Isolation Amplifier with Video Driver

■FEATURES

●Operating Voltage	4.5 to 5.5V
●Operating Temperature	-40 to 105°C
●Common Mode Rejection Ratio	-55dBtyp.
●75Ω Driver	
●DC Coupling, AC Coupling	
●Voltage Gain	0dBtyp.
●Frequency Characteristics	0dB at 10MHz
●Bipolar Technology	
●Package Outline	SOT-23-5

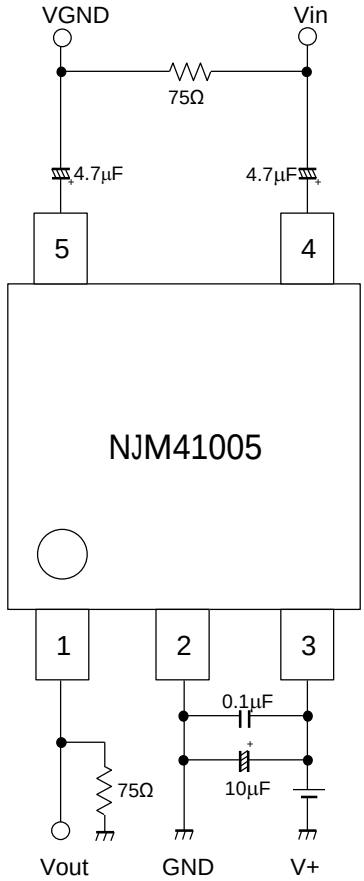
■GENERAL DESCRIPTION

NJM41005 is the isolation amplifier that has been developed in the video signal applications. It can remove the common-mode noise of the signal by the isolation amplifier. In addition, it has a built-in 75Ω driver, well suited to the interface of CAR AV.

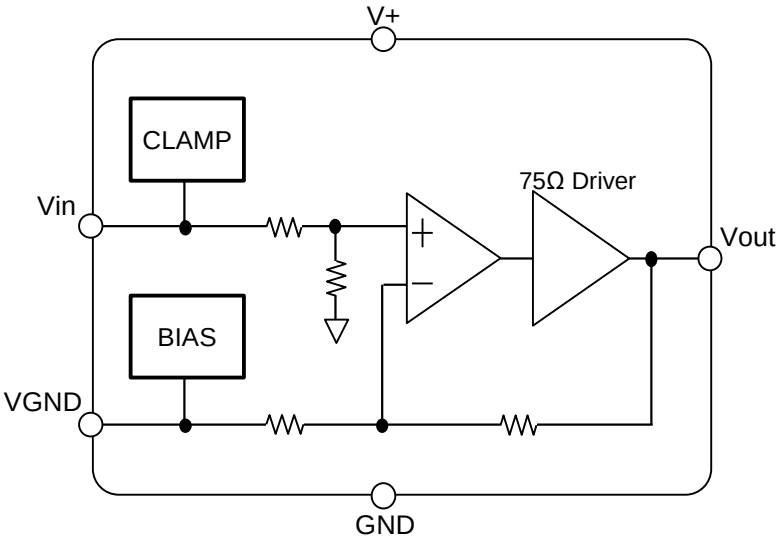
■APPLICATION

- ●Car Navigation
- ●Vehicle Camera ECU

■APPLICATION CIRCUIT (DC Coupling)



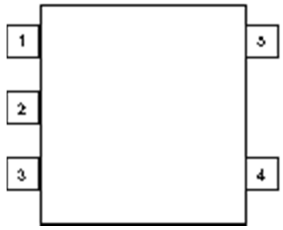
■EQUIVALENT CIRCUIT・BLOCK DIAGRAM



■Isolation amplifier series

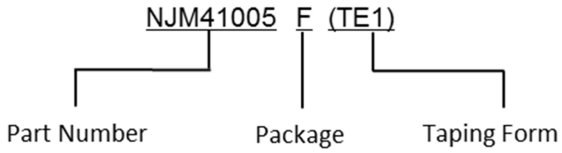
Channel	Part No.
1ch	NJM2505A
3ch	NJM41033

■PIN CONFIGURATION



PIN NO.	SYMBOL	DESCRIPTION
1	Vout	Video Signal Output Terminal
2	GND	GND Terminal
3	V+	Power Supply Terminal
4	Vin	Video Signal Input Terminal
5	VGND	GND Input Terminal (from sourse side)

■MARK INFORMATION



■ORDERING INFORMATION

PART NUMBER	PACKAGE OUTLINE	RoHS	HALOGEN-FREE	TERMINAL FINISH	MARKING	WEIGHT (mg)	MOQ(pcs)
NJM41005F-T	SOT-23-5	YES	YES	Sn-Bi	AK2	15.0	3,000

■**ABSOLUTE MAXIMUM RATINGS**

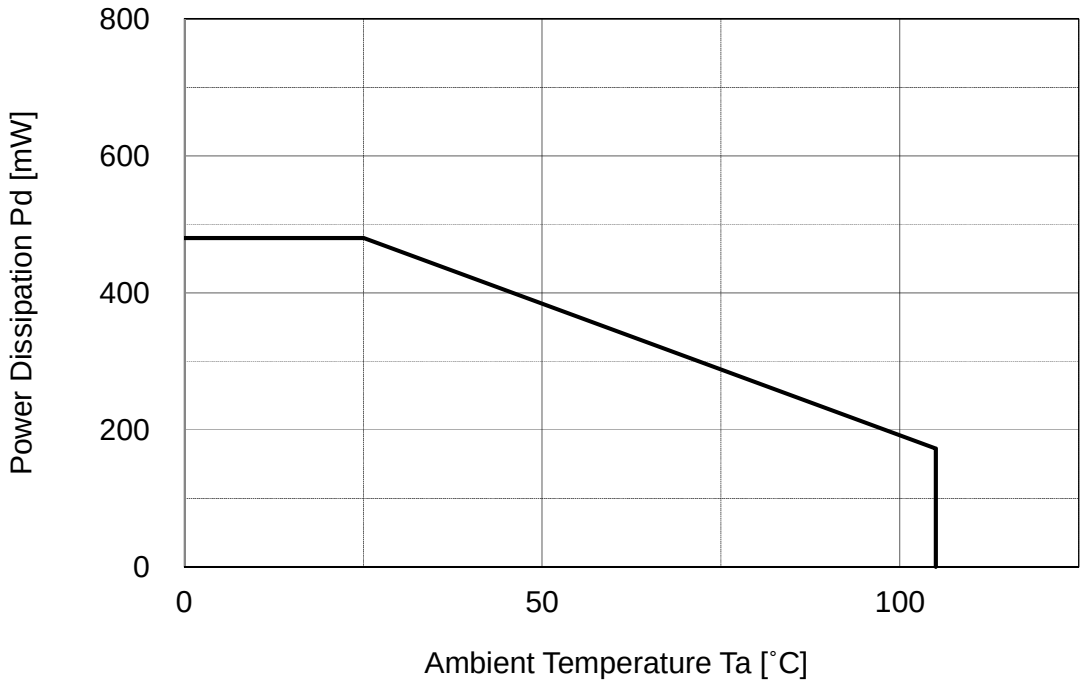
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	7	V
Power Dissipation (Ta=25°C)(4)	P_D	480 *1	mW
Operating Temperature Range	T_{opr}	-40 to 105	°C
Storage Temperature Range	T_{stg}	-40 to 150	°C

