

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).

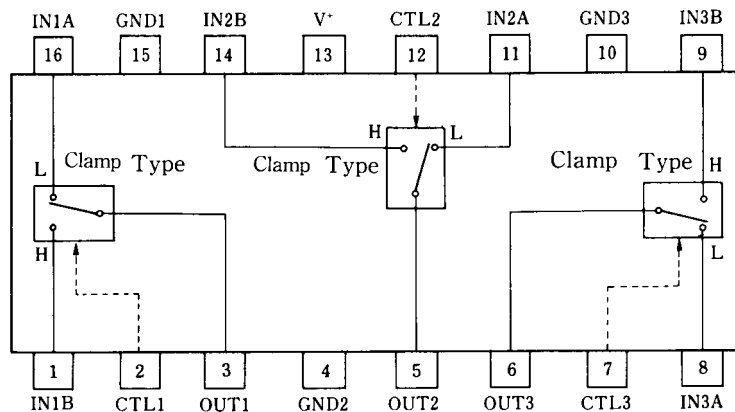
■ FEATURES

- 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_{P-P} Input)
- Package Outline DIP16, DMP16, SSOP16
- Bipolar Technology

■ APPLICATIONS

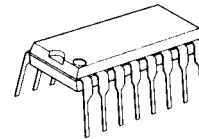
- VCR, Video Camera, AV-TV, Video Disk Player.

■ BLOCK DIAGRAM

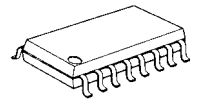


NJM2286D
NJM2286M

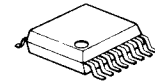
■ PACKAGE OUTLINE



NJM2286D



NJM2286M



NJM2286V

NJM2286

■ MAXIMUM RATINGS

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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	14	V
Power Dissipation	P_D	(DIP16) 700 (DMP16) 350	mW mW
Operating Temperature Range	T_{opr}	-40 to +85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +125	$^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS

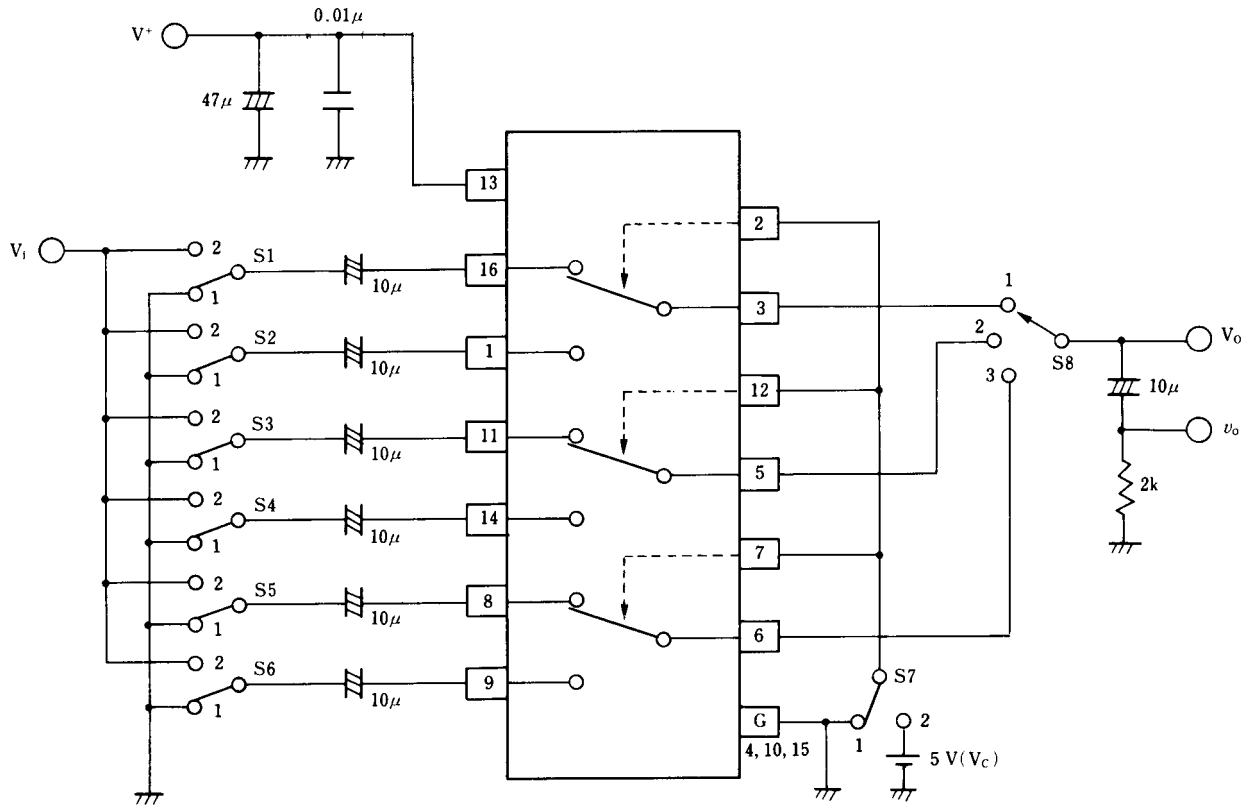
($V^+ = 5\text{V}$, $T_a = 25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current (1)	I_{CC1}	$V^+ = 5\text{V}$ (Note1)	7.9	11.3	14.7	mA
Operating Current (2)	I_{CC2}	$V^+ = 9\text{V}$ (Note1)	9.8	14.1	18.4	mA
Voltage Gain	G_V	$V_I = 100\text{kHz}$, $2V_{P-P}$, 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 Phasa	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



