



Dual Differential Comparators F393

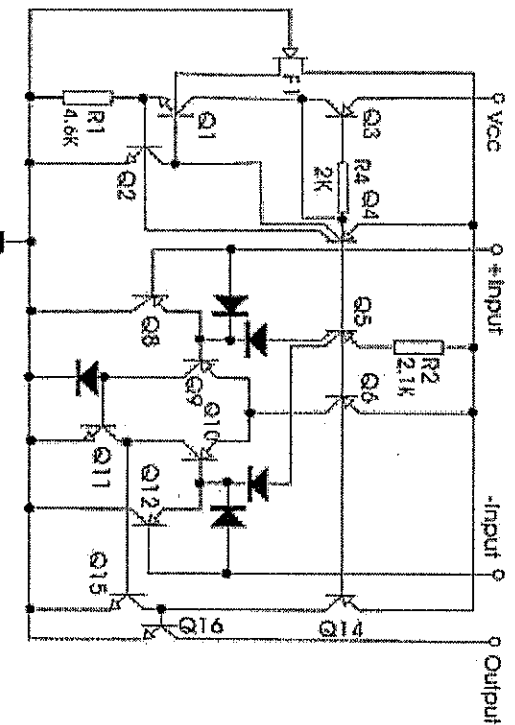
Description :

The HT393 consists of two independent voltage comparators with an offset voltage specification as low as 2.0mV max. for two comparators which were designed specifically to operation from a single power supply over a wide range of voltages. Operate 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 operated from a single power supply voltage.

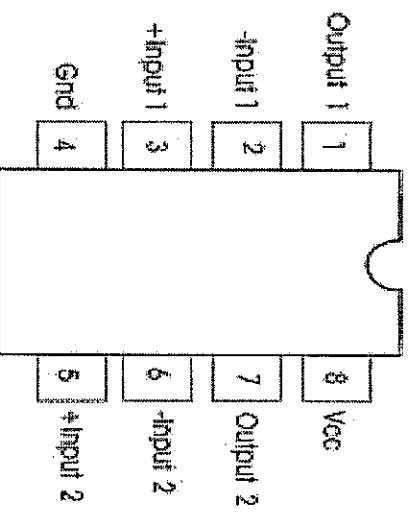
Feature :

- Wide supply voltage range : single supply operation : 2V to 36V dual supply operation : ±1V to ±18V
- Very low supply current drain (0.8mA) independent of supply voltage(2.0mW/comparator at 5.0 VDC)
- Low input biasing current : 25nA
- Low input offset current : 5.0nA; Low input offset voltage : 5.0mV
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- Output voltage compatible with TTL,DTL,ECL,MOS and CMOS logic systems.

Block Diagram



Pin Configuration





Pin Descriptions

No	Description	Symbol	No	Description	Symbol
1	Output 1	OUT1	5	+Input2	IN2 (+)
2	-Input 1	IN(-)	6	-Input2	IN2 (-)
3	+Input 1	IN(+)	7	Output2	OUT2
4	Ground	GND	8	Supply Voltage	Vcc

Absolute Maximum Ratings

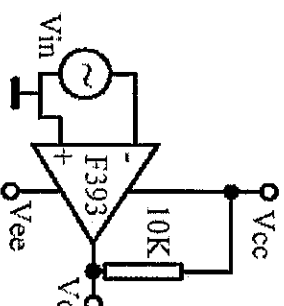
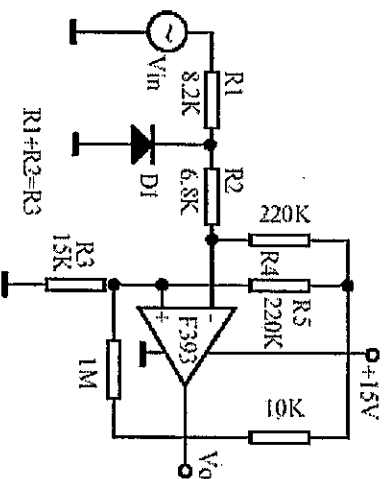
Characteristics	Symbol	Value			Unit
		Min	Max		
Supply Voltage	Single Supply Voltage	±18			V
	Dual Supplies Voltage	36			
Differential Input Voltage	V _{DR}	36			V
Input Common-mode Voltage	V _{ICR}	-0.3			V
Output Short Circuit to Ground	I _{OG}	20			mA
Input Current	I _{IN}	50			mA
Maximum Junction Temperature	T _J	125			°C
Power Dissipation	P _D	570			mW
Operating Temperature Range	T _{amb}	0			°C
Storage Temperature Range	T _{stg}	-65			°C

Electrical Characteristics (Unless otherwise specified :V_{CC}=5V, T_{amb}=25°C)