1) At on a board of EIA/JEDEC specification. (114.3 x 76.2 x 1.6mm 2 layers, FR-4)

■**RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	4.5 to 5.5	V

■**POWER DISSIPATION vs. AMBIENT TEMPERATURE**

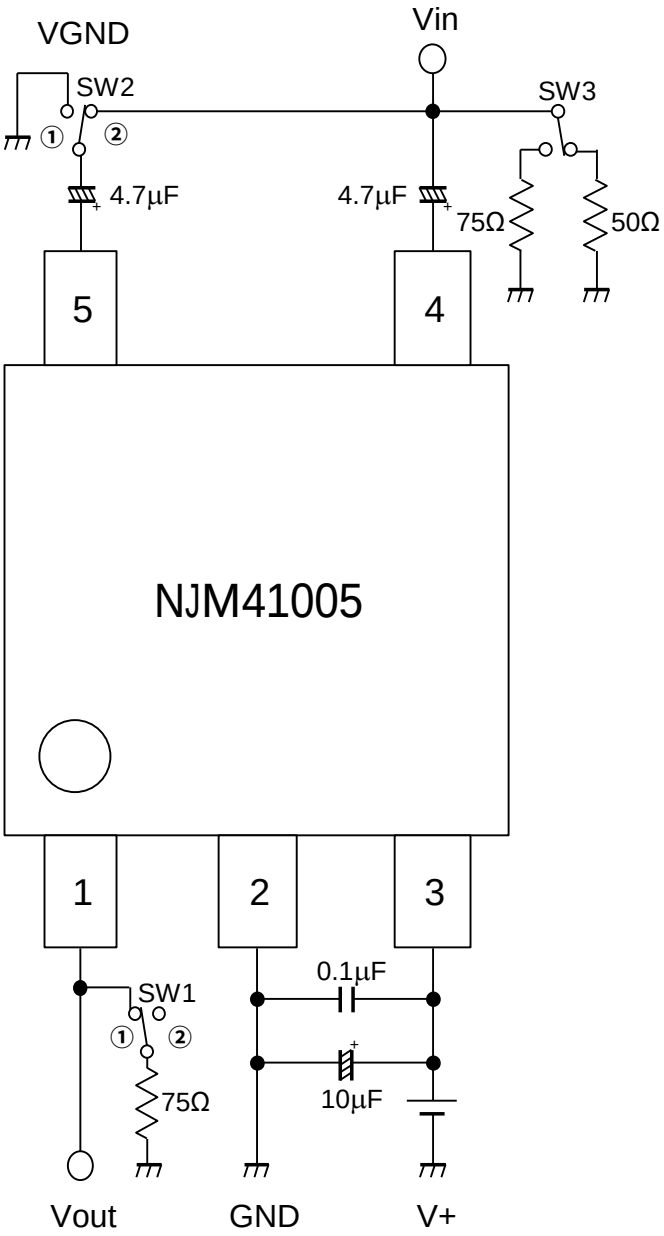


■**ELECTRICAL CHARACTERISTICS** (Ta=25°C, V^+=5.0V, RL=75Ω, unless otherwise specified)

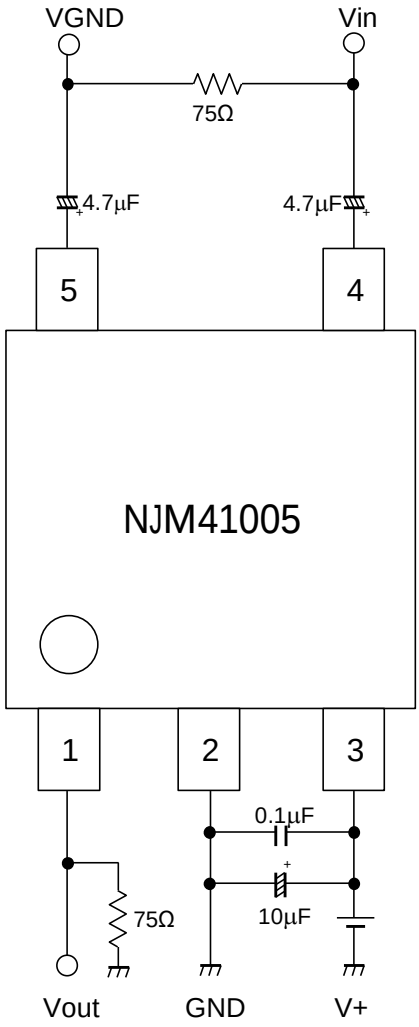
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	No Signal, RL=OPEN	-	10.0	14.0	mA
		No Signal, RL=OPEN , Ta=-40 to 105°C	-	-	14.0	
Maximum Output Voltage Swing	Vom	f=100kHz, Input Sine Signal, THD=1%	2.2	2.4	-	Vp-p
		f=100kHz, Input Sine Signal, THD=1%, Ta=-40 to 105°C	2.2	-	-	
Voltage Gain	Gv	Vin=100kHz, 1.0Vp-p, Input Sine Signal	-0.5	0	0.5	dB
		Vin=100kHz, 1.0Vp-p, Input Sine Signal, Ta=-40 to 105°C	-0.5	-	0.5	
Frequency Characteristic	Gf10M	Vin=10MHz/1MHz, 1.0Vp-p, Input Sine Signal	-	0	-	dB
Common Mode Rejection Ratio	CMRR	Vin=20kHz,1Vp-p	-	-55	-	dB
Differential Gain	DG	Vin=1.0Vp-p, 10step Video Signal	-	0.1	-	%
Differential Phase	DP	Vin=1.0Vp-p, 10step Video Signal	-	0.1	-	deg

