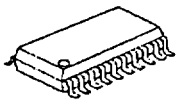
VIDEO AMPLIFIER WITH 75Ω DRIVER

■ DESCRIPTION

The NJM2538is a video amplifier with 75Ω drivers, which includes LPF and BPF of both Y and C system.

It is capable of composing the output circuit of digital video items with a little external parts, because it consists of black and white 2 level imposer, gain controller, Y/C mixer, and SDCinterface. Also it is most suitable for portable items because of small consumption.

■ PACKAGE OUTLINE

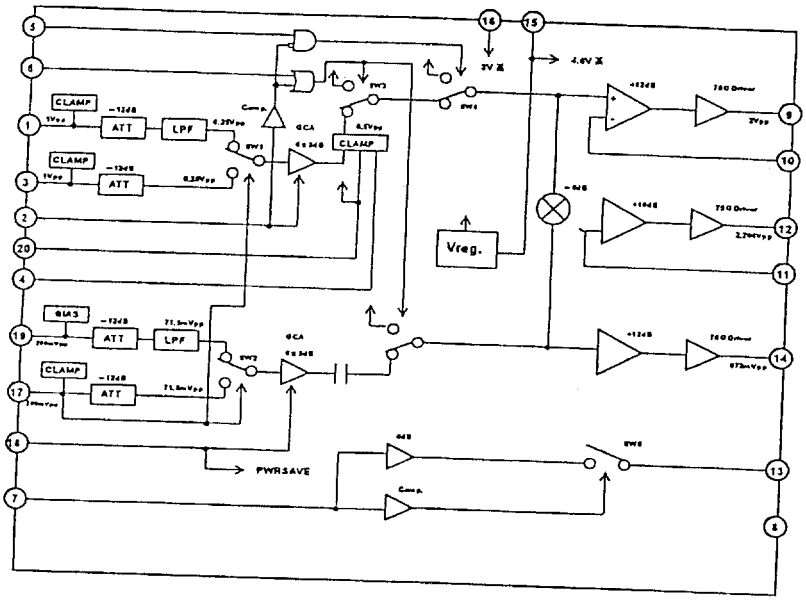


NJM2538V

■ FEATURES

- Operating Voltage $V^+1=4.5\sim5.3V$、$V^+2=2.7\sim5.3V$
- Low Power 110mW
- Internal Black and White 2Level Imposer
- Internal Gain Controller
- Internal SDC Interface
- Bipolar Technology
- Package Outline SSOP20

■ PIN CONFIGURATION AND BLOCK DIAGRAM



1. YIN1
2. GCA CTL/MUTE
3. YIN2
4. CLAMP
5. CHARA
6. BLANK
7. WIDE
8. GND
9. YOUT
10. YSAG
11. VSAG
12. VOUT
13. SDCOUT
14. COUT
15. V^+1
16. V^+2
17. CIN2/INCEL
18. GCA CTL2/PWRSAVE
19. CIN1
20. CLAMP REF

■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	7.0	V
Power Dissipation	P_D	300	mW
Operating Temperature Range	Topr	-20～+85	℃
Storage Temperature Range	Tstg	-40～+125	℃

■ ELECTRICAL CHARACTERISTICS (Ta=25℃, V^+1=4.8V, V^+2=3.0V, R_L=150Ω)

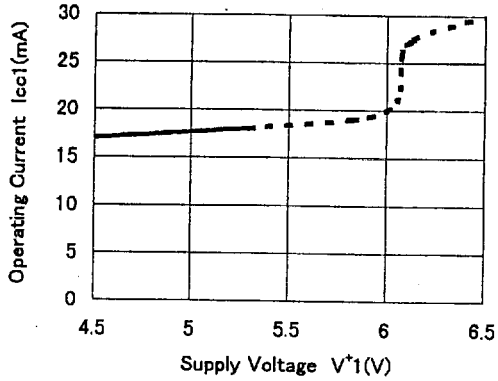
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current 1	Icc1	V^+1=4.8V, No Signal	—	18.0	28.0	mA
		V^+1=4.8V, Power Save	—	3.0	3.5	mA
Operating Current 2	Icc2	V^+2=3.0V, No Signal	—	7.6	12.0	mA
		V^+2=3.0V, Power Save	—	0.5	1	mA
【 Y Amplifier 】						
Voltage Gain 1	Gv_Y1	$Y_{IN}1, Y_{IN}2 \rightarrow Y_{OUT}$, GCACTL=0.5V 100kHz, 1Vpp Sign-Signal Input	-3.0	0	+3.0	dB
Voltage Gain 2	Gv_Y2	$Y_{IN}1, Y_{IN}2 \rightarrow Y_{OUT}$, GCACTL=2.5V 100kHz, 1Vpp Sign-Signal Input	+7.0	+9.0	+11.0	dB
Frequency Characteristic (IN2)	Gf_Y	10MHz/100kHz (200mVpp Sign-Signal Input)	-3.0	0	+3.0	dB
【 V Amplifier 】						
Voltage Gain 1	Gv_V1	$Y_{IN}1, Y_{IN}2 \rightarrow Y_{OUT}$, GCACTL=0.5V 100kHz, 1Vpp Sign-Signal Input	-3.0	0	+3.0	dB
Voltage Gain 2	Gv_V2	$Y_{IN}1, Y_{IN}2 \rightarrow Y_{OUT}$, GCACTL=2.5V 100kHz, 1Vpp Sign-Signal Input	+7.0	+9.0	+11.0	dB
Frequency Characteristic (IN2)	Gf_V	10MHz/100kHz (200mVpp Sign-Signal Input)	-3.0	0	+3.0	dB
【 C Amplifier 】						
Voltage Gain 1	Gv_C1	$C_{IN}2 \rightarrow C_{OUT}$, GCACTL=0.5V 4MHz, 286mVpp Sign-Signal Input	-3.0	0	+3.0	dB
Voltage Gain 2	Gv_C2	$C_{IN}2 \rightarrow C_{OUT}$, GCACTL=2.5V 4MHz, 286mVpp Sign-Signal Input	+7.0	+9.0	+11.0	dB
Frequency Characteristic (IN2)	Gf_C	7MHz/4MHz (286mVpp Sign-Signal Input)	-3.0	0	+3.0	dB
【 Filter 】						
YPF(YIN1)	Gf_{Y6M}	6MHz/100kHz, 200mVpp Sign-Signal Input	-0.5	0	—	dB
	$Gf_{Y7.2M}$	7.2MHz/100kHz, 200mVpp Sign-Signal Input	-1.0	0	—	dB
	Gf_{Y20M}	20MHz/100kHz, 200mVpp Sign-Signal Input	—	-30	-20	dB
	DL_Y	Gruop Delay: | GD3MHz-GD6MHz |	—	10	100	nsec
BPF(CIN1)	Gf_{C4M}	fo=4MHz, 200mVpp Sign-Signal Input	—	0	—	dB
	$Gf_{C\pm1M}$	fo=±1MHz/4MHz, 200mVpp Sign-Signal Input	-0.5	0	—	dB
	$Gf_{C\pm1.6M}$	fo=±1.6MHz/4MHz, 200mVpp Sign-Signal Input	-3.0	0	—	dB
	Gf_{C100K}	500kHz/4MHz, 200mVpp Sign-Signal Input	—	-15	-10	dB
	Gf_{C20M}	20MHz/4MHz, 200mVpp Sign-Signal Input	—	-25	-10	dB
	DL_C	Group Delay: | GD2MHz-GD6MHz |	—	60	90	nsec

