

CMOS-CCD 1H Delay Line for NTSC

Description

The CXL5513M/P are CMOS-CCD delay line ICs designed for processing video signals. This ICs provide a 1 H delay time for NTSC chroma signals including the external lowpass filter.

Features

- Single 5 V power supply
- Low power consumption
- Built-in peripheral circuit
- Built-in tripling PLL circuit
- Center bias mode

Absolute Maximum Ratings (Ta=25 °C)

• Supply voltage	V _{DD}	+6	V
• Operating temperature	T _{opr}	-10 to +60	°C
• Storage temperature	T _{stg}	-55 to +150	°C
• Allowable power dissipation	P _D		
	CXL5513M	350	mW
	CXL5513P	480	mW

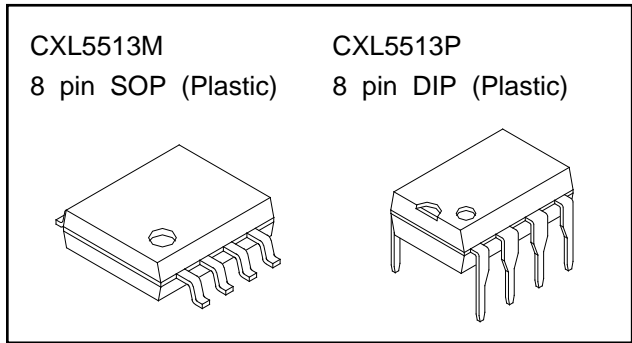
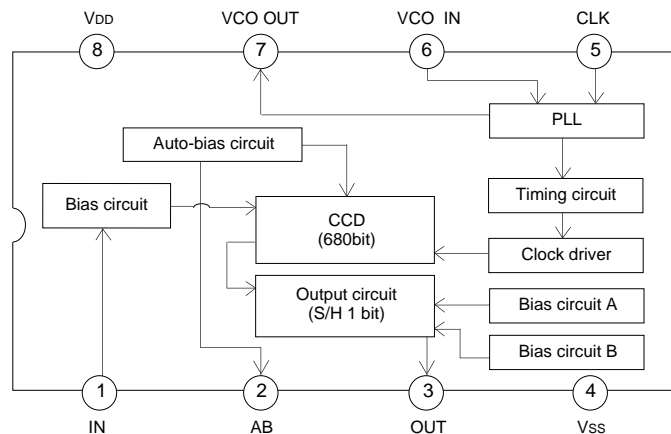
Recommended Operating Range (Ta=25 °C)

V_{DD} 5 V±5 %

Recommended Clock Conditions (Ta=25 °C)

- Input clock amplitude V_{CLK} 400 mVp-p (Typ.)
- Clock frequency f_{CLK} 3.579545 MHz
- Input clock waveform Sine wave

Block Diagram and Pin Configuration (Top View)



Input Signal Amplitude

V_{SIG} 500 mVp-p (typ.), 572 mVp-p (max.)

Functions

- 680-bit CCD register
- Clock driver
- Auto bias circuit
- Input center bias circuit.
- Sample and hold circuit
- Tripling PLL circuit
- Inverted output

Structure

CMOS-CCD

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Pin Description

Pin No.	Symbol	I/O	Description	Impedance
1	IN	I	Signal input	>10 K Ω
2	AB	O	Auto-bias DC output	
3	OUT	O	Signal output	40 to 500 Ω
4	Vss	—	GND	
5	CLK	I	Clock input (fsc)	>10 K Ω
6	VCO IN	I	VCO input	
7	VCO OUT	O	VCO output (3fsc)	
8	VDD	—	5 V power supply	

Electrical Characteristics

(Ta=25 °C, VDD=5 V, fCLK=3.579545 MHz, VCLK=400mVp-p, sine wave)

See "Electrical Characteristics Test Circuit".

