

ULTRA WIDE BAND, HIGH SLEW RATE SINGLE OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

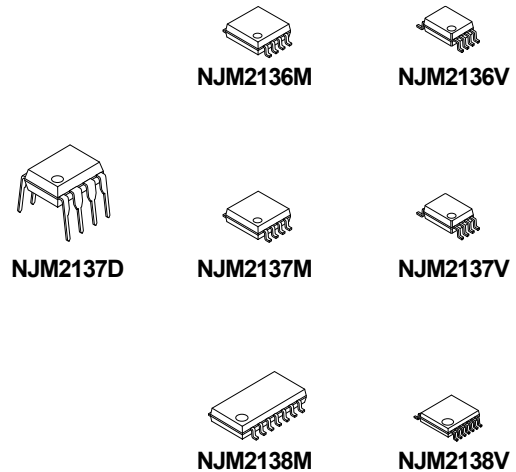
The NJM2136, NJM2137 and NJM2138 are single, dual and quad operational amplifiers operated from low voltage ($\pm 1.35V$). A 200MHz gain bandwidth and $45V/\mu s$ high slew rate make them suitable for use as active filter, high-speed analog and digital signal processor, industrial measurement equipment and others.

It can also be suitable for portable communication items because of low operating voltage and low operating current.

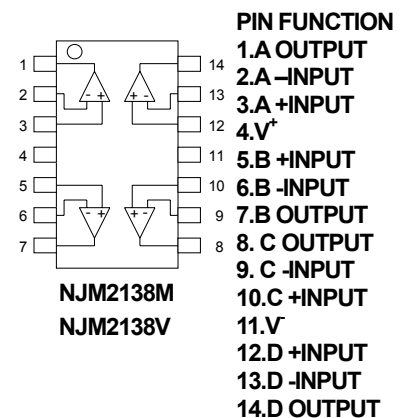
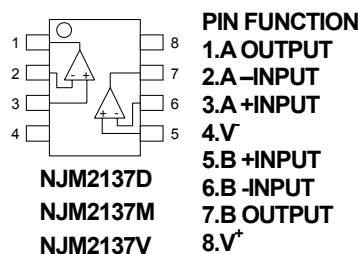
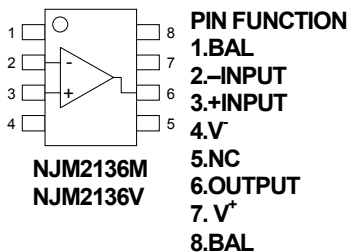
■ FEATURES

- Operating Voltage $\pm 1.35V \sim \pm 6V$
- Wide Bandwidth 200MHz typ.
- High Slew Rate $45V/\mu s$ typ.
- Input Offset Voltage Balance (only NJM2136)
- Operating Current
 - NJM2136: 0.63mA typ.
 - NJM2137: 1.14mA typ.
 - NJM2138: 2.27mA typ.
- Bipolar Technology
- Package Outline
 - NJM2136: DMP8, SSOP8
 - NJM2137: DIP8, DMP8, SSOP8
 - NJM2138: DMP14, SSOP14

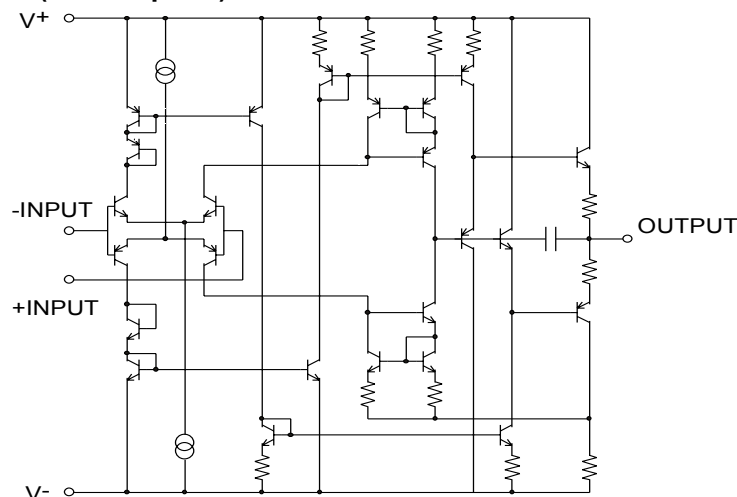
■ PACKAGE OUTLINE



■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT (each amplifier)



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■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

