LOW VOLTAGE VIDEO AMPLIFIER WITH LPF

■GENERAL DESCRIPTION

The **NJM2575** is a Low Voltage Video Amplifier contained LPF circuit. Internal 75Ω driver is easy to connect TV monitor directly. The **NJM2575** features low power and small package, and is suitable for low power design on downsizing of DSC and DVC.

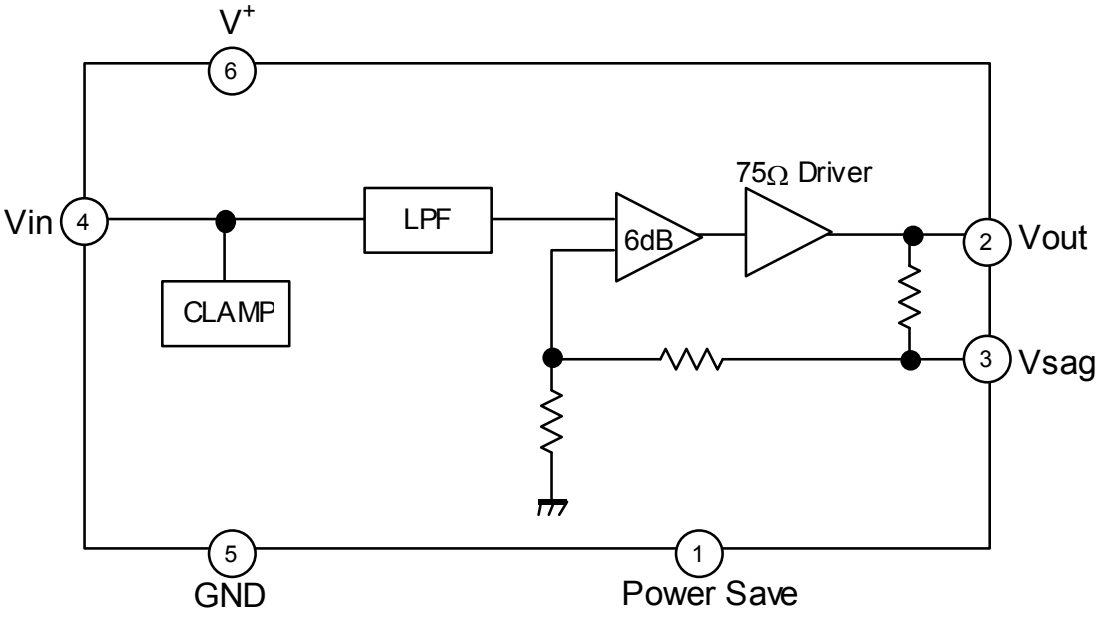
■PACKAGE OUTLINE

NJM2575F1

■FEATURES

- Operating Voltage 2.8 to 5.5V
- Composite Video Signal Input 1.0Vp-p
- 6dB Amplifier
- 75Ω Driver
- 2nd order Low Pass Filter
- Operating Current 7.0mA typ. at V^+ = 3.0V
- Operating Current (Power Save Mode) 60μA typ.at V^+ = 3.0V
- Bipolar Technology
- Package Outline SOT23-6 (MTP6)

■BLOCK DIAGRAM



■**ABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	7.0	V
Power Dissipation	P_D	200	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-40 to +125	°C

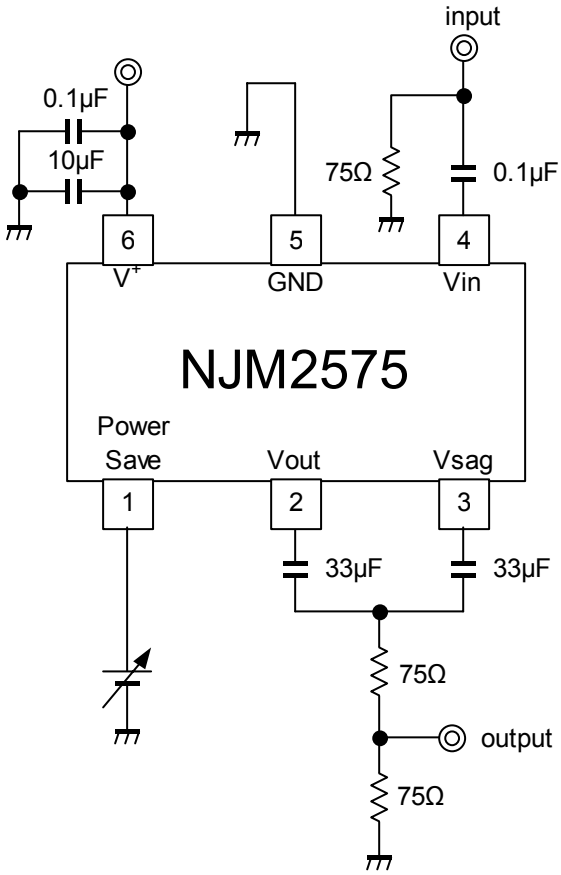
■**ELECTRICAL CHARACTERISTICS** (V^+=3.0V,R_L=150Ω,Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		2.8	3.0	5.5	V
Operating Current	I_{CC}	No Signal	-	7.0	10.0	mA
Operating Current at Power Save	Isave	Power Save Mode	-	60	90	μA
Maximum Output Voltage Swing	Vom	f=1kHz,THD=1%	2.2	2.4	-	Vp-p
Voltage Gain	Gv	Vin=100kHz,1.0Vp-p, Input Sine Signal	6.1	6.5	6.9	dB
Low Pass Filter Characteristic	Gfy4.5M	Vin=4.5MHz/100kHz,1.0Vp-p	-0.5	0.0	+0.5	dB
	Gfy8M	Vin=8MHz/100kHz,1.0Vp-p	-	-2.0	-	
	Gfy16M	Vin=16MHz/100kHz,1.0Vp-p	-	-12.0	-	
Differential Gain	DG	Vin=1.0Vp-p, Input 10step Video Signal	-	0.2	-	%
Differential Phase	DP	Vin=1.0Vp-p, Input 10step Video Signal	-	0.2	-	deg
S/N Ratio	SNv	Vin=1.0Vp-p, 100% White Video Signal, R_L=75Ω	-	+60	-	dB
2nd. Distortion	Hv	Vin=1.0Vp-p,3.58MHz, Sine Video Signal, R_L=75Ω	-	-40	-	dB
SW Change Voltage High Level	VthPH	active	1.8	-	V^+	V
SW Change Voltage Low Level	VthPL	non-active	0	-	0.3	

■**CONTROL TERMINAL**

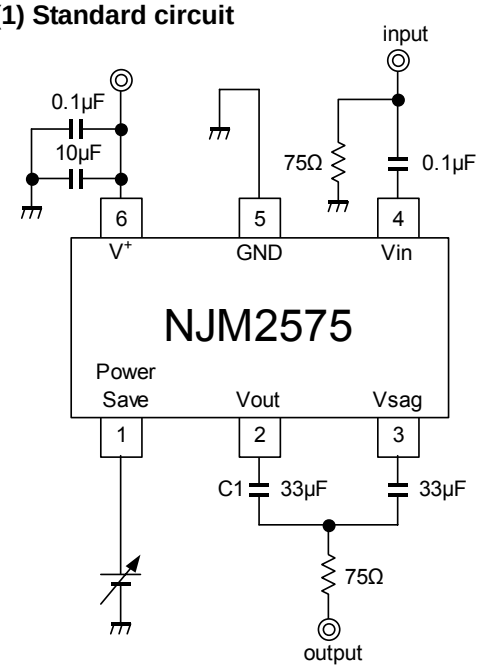
PARAMETER	STATUS	NOTE
Power Save	H	Power Save : OFF
	L	Power Save : ON (Mute)
	OPEN	Power Save : ON (Mute)

■TEST CIRCUIT

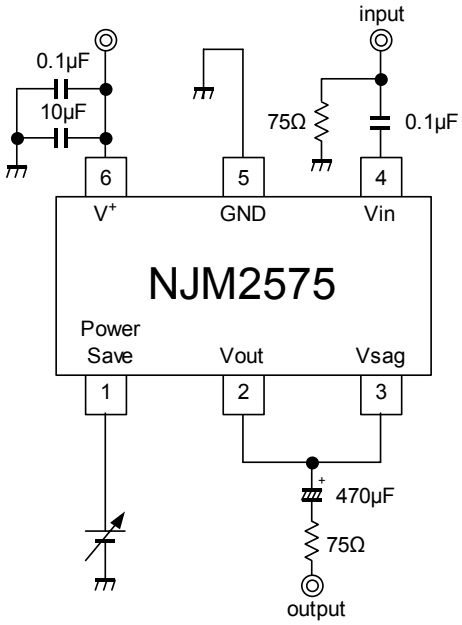


■APPLICATION CIRCUIT

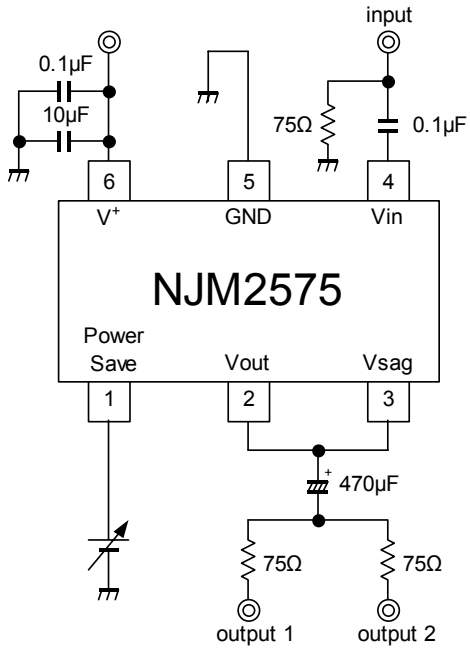
(1) Standard circuit



(2) SAG correction unused circuit



(3) Two-line driving circuit



(1) Standard circuit

This circuit is for a portable equipment of small mounting space.
The SAG correction reduces output coupling capacitor values.
However, this circuit may cause to SAG deterioration, and lose synchronization by luminance fluctuation.
Adjust the C1 value, checking the waveform containing a lot of low frequency components like a bounce waveform (Worst condition waveform of SAG). Change the capacitor of C1 into a large value to improve SAG.

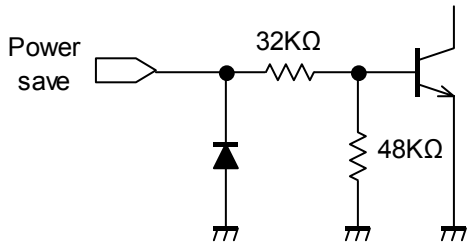
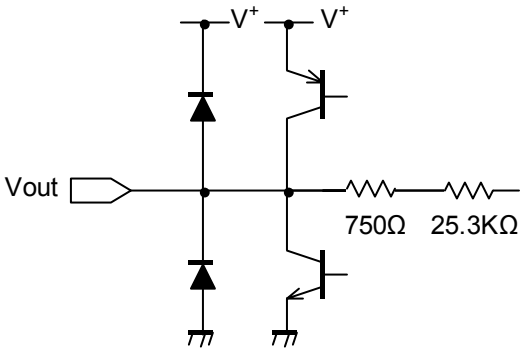
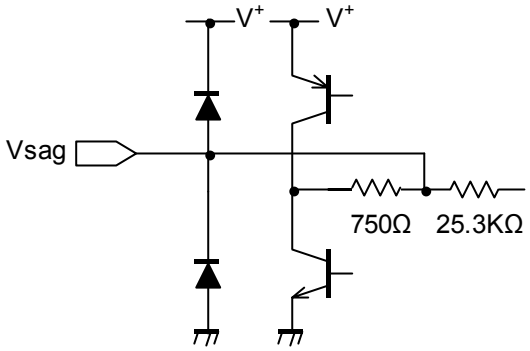
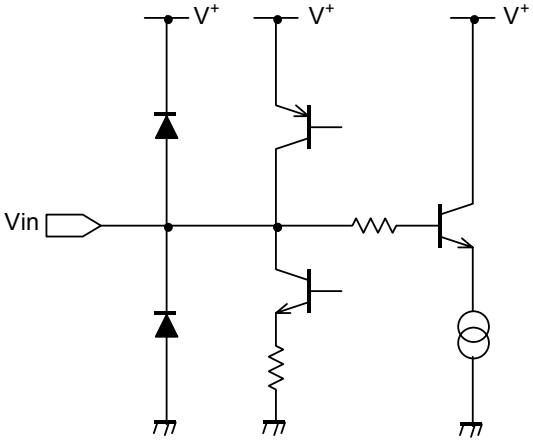
(2) SAG correction unused circuit

We recommend this circuit when there is no space limitation.
Connect the coupling capacitor after connecting the Vout pin and Vsag pin. The recommended value is 470μF or more.