■TEST CIRCUIT

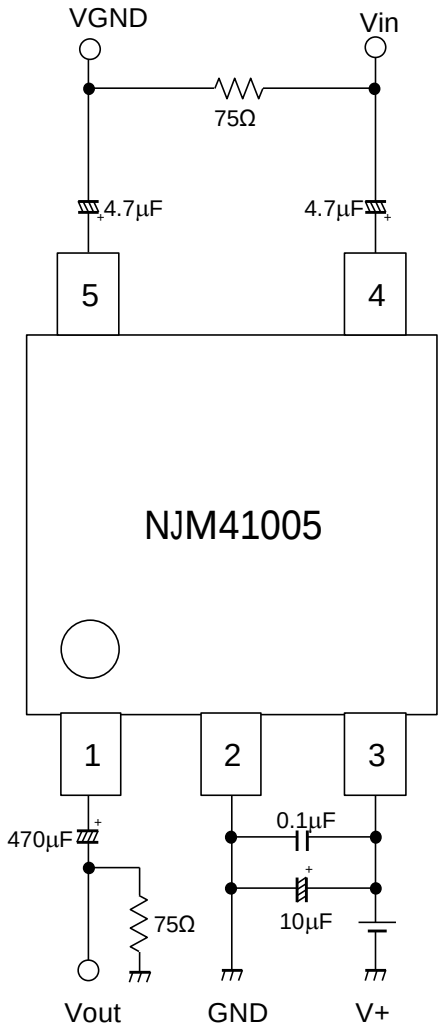
(When measuring CMR, SW2 of VGND is connected to ②.SW2 is connected to ① when measuring other electrical characteristics. When Icc is measured, SW1 of Vout is connected to ② and 75 Ω is disconnected and opened. SW1 is connected to ① in other special features.)



■**APPLICATION CIRCUIT 1**(Output DC Coupling)



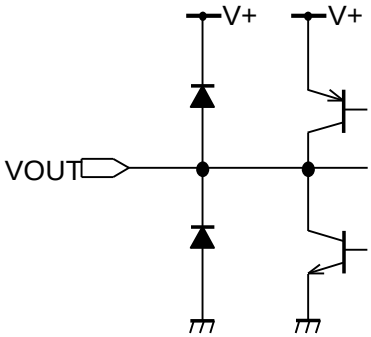
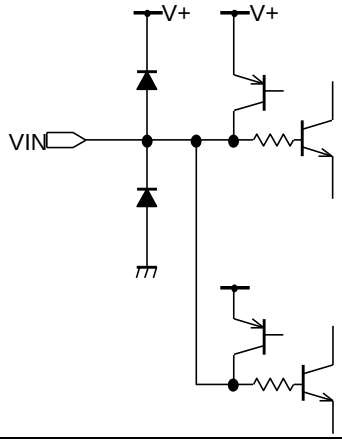
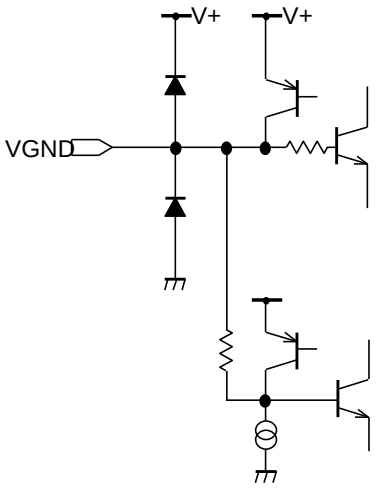
■**APPLICATION CIRCUIT 2**(Output AC Coupling)



■**APPLICATION**

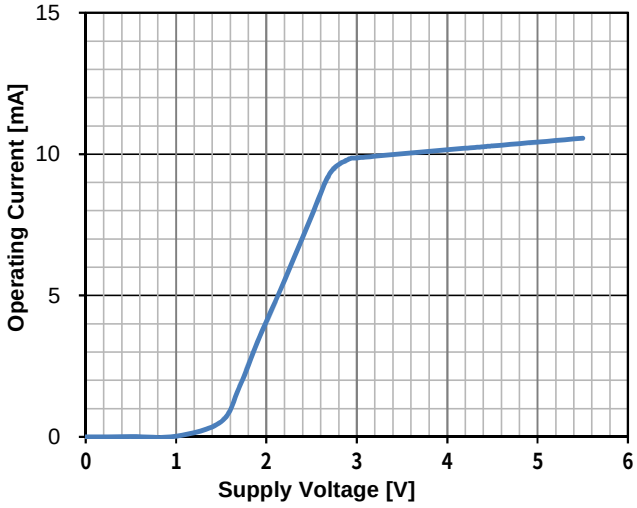
When using an external ESD protection resistor at the video input terminal, please connect the same resistance at the VIN terminal (pin 4) and the VGND terminal (pin 5). Please verify with resistance value about 100 Ω.

