

## 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).

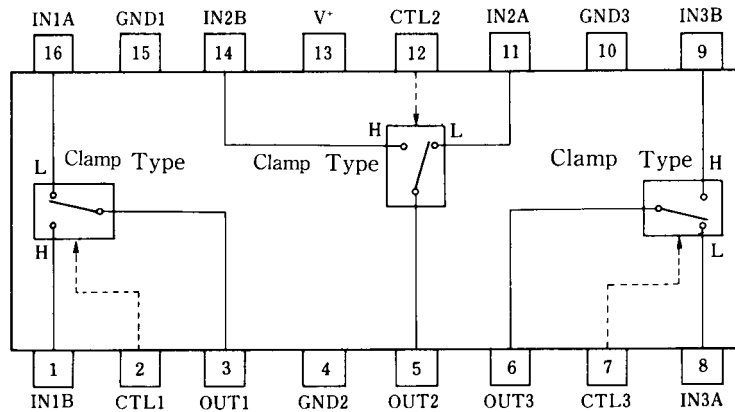
### ■ FEATURES

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

### ■ APPLICATIONS

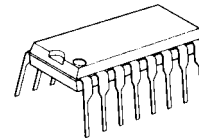
- VCR, Video Camera, AV-TV, Video Disk Player.

### ■ BLOCK DIAGRAM

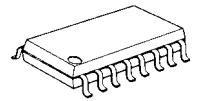


**NJM2286D**  
**NJM2286M**

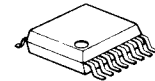
### ■ PACKAGE OUTLINE



**NJM2286D**



**NJM2286M**



**NJM2286V**

# NJM2286

## ■ MAXIMUM RATINGS

(T<sub>a</sub> = 25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	14	V
Power Dissipation	P <sub>D</sub>	(DIP16) 700 (DMP16) 350	mW mW
Operating Temperature Range	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

## ■ ELECTRICAL CHARACTERISTICS

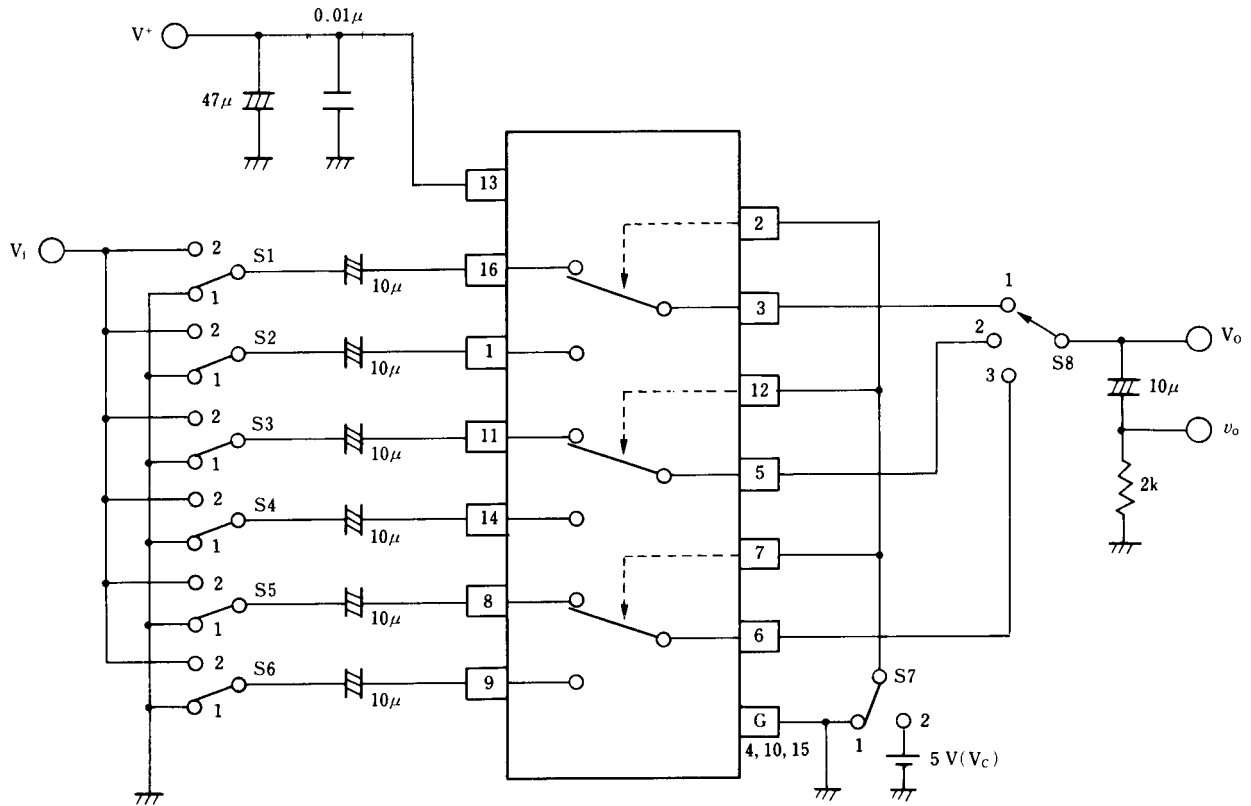
(V<sup>+</sup> = 5V, T<sub>a</sub> = 25°C)

