

HIGH SPEED DIFFERENTIAL COMPARATOR

■ GENERAL DESCRIPTION

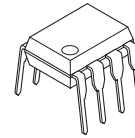
The NJM360 is a very high speed differential input, complementary TTL output voltage comparator. The device has been optimized for greater speed, input impedance and fan-out and lower input offset voltage.

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

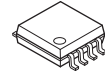
■ FEATURES

- Operating Voltage ($\pm 4.5V \sim \pm 6.5V$)
- High Speed Guarantee (20ns max.)
- Both output delay time has been precisely adjusted
- Complementary TTL Output
- High Input Impedance
- Stabilized Speed for Over Driving Change
- Bipolar Technology
- Fan-out is 4
- Low Input Offset Voltage
- Package Outline DIP8, DMP8, SOP8 JEDEC 150mil

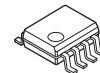
■ PACKAGE OUTLINE



NJM360D
(DIP8)

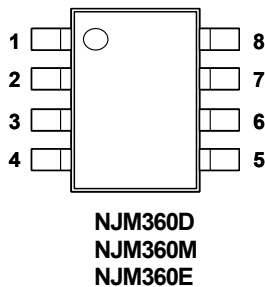


NJM360M
(DMP8)



NJM360E
(SOP8)

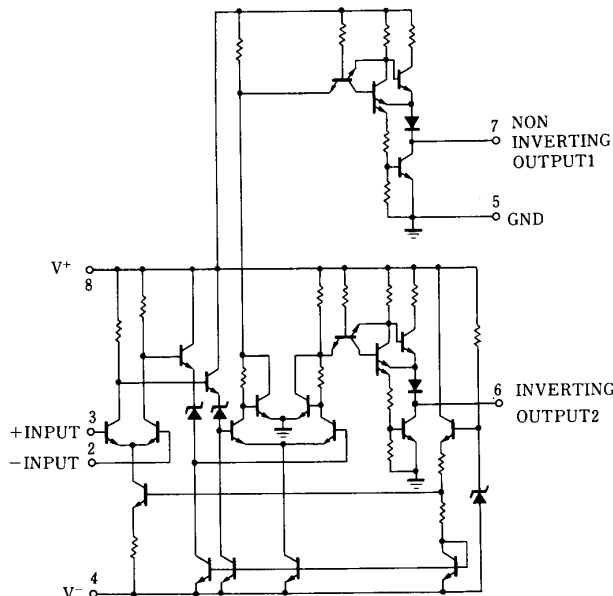
■ PIN CONFIGURATION



PIN FUNCTION

1. NC
2. -INPUT
3. +INPUT
4. V⁻
5. GND
6. OUT2
7. OUT1
8. V⁺

■ EQUIVALENT CIRCUIT



NJM360

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+V^-	± 8	V
Differential Input Voltage	V_{ID}	± 5	V
Input Voltage	V_I	± 8 (note1)	V
Power Dissipation	P_D	(DIP8) 500 (DMP8) 300 (SOP8) 300	mW
Maximum Output Current	I_O	± 20	mA
Operating Temperature Range	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-40~+125	°C

(note1) For supply voltage less than $\pm 8V$, the absolute input voltage is equal to the supply voltage.

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C)