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

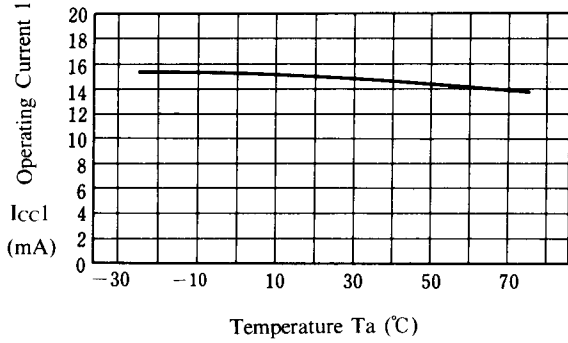
NJM2286

■ TERMINAL EXPLANATION

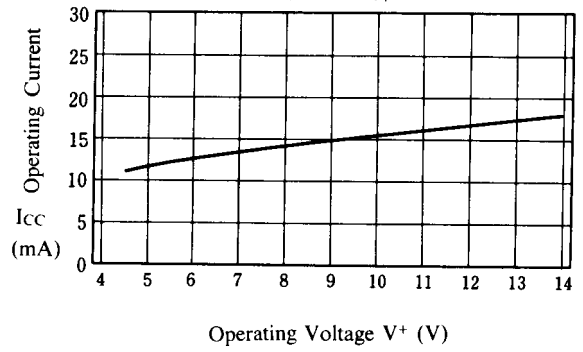
PIN No.	PIN NAME	VOLTAGE	INSIDE EQUIVALENT CIRCUIT
16 1 11 14 8 9	IN 1 A IN 1 B IN 2 A IN 2 B IN 3 A IN 3 B [Input]	1.5V	<p>The diagram shows an input terminal labeled 'IN' connected to a 500 ohm resistor. The other end of the resistor is connected to a common ground. A 2.2V source is also connected to the common ground.</p>
2 12 7	CTL 1 CTL 2 CTL 3 [Switching]		<p>The diagram shows a control circuit with two voltage sources: 2.3V and 1.9V. The 2.3V source is connected to a network of resistors (8k, 20k, 8k) and a transistor. The 1.9V source is connected to another transistor. The output of the circuit is labeled 'CLT'.</p>
3 5 6	OUT1 OUT2 OUT3 [Output]	0.8V	<p>The diagram shows an output terminal labeled 'OUT' connected to a transistor. The other end of the transistor is connected to a common ground.</p>
13	V ⁺	5V	
15 4 10	GND 1 GND 2 GND 3		

