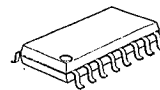# 2-INPUT 3CHANNEL VIDEO SWITCH

■ GENERAL DESCRIPTION

NJM2284 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. One of them is 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).
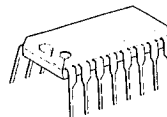
■ FEATURES

● 2 Input-1 Output Internalizing 3 Circuits (one of them is a Clamp type).
● Wide Operating Voltage
● Crosstalk 75dB(at 4.43MHz)
● Wide Bandwidth Frequency Feature 10MHz(2V$_{P-P}$ Input)
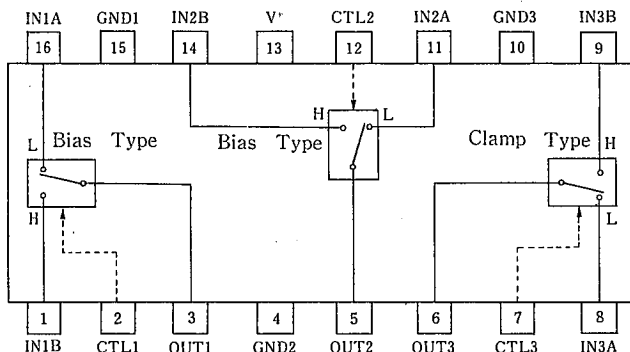● Package Outline DIP-16, DMP-16, SSOP-16

■ RECOMMENDED OPERATING CONDITION

● Supply Voltage   V$^+$ 4.75~13.0V

■ APPLICATIONS

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

■ PACKAGE OUTLINE

NJM2284D   NJM2284M

NJM2284V

■ BLOCK DIAGRAM

NJM2284D
NJM2284M
NJM2284V

NJM2284

■ MAXIMUM RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V⁺	14	V
Power Dissipation	P_D	(DIP16) 700	mW
		(DMP16) 350	mW
		(SSOP16) 300	mW
Operating Temperature Range	T_opr	−40~+85	℃
Storage Temperature Range	T_stg	−40~+125	℃

■ ELECTRICAL CHARACTERISTICS

(V⁺=5V, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current (1)	I_{CC1}	V⁺=5V (Note1)	8.1	11.6	15.1	mA
Operating Current (2)	I_{CC2}	V⁺=9V (Note1)	10.2	14.6	19.0	mA
Voltage Gain	G_V	V_1 =100kHz, $2V_{P-P}$, V_O/V_1	−0.6	−0.1	+0.4	dB
Frequency Gain	G_F	V_1 =$2V_{P-P}$, V_O(10MHz)/V_O(100kHz)	−1.0	0	+1.0	dB
Differential Gain	DG	V_1 =$2V_{P-P}$, Standard Staircase Signal	—	0.3	—	%
Differential Phasa	DP	V_1 =$2V_{P-P}$, Standard Staircase Signal	—	0.3	—	deg
Output Offset Voltage	V_{OS}	(Note2)	−10	0	+10	mV
Crosstalk	CT	V_1 =$2V_{P-P}$, 4.43MHz, V_O/V_1	—	−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

