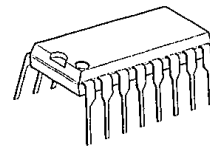


2-INPUT 3CHANNEL VIDEO SWITCH

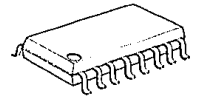
■ GENERAL DESCRIPTION

NJM2286 is a switching IC for switching over from one audio or video input signal to another. Internalizing 2 inputs, 1 output, and then each set of 3 can be operated independently. They are a "Clamp type" and it can be operated while DC level fixed in position of the video signal. It is a higher efficiency video switch, featuring the operating supply voltage 4.75 to 13.0V, the frequency feature 10MHz, and then the Crosstalk 75dB (at 4.43MHz).

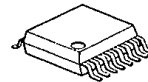
■ PACKAGE OUTLINE



NJM2286D



NJM2286M



NJM2286V

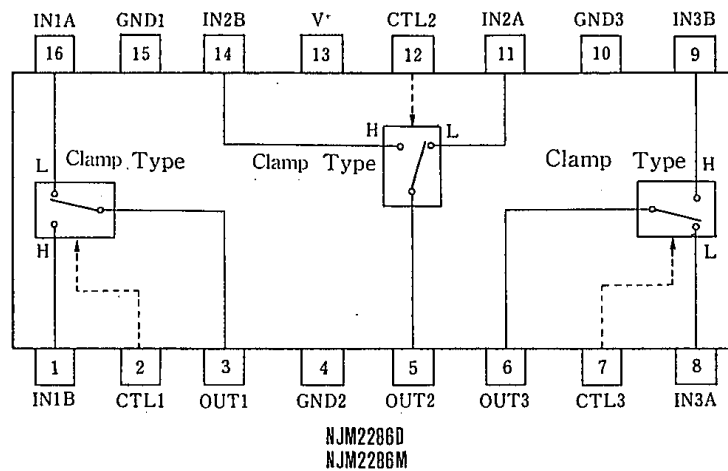
■ FEATURES

- 2 Input-1 Output Internalizing 3 Circuits (Clamp type).
- Wide Operating Voltage (4.75 ~ 13.0V)
- Crosstalk 75dB(at 4.43MHz)
- Wide Bandwidth Frequency Feature 10MHz(2V_{P-P} Input)
- Package Outline DIP16, DMP16, SSOP16
- Bipolar Technology

■ APPLICATIONS

- VCR, Video Camera, AV-TV, Video Disk Player.

■ BLOCK DIAGRAM



■ MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	14	V
Power Dissipation	Pd	(DIP16) 700	mW
		(DMP16) 350	mW
Operating Temperature Range	T _{opr}	-40~+85	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

