

OUTPUT COUPLING CAPACITOR-LESS LOW VOLTAGE VIDEO AMPLIFIER WITH LPF, Y/C MIX

■ GENERAL DESCRIPTION

The NJU71074 is a Low Voltage Video Amplifier with LPF, Y/C MIX circuit. By the internal charge pump circuit, output capacitor is unnecessary.

The NJU71074 features low power and small package, and is suitable for low power design on downsizing of portable video system and system with video output.

■ PACKAGE OUTLINE

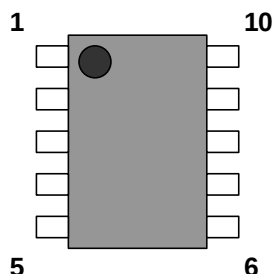


NJU71074RB2
MSOP10(TVSP10)

■ FEATURES

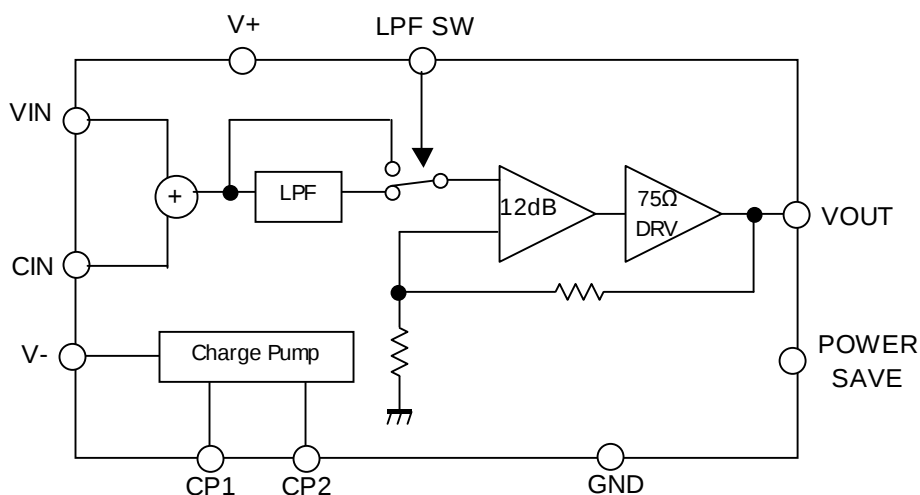
- Operating Voltage 2.5 to 3.45V
- Output coupling capacitor-less
- 12dB amplifier
- Internal 75Ω Driver Circuit (2-system drive)
- Internal Y/C MIX Circuit
- Internal LPF 0dB at 6.75MHz typ
 -40dB at 108MHz typ
- Power Save Circuit
- CMOS Technology
- Package Outline MSOP10(TVSP10)*
 *MEET JEDEC MO-187-DA / THIN TYPE

■ PIN CONFIGURATION



- 1: CP1
- 2: V+
- 3: YIN
- 4: Power save
- 5: CIN
- 6: VOUT
- 7: LPF SW
- 8: GND
- 9: V-
- 10: CP2

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	3.55	V
Power Dissipation	P _D	MSOP10(TVSP10): 480 (Note1)	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-55 to +125	°C

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

■ RECOMMENDED OPERATING CONDITION (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		2.5	-	3.45	V

■ ELECTRICAL CHARACTERISTICS (V⁺=3.0V, R_L=150Ω, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}	No Signal	-	17	23	mA
Operating Current at Power Save	I _{save}	No Signal, Power Save Mode	-	0.1	10	μA
Maximum Output Voltage Swing	V _{om}	Yin=100kHz, THD=1%	2.4	3.0	-	Vp-p
Voltage Gain 1	Gv1	Yin=100kHz, 0.5Vp-p, Input Sine Signal	11.6	12.0	12.4	dB
Voltage Gain 2	Gv2	Cin=3.58MHz, 0.15Vp-p, Input Sine Signal	11.6	12.0	12.4	dB
Frequency Characteristic at LPF through	Gf	Yin=10MHz/100kHz, 0.5Vp-p, Input Sine Signal	-1.0	0	1.0	dB
Low Pass Filter Characteristic	Gf _{6.75M}	Yin=6.75MHz/100kHz, 0.5Vp-p	-1.0	0	1.0	dB
	Gf _{54M}	Yin=54MHz/100kHz, 0.5Vp-p	-	-40	-24	
Differential Gain	DG	Yin=0.5Vp-p, 10step Video Signal	-	0.9	-	%
Differential Phase	DP	Yin=0.5Vp-p, 10step Video Signal	-	0.5	-	deg
S/N Ratio	SNv	Yin=100kHz to 6MHz, 0.5Vp-p 100% White Video Signal, R _L =75Ω	-	+65	-	dB
Input Resistance at Cin	R _{cin}	Chroma input	-	120	-	kΩ
Switching Noise Level	N _{swpl}	R _L =75Ω, V _{out} =10% White Video Signal	-	4	-	mVpp
SW Change Voltage High Level	V _{thPH}		1.25	-	V ⁺	V
SW Change Voltage Low Level	V _{thPL}		0	-	0.45	

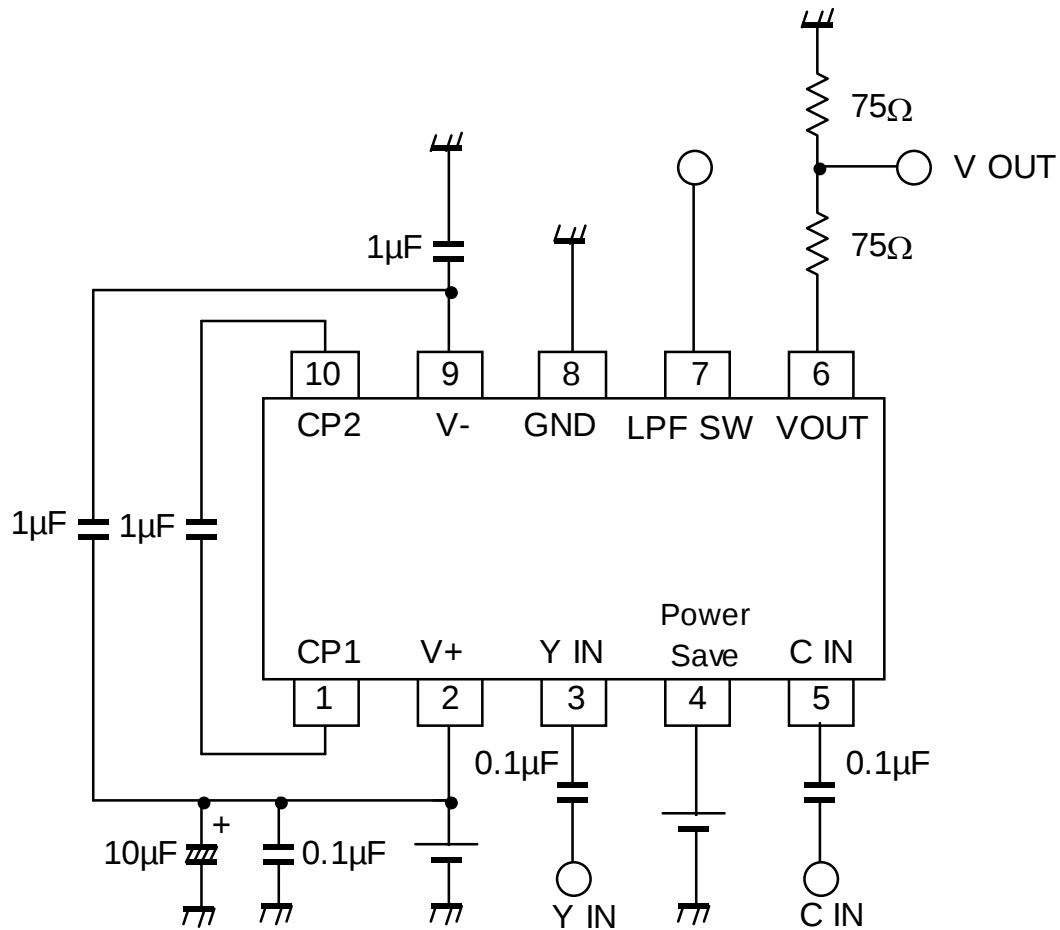
■ CONTROL TERMINAL

PARAMETER	STATUS	NOTE
LPF SW	H	Through mode
	L	LPF mode
	OPEN	LPF mode
Power Save	H	Power Save: OFF
	L	Power Save: ON (Mute)
	OPEN	Power Save: ON (Mute)