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



PARAMETER	S1	S2	S3	S4	S5	S6	S7	S8	TEST PART
$I_{CC1}$	1	1	1	1	1	1	1	1	$V^+$
$I_{CC2}$	1	1	1	1	1	1	1	1	$V^+$
$G_{V1}$	2	1	1	1	1	1	1	1	$V_o$
$G_{R1}$	2	1	1	1	1	1	1	1	$V_o$
$DG_1$	2	1	1	1	1	1	1	1	$V_o$
$DP_1$	2	1	1	1	1	1	1	1	$V_o$
CT 1	2	1	1	1	1	1	2	1	$V_o$
CT 2	1	2	1	1	1	1	1	1	$V_o$
CT 3	1	1	2	1	1	1	2	2	$V_o$
CT 4	1	1	1	2	1	1	1	2	$V_o$
CT 5	1	1	1	1	2	1	2	3	$V_o$
CT 6	1	1	1	1	1	2	1	3	$V_o$
$V_{OS1}$	1	1	1	1	1	1	1/2	1	$V_o$
$V_{C1}$	1/2	2/1	1	1	1	1	$V_C$	1	$V_C$
THD	2	1	1	1	1	1	1	1	$V_o$

# NJM2286

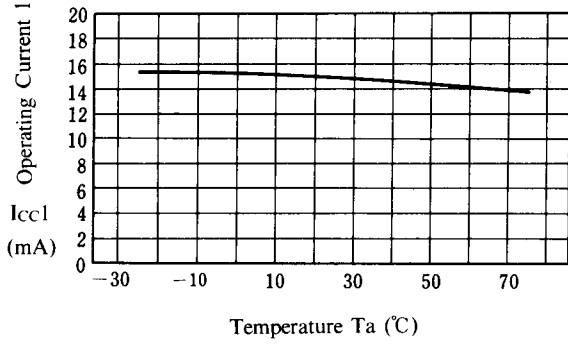
## ■ TERMINAL EXPLANATION

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	
2 12 7	CTL 1 CTL 2 CTL 3 [Switching]		
3 5 6	OUT1 OUT2 OUT3 [Output]	0.8V	
13	V <sup>+</sup>	5V	
15 4 10	GND 1 GND 2 GND 3		

## ■ TYPICAL CHARACTERISTICS

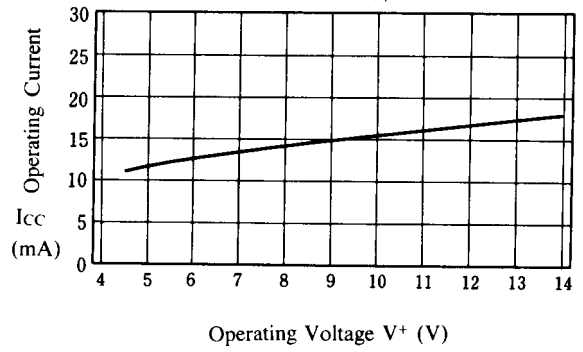
**Operating Current 1 vs. Temperature**

( $V^+ = 9V$ )