■ TYPICAL CHARACTERISTICS

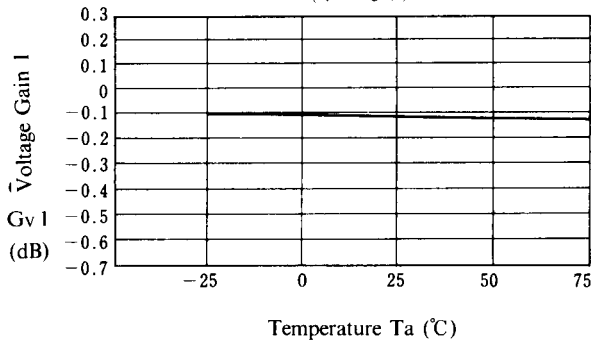
Operating Current 1 vs. Temperature
($V^+ = 9V$)



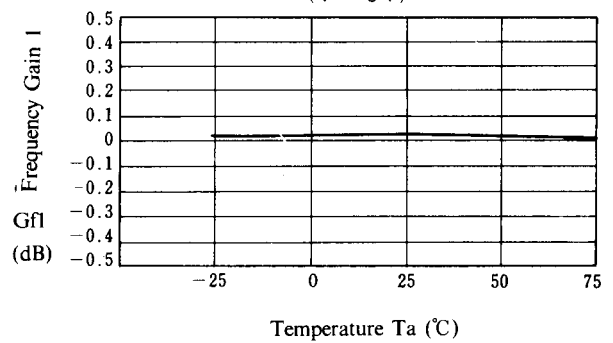
Operating Current vs. Operating Voltage
($T_a = 25^\circ C$)



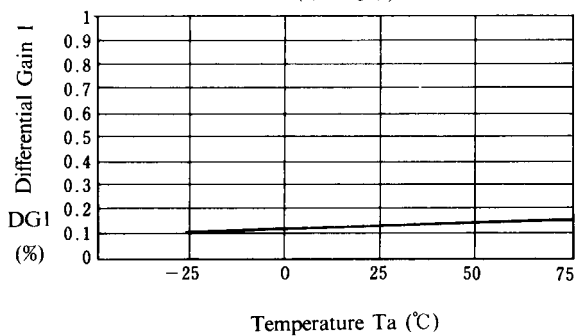
Voltage Gain 1 vs. Temperature
($V^+ = 5V$)



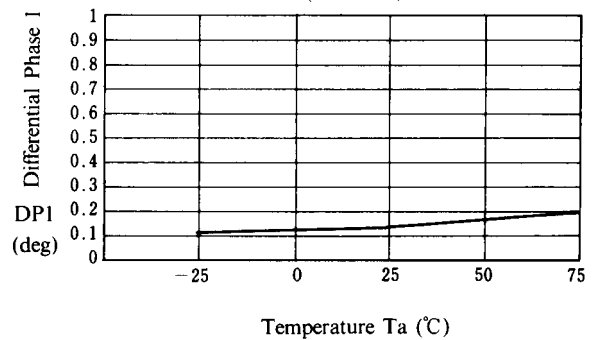
Frequency Gain 1 vs. Temperature
($V^+ = 5V$)



Differential Gain 1 vs. Temperature
($V^+ = 5V$)



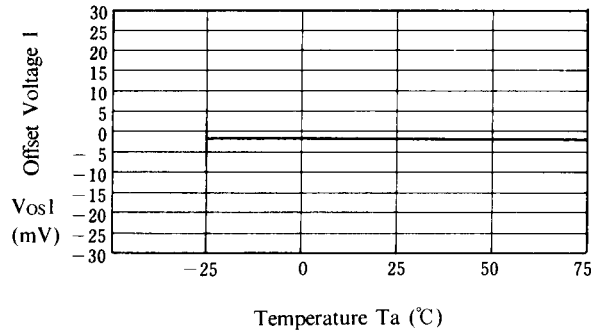
Differential Phase 1 vs. Temperature
($V^+ = 5V$)