■ ELECTRICAL CHARACTERISTICS

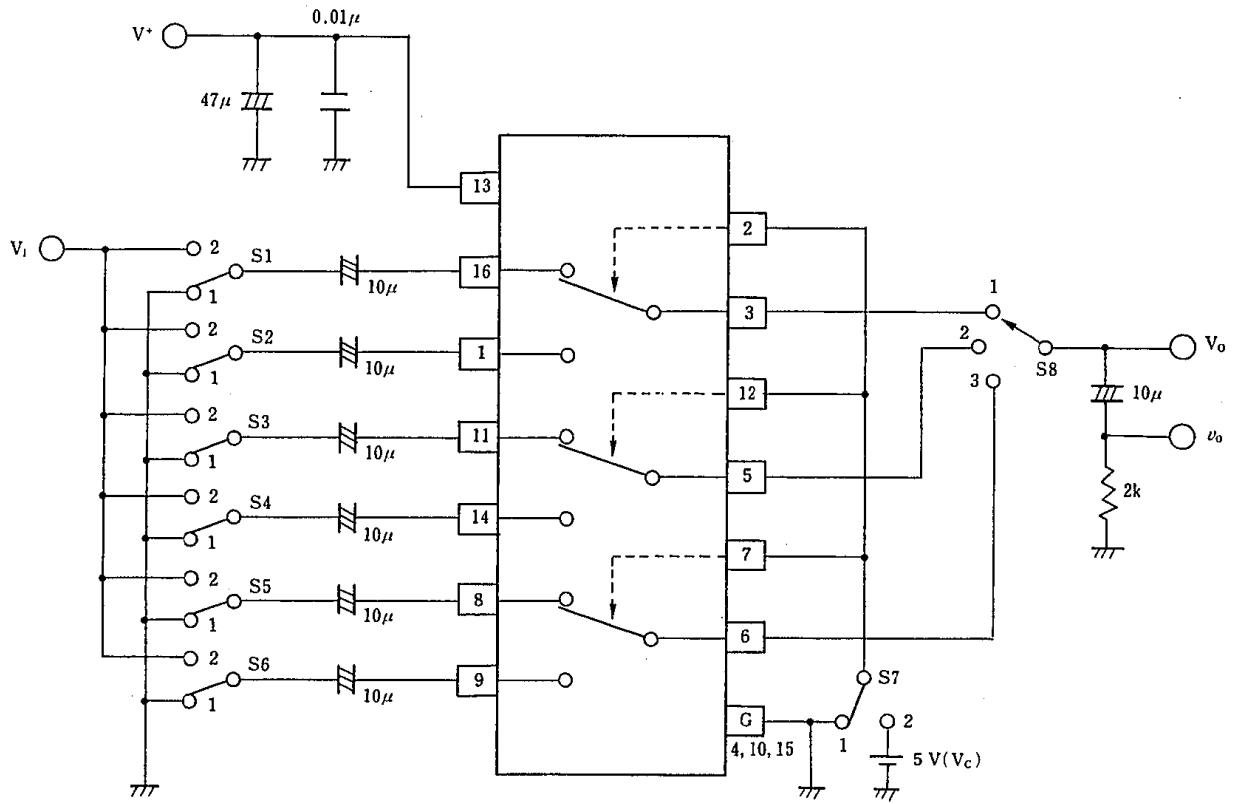
(V+=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current (1)	I _{CC1}	V+=5V (Note1)	7.9	11.3	14.7	mA
Operating Current (2)	I _{CC2}	V+=9V (Note1)	9.8	14.1	18.4	mA
Voltage Gain	G _V	V _I = 100kHz, 2V _{p-p} , V _O /V _I	-0.6	-0.1	+0.4	dB
Frequency Gain	G _F	V _I = 2V _{p-p} , V _O (10MHz)/V _O (100kHz)	-1.0	0	+1.0	dB
Differential Gain	DG	V _I = 2V _{p-p} , Standard Staircase Signal	—	0.3	—	%
Differential Phase	DP	V _I = 2V _{p-p} , Standard Staircase Signal	—	0.3	—	deg
Output Offset Voltage	V _{OS}	(Note2)	-15	0	+15	mV
Crosstalk	CT	V _I = 2V _{p-p} , 4.43MHz, V _O /V _I	—	-75	—	dB
Switch Change Over Voltage	V _{CH}	All inside Switch ON	2.5	—	—	V
Switch Change Over Voltage	V _{CL}	All inside Switch OFF	—	—	1.0	V

(Note1) S1=S2=S3=S4=S5=S6=S7=1

(Note2) S1=S2=S3=S4=S5=S6=1, S7=1→2 Measure the output DC voltage difference

■ TEST CIRCUIT



This IC requires 1MΩ resistance between INPUT and GND pin for clamp type input since the minute current causes an unstable pin voltage.

PARAMETER	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	TEST PART
Icc1	1	1	1	1	1	1	1	1	V+
Icc2	1	1	1	1	1	1	1	1	
Gv1	2	1	1	1	1	1	1	1	v0
Gf1	2	1	1	1	1	1	1	1	
DG1	2	1	1	1	1	1	1	1	
DP1	2	1	1	1	1	1	1	1	
CT 1	2	1	1	1	1	1	2	1	v0
CT 2	1	2	1	1	1	1	1	1	
CT 3	1	1	2	1	1	1	2	2	
CT 4	1	1	1	2	1	1	1	2	
CT 5	1	1	1	1	2	1	2	3	
CT 6	1	1	1	1	1	2	1	3	
Vos1	1	1	1	1	1	1	1/2	1	Vo
Vc1	1/2	2/1	1	1	1	1	Vc	1	Vc
THD	2	1	1	1	1	1	1	1	v0

