

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).

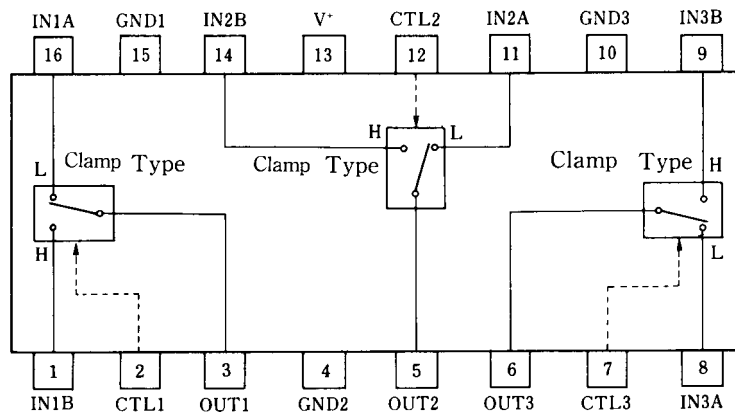
■ FEATURES

- 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

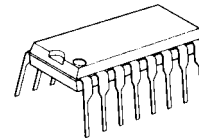
- VCR, Video Camera, AV-TV, Video Disk Player.

■ BLOCK DIAGRAM

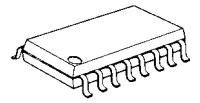


NJM2286D
NJM2286M

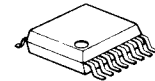
■ PACKAGE OUTLINE



NJM2286D



NJM2286M



NJM2286V

NJM2286

■ MAXIMUM RATINGS

(T_a = 25°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	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

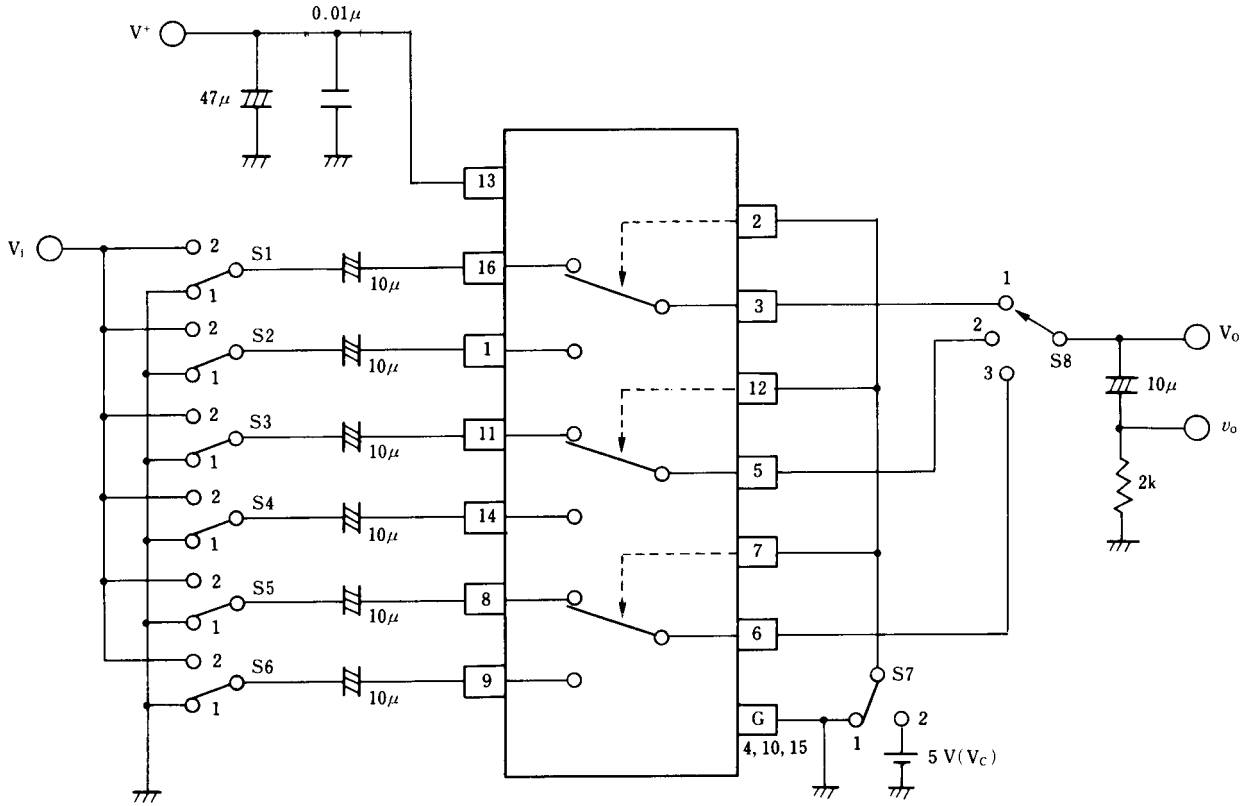
(V⁺ = 5V, T_a = 25°C)