■ TYPICAL CHARACTERISTICS

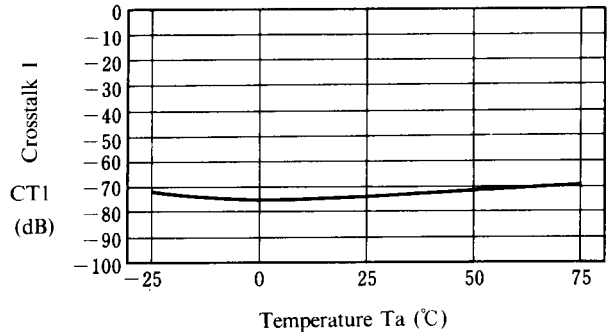
Offset Voltage vs. Temperature

(V⁺ = 5 V)



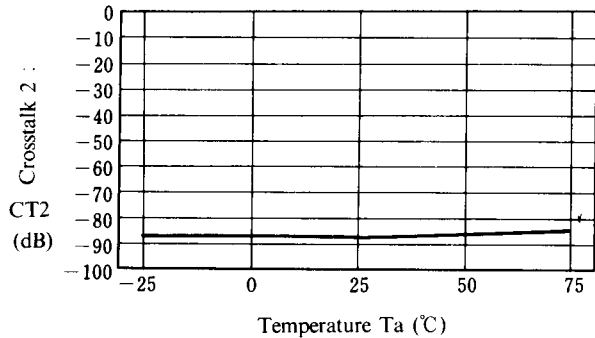
Crosstalk 1 vs. Temperature

(V⁺ = 5 V)



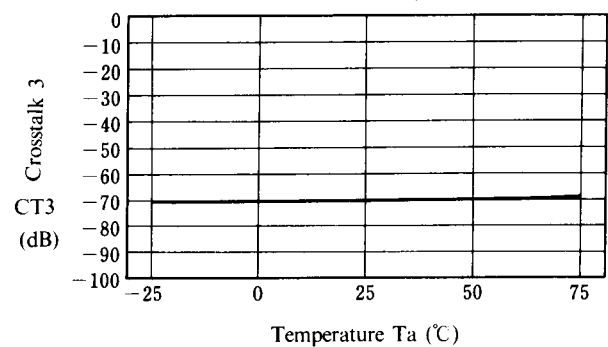
Crosstalk 2 vs. Temperature

(V⁺ = 5 V)



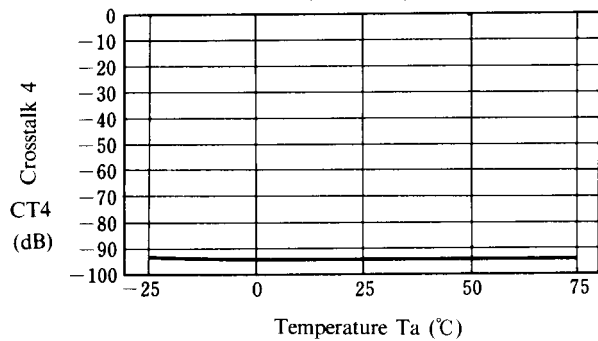
Crosstalk 3 vs. Temperature

(V⁺ = 5 V)



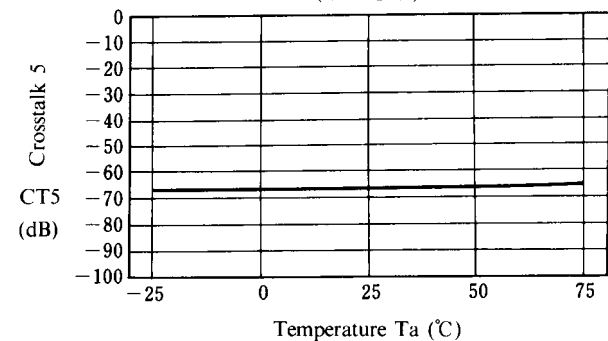
Crosstalk 4 vs. Temperature

(V⁺ = 5 V)



