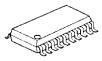
400MHz 3-channel Video Amplifier

■ GENERAL DESCRIPTION

The NJM41045 is a wideband 3-channel Video amplifier.

The NJM41045 is suitable for the HD video application because of -3dB large-signal bandwidth of 400MHz.

■ PACKAGE OUTLINE

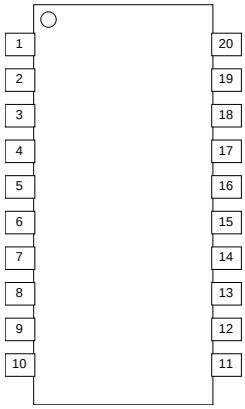


NJM41045VC3

■ FEATURES

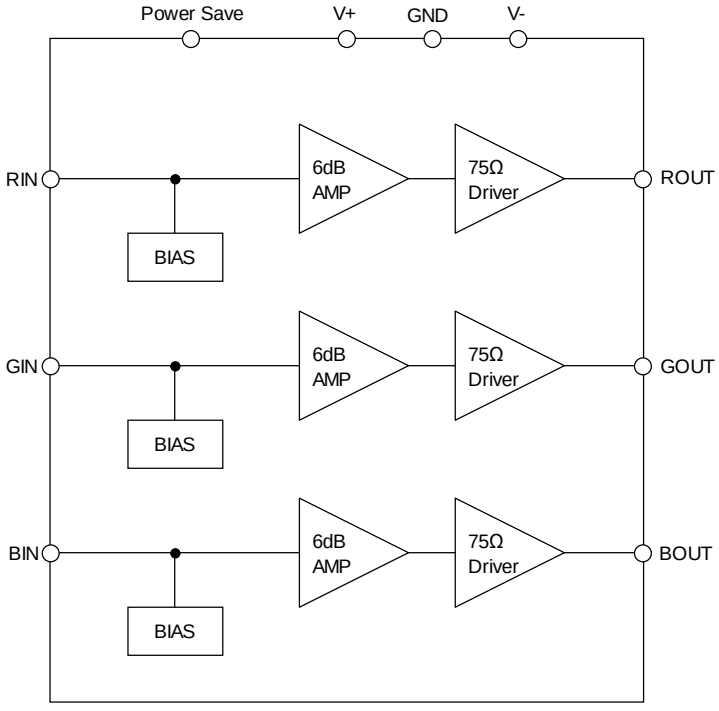
- Operating Voltage (Single) +4.5 to +9.5V
  (Dual) ±3.0 to ±5.0V
- Wide Bandwidth –3dB at 400MHz (2Vp-p Output)
- 6dB amplifier
- 75Ω Driver Circuit
- Power Save Function
- Bipolar Technology
- Package Outline SSOP20-C3

■ PIN CONFIGRATION



1. N.C.	11. V-3
2. VREF1	12. BOUT
3. RIN	13. V+3
4. Power save	14. V-2
5. VREF2	15. GOUT
6. GIN	16. V+2
7. GND	17. V-1
8. VREF3	18. ROUT
9. BIN	19. V+1
10. N.C.	20. N.C.

■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	12.0	V
Power Dissipation	P_D	1500 (Note 1)	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-40 to +150	°C

(Note 1) At on a board of EIA/JEDEC specification. (114.3 x 76.2 x 1.6mm 4 layers, FR-4)

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage1	Vopr1	Single Power Supply	+4.5	-	+9.5	V
Operating Voltage2	Vopr2	Dual Power Supply	±3.0	-	±5.0	V

■ **ELECTRICAL CHARACTERISTICS** (Ta= 25°C, V^+ = 5V, R_L= 150Ω)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	No Signal	-	65	80	mA
Operating Current at Power Save	Isave	No Signal,Power Save Mode	-	0.6	1	mA
Maximum Output Voltage Swing	Vom	100kHz, Sine Signal, THD=1%	2.2	2.4	-	Vp-p
Voltage Gain	Gv	1MHz, 1.0Vp-p, Sine Signal	5.5	6.0	6.5	dB
Frequency Characteristic 1	Gf1	400MHz/1MHz, 1.0Vp-p, Sine Signal	-	-3.0	-	dB
Frequency Characteristic 2	Gf2	450MHz/1MHz, 0.1Vp-p, Sine Signal	-	-3.0	-	dB
Gain Difference Between channel	ΔGvl	1MHz, 1.0Vp-p, Sine Signal (Note 2)	-0.5	0	0.5	dB
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
SW Voltage High Level	VthH		2.5	-	V^+	V
SW Voltage Low Level	VthL		0	-	1.0	V
Switch Inflow Current High Level	IthH	Vps=5V	-	-	400	μA
Switch Inflow Current Low Level	IthL	Vps=0.3V	-	-	20	μA