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



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

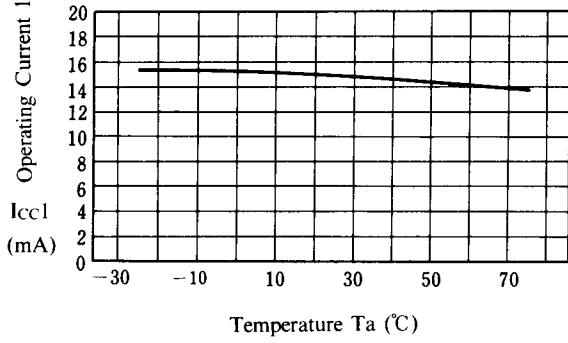
■ TERMINAL EXPLANATION

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 complex switching circuit. It includes a 2.3V source and a 1.9V source. A central transistor is connected to a common ground. The output of this transistor is connected to a network of resistors: an 8k resistor to a common ground, a 20k resistor to a terminal labeled 'CLT', and another 8k resistor to a common ground.</p>
3 5 6	OUT1 OUT2 OUT3 [Output]	0.8V	<p>The diagram shows a simple output circuit. A common ground is connected to the base of a transistor. The emitter is connected to a common ground. 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

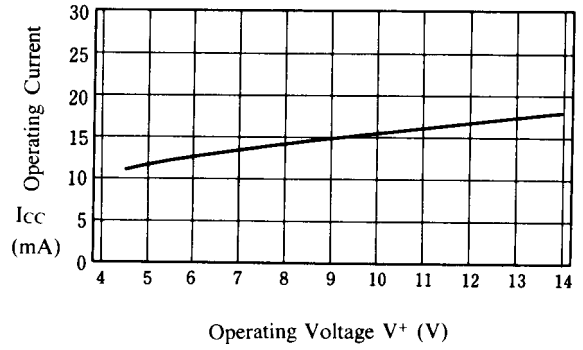
Operating Current 1 vs. Temperature

($V^+ = 9V$)



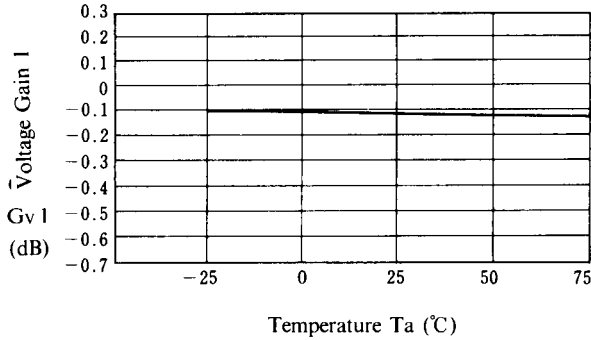
Operating Current vs. Operating Voltage

($T_a = 25^\circ C$)