■ ELECTRICAL CHARACTERISTICS (Ta=25℃, V^+1=4.8V, V^+2=3.0V, R_L=150Ω)

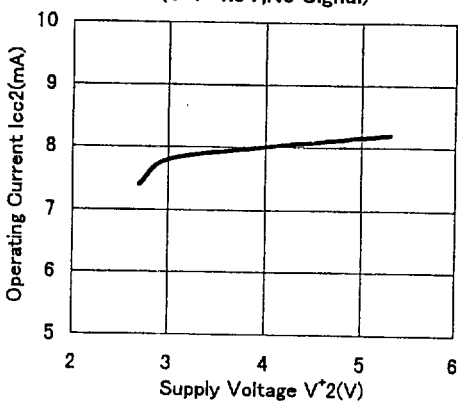
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
【 YC Delay 】						
YC Relative Difference Delay	T_{YC}	T_{YOUT}-T_{COUT} at 4MHz	—	+25	—	nsec
【 YC Output between Closstalk 】						
Closstalk 1	CT1	YIN1, 2→COUT 3.58MHz(Red Field Video Signal)	—	-40	—	dB
Closstalk 2	CT2	CIN1, 2→YOUT 3.58MHz(Red Field Video Signal)	—	-40	—	dB
【 S/N 】						
Y Output	SN_Y	Band 100kHz～6MHz, 75Ω Terminal 100% White Video Signal	—	-50	—	dB
V Output	SN_V	Band 100kHz～6MHz, 75Ω Terminal 100% White Video Signal	—	-50	—	dB
C Output	SN_{CAM}	Band 100kHz～500kHz, AM, 75Ω Terminal Red Field Video Signal	—	-58	—	dB
	SN_{CPM}	Band 100kHz～500kHz, PM, 75Ω Terminal Red Field Video Signal	—	-53	—	dB
【 Maximum Output Range 】						
Y-OUT	V_{OYM}	100kHz, Sign-Signal Input 75Ω Terminal	1.2	—	—	Vpp
V-OUT	V_{OVM}	100kHz, Sign-Signal Input 75Ω Terminal	1.2	—	—	Vpp
C-OUT	V_{OCM}	100kHz, Sign-Signal Input 75Ω Terminal	1.08	—	—	Vpp
【 Second Distortion 】						
Y, V Output	Gf_{Y8M}	6MHz/100kHz, 200mVpp Sign-Signal Input	—	-40	-30	dB
C Output	$Gf_{Y7.2M}$	7.2MHz/100kHz, 200mVpp Sign-Signal Input	—	-40	-30	dB
【 Super Impose 】						
Character Level	V_{CHA}	Output Range 1Vpp:100IRE/SYNC:40IRE	70	80	95	IRE
	V_{SET}	Output Range 1Vpp:100IRE/SYNC:40IRE	0	5	18	IRE
【 INCEL Control Signal 】						
L Level		L Level Guarantee Spec	GND	—	0.2	V
【 Impose Control Signal 】						
H Level	V_{CH}	H Level Guarantee Spec	1.4	—	3.0	V
L Level	V_{CL}	L Level Guarantee Spec	GND	—	0.6	V
【 GCA Control Signal 】						
GCACTLY	$V_{GC}1$	GCA Control Voltage Range	0.5	—	3.0	V
	$V_{GL}1$	MUTE Change Guarantee Spec	GND	—	,0.3	V
GCACTLC	$V_{GC}2$	GCA Control Voltage Range	0.5	—	V^+2	V
	$V_{GL}2$	Power Down Change Guarantee Spec	GND	—	0.3	V
【 SDC 】						
WIDE 1	$V_{SDC}1$	WIDE→SDC Voltage Gain WIDE=0.5～3.0V	5.5	6.0	6.5	dB
WIDE 2	$V_{SDC}2$	SDC Hi Resistance Guarantee Spec	—	—	0.3	V
Output Resistance	R_{SDC}	SDCOUT Hi Resistance	—	220	—	kΩ
Maximum Output Voltage	$V_{SDC}3$	110kΩ Resistance	4.0	—	—	V