■ **EQUIVALENT CIRCUIT**

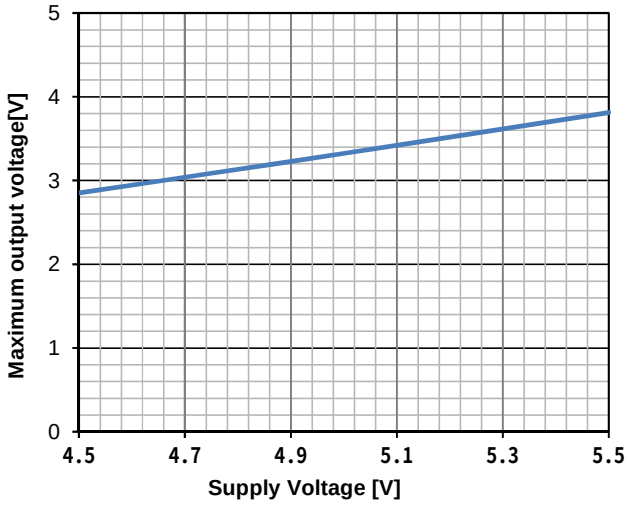
Pin. No.	Symbol	Function	Inside Equivalent Circuit	Voltage
1	Vout	Video Signal Output		0.5V
2	GND	GND	-	-
3	V+	Power Supply	-	-
4	Vin	Video Signal Input		1.5V
5	VGND	GND Input From sourse side		2.5V

■TYPICAL CHARACTERISTICS

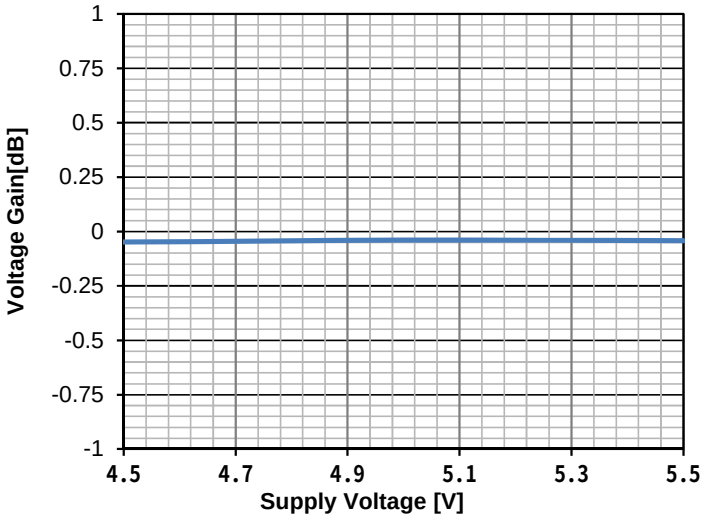
Operating Current vs. Supply Voltage



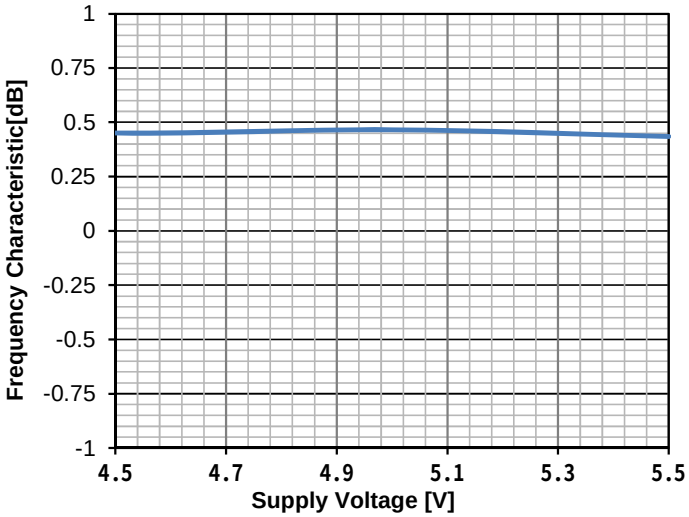
Maximum output voltage vs. Supply Voltage



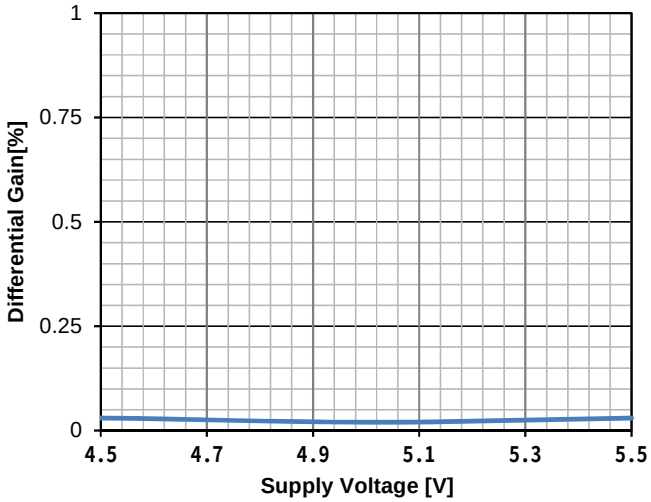
Voltage Gain vs. Supply Voltage
Vin=1.0Vpp 100KHz Sine Signal Input



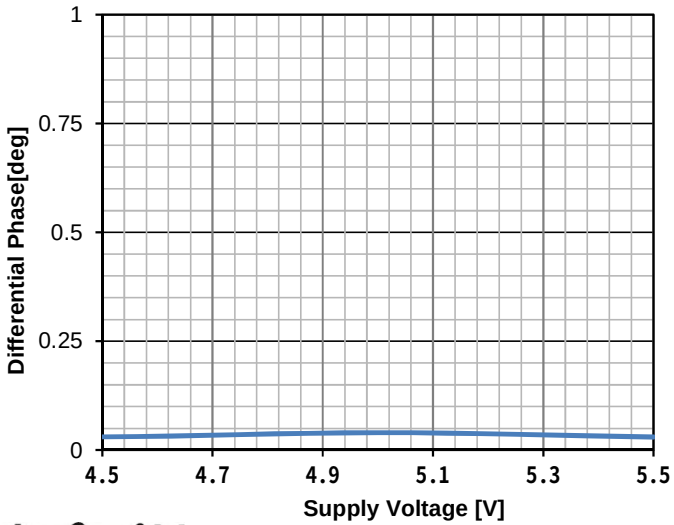
Frequancy Characteristic vs. Supply Voltage
Vin=1.0Vpp 10MHz Sine Signal Input



