

LOW SATURATION DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM2140 is a low saturation output voltage dual operational amplifier in small packages. It features a low voltage operation of $\pm 1.0\text{V}$ (min.) and low saturation output voltage of $\pm 2.0\text{Vp-p}$ (at supply voltage $\pm 2.5\text{V}$). The NJM2140 is available in both 8-lead MSOP and thin type MSOP packages.

■ FEATURES

- Operating Voltage $\pm 1\text{V}$ to $\pm 7\text{V}$
- High Slew Rate $4\text{V}/\mu\text{s}$ typ.
- Wide Band 12MHz typ.
- Low Saturation Output Voltage $\pm 2.4\text{V}$ typ. (at $V^+/V^- = \pm 2.5\text{V}$, $R_L = 10\text{k}\Omega$)
- Package Outline MSOP8 (VSP8) MEET JEDEC MO-187-DA
MSOP8 (TVSP8) MEET JEDEC MO-187-DA / THIN TYPE
- Bipolar Technology

■ PACKAGE OUTLINE

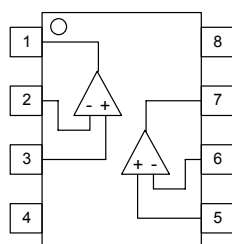


NJM2140R
(MSOP8 (VSP8))



NJM2140RB1
(MSOP8 (TVSP8))

■ PIN CONFIGURATION

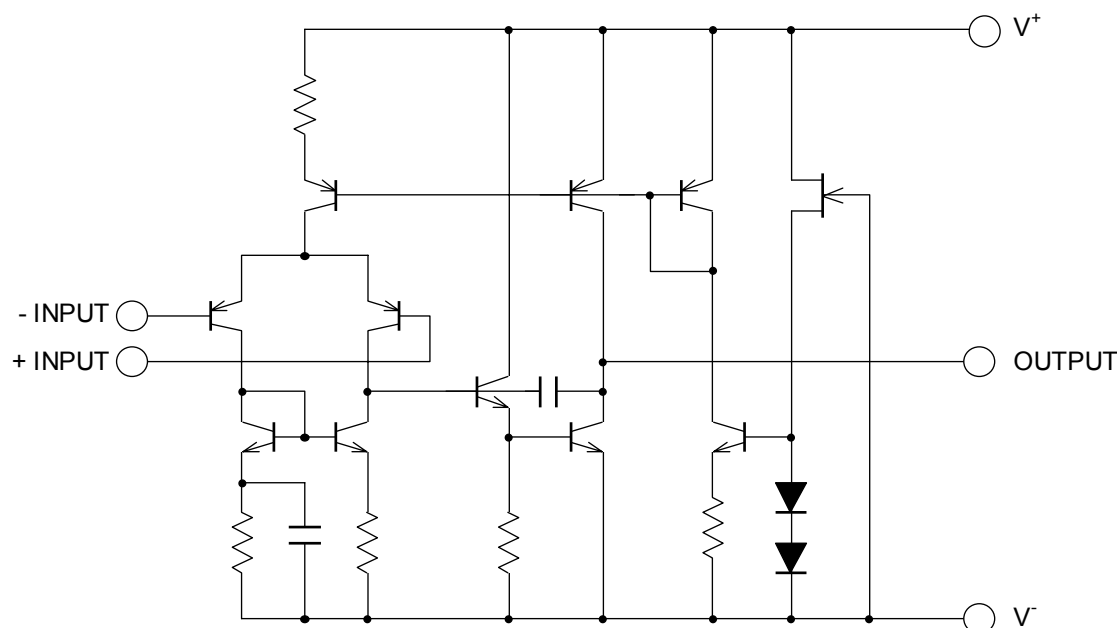


NJM2140R/RB1

PIN FUNCTION

- 1.A OUTPUT
- 2.A -INPUT
- 3.A +INPUT
- 4. V^-
- 5.B +INPUT
- 6.B -INPUT
- 7.B OUTPUT
- 8. V^+

■ EQUIVALENT CIRCUIT



NJM2140

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	± 7.0	V
Differential Input Voltage	V_{ID}	± 14	V
Power Dissipation	P_D	(MSOP8(VSP/TVSP8)) 320	mW
Operating Temperature Range	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-40~+125	°C

