LOW VOLTAGE VIDEO AMPLIFIER WITH LPF

■GENERAL DESCRIPTION

The **NJM2561** is a Low Voltage Video Amplifier contained LPF circuit. Internal 75Ω driver is easy to connect TV monitor directly.

The **NJM2561** features low power and small package, and is suitable for low power design on downsizing of DSC and DVC.

The **NJM2561F1A** which is guaranteed DC-coupling output operation is also prepared.

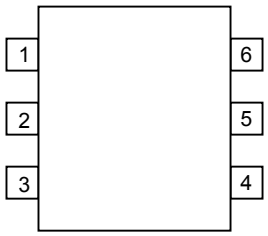
■PACKAGE OUTLINE

NJM2561F1 **NJM2561KG1**

■FEATURES

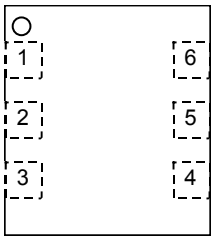
- Operating Voltage 2.8 to 5.5V
- 6^{th} Order LPF -33dB at 19MHz typ.
- 6dB Amplifier
- 75Ω Driver Circuit
- Power Save Circuit
- Bipolar Technology
- Package Outline SOT-23-6 (MTP6), ESON6

■PIN CONFIGURATION



MTP6

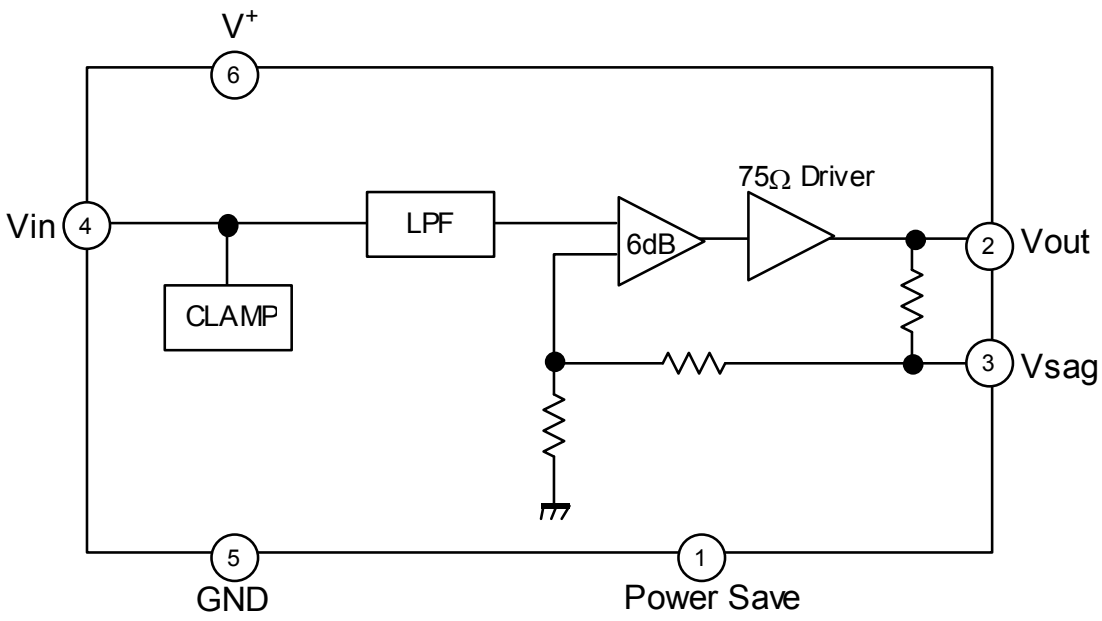
1. Power Save
2. Vout
3. Vsag
4. Vin
5. GND
6. V^+



ESON6

1. Vsag
2. GND
3. Power Save
4. V+
5. Vout
6. Vin

■BLOCK DIAGRAM (Pin Number: MTP6)



■**ABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	7.0	V
Power Dissipation	P_D	410(MTP6) Note1 260(ESON6) Note2 950(ESON6) Note3	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-40 to +125	°C

(Note1) At on a board of EIA/JEDEC specification. (114.3 x 76.2 x 1.6mm 2 layers, FR-4)
(Note1) At on a board of EIA/JEDEC specification. (101.5 x 114.5 x 1.6mm 2 layers, FR-4)
(Note1) At on a board of EIA/JEDEC specification. (101.5 x 114.5 x 1.6mm 4 layers, FR-4)

■ **RECOMMENDED OPEARATING CONDITION** (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		2.8	3.0	5.5	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	-	8.0	12.0	mA
Operating Current at Power Save	Isave	No Signal, Power Save Mode	-	30	50	μA
Maximum Output Voltage Swing	Vom	f=100kHz,THD=1%	2.2	2.5	-	Vp-p
Voltage Gain	Gv	Vin=100kHz, 1.0Vp-p, Input Sine Signal	6.1	6.5	6.9	dB
Low Pass Filter Characteristic	Gfy4.5M	Vin=4.5MHz/100kHz, 1.0Vp-p	-0.6	-0.1	0.4	dB
	Gfy19M	Vin=19MHz/100kHz, 1.0Vp-p	-	-33	-23	
Differential Gain	DG	Vin=1.0Vp-p, 10step Video Signal	-	0.5	-	%
Differential Phase	DP	Vin=1.0Vp-p, 10step Video Signal	-	0.5	-	deg
S/N Ratio	SNv	Vin=1.0Vp-p, R_L=75Ω 100% White Video Signal, 100KHz to 6MHz	-	+60	-	dB
2nd. Distortion	Hv	Vin=1.0Vp-p, 3.58MHz, Sine Signal, R_L=75Ω	-	-50	-	dB
SW Change Voltage High Level	VthPH	Active	1.8	-	V^+	V
SW Change Voltage Low Level	VthPL	Non-active	0	-	0.3	