Differential Gain vs. Supply Voltage

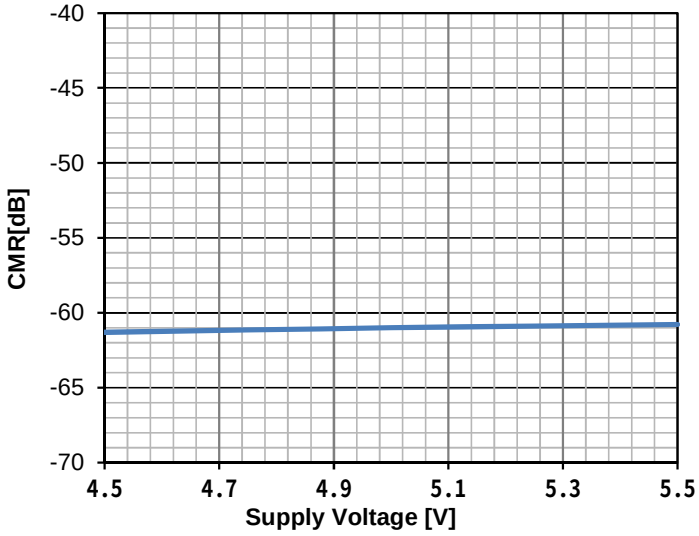


Differential Phase vs. Supply Voltage

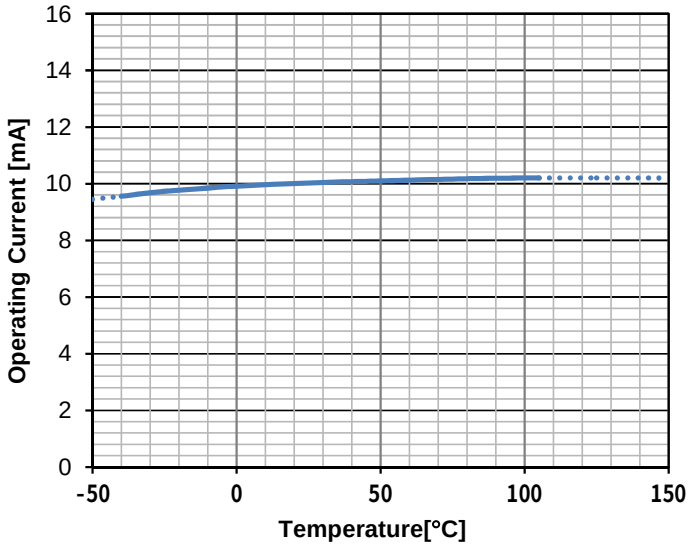


■TYPICAL CHARACTERISTICS

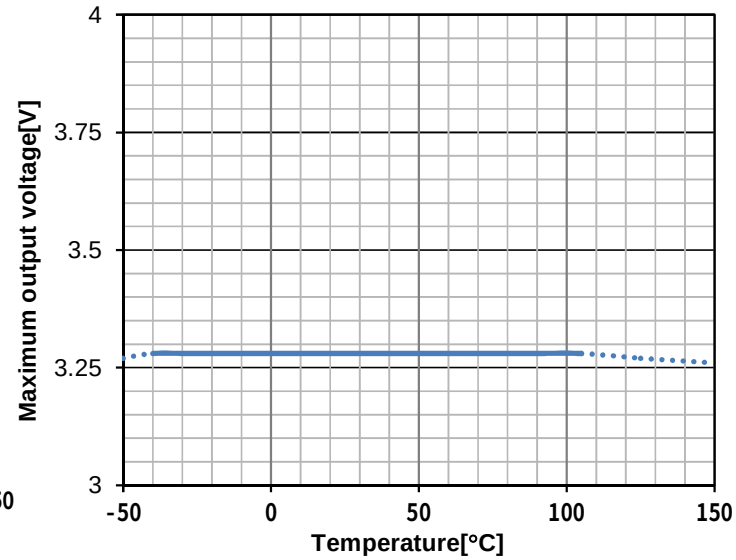
Common Mode Rejection Ratio
vs Supply Voltage