(3) Two-line driving circuit

This circuit drives two-line of 150Ω. However, it may cause to lose synchronization by an input signal of large APL change (100% white signals more than 1Vp-p). Confirm the large APL change waveform (100% white signals more than 1Vp-p) and evaluate sufficiently.

■TERMINAL FUNCTION

PIN No.	PIN NAME	DC VOLTAGE	EQUIVALENT CIRCUIT
1	Power save	-	
2	Vout	0.26V	
3	Vsag	-	
4	Vin	1.10V	
5	GND	-	
6	V^+	3V	

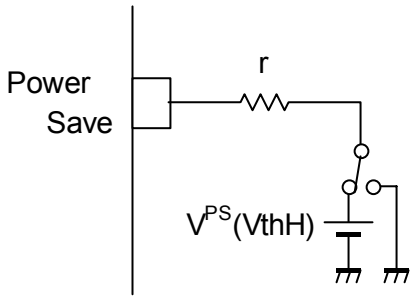
■ APPLICATION

When you use a power save terminal more than by 4.0V, please put resistance of about 20kΩ into a power save terminal.

In addition, power save terminal voltage (VthH) -- in the case of below 4.0V, resistance is not required

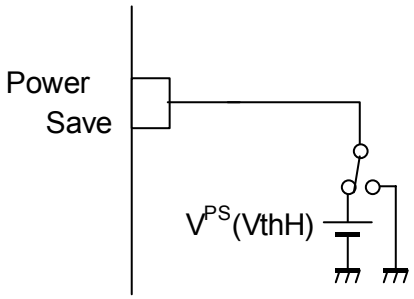
Example)

● PS(VthH) ≥ 4.0V



VthH ≥ 4.0V
r ≅ 20kΩ

● PS(VthH) < 4.0V



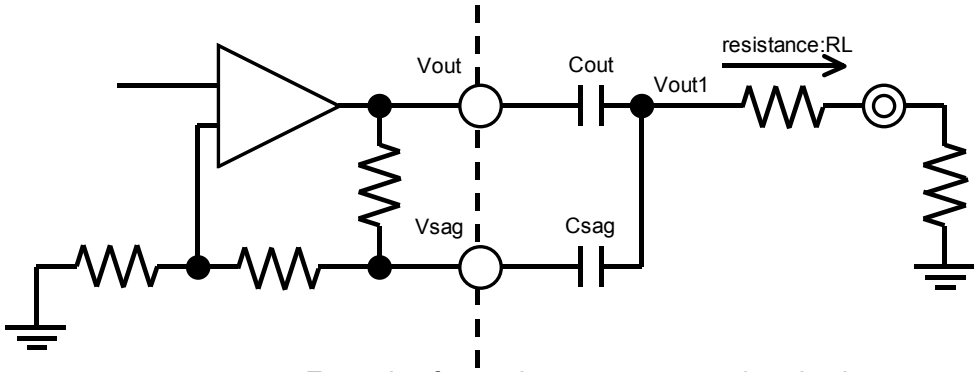
VthH < 4.0V

♦ **SAG correction circuit**

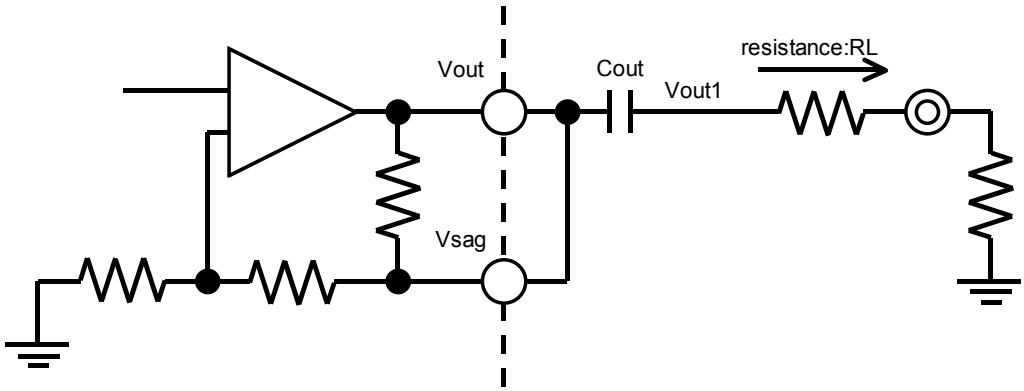
SAG correction circuit is a circuit to correct for low-frequency attenuation by high-pass filter consisting of the output coupling capacitance and load resistance. Low-frequency attenuation raises the sag in the vertical period of the video signal.

Capacitor for Vsag (Csag) is connected to the negative feedback of the amplifier. This Csag increase the low frequency gain to correct for the attenuation of low frequency gain.

Example SAG collection circuit

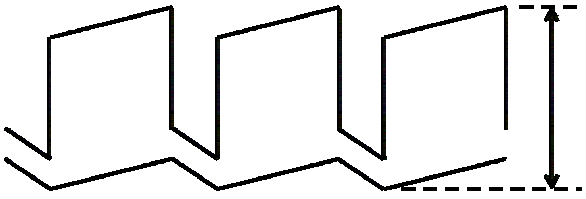


Example of not using sag compensation circuit

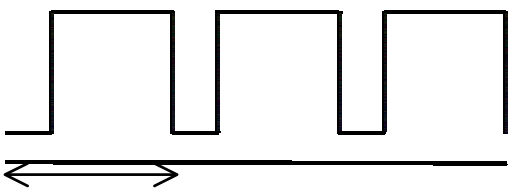


Waveform of Vout terminal and Vout1 terminal

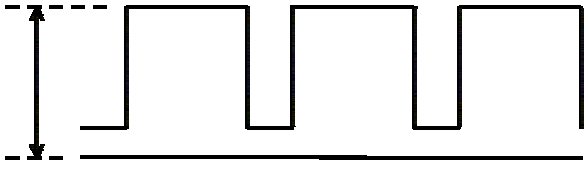
using SAG correction circuit
Waveform of Vout



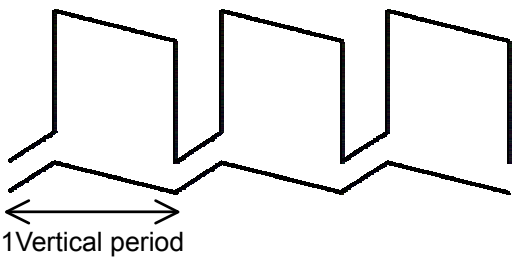
Waveform of Vout1



not using SAG correction circuit
Waveform of Vout

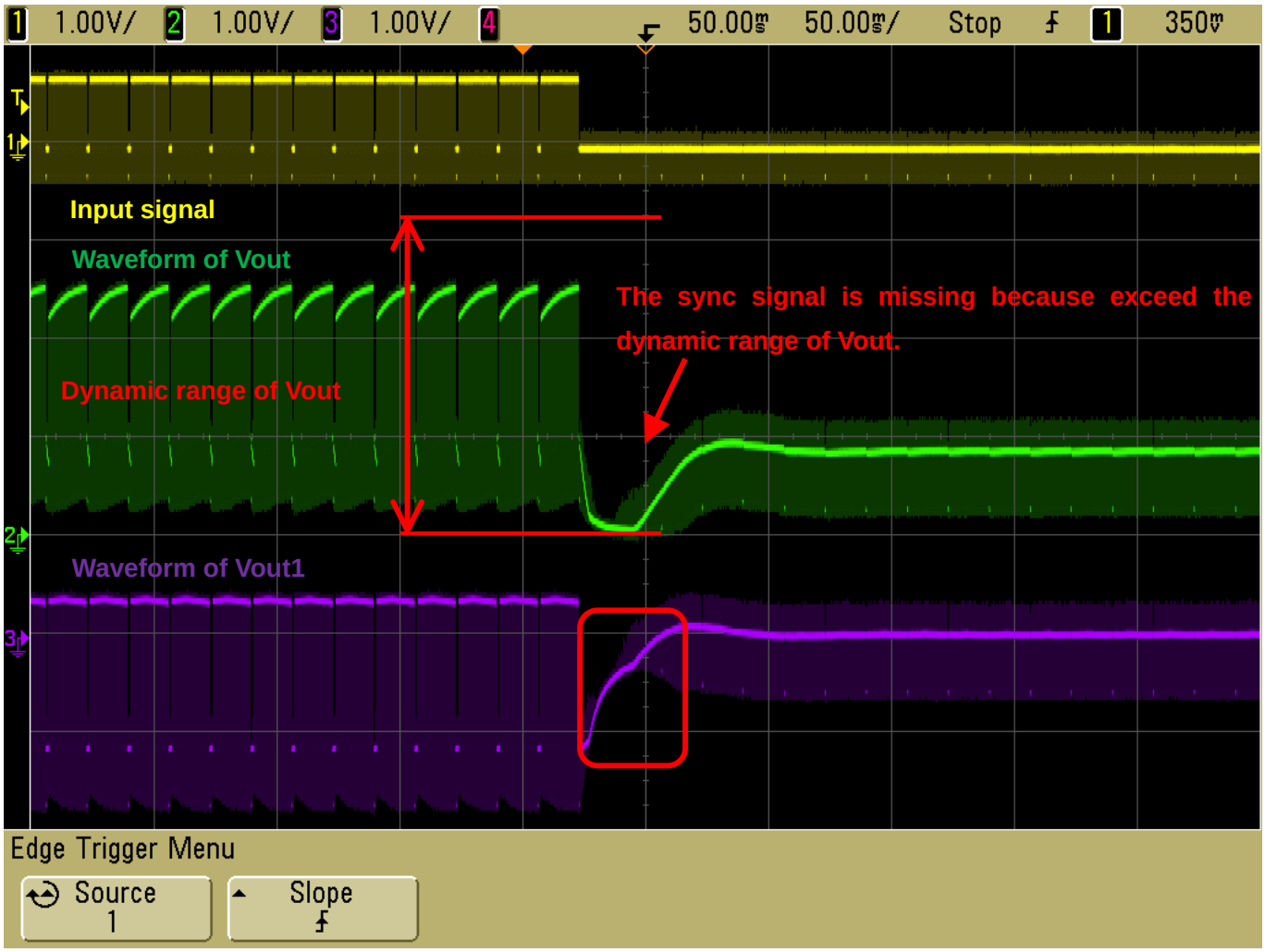


Waveform of Vout1



SAG correction circuit generates a low frequency component signal amplified to Vout terminal.
Changes of the luminance signal will be low-frequency components, if you want to output a large signal luminance changes. Therefore, generate correction signal of change of a luminance signal to Vout pin.
At this time, signal is over the dynamic range of Vout pin. This may cause a lack of sync signal, and waveform distortion.

Please see diagram below (green waveform), if you want to output large changes of a signal luminance, such as 100% white video signal and black signal. Thus, output signal exceed dynamic range of Vout pin and may be the signal lack.



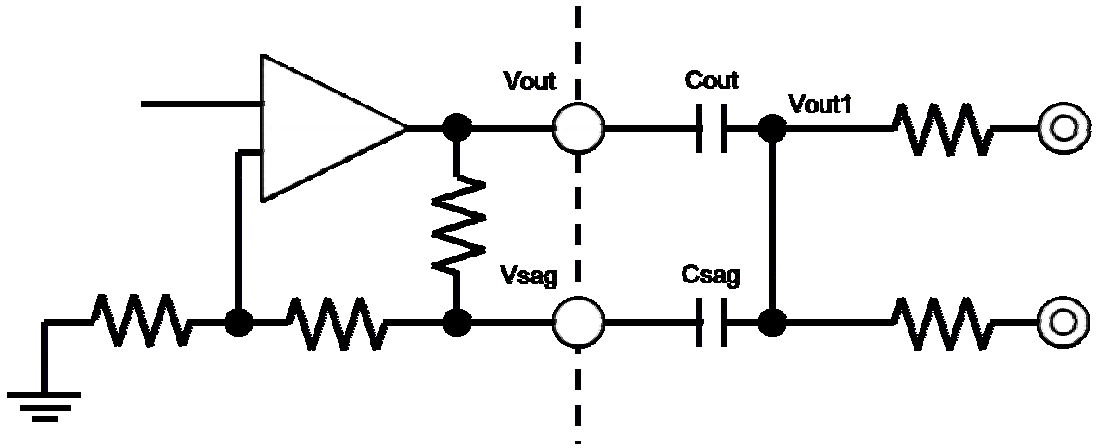
< Countermeasure for waveform distortion >

1. Please using small value the Sag compensation capacitor (VSAG).
It can ensure the dynamic range by using small value the capacitor (VSAG). It because of low-frequency variation of Vout pin is smaller. However, the output (VOUT) must be use large capacitor for this reason sag characteristics become exacerbated.