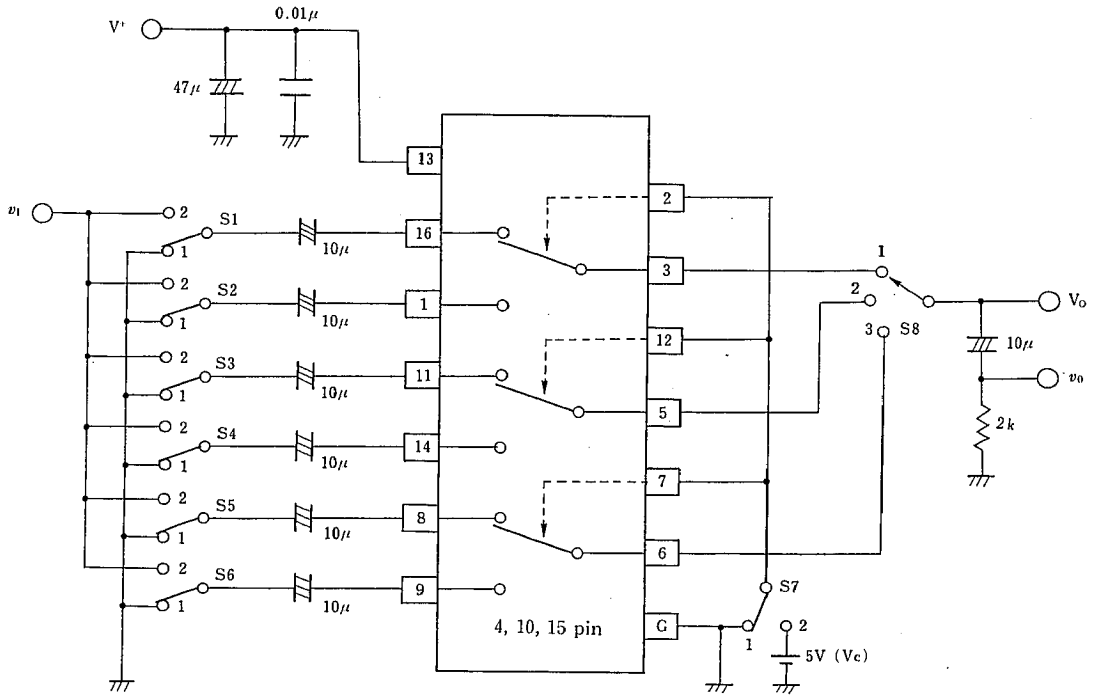(Note1) S1=S2=S3=S4=S5=S6=S7=1

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

5

■ **TERMINAL EXPLANATION**

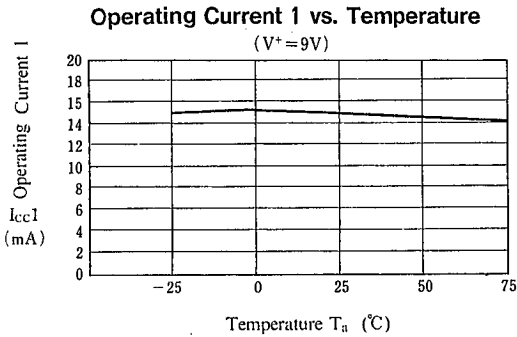| PIN No.	PIN NAME	VOLTAGE	INSIDE EQUIVALENT CIRCUIT
16 1 11 14	IN 1 A IN 1 B IN 2 A IN 2 B 〔Input〕	2.5 V	
8 9	I N 3 A I N 3 B 〔Input〕	1.5 V	
2 12 7	CTL 1 CTL 2 CTL 3 〔Switching〕		
3	OUT 1	1.8 V	
5	OUT 2		
6	OUT 3 〔Output〕	0.8 V	
13	V⁺	5 V	
15 4 10	GND 1 GND 2 GND 3		

NJM2284

■ **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
I_{CC1}	1	1	1	1	1	1	1	1.	V^+
I_{CC2}	1	1	1	1	1	1	1	1	
G_{v1}	2	1	1	1	1	1	1	1	v_0
G_{f1}	2	1	1	1	1	1	1	1	
DG_1	2	1	1	1	1	1	1	1	
DP_1	2	1	1	1	1	1	1	1	
CT 1	2	1	1	1	1	1	2	1	v_0
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	
V_{OS1}	1	1	1	1	1	1	1/2	1	V_0
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_0

■ TYPICAL CHARACTERISTICS

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

Operating Current 2 vs. Temperature
($V^+=5V$)

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
($V^+=5V$)