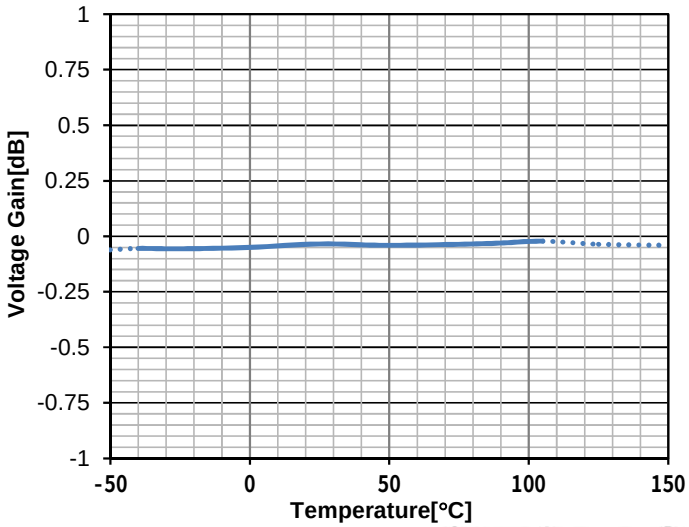
Operating Current vs. Temperature



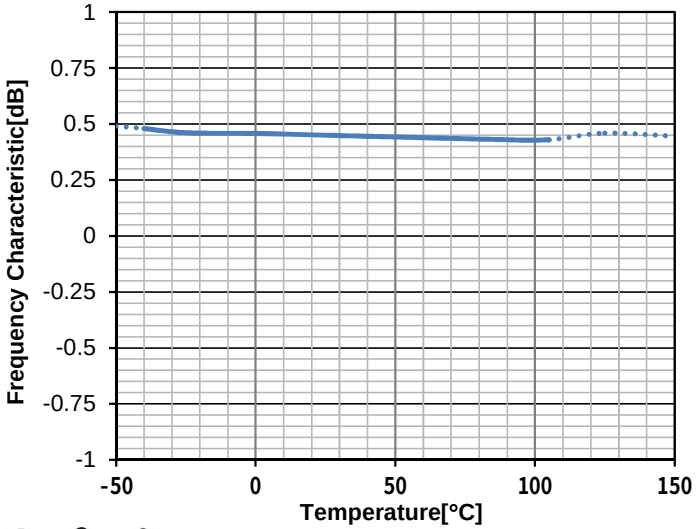
Maximum output voltage vs.
Temperature



Voltage Gain vs. Temperature
Vin=1.0Vpp 100KHz Sine Signal Input

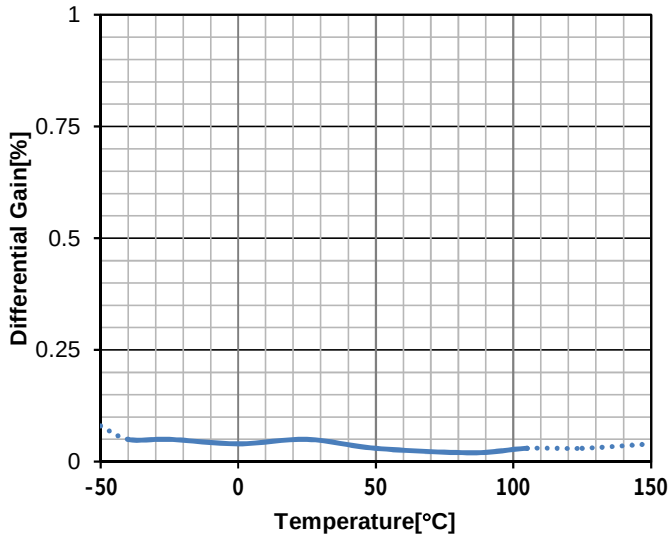


Frequancy Characteristic vs. Temperature
Vin=1.0Vpp 10MHz Sine Signal Input

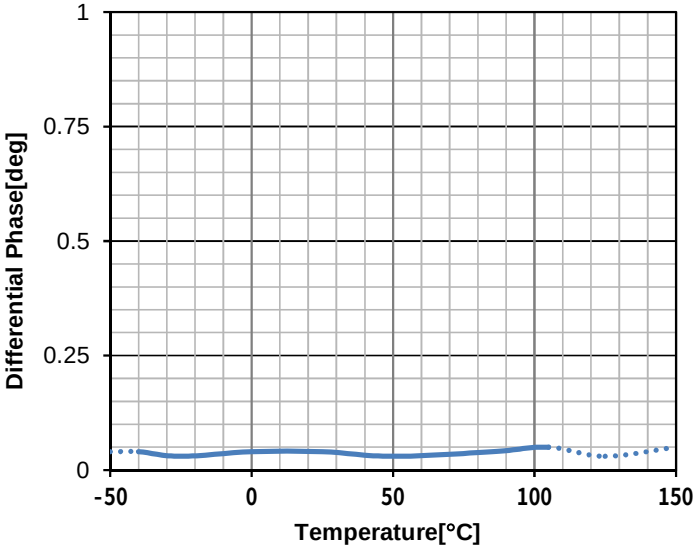


■TYPICAL CHARACTERISTICS

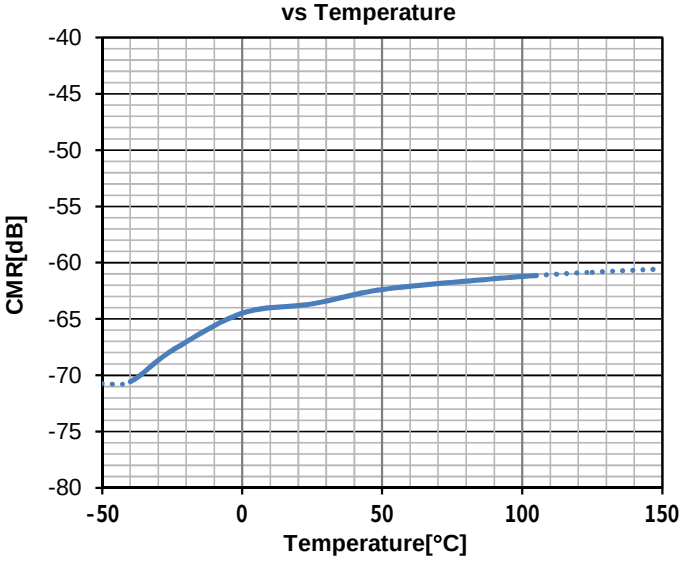
Differential Gain vs.Temperature



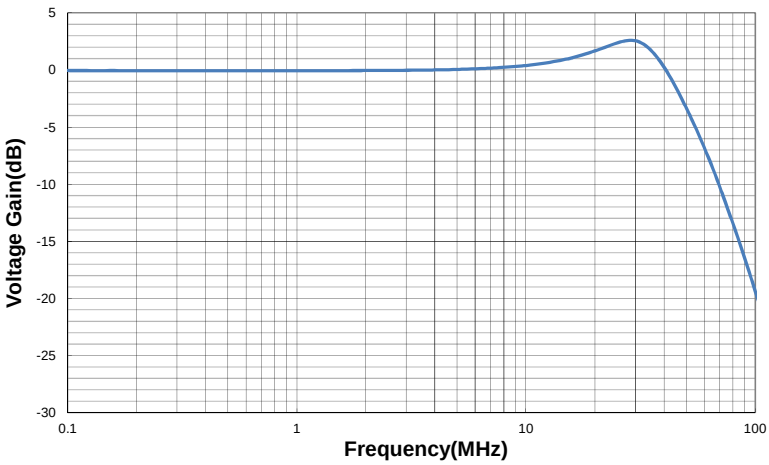
Differential Phase vs.Temperature



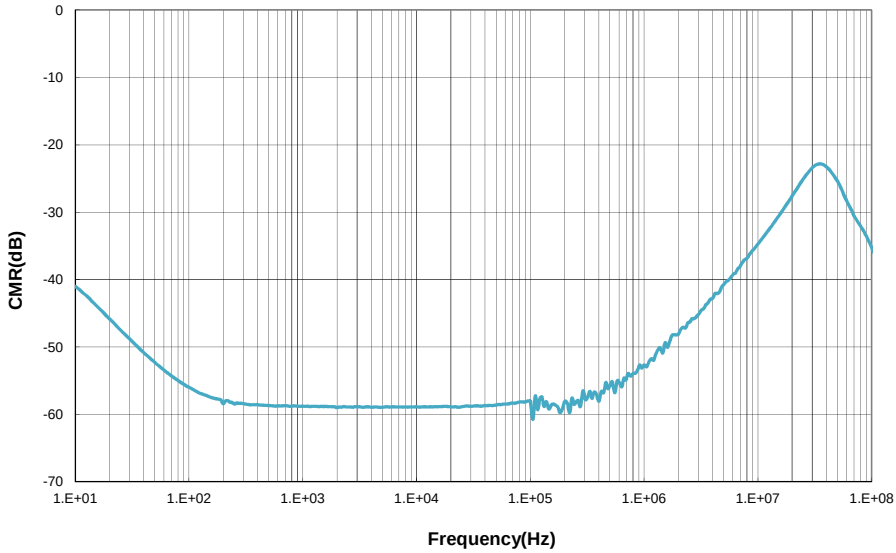
Common Mode Rejection Ratio vs Temperature