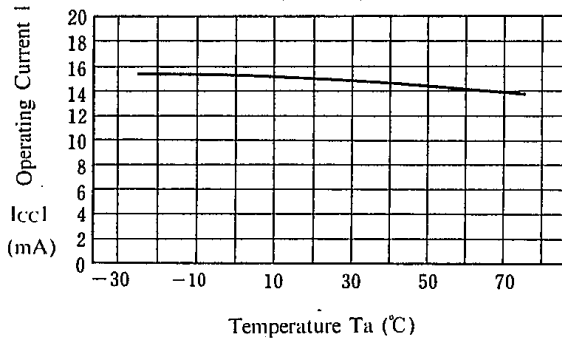
■ TERMINAL EXPLANATION

PIN No.	PIN NAME	VOLTAGE	INSIDE EQUIVALENT CIRCUIT
16 1 11 14 8 9	IN 1 A IN 1 B IN 2 A IN 2 B IN 3 A IN 3 B (Input)	1.5V	<p>The diagram shows a common emitter circuit. An input terminal labeled 'IN' is connected to the base of a transistor. A 500 ohm resistor is connected between the base and the emitter. The emitter is connected to ground through a diode. The collector is connected to another transistor, which is biased by a 2.2V source connected to its base. The collector of this second transistor is also connected to ground through a diode.</p>
2 12 7	CTL 1 CTL 2 CTL 3 (Switching)		<p>The diagram shows a complex multi-stage transistor circuit. It includes a 2.3V bias source connected to the base of a transistor. Another 1.9V bias source is connected to the base of another transistor. A diode is connected between the emitter of the 1.9V-biased transistor and ground. The collector of this transistor is connected to the base of a third transistor. An 8k resistor is connected between the collector of the third transistor and the CLT output terminal. Another 8k resistor is connected between the collector of the third transistor and ground. A 20k resistor is connected between the CLT terminal and ground. A diode is connected between the emitter of the third transistor and ground.</p>
3 5 6	OUT 1 OUT 2 OUT 3 (Output)	0.8V	<p>The diagram shows a common emitter circuit. The base of a transistor is connected to a common input line. The emitter is connected to ground through a diode. The collector is connected to an output terminal labeled 'OUT'.</p>
13	V+	5V	
15 4 10	GND 1 GND 2 GND 3		

■ TYPICAL CHARACTERISTICS

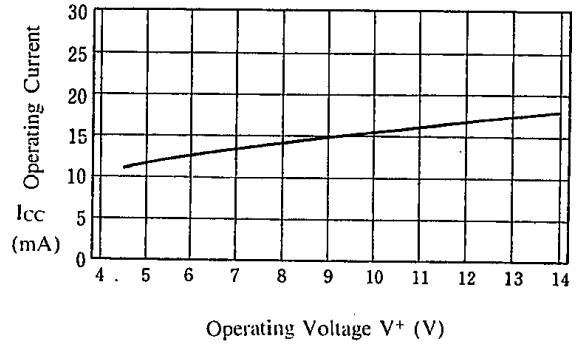
Operating Current 1 vs. Temperature

($V^+ = 9V$)



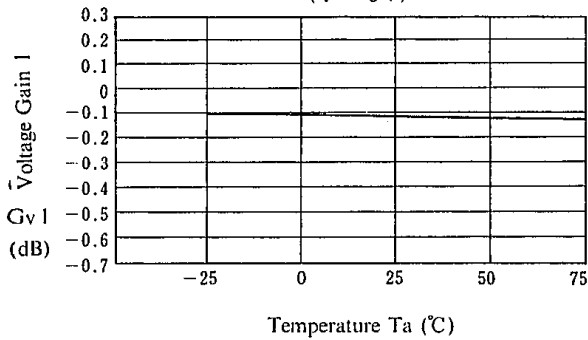
Operating Current vs. Operating Voltage

($T_a = 25^\circ C$)



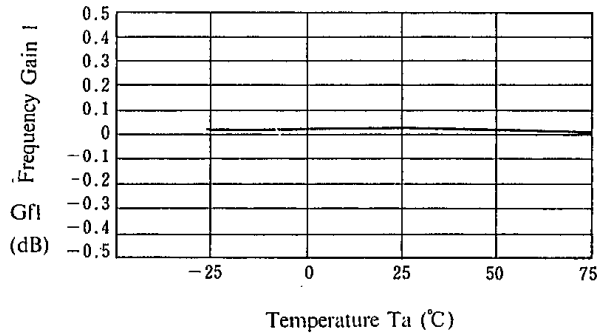
Voltage Gain 1 vs. Temperature

($V^+ = 5V$)



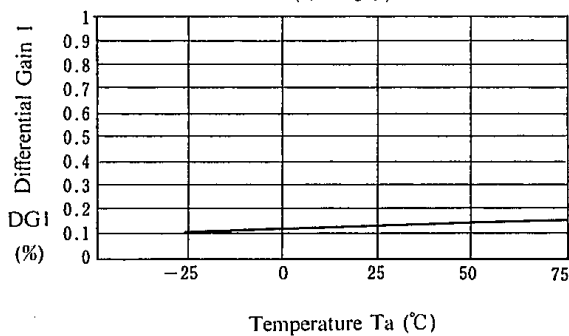
Frequency Gain 1 vs. Temperature

($V^+ = 5V$)



