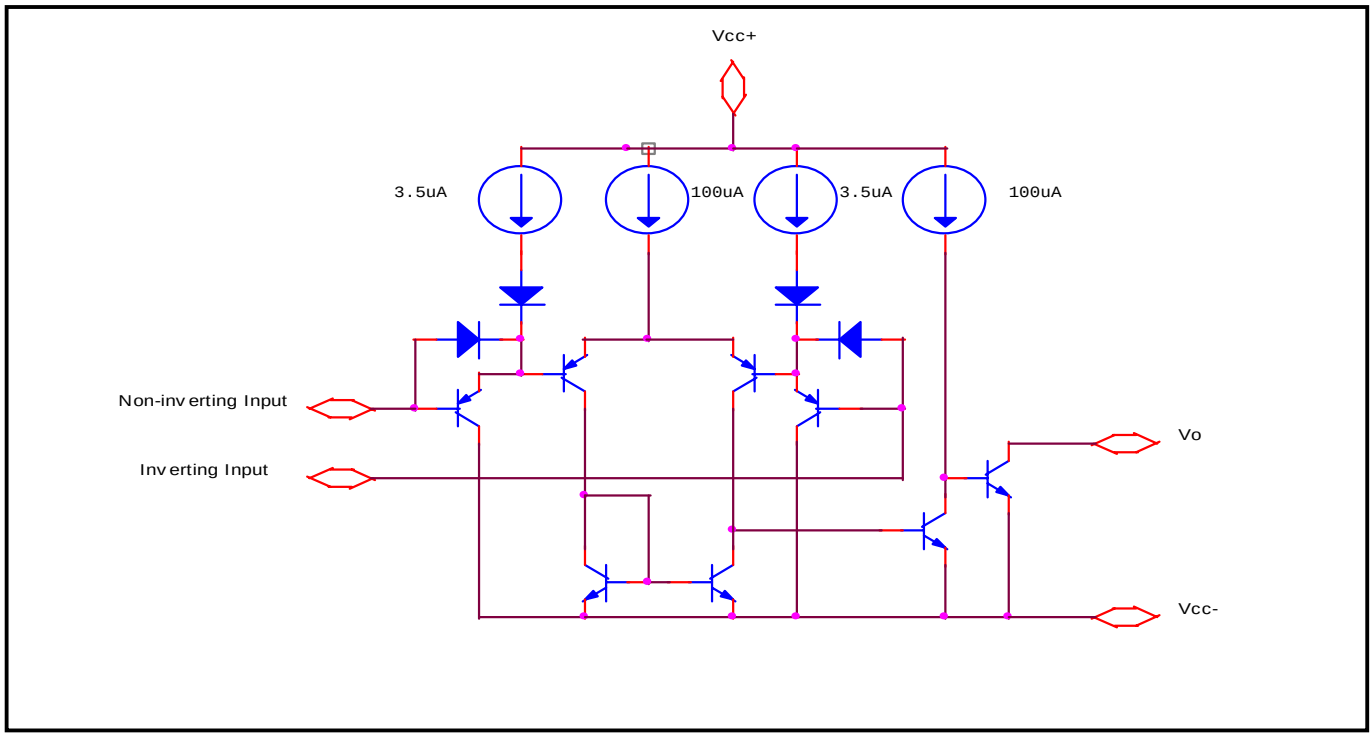


PIN CONFIGURATION

14 Pin PDIP/SOP
(Top View)



BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Temperature Range	Package
CM339CP	0℃ to 70℃	14-Pin PDIP(P14)
CM339CS	0℃ to 70℃	14-Pin SOP(S14)

ABSOULTE MAXIMUM RATINGS

Symbol	Parameter	CM339	Unit
Vcc	Supply voltage	±18 to 36	V
V_{id}	Differential input voltage	±36	V
V_I	Input voltage	-0.3 to + 36	V
P_{tot}	Power dissipation	570	mW
T_{oper}	Operating free-air temperature range	0, +70	℃
T_{stg}	Storage temperature range	-65, +150	℃

ELECTRICAL CHARACTERISTICS

Vcc^+ = +5V, Vcc^+ = GND, T_{amb}=25℃ (Unless otherwise specified)