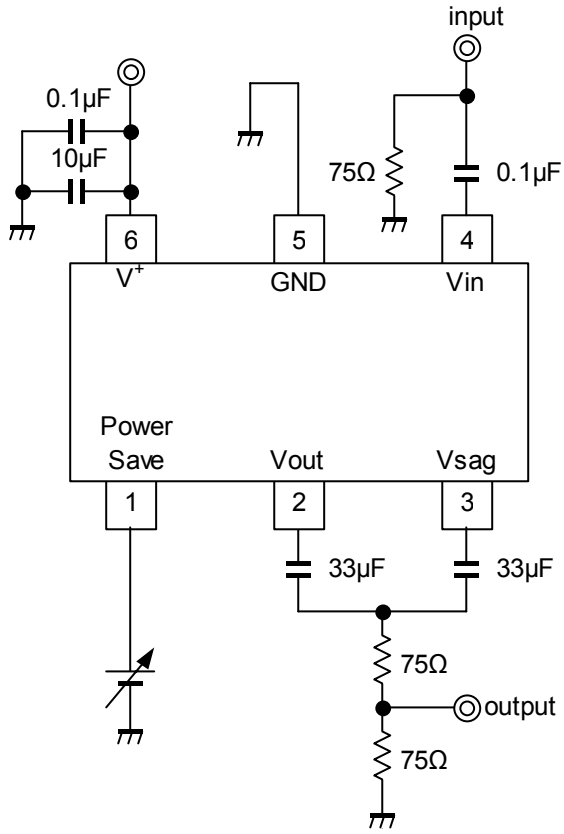
Note:NJM2561F1A is tested to guarantee enough output dynamic range on V^+=3.3V,1.5Vp-p input signal for DC-coupling(output capacitor less) video application.

■**CONTROL TERMINAL**

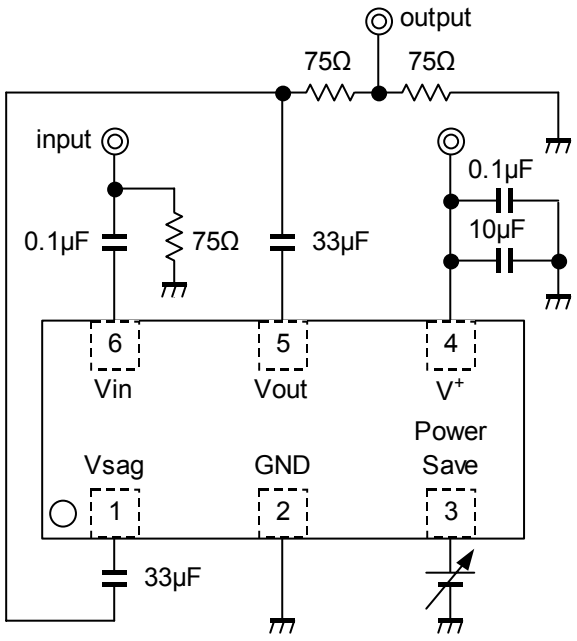
PARAMETER	STATUS	NOTE
Power Save	H	Power Save: OFF(Active)
	L	Power Save: ON (Mute)
	OPEN	Power Save: ON (Mute)

■TEST CIRCUIT

(MTP6)

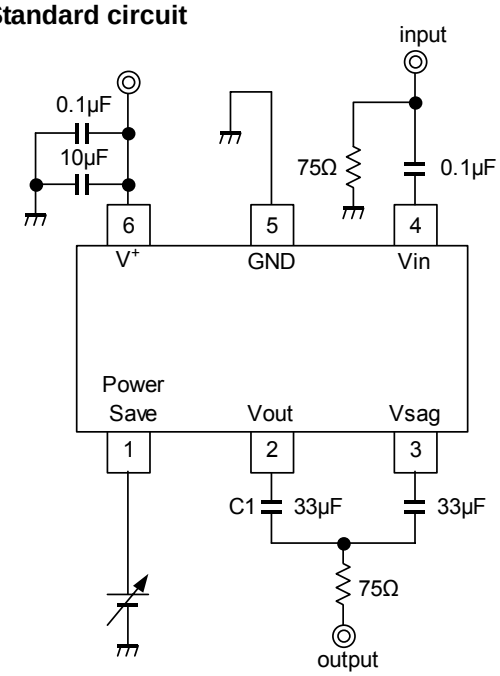


(ESON6)

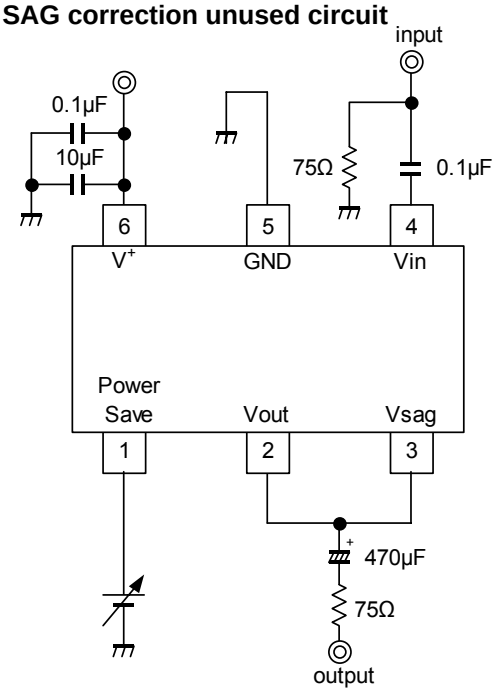


■ APPLICATION CIRCUIT (MTP6)

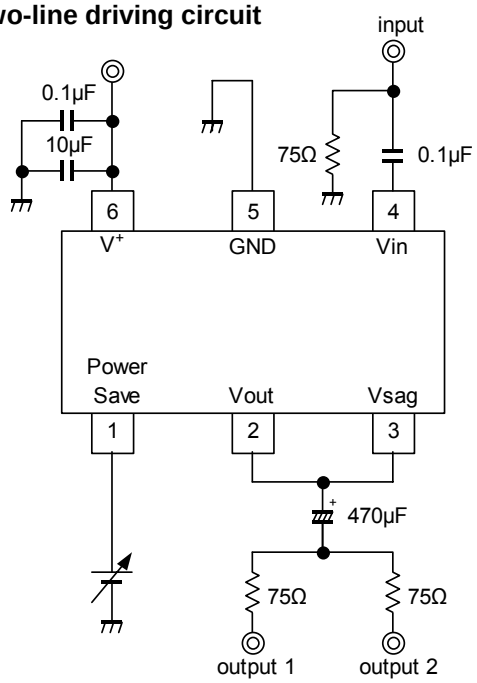
(1) Standard circuit



(2) SAG correction unused circuit



(3) Two-line driving circuit



(1) Standard circuit

This circuit is for a portable equipment of small mounting space.
The SAG correction reduces output coupling capacitor values.
However, this circuit may cause to SAG deterioration, and lose synchronization by luminance fluctuation.
Adjust the C1 value, checking the waveform containing a lot of low frequency components like a bounce waveform (Worst condition waveform of SAG). Change the capacitor of C1 into a large value to improve SAG.

