

LOW VOLTAGE VIDEO AMPLIFIER WITH LPF

■ GENERAL DESCRIPTION

The NJW1351 is a Low Voltage Video Amplifier with LPF circuit. By the internal charge pump circuit, output capacitor is unnecessary.

The NJW1351 features low power and small package, and is suitable for low power design on downsizing of portable video system and system with video output.

Moreover, the following voltage gain variations are arranged.

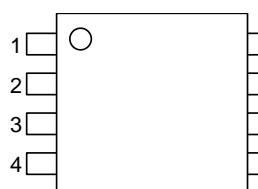
- NJW1350 (Gain=12dB)
- NJW1352 (Gain=9dB)
- NJW1353 (Gain=16dB)

■ FEATURES

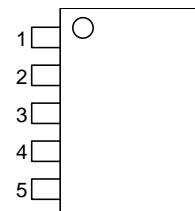
- Operating Voltage 2.5 to 3.45V
- Output coupling capacitor-less
- 6dB amplifier
- Internal 75Ω Driver Circuit (2-system drive)
- 6th order LPF -38dB at 19MHz typ
- Power Save Circuit
- Bi-CMOS Technology
- Package Outline MSOP8(TVSP8)*, SON10

*MEET JEDEC MO-187-DA / THIN TYPE

■ PIN CONFIGURATION



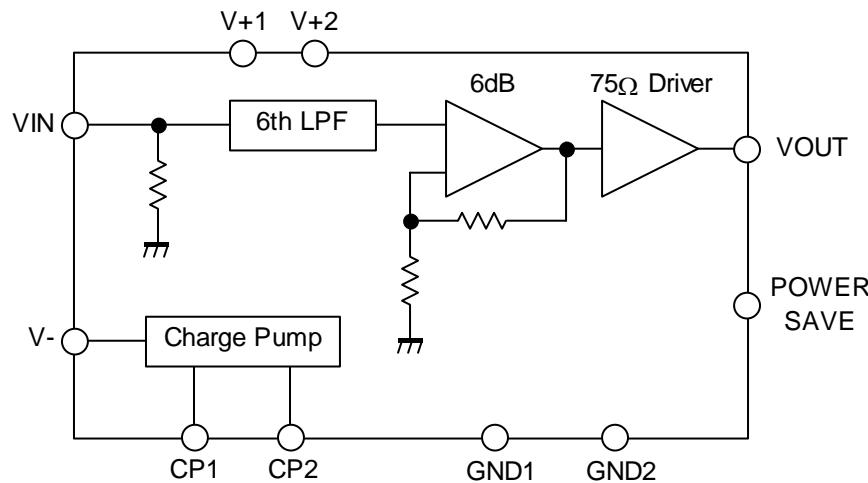
NJW1351RB1 (MSOP8)



NJW1351KK1 (SON10)

- | | |
|---------------|---------------|
| 1: CP1 | 10: 1: CP1 |
| 2: V+ | 2: V+2 |
| 3: VIN | 3: V+1 |
| 4: Power Save | 4: VIN |
| 5: VOUT | 5: Power Save |
| 6: GND | 6: VOUT |
| 7: V- | 7: GND1 |
| 8: CP2 | 8: GND2 |
| | 9: V- |

■ BLOCK DIAGRAM



(NOTE)

TVSP8: V+1 and V+2 are the same pins, and GND1 and GND2 are the same pins.

■ PACKAGE OUTLINE



NJW1351RB1
MSOP8(TVSP8)



NJW1351KK1

NJW1351

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	3.55	V
Power Dissipation	P _D	MSOP8(TVSP8):320 SON10:250	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-55 to +125	°C

■ RECOMMENDED OPERATING CONDITION (Ta=25°C)

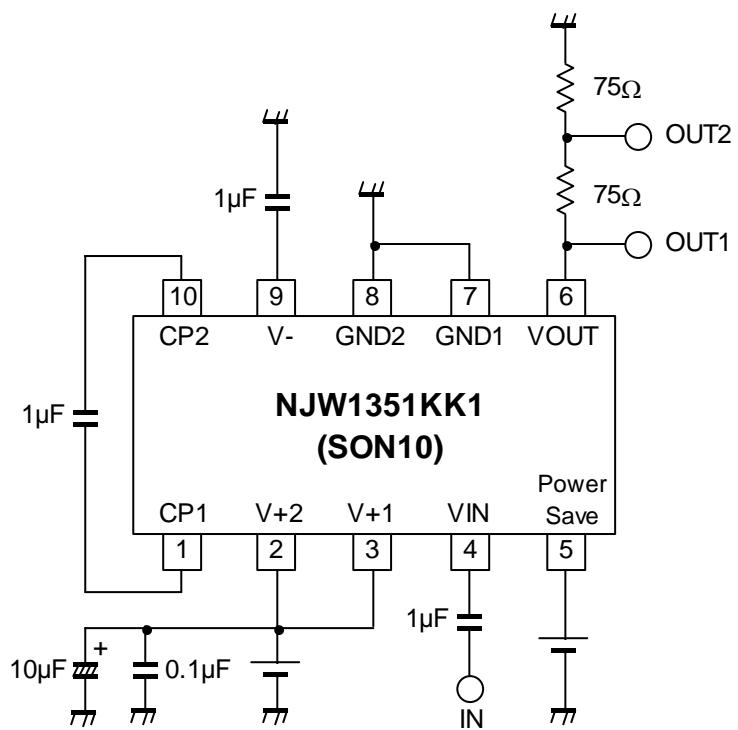
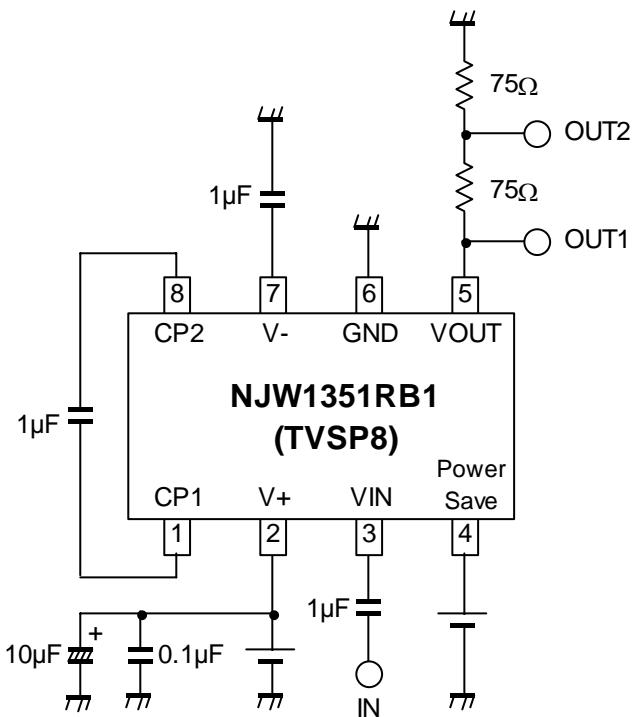
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		2.5	-	3.45	V