Item	Symbol	Conditions	SW conditions		Min.	Typ.	Max.	Unit	Note
			1	2					
Supply current	IDD	—	a	—	6	12	20	mA	1
Low frequency gain	GL	200 kHz 500mVp-p Sine wave	a	b	-2	0	2	dB	2
Frequency response	fR	200 kHz \leftrightarrow 3.57 MHz 150mVp-p Sine wave	b \leftrightarrow c	b	-2.5	-1.5	-0.5	dB	3
Differential gain	DG	5-staircase wave (See Note 4.)	d	c	0	3	5	%	4
Differential phase	DP	5-staircase wave (See Note 4.)	d	c	0	3	5	degree	4
S/H pulse coupling	CP	No signal input	f	a	—	—	350	mVp-p	5
S/N ratio	SN	50 % white video signal (See Note 6.)	e	d	52	56	—	dB	6

NOTE

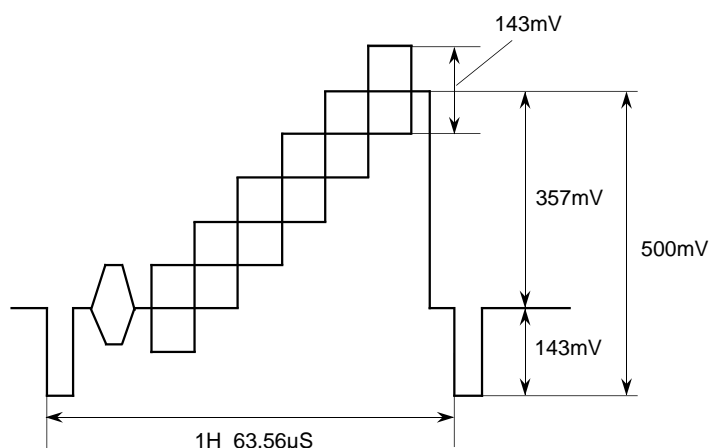
- 1 This is the IC supply current value during clock and signal input.
- 2 GL is the output gain of OUT pin when a 500 mVp-p, 200 kHz sine wave is fed to IN pin.

$$GL = 20 \log \frac{\text{OUT pin output voltage [mVp-p]}}{500 \text{ [mVp-p]}} \text{ [dB]}$$

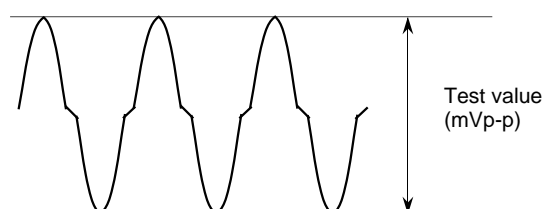
- 3 Indicates the dissipation at 3.58 MHz in relation to 200 kHz. From the output voltage at OUT pin when a 150 mVp-p, 200 kHz sine wave is fed to IN pin, and from the output voltage at OUT pin when a 150 mVp-p, 3.58 MHz sine wave is fed to the same, calculation is made according to the following formula.

$$fR = 20 \log \frac{\text{OUT pin output voltage (3.58 MHz) [mVp-p]}}{\text{OUT pin output voltage (200 kHz) [mVp-p]}} \text{ [dB]}$$

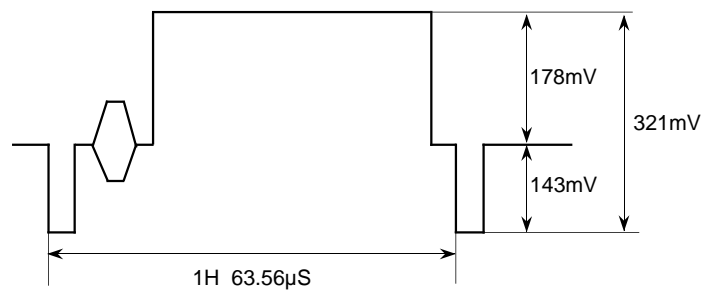
- 4 In Fig. below, the differential gain (DG) and the differential phase (DP), are tested with a vector scope when the 5-staircase wave is fed.



- 5 Leakage of internal clock components and related high frequency component to the output signal, during no signal input, is tested.

