■ Product summary

CA0023AN is a video isolation amplifier that transmits video signals from external equipment to internal circuit after removing external noise.
Its compact package (SON-8p) with integrated two circuits allows downsizing and cost cut of circuits.
Because a wide operating temperature range is guaranteed, the IC is optimum for video signal interface of vehicle equipment.

■ Features

- Includes two circuits
- Power supply voltage: 5.0V+/- 0.5V (maximum rating: 7.0V)
- Wide operating temperature range: -40 to 85°C
- Common mode noise reduction rate (CMRR): TYP -60dB
- Broadband frequency characteristics: 30MHz flat
- Package: SON-8pin 2.2mm x 2.2mm, 0.5mm pitch
- Bias input

■ Maximum ratings

Item	Symbol	Rating	Unit
Power supply voltage	VCC	7.0	V
Power dissipation	Pd	189	mW
Input voltage range	Vin	0 to VCC+0.2	V
Operating ambient temperature	Topr	-40 to +85	°C
Storage temperature	Tstg	-40 to +125	°C

■ Recommended operating conditions

Item	Symbol	Rating	Unit
Power supply	VCC	5.0±0.5	V

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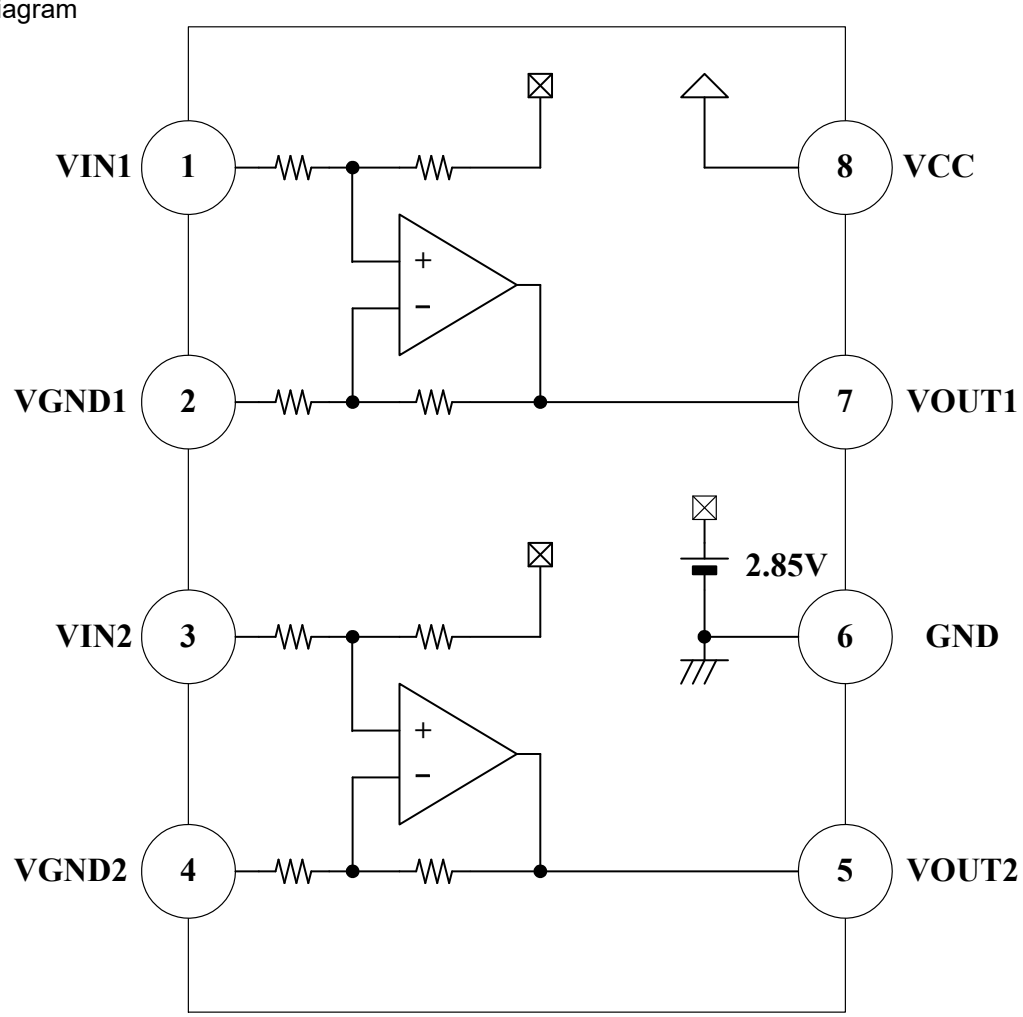
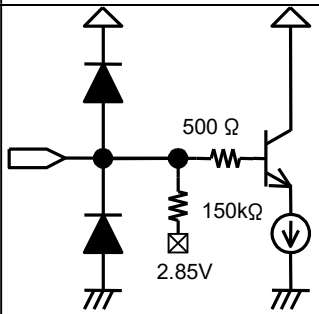
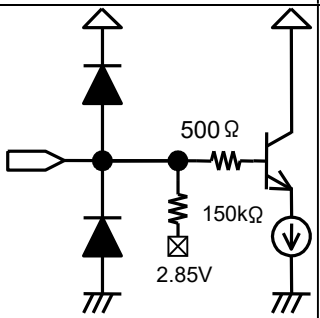
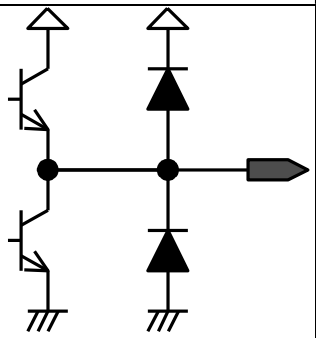
■Block diagram