NJM2284
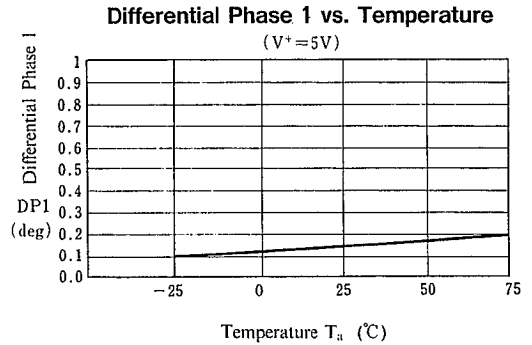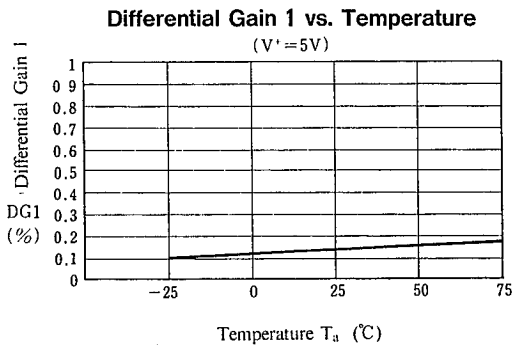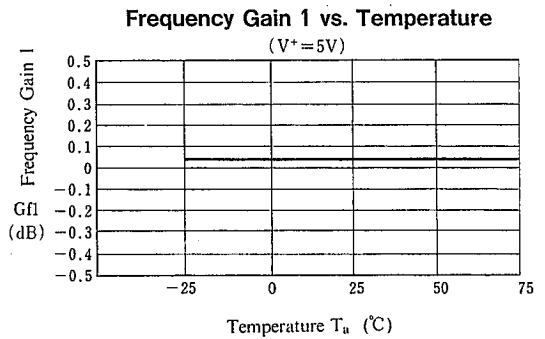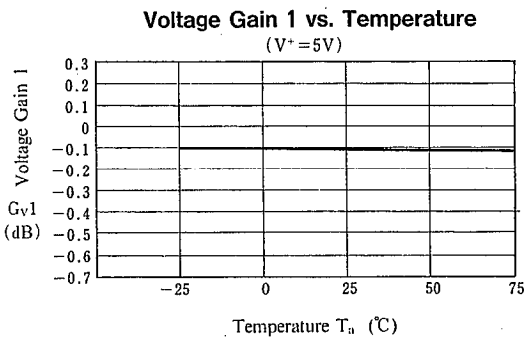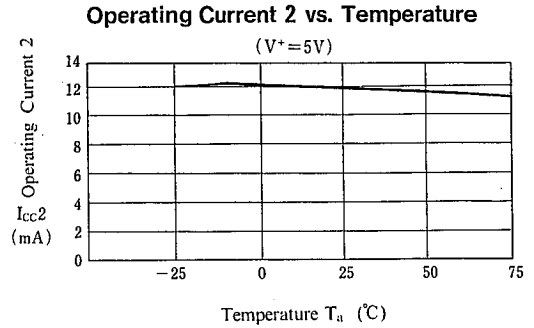
■ **TYPICAL CHARACTERISTICS**

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

Offset Voltage 1
$V_{os}1$
(mV)
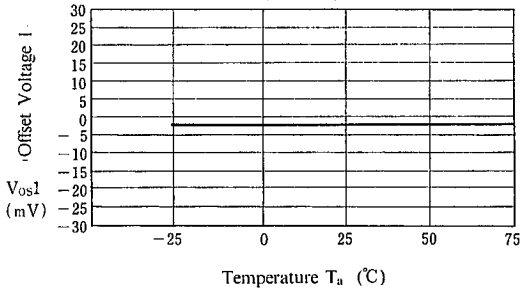
Temperature T_a (℃)

Crosstalk 1 vs. Temperature
(V^+=5V)

Crosstalk 1
CT1
(dB)
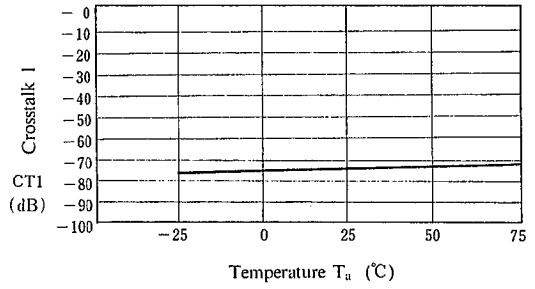
Temperature T_a (℃)

Crosstalk 2 vs. Temperature
(V^+=5V)

