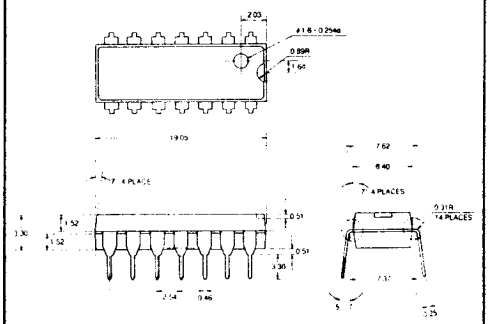
DBL 339

QUAD VOLTAGE COMPARATOR

Specially designed to offer a versatility as high as possible

14DIP Unit: mm



☐ FEATURES

- ○ Low current drain : 0.8mA
- ○ Allows sensing near ground
- ○ Logic output compatible with TTL, DTL, ECL, MOS and CMOS
- ○ Low input biasing current
- ○ Low input offset current
- ○ Low output saturation voltage
- ○ Wide supply voltage range :
  - Single : 2V~36V
  - Dual : ±1V~18V

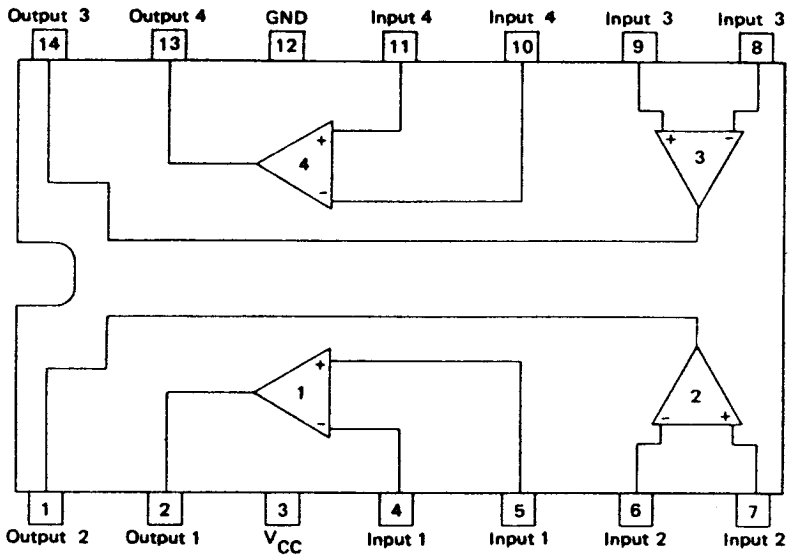
☐ APPLICATIONS

- ○ High precision comparators
- ○ Driving logic systems
- ○ Various multivibrators
- ○ Generators and Oscillators

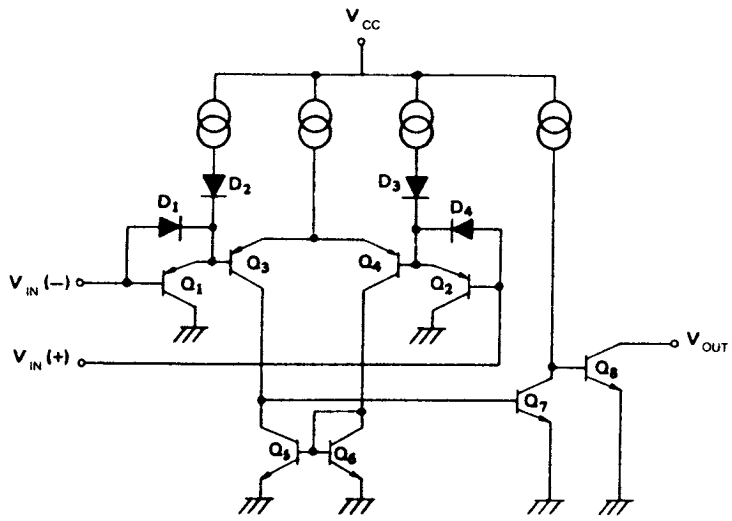
☐ MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit
Supply Voltage	V_{CC}	36 or ±18	V
Differential Input Voltage	V_{IND}	36	V
Input Voltage	V_{IN}	−0.3~36	V
Power Dissipation	P_D	570	mW
Operating Temperature	T_{opr}	0~+70	°C
Storage Temperature	T_{stg}	−55~+150	°C