■Terminal functions

No.	Symbol	Terminal Function
1	VIN1	Video signal input 1
2	VGND1	Video GND input 1
3	VIN2	Video signal input 2
4	VGND2	Video GND input 2
5	VOUT2	Video signal output 2
6	GND	Ground
7	VOUT1	Video signal output 1
8	VCC	Power supply input

■Equivalent circuit of input and output terminal

No.	Symbol	I/O	Equivalent circuit	DC voltage	Explanation
8	VCC	IN	–	5V	Power supply pin
6	GND	IN	–	0V	Grounding pin
1 3	VIN1 VIN2	IN		2.85V	Video signal input pin is used for bias type input Input impedance is 150kΩ
2 4	VGND1 VGND2	IN		2.85V	Video GND input pin is used for bias type input Input impedance is 150kΩ
5 7	VOUT1 VOUT2	OUT		2.1V	Video signal output pin. Use load resistance of 2kΩ and above VOUT pin cannot drive 75Ω

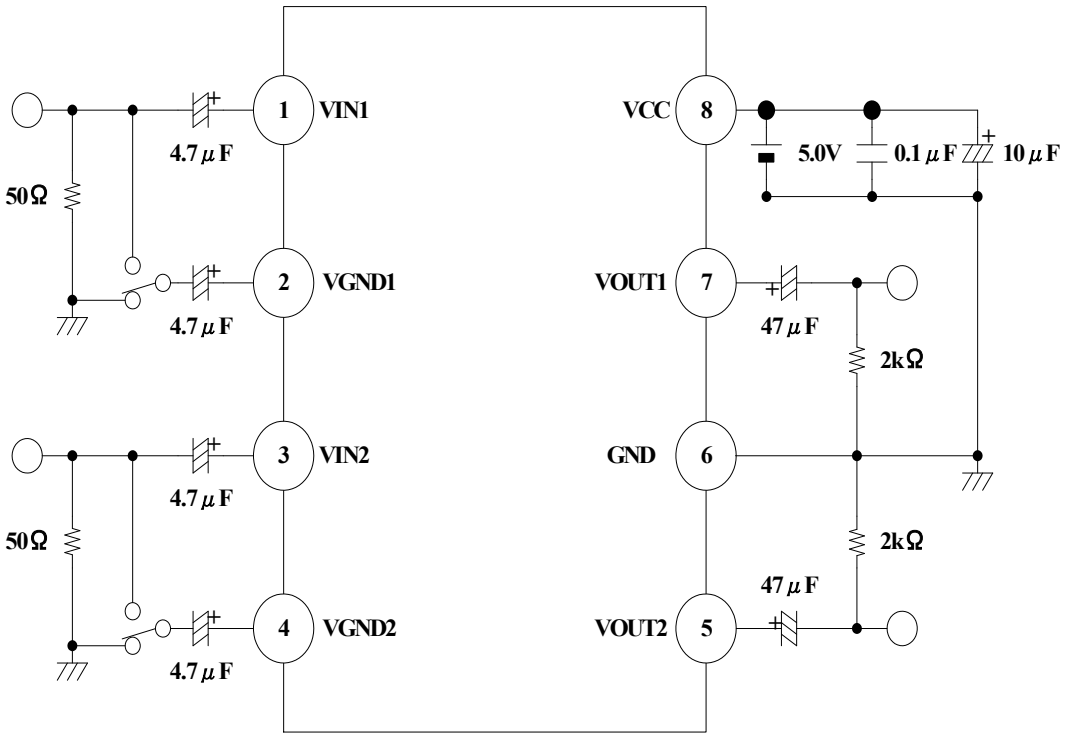
■Electrical characteristics

Measurement conditions: VCC=5.0V, Ta=25°C

Item	Symbol	Condition	MIN	TYP	MAX	UNIT
Consumption current	ICC	No signal	7.7	11	14.3	mA