Crosstalk 2
CT2
(dB)
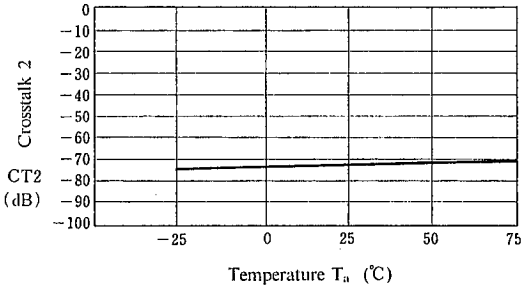
Temperature T_a (℃)

Crosstalk 3 vs. Temperature
(V^+=5V)

Crosstalk 3
CT3
(dB)
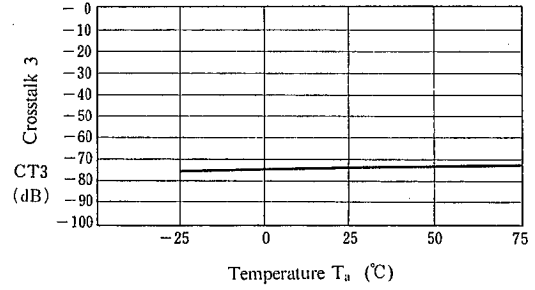
Temperature T_a (℃)

Crosstalk 4 vs. Temperature
(V^+=5V)

Crosstalk 4
CT4
(dB)
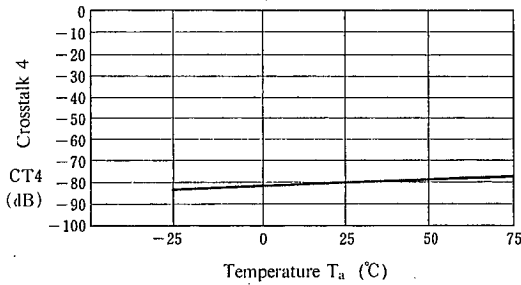
Temperature T_a (℃)

Crosstalk 5 vs. Temperature
(V^+=5V)

Crosstalk 5
CT5
(dB)
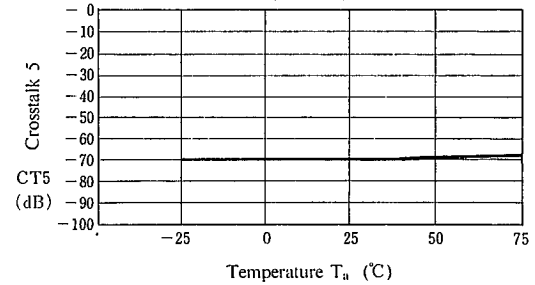
Temperature T_a (℃)

■ TYPICAL CHARACTERISTICS

Crosstalk 6 vs. Temperature

(V⁺＝5V)

Crosstalk 6 CT6 (dB) vs. Temperature Tₐ (℃)
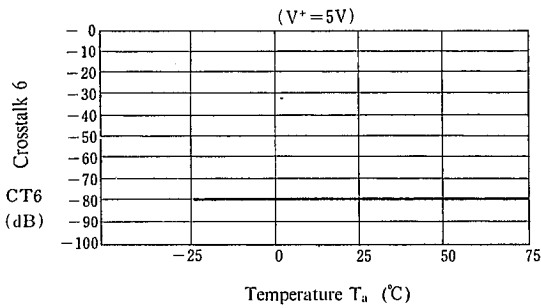
Switch Change Over 1 vs. Temperature

(V⁺＝5V)

Switch Change Over 1 Vc1 (V) vs. Temperature Tₐ (℃)
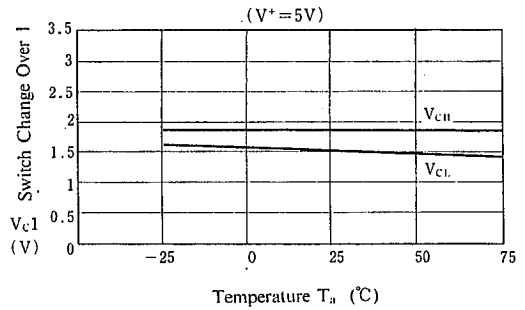
Operating Current vs. Operating Voltage