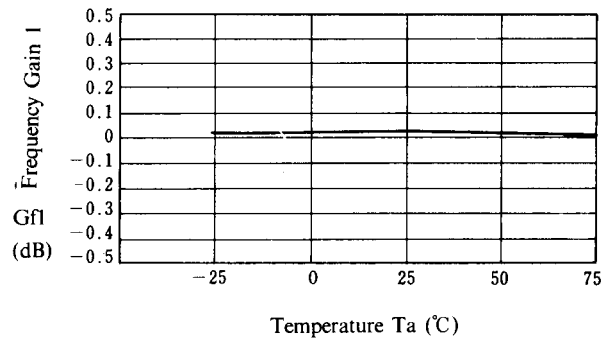
Voltage Gain 1 vs. Temperature

($V^+ = 5V$)



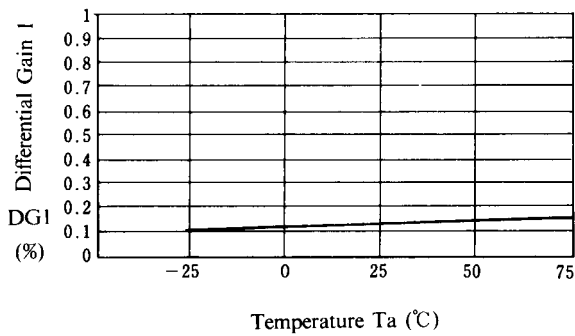
Frequency Gain 1 vs. Temperature

($V^+ = 5V$)



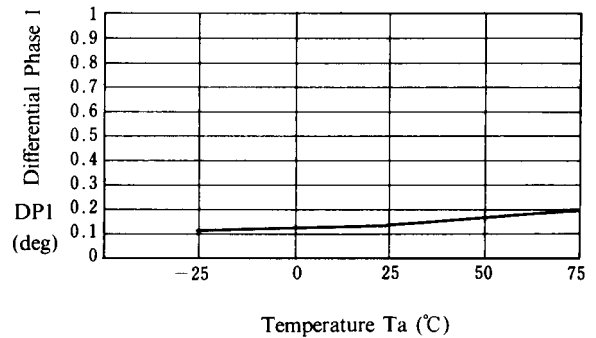
Differential Gain 1 vs. Temperature

($V^+ = 5V$)



Differential Phase 1 vs. Temperature

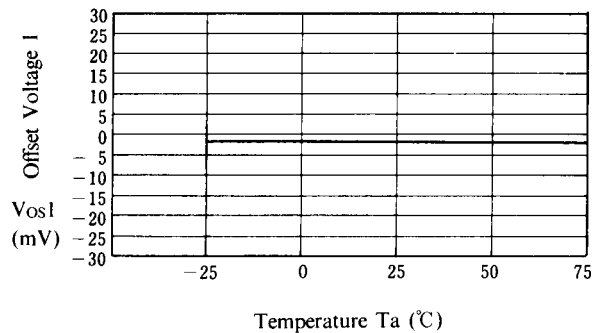
($V^+ = 5V$)



■ TYPICAL CHARACTERISTICS

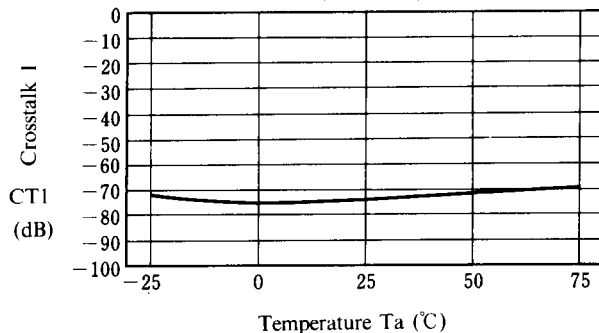
Offset Voltage vs. Temperature

(V⁺ = 5 V)