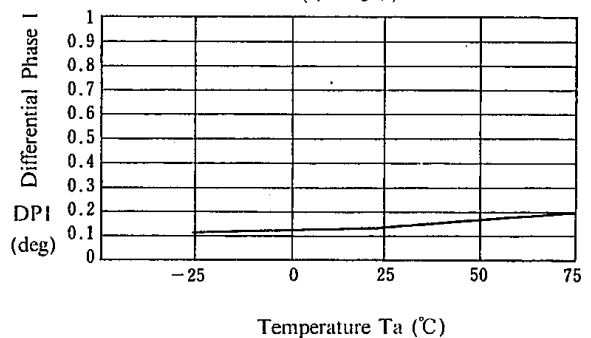
Differential Gain 1 vs. Temperature

($V^+ = 5V$)



Differential Phase 1 vs. Temperature

($V^+ = 5V$)

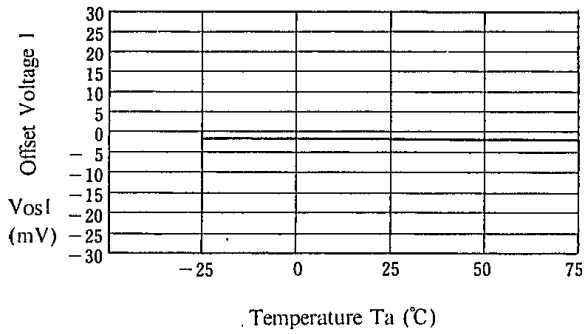


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■ TYPICAL CHARACTERISTICS

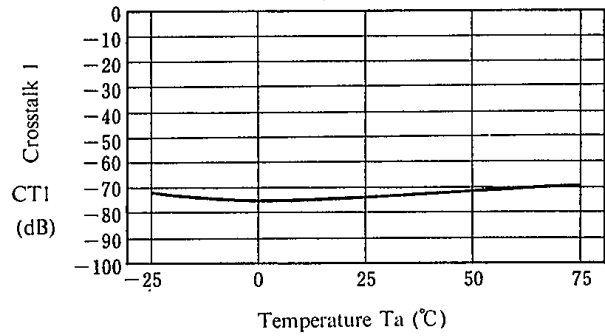
Offset Voltage vs. Temperature

($V^+ = 5\text{ V}$)



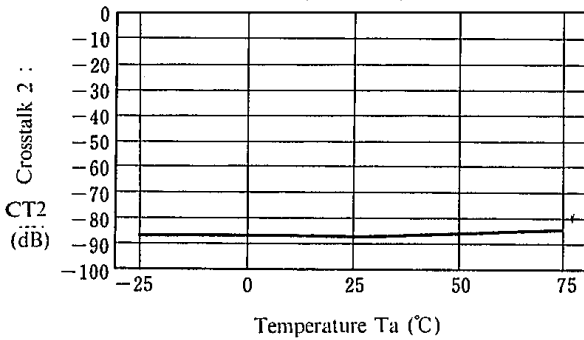
Crosstalk 1 vs. Temperature

($V^+ = 5\text{ V}$)



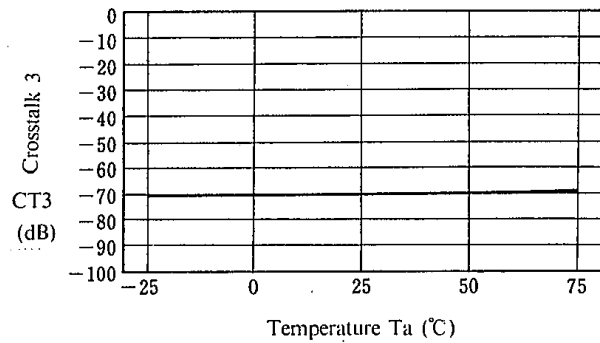
Crosstalk 2 vs. Temperature

($V^+ = 5\text{ V}$)



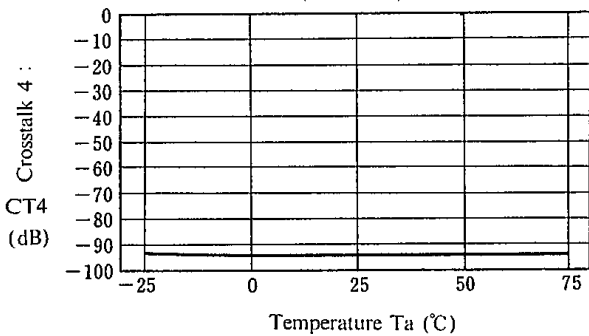
Crosstalk 3 vs. Temperature

($V^+ = 5\text{ V}$)