■ ELECTRICAL CHARACTERISTICS (V⁺=3.0V, R_L=150Ω, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}	No Signal	-	14.0	20.0	mA
Operating Current at Power Save	I _{save}	No Signal, Power Save Mode	-	0	1.0	μA
Maximum Output Voltage Swing	V _{om}	f=100kHz, THD=1%	4.5	5.2	-	V _{p-p}
Voltage Gain	G _v	V _{in} =100kHz, 1.0V _{p-p} , Input Sine Signal	6.0	6.4	6.8	dB
Low Pass Filter Characteristic	G _{fy4.5M}	V _{in} =4.5MHz/100kHz, 1.0V _{p-p}	-0.75	-0.05	0.25	dB
	G _{fy8M}	V _{in} =8MHz/100kHz, 1.0V _{p-p}	-7.0	-3.0	-1.0	
	G _{fy19M}	V _{in} =19MHz/100kHz, 1.0V _{p-p}	-	-38	-23	
Differential Gain	DG	V _{in} =1.0V _{p-p} , 10step Video Signal	-	0.5	-	%
Differential Phase	DP	V _{in} =1.0V _{p-p} , 10step Video Signal	-	0.5	-	deg
S/N Ratio	SNv	100kHz to 6MHz, V _{in} =1.0V _{p-p} 100% White Video Signal, R _L =75Ω	-	+70	-	dB
Switching Noise Level	N _{swpl}	R _L =75Ω, 10% White Video Signal input	-	4.0	7.0	mV _{pp}
2nd. Distortion	H _v	V _{in} =1.0V _{p-p} , Sine Signal , 3.58MHz, R _L =75Ω	-	-60	-	dB
SW Change Voltage High Level	V _{thPH}		1.25	-	V ⁺	V
SW Change Voltage Low Level	V _{thPL}		0	-	0.45	

■ CONTROL TERMINAL

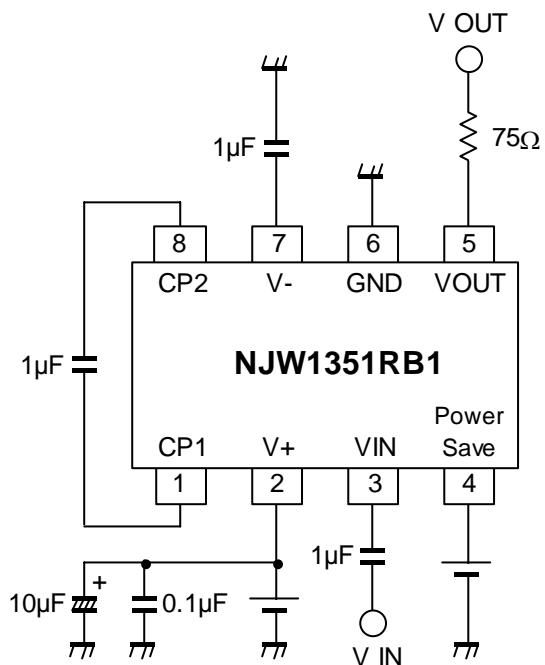
PARAMETER	STATUS	NOTE
Power Save	H	Power Save: OFF
	L	Power Save: ON (Mute)
	OPEN	Power Save: ON (Mute)