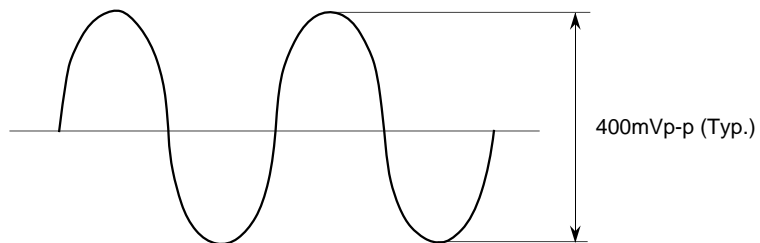


- 6 S/N ratio during a 50 % white video signal input shown in Fig. below is tested at the video noise meter, in BPF 100 kHz to 4 MHz, Sub Carrier Trap mode.

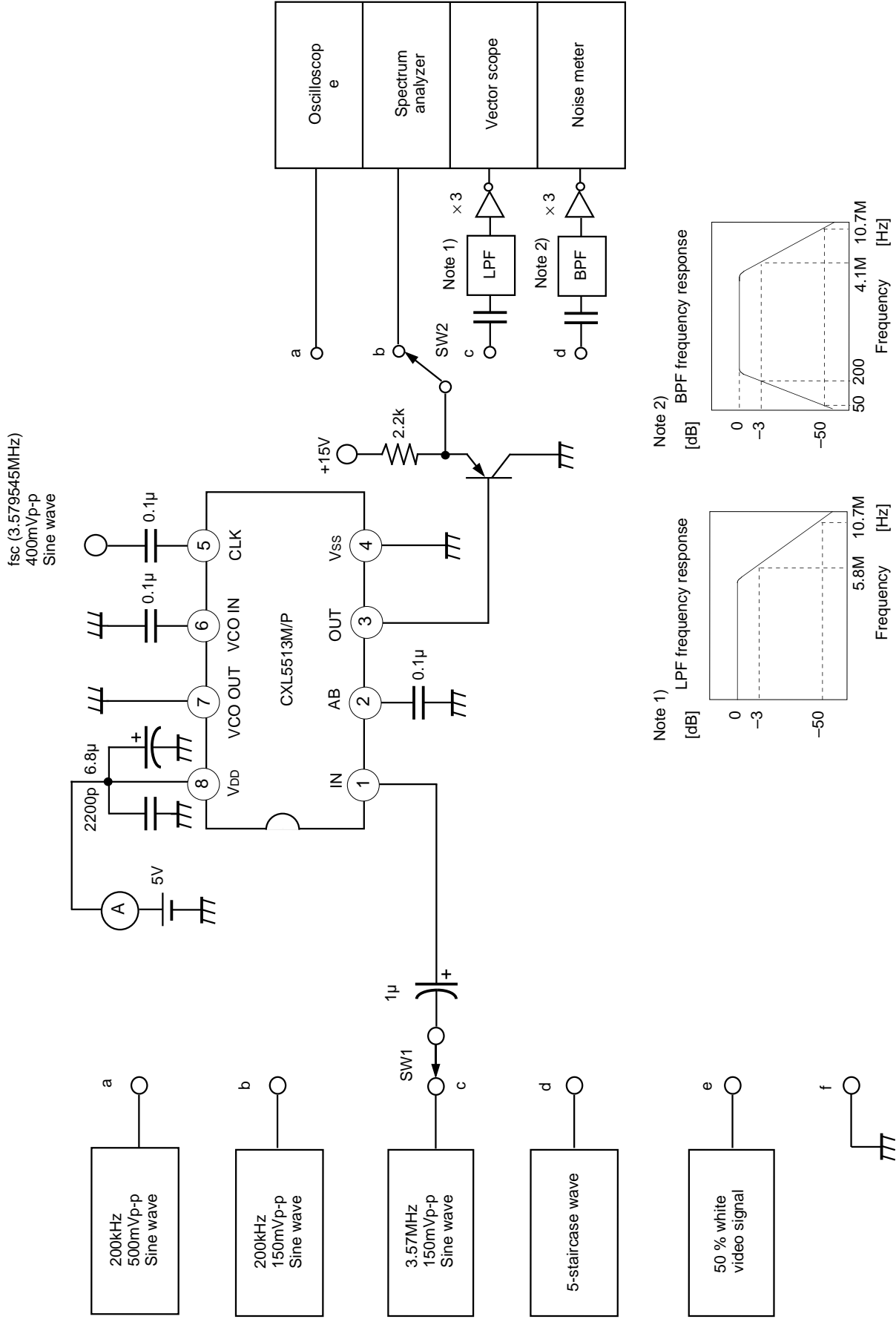


CLOCK

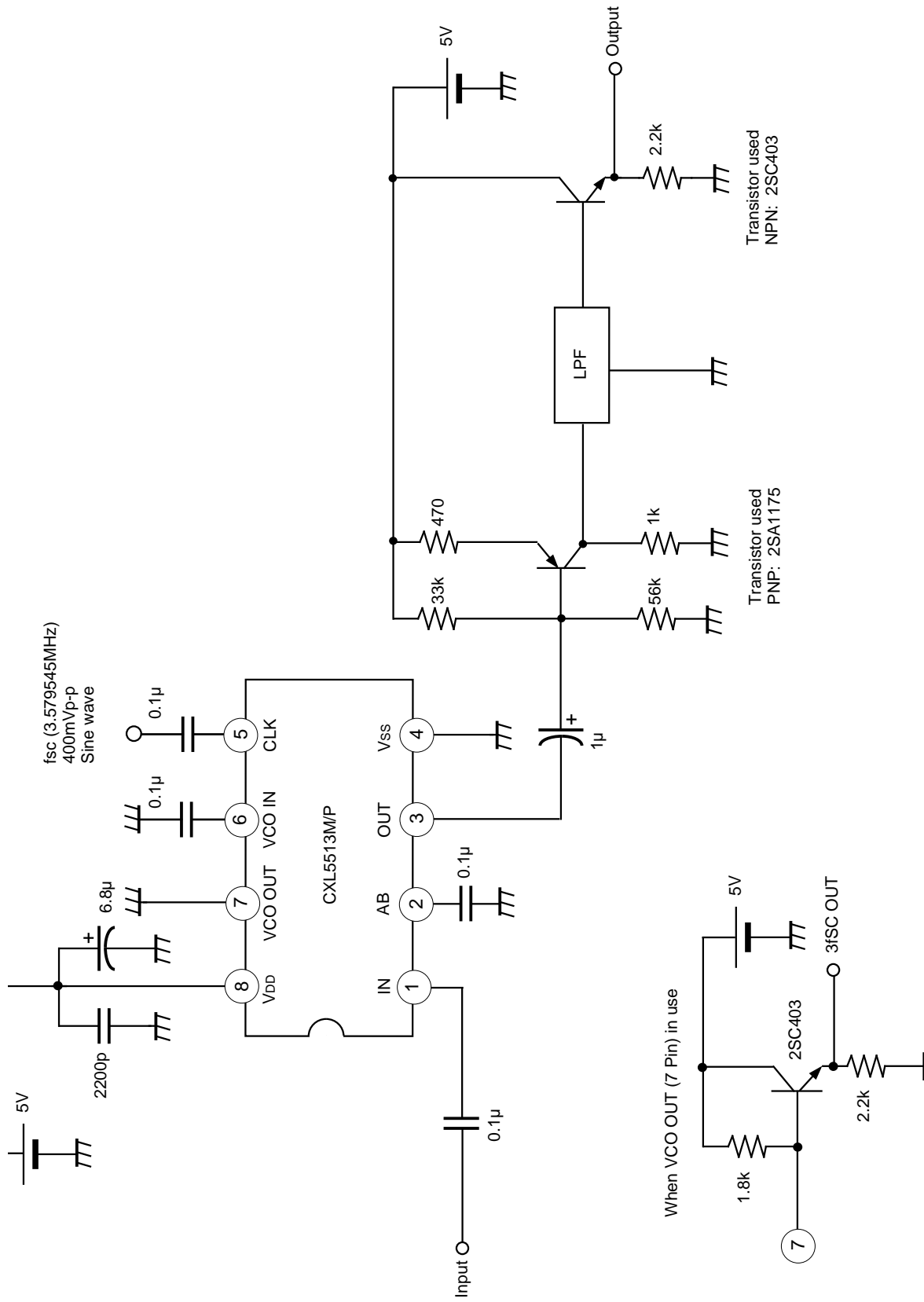
fSC (3.579545MHz) Sine wave



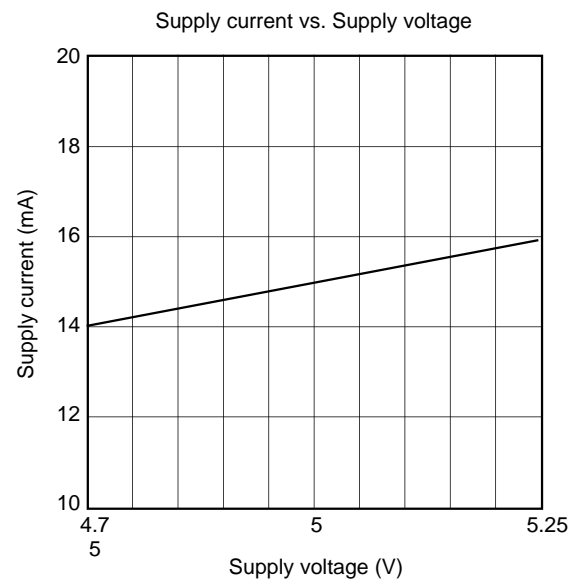