(2) SAG correction unused circuit

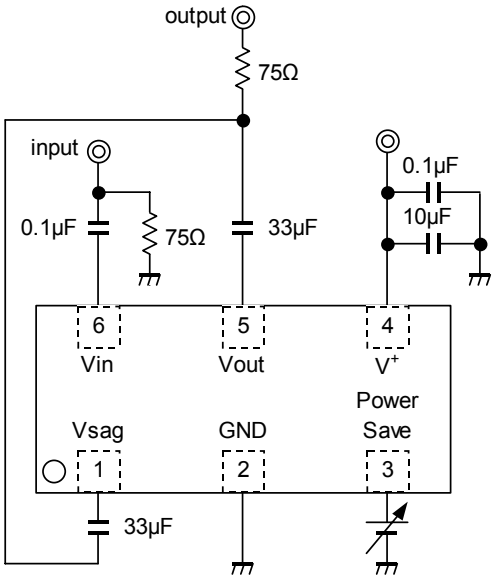
We recommend this circuit when there is no space limitation.
Connect the coupling capacitor after connecting the Vout pin and Vsag pin. The recommended value is 470μF or more.

(3) Two-line driving circuit

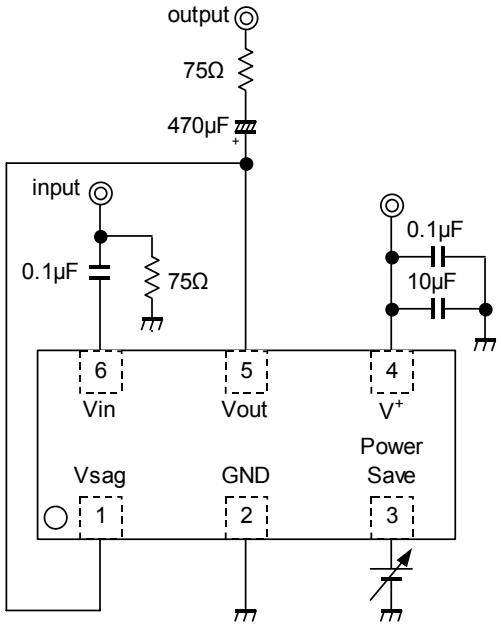
This circuit drives two-line of 150Ω. However, it may cause to lose synchronization by an input signal of large APL change (100% white signals more than 1Vp-p). Confirm the large APL change waveform (100% white signals more than 1Vp-p) and evaluate sufficiently.

■ APPLICATION CIRCUIT (ESON6)

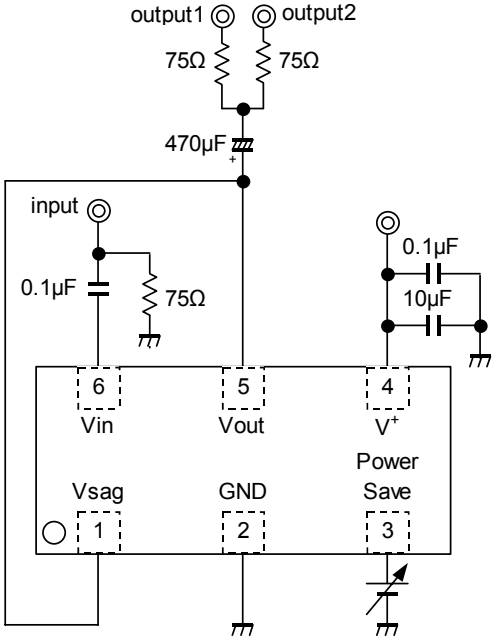
(1) Standard circuit



(2) SAG correction unused circuit



(3) Two-line driving circuit



(1) Standard circuit

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(2) SAG correction unused circuit

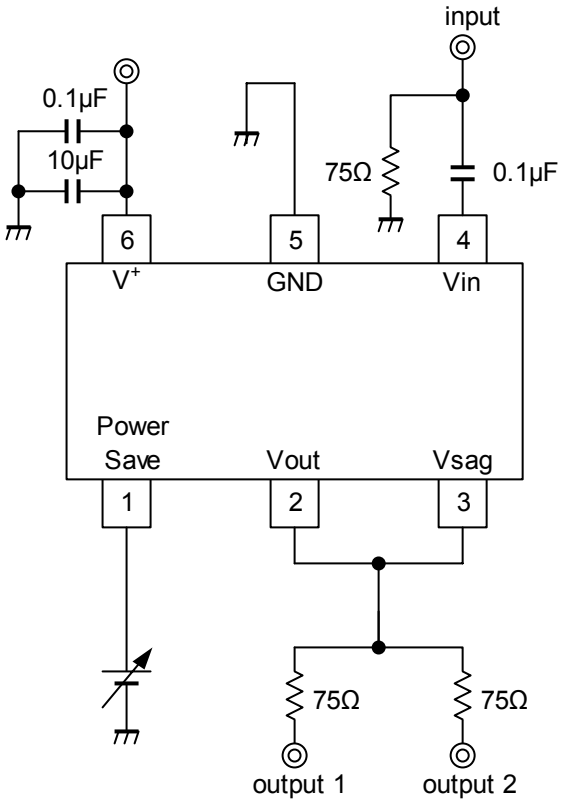
We recommend this circuit when there is no space limitation.
Connect the coupling capacitor after connecting the Vout pin and Vsag pin. The recommended value is 470μF or more.