■ TEST CIRCUIT

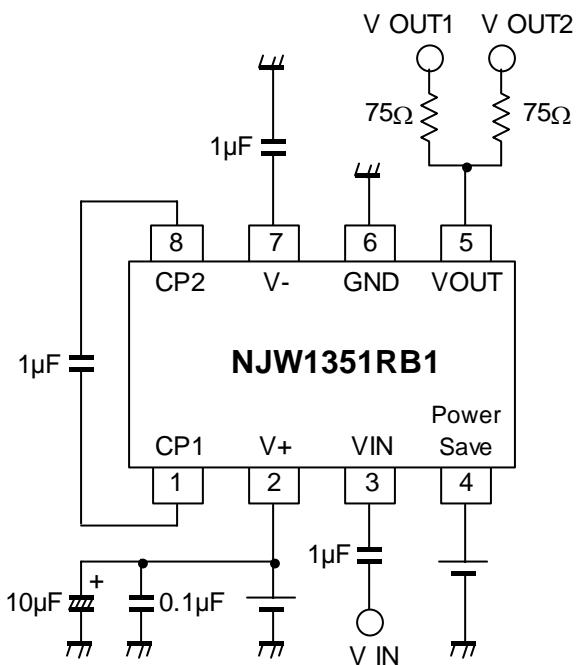
NJW1351

■ APPLICATION CIRCUIT (TVSP8)

(1) Standard circuit



(2) Two-line driving circuit



■ PIN FUNCTION (TVSP8)

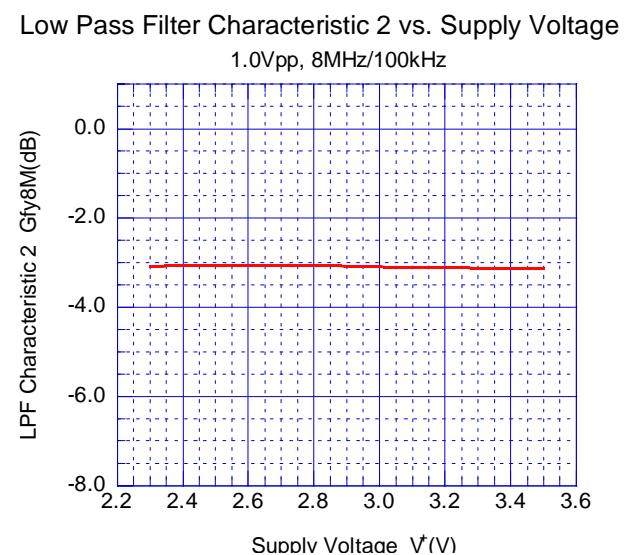
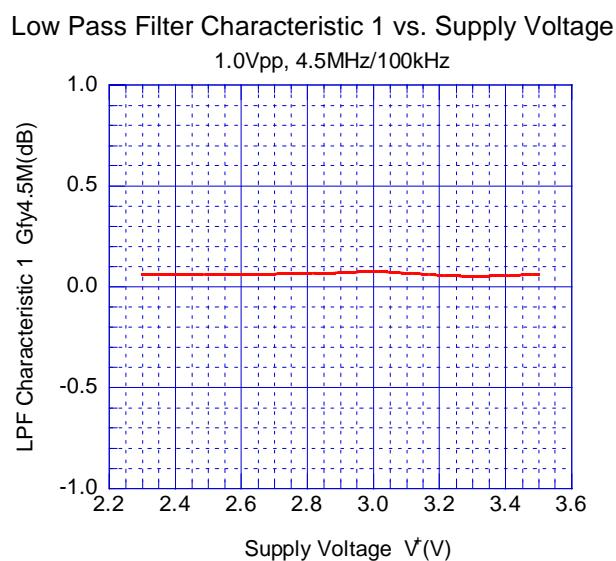
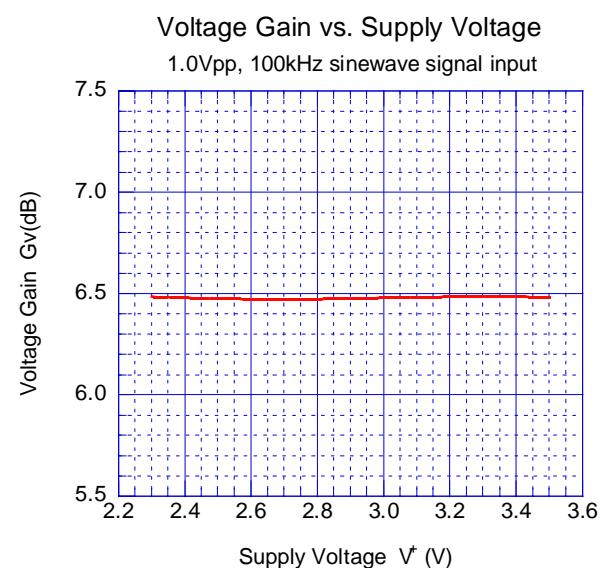
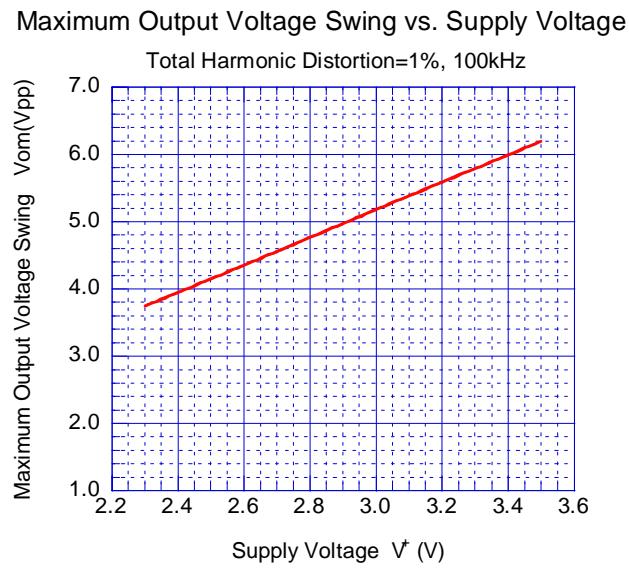
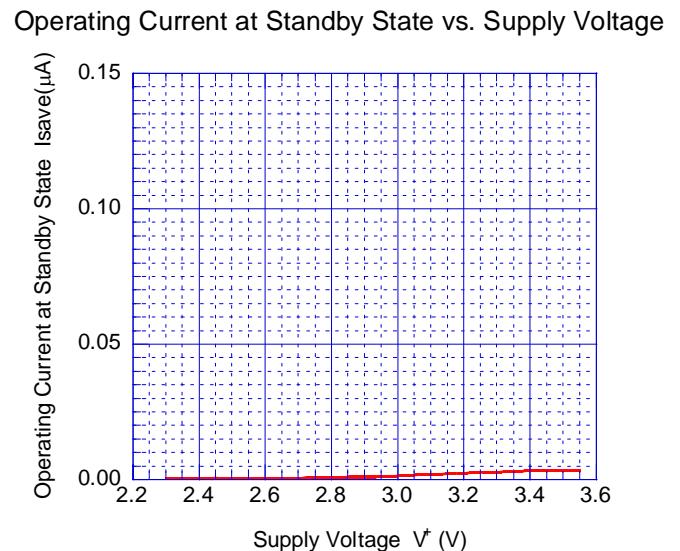
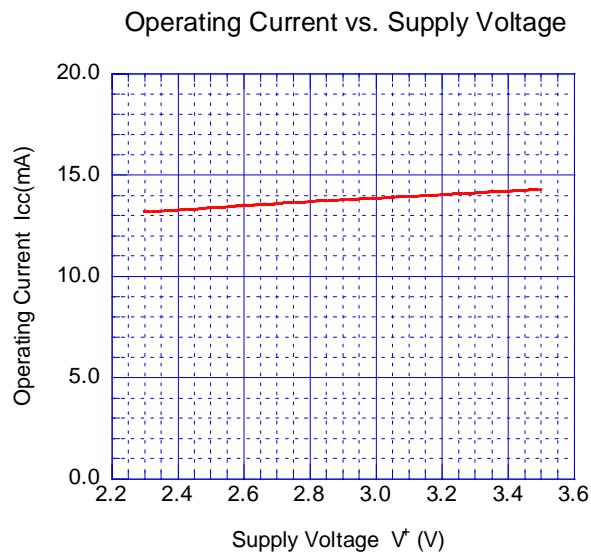
PIN NO.	PIN NAME	INSIDE EQUIVALENT CIRCUIT
1	CP1	
2	V ⁺	-
3	V _{in}	
4	Power Save	
5	V _{out}	
6	GND	-
7	V ⁻	-
8	CP2	

