

MITSUBISHI <LINEAR ICs>  
**M5234P, FP**

**QUAD COMPARATOR**

**DESCRIPTION**

The M5234 is a semiconductor circuit for a comparator designed to operate over a wide supply voltage range from 2 ~ 36V from a single power supply, with four circuits in each 14-pin DIP and 14-pin mini flat package. A differential circuit which is equivalent to a conventional single power supply operational amplifier is used to enable operation from GND level to improve input characteristics. Power dissipation (circuit current) is low and output voltage is large. It is a general-purpose comparator suitable for a variety of electronic equipment.

**FEATURES**

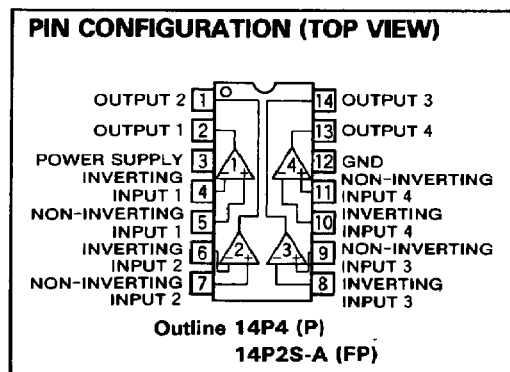
- Wide operating supply voltage range ..... 2V~36V  
 Dual power supplies:  $\pm 1V \sim \pm 18V$
- Low circuit current ..... 0.8mA (typ.)
- Wide common mode input voltage range  
 ..... 0V~ $V_{CC} - 1.5V$  (single power supply)
- Open collector output
- Output sink current ..... 25mA
- Response time ..... 1.3  $\mu$ sec
- Pin compatible with general-purpose comparators 339, 2901

**APPLICATION**

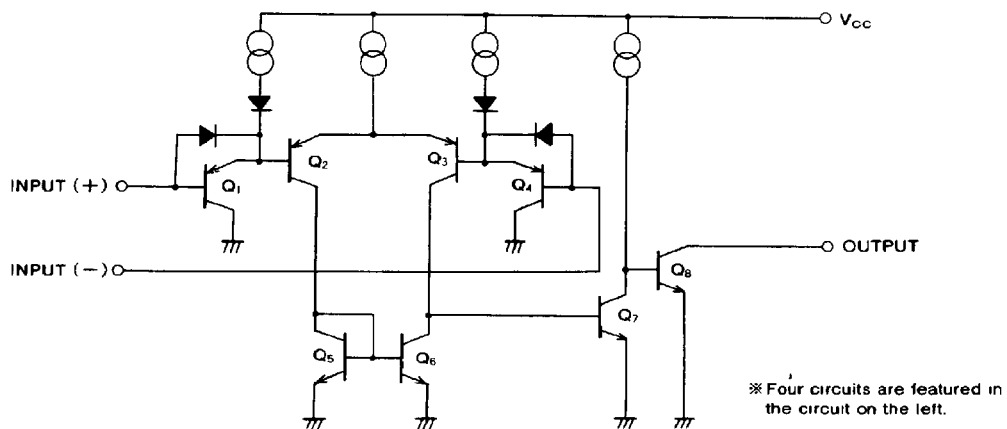
Voltage comparator, window comparator, CR timer, time delay circuit, oscillator, etc.

**RECOMMENDED OPERATING CONDITIONS**

- Supply voltage range ..... 2~36V
- Rated supply voltage ..... 12V



**EQUIVALENT CIRCUIT**



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**QUAD COMPARATOR**

**ABSOLUTE MAXIMUM RATINGS** ( $T_a=25^\circ\text{C}$ , unless otherwise noted)

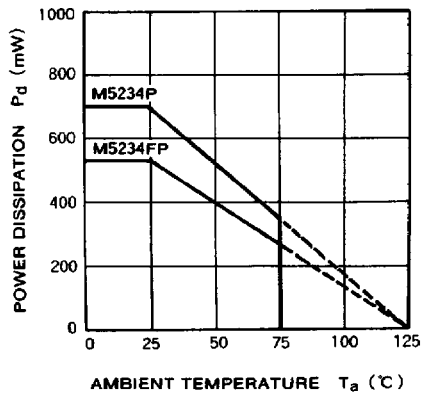
Symbol	Parameter	Ratings	Unit
$V_{CC}$	Supply voltage	36( $\pm 18$ )	V
$V_{IO}$	Differential input voltage	36	V
$V_{ICM}$	Common mode input voltage range	-0.3~+36	V
$P_d$	Power dissipation	700(DIP)/550(FP)	mW
$T_{opr}$	Operating temperature	-20~+75	$^\circ\text{C}$
$T_{stg}$	Storage temperature	-55~+125	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=\pm 15\text{V}$ )