☐ BLOCK DIAGRAM



☐ EQUIVALENT CIRCUIT (One section)



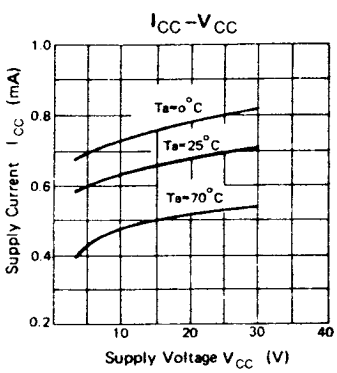
☐ ELECTRICAL CHARACTERISTICS

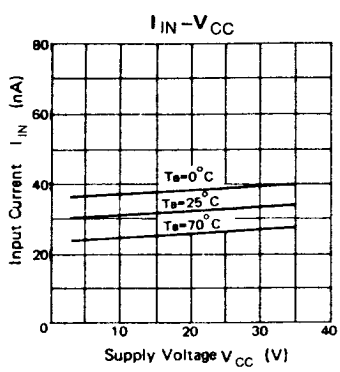
(Unless otherwise specified, V_{CC} = 5V and 0°C ≦ Ta ≦ 70°C)

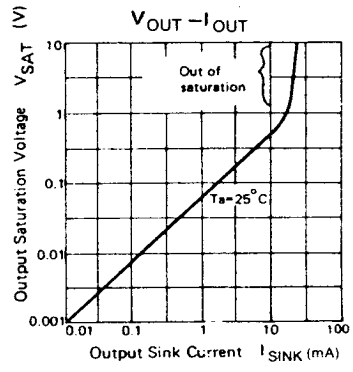
Characteristic	Symbol	Test Condition		Min.	Typ.	Max.	Unit
Input Offset Voltage	V_{IOS}	V_{OUT} = 1.4V, 5V ≦ V_{CC} ≦ 30V	Ta = 25°C	—	±2	±5	mV
		Rg = 0Ω, 0V ≦ V_{IC} ≦ V_{CC} − 1.5V		—	—	±9	mV
Input Offset Current	I_{IOS}	—	Ta = 25°C	—	±5	±50	nA
				—	—	±150	nA
Input Bias Current	I_{IB}	—	Ta = 25°C	—	25	250	nA
				—	—	400	nA
Input Common Mode Voltage Range	V_{ICR}	—	Ta = 25°C	0	—	V_{CC}-1.5	V
				0	—	V_{CC}-2	V
Supply Current	I_{CC}	R_L = ∞, Ta = 25°C		—	0.8	2	mA
Voltage Gain	G_V	R_L ≧ 15KΩ, V_{CC} = 15V, Ta = 25°C		—	200	—	V/mV
Response Time — Large Signal	t_R	V_{RL} = 5V, R_L = 5.1KΩ, Ta = 25°C	V_{IN} = TTL Logic swing, V_{REF} = 1.4V	—	300	—	nS
Response Time — Small Signal	t_R	V_{RL} = 5V, R_L = 5.1KΩ, Ta = 25°C	V_{IN} = 100mV step with 5mV overdriver	—	1.3	—	μS
Output sink Current	I_{SINK}	V_{IN}- ≧ 1V, V_{IN}+ = 0V; V_{OUT} ≦ 1.5V, Ta = 25°C		6	16	—	mA
Output Leakage Current	I_{LEAK}	V_{IN}+ > 1V, V_{IN}- = 0V	V_{OUT} = 5V, Ta = 25°C	—	0.1	—	nA
			V_{OUT} = 30V	—	—	1	μA
Saturation Voltage	V_{SAT}	V_{IN}- ≧ 1V, V_{IN}+ = 0V	Ta = 25°C	—	250	400	mV
		I_{SINK} ≦ 4mA		—	—	700	mV
Differential Input Voltage	V_{IND}	Keep all V_{IN}'S ≧ 0V		—	—	36	V

