

CMOS-CCD 1H Delay Line for PAL

Description

The CXL5514M/P are CMOS-CCD delay line ICs designed for processing video signals. This ICs provide a 1H delay time for PAL signals including the external lowpass filter.

Features

- Single 5V power supply
- Low power consumption
- Built-in peripheral circuit
- Built-in tripling PLL circuit
- Sync tip clamp 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 | | |
| | CXL5514M | 350 | mW |
| | CXL5514P | 480 | mW |

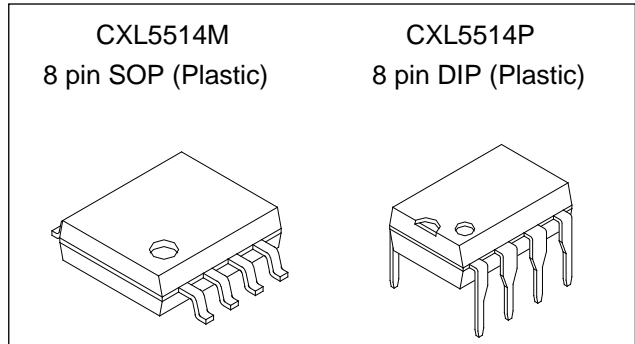
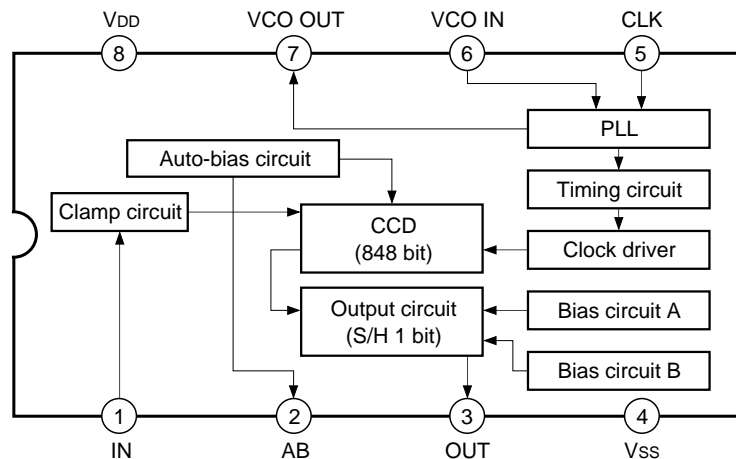
Recommended Operating Range (Ta = 25°C)

V_{DD} 5V ± 5%

Recommended Clock Conditions (Ta = 25°C)

- Input clock amplitude
V_{CLK} 0.2 to 1.0Vp-p (0.4Vp-p Typ.)
- Clock frequency f_{CLK} 4.433619MHz
- Input clock waveform Sine wave

Block Diagram and Pin Configuration (Top View)



Input Signal Amplitude

V_{SIG} 500mVp-p (Typ.), 575mVp-p (Max.)
(at internal clamp condition)

Functions

- 848-bit CCD register
- Clock driver
- Auto-bias circuit
- Sync tip clamp 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 | >10KΩ |
| 2 | AB | O | Auto-bias DC output | |
| 3 | OUT | O | Signal output | 40 to 500Ω |
| 4 | V _{SS} | — | GND | |
| 5 | CLK | I | Clock input (fsc) | >10KΩ |
| 6 | VCO IN | I | VCO input | |
| 7 | VCO OUT | O | VCO output (3fsc) | |
| 8 | V _{DD} | — | 5V power supply | |

Electrical Characteristics

(T_a = 25°C, V_{DD} = 5V, f_{CLK} = 4.433619MHz, V_{CLK} = 400mVp-p, sine wave)
See "Electrical Characteristics Test Circuit".

| Item | Symbol | Conditions | SW conditions | | Min. | Typ. | Max. | Unit | NOTE |
|--------------------|-----------------|-----------------------------------------|---------------|---|------|------|------|--------|------|
| | | | 1 | 2 | | | | | |
| Supply current | I _{DD} | — | a | — | 10 | 15 | 20 | mA | 1 |
| Low frequency gain | GL | 200kHz 500mVp-p Sine wave | a | b | -2 | 0 | 2 | dB | 2 |
| Frequency response | f _R | 200kHz ↔ 4.434MHz 150mVp-p Sine wave | b ↔ c | b | -2.7 | -1.7 | -0.7 | 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