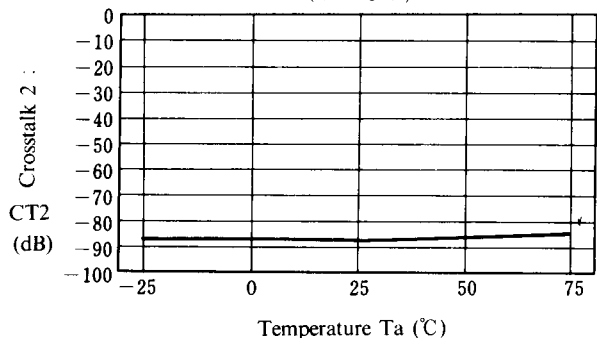
Crosstalk 1 vs. Temperature

(V⁺ = 5 V)



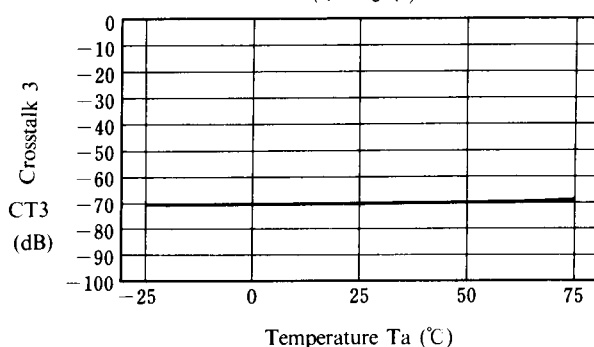
Crosstalk 2 vs. Temperature

(V⁺ = 5 V)



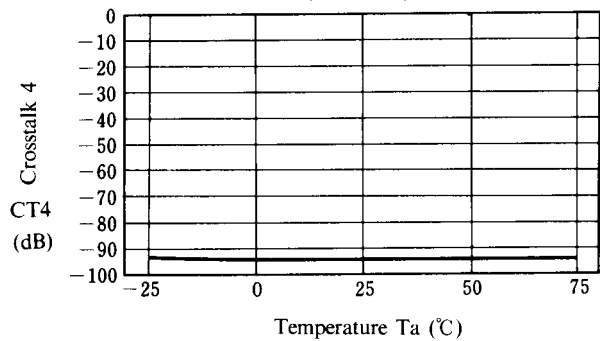
Crosstalk 3 vs. Temperature

(V⁺ = 5 V)



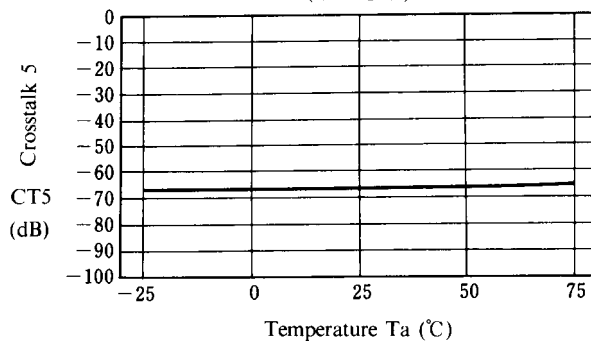
Crosstalk 4 vs. Temperature

(V⁺ = 5 V)



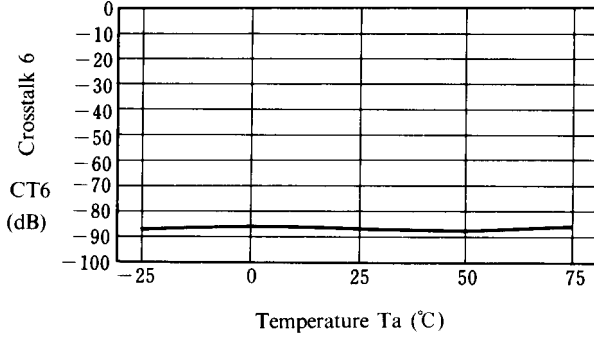
Crosstalk 5 vs. Temperature

(V⁺ = 5 V)