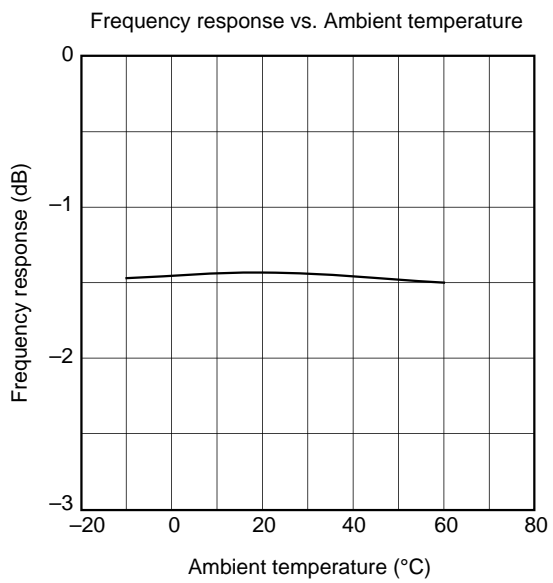
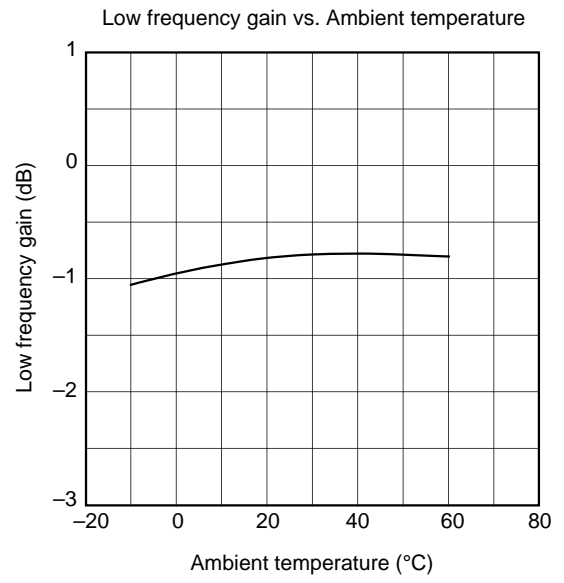
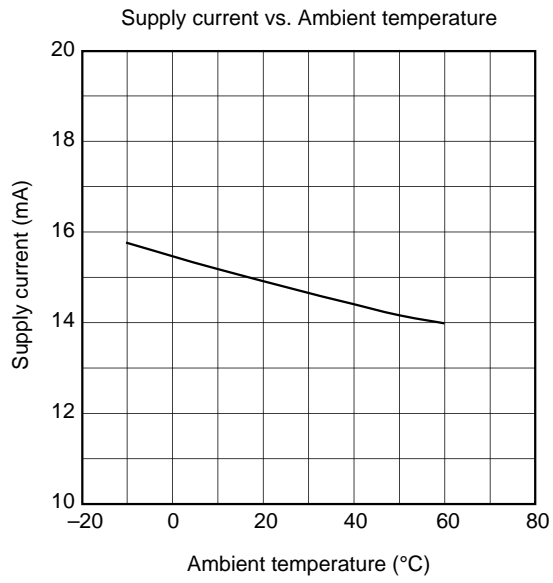
Electrical Characteristics Test Circuit