2. Please do not use the sag correction circuit.
Signal can output within dynamic range for reason it does not change the DC level of the output terminal.
However, the output (VOUT) must be use large capacitor for this reason sag characteristics become exacerbated.

< Dual drive at using SAG correction circuit >

Using sag correction circuit at dual drive circuit is below. Dual drives are less load resistance. Thus, the cut-off frequency of HPF that is composed of the output capacitor and load resistance will be small. Therefore, the sag characteristics deteriorate.
Please size up to the output capacitor (Vout) for not to deteriorate the sag characteristics.

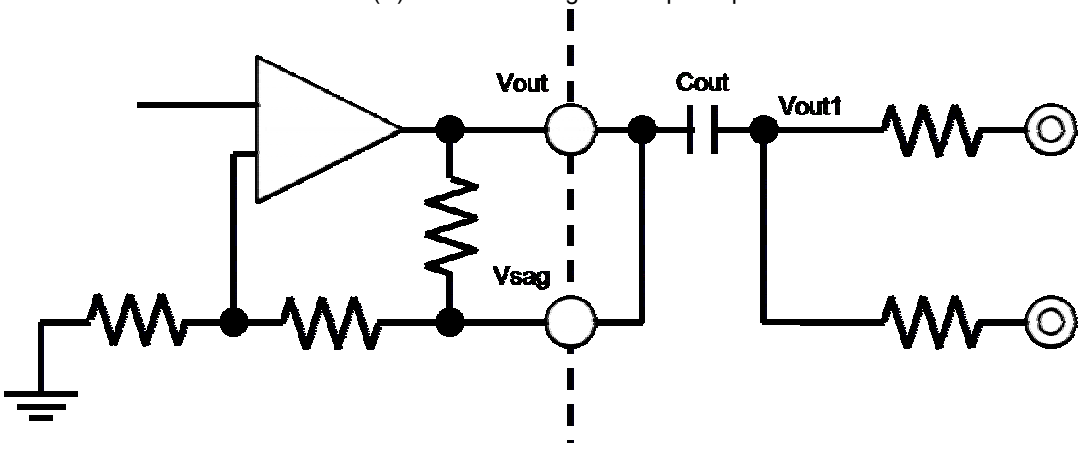


< Dual drive at not using SAG correction circuit >

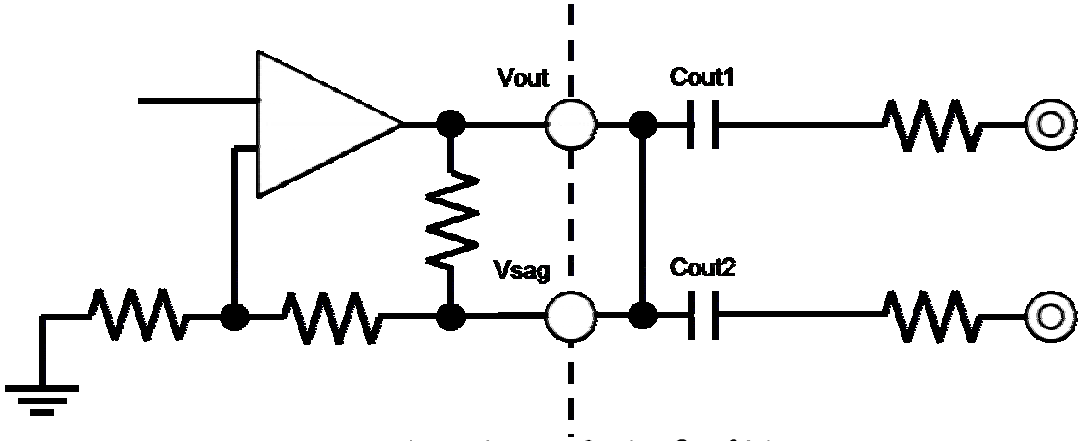
We recommended two-example dual drive circuit with not use sag correction circuit. Please change the configuration to be used according to the situation. Please configure to meet the following conditions. Then you can adjust the characteristics of each configuration.

$$Cout = Cout1 + Cout2$$
$$Cout1 = Cout2$$

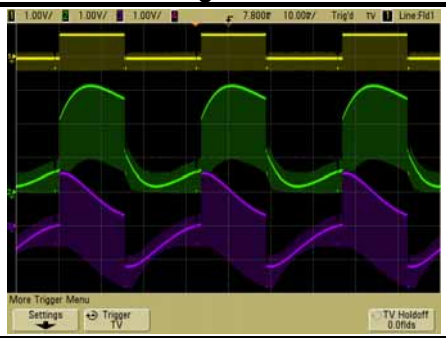
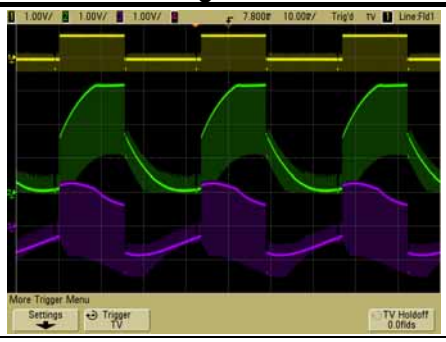
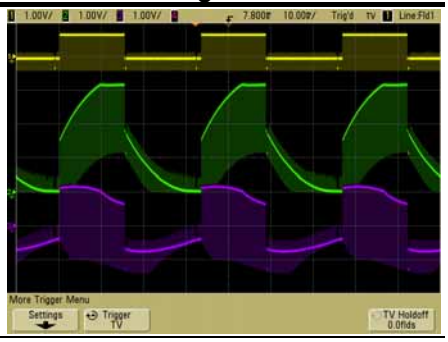
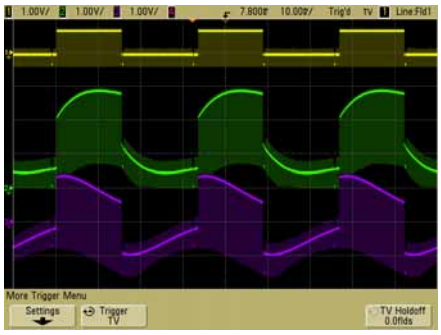
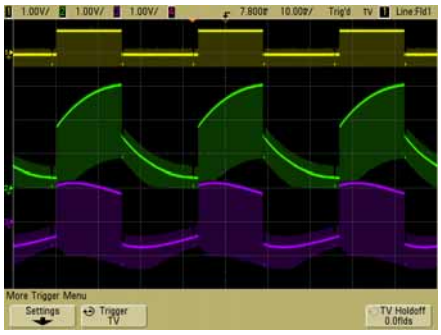
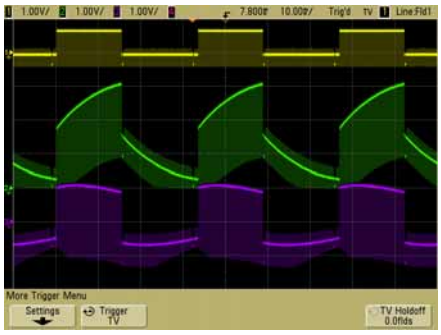
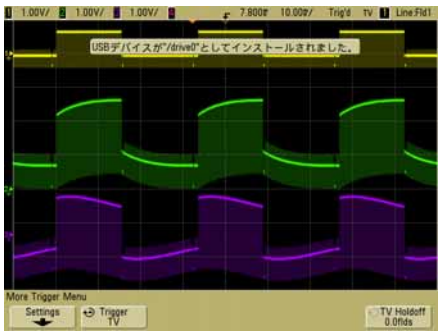
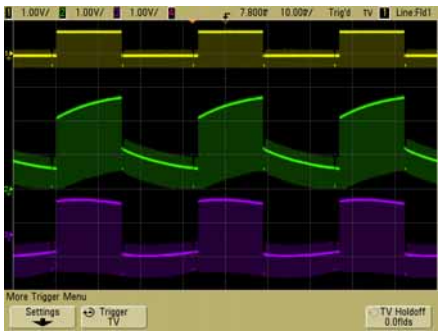
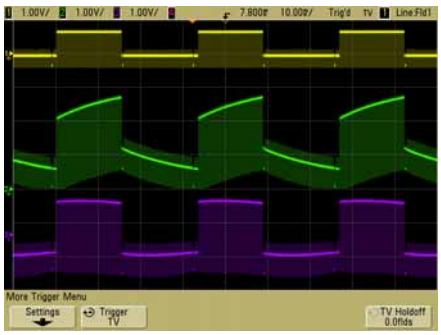
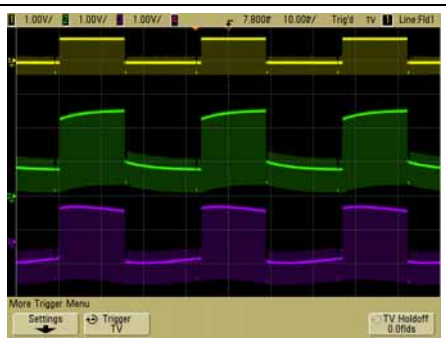
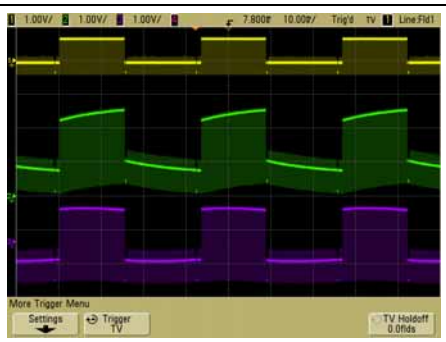
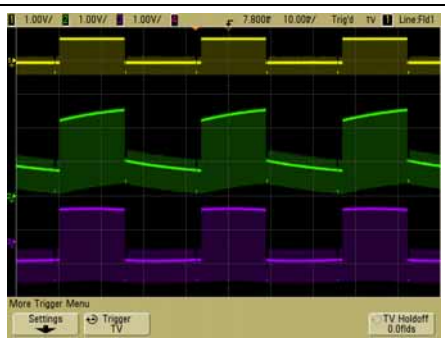
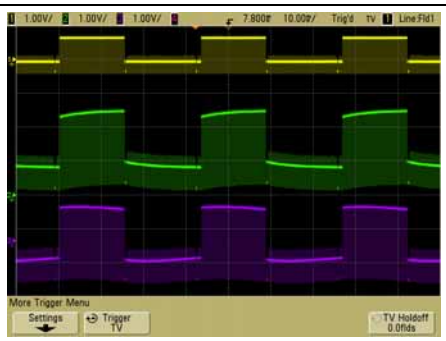
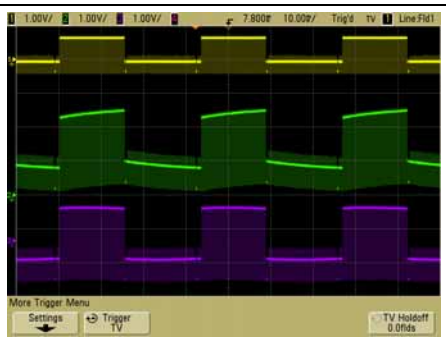
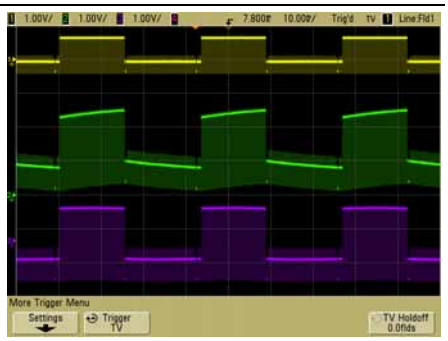
(A) In case of using one output capacitor