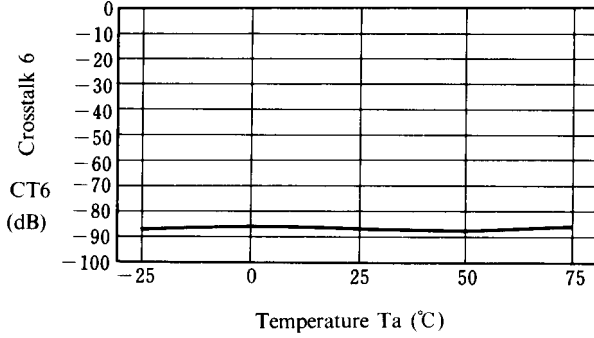
Crosstalk 5 vs. Temperature

(V⁺ = 5 V)

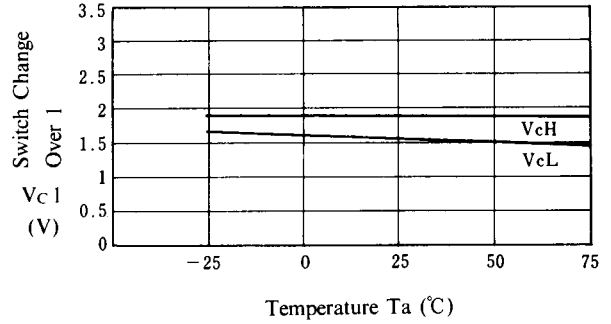


■ TYPICAL CHARACTERISTICS

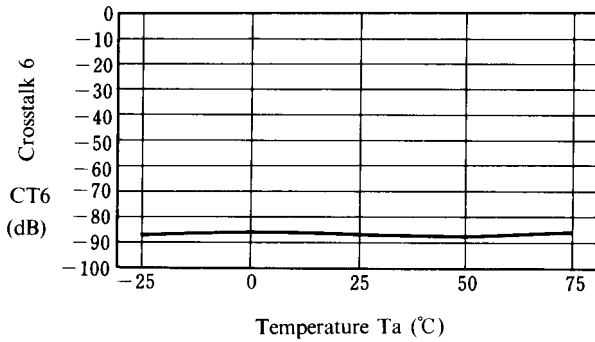
Crosstalk 6 vs. Temperature
($V^+ = 5\text{ V}$)



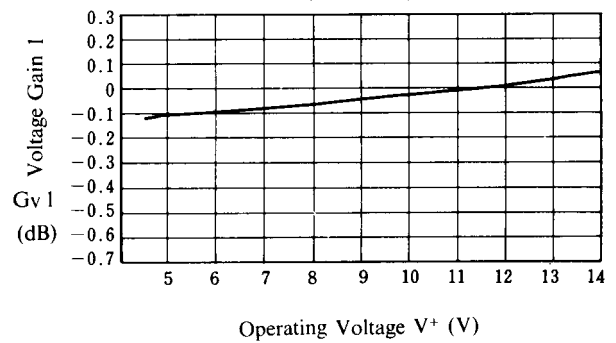
Switch Change Over 1 vs. Temperature
($V^+ = 5\text{ V}$)



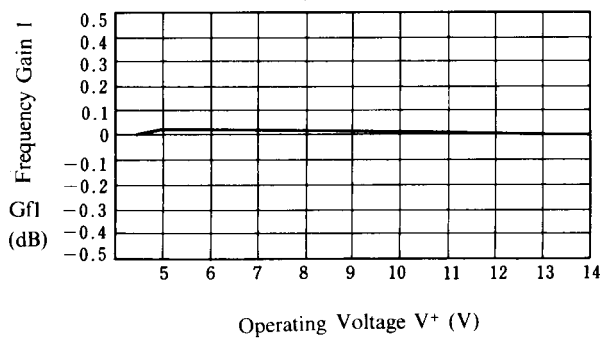
Supply Current 2 vs. Temperature
($V^+ = 5\text{ V}$)



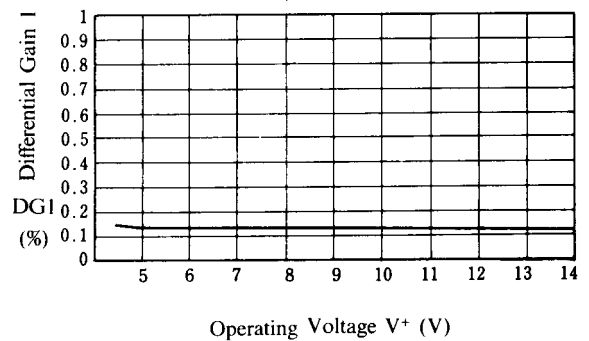
Voltage Gain 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