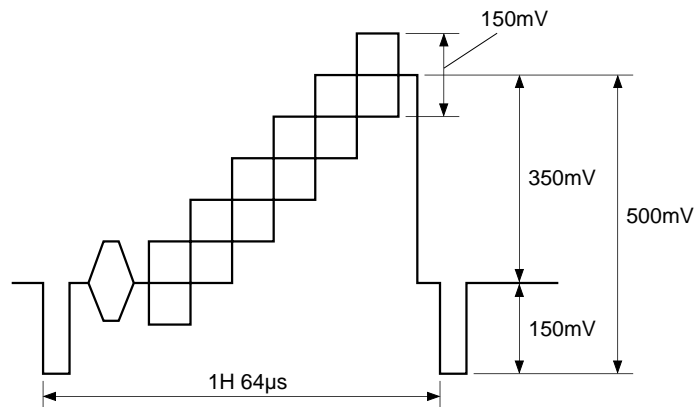
1. This is the IC supply current value during clock and signal input.
2. GL is the output gain of OUT pin when a 500mVp-p, 200kHz sine wave is fed to IN pin.

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

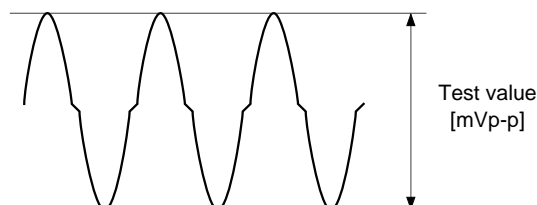
3. Indicates the dissipation at 4.434MHz in relation to 200kHz. From the output voltage at OUT pin when a 150mVp-p, 200kHz sine wave is fed to IN pin, and from the output voltage at OUT pin when a 150mVp-p, 4.434MHz sine wave is fed to the same, calculation is made according to the following formula.

$$f_R = 20 \log \frac{\text{OUT pin output voltage (4.434MHz) [mVp-p]}}{\text{OUT pin output voltage (200kHz) [mVp-p]}} \text{ [dB]}$$

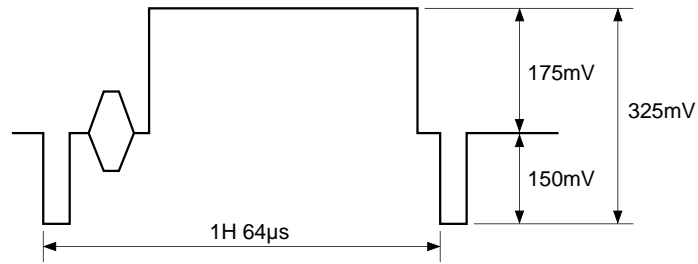
4. In Fig. below, the differential gain (DG) and the differential phase (DP) are tested with a vector scope when the 5-staircase wave is fed.



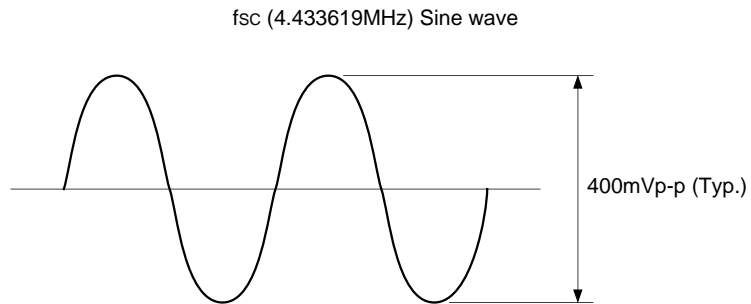
5. Leakage of internal clock components and related high frequency component to the output signal, during no signal input, is tested.