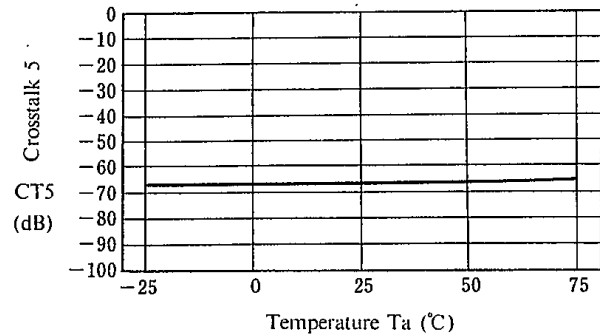
Crosstalk 4 vs. Temperature

($V^+ = 5\text{ V}$)



Crosstalk 5 vs. Temperature

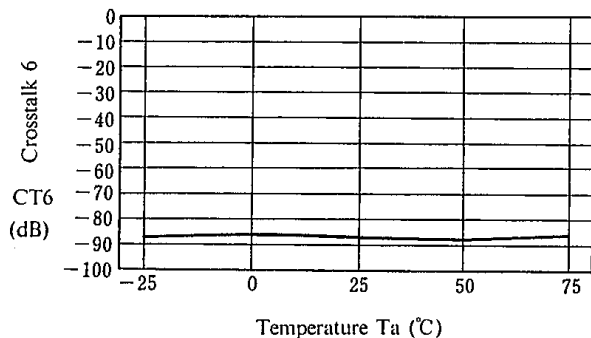
($V^+ = 5\text{ V}$)



■ TYPICAL CHARACTERISTICS

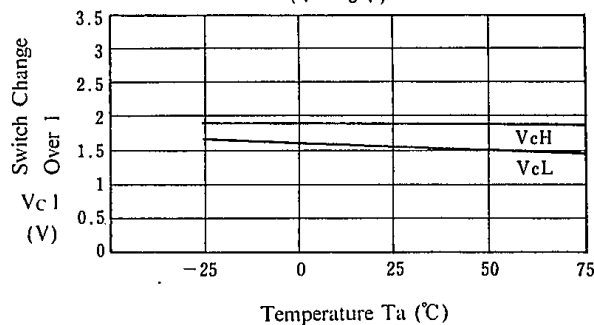
Crosstalk 6 vs. Temperature

($V^+ = 5\text{ V}$)



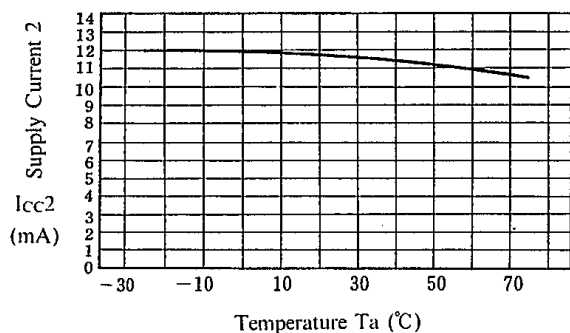
Switch Change Over 1 vs. Temperature

($V^+ = 5\text{ V}$)



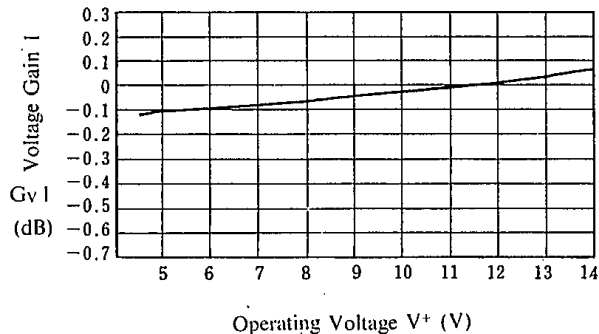
Supply Current 2 vs. Temperature

($V^+ = 5\text{ V}$)



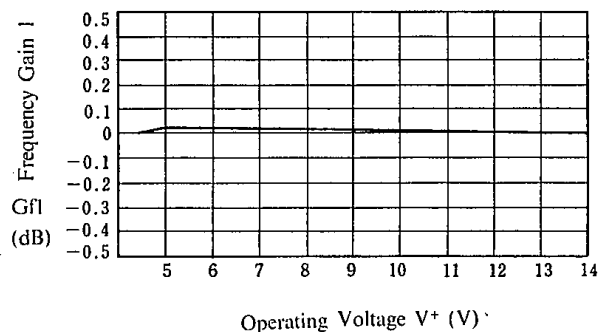
Voltage Gain 1 vs. Operating Voltage

($T_a = 25^\circ\text{C}$)