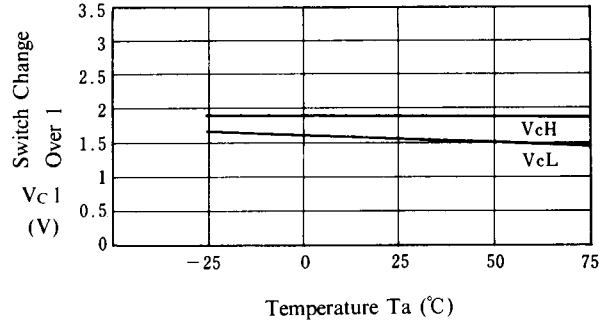


■ TYPICAL CHARACTERISTICS

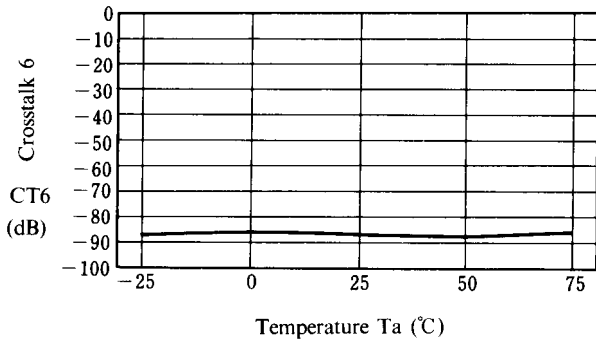
Crosstalk 6 vs. Temperature
($V^+ = 5\text{ V}$)



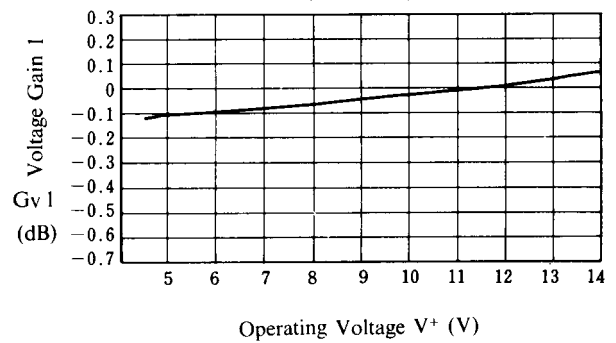
Switch Change Over 1 vs. Temperature
($V^+ = 5\text{ V}$)



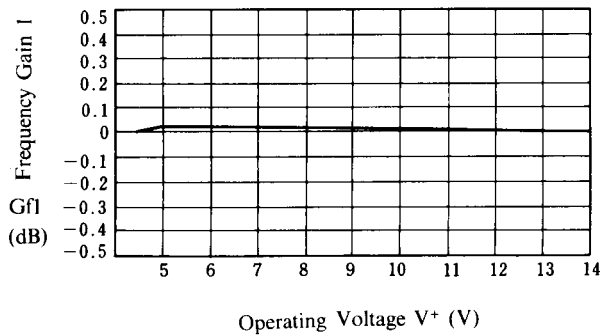
Supply Current 2 vs. Temperature
($V^+ = 5\text{ V}$)



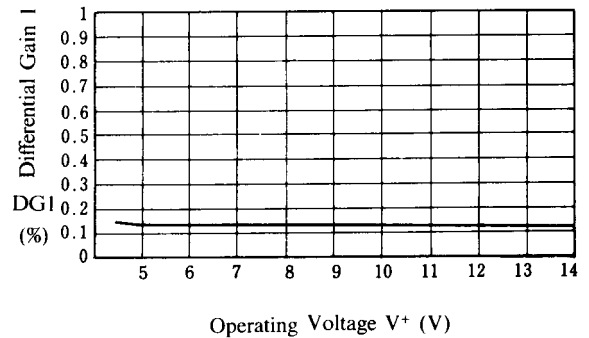
Voltage Gain 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