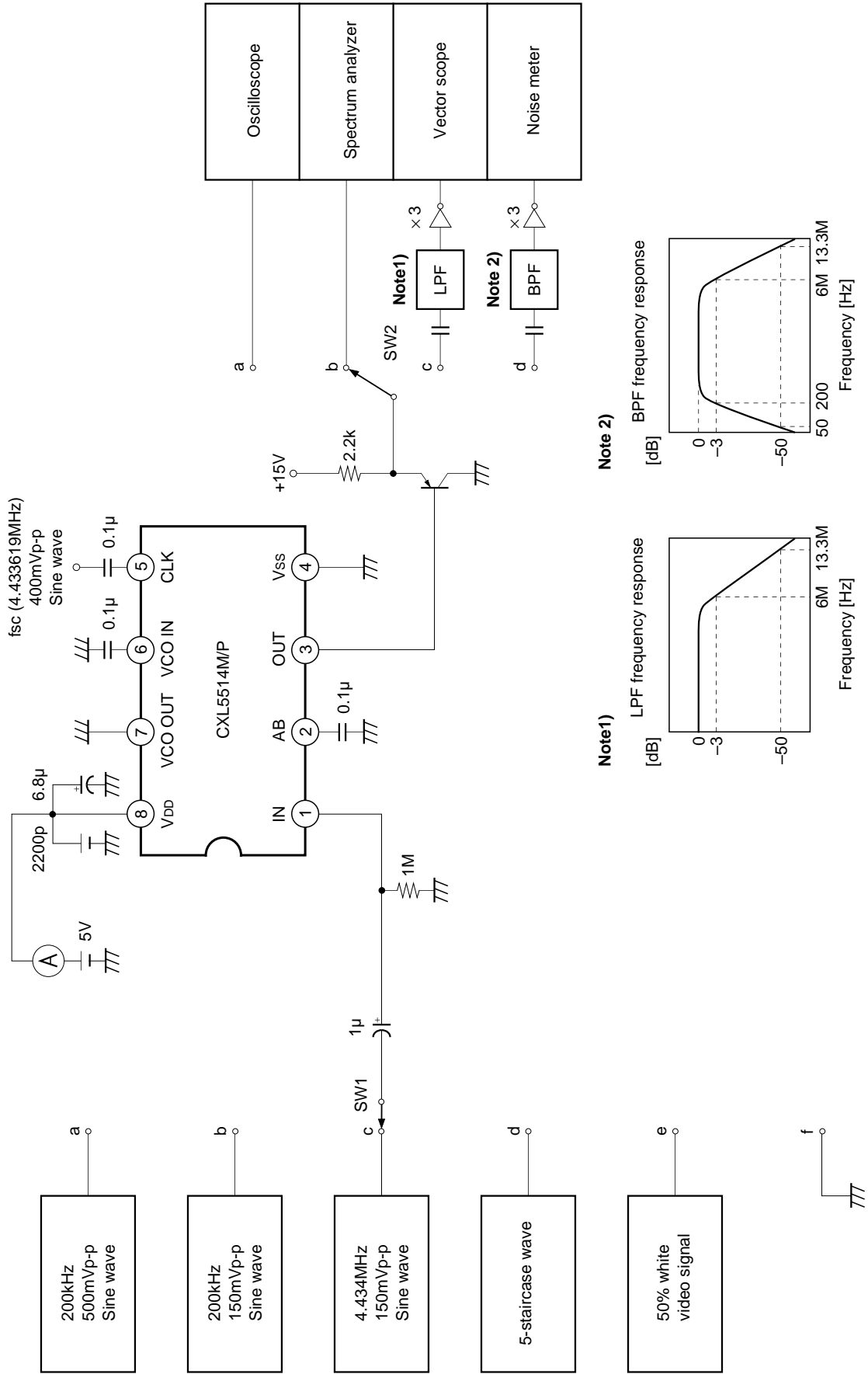
6. S/N ratio during a 50% white video signal input shown in Fig. below is tested at the video noise meter, in BPF 100kHz to 5MHz, Sub Carrier Trap mode.