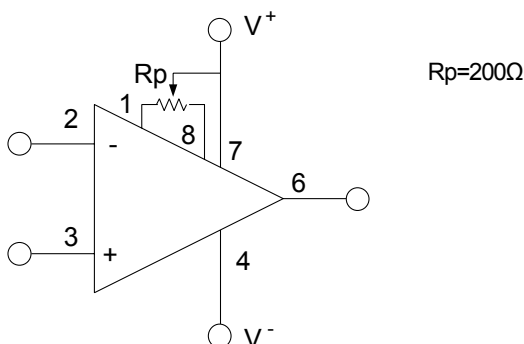
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	± 6.75	V
Differential Input Voltage	V_{ID}	± 3	V
Power Dissipation	P_D	(DIP8) 500 (DMP8) 300 (SSOP8) 250 (DMP14) 300 (SSOP14) 300	mW
Operating Temperature Range	T_{opr}	-40~+85	°C
Storage Temperature Range	T_{stg}	-50~+125	°C

■ ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V^+/V^-		± 1.35	-	± 6.00	V
Input Offset Voltage	V_{IO}	$R_S=0\Omega$	-	1.0	5.0	mV
Input Bias Current	I_B		-	0.5	2.0	μA
Input Offset Current	I_{IO}		-	20	200	nA
Large Signal Voltage Gain	A_V	$R_L \geq 2k\Omega$	65	75	-	dB
Input Common Mode Voltage Range	V_{ICM}		± 1.2	± 1.5	-	V
Common Mode Rejection Ratio	CMR	$-1V \leq V_{cm} \leq +1V$	45	60	-	dB
Supply Voltage Rejection Ratio	+SVR	NJM2136	70	80	-	dB
	-SVR		50	60	-	
	+SVR	NJM2137/NJM2138	50	60	-	
	-SVR		70	80	-	
Maximum Output Voltage Swing	V_{OM}	$R_L=1k\Omega$	1.1 -0.9	1.4 -1.2	- -	V
Operating Current (all Amp.)	I_{CC}	NJM2136, $R_L=\infty$	-	0.63	0.82	mA
		NJM2137, $R_L=\infty$	-	1.14	1.50	
		NJM2138, $R_L=\infty$	-	2.27	3.00	
Slew Rate	SR	$A_V=0dB$	-	45	-	V/ μs
Gain Bandwidth Product	GB	60dB • 500kHz	120	200	-	MHz
Phase Margin	ϕ_M	40dB	-	25	-	deg.
Unity Gain Bandwidth	f_T	40dB	-	40	-	MHz

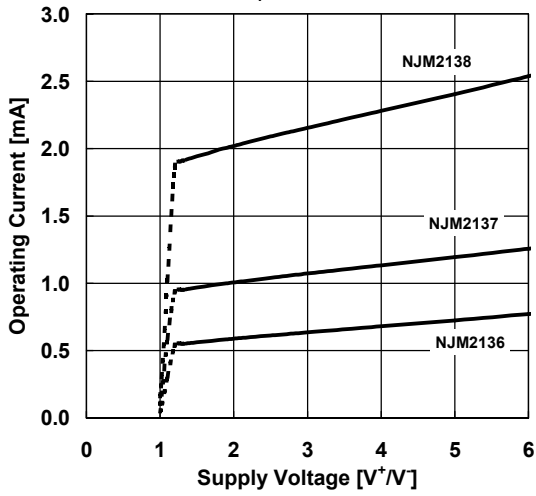
■ OFFSET ADJUSTMENT METHOD (only NJM2136)



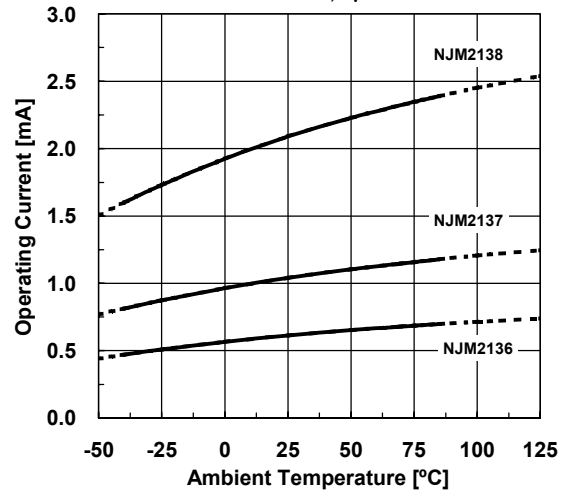
(note) The electrical characteristics change a little, in case the R_P is connected.

