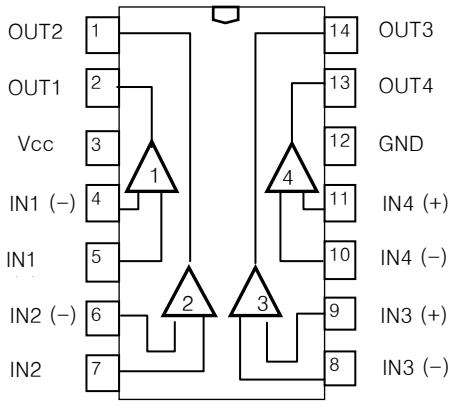
FEATURES

- Wide single supply voltage range 2.0V_{DC} TO 36V_{DC} or dural supplies ±1.0V_{DC} to ±18V_{DC}
- Very low supply current drain (0.8㎃) independent of supply voltage (1.0㎽/comparator at 5.0V_{DC})
- Low input biasing current 25㎁
- Low input offset current ±5㎁ and offset voltage
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- Low output 250㎷ at 4㎃ saturation voltage
- Output voltage compatible with TTL, DTL, ECL, MOS and CMOS logic system

SOP14/ DIP14 PKG



APPLICATION

- A/D Converters
- Wide range VOC
- MOS clock generator
- Hihg voltage logic gate
- Multivibrators

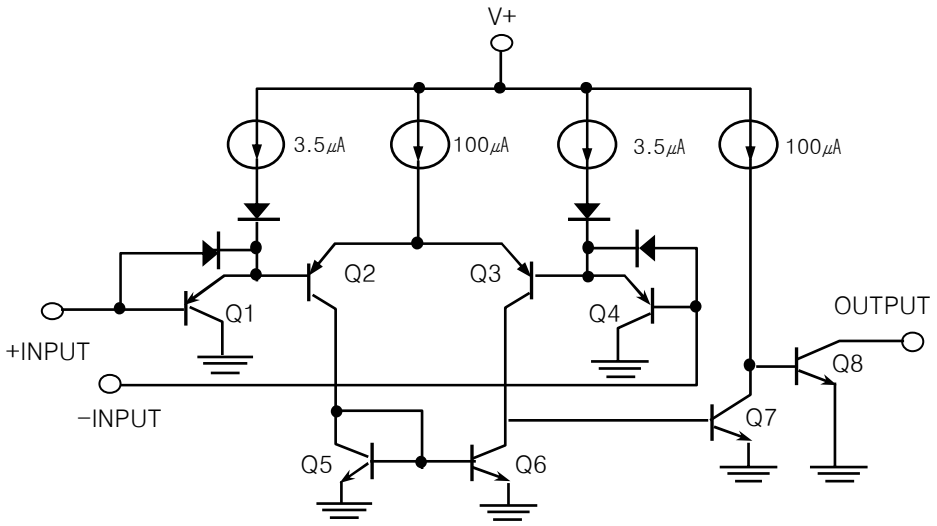
ORDERING INFORMATION

Device	Package
LM339D	SOP 14
LM339N	DIP 14

DESCRIPTION

The LM339 consists of four independent precision voltage comparators, with an offset voltage specification as low as 20㎷ max for each comparator, which were designed specifically to operate from a single power supply over a wide range of voltages.
Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.
These comparators also have a unique characteristic in that the input common-mode voltage range includes ground, even though they are operated from a single power supply voltage.
The LM339 series was designed to directly interface with TTL and CMOS.
When operated from both plus and minus power supplies, the LM339 series will directly interface with MOS logic where their low power drain is a distinct advantage over standard comparators.

EQUIPMENT CIRCUIT



(one comparator only)

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	±18 or 36	V
Differential Input Voltage	$V_{I(DIFF)}$	36	V
Input Voltage	V_I	−0.3 to +36	V
Output Short Circuit to GND		Continuous	
Power Dissipation	P_D	570	mW
Operating Temperature	T_{OPR}	0~+70	℃
Storage Temperature	T_{STG}	−65 to +150	℃

Electrical characterisitics at specified free-air temperature, V_{CC}=5V(unless otherwise noted)

PARAMETER	TEST CONDITION*			LM339			UNIT
				MIN	TYP	MAX	
V_{IO} Input Offset Voltage	V_{CC}=5V to 30V, V_{IC}=V_{ICR}MIN, V_O=1.4V		25℃		2	5	mV
			Full Range			9	
I_{IO} Input Offset Current	V_O=1.4V		25℃		5	50	nA
			Full Range			150	
I_{IB} Input Bias Current	V_O=1.4V		25℃		−25	−250	nA
			Full Range			−400	
V_{ICR} Common-Mode Input Voltage Range**			25℃	0toV_{CC}−1.5			V
			Full Range	0toV_{CC}−2			
A_{VD} Large-Signal Differential Voltage Amplification	V_{CC}=15V, V_O=1.4V to 11.4V, R_L≥15kΩ to V_{CC}		25℃	50	200		V/mV
I_{OH} High-Level Output Current	V_{OH}=5V, V_{ID}=1V		25℃		0.1	50	nA
	V_{OH}=30V, V_{ID}=1V		Full Range			1	μA
V_{OL} Low-Level Output Voltage	I_{OL}=4mA, V_{ID}=−1V		25℃		150	400	mV
			Full Range			700	
I_{OL} Low-Level Output Current	V_{OL}=1.5V, V_{ID}=−1V		25℃	6			mA
I_{CC} Supply Current	RL=∞	V_{CC}=5V	25℃		0.8	2	mA
		V_{CC}=30V	Full Range			2.5	