(Note 2) Between ROUT/GOUT/BOUT

■ **ELECTRICAL CHARACTERISTICS** (Ta= 25°C, $V^{+/-}$ = ±5.0V, R_L= 150Ω)

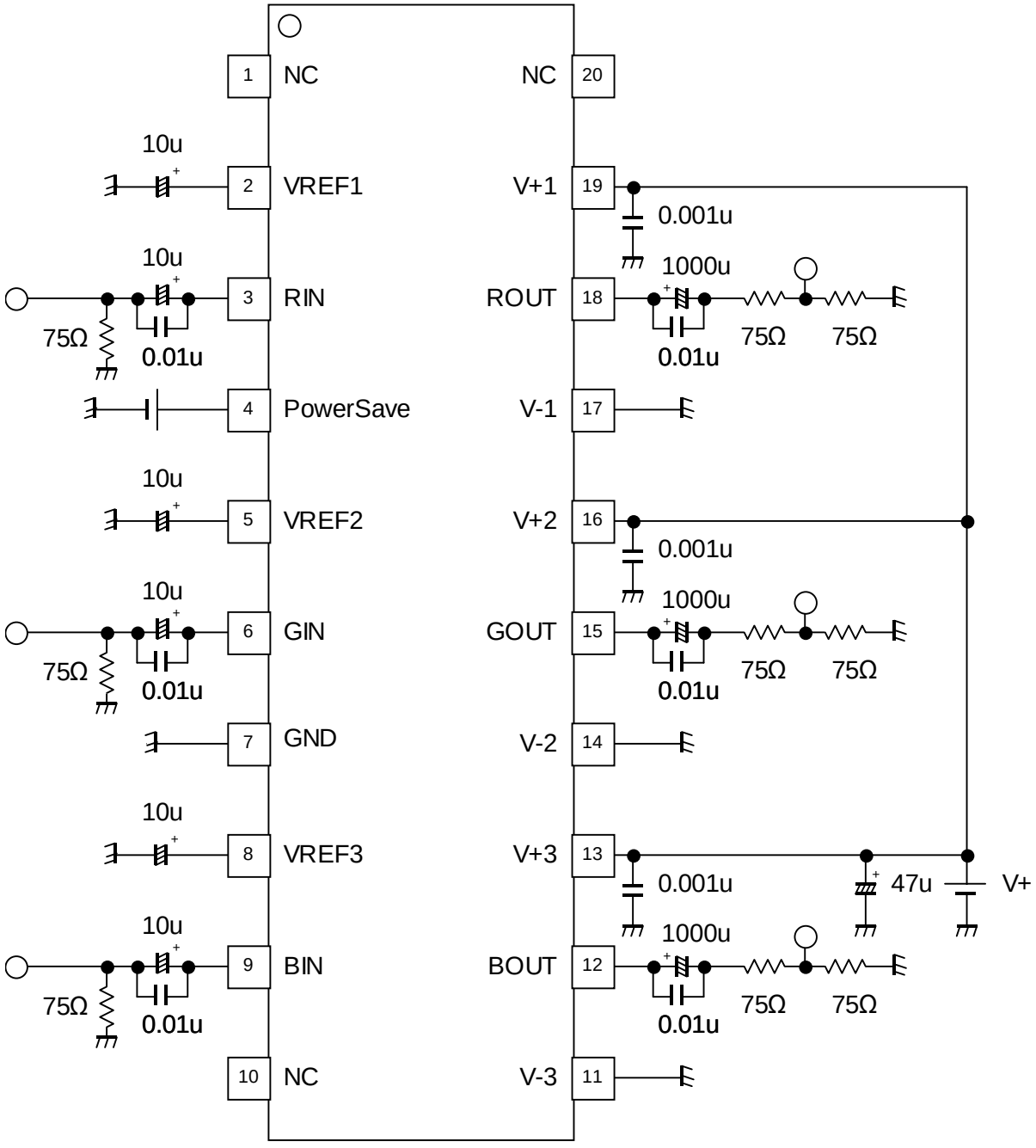
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current1	I_{CC}	No Signal	-	65	80	mA
Operating Current2	Iee	No Signal	-80	-65	-	mA
Operating Current at Power Save 1	Isave_Icc	No Signal, Power Save Mode	-	0.75	1.3	mA
Operating Current at Power Save 2	Isave_Iee	No Signal, Power Save Mode	-1.3	-0.4	-	mA
Maximum Output Voltage Swing	Vom	100kHz, Sine Signal, THD=1%	2.2	2.4	-	Vp-p
Voltage Gain	Gv	1MHz, 1.0Vp-p, Sine Signal	5.5	6.0	6.5	dB
Frequency characteristic 1	Gf1	400MHz/1MHz, 1.0Vp-p, Sine Signal	-	-3.0	-	dB
Frequency characteristic 2	Gf2	450MHz/1MHz, 0.1Vp-p, Sine Signal	-	-3.0	-	dB
Gain Difference Between channel	ΔGvl	1MHz, 1.0Vp-p, Sine Signal (Note 2)	-0.5	0	0.5	dB
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
SW Voltage High Level	VthH		2.5	-	V^+	V
SW Voltage Low Level	VthL		0	-	1.0	V
Switch Inflow Current High Level	IthH	Vps=5V	-	-	400	μA
Switch Inflow Current Low Level	IthL	Vps=0.3V	-	-	20	μA