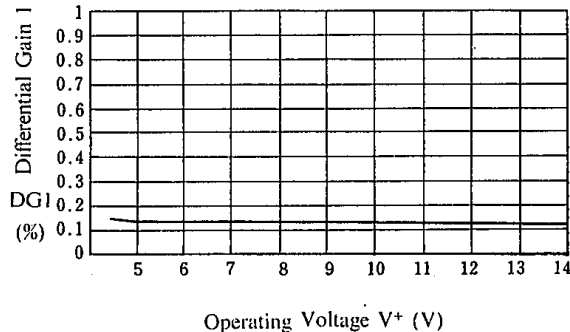
Frequency Gain 1 vs. Operating Voltage

($T_a = 25^\circ\text{C}$)



Differential Gain 1 vs. Operating Voltage

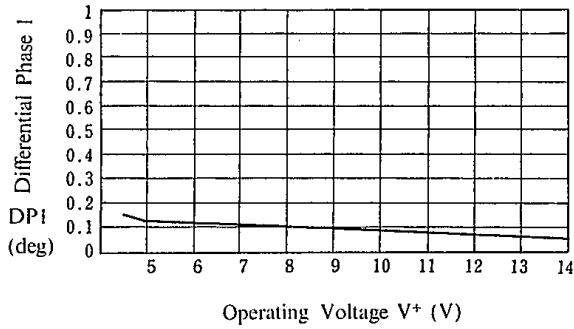
($T_a = 25^\circ\text{C}$)



TYPICAL CHARACTERISTICS

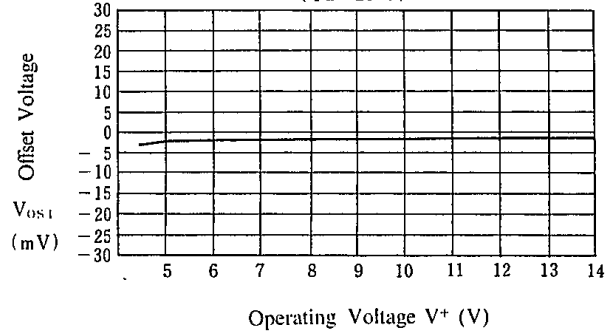
Differential Phase 1 vs. Operating Voltage

(Ta = 25°C)



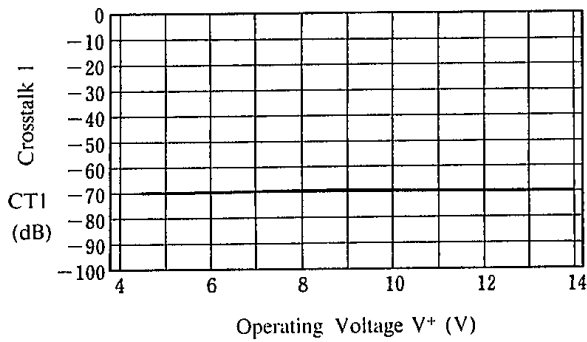
Offset Voltage 1 vs. Operating Voltage

(Ta = 25°C)



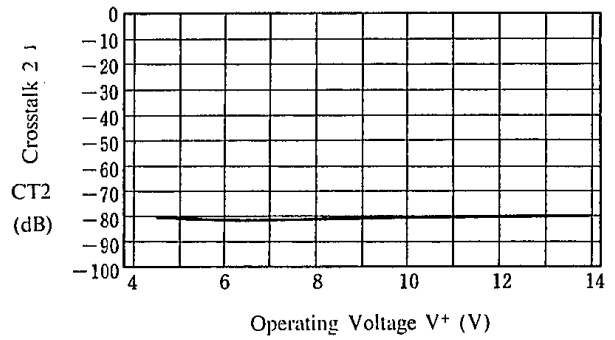
Crosstalk 1 vs. Operating Voltage

(Ta = 25°C)



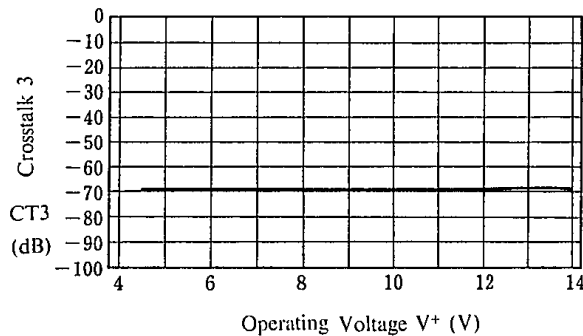
Crosstalk 2 vs. Operating Voltage

(Ta = 25°C)



