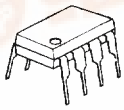
HIGH SPEED DIFFERENTIAL COMPARATOR

■ GENERAL DESCRIPTION

The NJM360 is a very high speed differential input, complementaly TTL output voltage comparator. The device has been optimized for greater speed, input impedance and fan-out and lower input offset voltage.

Applications involve high speed analog to digital convertors and zero-crossing detectors in disc file systems.

■ PACKAGE OUTLINE



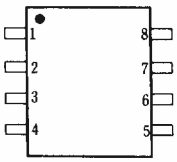
NJM360D

NJM360M

■ FEATURES

- Operating Voltage (±4.5V～±6.5V)
- High Speed Guarrantee (20ns max.)
- Both output delay time has been precisely adjusted
- Complimentally TTL Output
- High Input Impedance
- Stablized Speed for Over Driving Change
- Bipolar Technology
- Fan-out is 4
- Low Input Offset voltage
- Package Outline DIP8, DMP8, (SSOP8)

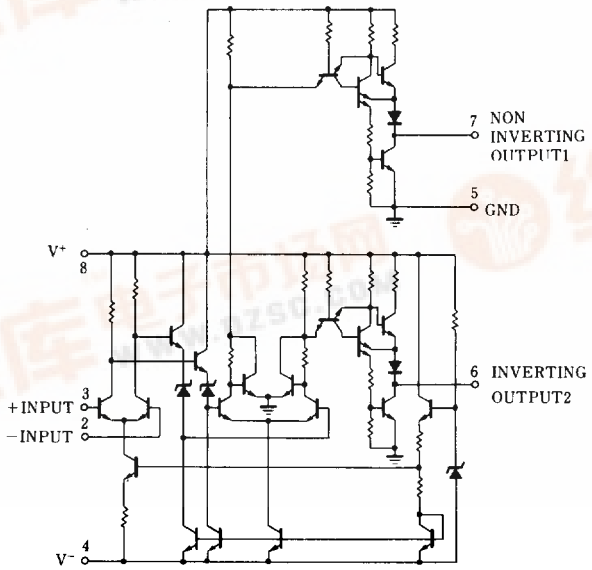
■ PIN CONFIGURATION



NJM330D
NJM360M

PIN FUNCTION
1. NC
2. −INPUT
3. +INPUT
4. V⁻
5. GND
6. OUT 2
7. OUT 1
8. V⁺

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±8	V
Differential Input Voltage	V_{ID}	±5	V
Input Voltage	V_I	±8(note 1)	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
Maximum Output Current	I_O	±20	mA
Operating Temperature Range	Topr	−20～+75	℃
Storage Temperature Range	Tstg	−40～+125	℃

(note 1) For supply voltage less than ±8V, the absolute input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

(Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Supply Voltage	V^+		4.5	5	6.5	V
Operating Supply Voltage	V^-		−4.5	−5	−6.5	V
Input Offset Voltage	V_{IO}	$R_S \leqq 200\Omega$	—	2	5	mV
Input Offset Current	I_{IO}		—	0.5	3	μA
Input Bias Current	I_B		—	5	20	μA
Output Resistance	R_O	$V_{OUT}=V_{OM}$	—	100	—	Ω
Response Time 1	t_R 1	$V^+/V^-=\pm5V$(note 1)	—	13	25	ns
Response Time 2	t_R 2	$V^+/V^-=\pm5V$(note 2)	—	12	20	ns
Response Time 3	t_R 3	$V^+/V^-=\pm5V$(note 3)	—	14	—	ns
Response Time Difference Between Outputs						
(t_{pd} of + V_{IN1}) − (t_{pd} of − V_{IN2})		(note 1)	—	2	—	ns
(t_{pd} of + V_{IN2}) − (t_{pd} of − V_{IN1})		(note 1)	—	2	—	ns
(t_{pd} of + V_{IN1}) − (t_{pd} of + V_{IN2})		(note 1)	—	2	—	ns
(t_{pd} of − V_{IN1}) − (t_{pd} of − V_{IN2})		(note 1)	—	2	—	ns
Input Resistance	R_{IN}	f=1MHz	—	17	—	kΩ
Input Capacitance	C_{IN}	f=1MHz	—	3	—	pF
Average Temperature Coefficient of Input Offset Voltage	$\Delta V_{IO}/\Delta T$	$R_S=50\Omega$	—	8	—	μV/℃
Average Temperature Coefficient of Input Offset Current	$\Delta I_{IO}/\Delta T$		—	7	—	nA/℃
Common Mode Input Voltage Range	V_{ICM}	$V^+/V^-=\pm6.5V$	±4	±4.5	—	V
Differential Input Voltage Range	V_{ID}		±5	—	—	V
Output High Voltage (High)	V_{OH}	$I_{OUT}=-320\mu A$, $V^+/V^-=\pm4.5V$	2.4	3	—	V
Output Low Voltage (Low)	V_{OL}	$I_{SINK}=6.4mA$, $V^+/V^-=\pm4.5V$	—	0.25	0.4	V
Positive Supply Current	I^+	$V^+/V^-=\pm6.5V$	—	18	32	mA
Negative Supply Current	I^-	$V^+/V^-=\pm6.5V$	—	−9	−16	mA

Note 1: Response time measured from the 50% point of a $30mV_{p-p}$ 10MHz sinusoidal input to the 50% point of the output.