■ TYPICAL CHARACTERISTICS

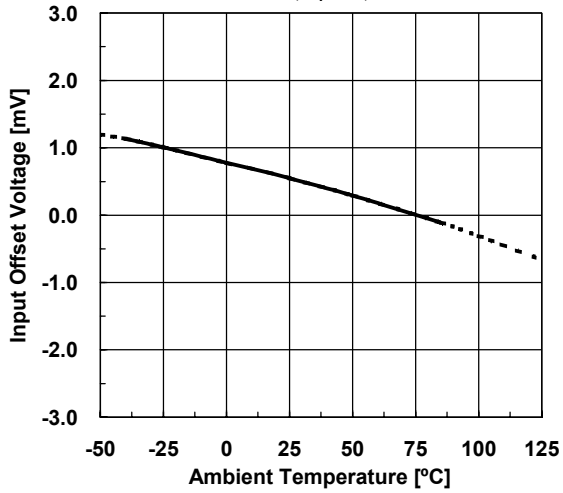
Operating Current vs. Supply Voltage
 $G_V=0\text{dB}$, $T_a=25^\circ\text{C}$



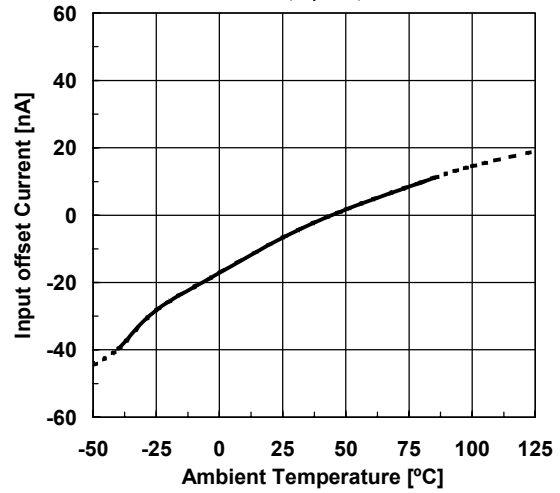
Operating Current vs. Temperature
 $V^+/V=\pm 2.5\text{V}$, $G_V=0\text{dB}$



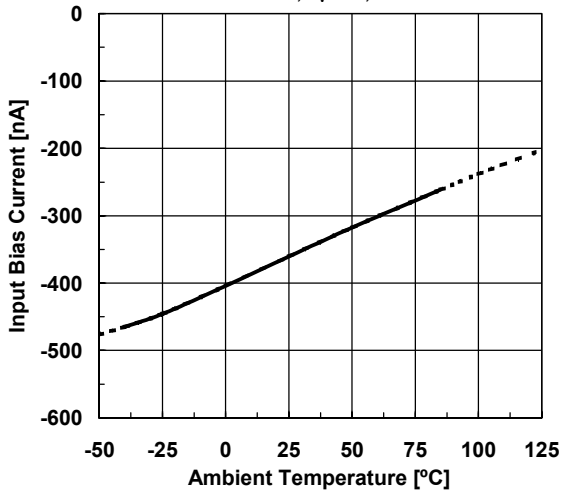
Input Offset Voltage vs. Temperature
 $V^+/V=\pm 2.5\text{V}$, $G_V=0\text{dB}$, $T_a=25^\circ\text{C}$



Input Offset Current vs. Temperature
 $V^+/V=\pm 2.5\text{V}$, $G_V=0\text{dB}$, $T_a=25^\circ\text{C}$