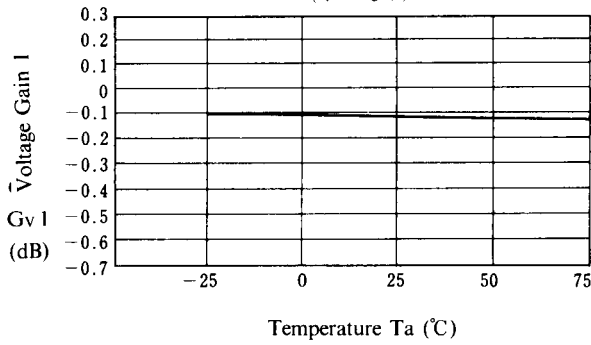
**Operating Current vs. Operating Voltage**

( $T_a = 25^\circ C$ )



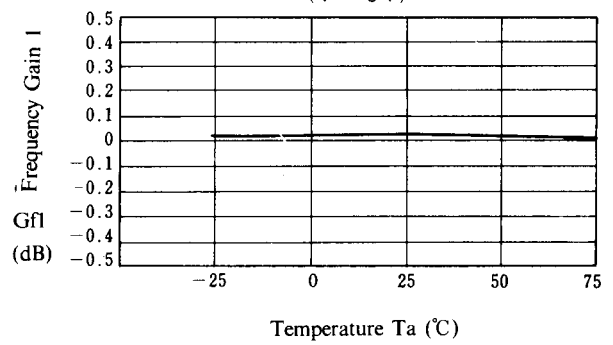
**Voltage Gain 1 vs. Temperature**

( $V^+ = 5V$ )



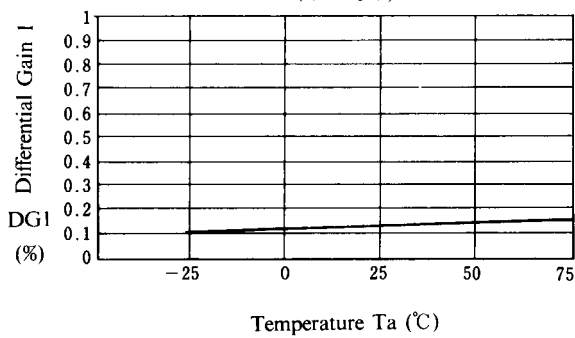
**Frequency Gain 1 vs. Temperature**

( $V^+ = 5V$ )



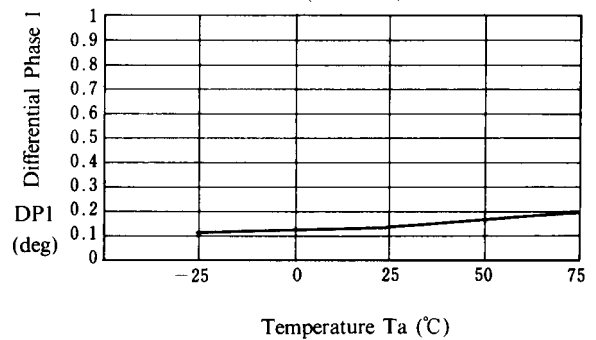
**Differential Gain 1 vs. Temperature**

( $V^+ = 5V$ )



**Differential Phase 1 vs. Temperature**

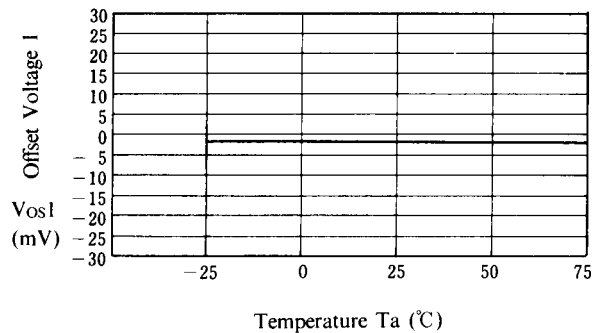
( $V^+ = 5V$ )