CLOCK

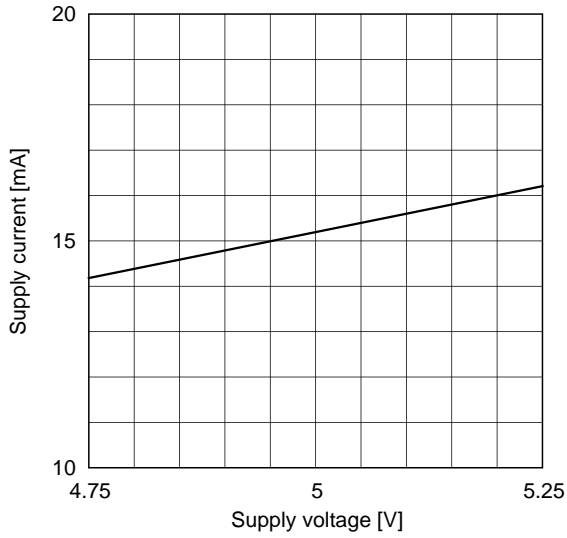


Electrical Characteristics Test Circuit

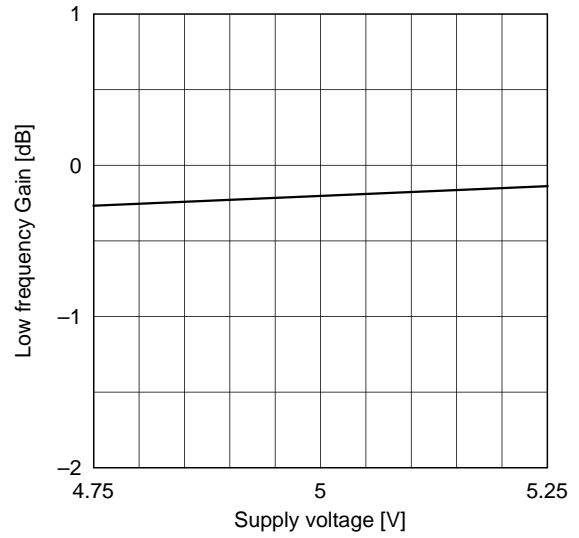


Example of Representative Characteristics

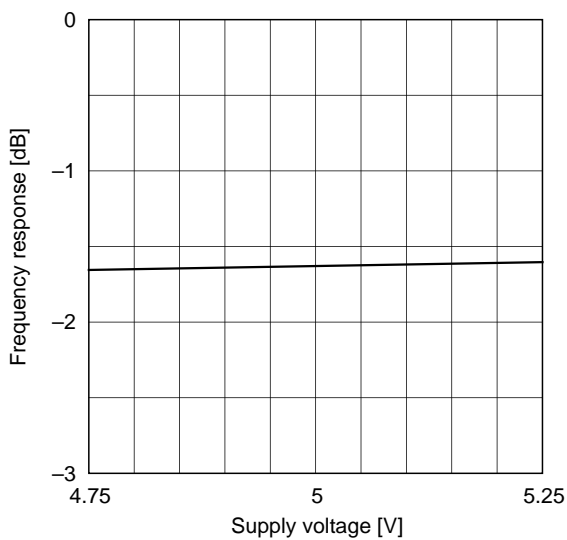
Supply current vs. Supply voltage



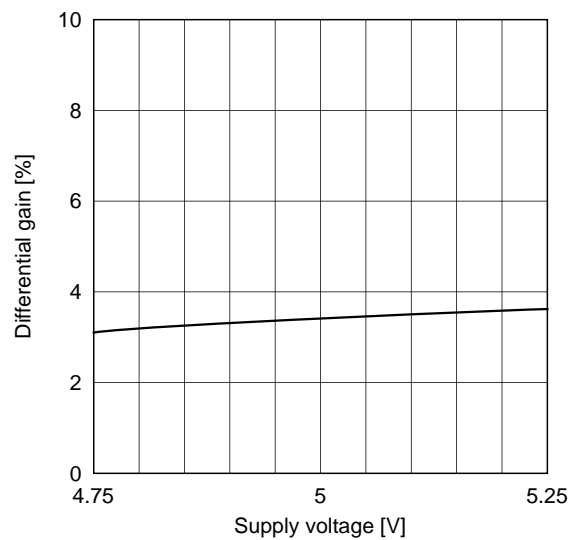
Low frequency Gain vs. Supply voltage