(Note 2) Between ROUT/GOUT/BOUT

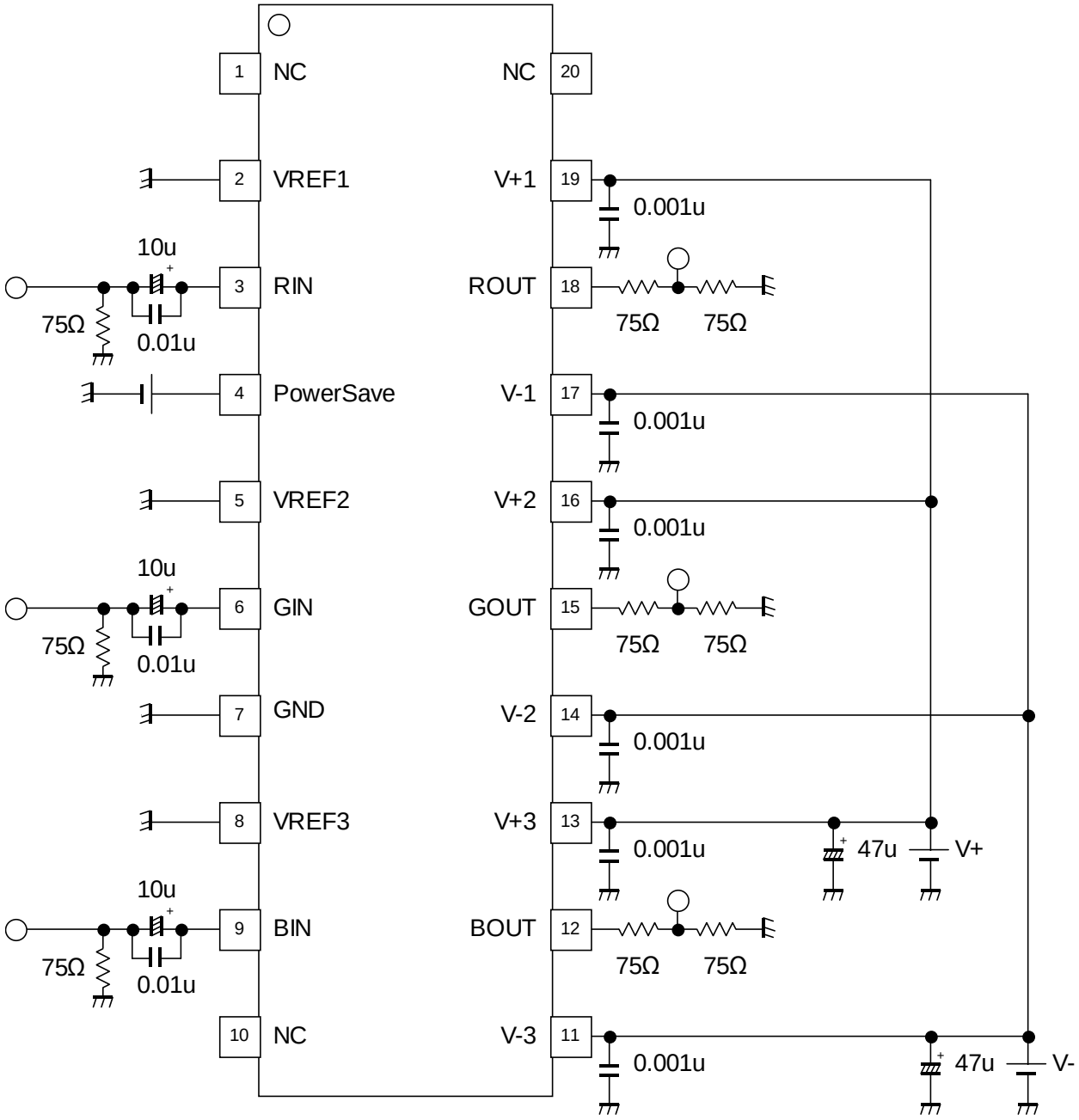
■ **CONTROL TERMINAL**

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