Characteristics	Test conditions	Symbol	Value			Unit
			Min	Typ.	Max	
Input Offset Voltage	0°C ≤ Ta ≤ 70°C	V _{IO}	±1.0	±5.0	±5.0	mV
			±9.0			
Input Offset Current	0°C ≤ Ta ≤ 70°C	I _{IO}	±5.0	±50	±150	nA
			±150			
Input Bias Current	0°C ≤ Ta ≤ 70°C	I _B	25	250	400	nA
			400			
Input Common-mode Voltage Range	0°C ≤ Ta ≤ 70°C	V _{ICR}	0		V _{CC} -1.5	V
			0		V _{CC} -2.0	
			0.4	1.0		
Supply Current	R _L =∞, dual comparator V _{CC} =30V	I _{CC}	0.4		2.5	mA
			2.5			
Voltage Gain	R _L ≥ 15KΩ, V _{CC} =15V	G _V	50	200		V/mV
			200			
Large Signal Response Time	V _{IN} =TTL Logic Swing, V _{REF} =1.4V, V _{RL} =5.0V, R _L =5.1KΩ	t _{RES}	300			ns
			300			
Response Time	V _{RL} =5.0V, R _L =5.1KΩ	t _{RES}	1.3			ns
			1.3			
Input Differential Voltage	V _{IN(-)} ≥ 1.0V, V _{IN(+)} =0V, V _O ≤ 1.5V	V _{ID}			V _{CC}	V
Output Sink Current	V _{IN(-)} ≥ 1.0V, V _{IN(+)} =0V, I _{SNK} ≤ 4.0mA	I _{SNK}	6.0	16		mA
			16			
Output saturation voltage	V _{IN(-)} ≥ 1.0V, V _{IN(+)} =0V, I _{SNK} ≤ 4.0mA, 0°C ≤ Ta ≤ 70°C	V _{SAT}	150		400	mV
			150		700	
Output Leakage Current	V _{IN(+)} ≥ 1.0V, V _{IN(-)} =0V, V _O =30V, 0°C ≤ Ta ≤ 70°C	I _{OL}	0.1			nA
			0.1		1000	

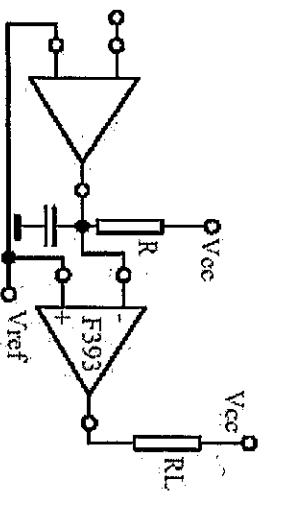
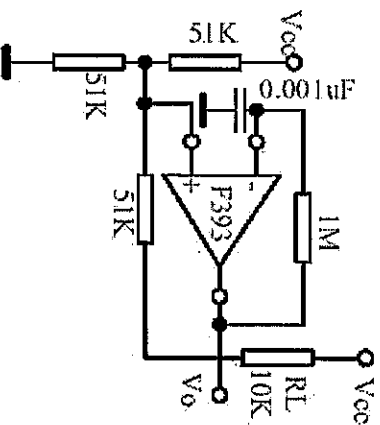


Application Circuit



Applied Single Power Supply

Applied Split Power Supply





Typical Characteristics Curves

Fig1. Supply Current VS Supply Voltage

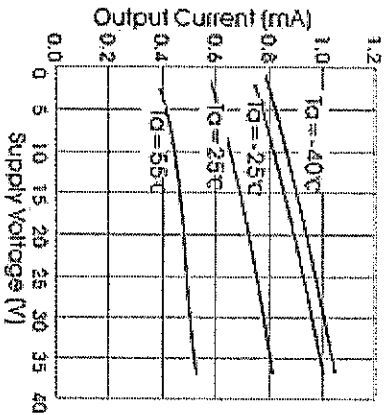


Fig2. Input Current VS Supply Voltage

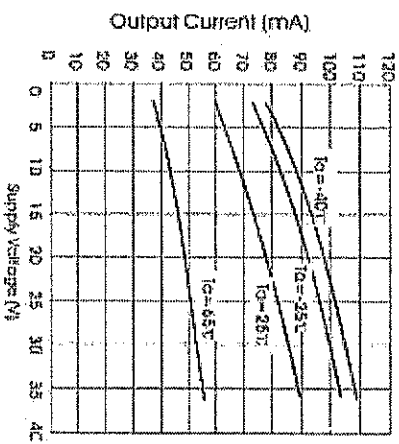


Fig3. Output Saturation Voltage VS Sink Current

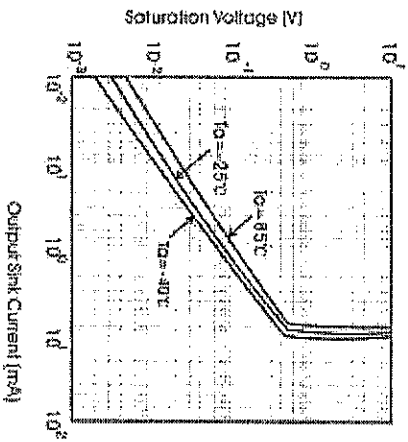


Fig4. Response Time for Various Input Overdrive-Negative Transition

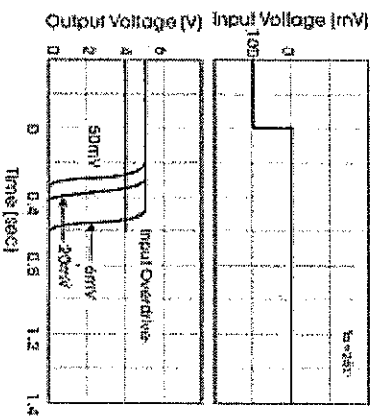


Fig5. Response Time for Various Input Overdrive-Positive Transition