Maximum output voltage *	Vmax	f=10kHz, THD=1%	3.2	3.6	-	Vpp
Voltage gain	Gv	Vin=1Vpp, f=1MHz	-1	0	1	dB
Frequency response	Gf	Vin=1Vpp, f=1MHz reference 10MHz	-1	0	1	dB
		Vin=1Vpp, f=1MHz reference 30MHz	-	0	-	dB
Common mode noise Rejection rate *	CMRR	Vin=1Vpp, f=20kHz	-	-60	-	dB
Cross talk *	CT	Vin=1Vpp, f=4.43MHz	-	-60	-40	dB
Input impedance	Zin	-	110	150	190	kΩ
Differential gain *	Dg	Vin=1Vpp, Standard stair step signal	-	0.1	-	%
Differential phase *	Dp	Vin=1Vpp, Standard stair step signal	-	0.3	-	deg.
Luminance S/N *	S/Ny	Vin=1Vpp, 100k~6MHz 100% white signal	-	70	-	dB

* Design guarantee item

■Measurement circuit diagram



■ Attention

・Be sure to connect 0.1μF bypass capacitor to between power supply terminals in order to lower the impedance of a power supply line.

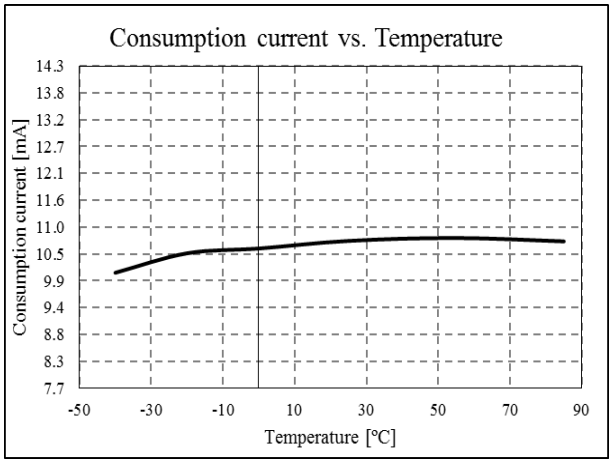
・Bypass capacitor should consider pattern of Printed Circuit to be able to arrange to near the IC