(Ta＝25°C)

Operating Current Icc (mA) vs. Operating Voltage V⁺ (V)
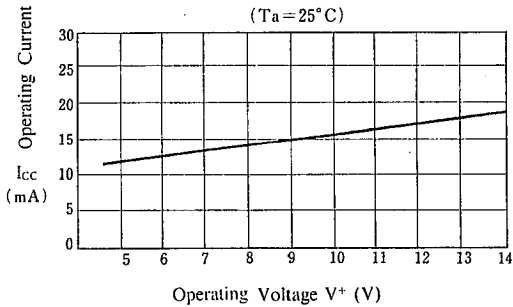
Voltage Gain 1 vs. Operating Voltage

(Ta＝25°C)

Voltage Gain 1 Gv1 (dB) vs. Operating Voltage V⁺ (V)
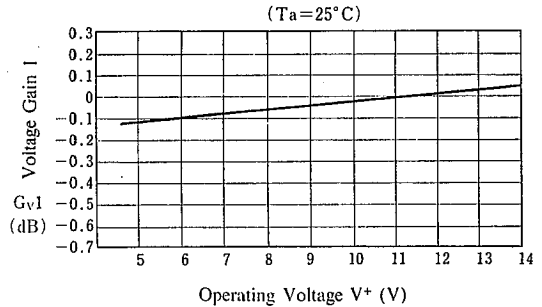
Frequency Gain 1 vs. Operating Voltage

(Ta＝25°C)

Frequency Gain 1 Gf1 (dB) vs. Operating Voltage V⁺ (V)
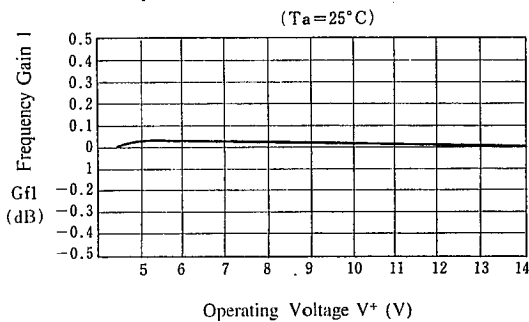
Differential Gain 1 vs. Operating Voltage

(Ta＝25°C)

Differential Gain 1 DG1 (%) vs. Operating Voltage V⁺ (V)
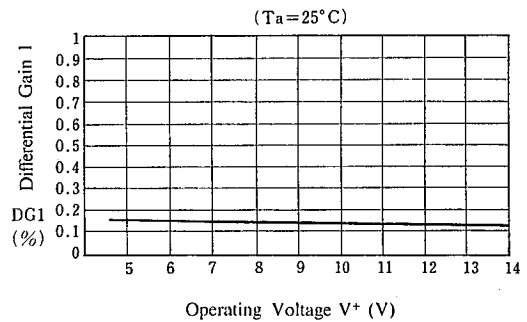
■ **TYPICAL CHARACTERISTICS**

Differential Phase 1 vs. Operating Voltage

(Ta=25°C)

Differential Phase 1

DP1 (deg)

Operating Voltage V$^+$ (V)
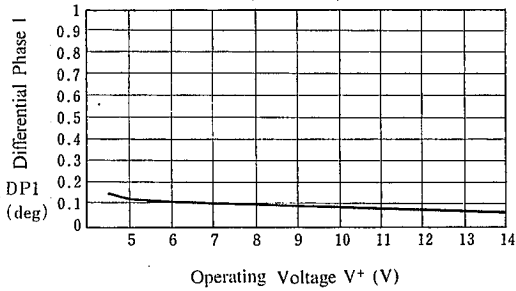
Offset Voltage 1 vs. Operating Voltage

(Ta=25°C)

Offset Voltage 1

V$_{os1}$ (mV)