■ TERMINAL FUNCTION

PIN No.	PIN NAME	FUNCTION	EQUIVALENT CIRCUIT	DC VOLTAGE
1 10	CP1 CP2	Flying Capacitor Terminal		-
3	YIN	Y Signal Input		0V
4 7	Power Save LPF SW	Power Save LPF Switch		-
5	CIN	C Signal Input		0V
6	VOUT	Output		0V

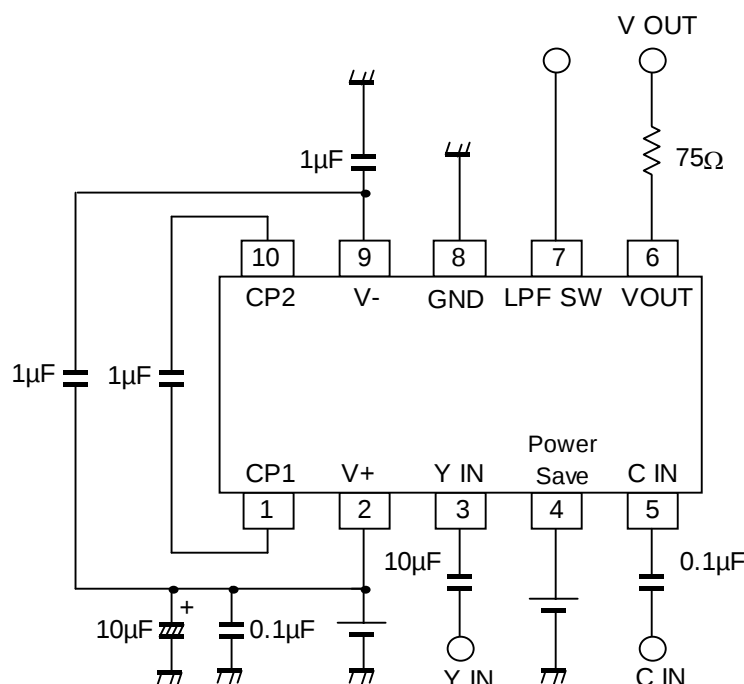
■ TEST CIRCUIT



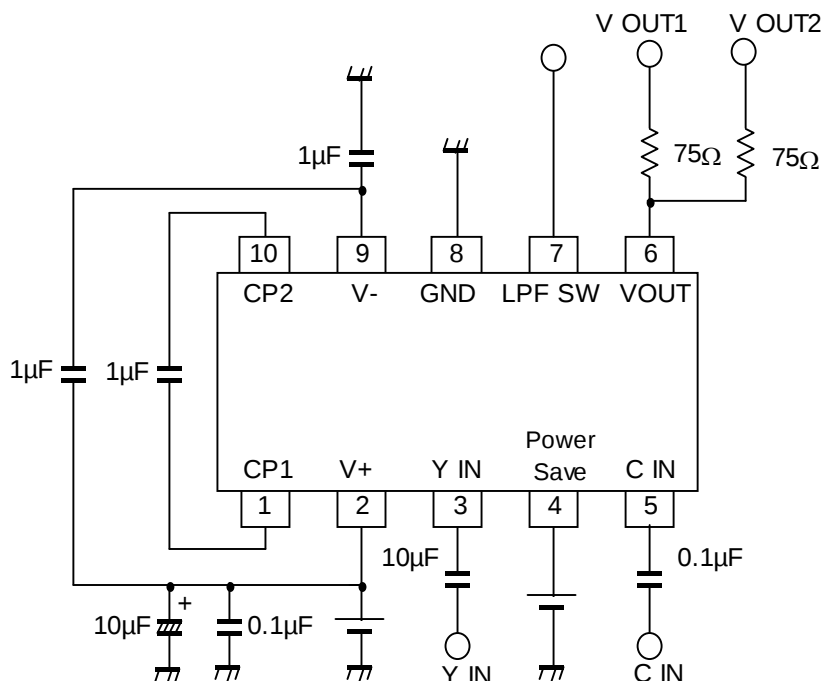
Note) Refer to "APPLICATION CIRCUIT (next page)" at real use.

■ APPLICATION CIRCUIT

1) 1-Drive system



2) 2-Drive system



■ APPLICATION

The purpose of the capacitor (1µF) between the 2pin(V+)-9pin(V-) is to improve the switching noise characteristics. It capacitor (1µF) can removed at if the switching noise characteristics are satisfied when capacitor (1µF) is not connected.

When sag increased, please increase capacitor of 3pin(YIN) than 10µF.

APPLICATION

When coax multiplex transmission, we recommend that you adjust the output signal.
Please refer to figure1.

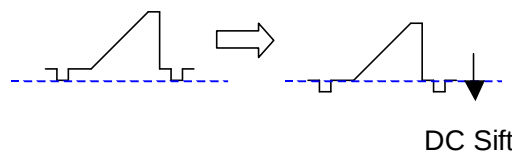
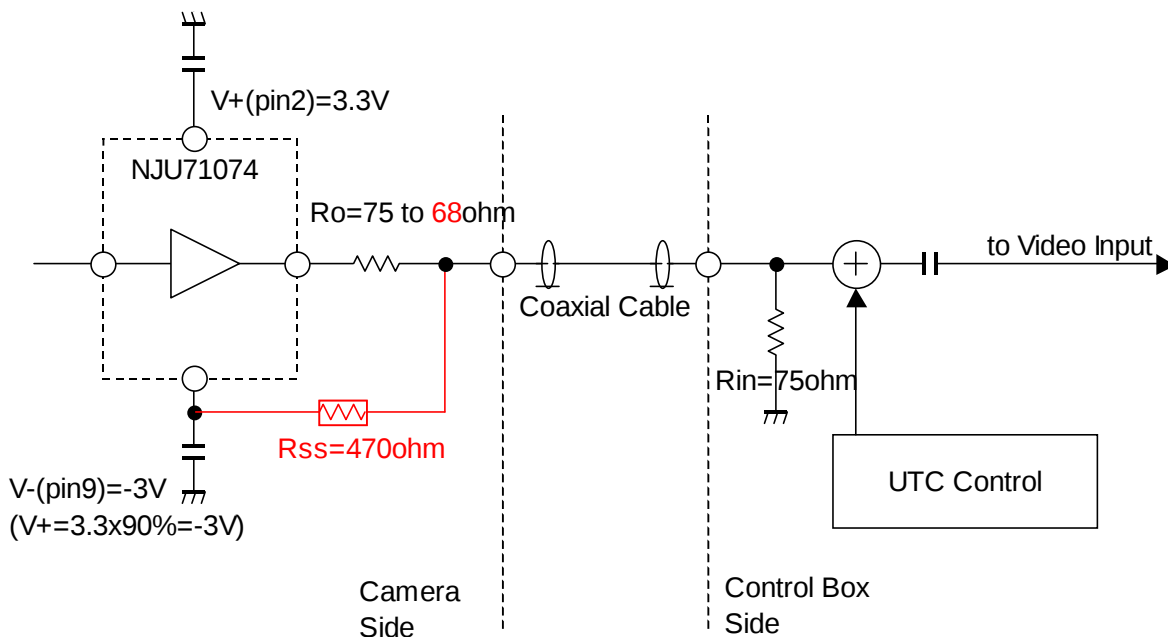


Figure1: How to shift the output DC signal

The rare case, there is to be superimposed the directly DC control signal on the video signal when superimposed a control signal to the video signal by using a coaxial cable.

In that case, the following symptoms will appear.

- The control signal appears on the screen.
- Loss of synchronization of the video signal

Shows the proposed measures on the next page.

A case of multiple coaxial transmission: UTC(Up The Coaxial)

This is one of a case at the multiplex coaxial transmission used in CCTV.

It is a system that control signals of camera multiplexing to the coaxial cable.

This system is superimposed on the control signal pulse in the vertical blanking period as shown in Figure 2.

This is because do not affect the video signal.