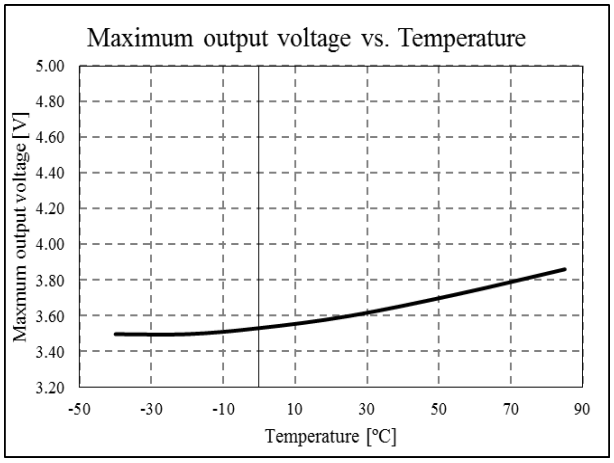
・This IC cannot drive 75Ω directly. When driving 75Ω, connect a video driver IC behind this IC.

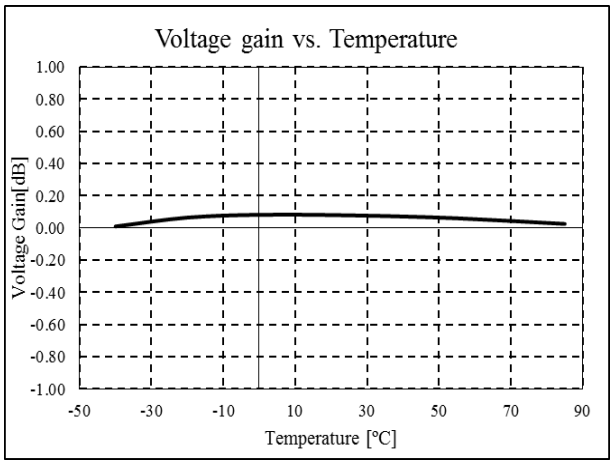
・Be sure to connect SW1 and SW2 to VIN side while measuring CMRR.

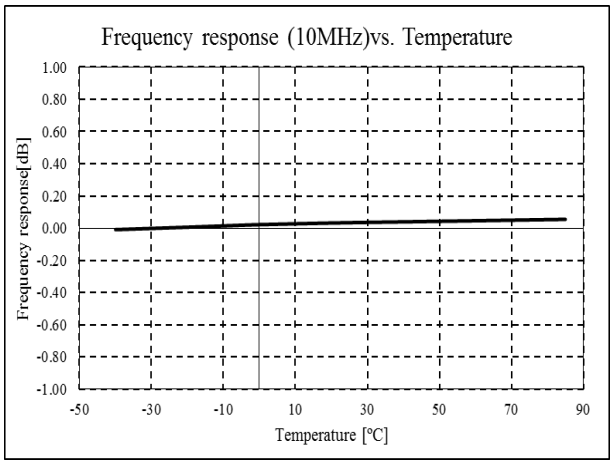
・Be sure to open the voltage of the backside die-pad, or connect the die-pad to GND. Please don't use the connection with GND as an electrode except in case making short-circuit with 6-pin.

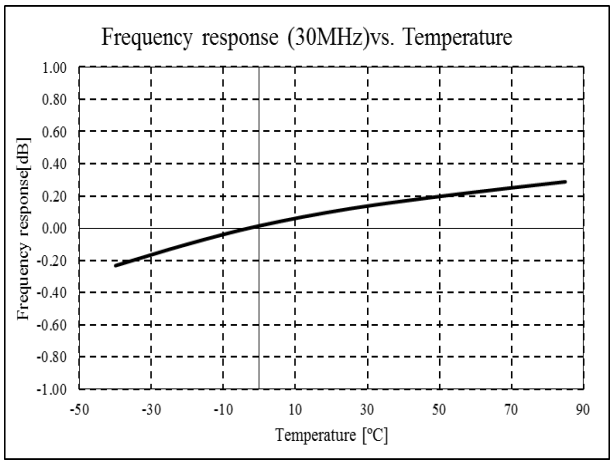
■ Characteristic data(reference)