■ TYPICAL CHARACTERISTICS

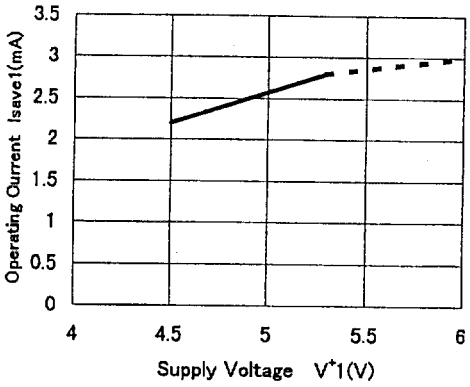
Operating Current vs. Supply Voltage
(V^+2=3V,No Signal)



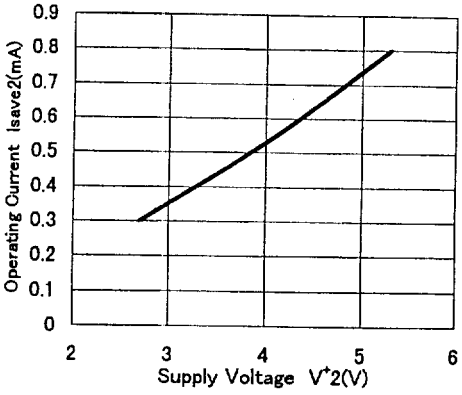
Operating Current vs. Supply Voltage
(V^+1=4.8V,No Signal)



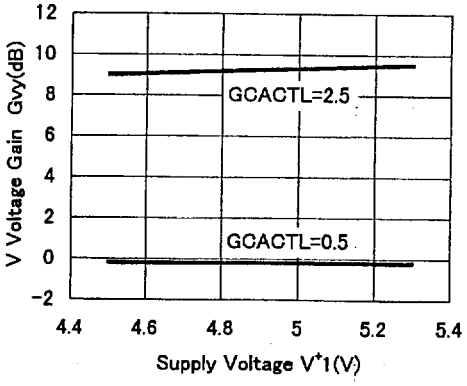
Operating Current vs. Supply Voltage
(V^+2=3V,Power Save)



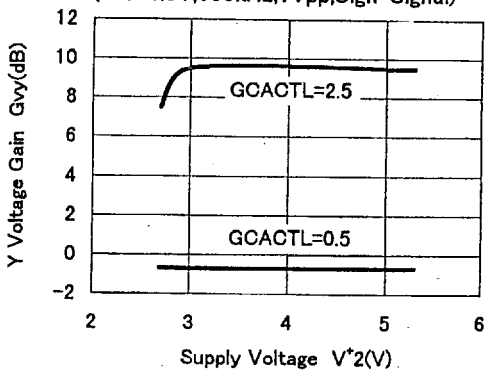
Operating Curremt vs. Supply Voltage
(V^+1=4.8V,Power Save)



Y Voltage Gain vs. Supply Voltage
(V^+2=3V,100kHz,1Vpp,Sigh-Signal)

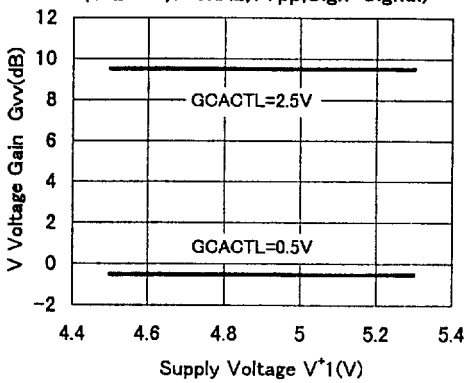


Y Voltage Gain vs. Supply Voltage
(V^+1=4.8V,100kHz,1Vpp,Sign-Signal)

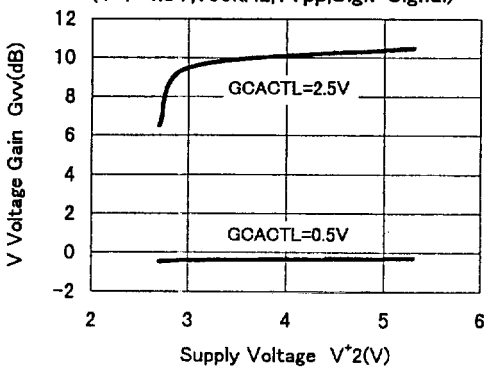


■ TYPICAL CHARACTERISTICS

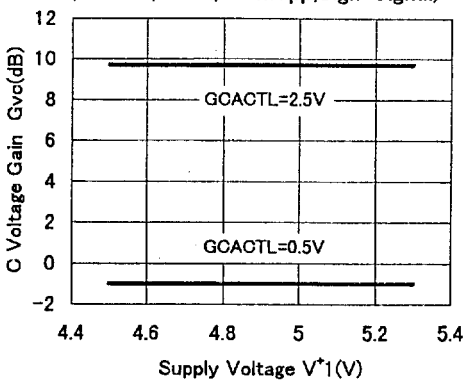
V Voltage Gain vs. Supply Voltage
(V^+2=3V,100kHz,1Vpp,Sign-Signal)



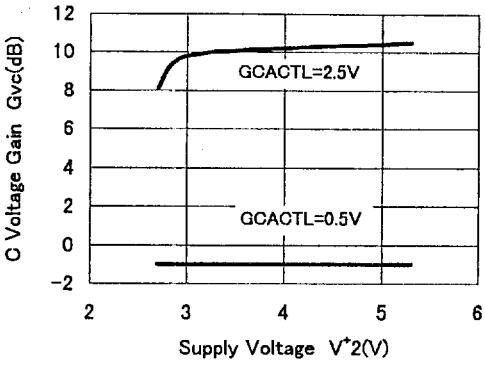
V Voltage Gain vs. Supply Voltage
(V^+1=4.8V,100kHz,1Vpp,Sign-Signal)



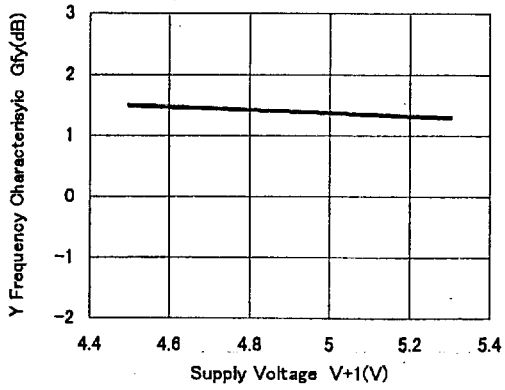
C Voltage Gain vs. Supply Voltage
(V^+2=3V,4MHz,286mVpp,Sign-Signal)