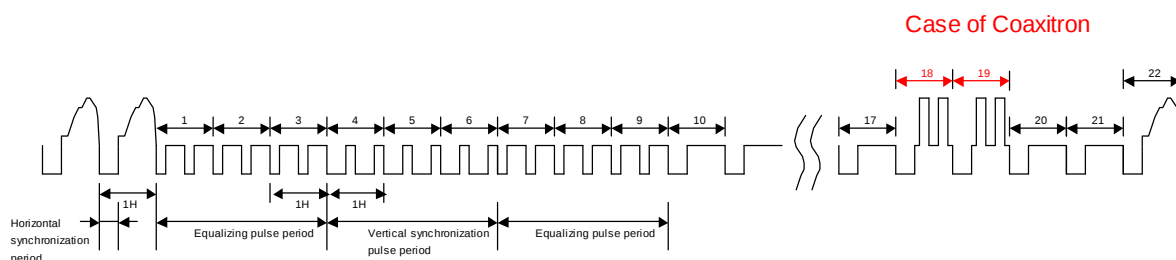


Figure2: A case of UTC

Proposed measures is shift the output DC signal by using the V- terminal (pin 9) of NJU71074.

The steps are as follows:

1. A resistor: R_{ss} add between the R_o (75Ω) and V- terminal (pin9).

2. Reduce $R_o(75\Omega)$.

By adding a R_{ss} , level of the video signal is attenuated.

Example: Level of the video signal will be reduced 5% at connected $R_{ss} = 470\Omega$ and $R_o = 75\Omega$.

Therefore, increase 5% of video output level by changed to 68Ω the R_o .

*Table 1 shows an external resistor value and the swing of video output signal at $V+$ (pin2) = 3.3V, 3V.

3. Please evaluation of S/N. Because it is a possibility of noise change by internal IC charge pump by this measure.

	Value(typ.)		UNIT
V+(pin2)	3.3	3	V
V-(pin9) ($V+ \times 90\%$)	-2.97	-2.7	V
Termination resistance	75	75	ohm
Resistance (between V_{ss} and V_{out})	470	470	ohm
Output resistance(R_o)	68	68	ohm
Sync. Voltage of V_{out}	-0.209	-0.19	V
Swing of V_{out}	0.975	0.975	Vpp

Table 1: external resistor value and the swing of video output signal at $V+$ (pin2) = 3.3V, 3V.

- Case of 2-system 75ohm drive

Shown in Figure 3, 2-system drive will be possible at system 1 (75Ω for multiplex coaxial system) and system -2(75Ω system for monitoring).

However, shown in Figure 4, 2-system drive is not recommended, case of system 1and 2 (75Ω for multiplex coaxial system)