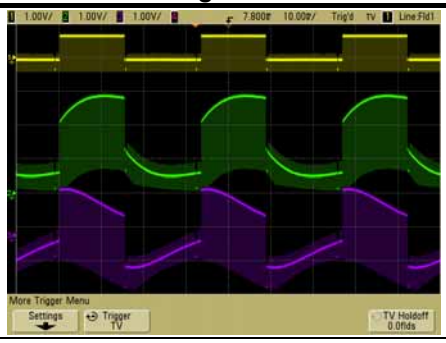
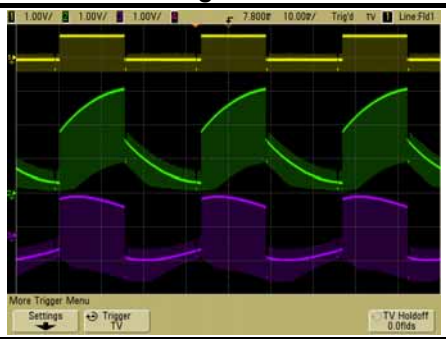
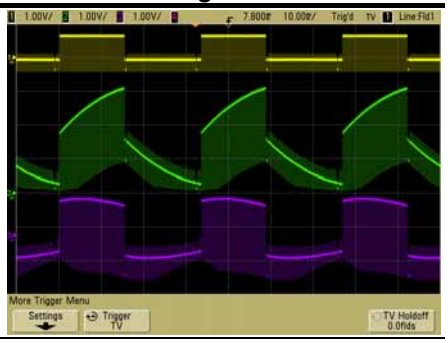
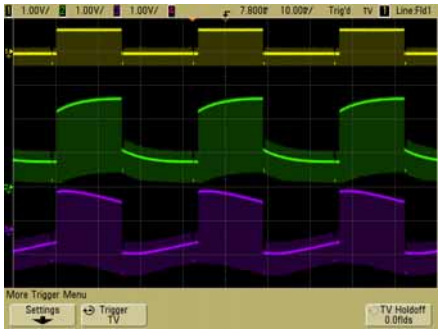
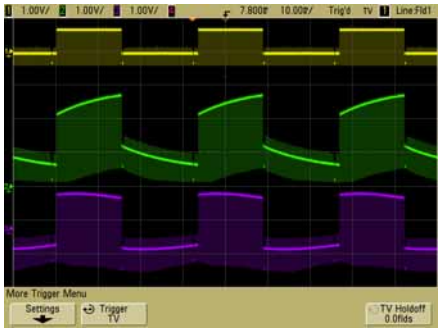
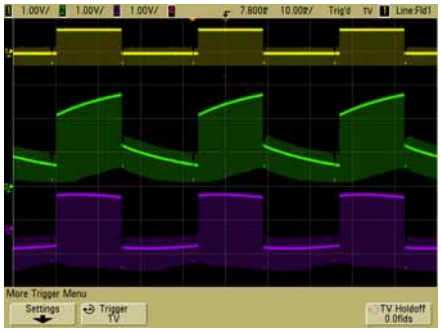
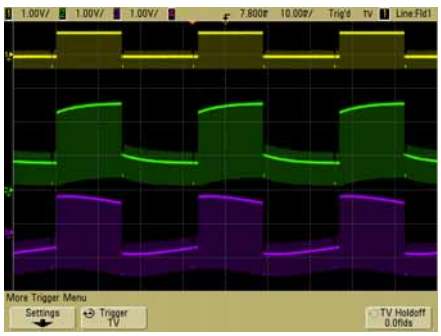
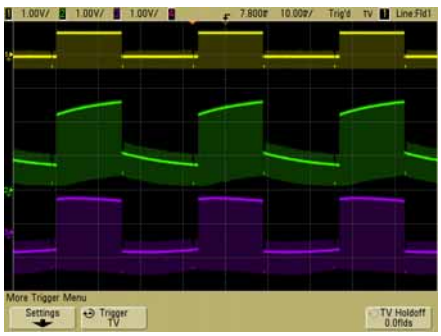
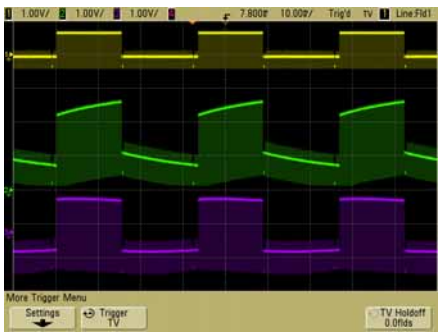
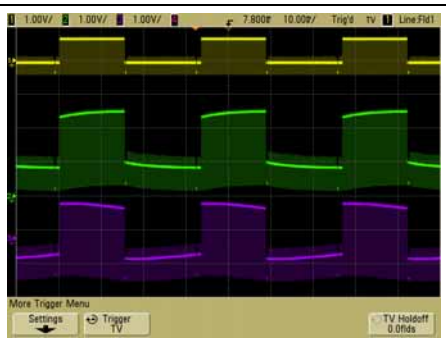
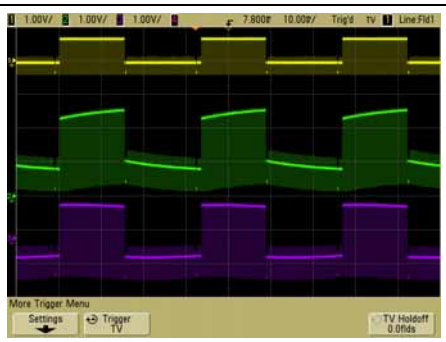
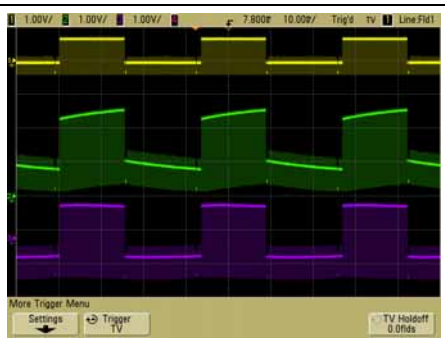
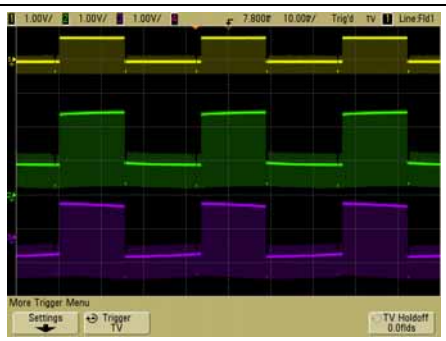
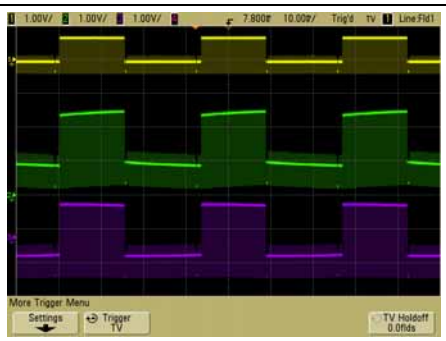
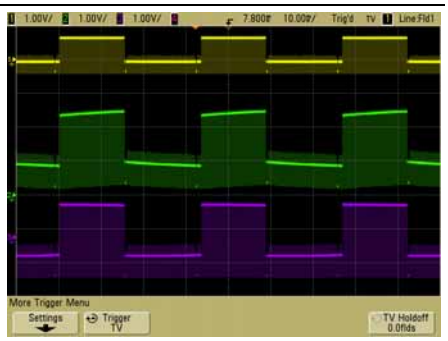
(B) In case of using two output capacitors



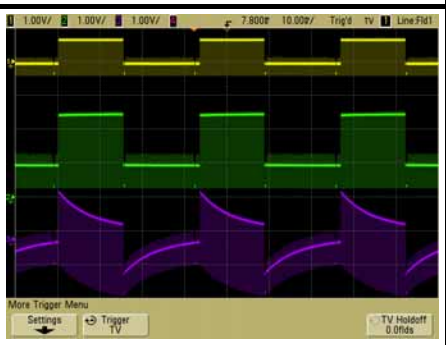
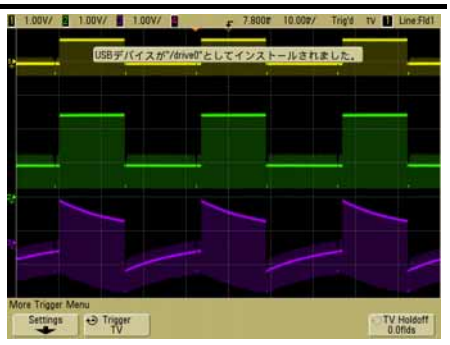
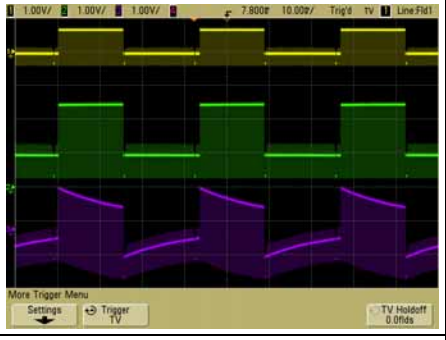
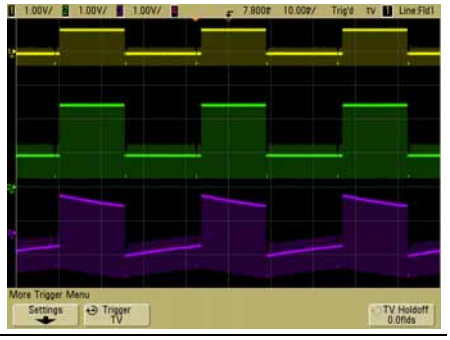
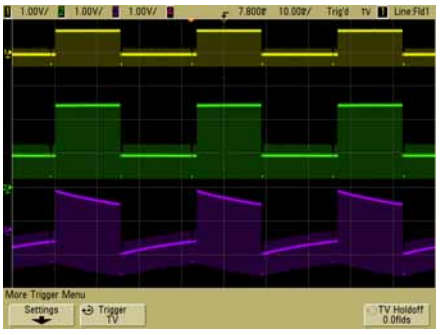
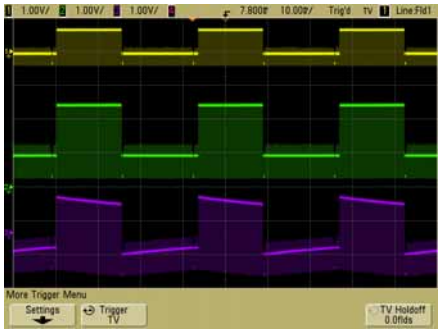
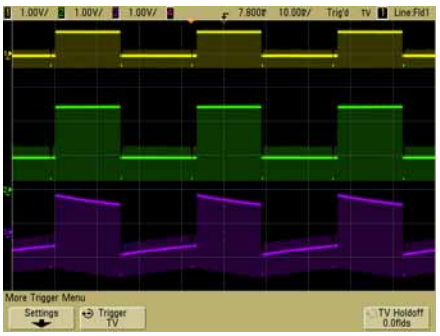
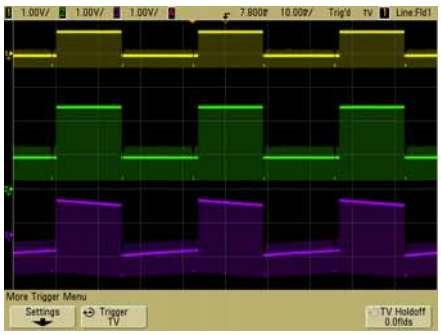
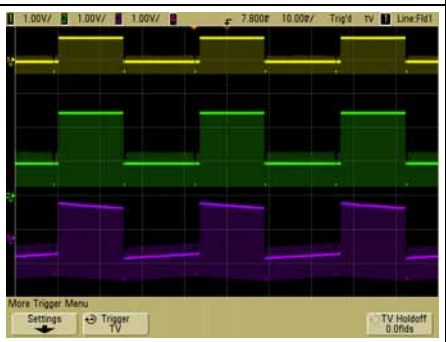
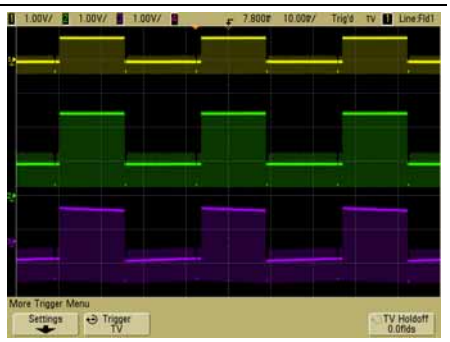
< Using SAG correction circuit >
Input signal: bounce signal (IRE0%, IRE100%, 30Hz), resistance=150Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

	Csag=10uF	Csag=22uF	Csag=33uF
Cout=33uF			
Cout=47uF			
Cout=100uF			
Cout=220uF			
Cout=330uF			