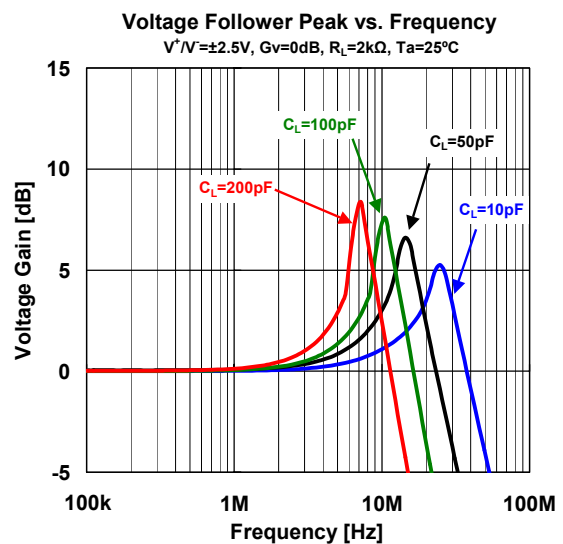
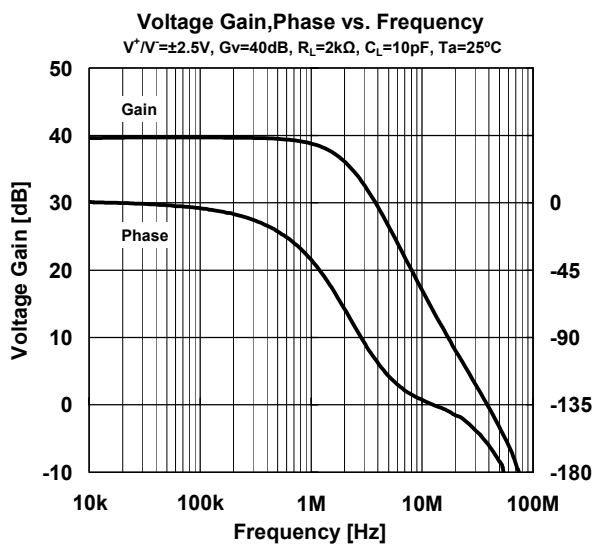
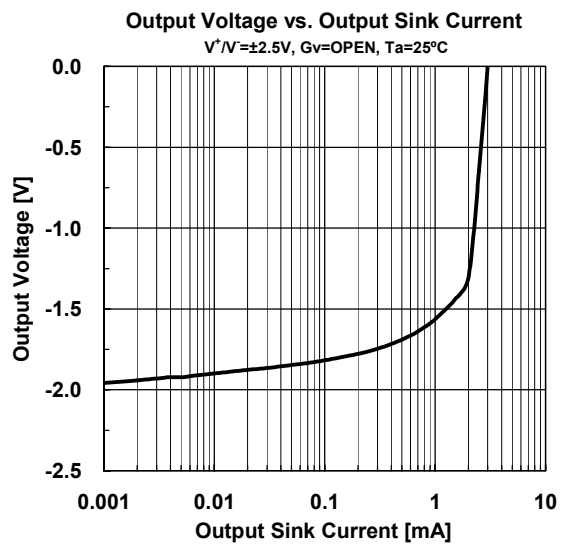
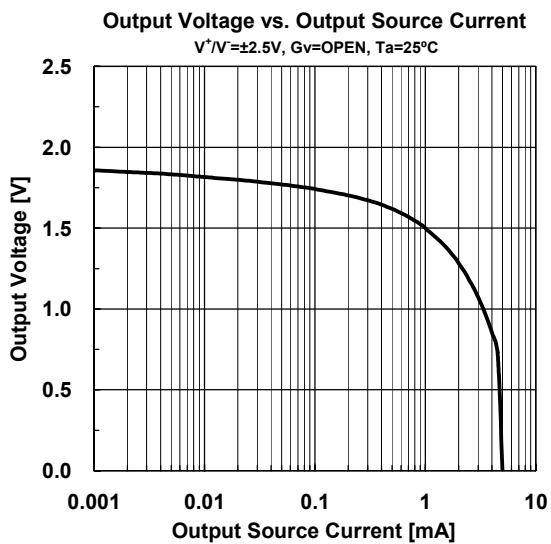
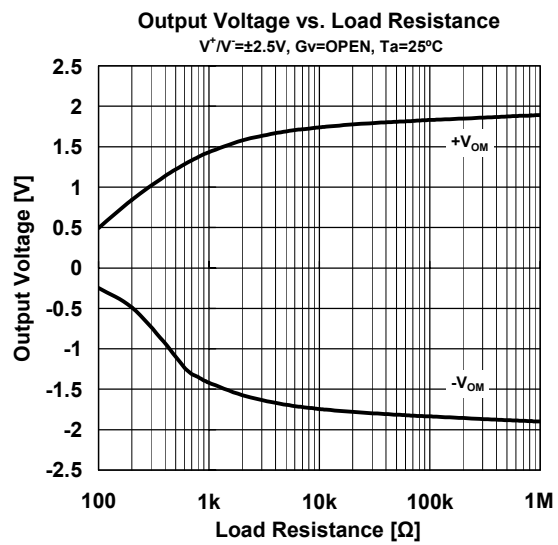
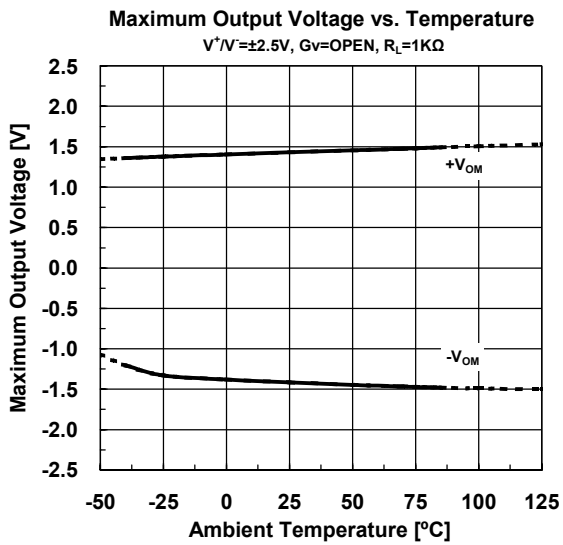