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}	$R_S \leq 200\Omega$	-	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_{R1}	$V^+V^-=\pm 5V$ (note1)	-	13	25	ns
Response Time 2	t_{R2}	$V^+V^-=\pm 5V$ (note2)	-	12	20	ns
Response Time 3	t_{R3}	$V^+V^-=\pm 5V$ (note3)	-	14	-	ns
Response Time Difference Between Outputs ($t_{pd} \text{ of } +V_{IN1}$)-($t_{pd} \text{ of } -V_{IN2}$)		(note1)	-	2	-	ns
($t_{pd} \text{ of } +V_{IN2}$)-($t_{pd} \text{ of } -V_{IN1}$)		(note1)	-	2	-	ns
($t_{pd} \text{ of } +V_{IN1}$)-($t_{pd} \text{ of } +V_{IN2}$)		(note1)	-	2	-	ns
($t_{pd} \text{ of } -V_{IN1}$)-($t_{pd} \text{ of } -V_{IN2}$)		(note1)	-	2	-	ns
Input Resistance	R_{IN}	$f=1MHz$	-	17	-	k Ω
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	-	$\mu V/^\circ C$
Average Temperature Coefficient of Input Offset Current	$\Delta I_{IO}/\Delta T$		-	7	-	nA/°C
Common Mode Input Voltage Range	V_{ICM}	$V^+V^-=\pm 6.5V$	± 4	± 4.5	-	V
Differential Input Voltage Range	V_{ID}		± 5	-	-	V
Output High Voltage (High)	V_{OH}	$V^+V^-=\pm 4.5V, I_{OUT}=-320\mu A$	2.4	3	-	V
Output Low Voltage (Low)	V_{OL}	$V^+V^-=\pm 4.5V, I_{SINK}=6.4mA$	-	0.25	0.4	V
Positive Supply Current	I^+	$V^+V^-=\pm 6.5V$	-	18	32	mA
Negative Supply Current	I^-	$V^+V^-=\pm 6.5V$	-	-9	-16	mA

(note1) Response time measured from the 50% point of a 30mV_{P-P} 10MHz sinusoidal input to the 50% point of the output.

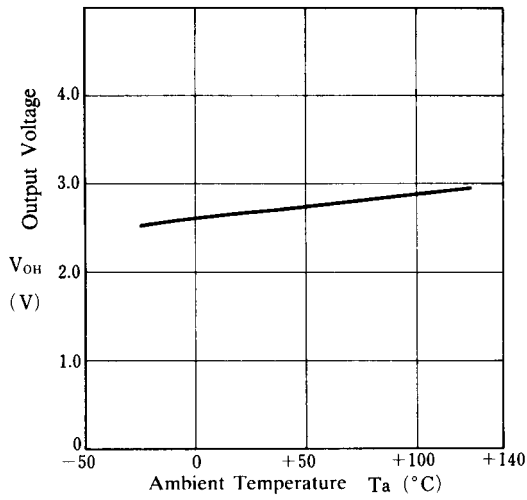
(note2) Response time measured from the 50% point of a 2V_{P-P} 10MHz sinusoidal input to the 50% point of the output.

(note3) 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

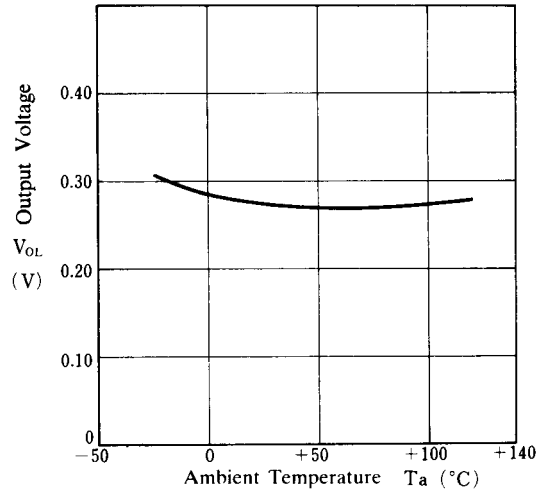
Output Voltage (High) vs. Temperature

($V^+/V^- = \pm 4.5V$, $I_{OUT} = -320\mu A$)



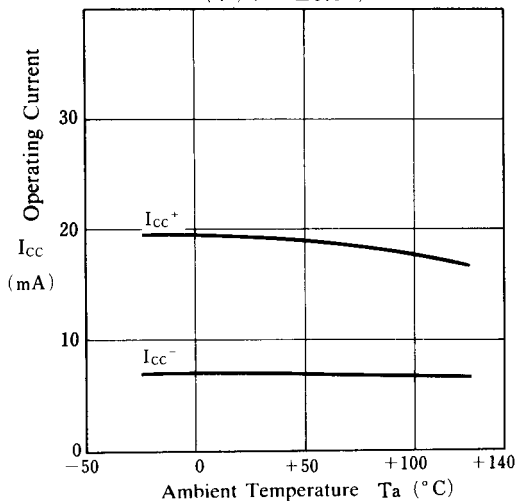
Output Voltage (Low) vs. Temperature

($V^+/V^- = \pm 4.5V$, $I_{SINK} = 6.4mA$)