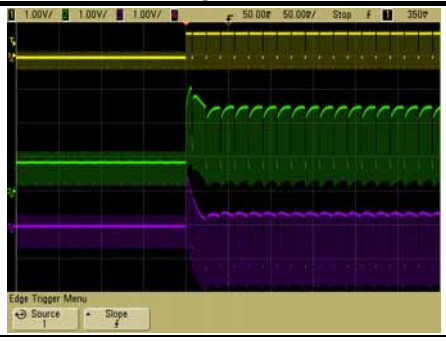
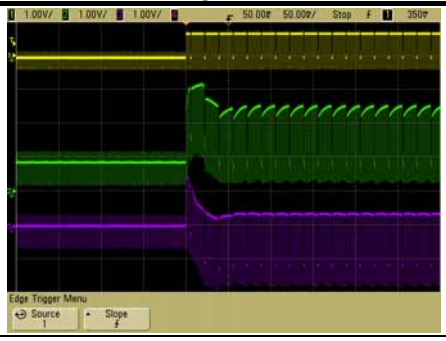
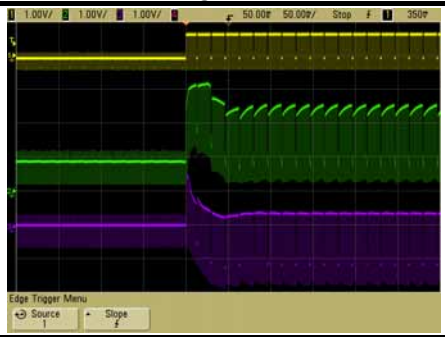
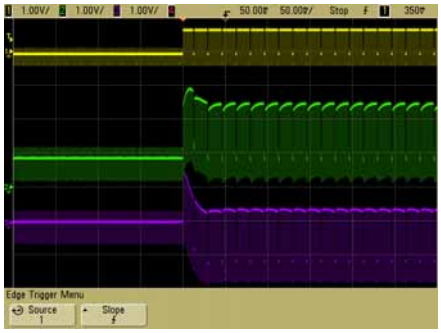
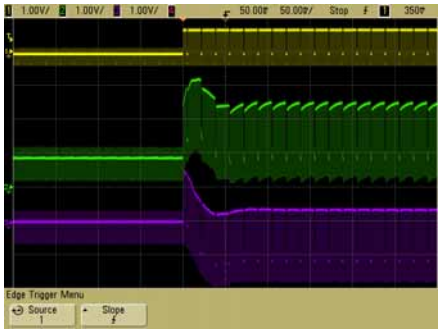
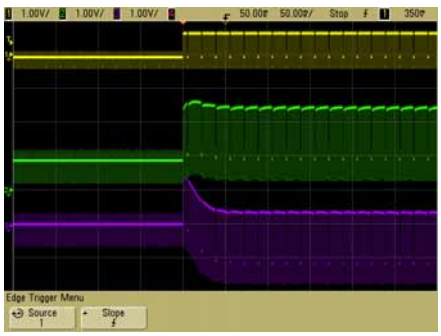
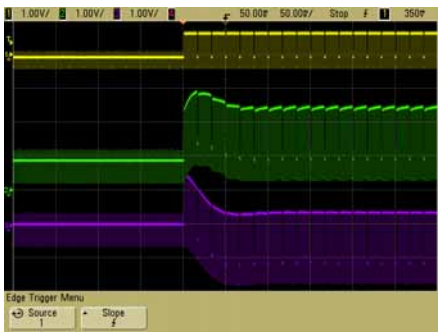
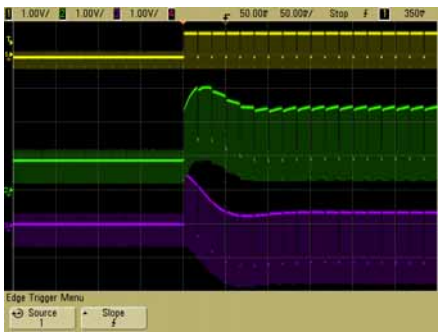
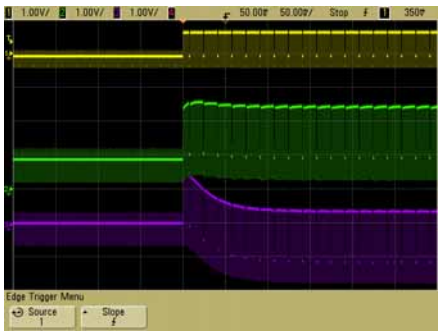
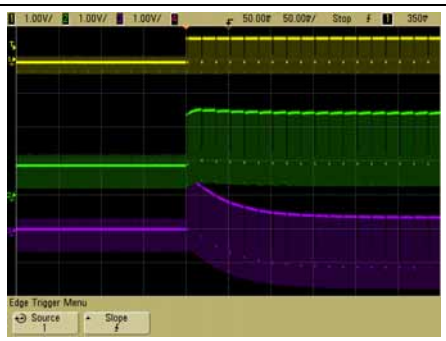
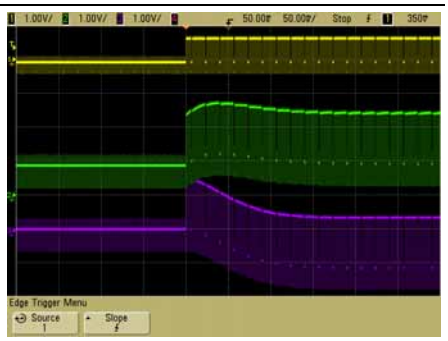
Input signal: bounce signal (IRE0%, IRE100%, 30Hz), resistance=150Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

	Csag=10uF	Csag=22uF	Csag=33uF
Cout=100uF			
Cout=220uF			
Cout=330uF			
Cout=470uF			
Cout=1000uF			

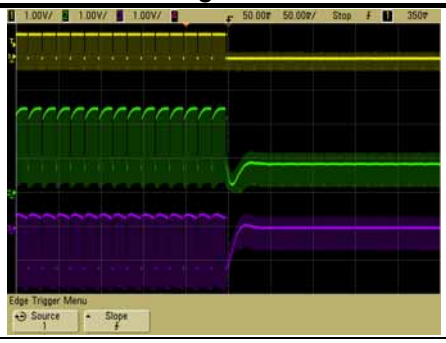
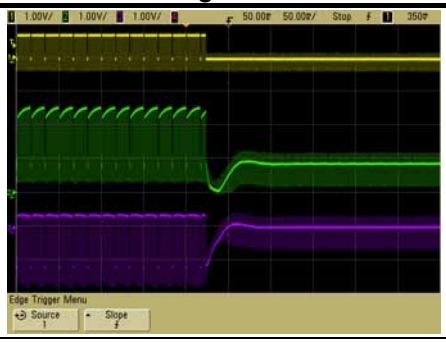
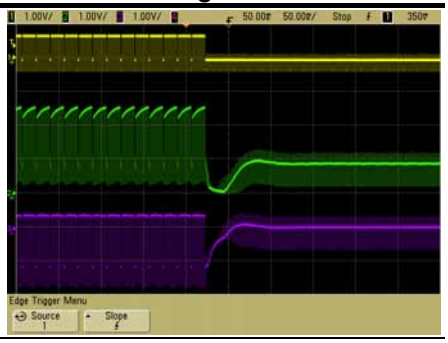
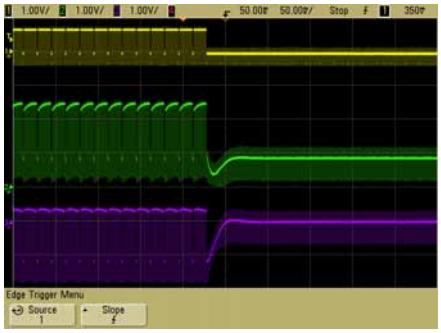
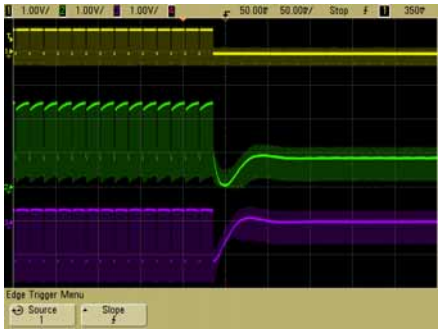
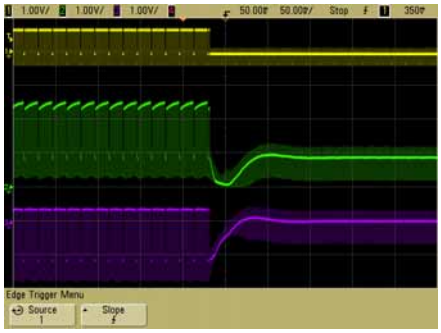
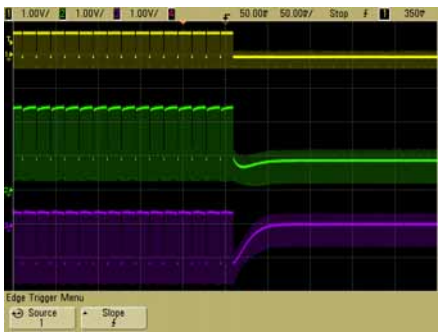
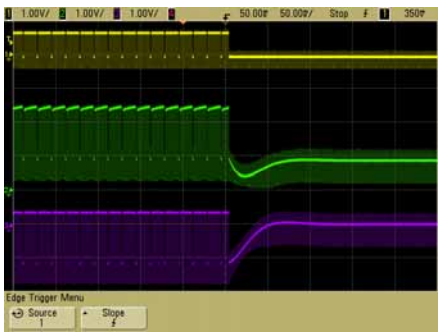
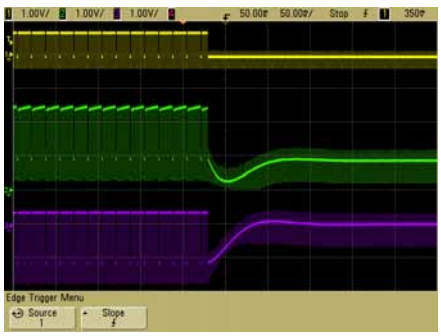
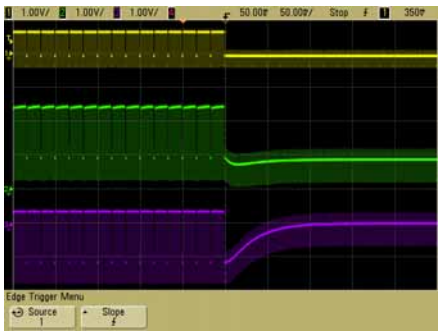
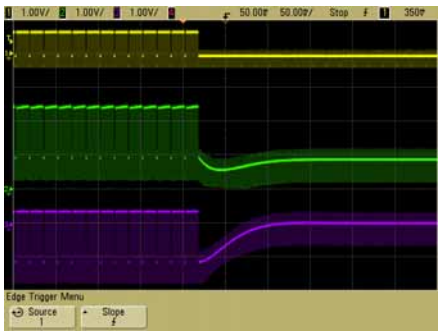
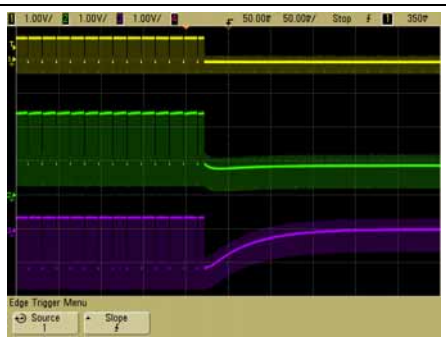
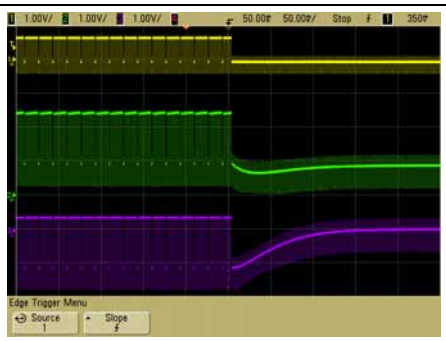
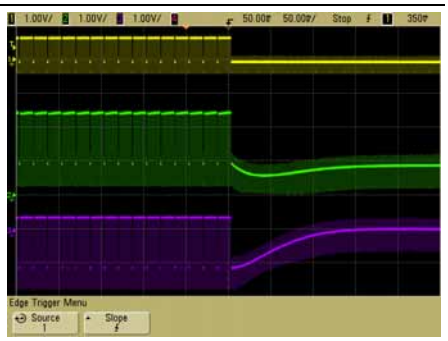
< Not using SAG correction circuit >
Input signal: bounce signal (IRE0%, IRE100%, 30Hz), resistance=150Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