Operating Voltage V$^+$ (V)
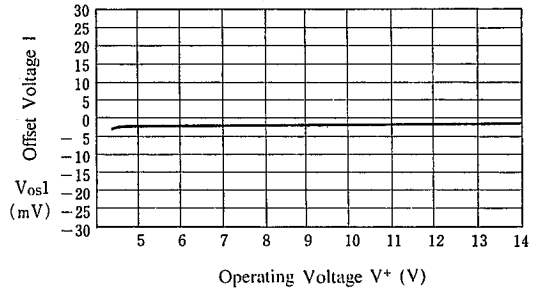
Crosstalk 1 vs. Operating Voltage

(Ta=25°C)

Crosstalk 1

CT1 (dB)

Operating Voltage V$^+$ (V)
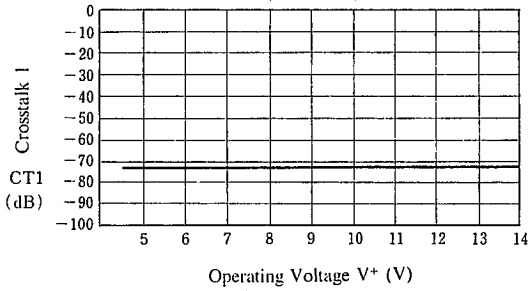
Crosstalk 2 vs. Operating Voltage

(Ta=25°C)

Crosstalk 2

CT2 (dB)

Operating Voltage V$^+$ (V)
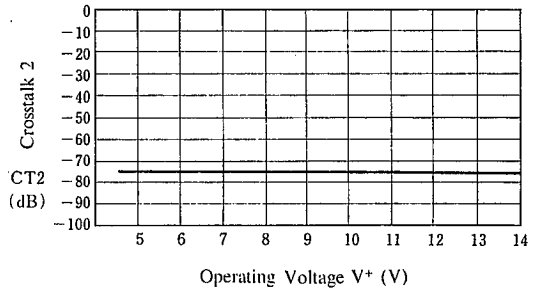
Crosstalk 3 vs. Operating Voltage

(Ta=25°C)

Crosstalk 3

CT3 (dB)

Operating Voltage V$^+$ (V)
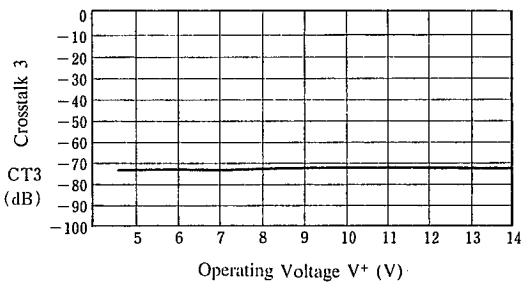
Crosstalk 4 vs. Operating Voltage

(Ta=25°C)

Crosstalk 4

CT4 (dB)

Operating Voltage V$^+$ (V)
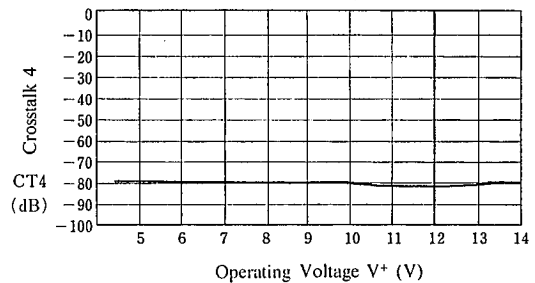
■ TYPICAL CHARACTERISTICS

Crosstalk 5 vs. Operating Voltage
(Ta=25°C)

Crosstalk 5 — CT5 (dB)

Operating Voltage V+ (V)
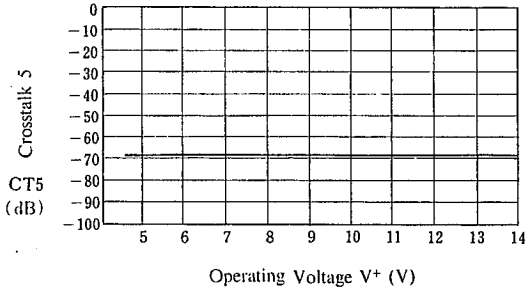
Crosstalk 6 vs. Operating Voltage
(Ta=25°C)

Crosstalk 6 — CT6 (dB)