(3) Two-line driving circuit

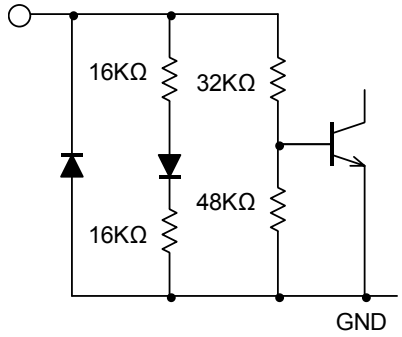
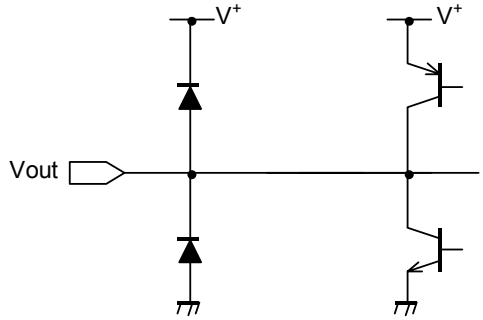
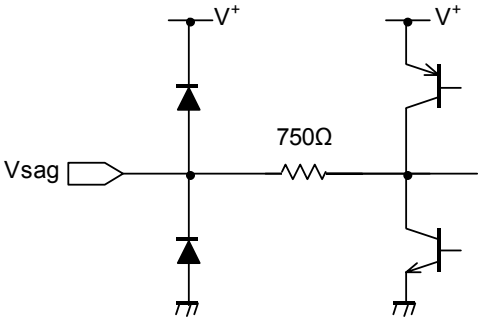
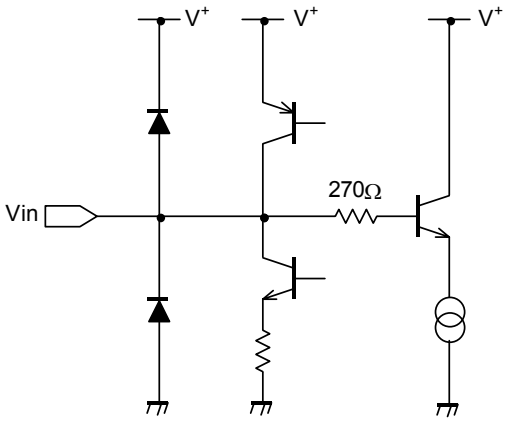
This circuit drives two-line of 150Ω. However, it may cause to lose synchronization by an input signal of large APL change (100% white signals more than 1Vp-p). Confirm the large APL change waveform (100% white signals more than 1Vp-p) and evaluate sufficiently.