	RL=75Ω	RL=150Ω
Cout=100uF		
Cout=220uF		
Cout=330uF		
Cout=470uF		
Cout=1000uF		

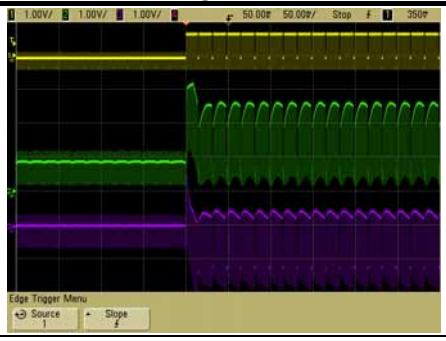
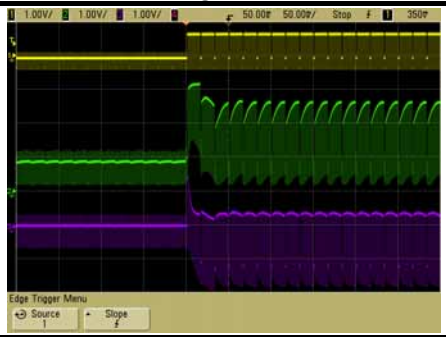
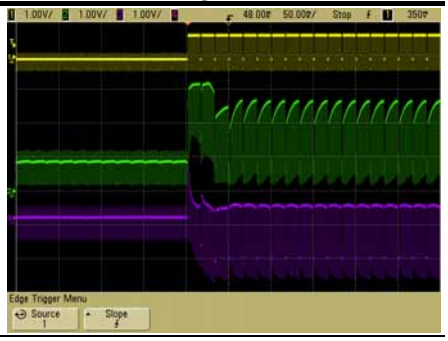
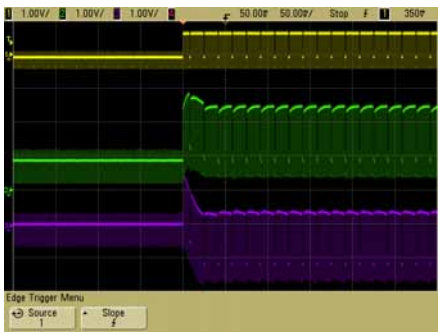
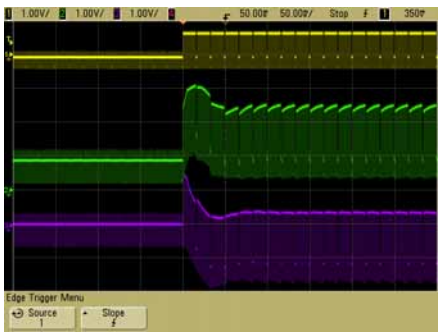
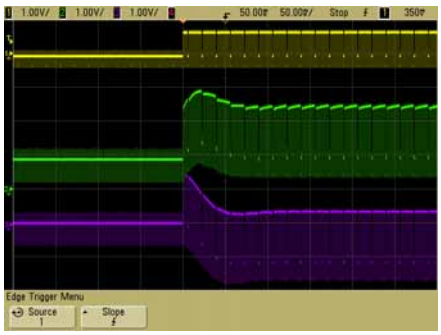
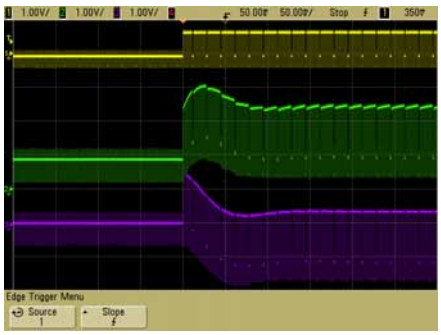
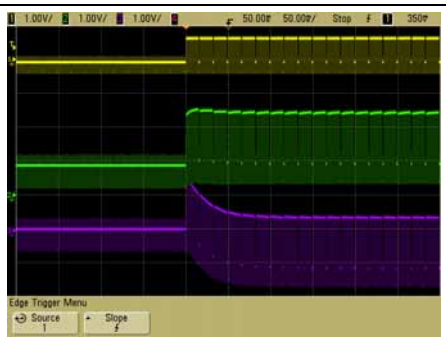
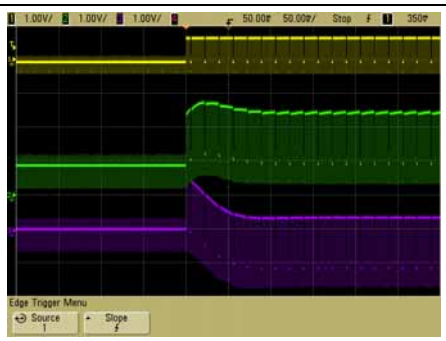
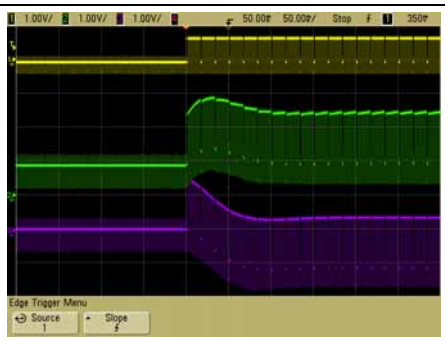
< Using SAG correction circuit >
Input signal: Black to White100%, resistance150Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

	Csag=10uF	Csag=22uF	Csag=33uF
Cout=33uF			
Cout=47uF			
Cout=100uF			
Cout=220uF			
Cout=330uF			

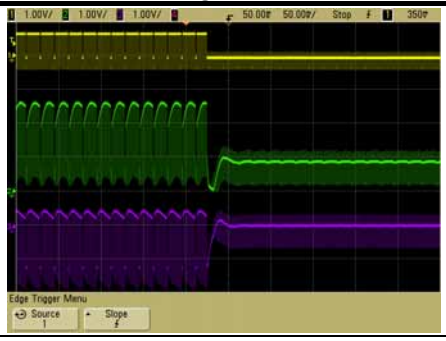
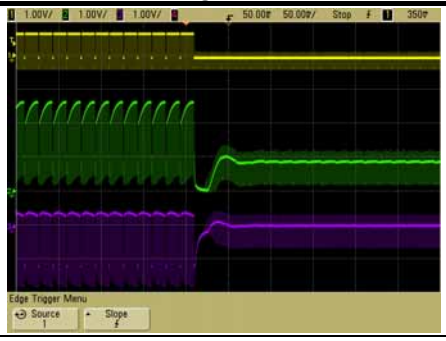
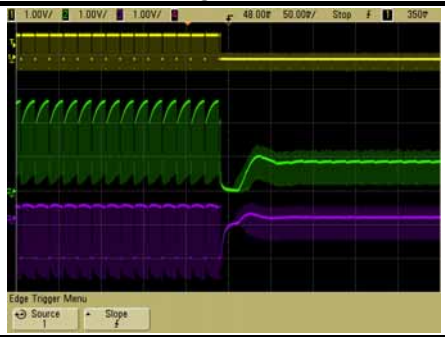
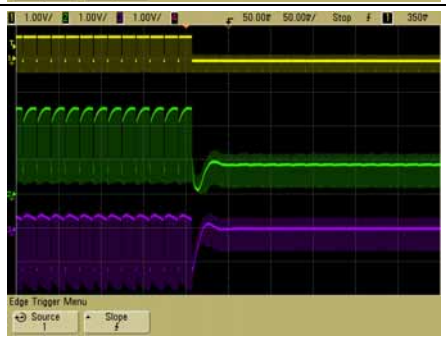
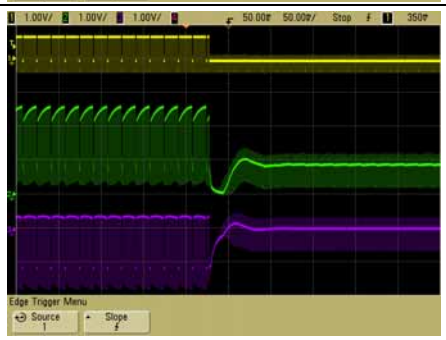
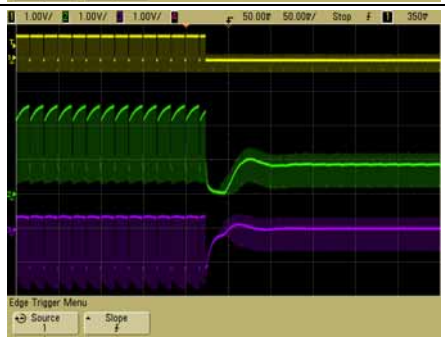
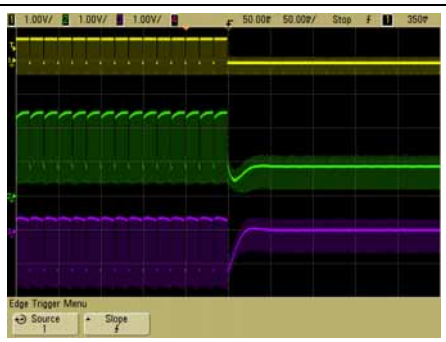
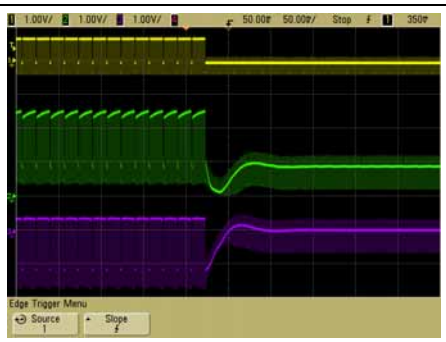
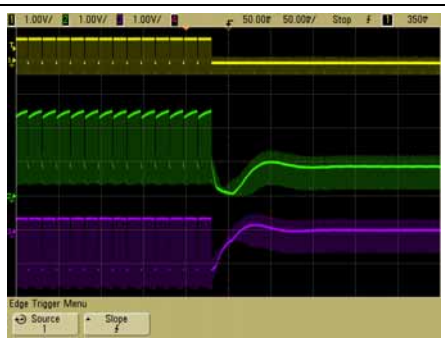
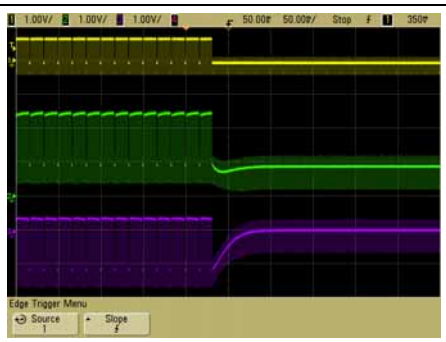
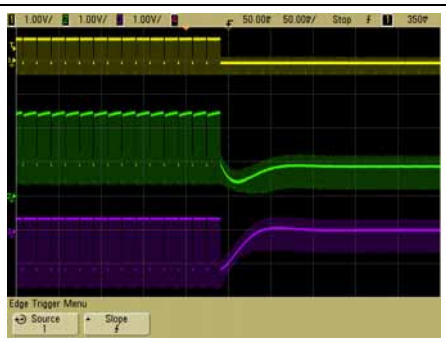
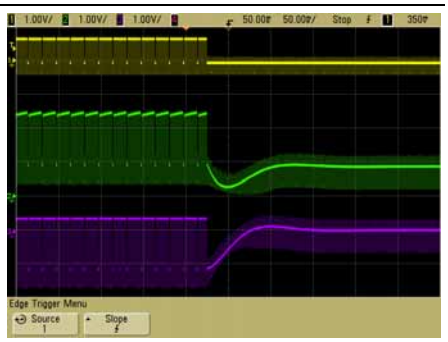
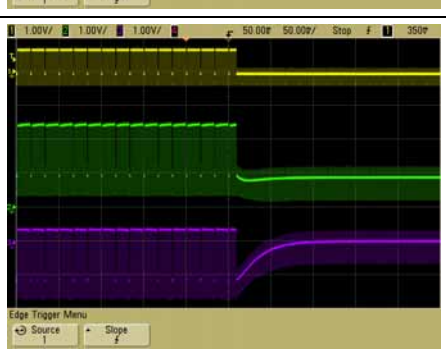
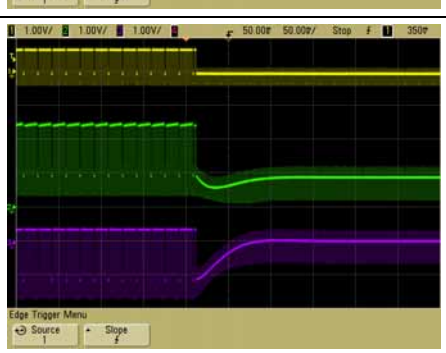
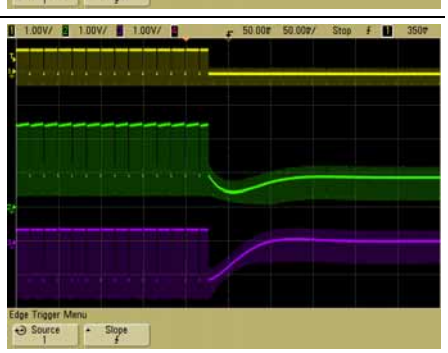
Input signal: White100% to Black, resistance150Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