* Full range (MIN to MAX), for LM339 is 0℃ to 70℃. All characteristics are measured with zero common-mode input voltage unless otherwise specified.

** The voltage at either input or common-mode should not be allowed to go negative by more than 0.3V. The upper end of the common-mode voltage range is V_{CC} −1.5V, but either or both inputs can go to 30V without damage.

Switching characteristics, V_{CC}=5V, T_A=25℃

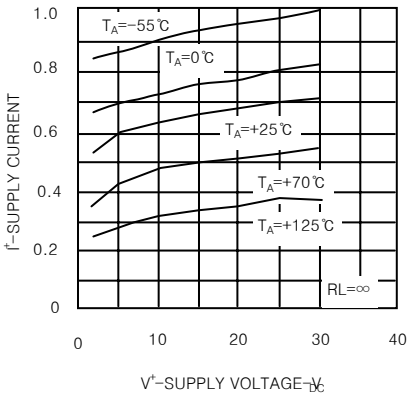
PARAMETER	TEST CONDITIONS		LM339			UNIT
			MIN	TYP	MAX	
Response Time	RL Connected to 5V Through 5.1kΩ, C_L=15pF*(See Note 1)	100-mV Input Step with 5-mV Overdrive		1.3		μs
		TTL-Level Input Step		0.3		

* C_L includes probe and jig capacitance.

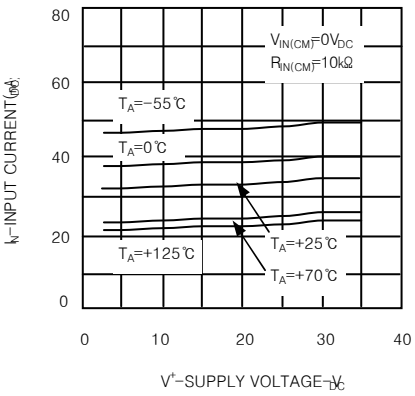
Note 1 : The response time specified is the interval between the input step function and the instant when the output crosses 1.4V.