■ **NJM2561F1A APPLICATION CIRCUIT (MTP6 only)**

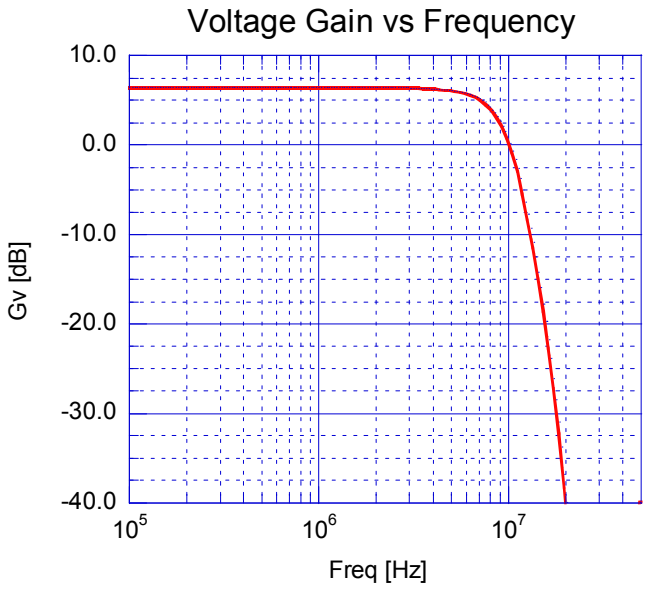
(1) Standard circuit

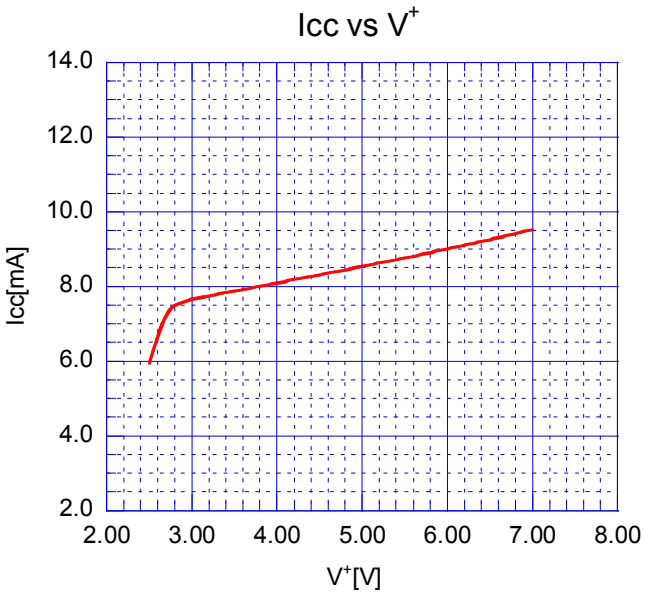


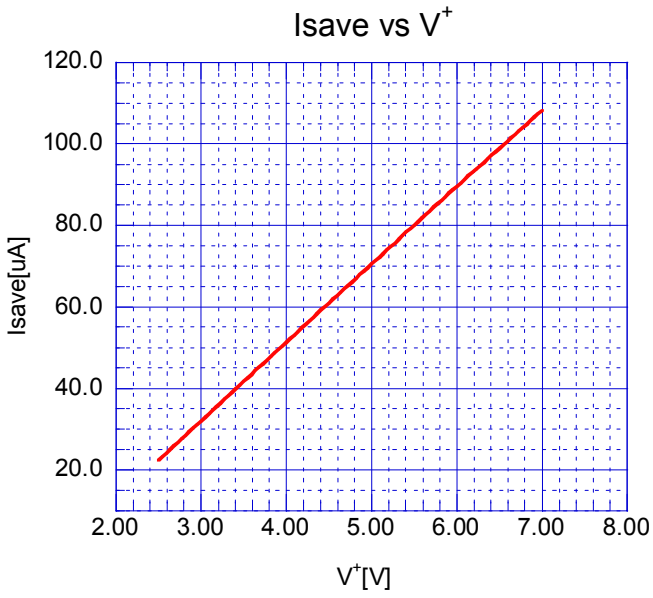
■ **TERMINAL DESCRIPTION**

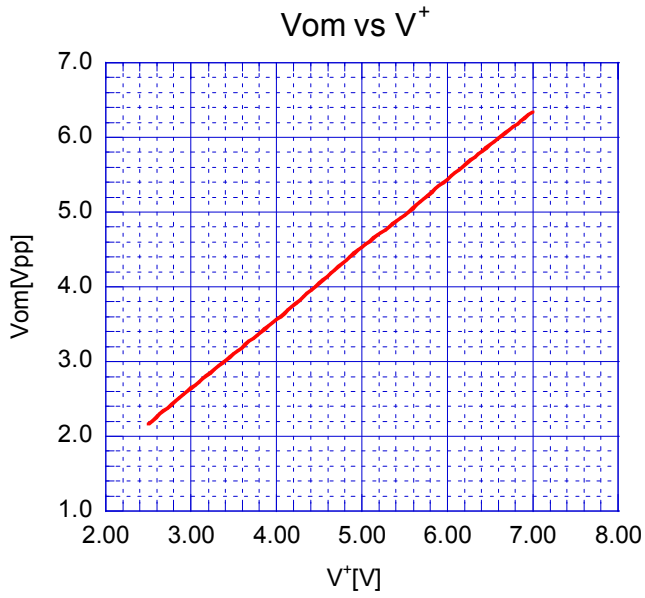
PIN No.		SYMBOL	VOLTAGE	EQUIVALENT CIRCUIT
MTP6	ESON6			
1	3	Power Save	-	
2	5	Vout	0.33V	
3	1	Vsag	-	
4	6	Vin	1.10V	
5	2	GND	-	
6	4	V^+	3V	