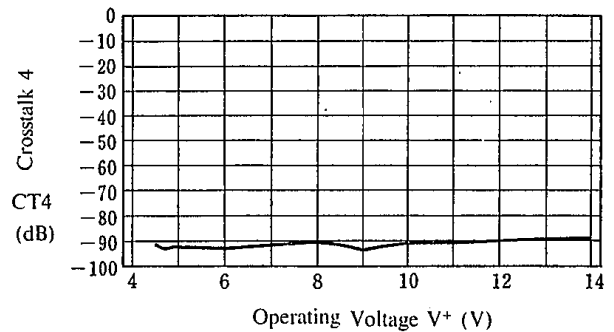
Crosstalk 3 vs. Operating Voltage

(Ta = 25°C)



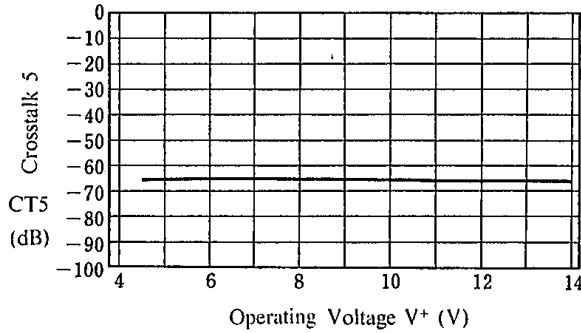
Crosstalk 4 vs. Operating Voltage

(Ta = 25°C)

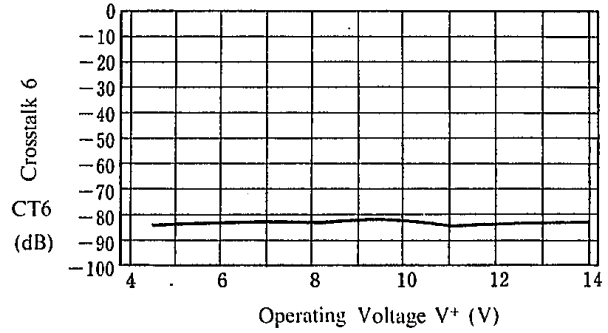


■ TYPICAL CHARACTERISTICS

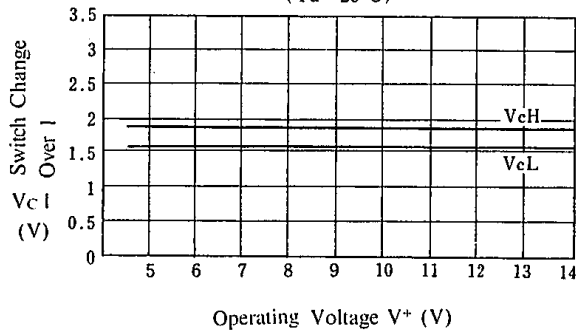
Crosstalk 5 vs. Operating Voltage
($T_a=25^\circ\text{C}$)



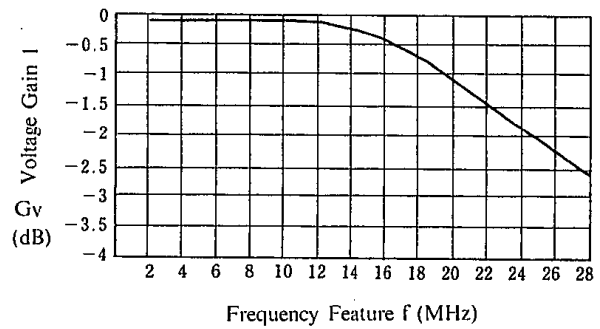
Crosstalk 6 vs. Operating Voltage
($T_a=25^\circ\text{C}$)



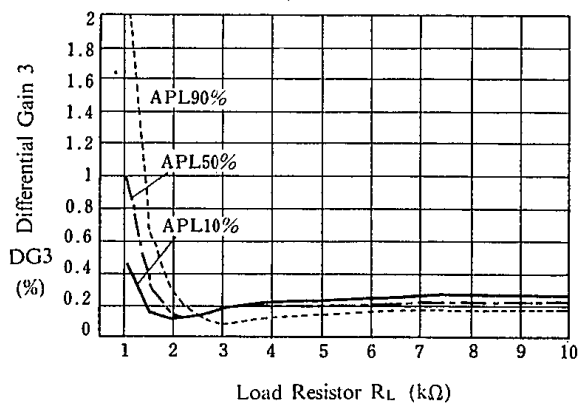
Switch Change Over 1 vs. Operating Voltage
($T_a=25^\circ\text{C}$)