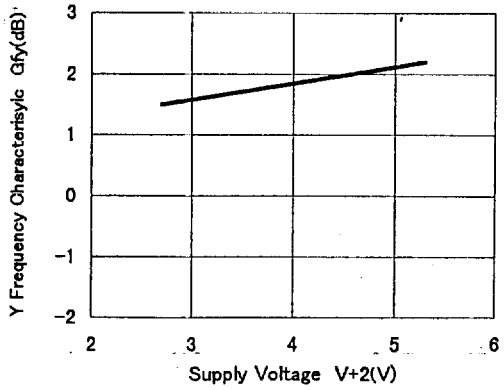
C Voltage Gain vs. Supply Voltage
(V^+1=4.8V,4MHz,286mVpp,Sign-Signal)



Y Frequency Characteristic vs. Supply Voltage
(IN2,10MHz/100kHz)

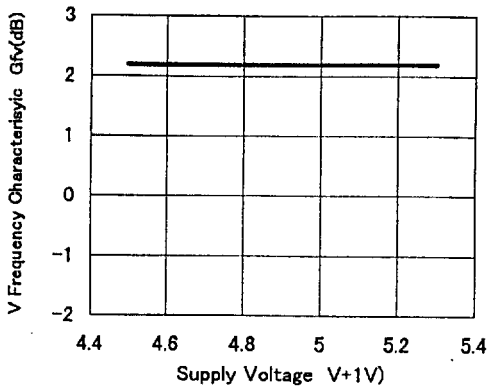


Y Frequency Characteristic vs. Supply Voltage
(IN2,10MHz/100kHz)

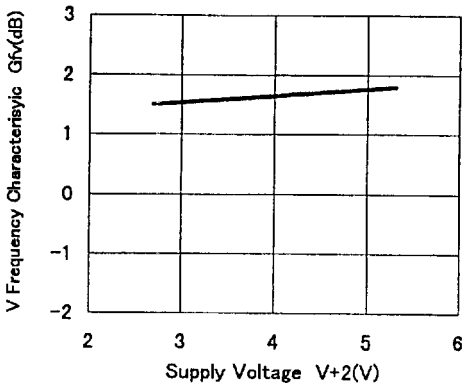


■ TYPICAL CHARACTERISTICS

V Frequency Characteristic vs. Supply Voltage
(IN2,10MHz/100kHz)



V Frequency Characteristic vs. Supply Voltage
(IN2,10MHz/100kHz)



C Frequency Characteristic vs. Supply Voltage
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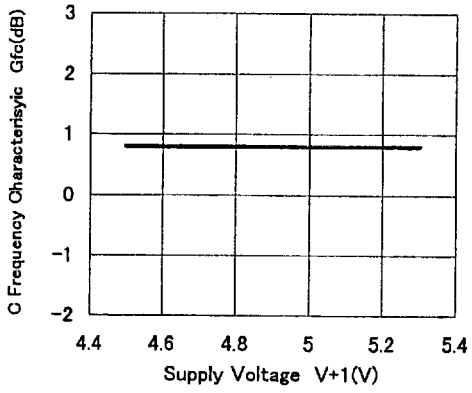

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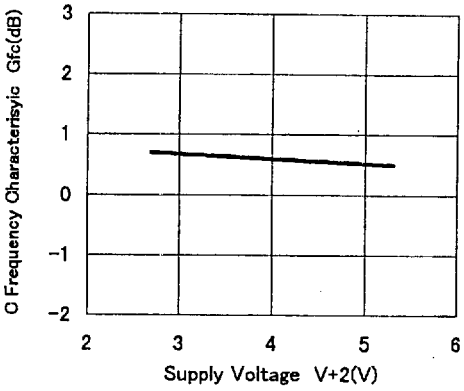
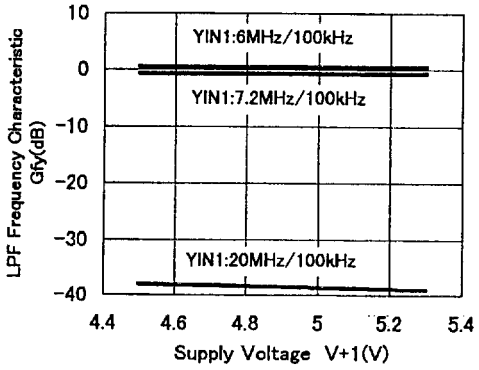
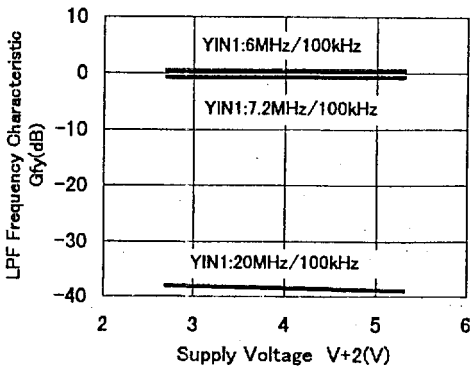


LPF vs. Supply Voltage
(V+2=3V)

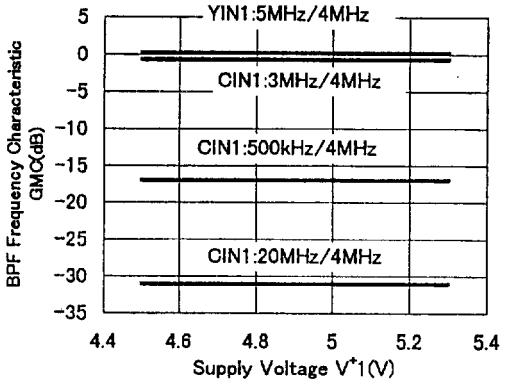


LPF vs. Supply Voltage
(V+1=4.8V)