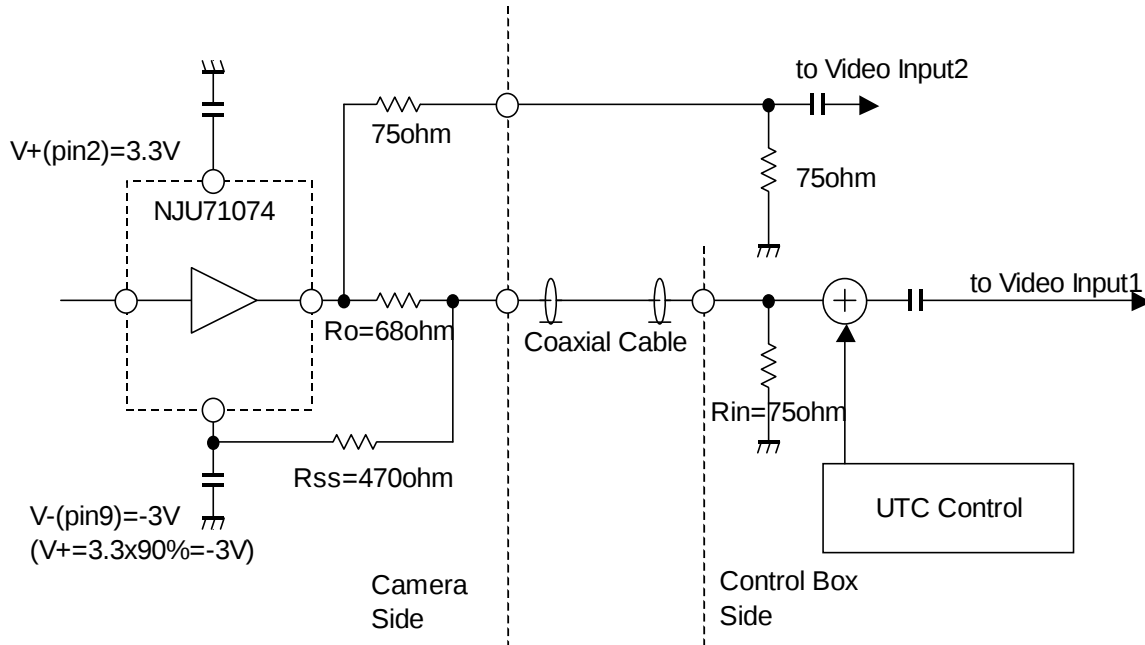


Figure 3: Recommended 2-system drive circuit

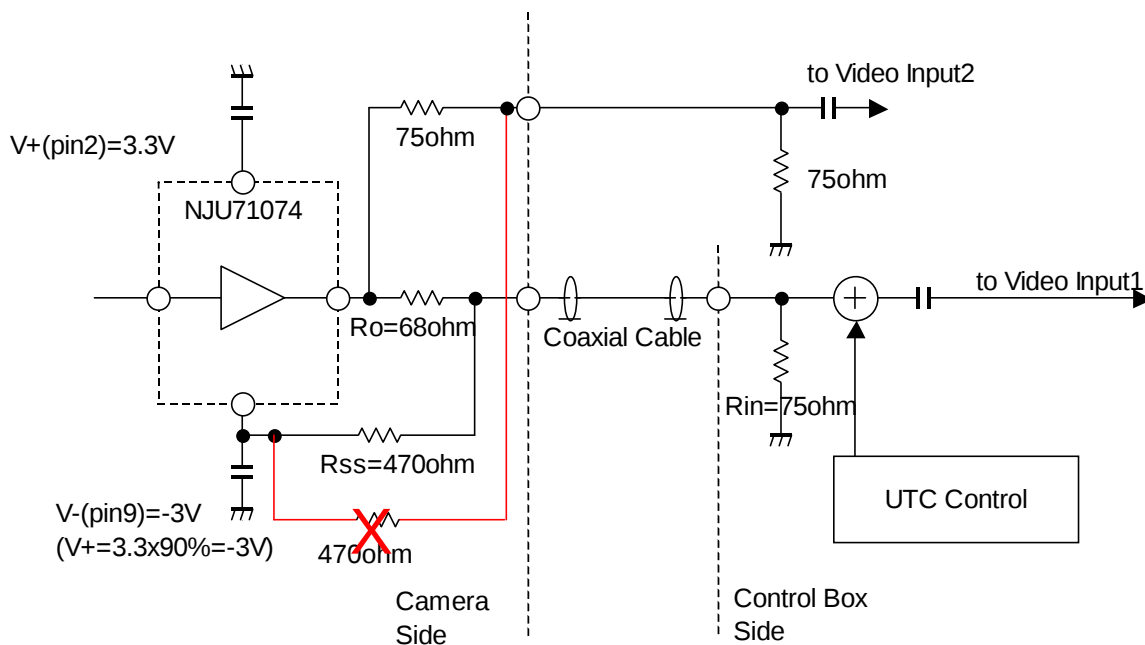
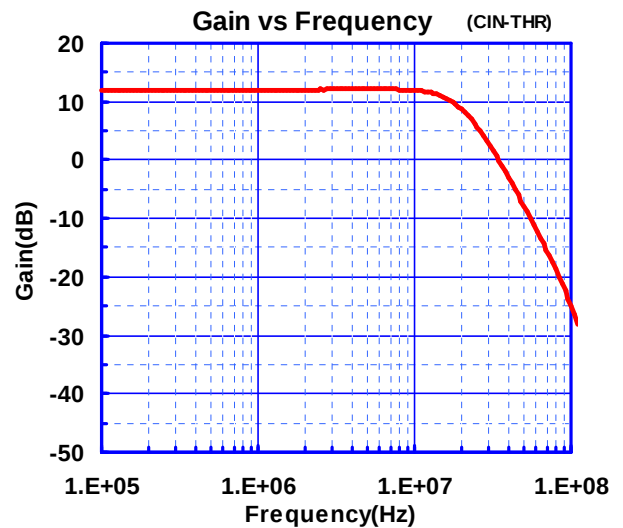
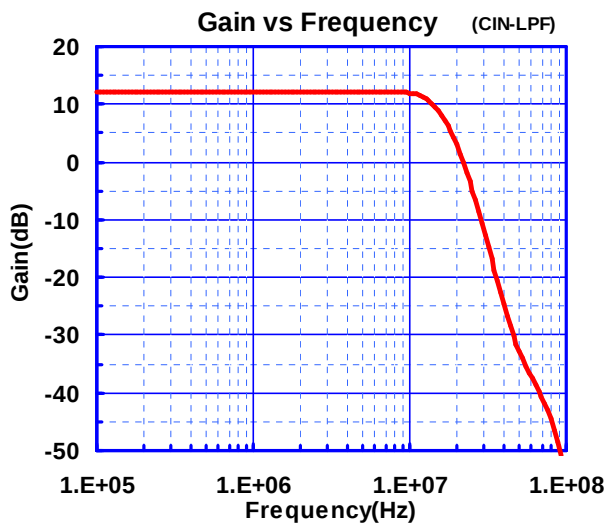
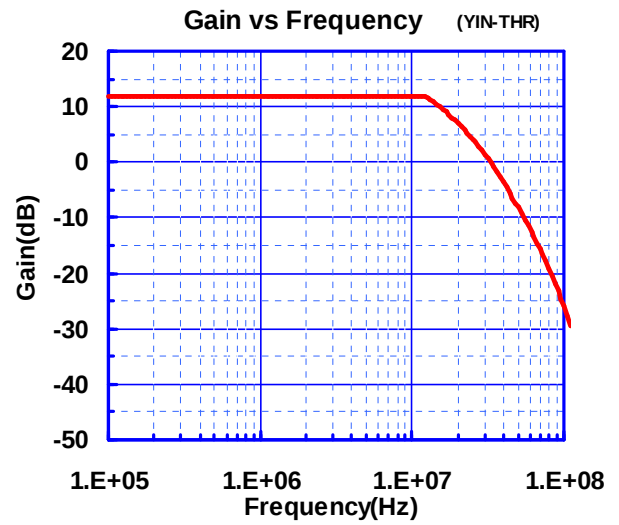