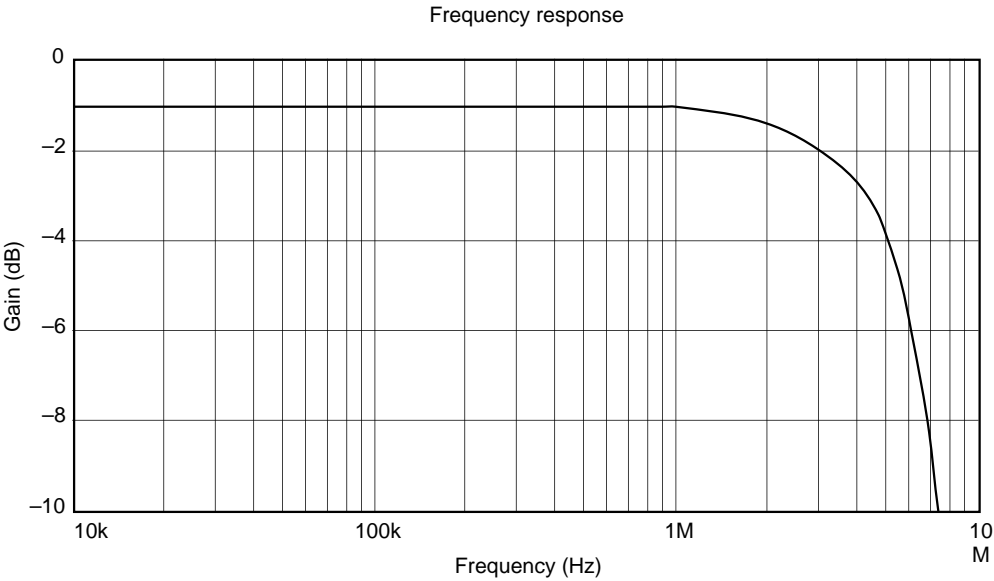
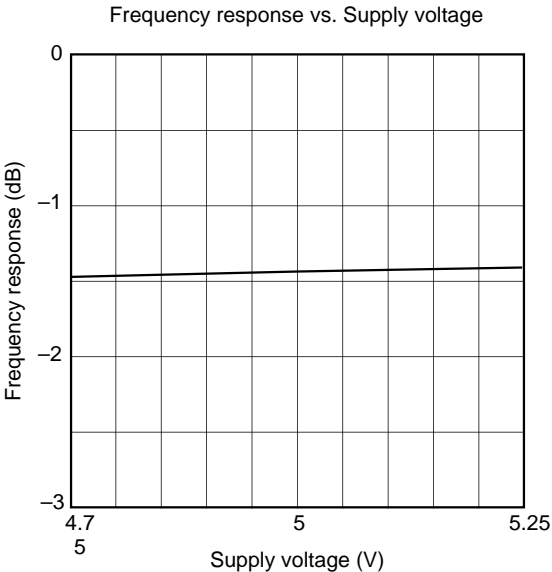
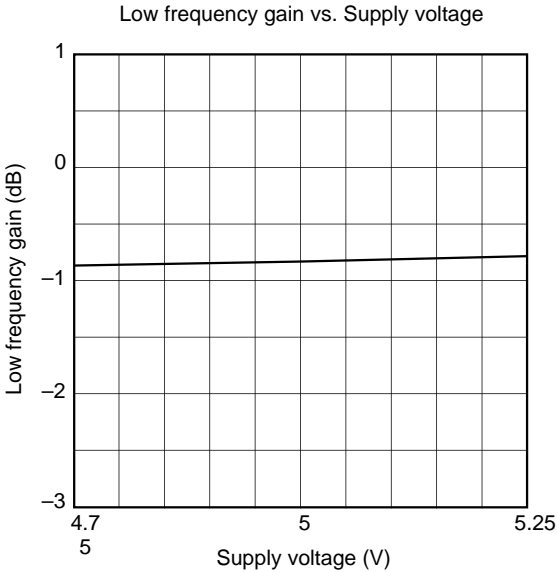