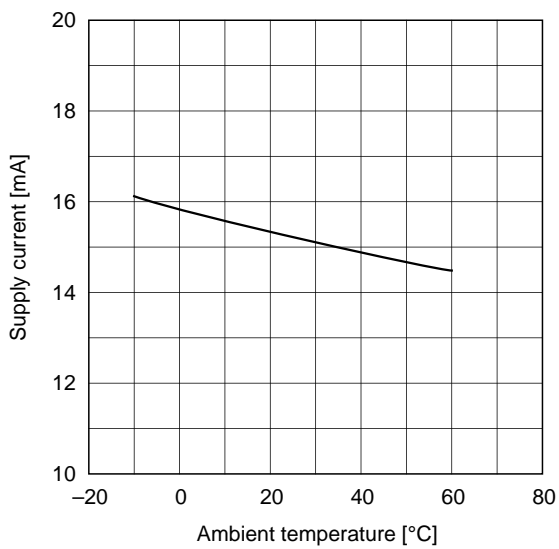
Frequency response vs. Supply voltage



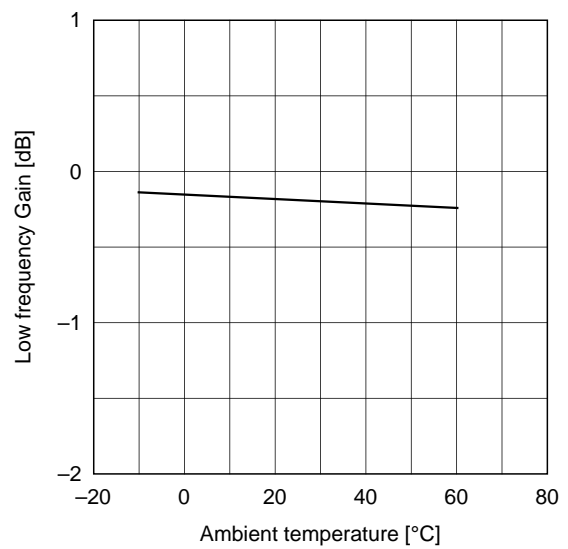
Differential gain vs. Supply voltage



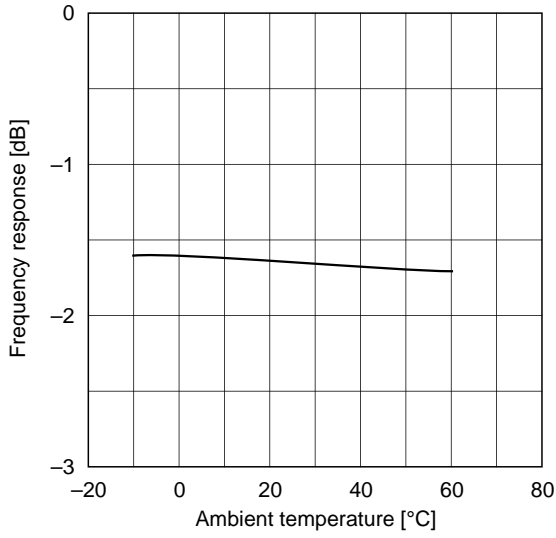
Supply current vs. Ambient temperature



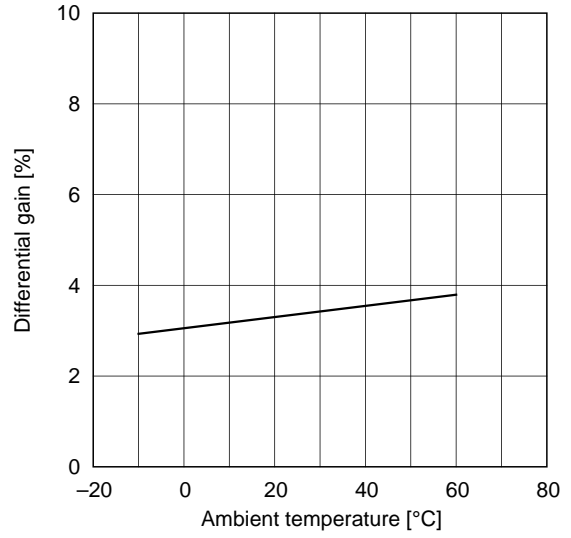
Low frequency Gain vs. Ambient temperature