Symbol	Parameter	CM339			Units
		Min.	Typ.	Max.	
Vio	Input offset voltage- (note 1) T_{amb} = +25℃ $T_{min} \le T_{amb} \le T_{max}$		1.0	2.2	MV
I_{io}	Input offset current T_{amb} = +25℃ $T_{min} \le T_{amb} \le T_{max}$		5.0	50	nA
I_{io}	Input bias current T_{amb} = +25℃ $T_{min} \le T_{amb} \le T_{max}$		25	250	nA
A_{vd}	Large signal voltage gain (Vcc = 15, R_L = 15kΩ, Vo = 1 to 11V)	50	200		V/mV
Icc	Supply current (all comparators) Vcc = +5V, no load Vcc = +30V, no load		0.8	2.0	mA
V_{icm}	Input common mode voltage range- (note 2) (Vcc = 30V) T_{amb} = +25℃ $T_{min} \le T_{amb} \le T_{max}$	0		Vcc^+ - 1.5	V
V_{id}	Differential input voltage - (note 4)			36	V
I_{sink}	Output sink current (V_{id} = -1V, Vo = 1.5V)	6.0	16		mA
t_{re}	Response Time - (note 3) (R_L = 5.1kΩ connected to Vcc^+)		1.3		μs
t_{rel}	Large signal response time (R_L = 5.1kΩ connected to Vcc^+, ei = TTL, $V_{(ref)}$) = +1.4V)		300		ns

Notes : 1.At output switch point, Vo = 1.4V, Rs = 0 with Vcc^+ from 5V to 30V, and over the full input common-mode range (0V to Vcc^+ -1.5V).

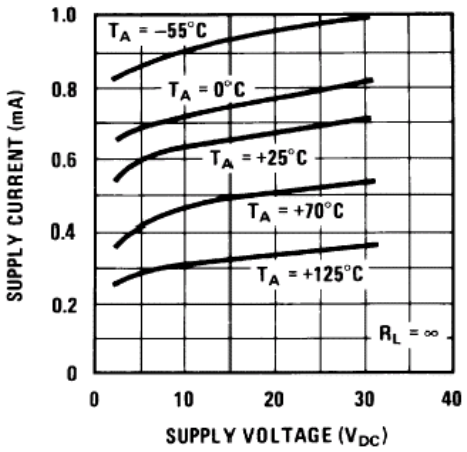
2.The input common-mode voltage of the either input signal voltage should not be allowed to go negative by more than 0.3V. The upper and of the common-mode voltage range is Vcc^+ -1.5V, but either or both inputs can go to +30V without damage.

3.The response time specified is for a 100mV input step with 5mV overdrive. For larger overdrive signals 300ns can be obtained.

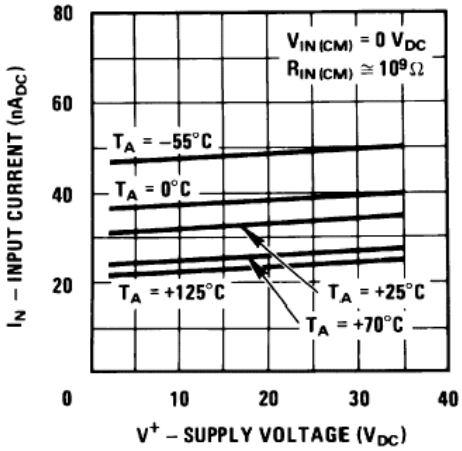
4.Positive excursions of input voltage may power supply level. As long as the other voltage remains within the common-mode range, the comparator will provide a proper output state. The low input voltage state must not be less than –0.3V (or 0.3V bellow the negative power supply, if used).