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



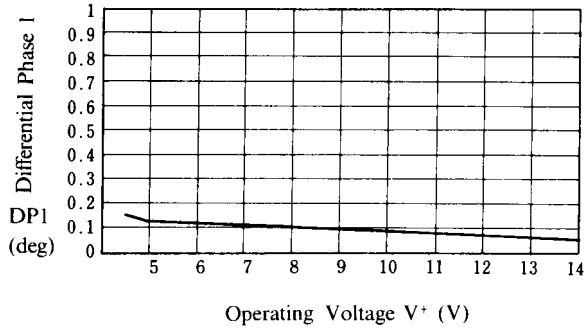
Differential Gain 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



■ TYPICAL CHARACTERISTICS

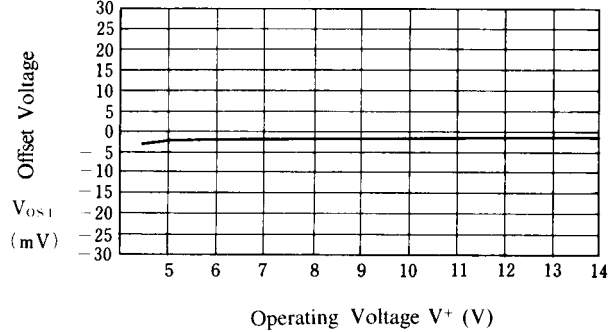
Differential Phase 1 vs. Operating Voltage