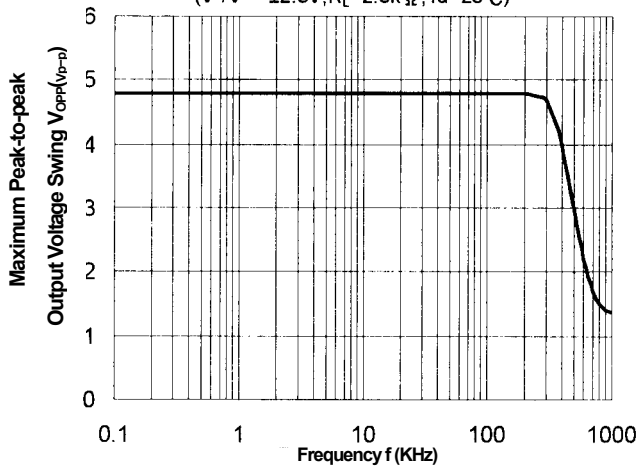
■ ELECTRICAL CHARACTERISTICS

($V^+/V^- = \pm 2.5V, Ta = 25^\circ C$)

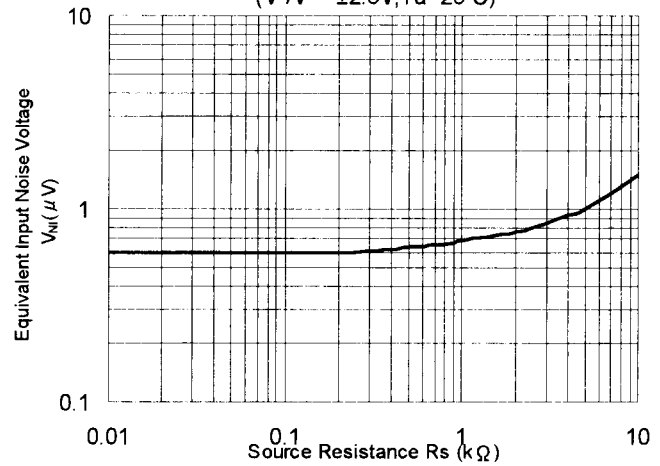
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_S \leq 10k\Omega$	-	1	6	mV
Input Offset Current	I_{IO}		-	10	200	nA
Input Bias Current	I_B		-	100	300	nA
Large Signal Voltage Gain	A_V	$R_L \geq 10k\Omega$	60	80	-	dB
Maximum Output Voltage Swings 1	V_{OM1}	$R_L = 2.5k\Omega$	± 2.0	± 2.2	-	V
Maximum Output Voltage Swings 2	V_{OM2}	$R_L \geq 10k\Omega$	± 2.3	± 2.4	-	V
Input Common Mode Voltage Range	V_{ICM}		± 1.5	-	-	V
Common Mode Rejection Ratio	CMRR		60	74	-	dB
Supply Voltage Rejection Ratio	PSRR		60	80	-	dB
Operating Current	I_{CC}		-	3.5	5	mA
Slew Rate	SR		-	4	-	V/ μs
Unity Gain Frequency	f_T		-	12	-	MHz

■ TYPICAL CHARACTERISTICS

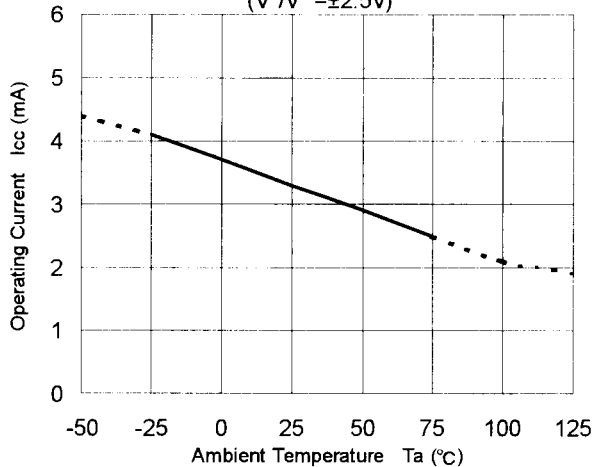
Maximum Peak-to-peak Output Voltage Swing vs. Frequency
($V^+/V^- = \pm 2.5V, R_L = 2.5k\Omega, T_a = 25^\circ C$)



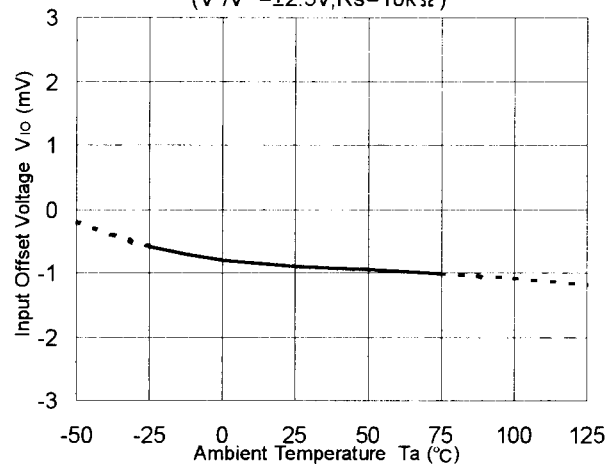
Equivalent Input Noise Voltage vs. Source Resistance
($V^+/V^- = \pm 2.5V, T_a = 25^\circ C$)