## ■ TYPICAL CHARACTERISTICS

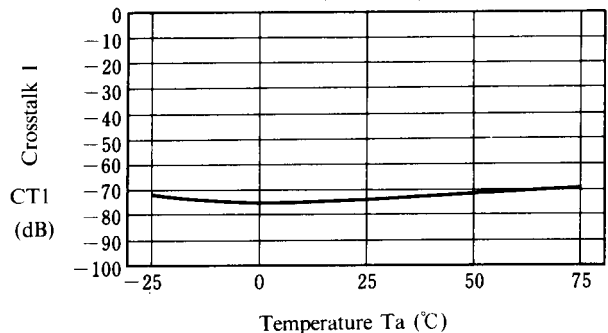
**Offset Voltage vs. Temperature**

(V<sup>+</sup> = 5 V)



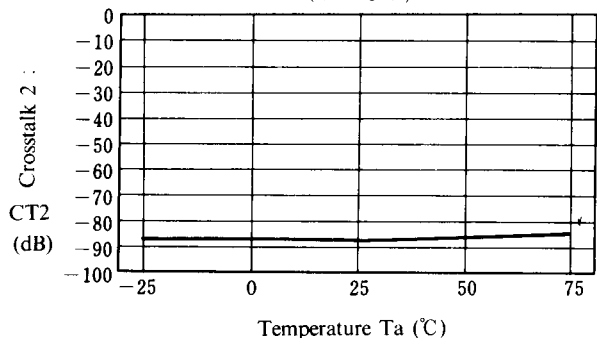
**Crosstalk 1 vs. Temperature**

(V<sup>+</sup> = 5 V)



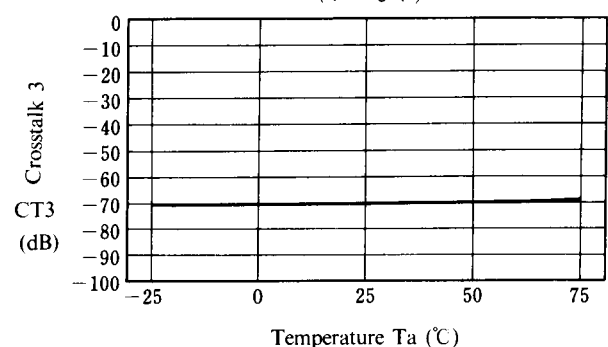
**Crosstalk 2 vs. Temperature**

(V<sup>+</sup> = 5 V)



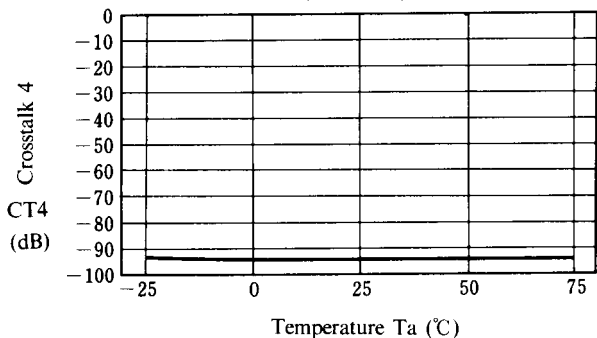
**Crosstalk 3 vs. Temperature**

(V<sup>+</sup> = 5 V)



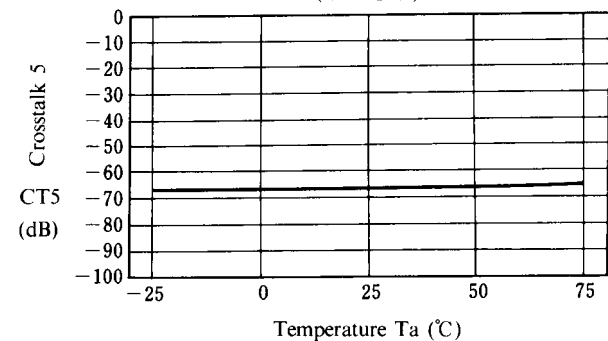
**Crosstalk 4 vs. Temperature**

(V<sup>+</sup> = 5 V)



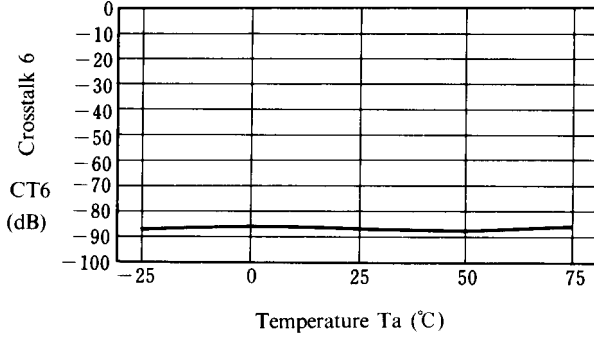
**Crosstalk 5 vs. Temperature**

(V<sup>+</sup> = 5 V)

