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New Japan Radio Co.,Ltd.

www.njr.com

HIGH SPEED DIFFERENTIAL COMPARATOR

■ GENERAL DESCRIPTION

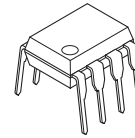
The NJM360 is a very high speed differential input, complementary TTL output voltage comparator. The device has been optimized for greater speed, input impedance and fan-out and lower input offset voltage.

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

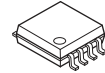
■ FEATURES

- 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

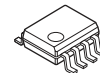
■ PACKAGE OUTLINE



NJM360D
(DIP8)

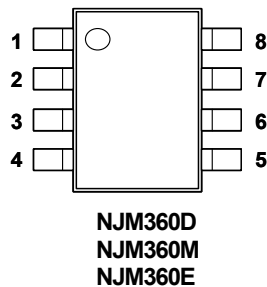


NJM360M
(DMP8)



NJM360E
(SOP8)

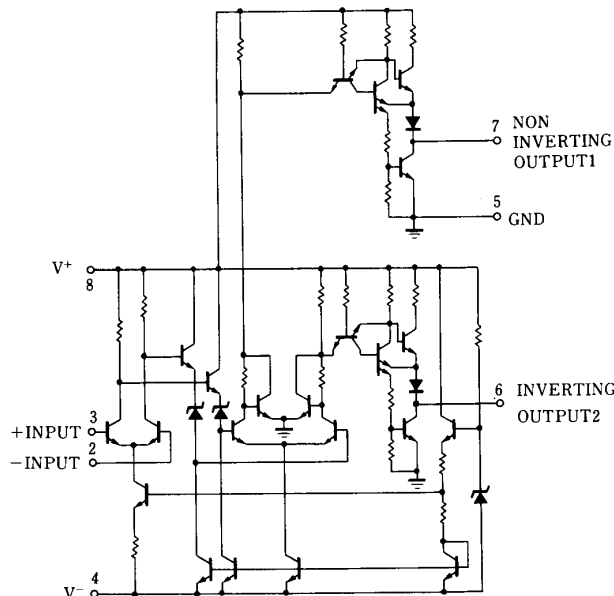
■ PIN CONFIGURATION



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.

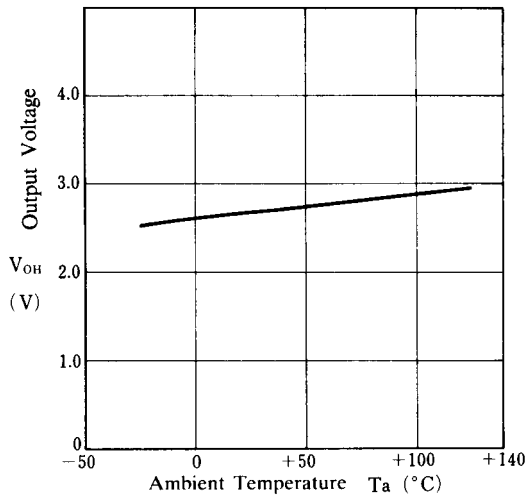
(note2) Response time measured from the 50% point of a 2V_{P-P} 10MHz sinusoidal input to the 50% point of the output.