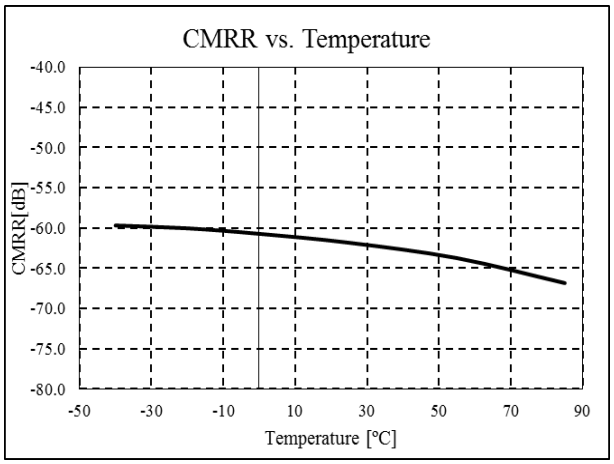


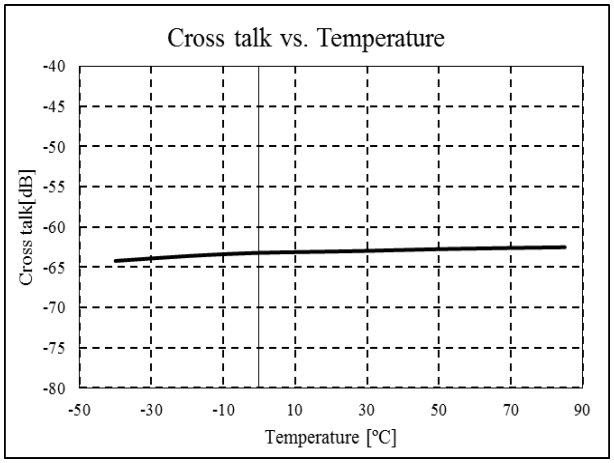


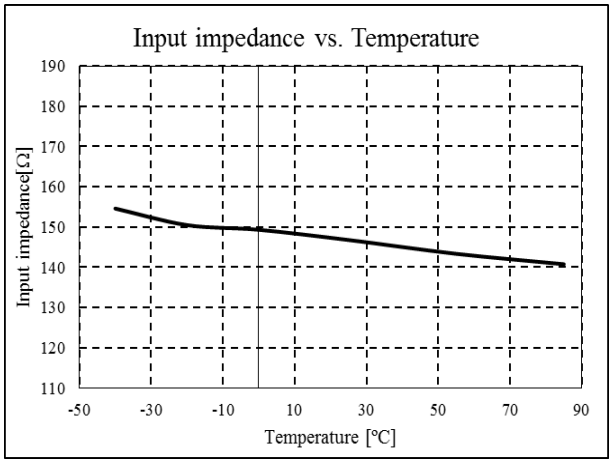


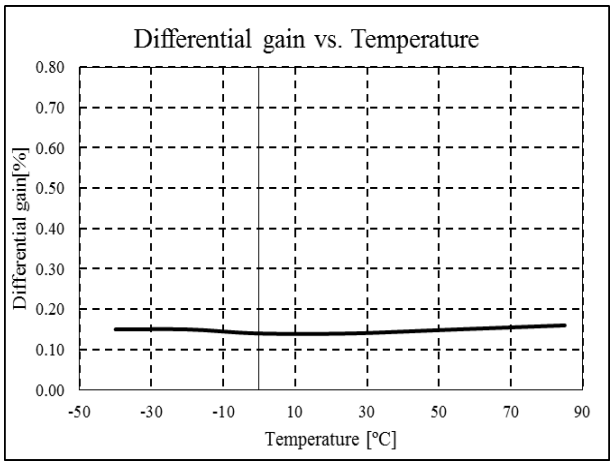


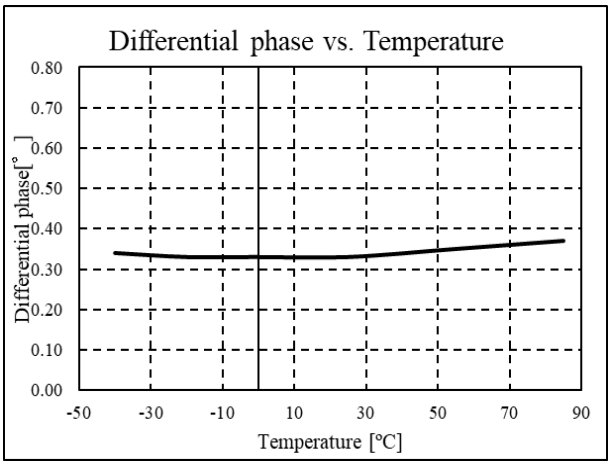


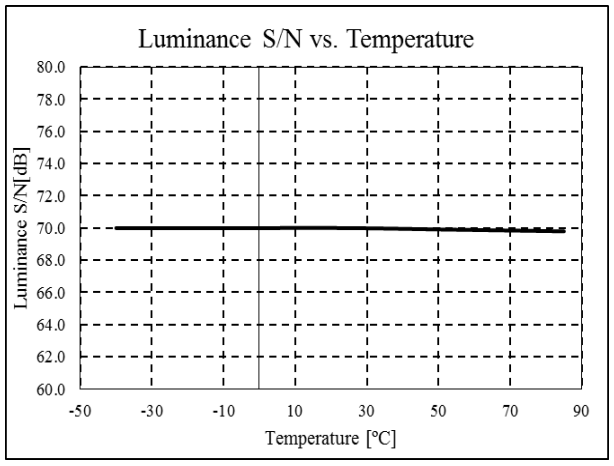



Cross talk vs. Temperature
Cross talk[dB]
-40
-45
-50
-55
-60
-65
-70
-75
-80
-50 -30 -10 10 30 50 70 90
Temperature [℃]