Input Bias Current vs. Temperature
 $V^+/V=\pm 2.5\text{V}$, $G_V=0\text{dB}$, $T_a=25^\circ\text{C}$

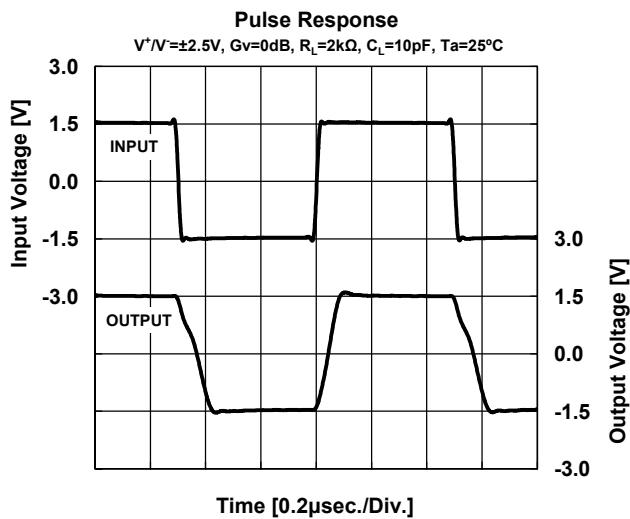
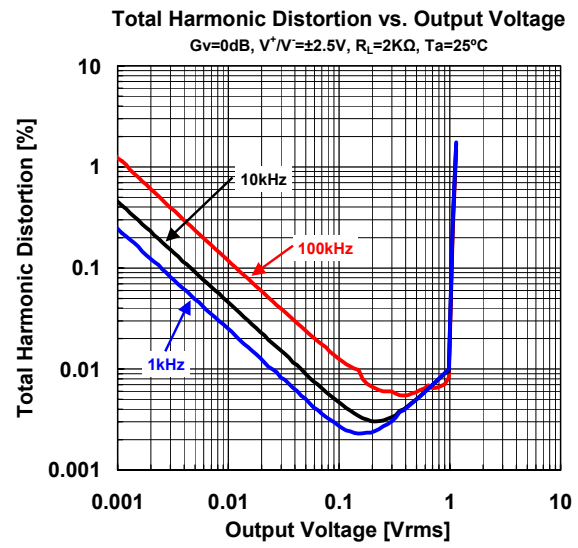
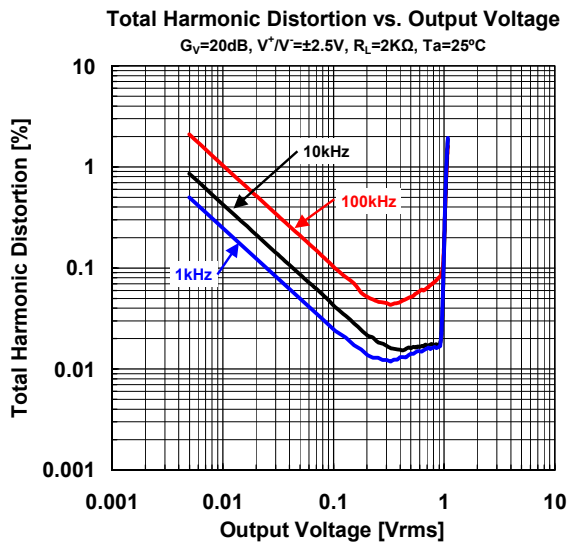


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■ TYPICAL CHARACTERISTICS



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[CAUTION]

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