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



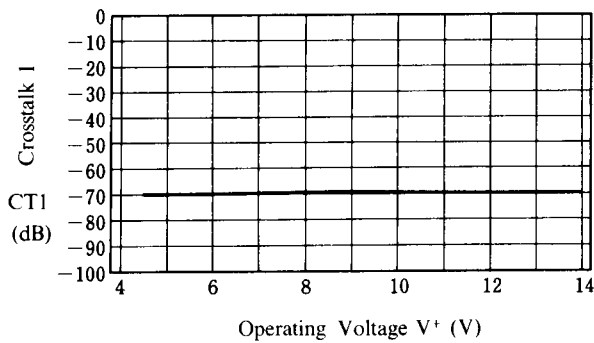
Offset Voltage 1 vs. Operating Voltage

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



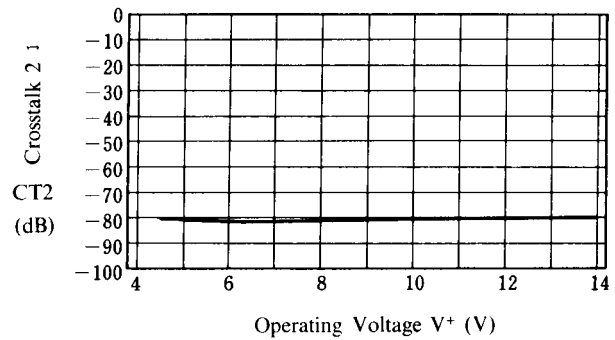
Crosstalk 1 vs. Operating Voltage

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



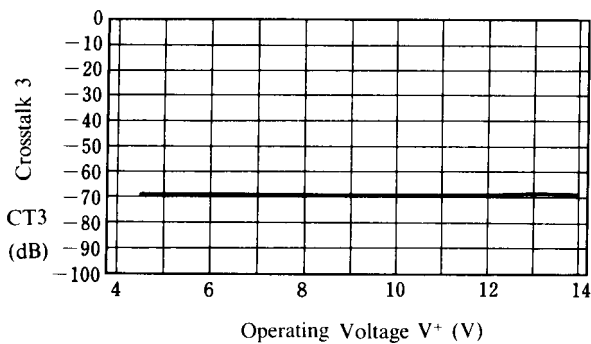
Crosstalk 2 vs. Operating Voltage

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



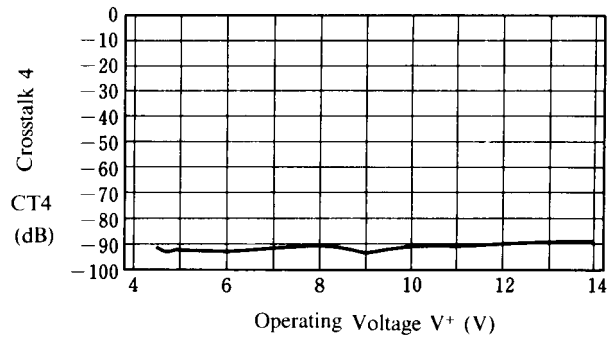
Crosstalk 3 vs. Operating Voltage

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



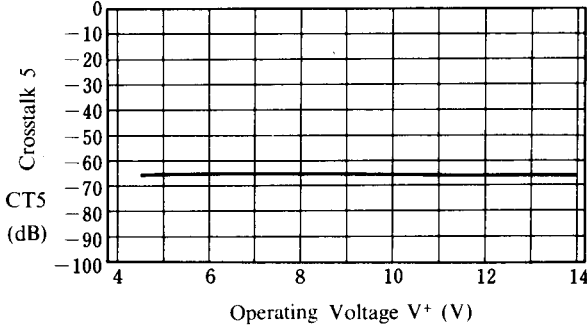
Crosstalk 4 vs. Operating Voltage

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

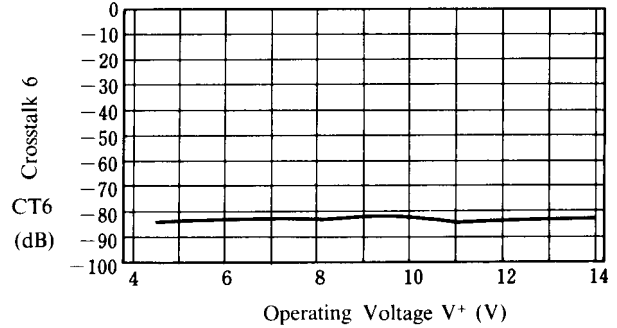


■ TYPICAL CHARACTERISTICS

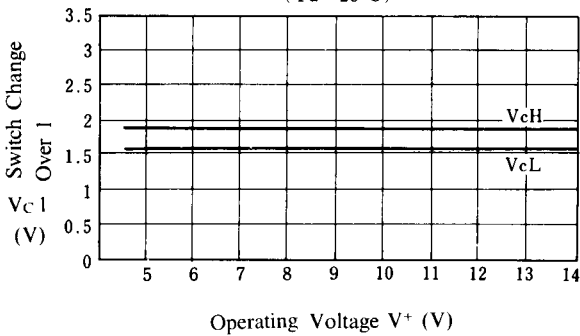
Crosstalk 5 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



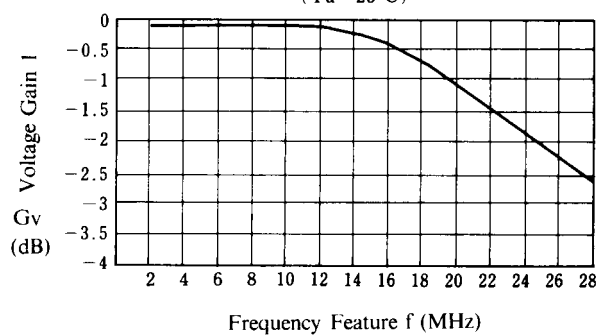
Crosstalk 6 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



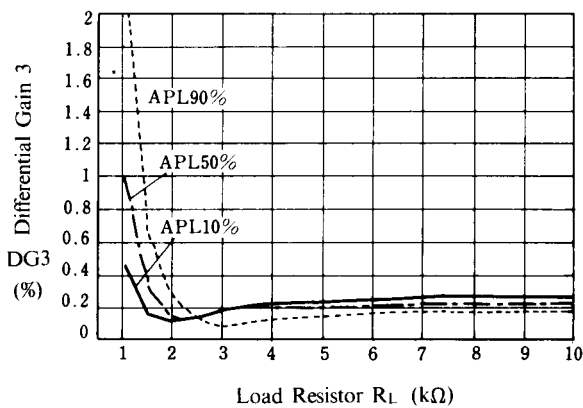
Switch Change Over 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