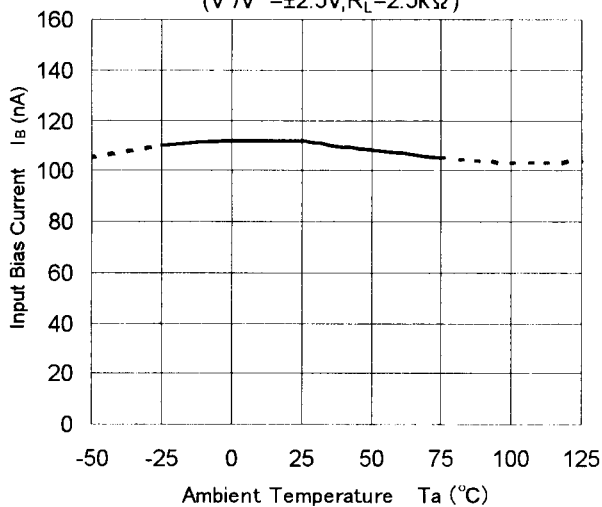
Operating Current vs. Temperature
($V^+/V^- = \pm 2.5V$)



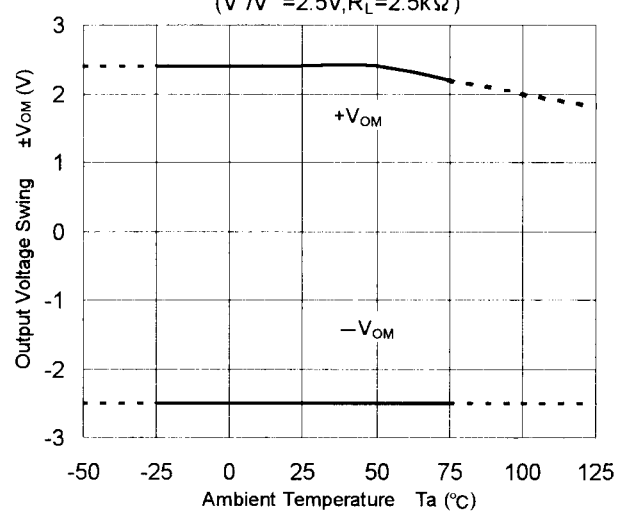
Input Offset Voltage vs. Temperature
($V^+/V^- = \pm 2.5V, R_s = 10k\Omega$)