TYPICAL PERFORMANCE CHARACTERISTICS

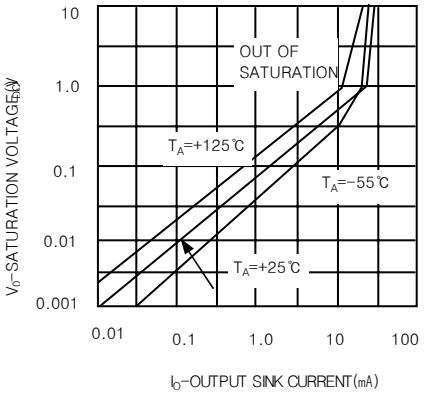
SUPPLY CURRENT



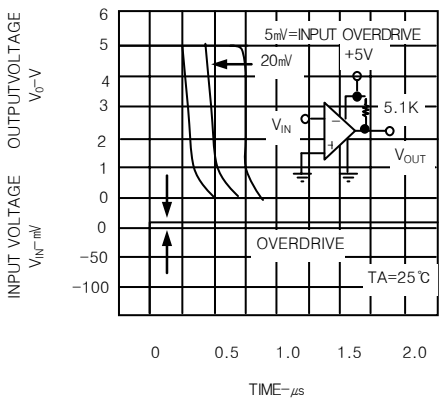
INPUT CURRENT



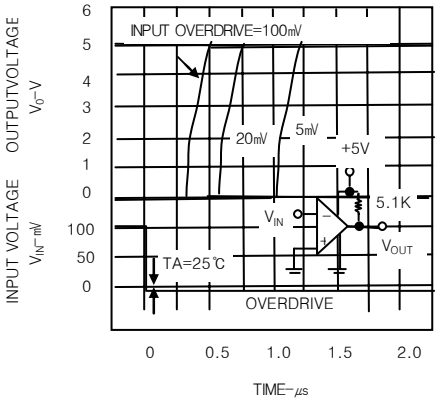
OUTPUT SATURATION VOLTAGE



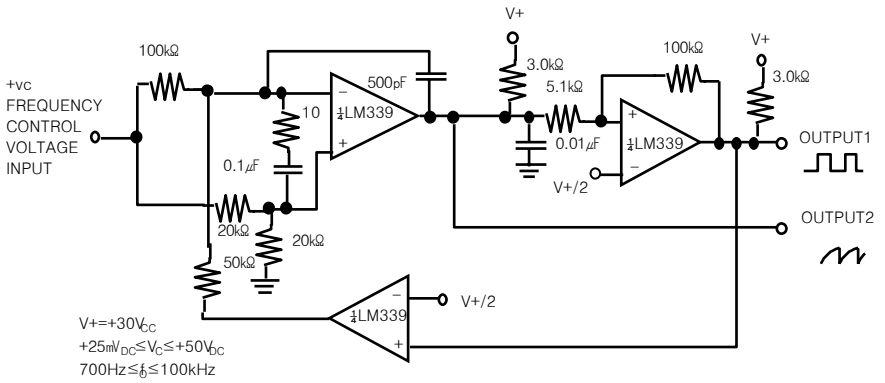
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES− NEGATIVE TRANSITION



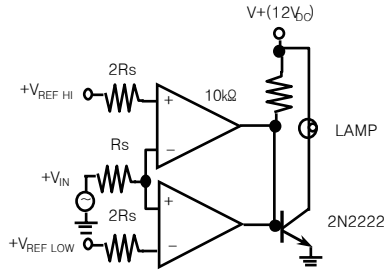
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES− POSITIVE TRANSITION



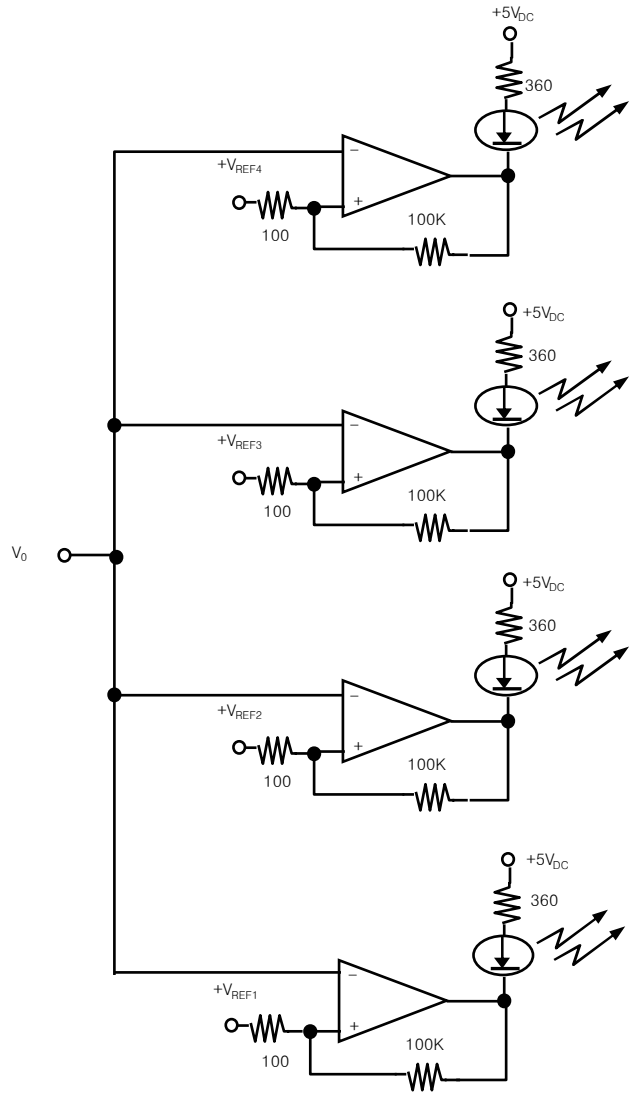
TYPICAL APPLICATIONS



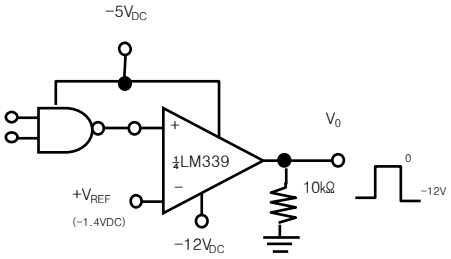
TWO-DECADE HIGH-FREQUENCY VCO



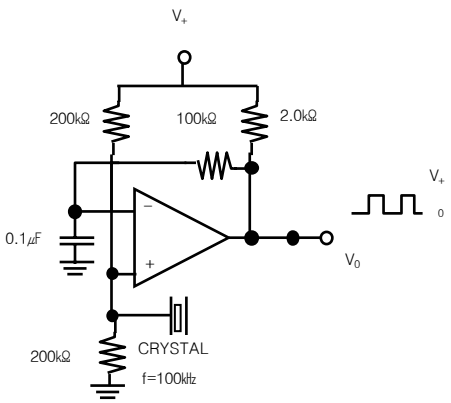
LIMIT COMPARATOR



VISIBLE VOLTAGE INDICATOR



TTL-to-MOS LOGIC CONVERTER



CRYSTAL-CONTROLLED OSCILLATOR