

# IR2339/IR2339N Quad Comparator

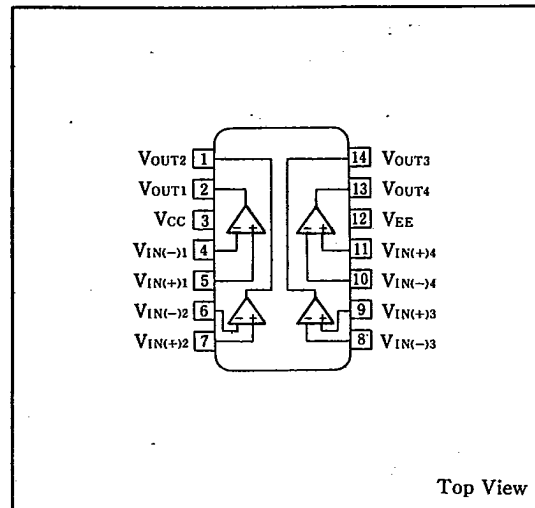
## ■ Description

The IR2339/IR2339N is a high performance quad comparator, which operates from a single power supply to a wide range of voltages. Its outputs are compatible with DTL, TTL and MOS logic circuits.

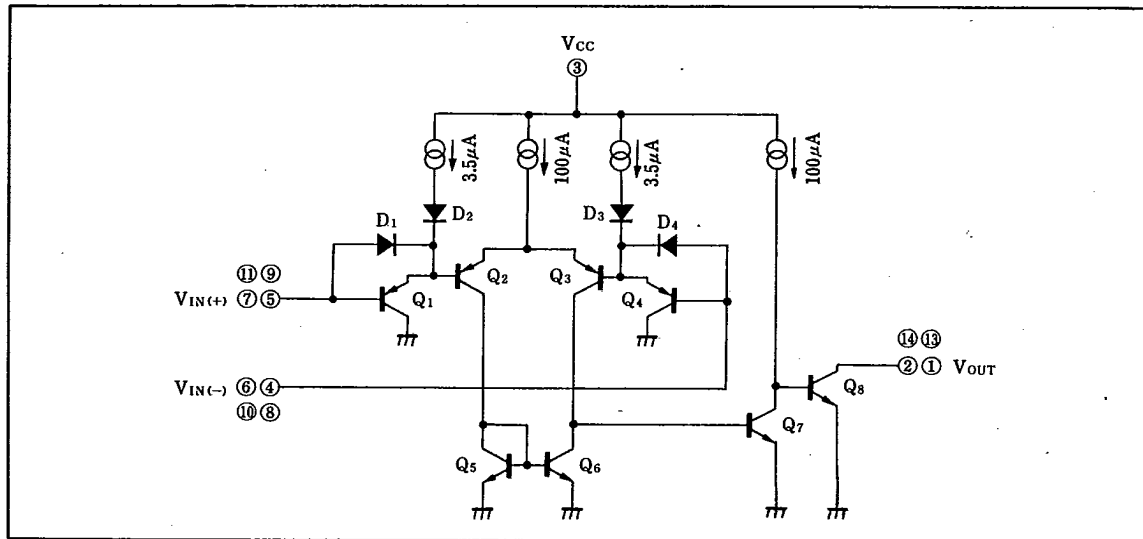
## ■ Features

1. Single or dual supply
2. Wide power range supply  
 2~36V :single supply  
 ±1~±18V :dual supply
3. Low supply current drain independent of supply voltage 0.8mA (TYP.)
4. Wide common-mode input voltage range  
 0~(V<sub>CC</sub>-1.5V): single supply
5. 14-pin dual-in-line package (IR2339)  
 14-pin small-outline package (IR2339N)

## ■ Pin Connections



## ■ Equivalent Circuit



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**Absolute Maximum Ratings**