TYPICAL CHARACTERISTICS

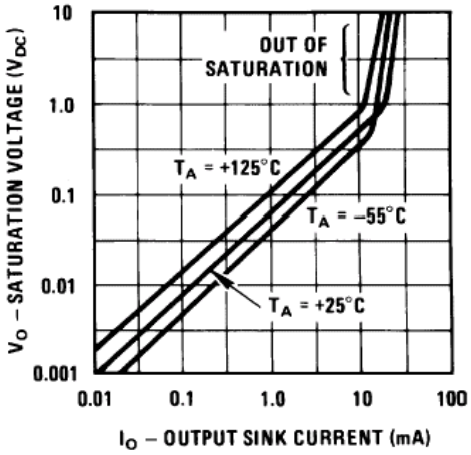
Supply Current



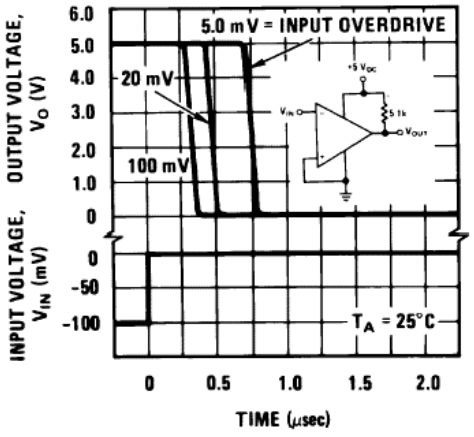
Input Current



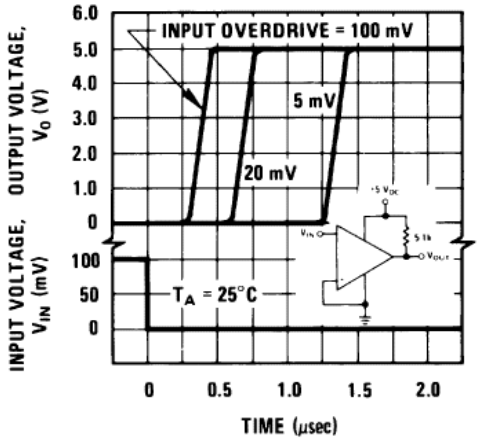
Output Saturation Voltage



Response Time for Various Input Overdrives – Negative Transistors

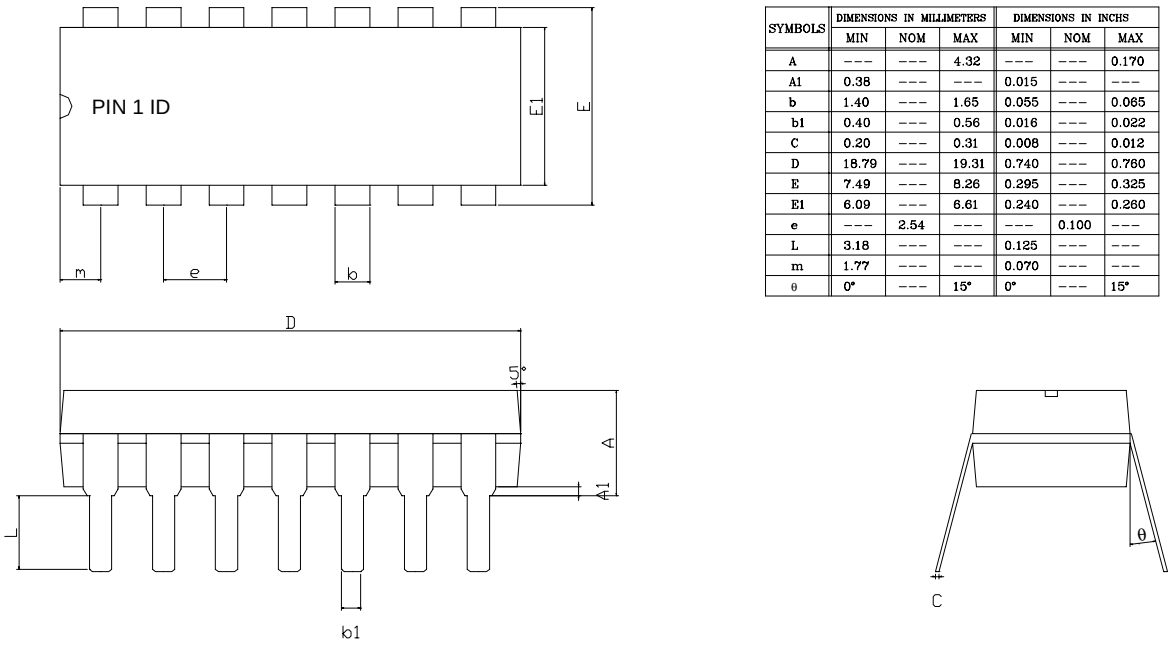


Response Time for Various Input Overdrives – Positive Transistors



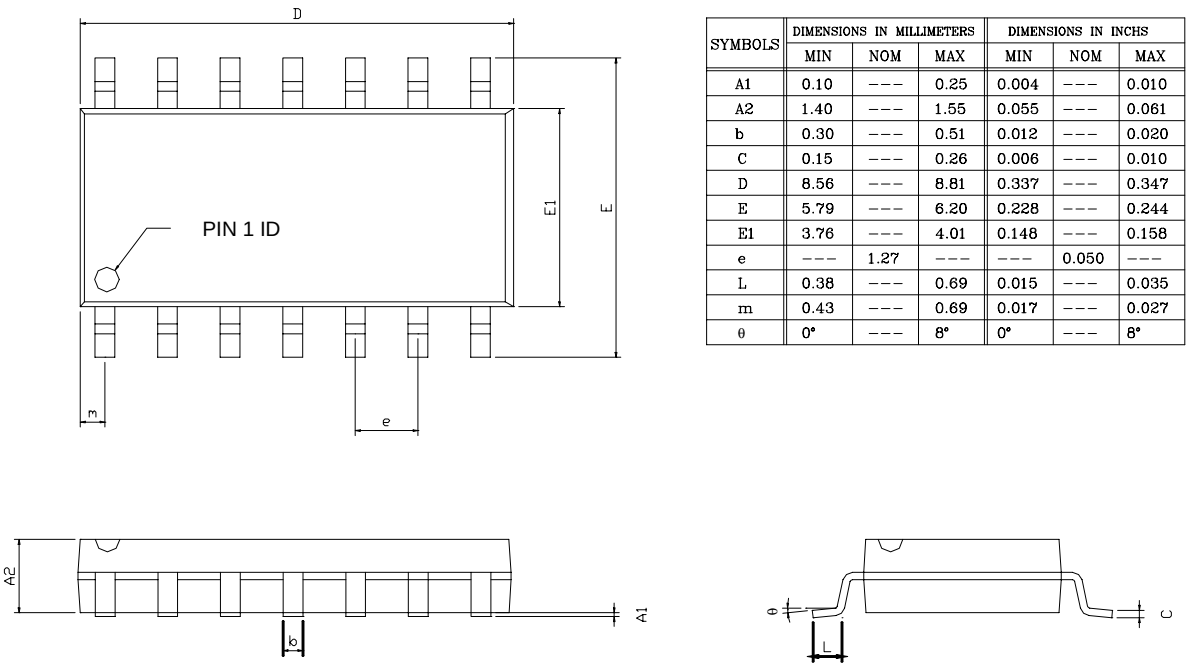
PACKAGE DIMENSION

14-PIN PDIP (P14)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	4.32	---	---	0.170
A1	0.38	---	---	0.015	---	---
b	1.40	---	1.65	0.055	---	0.065
b1	0.40	---	0.56	0.016	---	0.022
C	0.20	---	0.31	0.008	---	0.012
D	18.79	---	19.31	0.740	---	0.760
E	7.49	---	8.26	0.295	---	0.325
E1	6.09	---	6.61	0.240	---	0.260
e	---	2.54	---	---	0.100	---
L	3.18	---	---	0.125	---	---
m	1.77	---	---	0.070	---	---
θ	0°	---	15°	0°	---	15°

14-PIN SOP (S14)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	0.10	---	0.25	0.004	---	0.010
A2	1.40	---	1.55	0.055	---	0.061
b	0.30	---	0.51	0.012	---	0.020
C	0.15	---	0.26	0.006	---	0.010
D	8.56	---	8.81	0.337	---	0.347
E	5.79	---	6.20	0.228	---	0.244
E1	3.76	---	4.01	0.148	---	0.158
e	---	1.27	---	---	0.050	---
L	0.38	---	0.69	0.015	---	0.035
m	0.43	---	0.69	0.017	---	0.027
θ	0°	---	8°	0°	---	8°

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