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■ PIN FUNCTION(SON10)

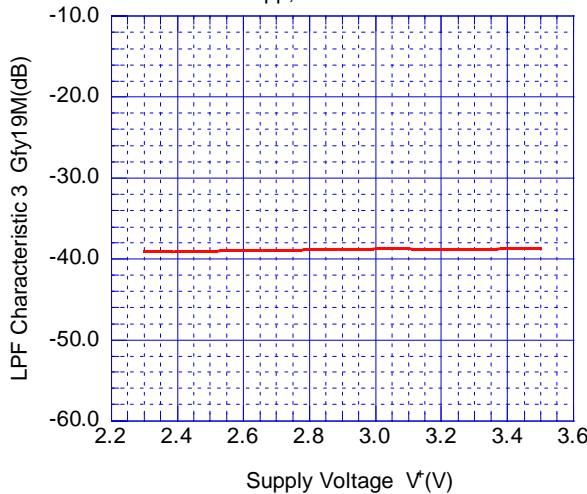
PIN NO.	PIN NAME	INSIDE EQUIVALENT CIRCUIT
1	CP1	
2,3	V+2,V+1	-
4	Vin	
5	Power Save	
6	Vout	
7,8	GND1,GND2	-
9	V-	-
10	CP2	

■ TYPICAL CHARACTERISTICS

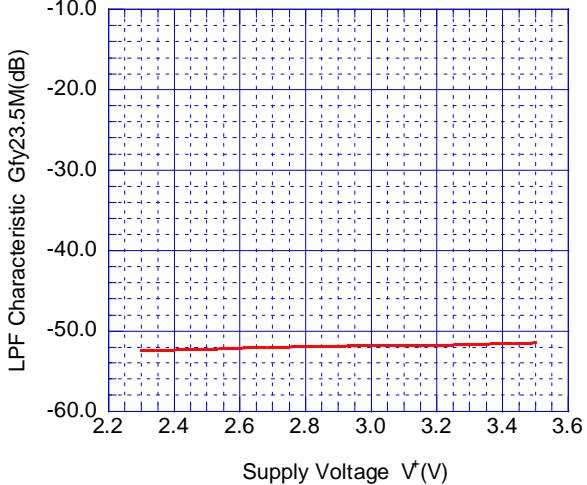


TYPICAL CHARACTERISTICS

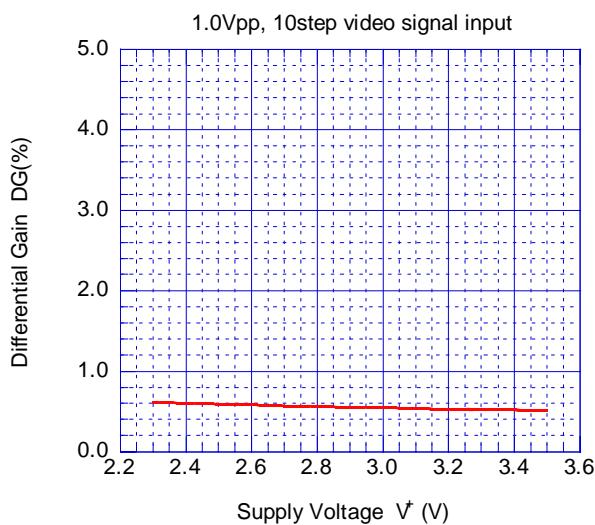
Low Pass Filter Characteristic 3 vs. Supply Voltage
1.0Vpp, 19MHz/100kHz