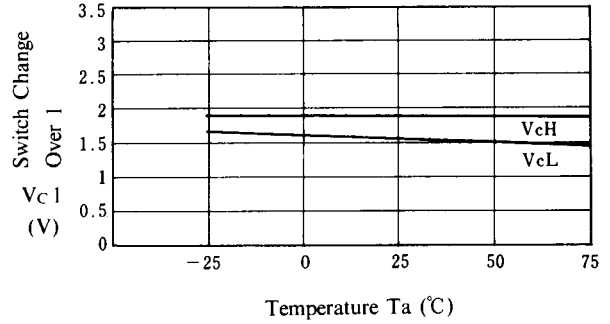


## ■ TYPICAL CHARACTERISTICS

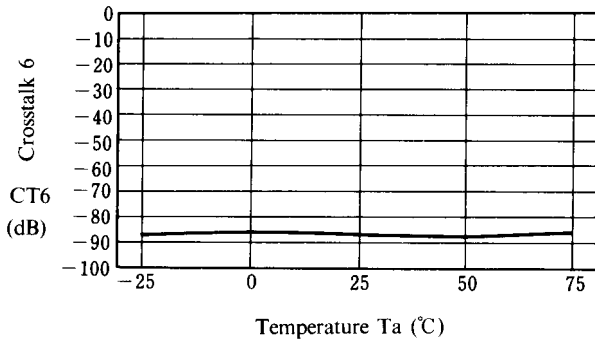
**Crosstalk 6 vs. Temperature**  
( $V^+ = 5\text{ V}$ )



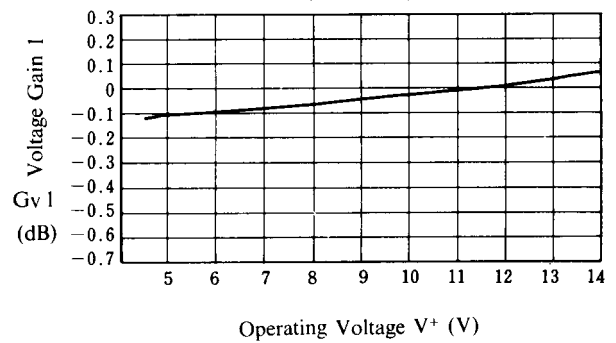
**Switch Change Over 1 vs. Temperature**  
( $V^+ = 5\text{ V}$ )



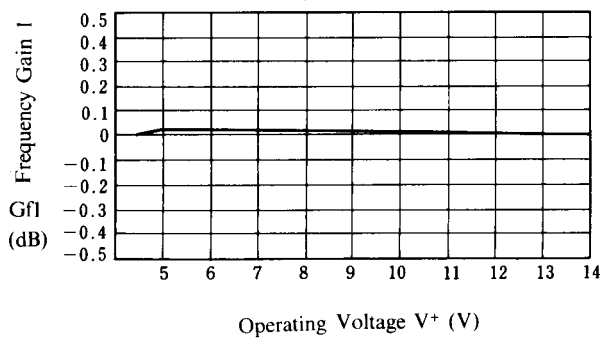
**Supply Current 2 vs. Temperature**  
( $V^+ = 5\text{ V}$ )



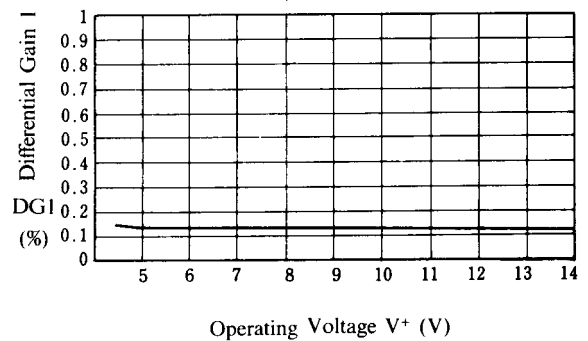
**Voltage Gain 1 vs. Operating Voltage**  
( $T_a = 25^\circ\text{C}$ )