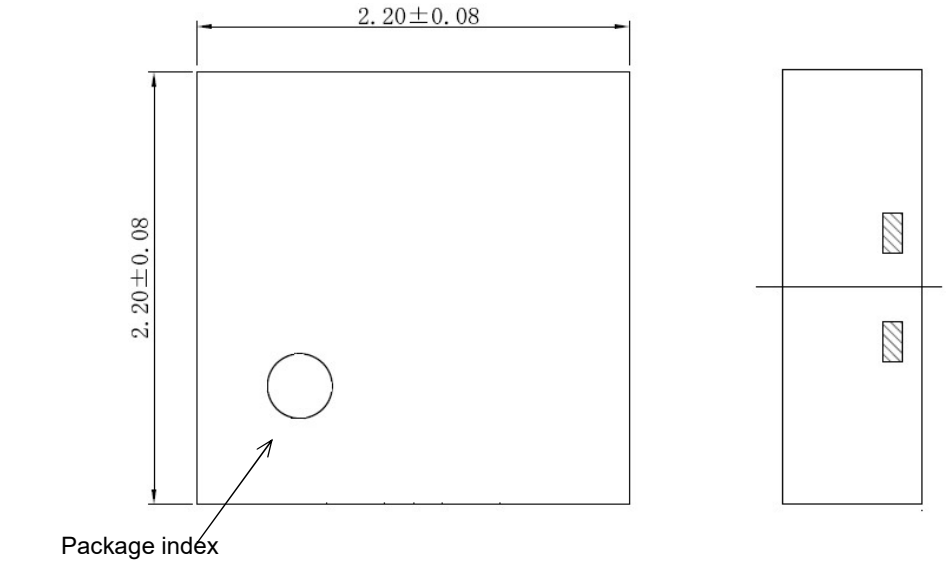

Input impedance vs. Temperature
Input impedance[Ω]
190
180
170
160
150
140
130
120
110
-50 -30 -10 10 30 50 70 90
Temperature [℃]

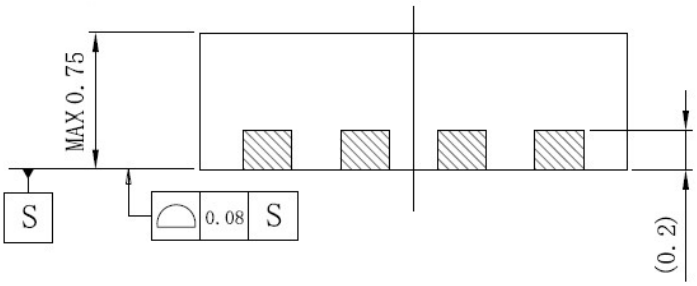

Differential gain vs. Temperature
Differential gain[%]
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-50 -30 -10 10 30 50 70 90
Temperature [℃]