	Csag=10uF	Csag=22uF	Csag=33uF
Cout=33uF			
Cout=47uF			
Cout=100uF			
Cout=220uF			
Cout=330uF			

< Using SAG correction circuit >
Input signal: Black to White100%, resistance=75Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

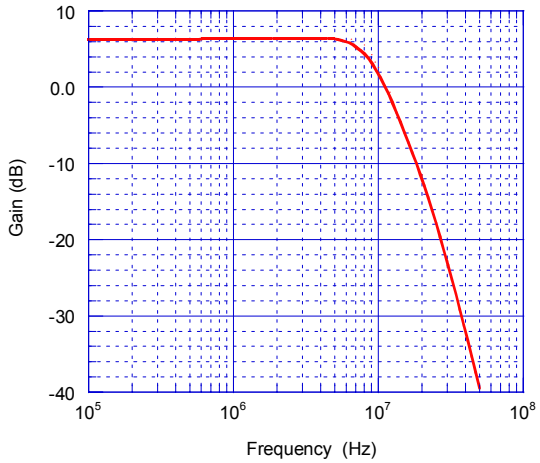
	Csag=10uF	Csag=22uF	Csag=33uF
Cout=33uF			
Cout=47uF			
Cout=100uF			
Cout=220uF			
Cout=330uF			

Input signal: White100% to Black, resistance=75Ω
Waveform: yellow: input signal, green: Vout signal, purple: Vout1signal

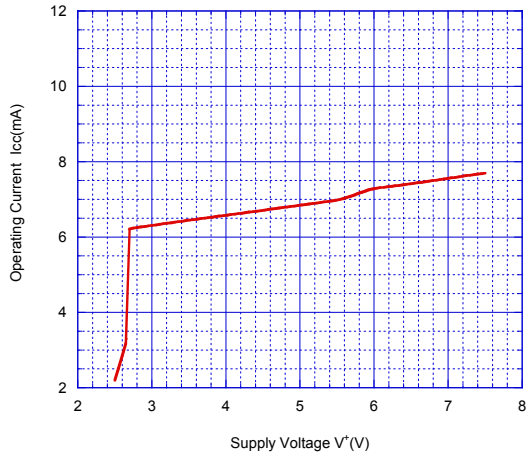
	Csag=10uF	Csag=22uF	Csag=33uF
Cout=33uF			
Cout=47uF			
Cout=100uF			
Cout=220uF			
Cout=330uF			

■TYPICAL CHARACTERISTICS

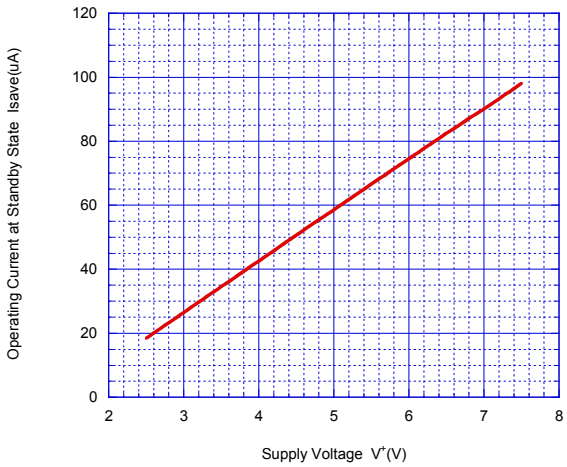
Frequency Characteristic



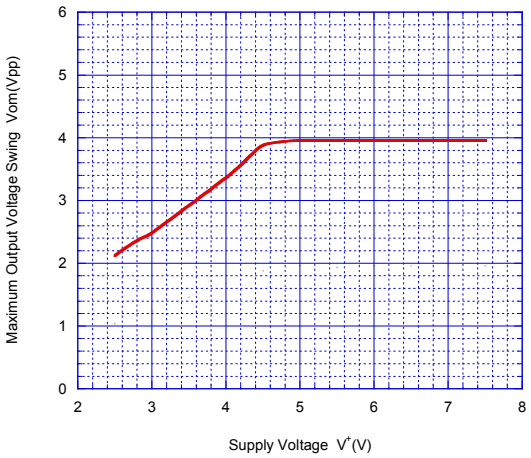
Operating Current vs. Supply Voltage



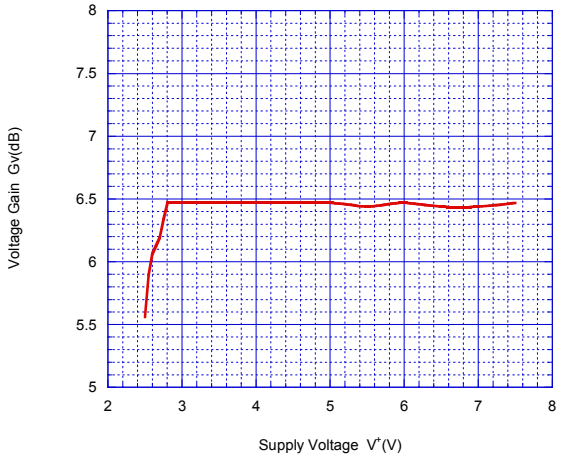
Operating Current at Standby State vs. Supply Voltage



Maximum Output Voltage Swing vs. Supply Voltage

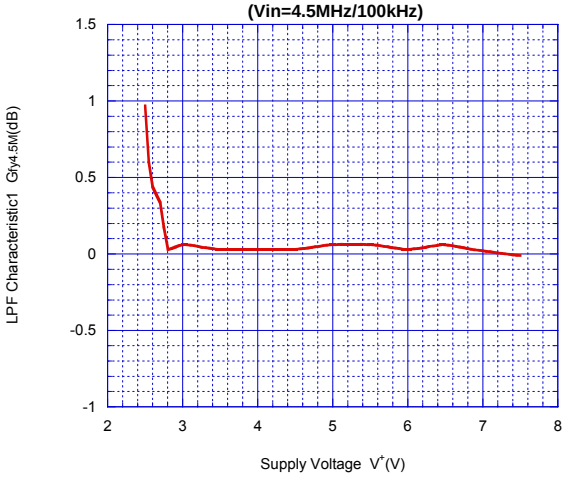


Voltage Gain vs. Supply Voltage

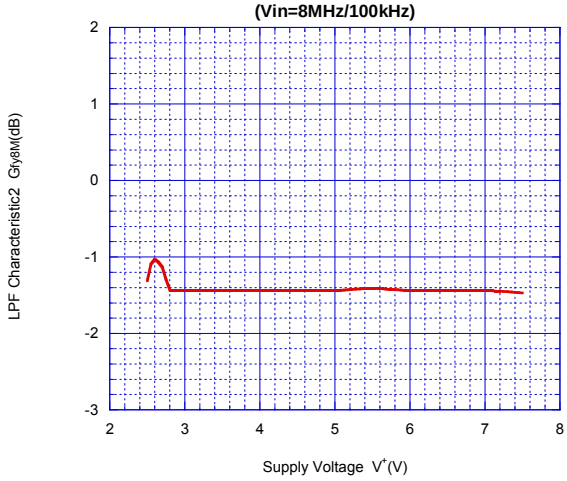


■TYPICAL CHARACTERISTICS

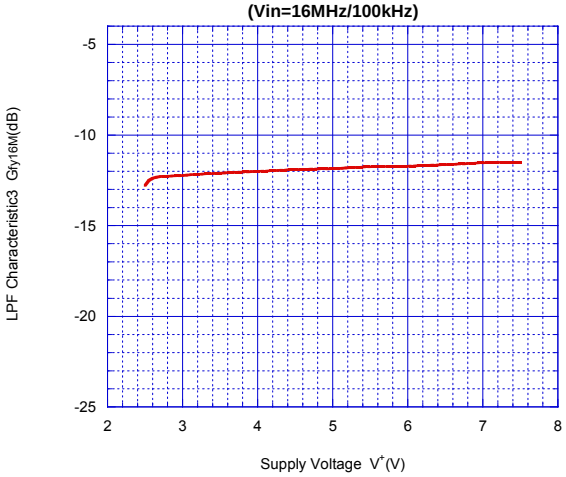
Low Pass Filter Characteristic1 vs. Supply Voltage
(Vin=4.5MHz/100kHz)



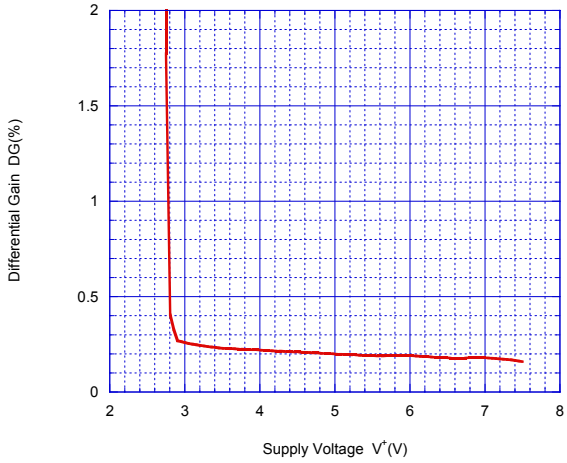
Low Pass Filter Characteristic2 vs. Supply Voltage
(Vin=8MHz/100kHz)



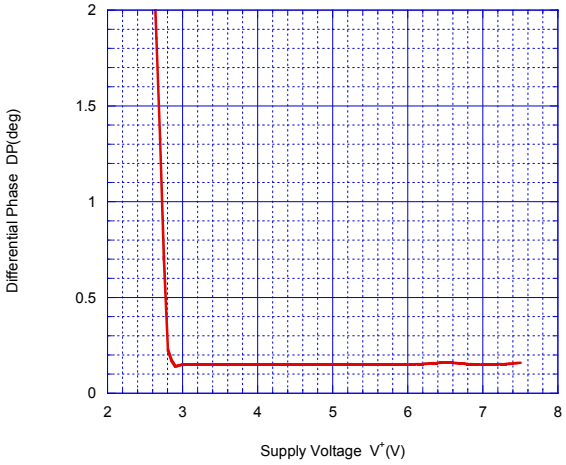
Low Pass Filter Characteristic3 vs. Supply Voltage
(Vin=16MHz/100kHz)