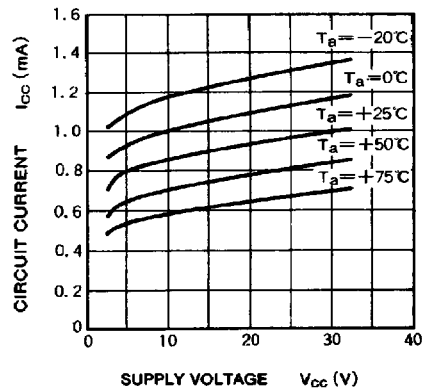
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{IO}$	Input offset voltage	$V_O=1.4\text{V}$ , $V_{REF}=1.4\text{V}$ , $R_S=0\Omega$		2	5	mV
$I_{IO}$	Input offset current			5	50	nA
$I_B$	Input bias current			25	250	nA
$V_{ICM}$	Common mode input voltage range		0		$V_{CC}-1.5$	V
$G_V$	Voltage gain	$R_L=15\text{k}\Omega$		200		V/mV
$I_{CC}$	Circuit current	$R_L=\infty$		0.8	2	mA
$t_{PLH}$	Response time	$R_L=5.1\text{k}\Omega$ , $V_{RL}=5\text{V}$		1.3		$\mu\text{sec}$
$I_{sink}$	Output sink current	$V_{IN(-)}=1\text{V}$ , $V_{IN(+)}=0\text{V}$ , $V_O \leq 1.5\text{V}$	10	25		mA
$V_{OL}$	Output saturation voltage	$V_{IN(-)}=1\text{V}$ , $V_{IN(+)}=0\text{V}$ , $I_{sink}=8\text{mA}$		200	400	mV
$I_{LO}$	Output leak current	$V_{IN(+)}=1\text{V}$ , $V_{IN(-)}=0\text{V}$ , $V_O=5\text{V}$		0.1		nA

**TYPICAL CHARACTERISTICS**

**THERMAL DERATING (MAXIMUM RATING)**



**CIRCUIT CURRENT VS. SUPPLY VOLTAGE**

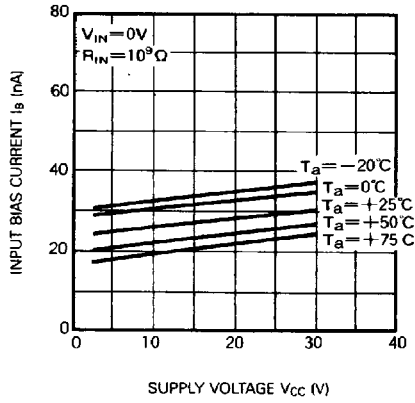


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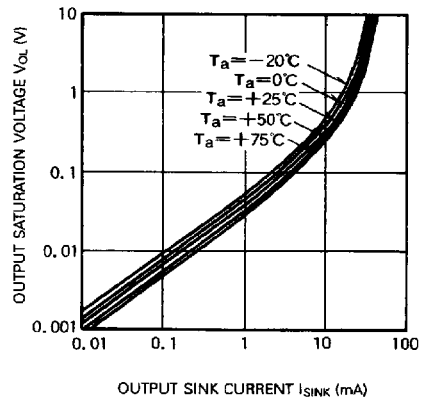


**QUAD COMPARATOR**

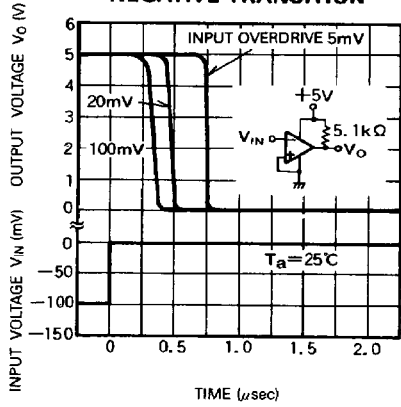
**INPUT BIAS CURRENT VS. SUPPLY VOLTAGE**



**OUTPUT SATURATION VOLTAGE VS. OUTPUT SINK CURRENT**



**RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES VS. NEGATIVE TRANSITION**



**RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES VS. NEGATIVE TRANSITION**