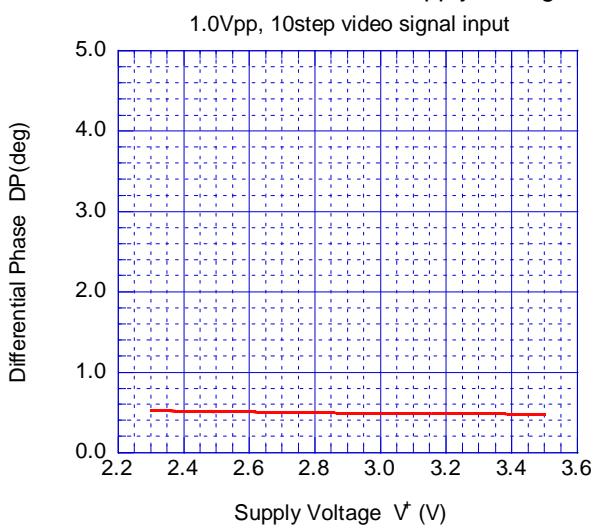
Low Pass Filter Characteristic vs. Supply Voltage
1.0Vpp, 23.5MHz/100kHz



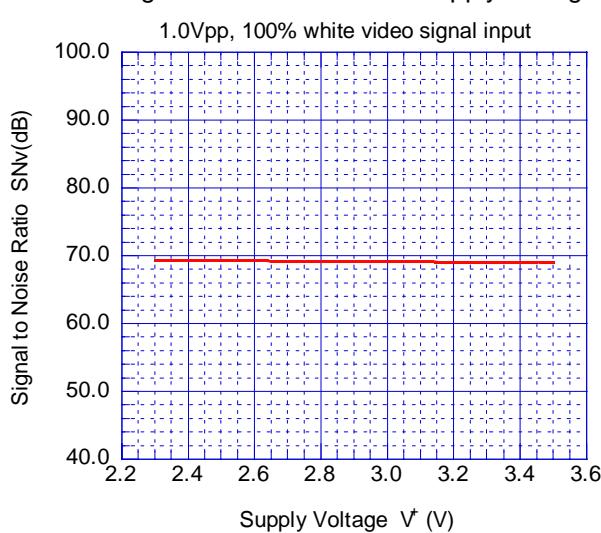
Differential Gain vs. Supply Voltage



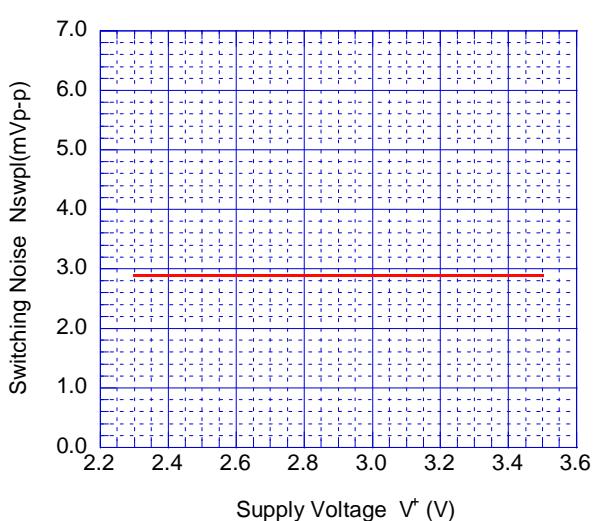
Differential Phase vs. Supply Voltage



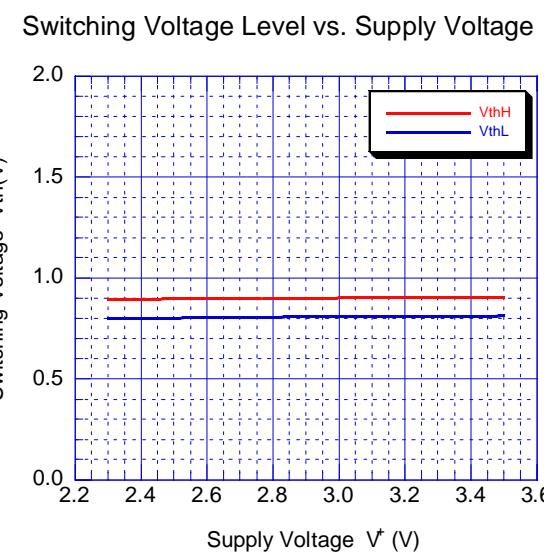
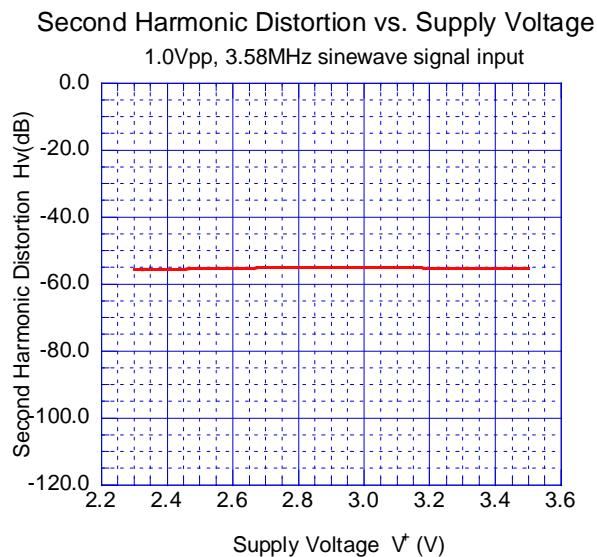
Signal to Noise Ratio vs. Supply Voltage