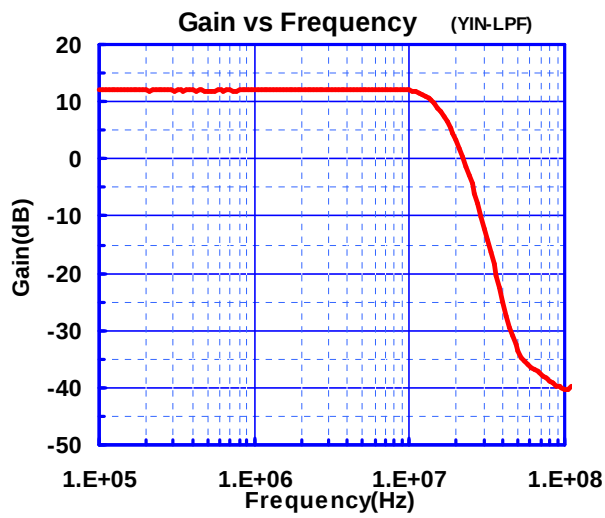
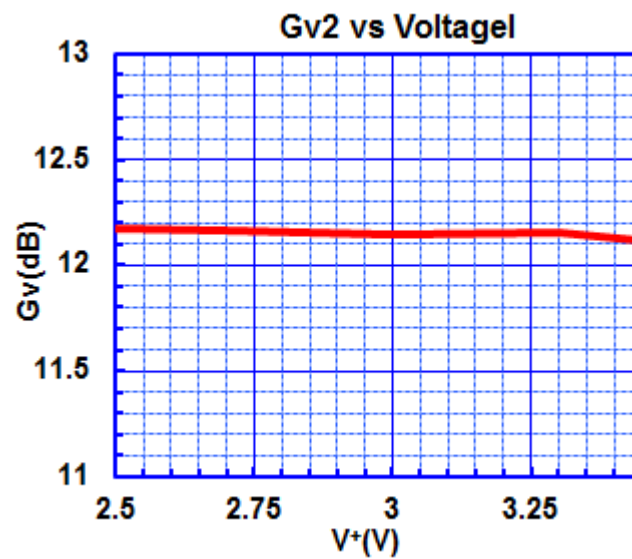
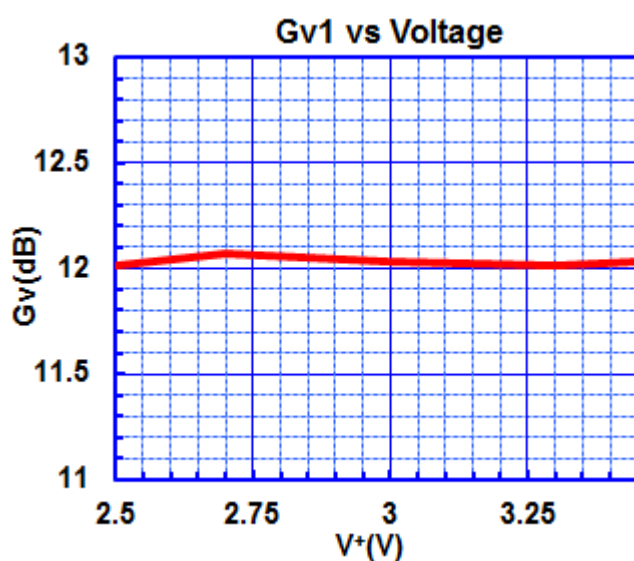
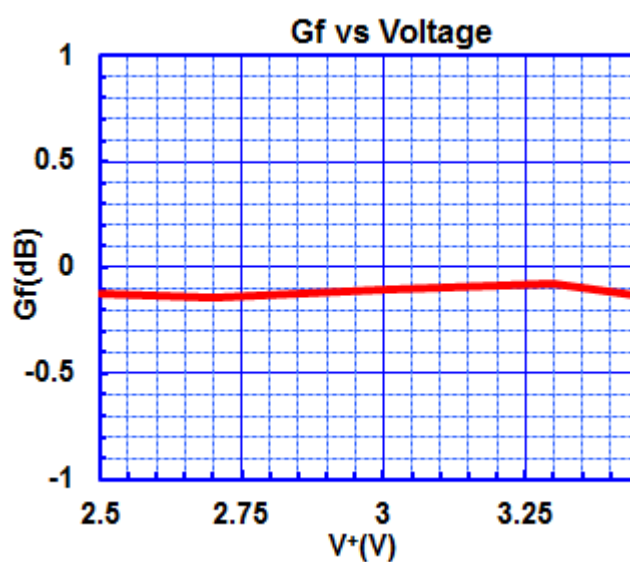
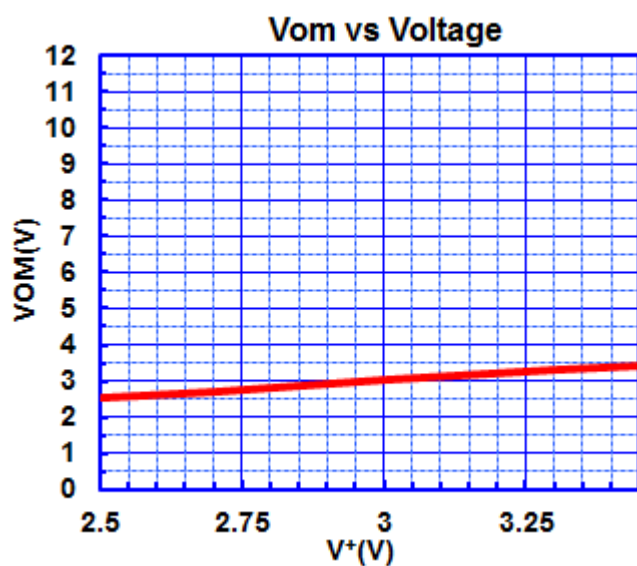
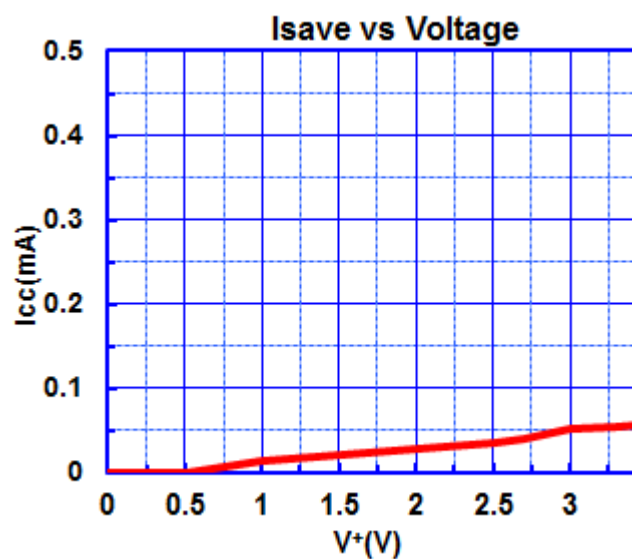
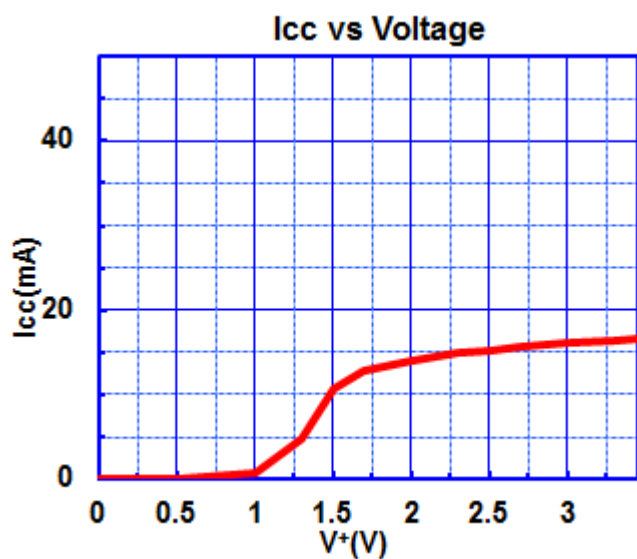