Operating Voltage V+ (V)
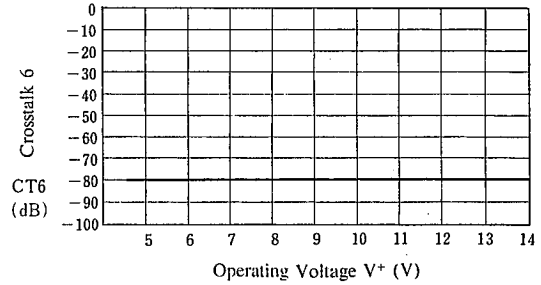
Switch Change Over 1 vs. Operating Voltage
(Ta=25°C)

Switch Change Over 1 — Vc1 (V)

V_{CH}

V_{CL}

Operating Voltage V+ (V)
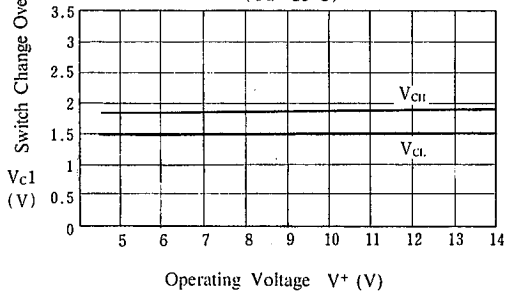
Differential Gain vs. APL
(Ta=25°C)

Differential Gain — DG5 (%)

APL (%)
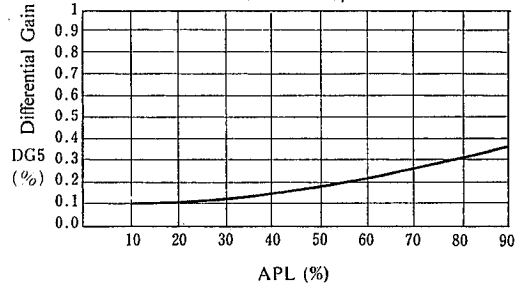
Voltage Gain 1 vs. Frequency Feature
(Ta=25°C)

Voltage Gain 1 — Gv (dB)

Frequency f (MHz)
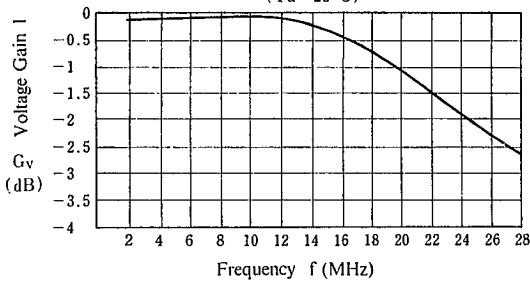
Differential Gain 1 vs. Load Resistor
(Ta=25°C)

Differential Gain 1 — DG1 (%)

APL10%

APL50%   APL90%

Load Resistor RL (kΩ)

■ TYPICAL CHARACTERISTICS

Differential Gain 5 vs. Load Resistor

(Ta=25°C)

Differential Gain 5

DG5 (%)

APL90%
APL50%
APL10%

Load Resistor RL (kΩ)

Differential Phase 1 vs. Load Resistor

(Ta=25°C)

Differential Phase 1

DP1 (deg)

APL90%
APL10%
APL50%

Load Resistor RL (kΩ)

Differential Phase 5 vs. Load Resistor

(Ta=25°C)

Differential Phase 5

DP5 (deg)

APL90%
APL50%
APL10%

Load Resistor RL (kΩ)

Differential Gain 1 vs. APL

(Ta=25°C)

Differential Gain 1

DG1 (%)

APL (%)

Differential Phase 1 vs. APL

(Ta=25°C)

Differential Phase 1

DP1 (deg)

APL (%)

Differential Phase 5 vs. APL

(Ta=25°C)

Differential Phase 5

DP5 (deg)

APL (%)

■ **TYPICAL CHARACTERISTICS**

Total Harmonic Distortion 1 vs. Load Resistor

$(Ta=25°C)$

Total Harmonic Distortion 1

THD1
(%)

Load Resistor RL (kΩ)

MEMO

New Japan Radio Co.,Ltd.