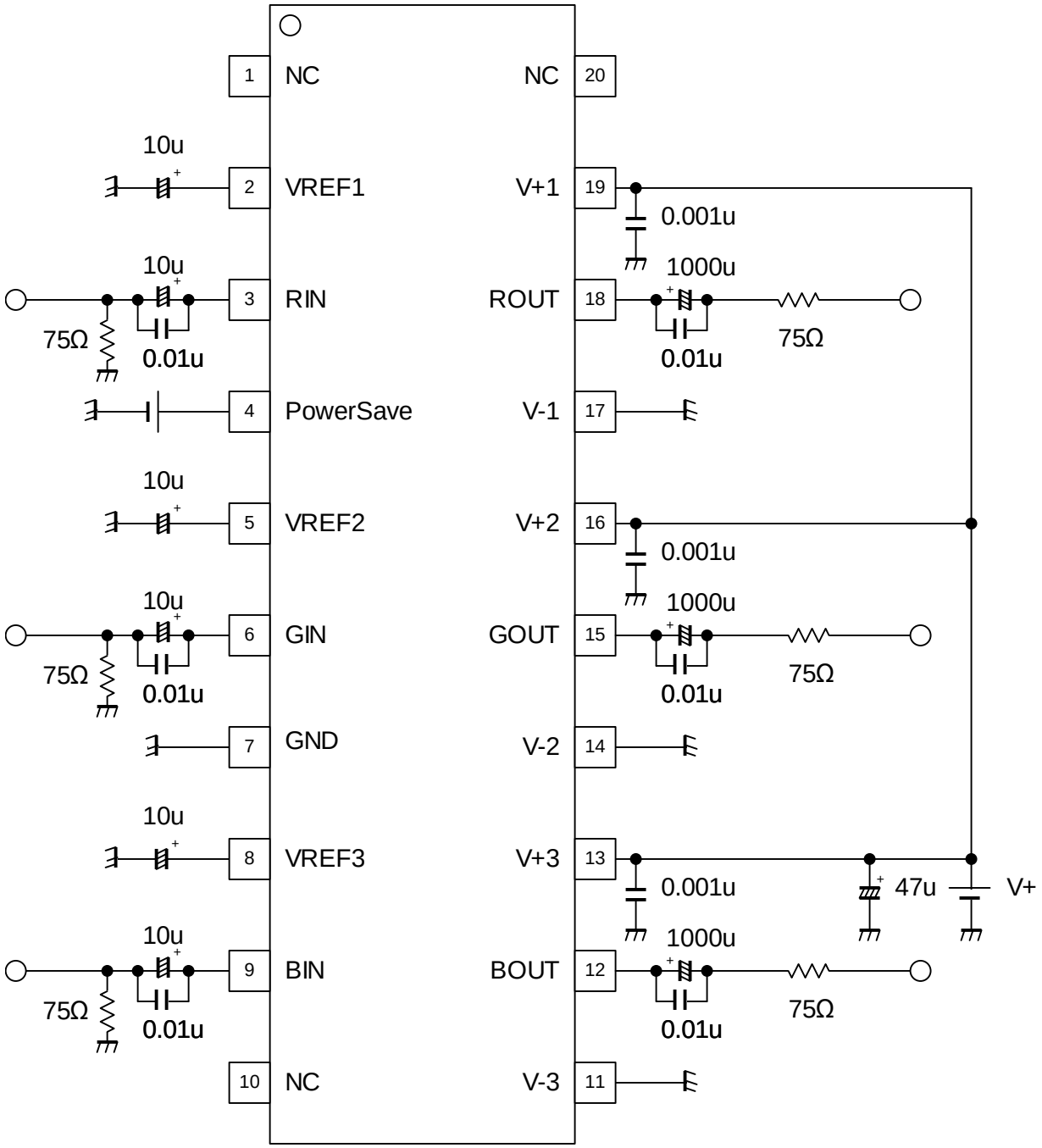
■ **TEST CIRCUIT(SINGLE SUPPLY)**



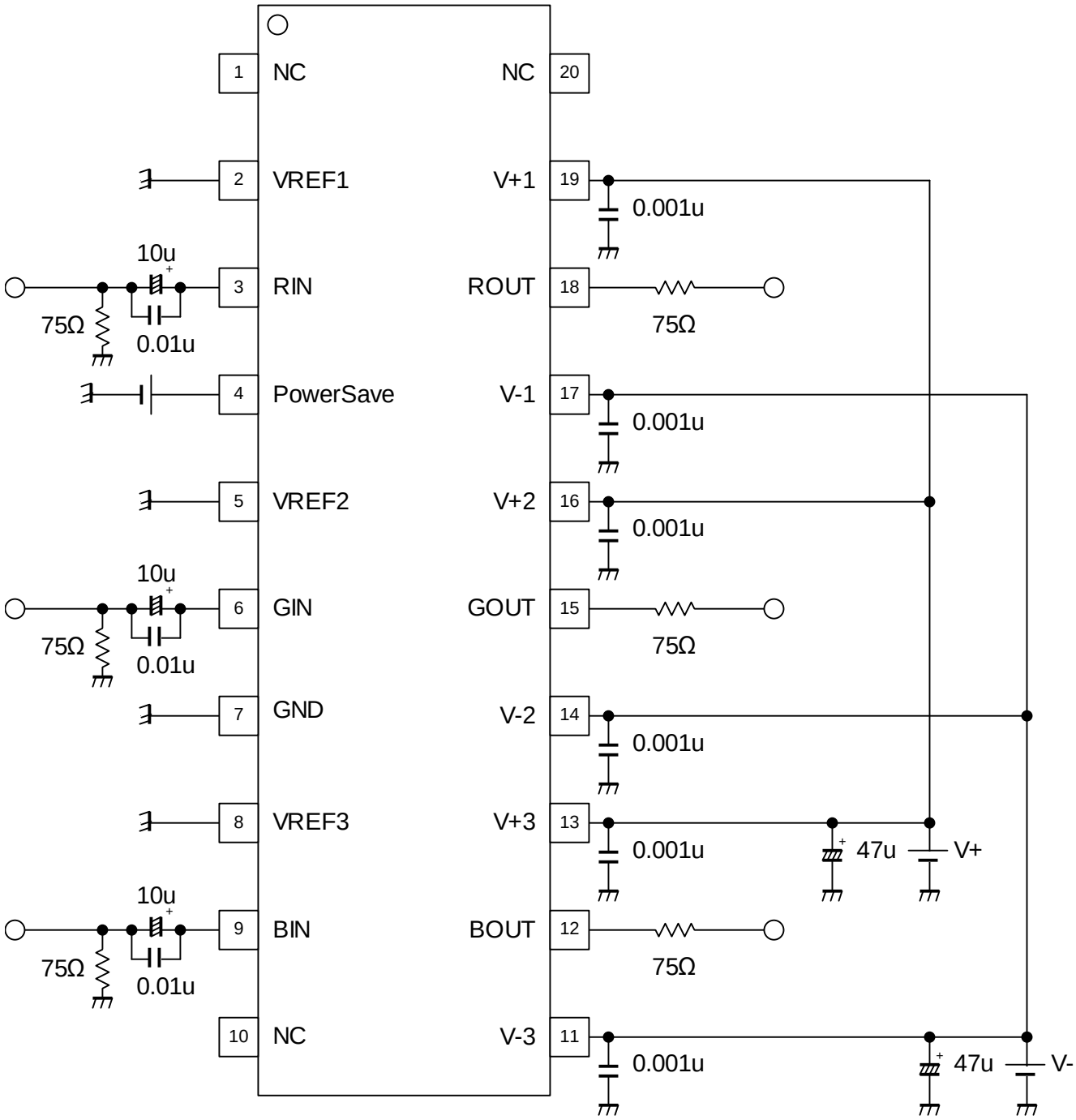