Figure 4: Not recommended 2-system drive circuit

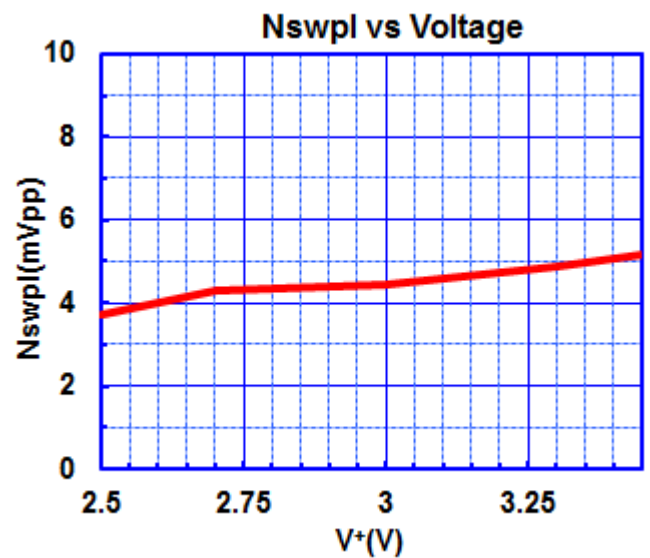
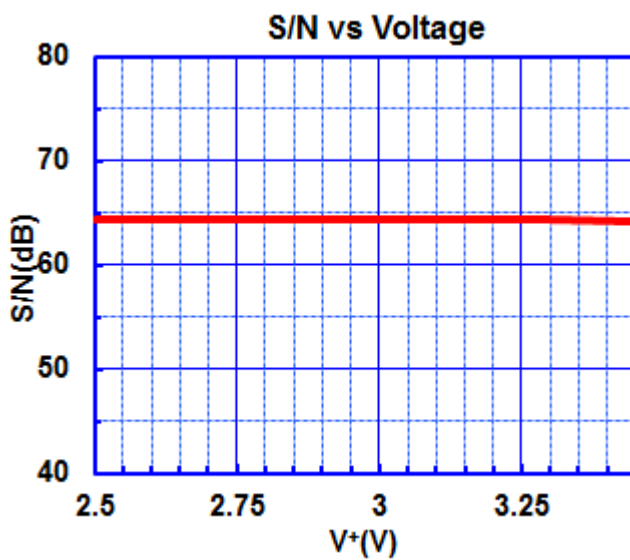
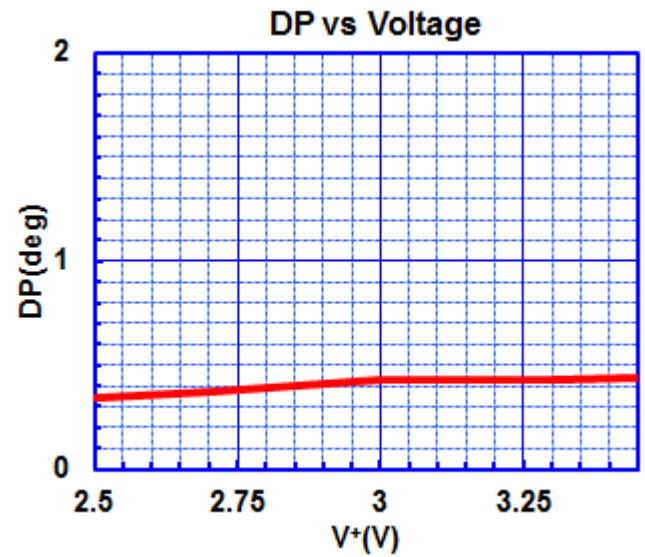
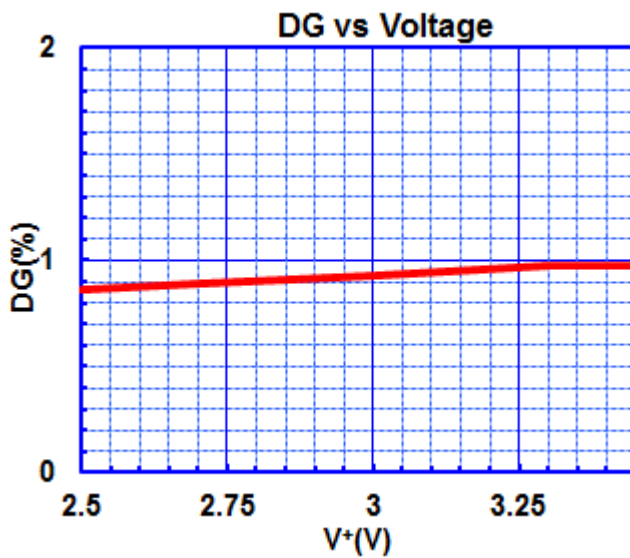
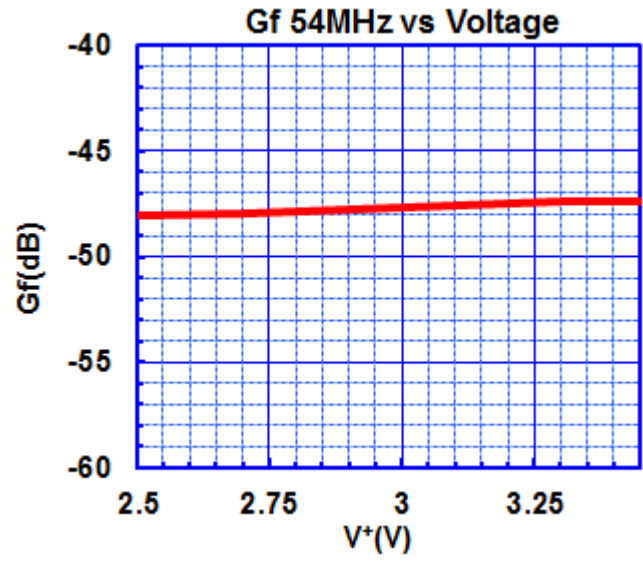
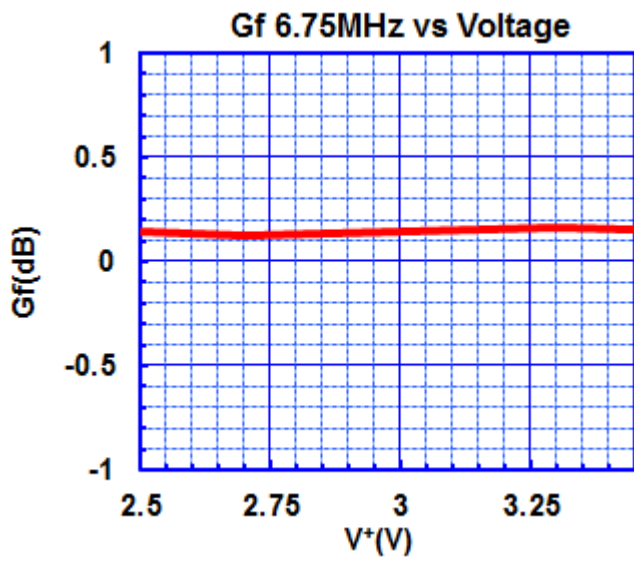
■ TYPICAL CHARACTERISTICS