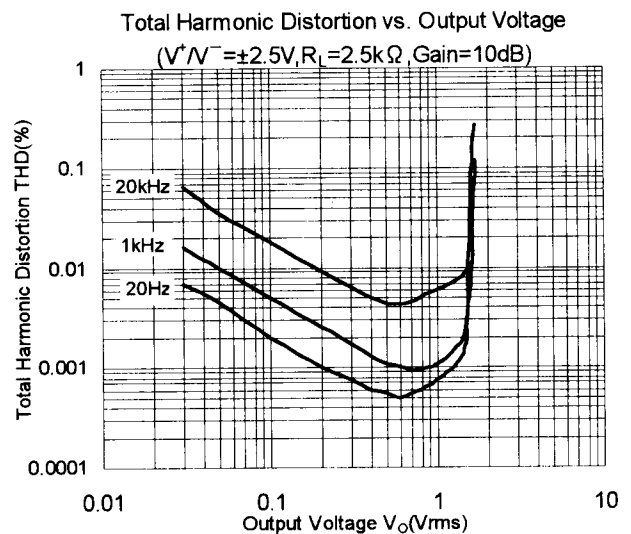
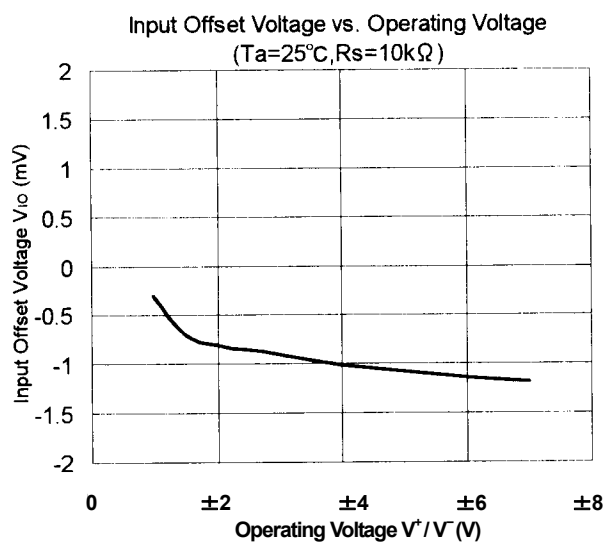
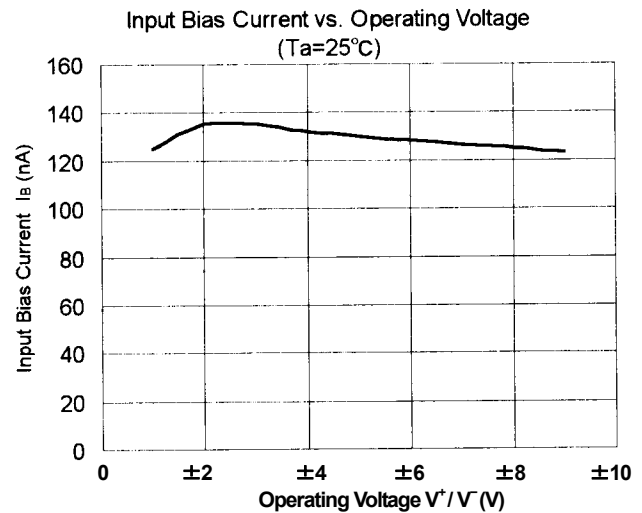
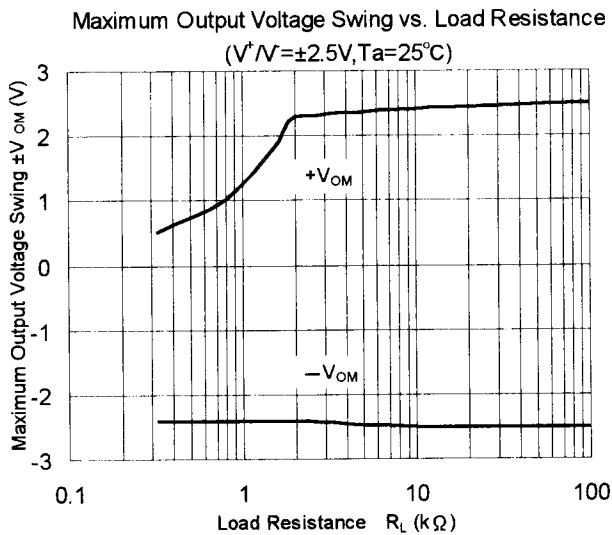
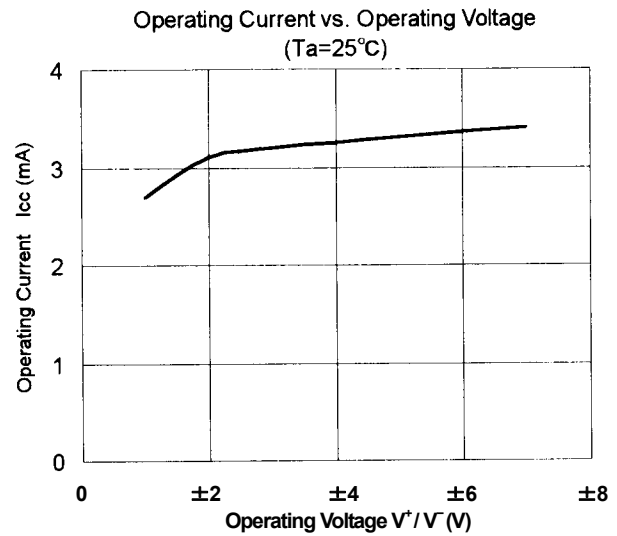
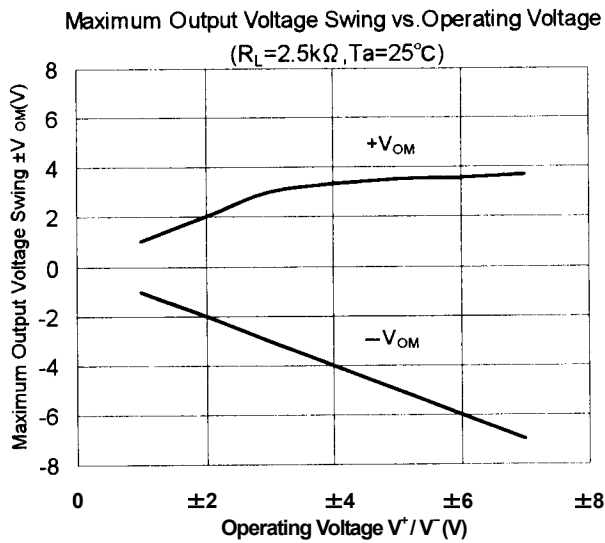
Input Bias Current vs. Temperature
($V^+/V^- = \pm 2.5V, R_L = 2.5k\Omega$)



Output Voltage Swing vs. Temperature
($V^+/V^- = 2.5V, R_L = 2.5k\Omega$)



■ TYPICAL CHARACTERISTICS



[CAUTION]

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