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



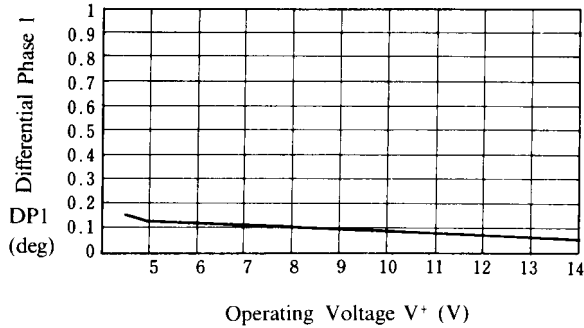
**Differential Gain 1 vs. Operating Voltage**  
( $T_a = 25^\circ\text{C}$ )



## ■ TYPICAL CHARACTERISTICS

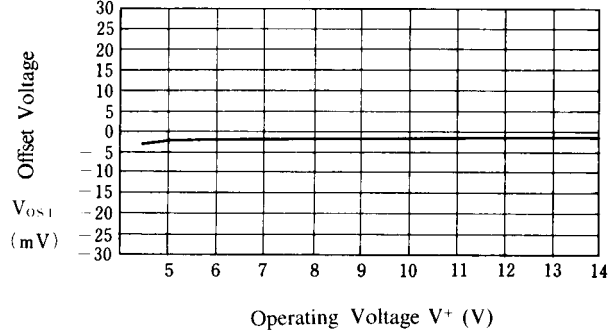
**Differential Phase 1 vs. Operating Voltage**

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



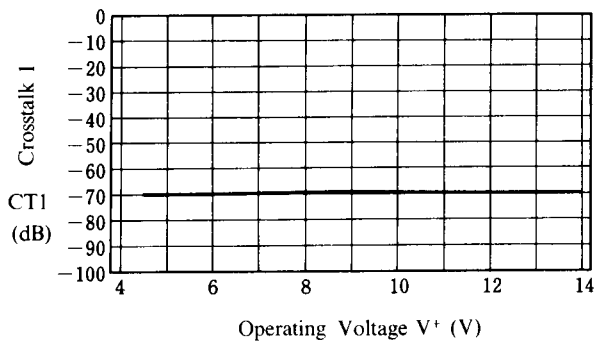
**Offset Voltage 1 vs. Operating Voltage**