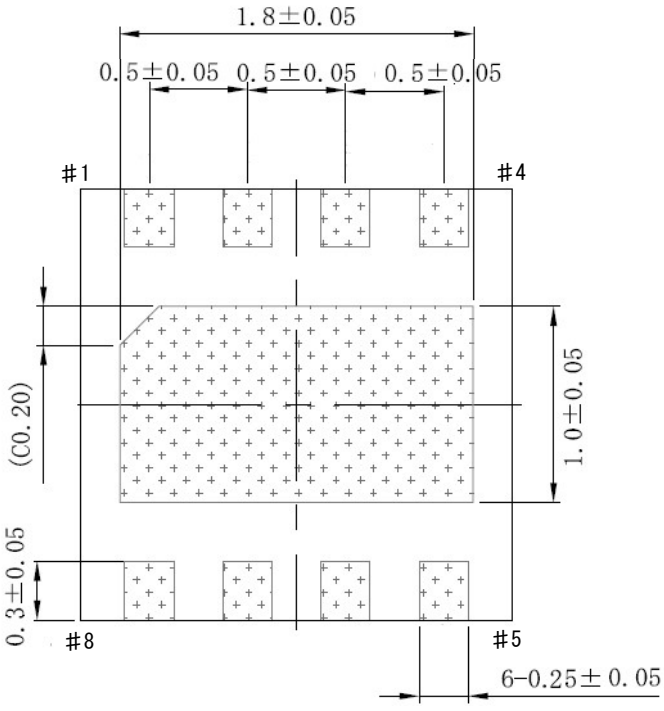

Differential phase vs. Temperature
Differential phase[°]
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-50 -30 -10 10 30 50 70 90
Temperature [℃]


Luminance S/N vs. Temperature
Luminance S/N[dB]
80.0
78.0
76.0
74.0
72.0
70.0
68.0
66.0
64.0
62.0
60.0
-50 -30 -10 10 30 50 70 90
Temperature [℃]

■ External dimensions

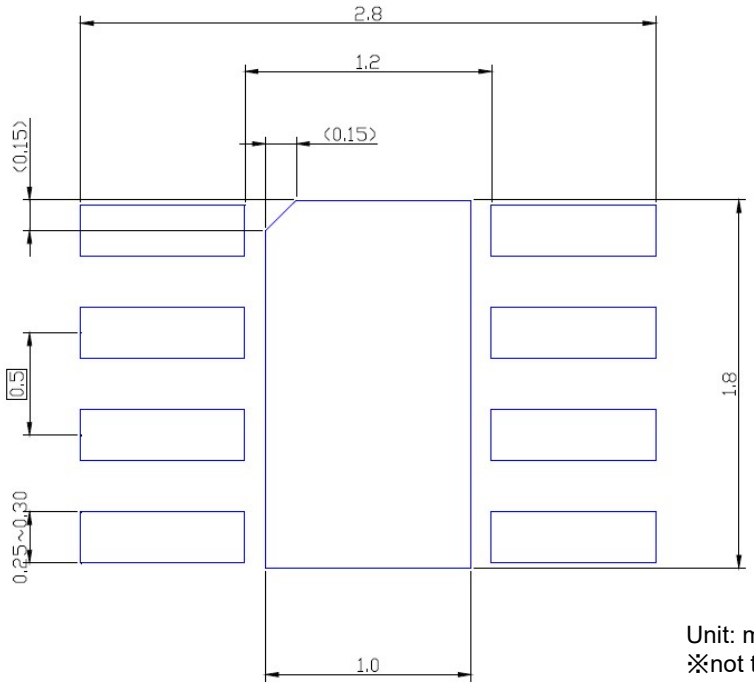






Unit: mm
※not to scale

■ Reference land pattern



Unit: mm
※not to scale

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