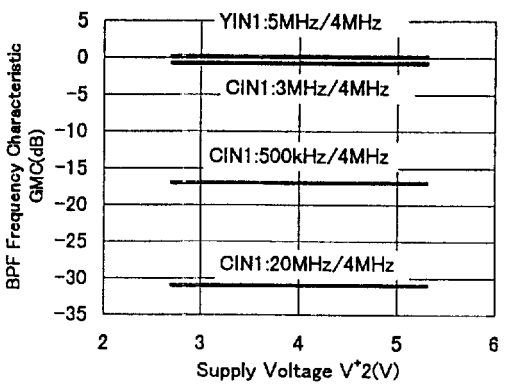


■ TYPICAL CHARACTERISTICS

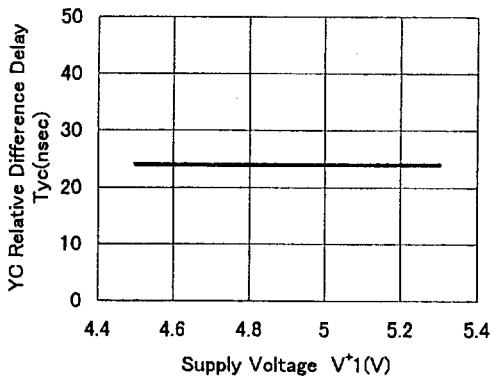
BPF Frequency Characteristic vs. Supply Voltage
(V^+2=3V)



BPF Frequency Characteristic vs. Supply Voltage
(V^+1=4.8V)



YC Relative Difference Delay vs. Supply Voltage
(V^+2=3V,Ty-Tc@4MHz)



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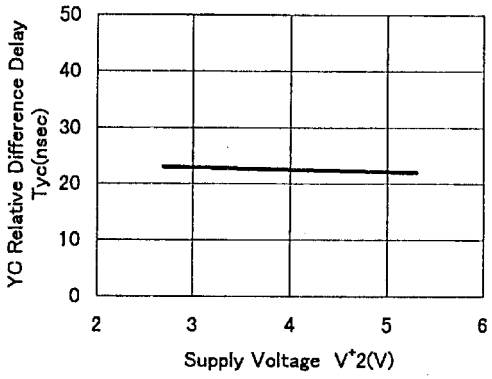
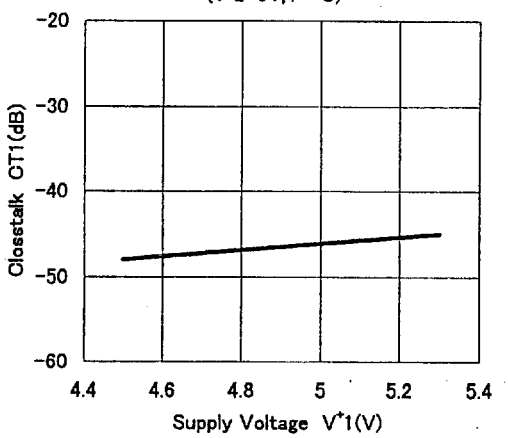
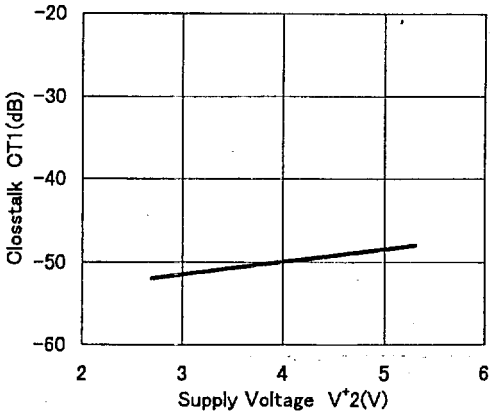


Closstalk vs. Supply Voltage
(V^+2=3V,Y→C)

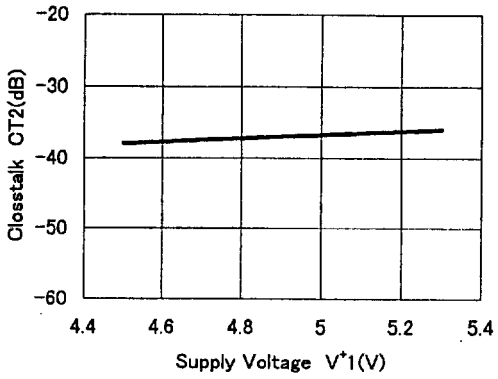


Closstalk vs. Supply Voltage
(V^+1=4.8V,Y→C)

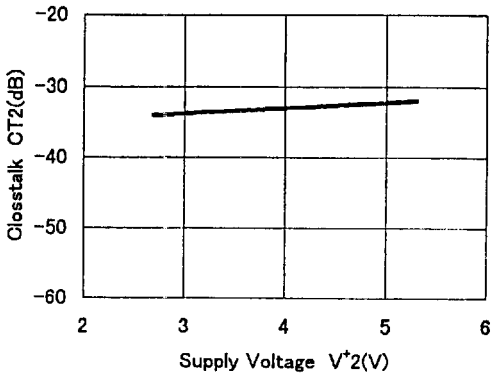


■ TYPICAL CHARACTERISTICS

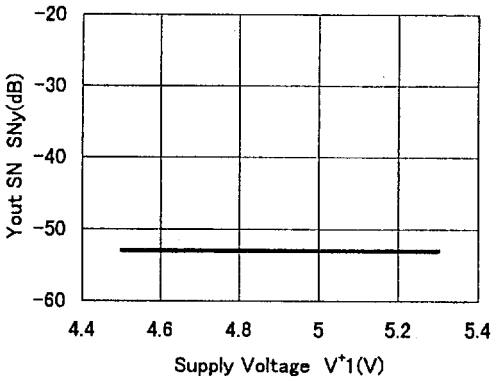
Closstalk vs. Supply Voltage
(V^+2=3V,C→Y)