Parameter	Symbol	Condition	Rating	Unit	
Supply voltage	$V_{CC}-V_{EE}$		36	V	
Differential input voltage	$V_{ID}$		36	V	
Input voltage	$V_{IN}$		-0.3~+36	V	
Power dissipation	$P_D$	$T_a \leq 25^\circ C$	IR2339	570	mW
			IR2339N	325	
$P_D$ derating ratio	$\Delta P_D / ^\circ C$	$T_a > 25^\circ C$	IR2339	5.7	mW/ $^\circ C$
			IR2339N	3.3	
Operating temperature	$T_{opr}$		-30~+85	$^\circ C$	
Storage temperature	$T_{stg}$		IR2339	-55~+125	$^\circ C$
			IR2339N	-55~+150	

**Electrical Characteristics**

( $V_{CC}=5V, T_a=25^\circ C$ )

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit	Note
Input offset voltage	$V_{IO}$	$V_{OUT}=1.4V, V_{REF}=1.4V, R_S=0\Omega$		2	5	mV	
Input offset current	$I_{IO}$	$V_{OUT}=1.4V$		5	50	nA	
Input bias current	$I_B$	$V_{OUT}=1.4V$		25	250	nA	1
In-phase input voltage	$V_{ICM}$		0		$V_{CC}-1.5$	V	
Major amplitude voltage gain	$A_V$	$R_L=15k\Omega$		106		dB	
Supply current	$I_{CC}$	$R_L=\infty$		0.8	2	mA	
Response time		$R_L=5.1k\Omega, V_{RL}=5V$		1.3		$\mu s$	2
Output sink current	$I_{sink}$	$V_{REF}=0V, V_{IN}=1V, V_{OUT}=1.5V$	6	16		mA	
Output saturation voltage	$V_{SAT}$	$V_{REF}=0V, V_{IN}=1V, I_{sink}=3mA$		0.2	0.4	V	
Output leakage current	$I_{OL}$	$V_{IN}=0V, V_{REF}=1V$		0.1	1	$\mu A$	
		$V_{OUT}=5V$	IR2339N	0.1			
Differential input voltage	$V_{ID}$	$V_{CC}=5\sim 30V$ Keep $V_{IN'S} \geq 0V_{DC}$ (or $V_{EE}$ if used)			$V_{CC}$	V	3



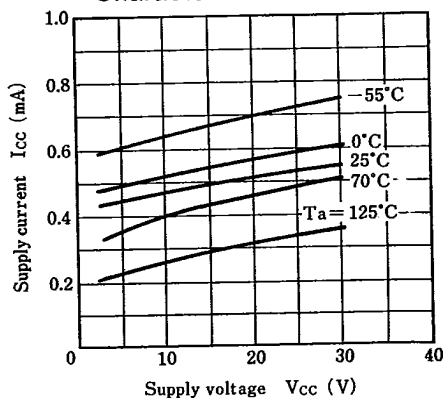
Note1) Determined by the flow-out current(input stage organized as PNP transistor)

Note2) The value when the input amplitude is 100mV and the overdrive 5mV. By increasing the amount of overdrive, reduction of the response time is possible.

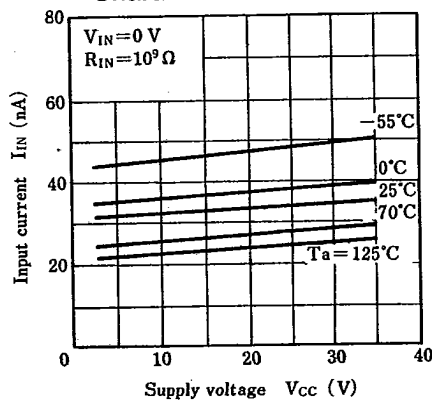
Note3) The input voltage is allowed to exceed  $V_{CC}$ . When either of the input terminal voltages is within the in-phase voltage range, the comparator comes in the right output state. But make sure that the input should never be allowed to exceed the maximum rated voltage.

**Electrical Characteristic Curves**

Supply current—Supply voltage Characteristics



Input current—Supply voltage Characteristics



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