Voltage Gain Vs. Frequency
Vin=1.0Vpp, RL=75ohm, Sine Signal Input



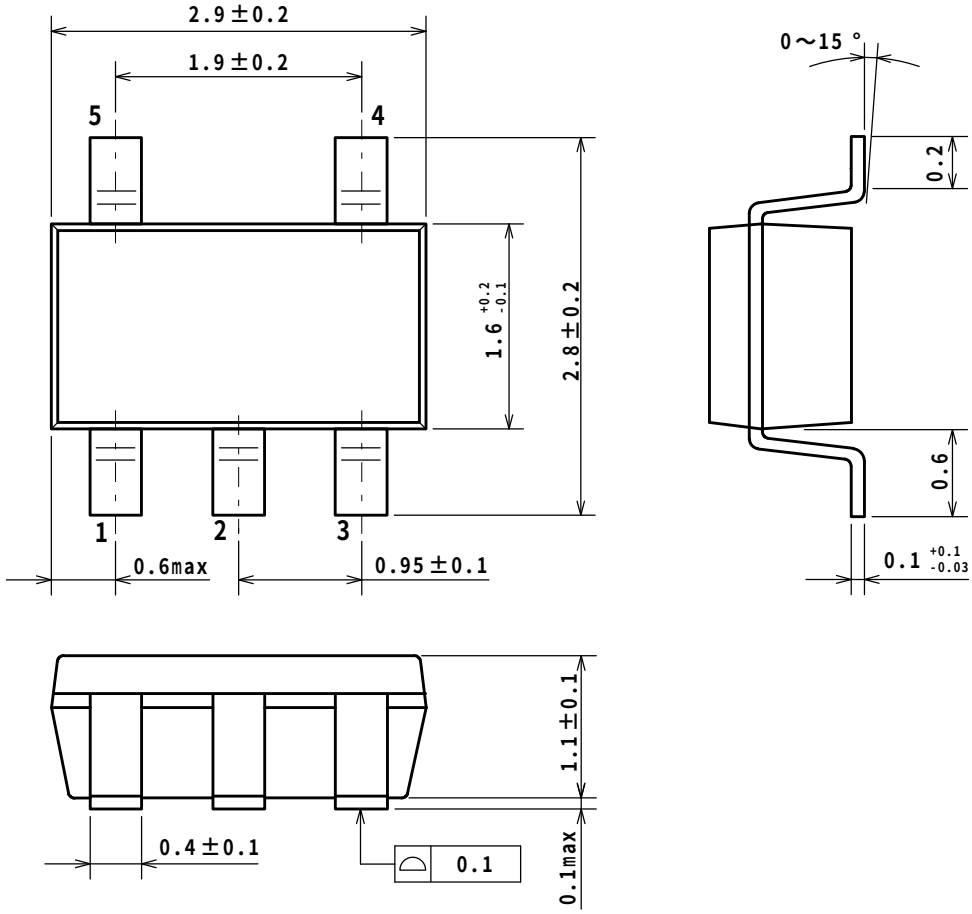
CMR vs Frequency



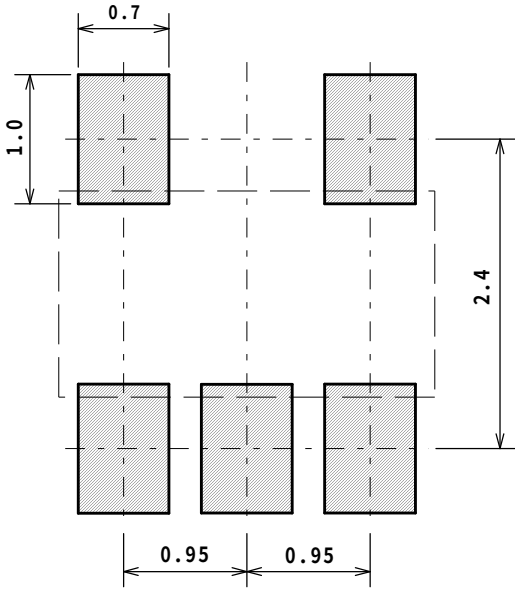
SOT-23-5

Unit: mm

■PACKAGE DIMENSIONS



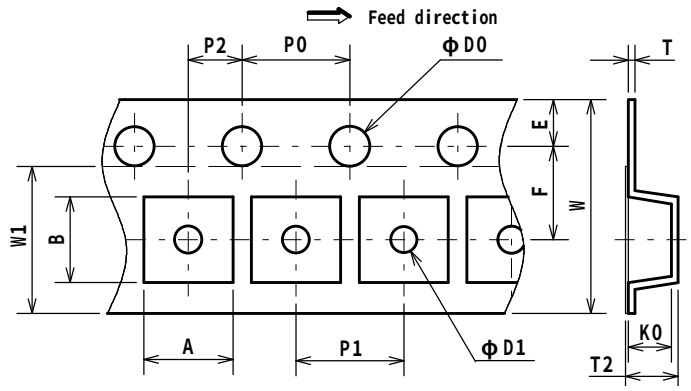
■EXAMPLE OF SOLDER PADS DIMENSIONS



■PACKING SPEC

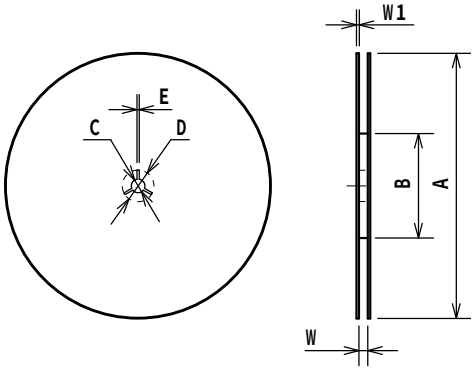
Unit: mm

TAPING DIMENSIONS



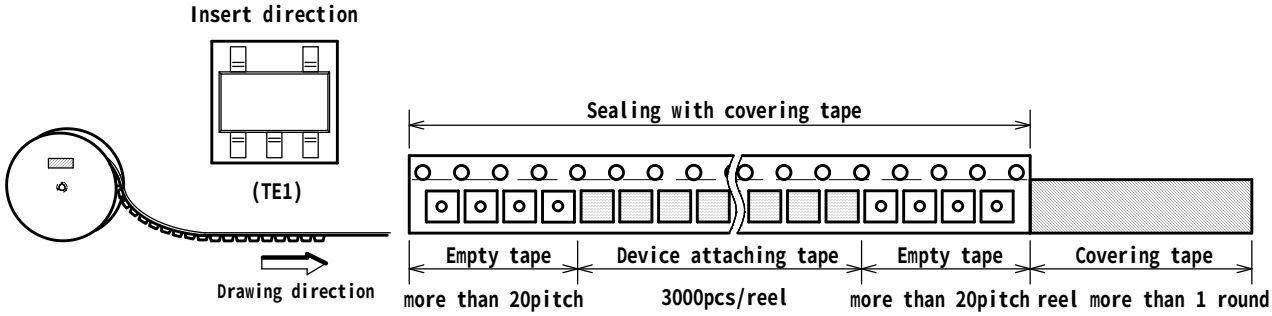
SYMBOL	DIMENSION	REMARKS
A	3.3±0.1	BOTTOM DIMENSION
B	3.2±0.1	BOTTOM DIMENSION
D0	1.55	
D1	1.05	
E	1.75±0.1	
F	3.5±0.05	
P0	4.0±0.1	
P1	4.0±0.1	
P2	2.0±0.05	
T	0.25±0.05	
T2	1.82	
K0	1.5±0.1	
W	8.0±0.3	
W1	5.5	THICKNESS 0.1MAX

REEL DIMENSIONS

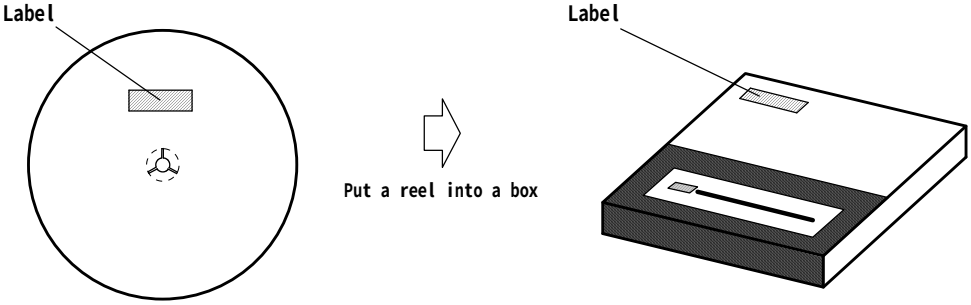


SYMBOL	DIMENSION
A	φ180±1
B	φ 60±1
C	φ 13±0.2
D	φ 21±0.8
E	2±0.5
W	9±0.5
W1	1.2±0.2

TAPING STATE



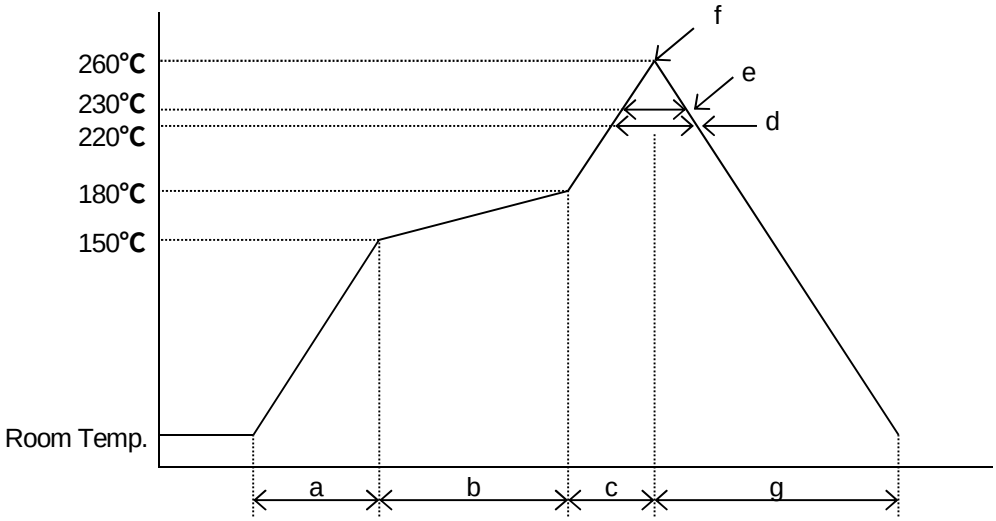
PACKING STATE



INFRARED REFLOW SOLDERING METHOD

EAE-D1006-000-02

∗Recommended reflow soldering procedure



a:Temperature ramping rate	: 1 to 4℃/s
b:Pre-heating temperature	: 150 to 180℃
time	: 60 to 120s
c:Temperature ramp rate	: 1 to 4℃/s
d:220℃ or higher time	: Shorter than 60s
e:230℃ or higher time	: Shorter than 40s
f:Peak temperature	: Lower than 260℃
g:Temperature ramping rate	: 1 to 6℃/s

The temperature indicates at the surface of mold package.

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   Equipment Used in the Deep sea
   Power Generator Control Equipment (Nuclear, Steam, Hydraulic)
   Life Maintenance Medical Equipment
   Fire Alarm/Intruder Detector
   Vehicle Control Equipment (airplane, railroad, ship, etc.)
   Various Safety devices

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