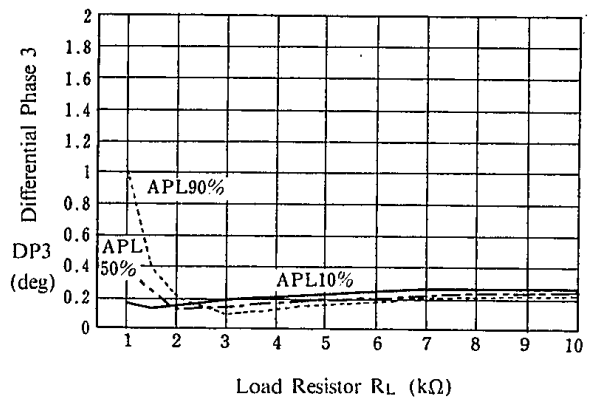
Voltage Gain 1 vs. Frequency Feature
($T_a=25^\circ\text{C}$)



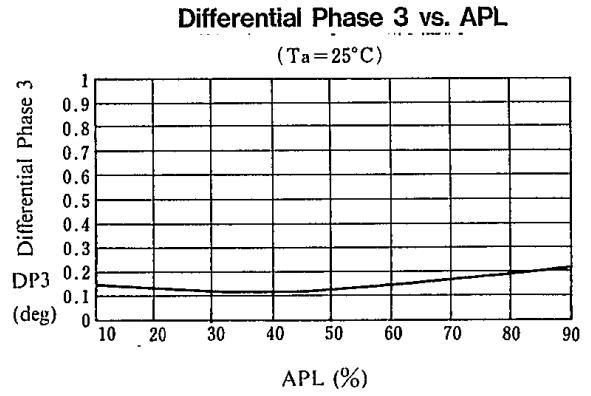
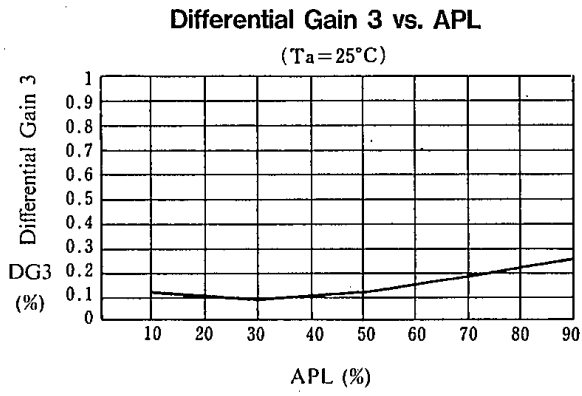
Differential Gain 3 vs. Load Resistor
($T_a=25^\circ\text{C}$)



Differential Phase 3 vs. Load Resistor
($T_a=25^\circ\text{C}$)



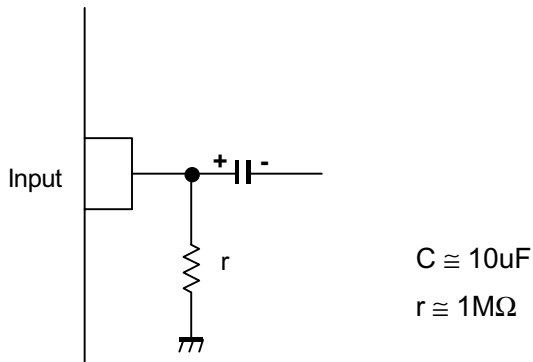
■ TYPICAL CHARACTERISTICS



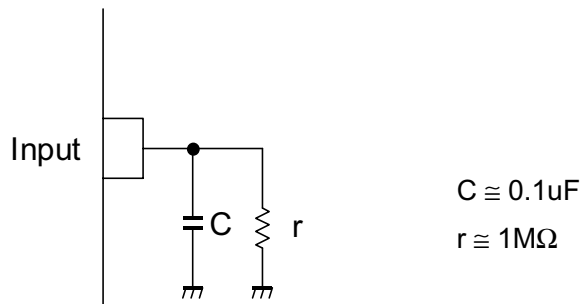
5

■APPLICATION

This IC requires $1\text{M}\Omega$ resistance between INPUT and GND pin for clamp type input since the minute current causes an unstable pin voltage.



This IC requires $0.1\mu\text{F}$ capacitor between INPUT and GND, $1\text{M}\Omega$ resistance between INPUT and GND for clamp type input at mute mode.



[CAUTION]

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