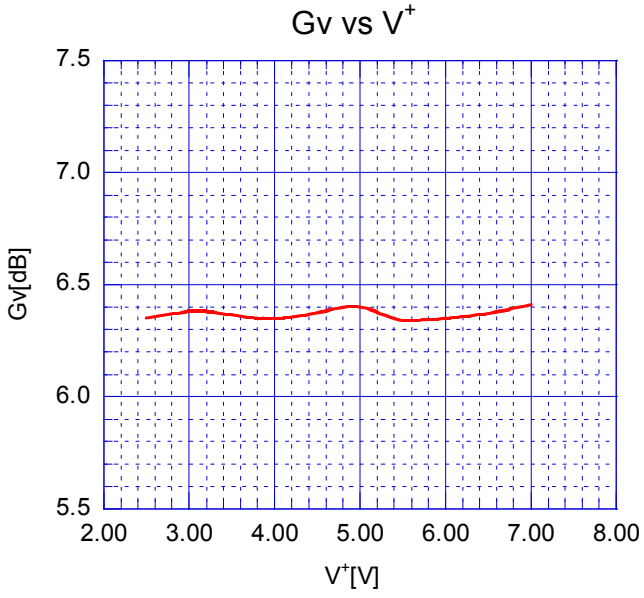
■TYPICAL CHARACTERISTICS





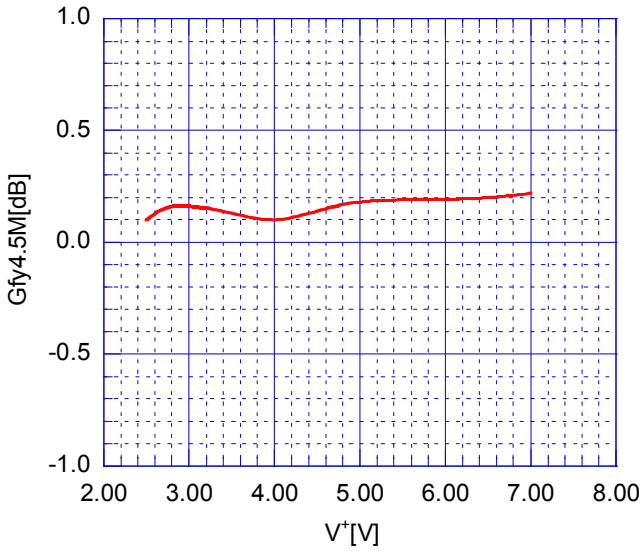




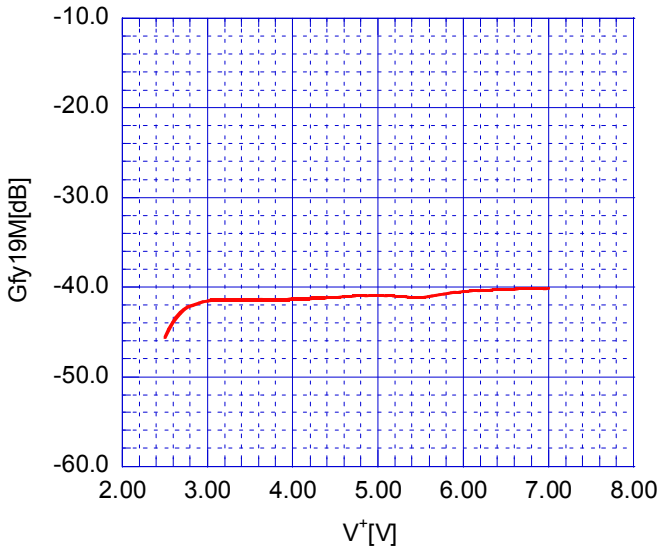


■TYPICAL CHARACTERISTICS

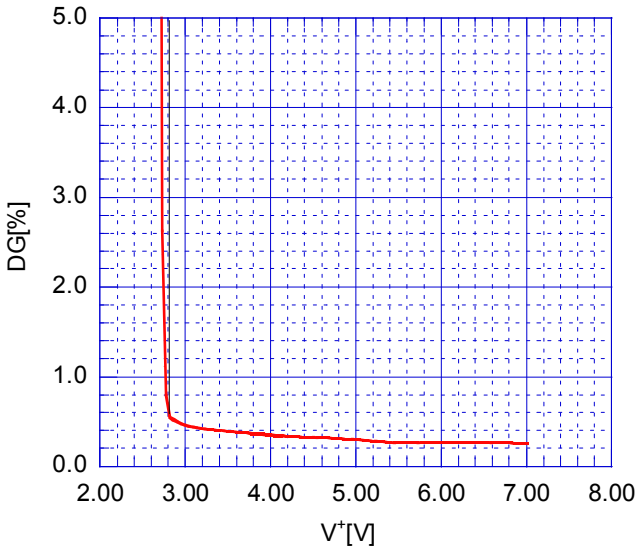
Gfy4.5M vs V^+



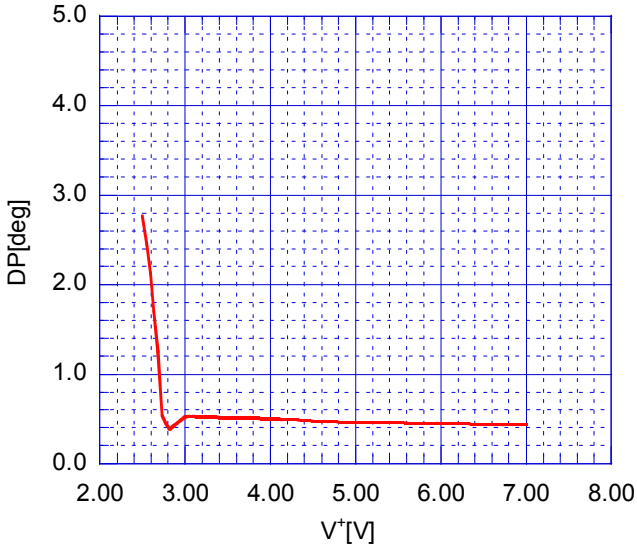
Gfy19M vs V^+



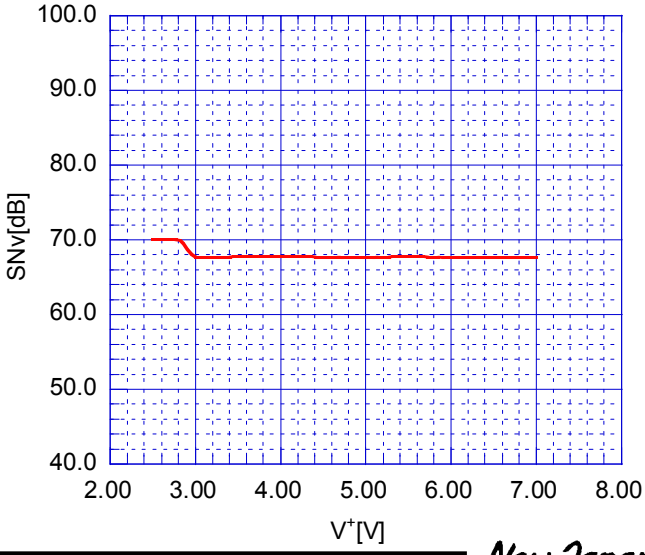
DG vs V^+



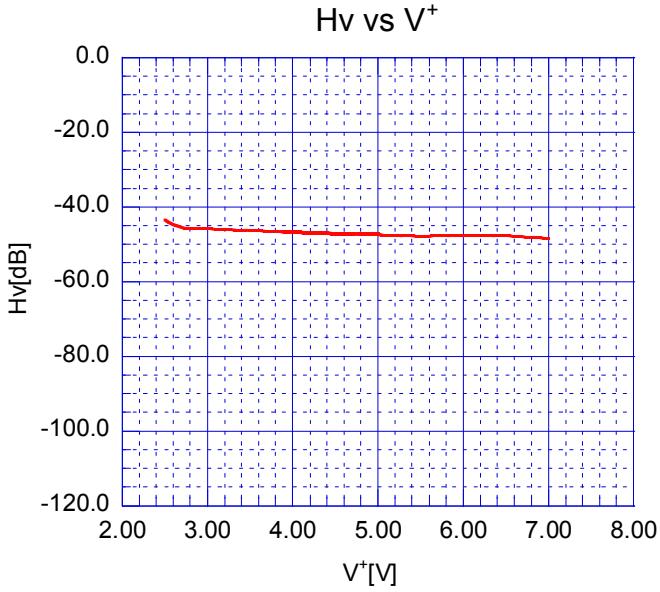
DP vs V^+



SNv vs V^+