■ **TEST CIRCUIT(DUAL SUPPLY)**



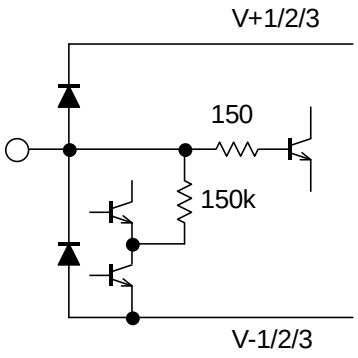
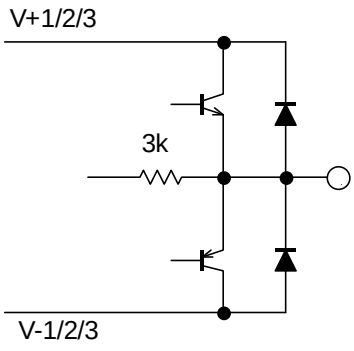
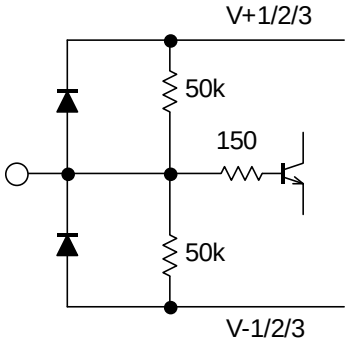
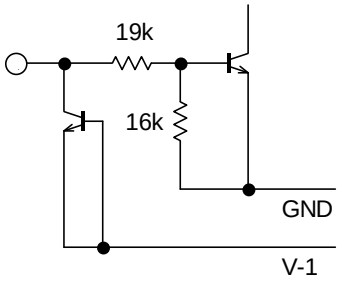
■ **APPLICATION CIRCUIT(SINGLE SUPPLY)**



■ APPLICATION CIRCUIT(DUAL SUPPLY)