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



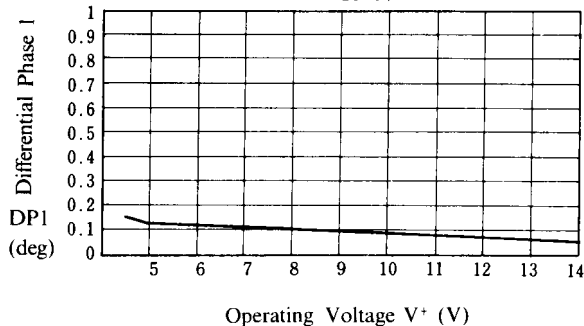
Differential Gain 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



■ TYPICAL CHARACTERISTICS

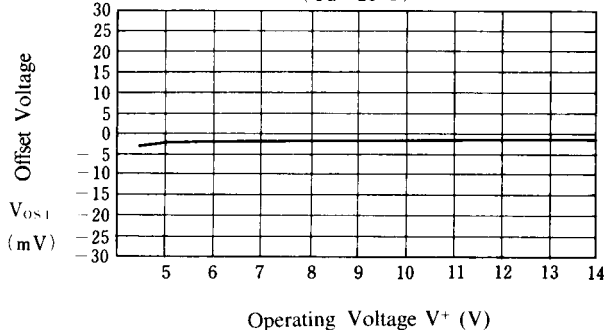
Differential Phase 1 vs. Operating Voltage