Switching Noise Level vs. Supply Voltage

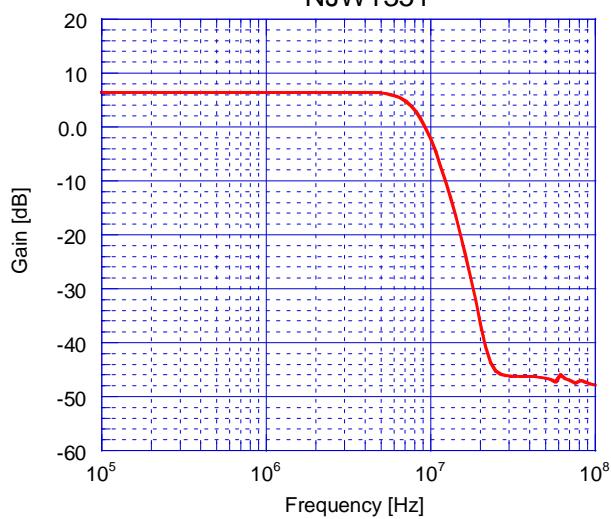


■TYPICAL CHARACTERISTICS



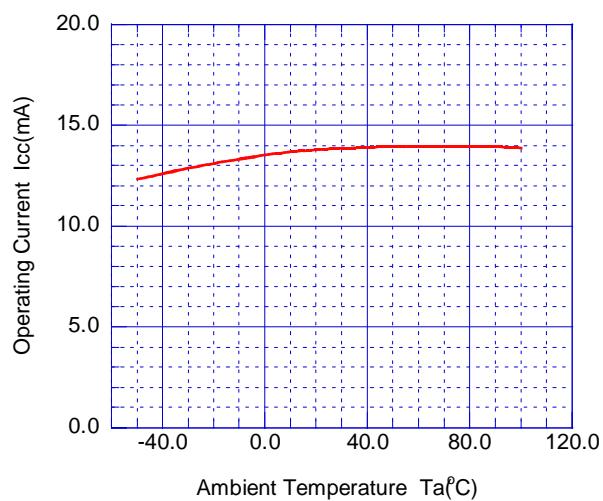
Voltage Gain vs. Frequency

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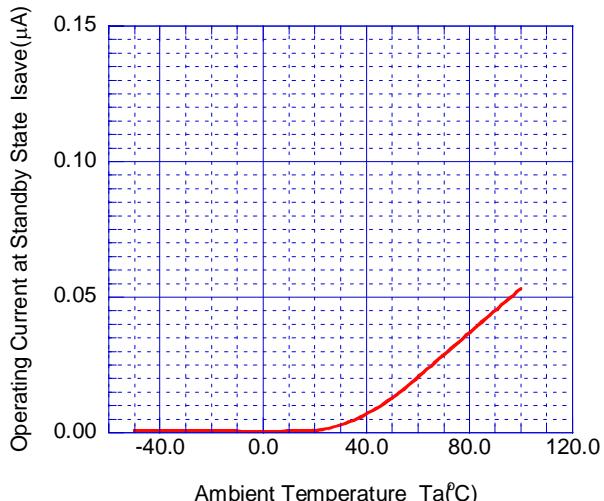