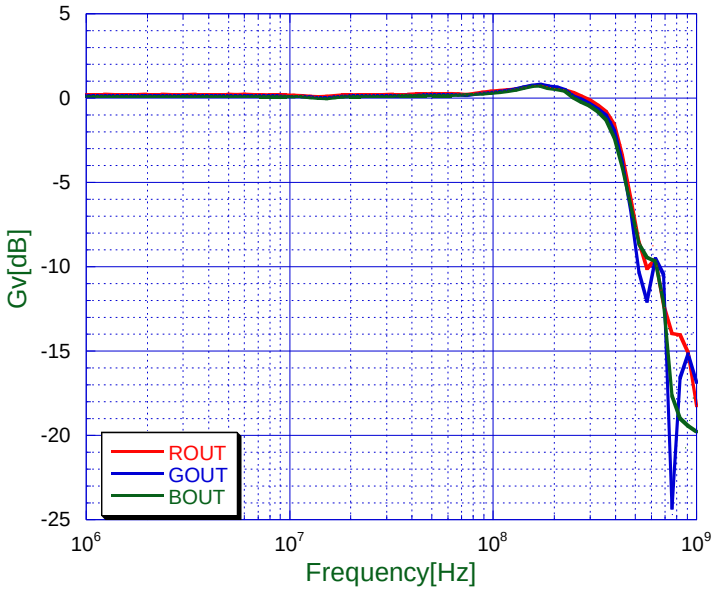


■ **TERMINAL FUNCTION**

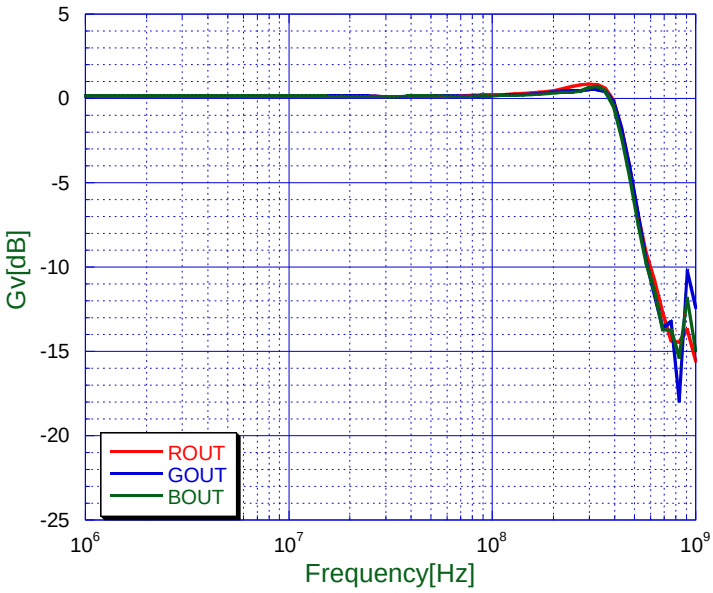
PIN No.	PIN NAME	FUNCTION	EQUIVALENT CIRCUIT	DC VOLTAGE
3 6 9	RIN GIN BIN	R signal input G signal input B signal input		V+/2 at Single supply 0V at Dual supply
12 15 18	BOUT GOUT ROUT	B signal output G signal output R signal output		V+/2 at Single supply 0V at Dual supply
2 5 8	VREF1 VREF2 VREF3	Reference voltage		V+/2 at Single supply 0V at Dual supply
4	Power Save	Power Save		-

■ TYPICAL CHARACTERISTICS

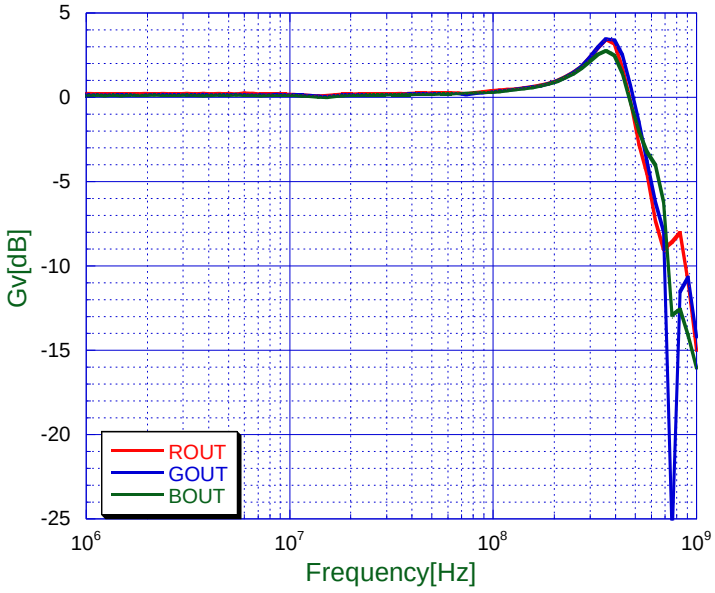
Voltage Gain vs. Frequency
(Single Supply 1Vpp)



Voltage Gain vs. Frequency
(Dual Supply 1Vpp)



Voltage Gain vs. Frequency
(Single Supply 0.1Vpp)



Voltage Gain vs. Frequency
(Dual Supply 0.1Vpp)