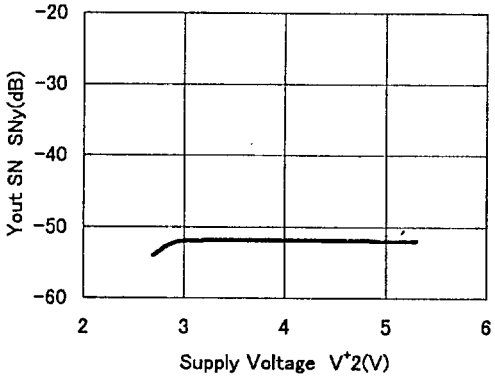
Closstalk vs. Supply Voltage
(V^+1=4.8V,C→Y)



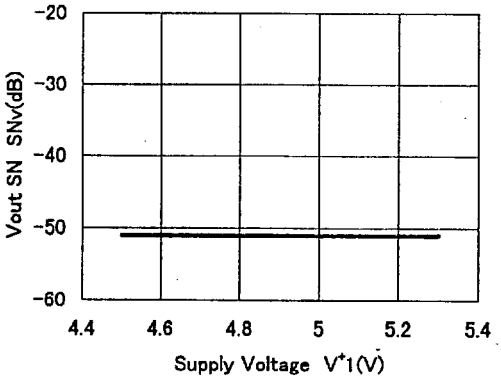
Yout SN vs. Supply Voltage
(V^+2=3V)



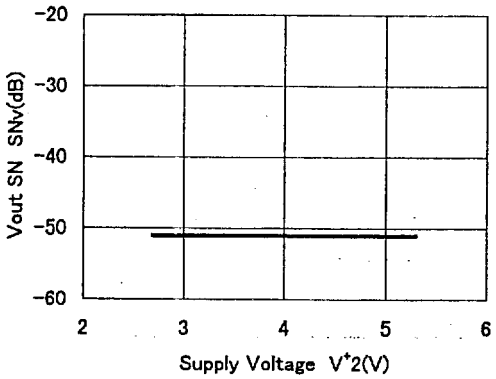
Yout SN vs. Supply Voltage
(V^+1=4.8V)



Vout SN vs. Supply Voltage
(V^+2=3V)

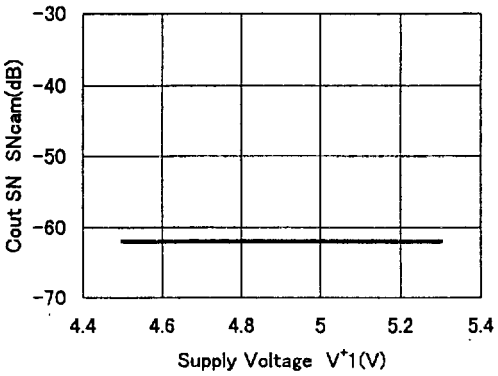


Vout SN vs. Supply Voltage
(V^+1=4.8V)

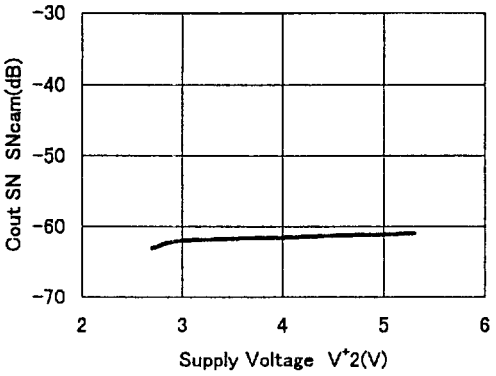


■ TYPICAL CHARACTERISTICS

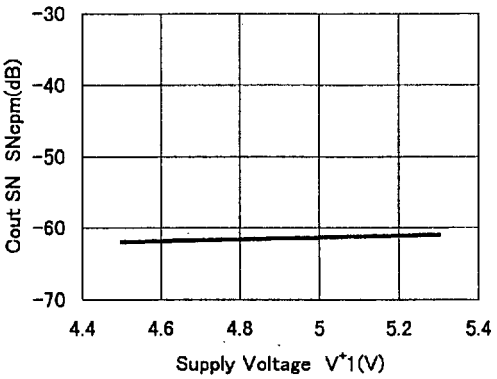
Cout SN(C-AM) vs. Supply Voltage
(V^+2=3V)



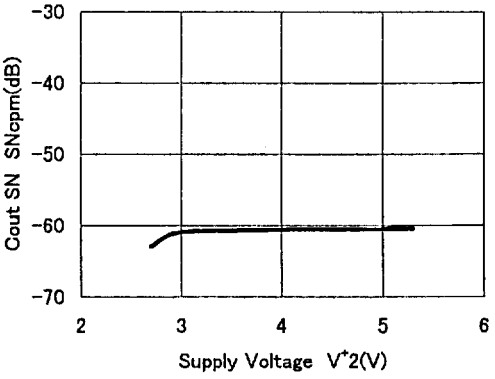
Cout SN(C-AM) vs. Supply Voltage
(V^+1=4.8V)



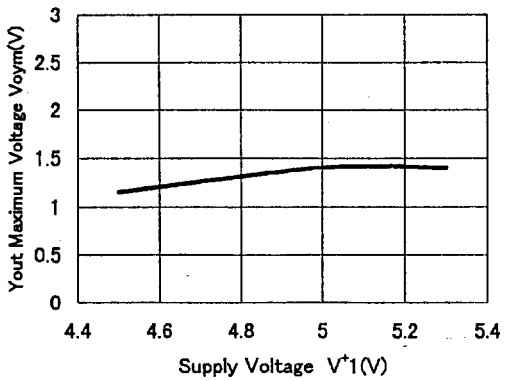
Cout SN(C-PM) vs. Supply Voltage
(V^+2=3V)