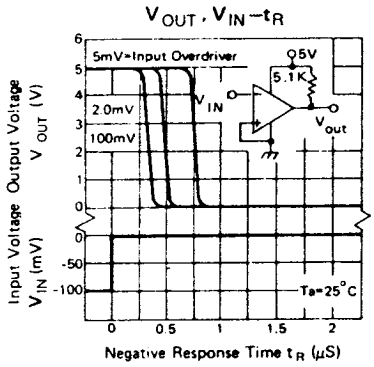
* V_{IC} : Input Common Mode Voltage

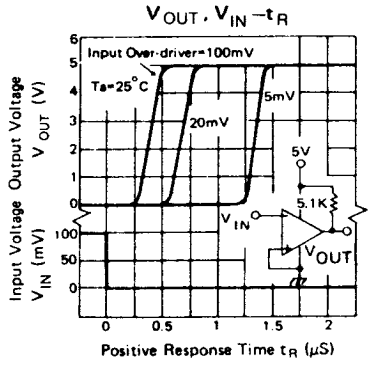
☐ TYPICAL PERFORMANCE CHARACTERISTICS











☐ APPLICATION INFORMATION

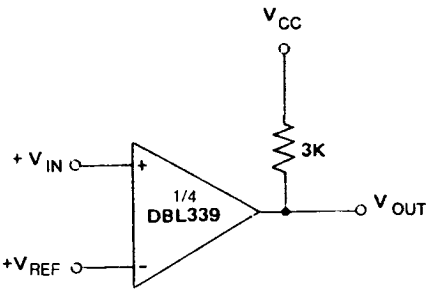
During the output voltage transition intervals as the comparator change states, the DBL339 can easily oscillate if the output lead is inadvertently allowed to capacitively couple to the inputs via stray capacitance. PC board layout is helpful it reduces stray input-output coupling. Reducing the input resistors to less than 10KΩ reduces the feedback signal levels and finally. Adding even a smll amount (1 to 10mV) of positive feedback(hysteresis)causes shch a rapid transition that oscillations due to stray feedback are not possible. It is good design practice to ground all pins of and unused comparator

The differential input voltage may be larger than V_{CC} without damaging the device. Because input voltage more negative than −0.3V(at 25°C)should not be used, an input clamp diode can be used as protection. The output of the DBL339 is the uncommitted collector of a grounded-emitter NPN output transistor. Many collectors can be tied together to provide wired-OR output function.

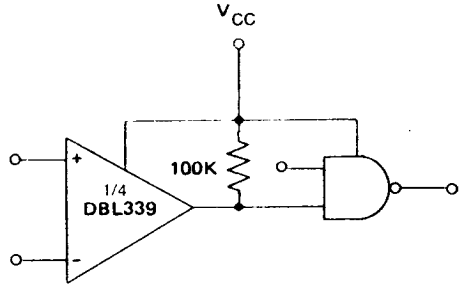
When the output sink current limit(approximately 16mA)is exceeded, the output transistor will come out of saturation and output voltage will rise very rapidly. Under this limit, the output saturation voltage is limited by the approximately 60Ω saturation resistance of the output transistor.

☐ APPLICATION CIRCUITS (V_{CC} =5V)