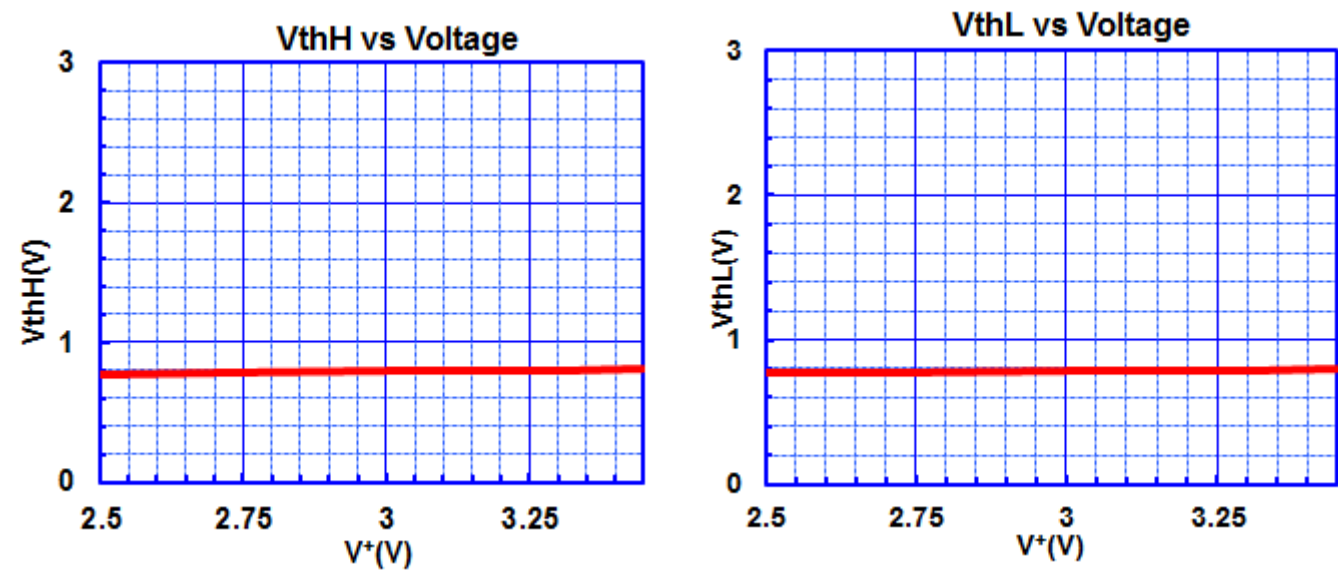
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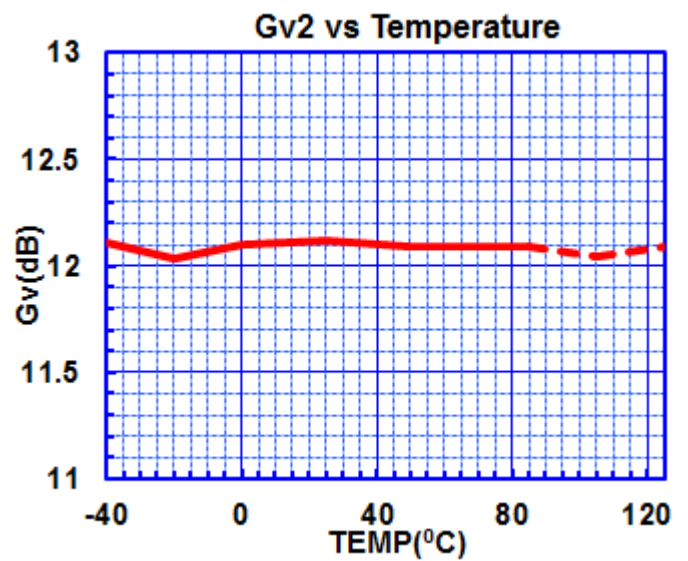
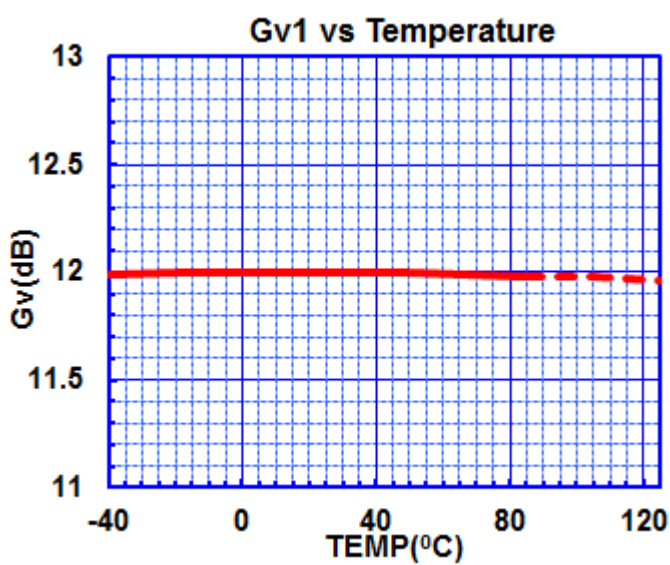
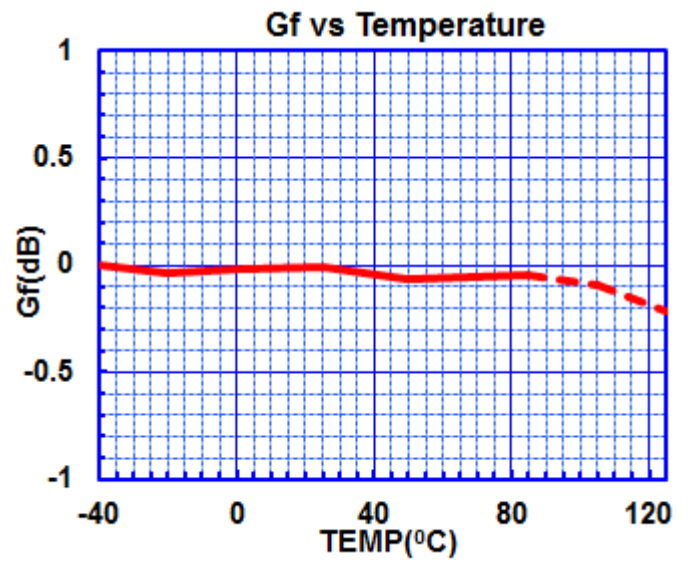
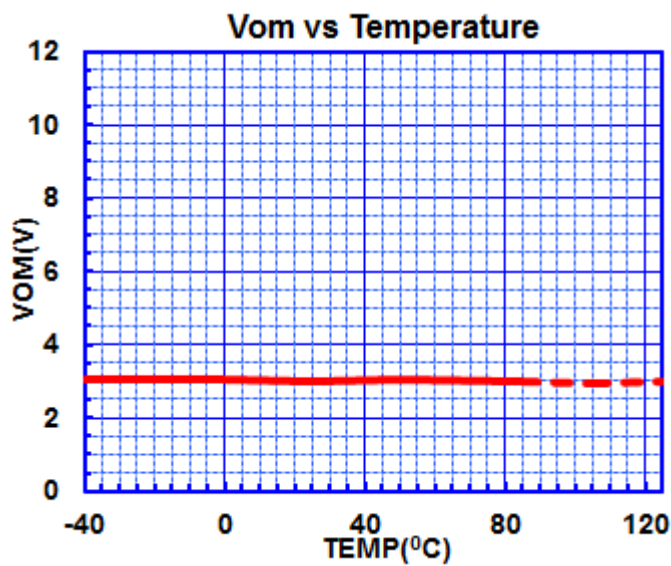
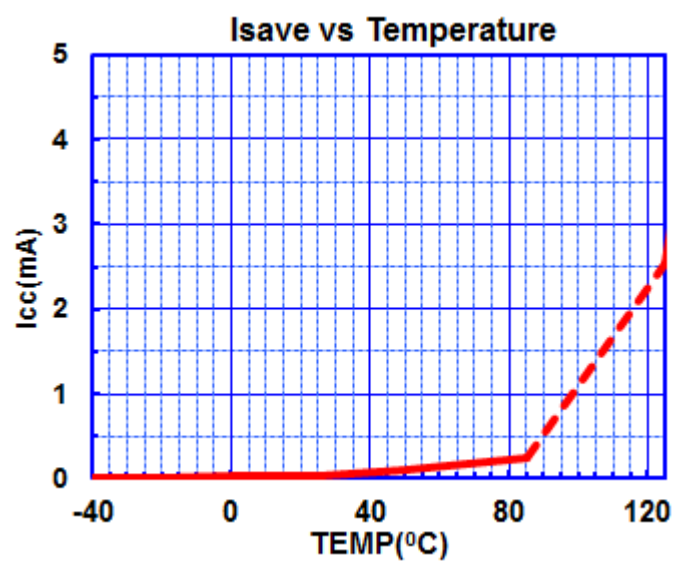
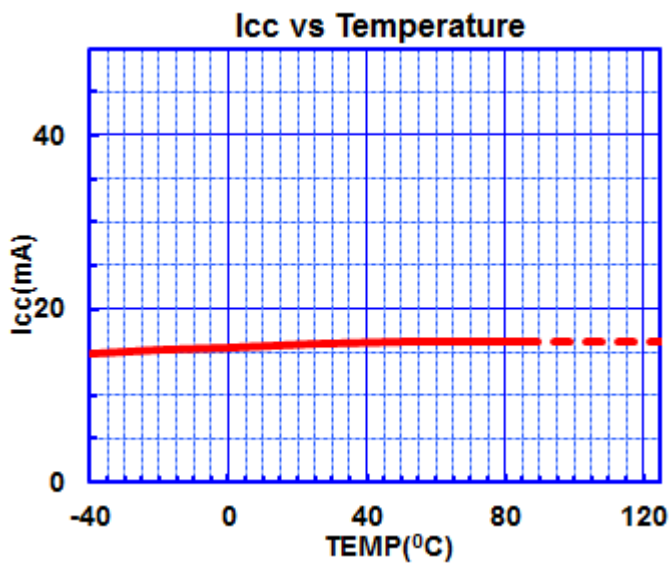
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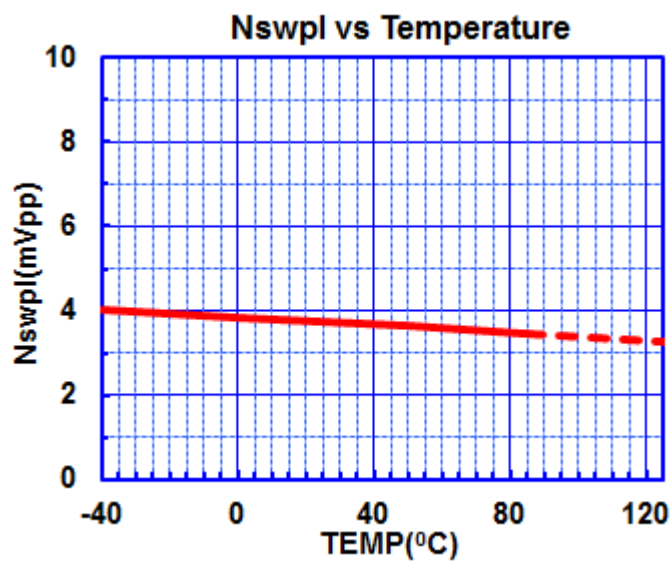
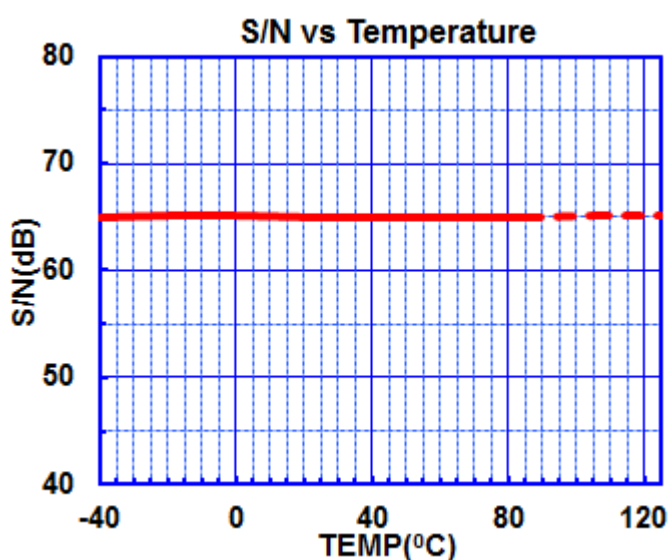
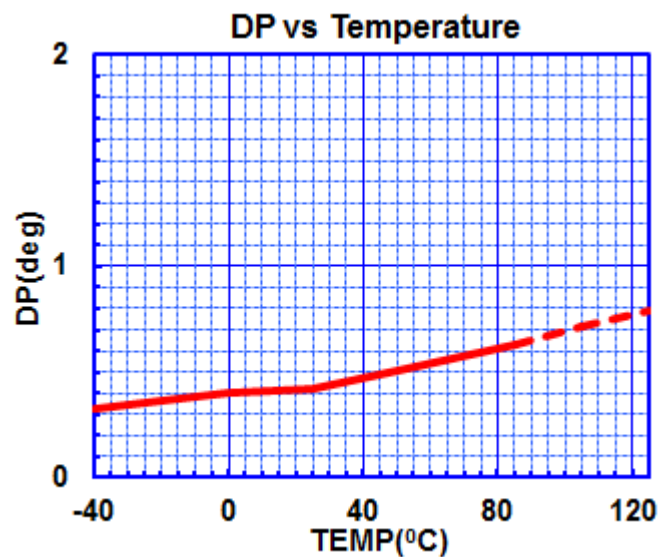