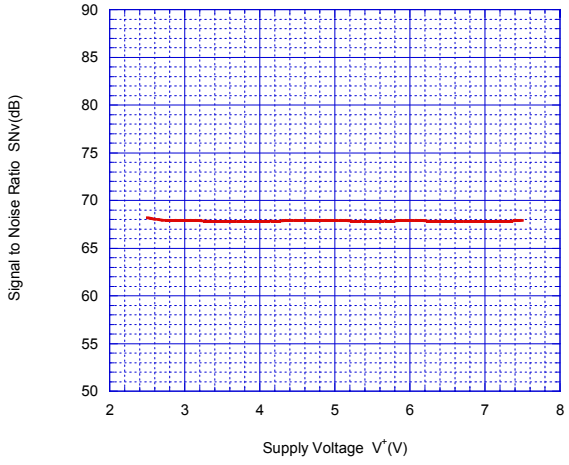
Differential Gain vs. Supply Voltage



Differential Phase vs. Supply Voltage

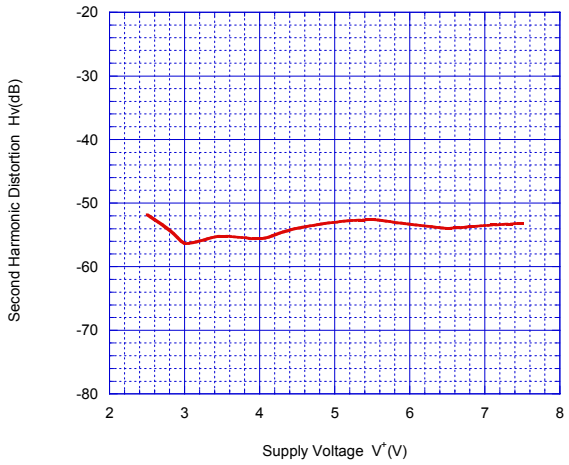


Signal to Noise Ratio vs. Supply Voltage

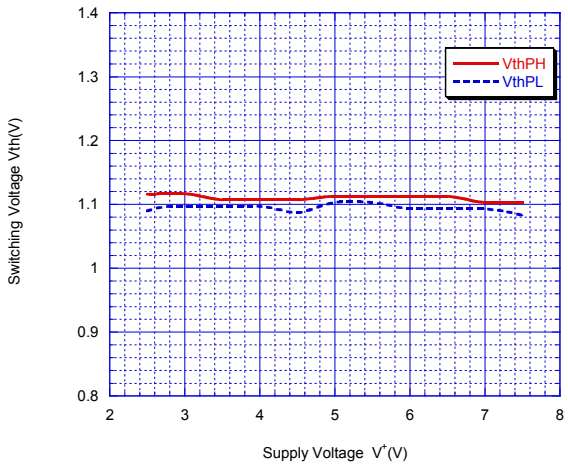


■TYPICAL CHARACTERISTICS

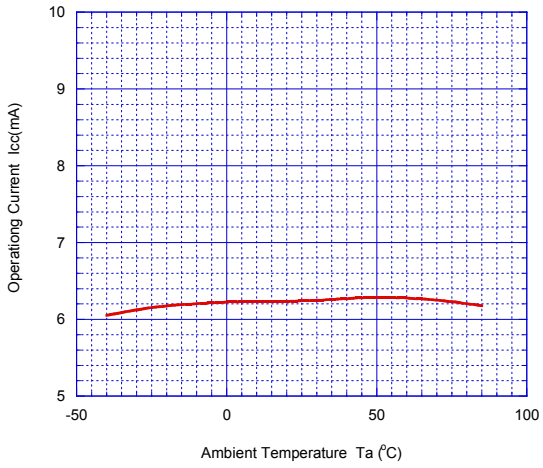
Second Harmonic Distortion vs. Supply Voltage



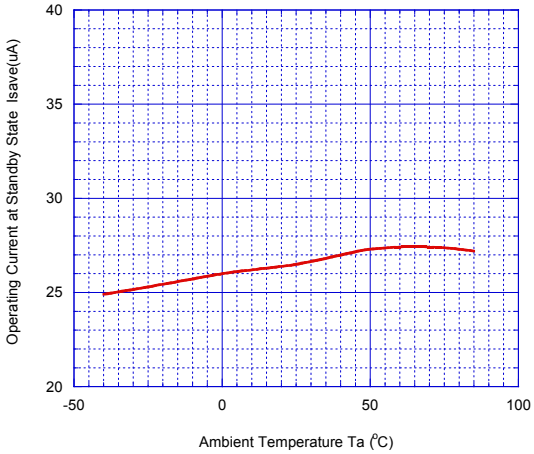
Switching Voltage vs. Supply Voltage



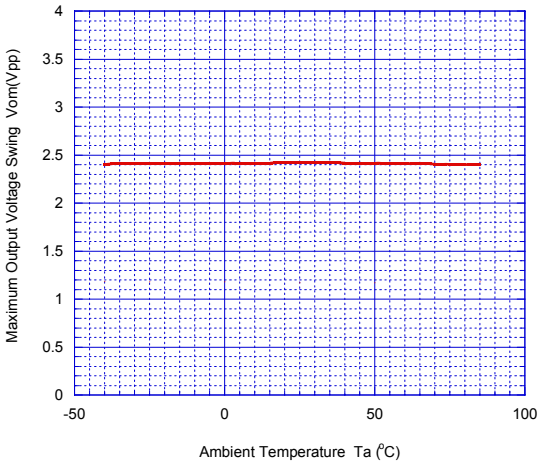
Operating Current vs. Temperature



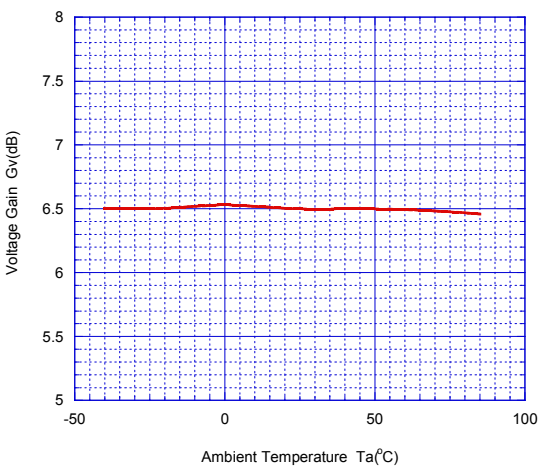
Operating Current at Standby State vs. Temperature



Maximum Output Voltage Swing vs. Temperature

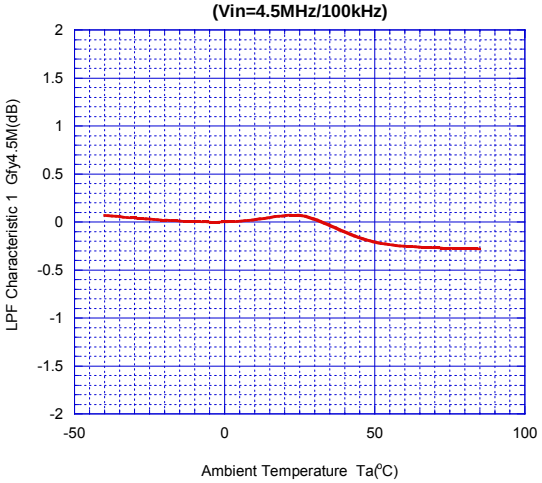


Voltage Gain vs. Temperature

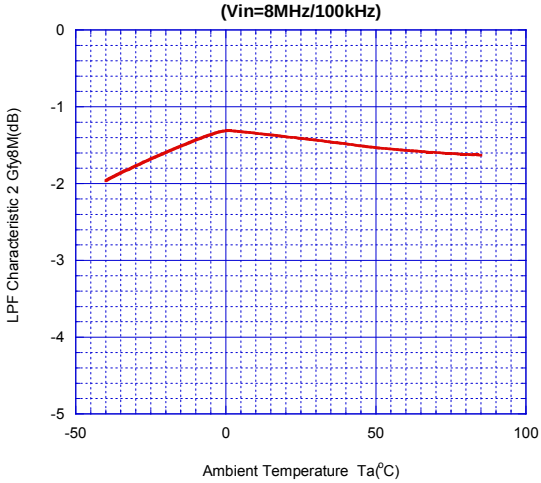


■TYPICAL CHARACTERISTICS

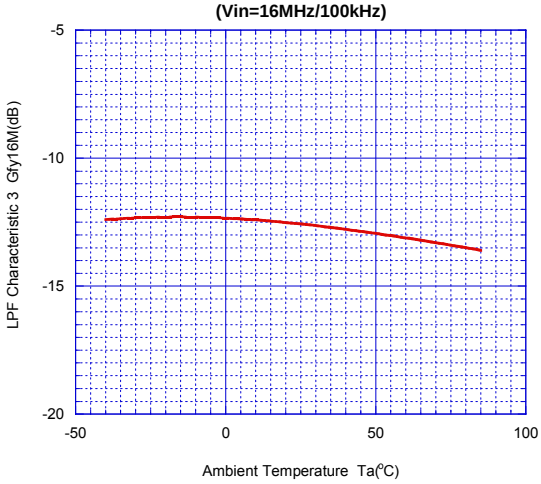
Low Pass Filter Characteristic 1 vs. Temperature (Vin=4.5MHz/100kHz)



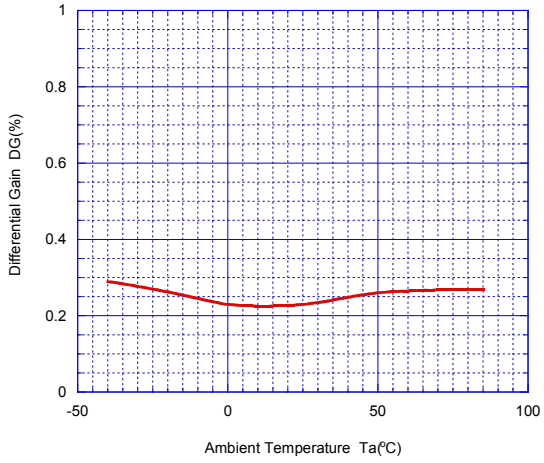
Low Pass Filter Characteristic 2 vs. Temperature (Vin=8MHz/100kHz)



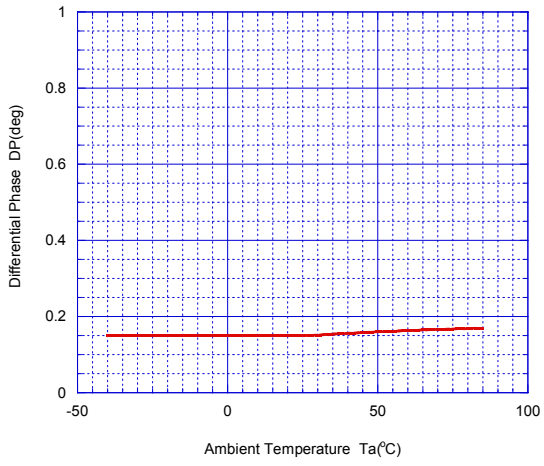
Low Pass Filter Characteristic 3 vs. Temperature (Vin=16MHz/100kHz)



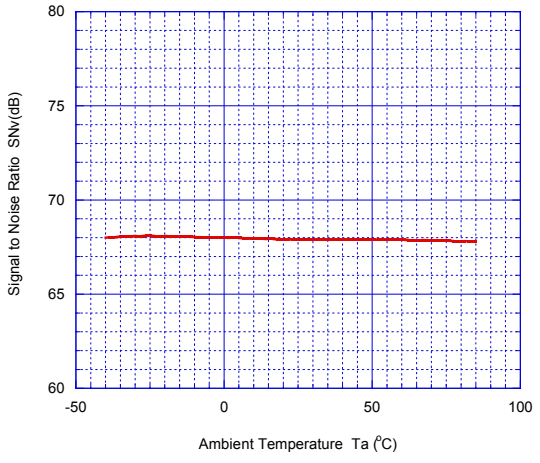
Differential Gain vs. Temperature



Differential Phase vs. Temperature

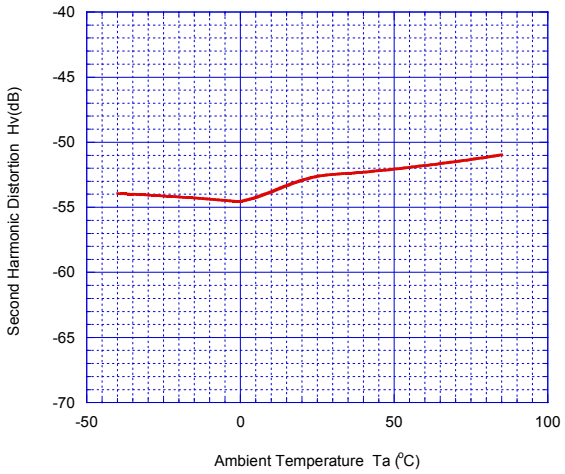


Signal to Noise Ratio vs. Temperature

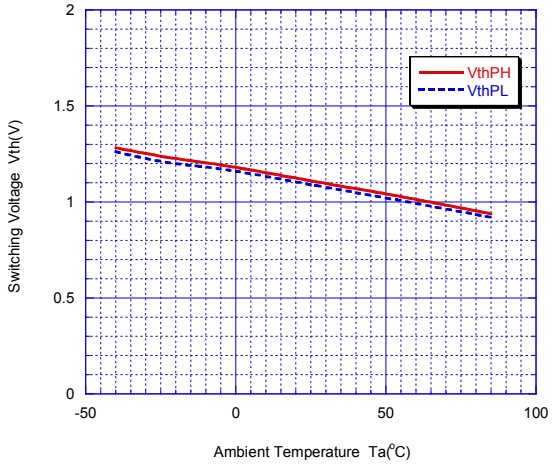


■TYPICAL CHARACTERISTICS

Second Harmonic Distortion vs. Temperature



Switching Voltage vs. Temperature



[CAUTION]
The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NJR:

NJM2575F1-TE2 NJM2575F1-TE1

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург, Промышленная ул, дом № 19, литера Н, помещение 100-Н Офис 331