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



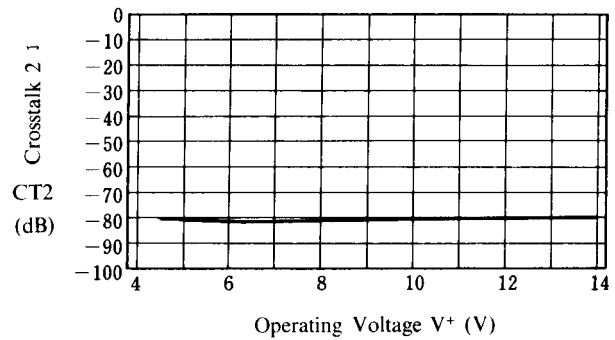
**Crosstalk 1 vs. Operating Voltage**

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



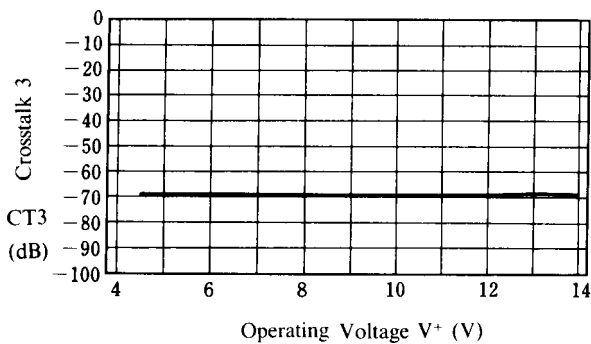
**Crosstalk 2 vs. Operating Voltage**

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



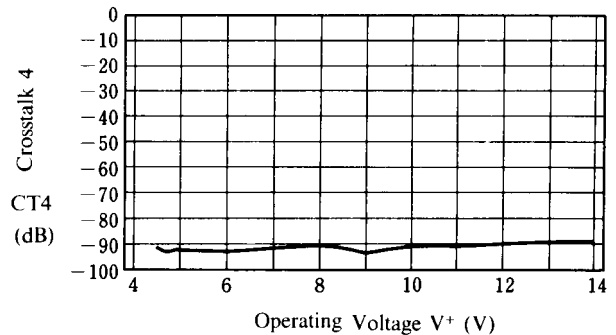
**Crosstalk 3 vs. Operating Voltage**

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



**Crosstalk 4 vs. Operating Voltage**

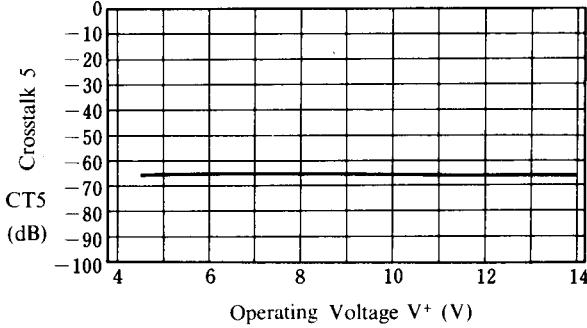
( $T_a = 25^\circ\text{C}$ )



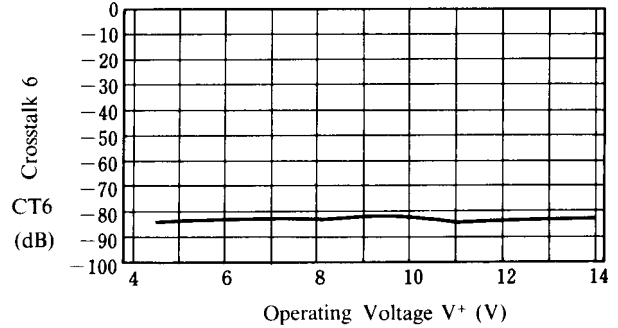


## ■ TYPICAL CHARACTERISTICS

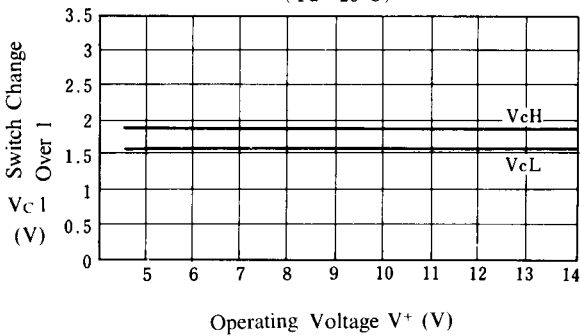
**Crosstalk 5 vs. Operating Voltage**  
( $T_a = 25^\circ\text{C}$ )



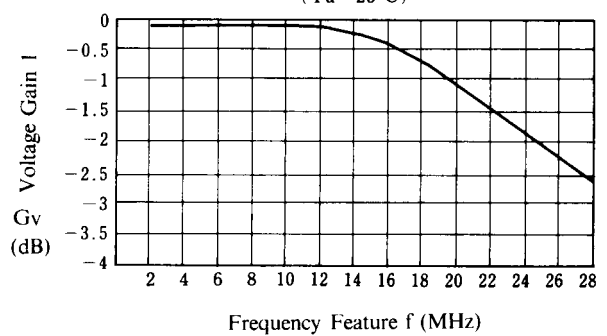
**Crosstalk 6 vs. Operating Voltage**  
( $T_a = 25^\circ\text{C}$ )



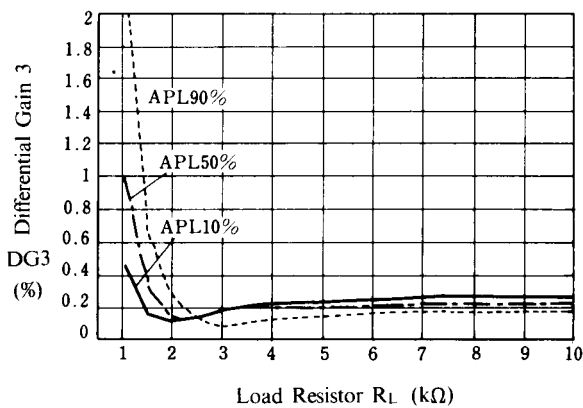
**Switch Change Over 1 vs. Operating Voltage**  
( $T_a = 25^\circ\text{C}$ )