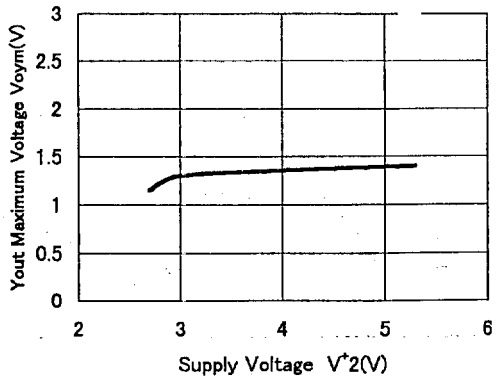
Cout SN(C-PM) vs. Supply Voltage
(V^+1=4.8V)



Yout Maximum Voltage vs. Supply Voltage
(V^+2=3V)

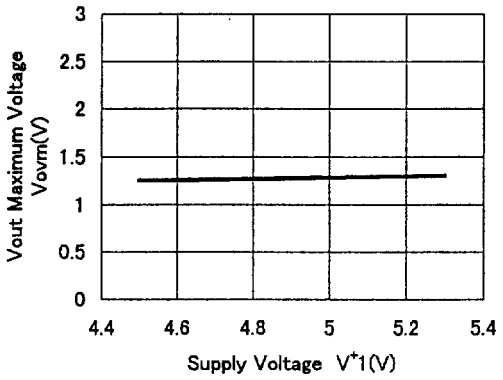


Yout Maximum Voltage vs. Supply Voltage
(V^+1=4.8V)

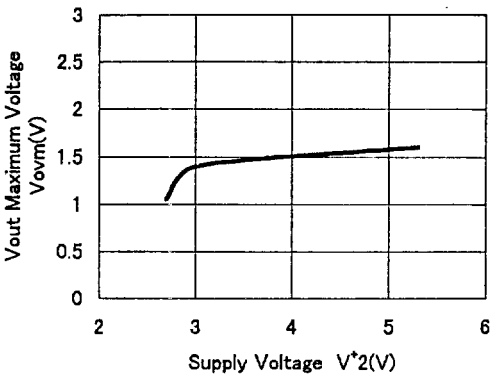


■ TYPICAL CHARACTERISTICS

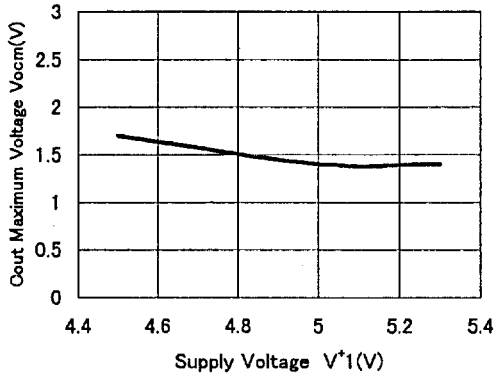
Vout Maximum Voltage vs. Supply Voltage
(V^+2=3V)



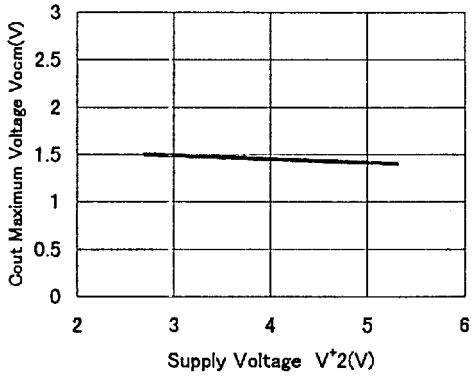
Vout Maximum Voltage vs. Supply Voltage
(V^+1=4.8V)



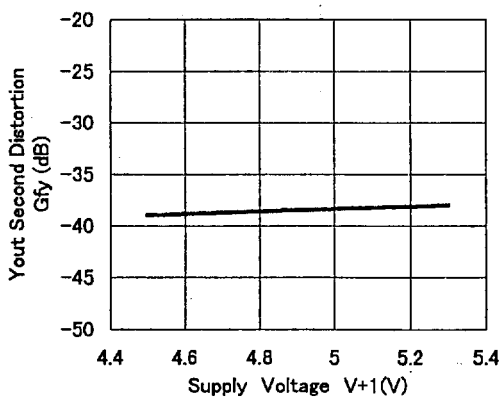
Cout Maximum Voltage vs. Supply Voltage
(V^+2=3V)



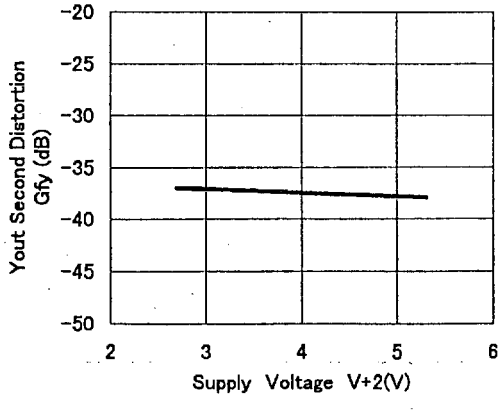
Cout Maximum Voltage vs. Supply Voltage
(V^+1=4.8V)



Yout Second Distortion vs. Supply Voltage
(V+2=3V)

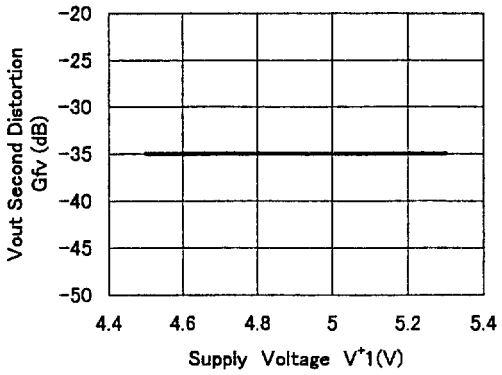


Yout Second Distortion vs. Supply Voltage
(V+1=4.8V)