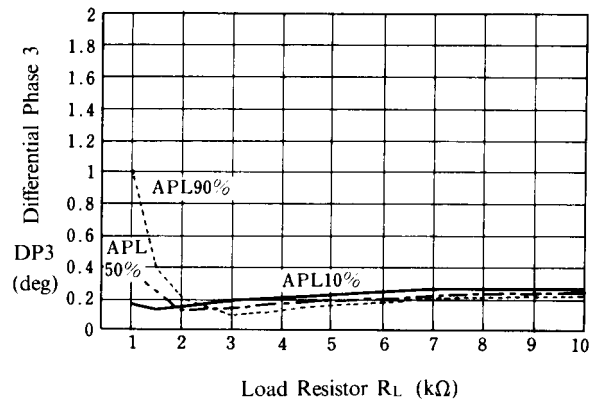
Voltage Gain 1 vs. Frequency Feature
($T_a = 25^\circ\text{C}$)



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

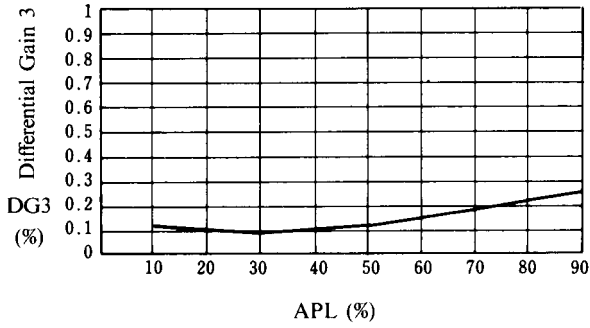


Differential Phase 3 vs. Load Resistor
($T_a = 25^\circ\text{C}$)

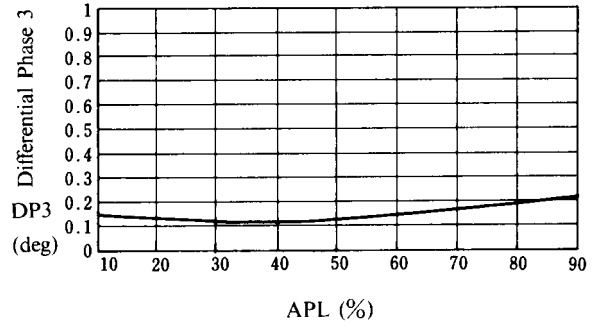


■ TYPICAL CHARACTERISTICS

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

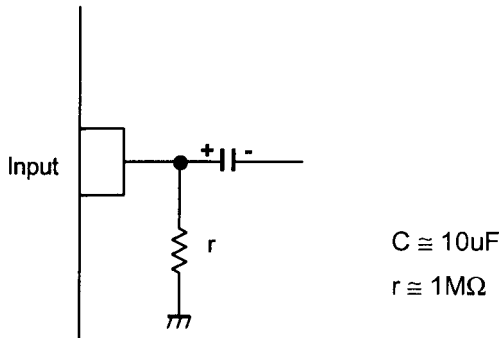


Differential Phase 3 vs. APL
($T_a = 25^\circ\text{C}$)

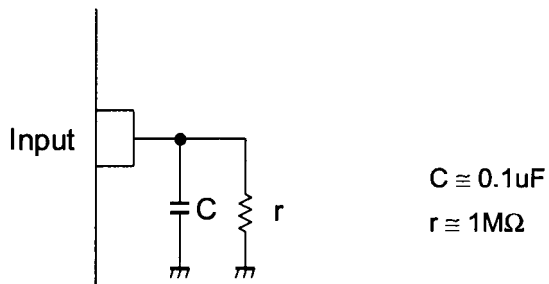


■ APPLICATION

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 $0.1\mu F$ capacitor between INPUT and GND, $1M\Omega$ resistance between INPUT and GND for clamp type input at mute mode.



[CAUTION]
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