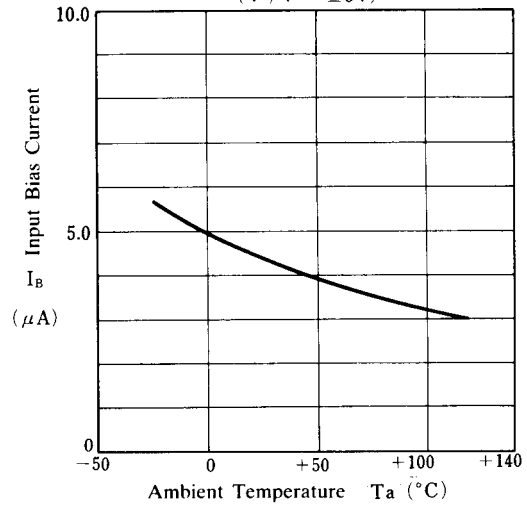
Operating Current vs. Temperature

($V^+/V^- = \pm 6.5V$)



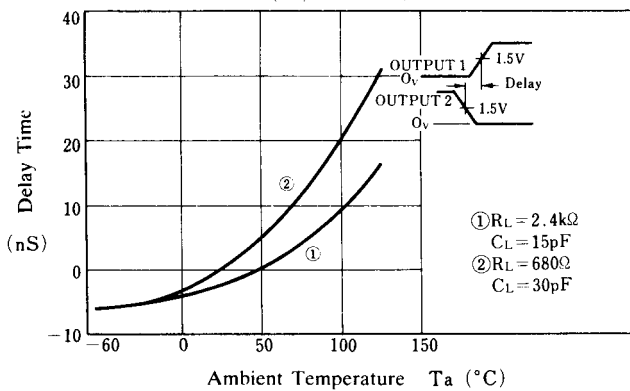
Input Bias Current vs. Temperature

($V^+/V^- = \pm 5V$)



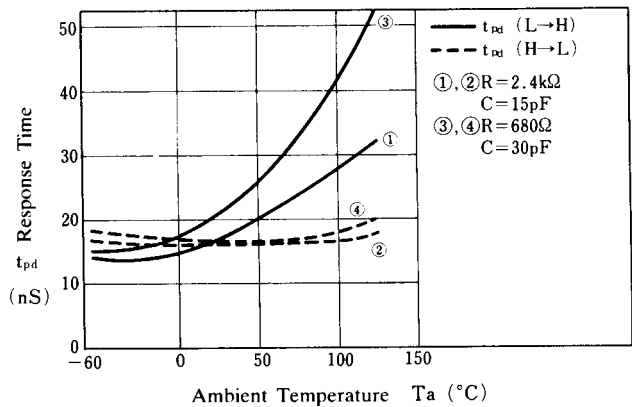
OUTPUT1 and OUTPUT2 Delay Time vs. Temperature

($V^+/V^- = \pm 5V$)



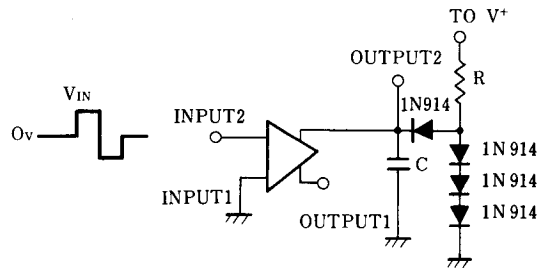
Response Time vs. Temperature

($V^+/V^- = \pm 5V$, $V_{IN} = \pm 50mV$)



NJM360

■ AC TEST CIRCUIT



[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.