(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

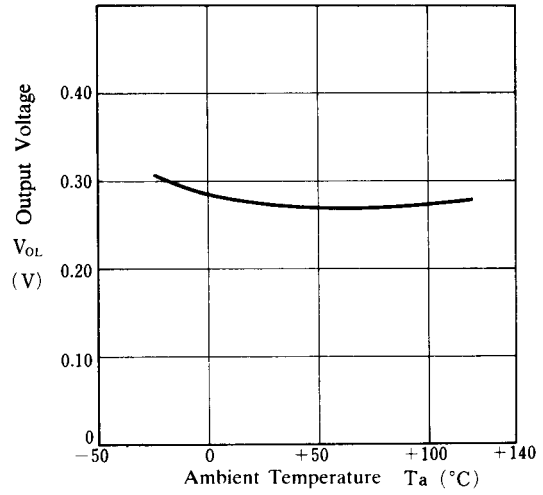
Output Voltage (High) vs. Temperature

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



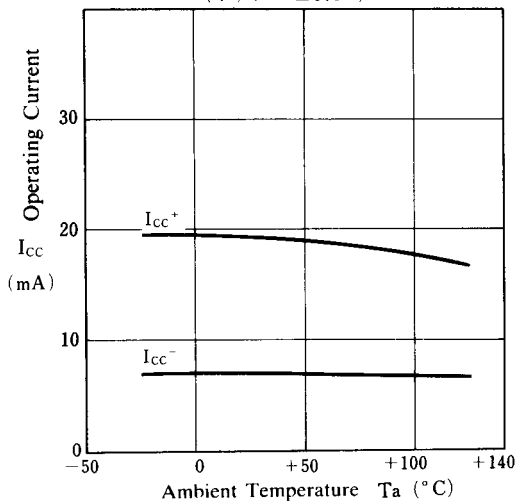
Output Voltage (Low) vs. Temperature

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



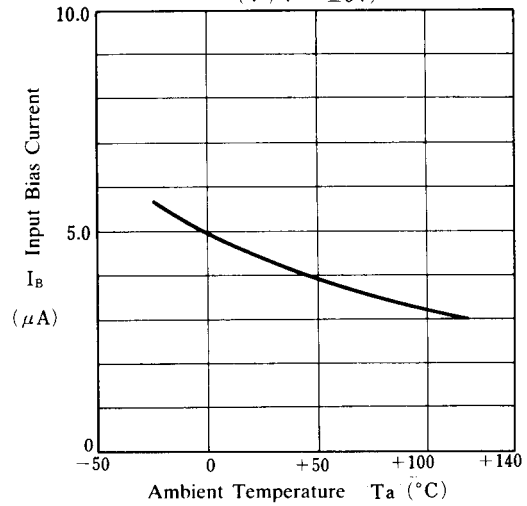
Operating Current vs. Temperature

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



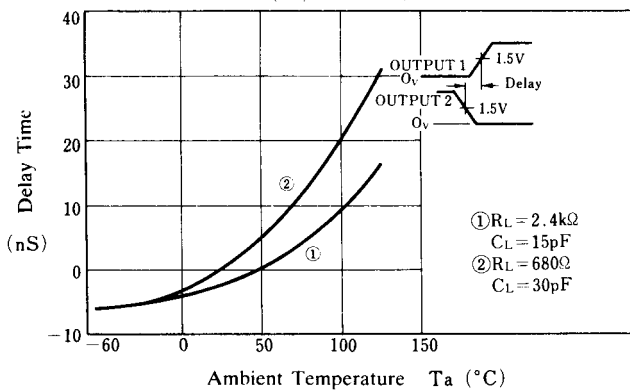
Input Bias Current vs. Temperature

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



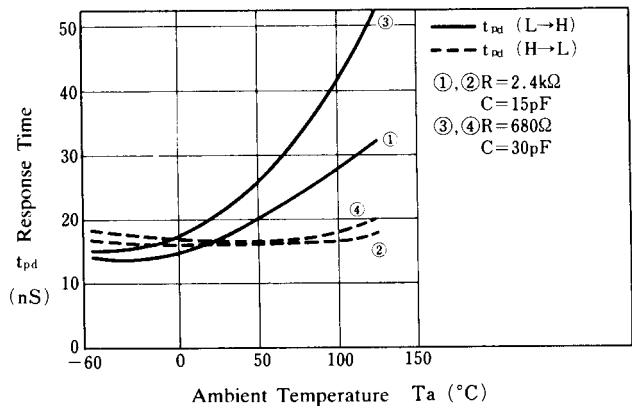
OUTPUT1 and OUTPUT2 Delay Time vs. Temperature

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



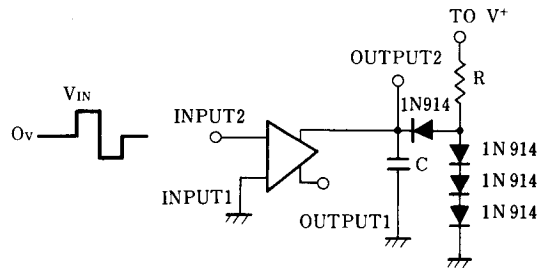
Response Time vs. Temperature

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



NJM360

■ AC TEST CIRCUIT



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