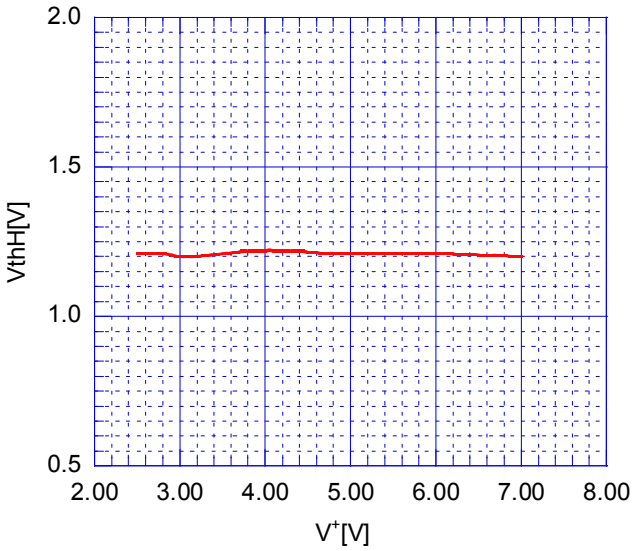


Hv vs V^+

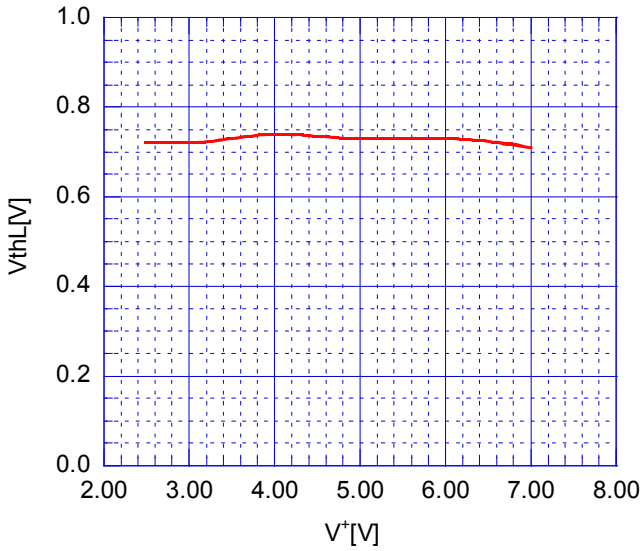


■TYPICAL CHARACTERISTICS

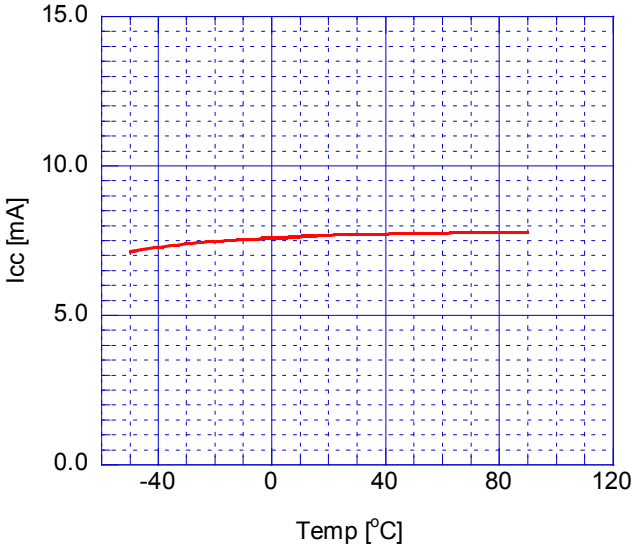
VthH vs V^+



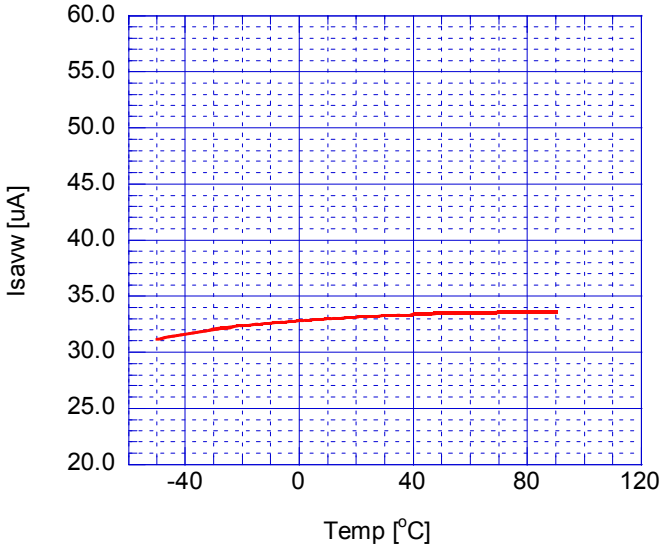
VthL vs V^+



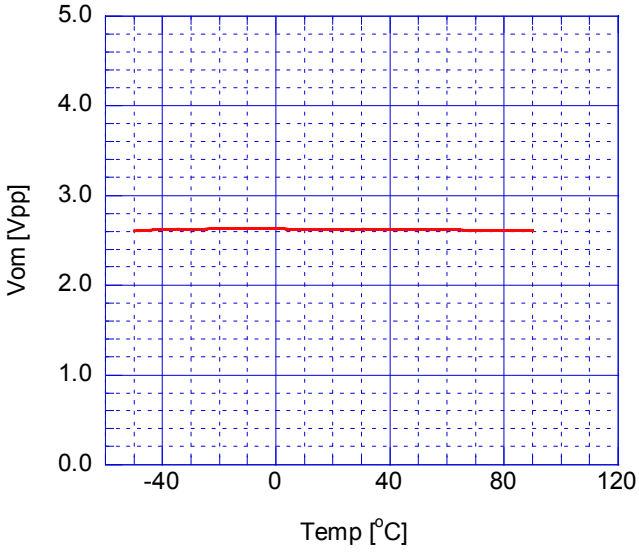
Icc vs Temp.



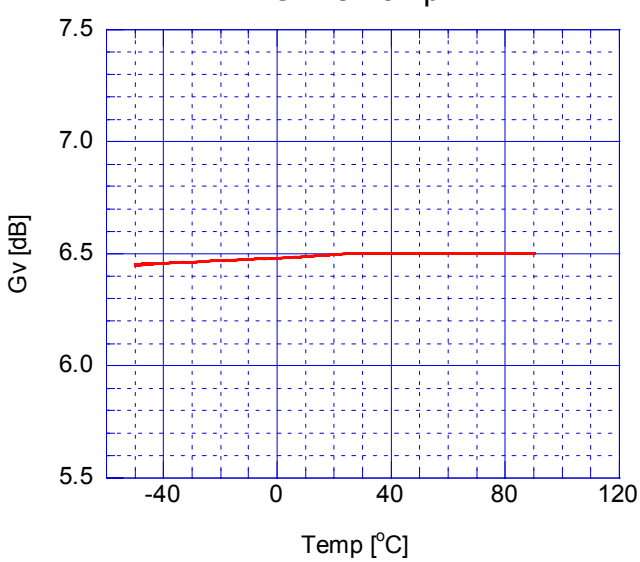
Isave vs Temp.



Vom vs Temp.

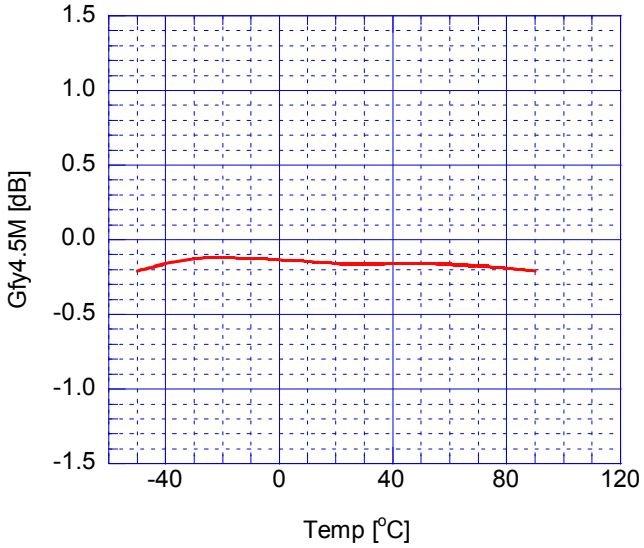


Gv vs Temp.