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



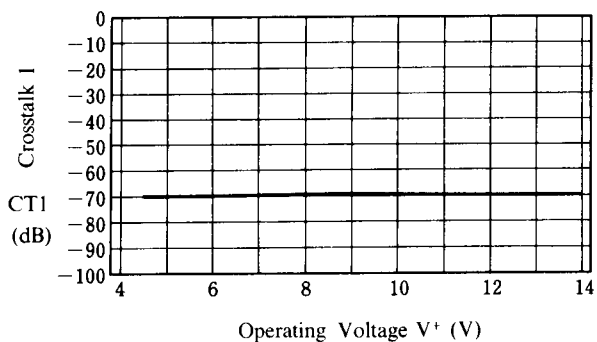
Offset Voltage 1 vs. Operating Voltage

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



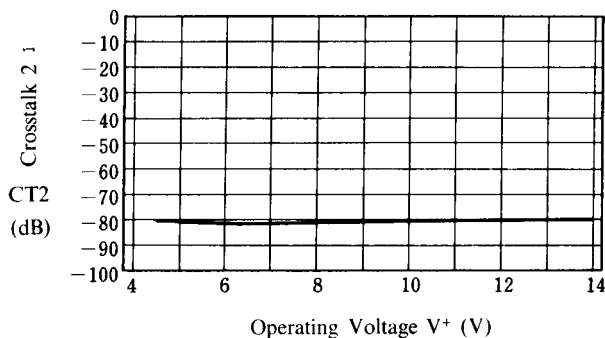
Crosstalk 1 vs. Operating Voltage

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



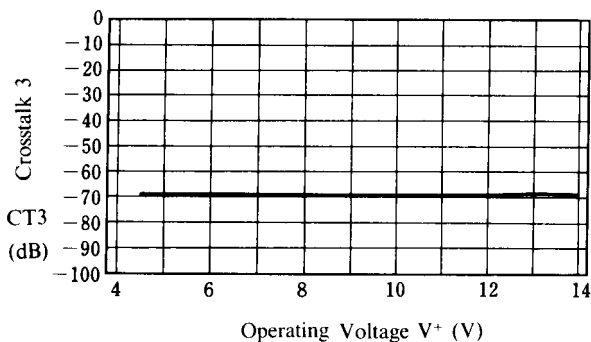
Crosstalk 2 vs. Operating Voltage

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



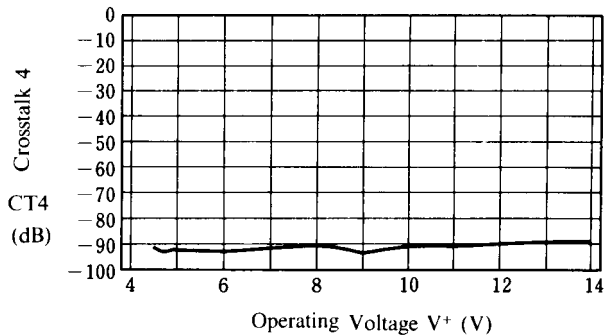
Crosstalk 3 vs. Operating Voltage

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



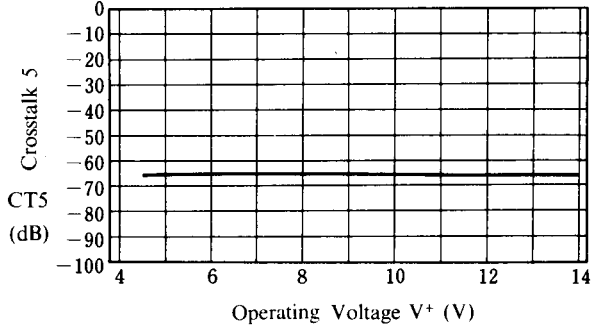
Crosstalk 4 vs. Operating Voltage

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

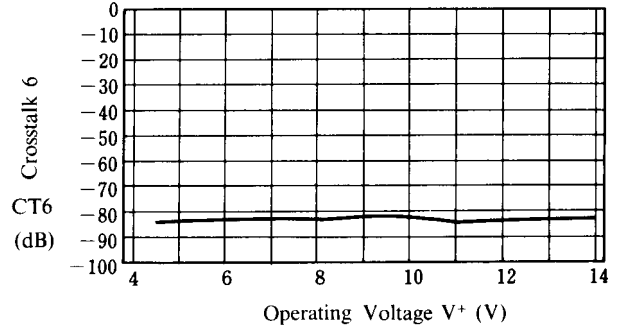


■ TYPICAL CHARACTERISTICS

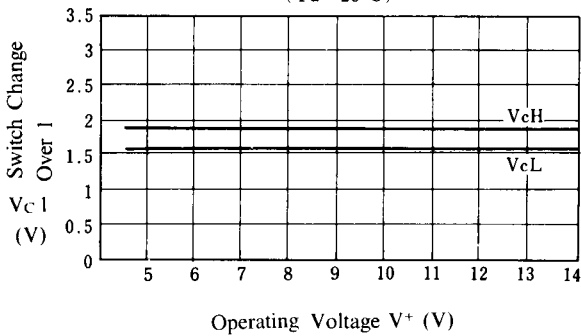
Crosstalk 5 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



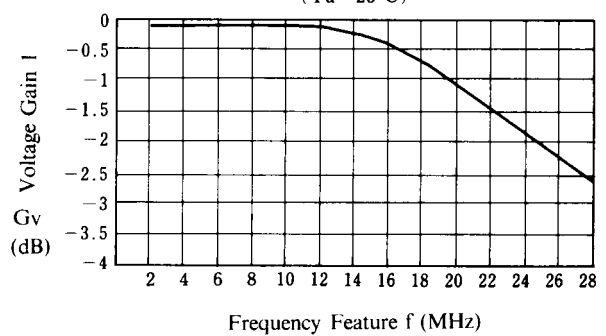
Crosstalk 6 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



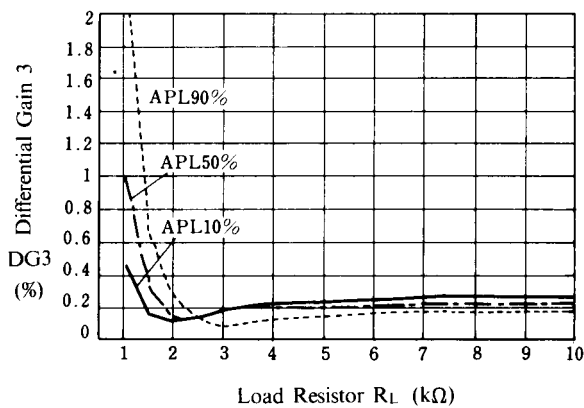
Switch Change Over 1 vs. Operating Voltage
($T_a = 25^\circ\text{C}$)