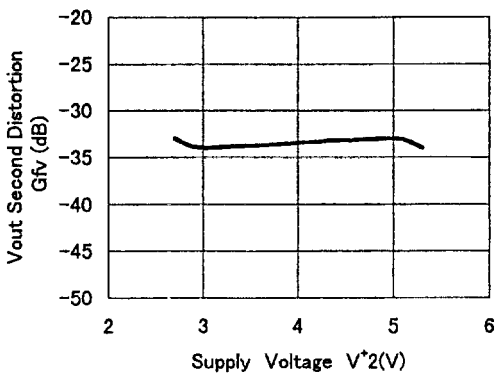


■ TYPICAL CHARACTERISTICS

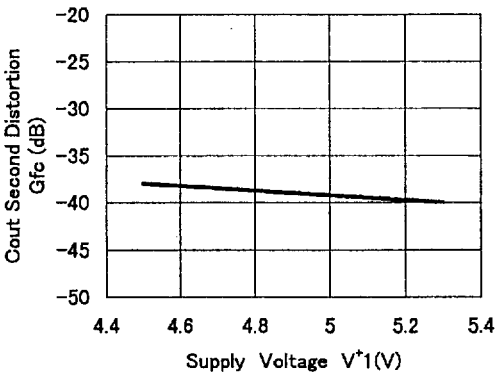
Vout Second Distortion vs. Supply Voltage
(V^+2=3V)



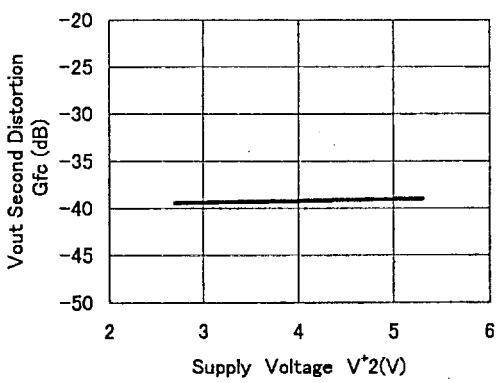
Vout Second Distortion vs. Supply Voltage
(V^+1=4.8V)



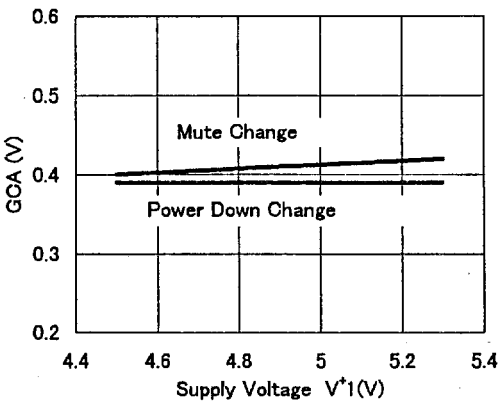
Cout Second Distortion vs. Supply Voltage
(V^+2=3V)



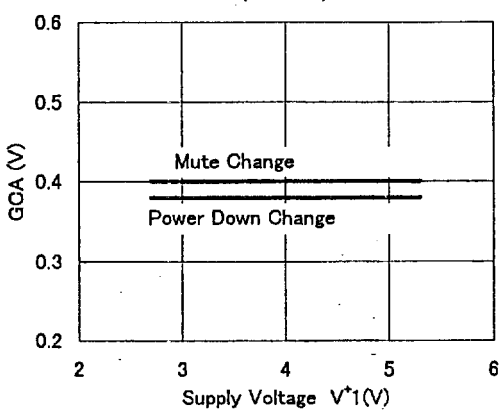
Cout Second Distortion vs. Supply Voltage
(V^+1=4.8V)



GCA vs. Supply Voltage
(V^+2=3V)

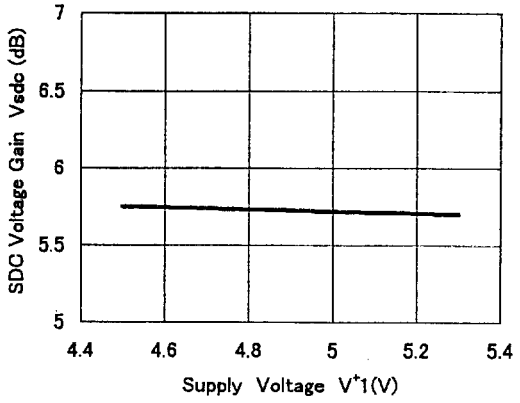


GCA vs. Supply Voltage
(V^+2=3V)

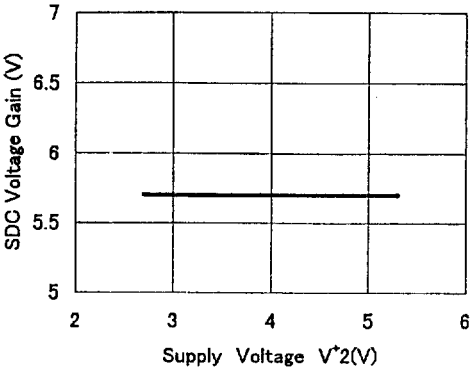


■ TYPICAL CHARACTERISTICS

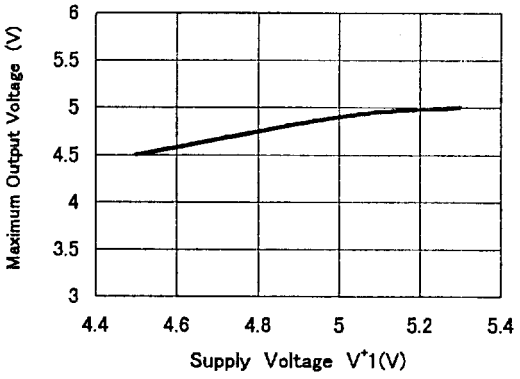
SDC Voltage Gain vs. Supply Voltage
(V^+2=3V)



SDC Voltage Gain vs. Supply Voltage
(V^+1=4.8V)



Maximum Output Voltage vs. Supply Voltage
(V^+2=3V)



Maximum Output Voltage vs. Supply Voltage
(V^+1=4.8V)