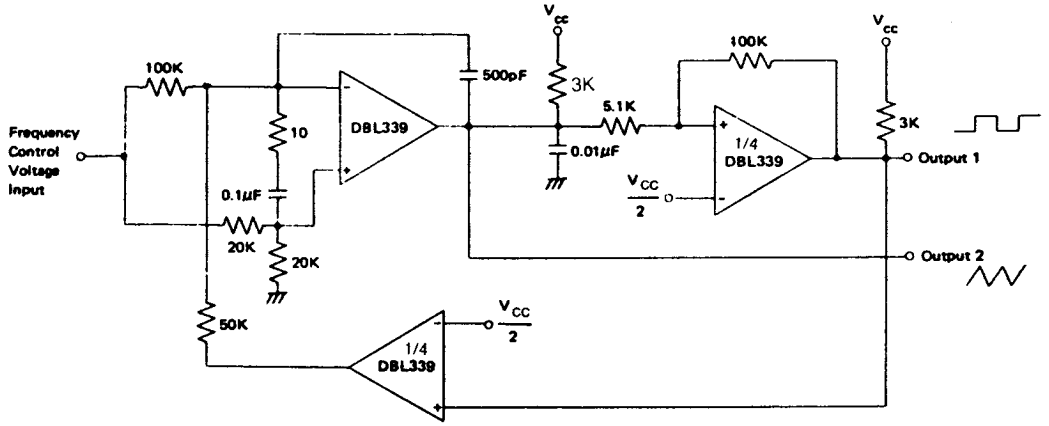
1. Basic Comparator



2. Driving CMOS

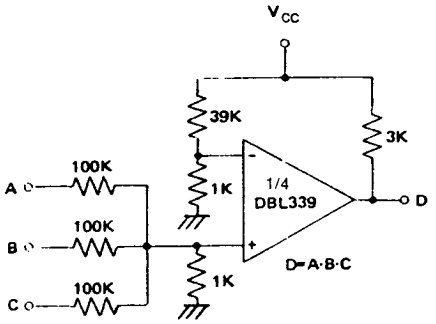


3. Two decade High frequency VCO

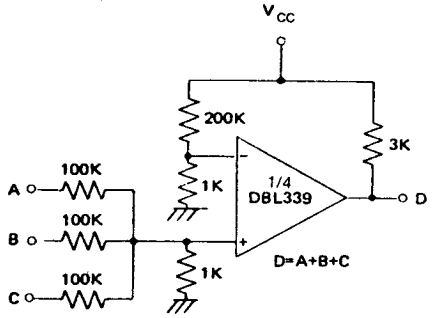


☐ APPLICATION CIRCUITS (V_{CC} =15V)

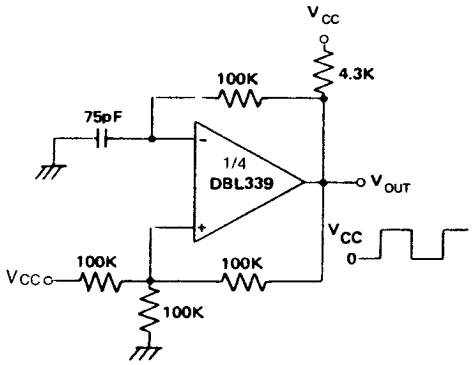
4. AND Gate



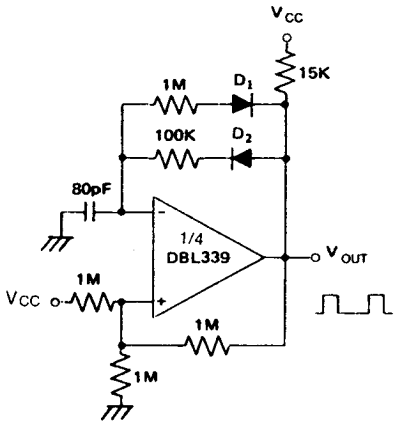
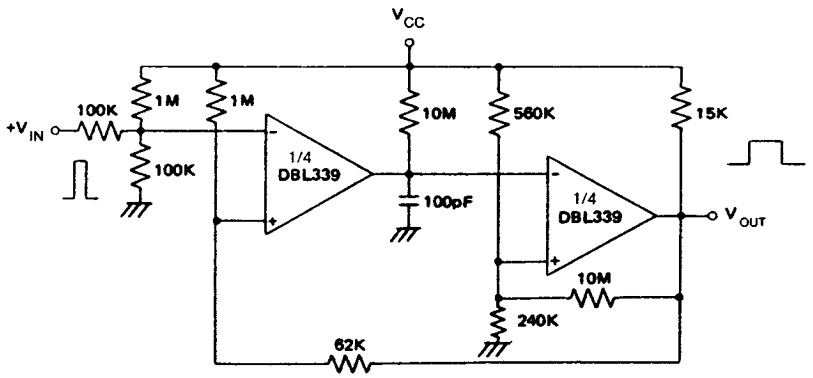
5. OR Gate



6. Squarewave Oscillator



7. Pulse Generator



8. One-Shot Multivibrator with Input Lock Out