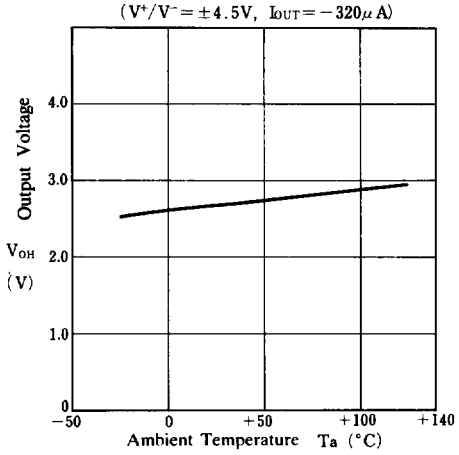
Note 2: Response time measured from the 50% point of a $2V_{p-p}$ 10MHz sinusoidal input to the 50% point of the output.

Note 3: Response time measured from the start of a 100mV input step with 5mV overdrive to the time when the output crosses the logic threshold.

■ TYPICAL CHARACTERISTICS

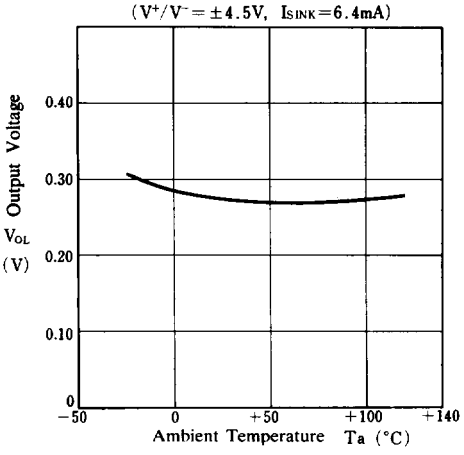
Output Voltage (High) vs. Temperature

($V^+/V^-=\pm4.5V$, $I_{OUT}=-320\mu A$)



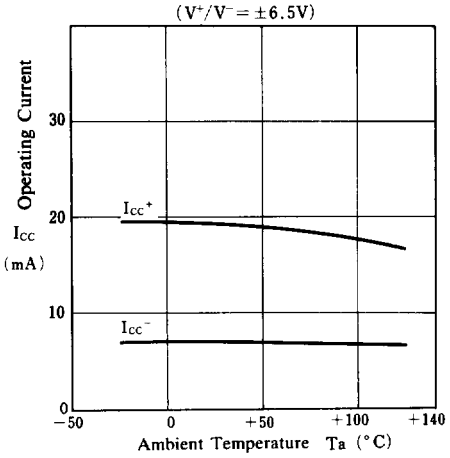
Output Voltage (Low) vs. Temperature

($V^+/V^-=\pm4.5V$, $I_{SINK}=6.4mA$)



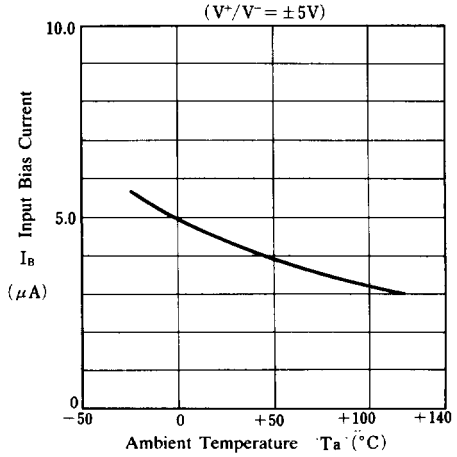
Operating Current vs. Temperature

($V^+/V^-=\pm6.5V$)



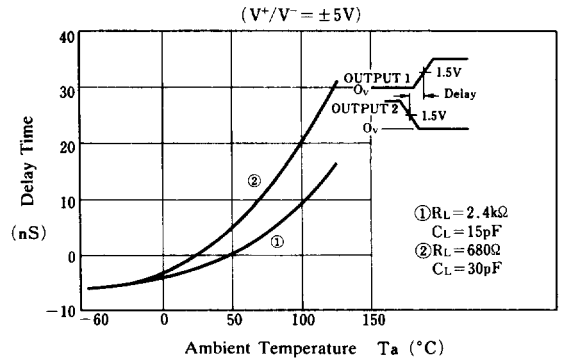
Input Bias Current vs. Temperature

($V^+/V^-=\pm5V$)



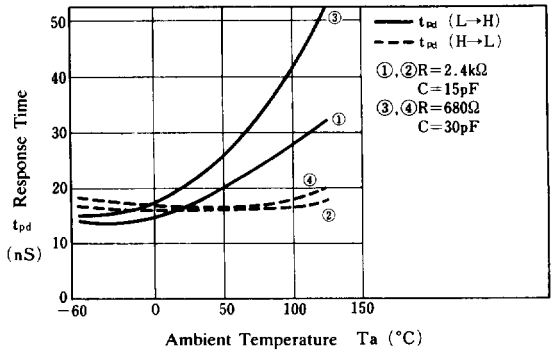
OUTPUT1 and OUTPUT2 Delay Time vs. Temperature

($V^+/V^-=\pm5V$)



Response Time vs. Temperature

($V^+/V^-=\pm5V$, $V_{IN}=\pm50mV$)



■ AC TEST CIRCUIT