TYPICAL CHARACTERISTICS

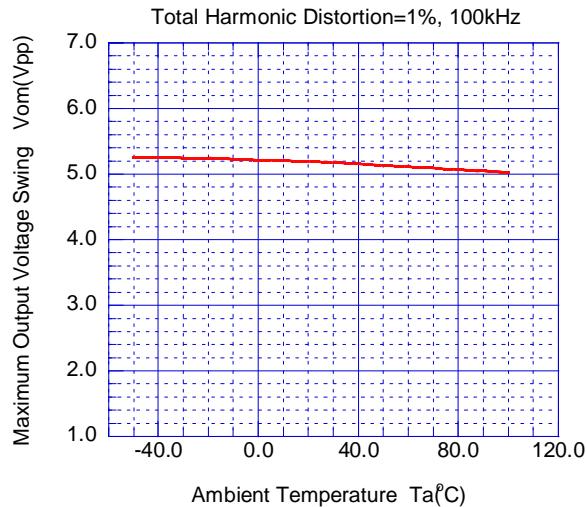
Operating Current vs. Temperature



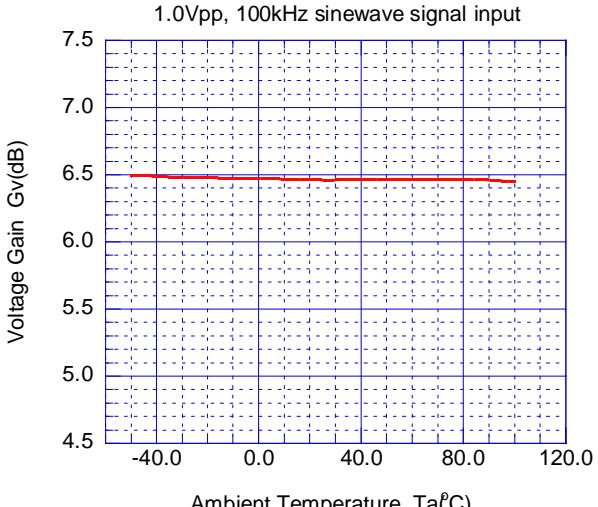
Operating Current at Standby State vs. Temperature



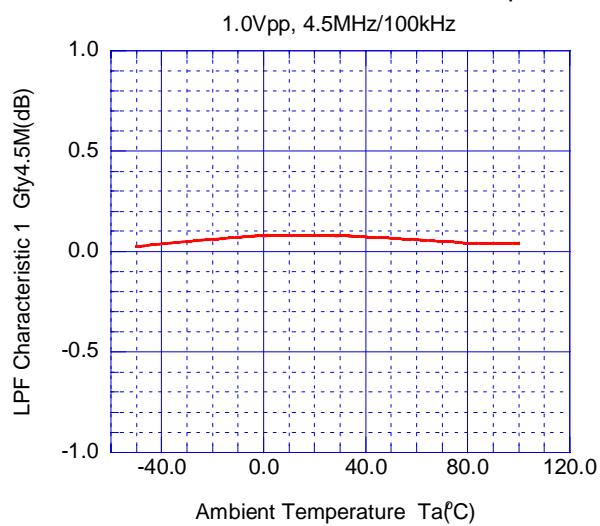
Maximum Output Voltage Swing vs. Temperature



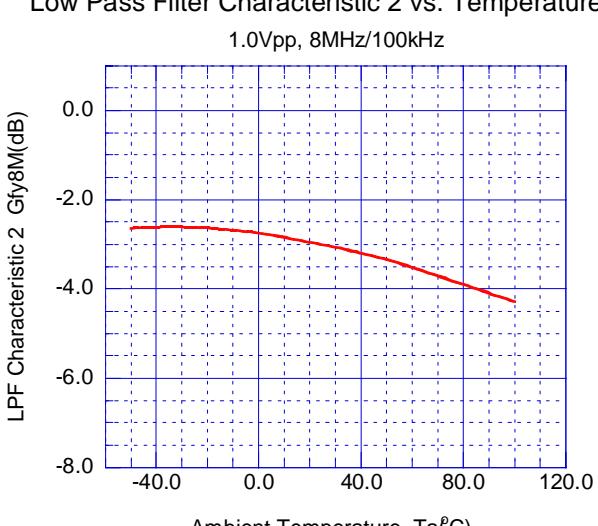
Voltage Gain vs. Temperature



Low Pass Filter Characteristic 1 vs. Temperature



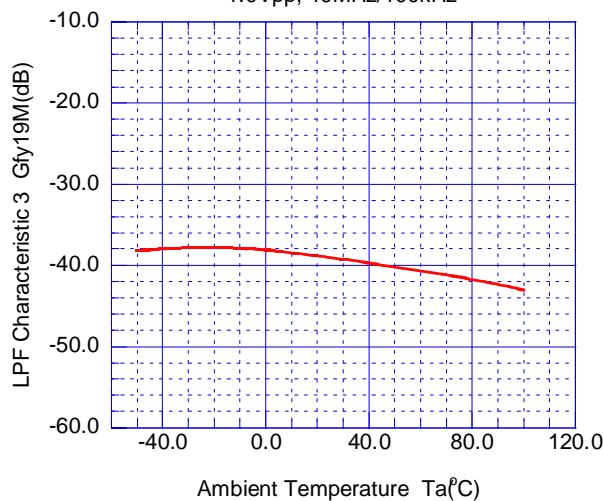
Low Pass Filter Characteristic 2 vs. Temperature



■TYPICAL CHARACTERISTICS

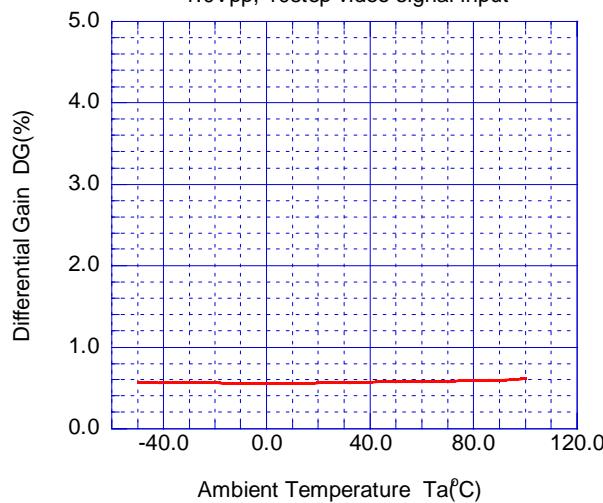
Low Pass Filter Characteristic 3 vs. Temperature