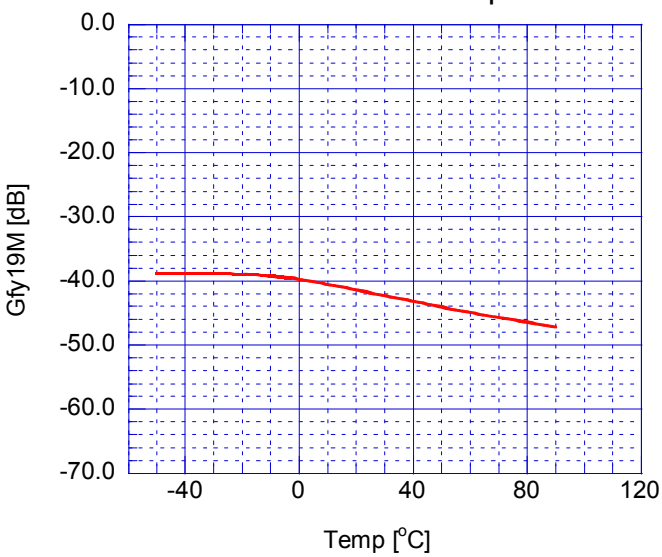


■TYPICAL CHARACTERISTICS

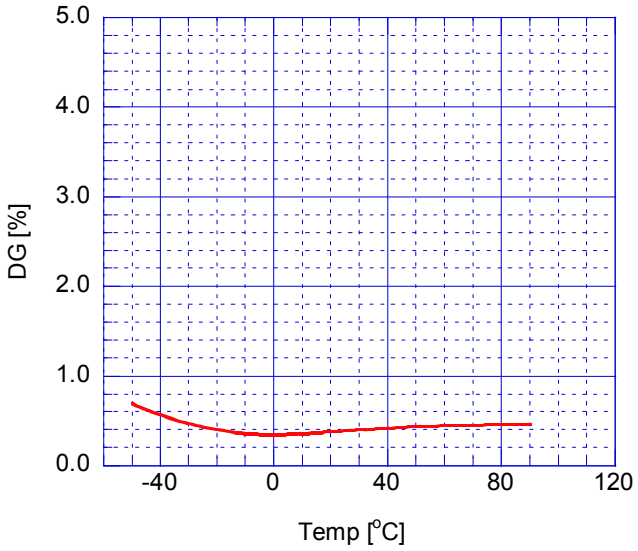
LPF4.5M vs Temp.



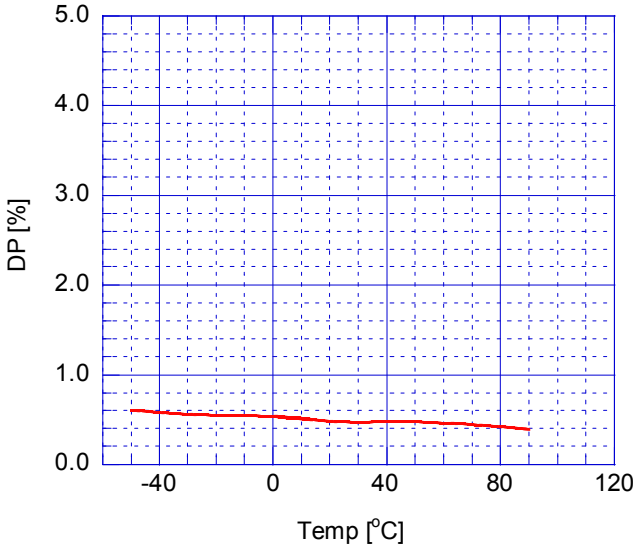
LPF19M vs Temp.



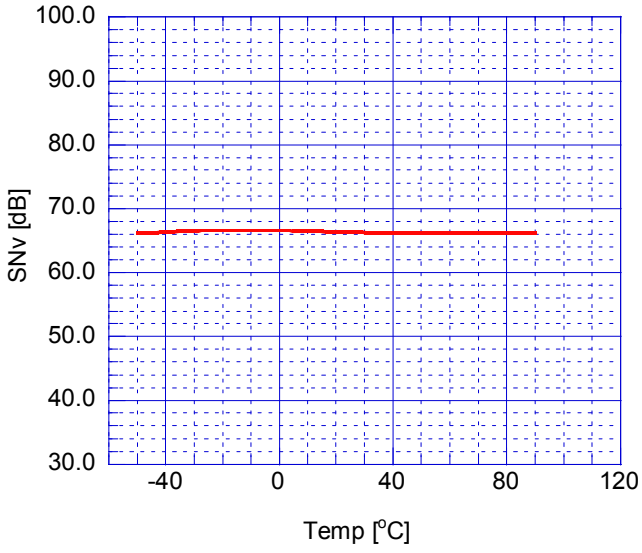
DG vs Temp.



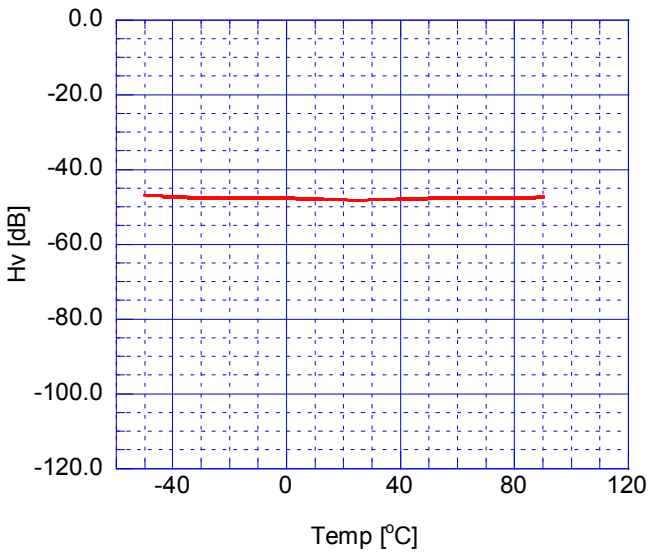
DP vs Temp.



SNv vs Temp.



Hv vs Temp.



■TYPICAL CHARACTERISTICS