Application Circuit



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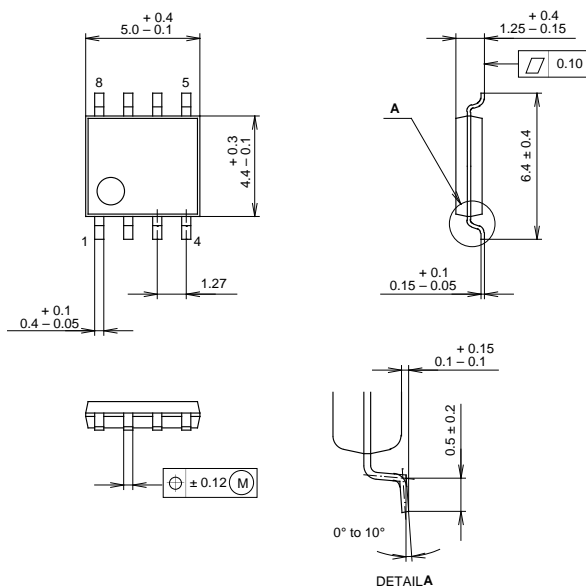




Package Outline Unit : mm

CXL5513M

8PIN SOP (PLASTIC)



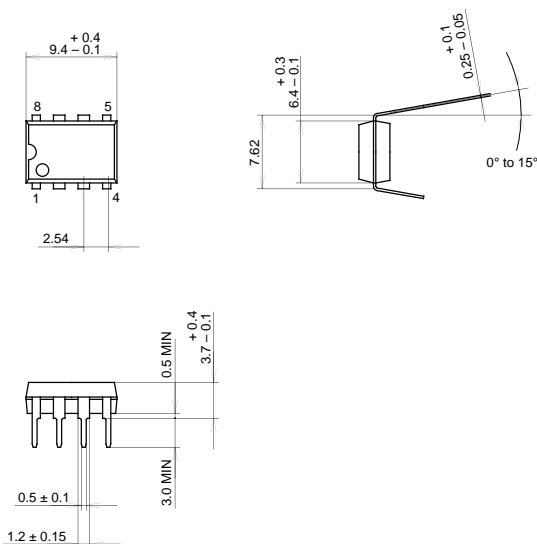
PACKAGE STRUCTURE

SONY CODE	SOP-8P-L03
EIAJ CODE	+SOP008-P-0225-A
JEDEC CODE	

MOLDING COMPOUND	EPOXY / PHENOL RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	42 ALLOY
PACKAGE WEIGHT	0.1g

CXL5513P

8PIN DIP (PLASTIC) 300mil



PACKAGE STRUCTURE

SONY CODE	DIP-8P-01
EIAJ CODE	+DIP008-P-0300-A
JEDEC CODE	

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE WEIGHT	0.5g