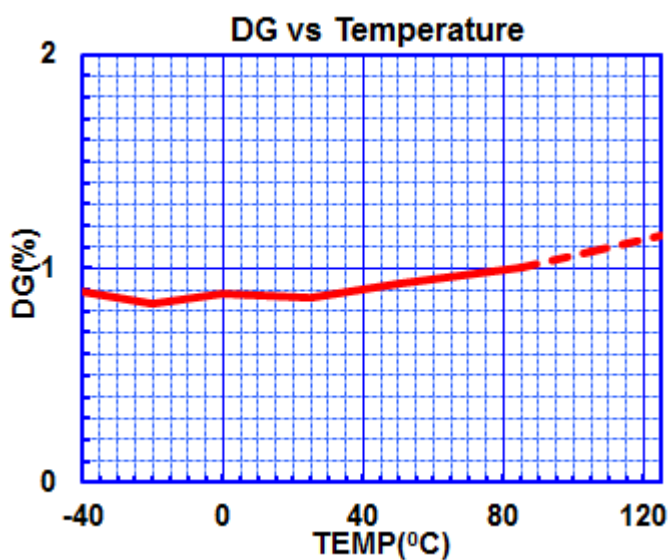
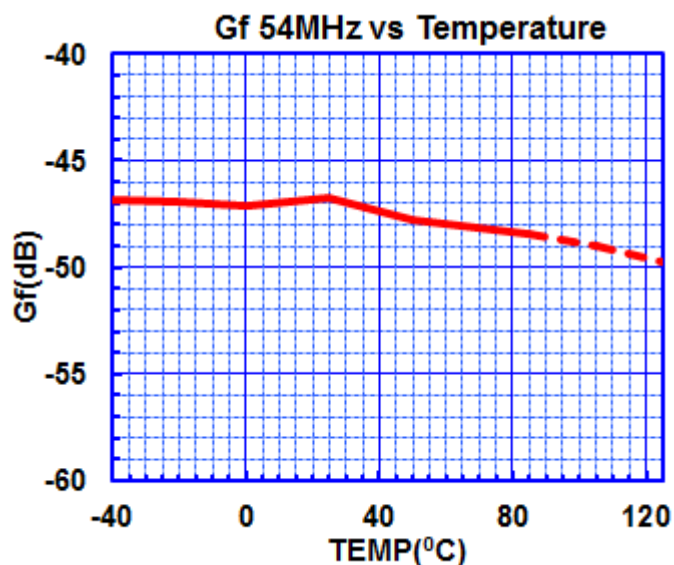
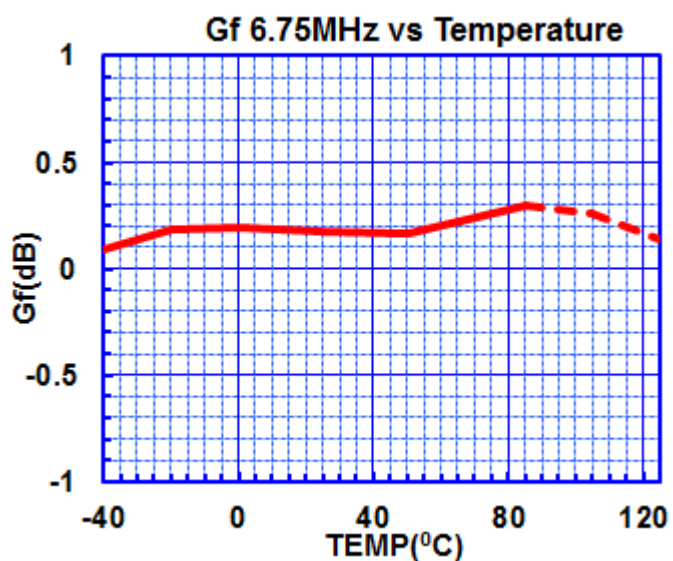
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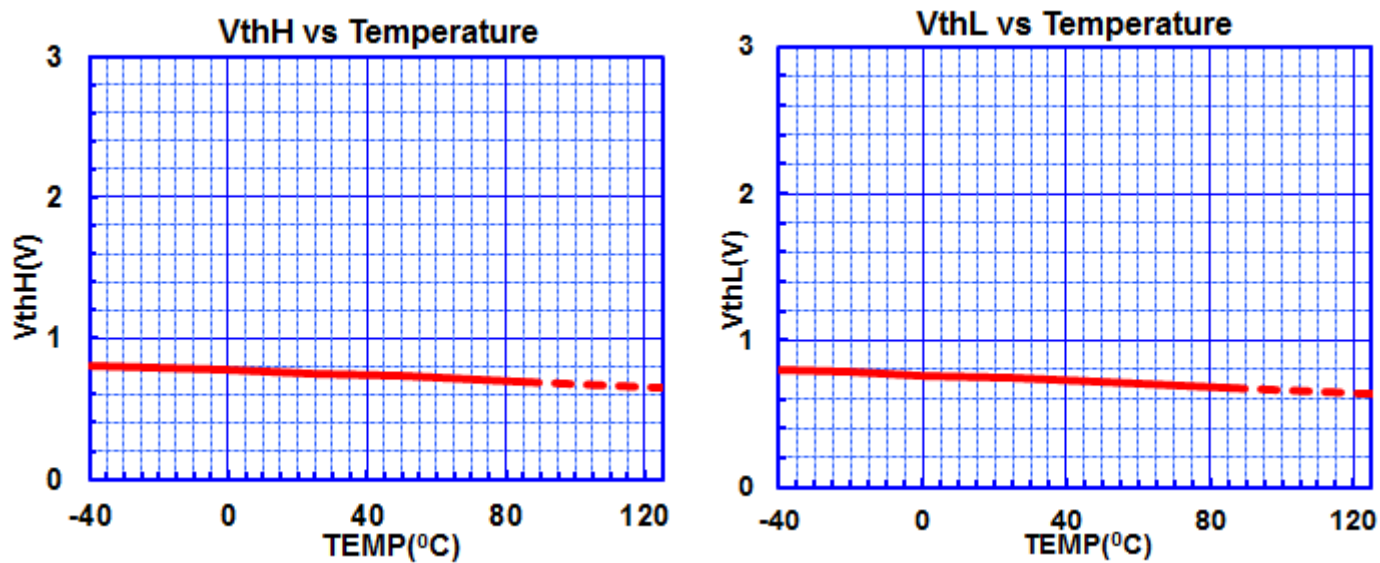
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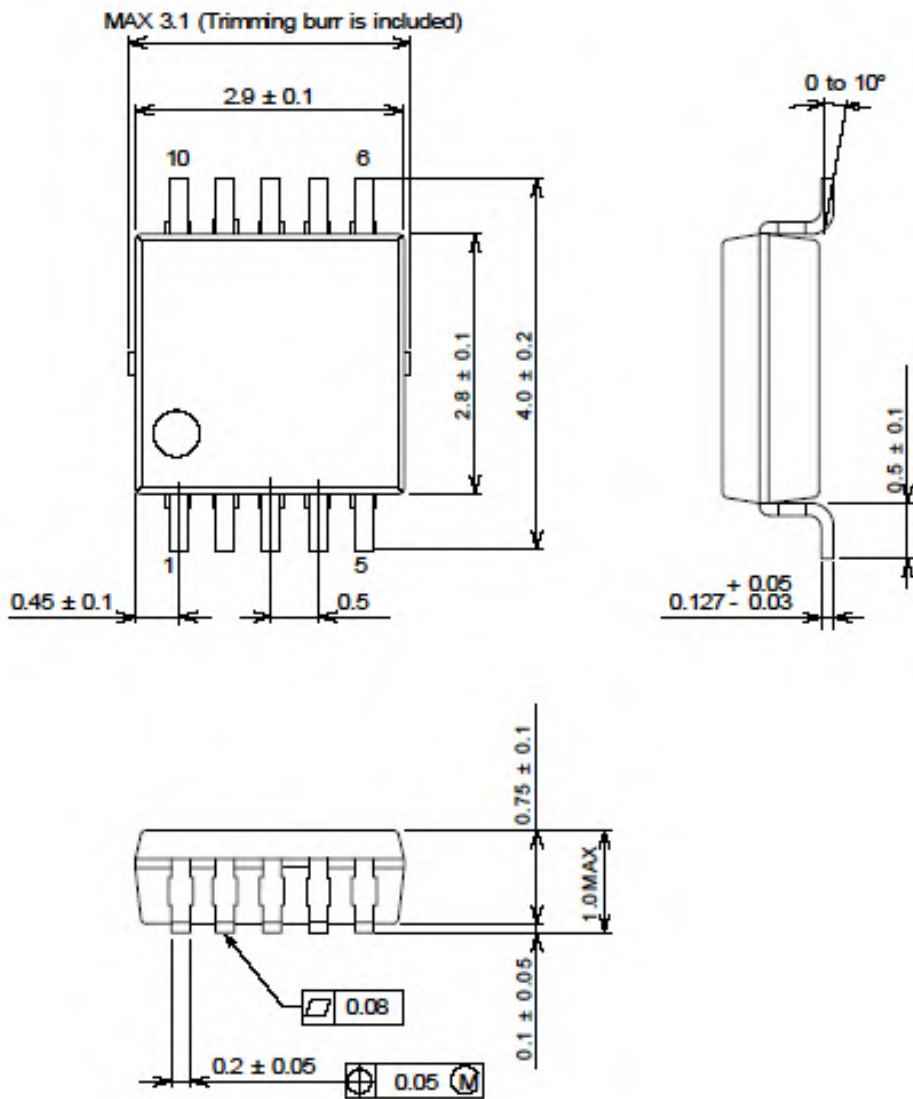


■ TYPICAL CHARACTERISTICS



■ PACKAGE DIMENSIONS: MSOP10(TVSP10)*MEET JEDEC MO-187-DA / THIN TYPE

TVSP10



GD-R01004A-2

UNIT : mm

[CAUTION]
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