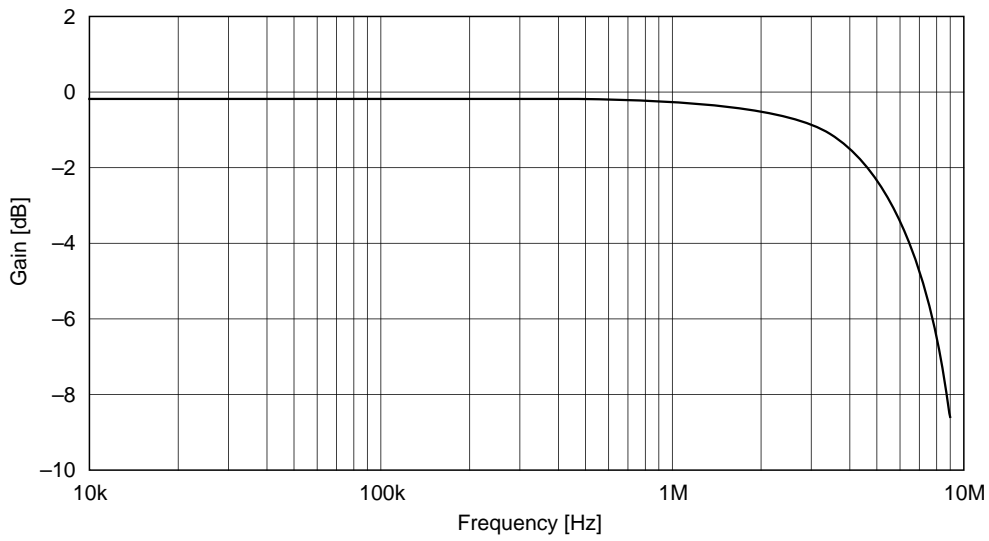
Frequency response vs. Ambient temperature



Differential gain vs. Ambient temperature



Frequency response

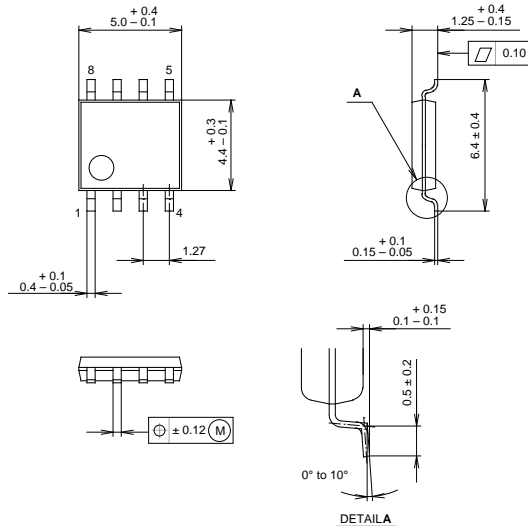


Package Outline

Unit : mm

CXL5514M

8PIN SOP (PLASTIC)



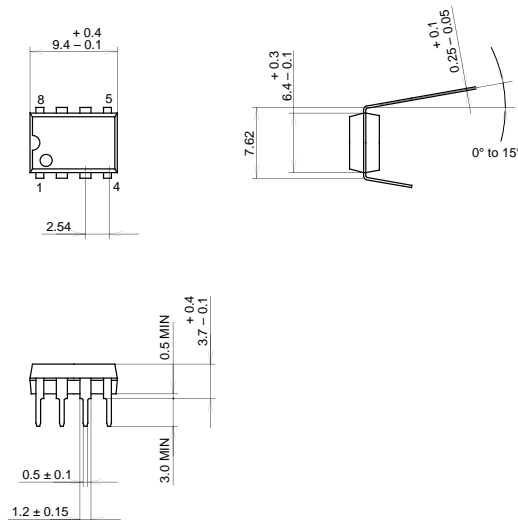
PACKAGE STRUCTURE

| | |
|------------|------------------|
| 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 |

CXL5514P

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 |