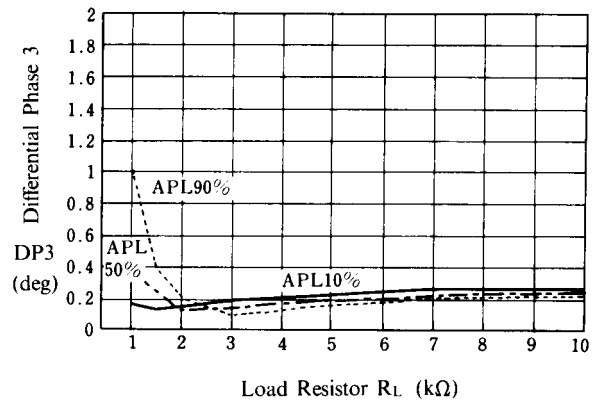
Voltage Gain 1 vs. Frequency Feature
($T_a = 25^\circ\text{C}$)



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

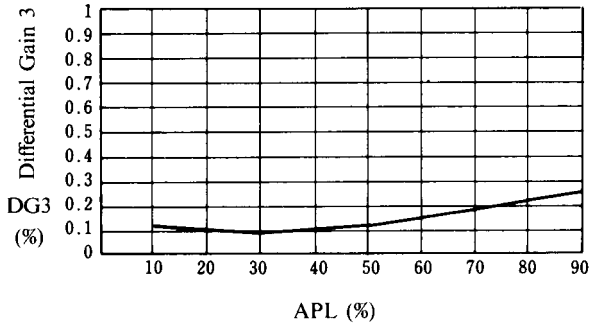


Differential Phase 3 vs. Load Resistor
($T_a = 25^\circ\text{C}$)

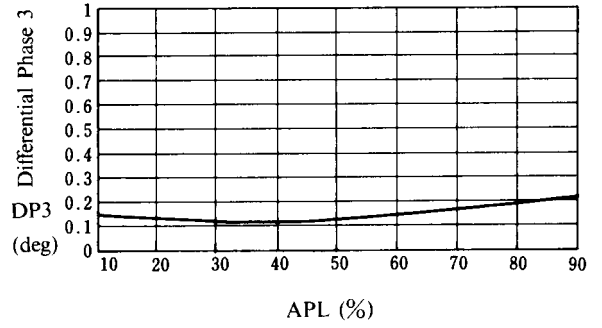


■ TYPICAL CHARACTERISTICS

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

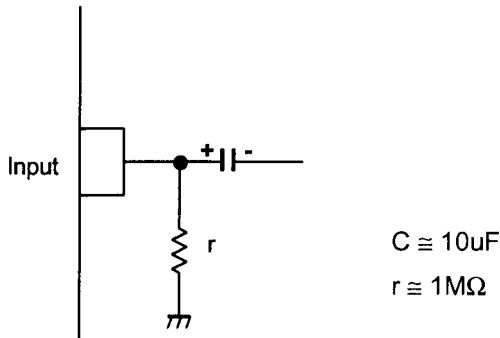


Differential Phase 3 vs. APL
($T_a = 25^\circ\text{C}$)

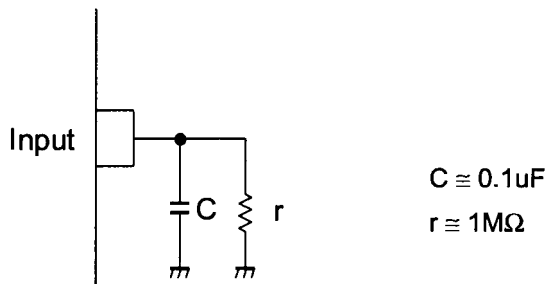


■ APPLICATION

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.



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