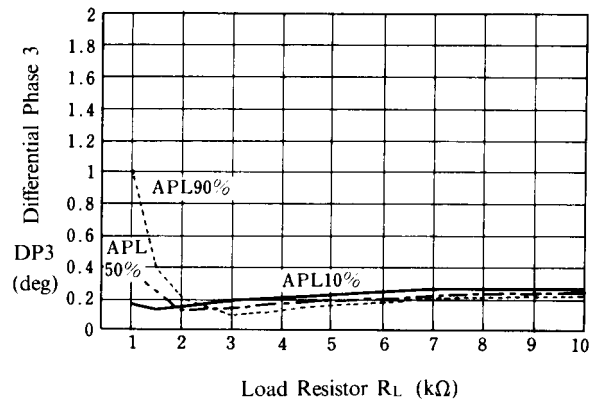
**Voltage Gain 1 vs. Frequency Feature**  
( $T_a = 25^\circ\text{C}$ )



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

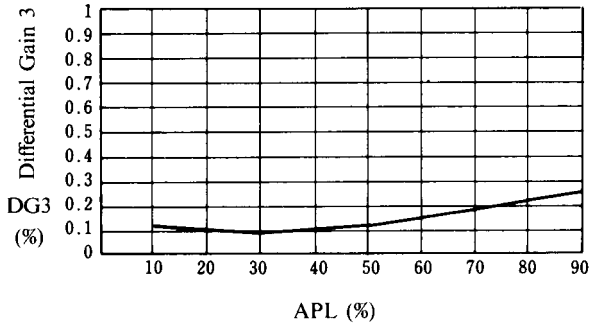


**Differential Phase 3 vs. Load Resistor**  
( $T_a = 25^\circ\text{C}$ )

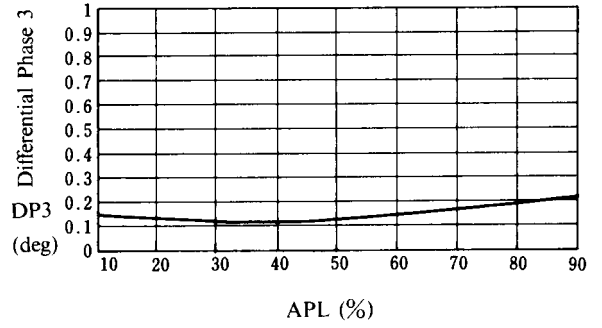


## ■ TYPICAL CHARACTERISTICS

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

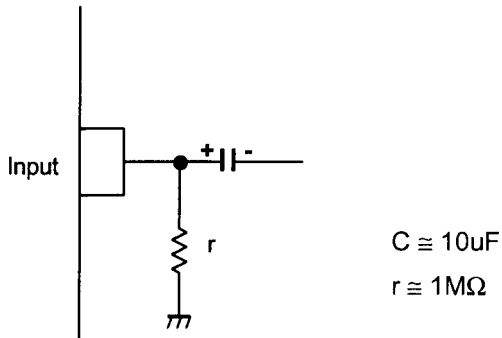


**Differential Phase 3 vs. APL**  
( $T_a = 25^\circ\text{C}$ )

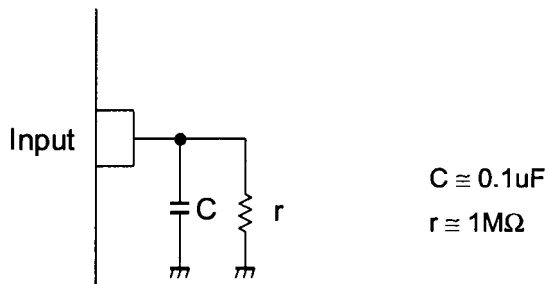


## ■ APPLICATION

This IC requires  $1M\Omega$  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,  $1M\Omega$  resistance between INPUT and GND for clamp type input at mute mode.



**[CAUTION]**

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