1.0Vpp, 19MHz/100kHz



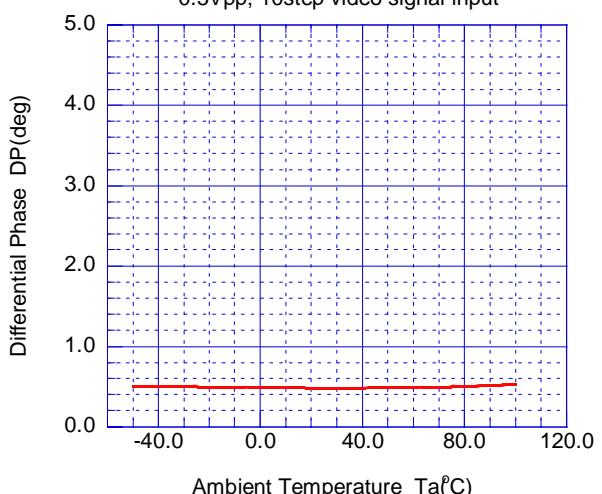
Differential Gain vs. Temperature

1.0Vpp, 10step video signal input



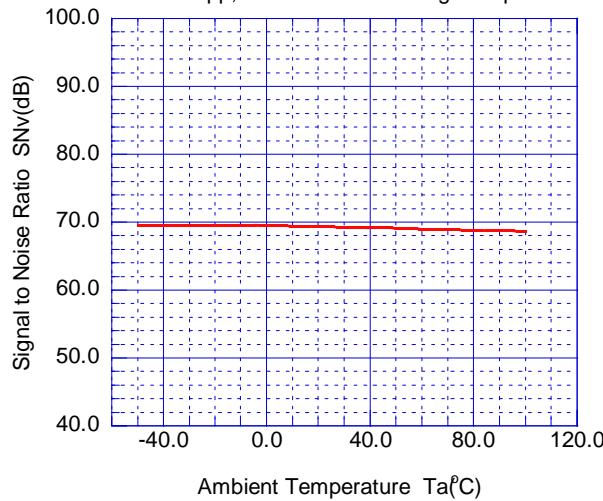
Differential Phase vs. Temperature

0.5Vpp, 10step video signal input

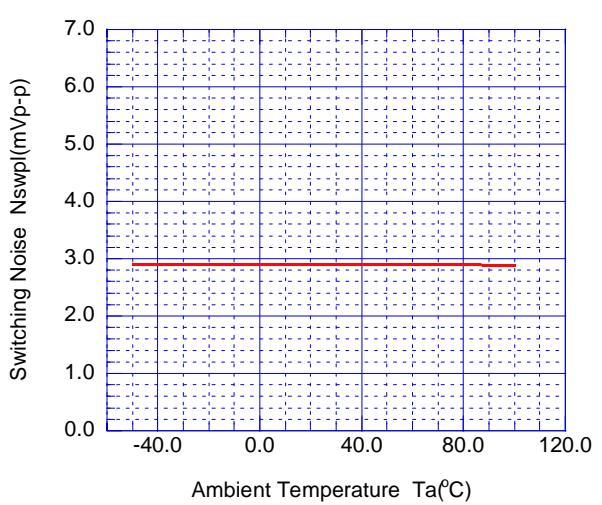


Signal to Noise Ratio vs. Temperature

1.0Vpp, 100% white video signal input



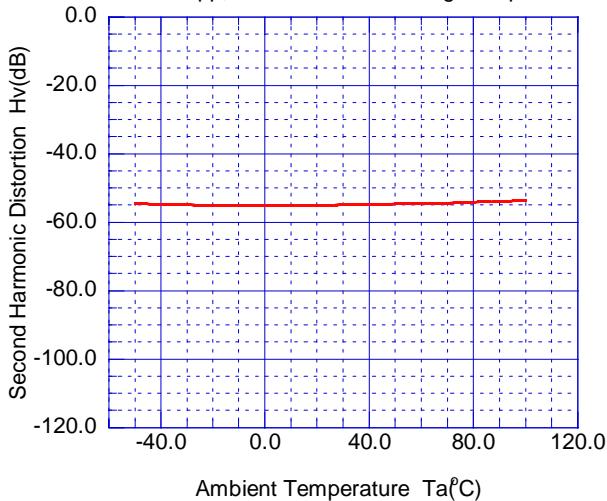
Switching Noise Level vs. Temperature



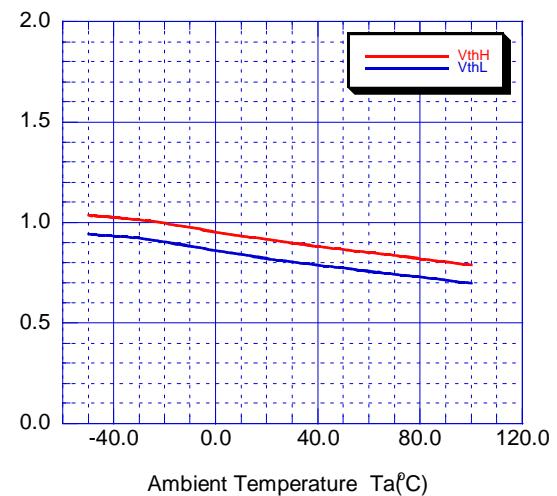
■TYPICAL CHARACTERISTICS

Second Harmonic Distortion vs. Temperature

1.0Vpp, 3.58MHz sinewave signal input



Switching Voltage Level vs. Temperature



[CAUTION]

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[NJW1351RB1-TE1](#) [NJW1351RB1-TE2](#) [NJW1351KK1-TE3](#)



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