75 Ω VIDEO LINE DRIVER

FEATURES

- **Internal Y-C Summing Circuit**
- **Voltage Gain is 6 dB Fixed**
- **Internal 75 Ω Driver**
- **Active High ON/OFF Control**
- **Very Low Standby Current (typ. $I_{STBY} \leq 25$ μA)**
- **Very Small Output Capacitor Using SAG Function Pin**
- **Very Small Package (SOT23L-8)**
- **Single +5 V Power Supply Operation**

APPLICATIONS

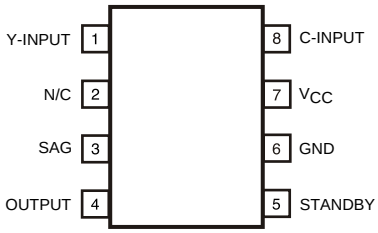
- **Video Equipment**
- **Digital Cameras**
- **CCD Cameras**
- **TV Monitors**
- **Video Tape Recorders**
- **LCD Projectors**

DESCRIPTION

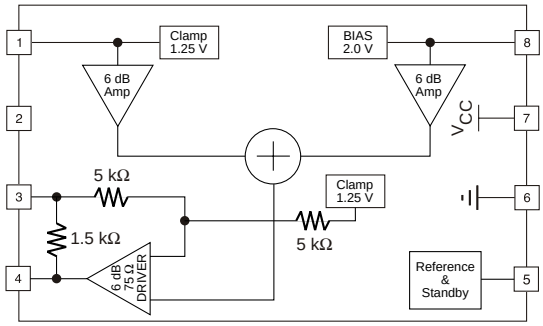
Operating from a single +5 V supply, the TK15409 is a video line driver IC that takes standard Y and C analog inputs and provides a composite analog output for driving 150 Ω loads (75 Ω resistor and 75 Ω cable load). Internal summing of the Y and C inputs is performed to produce the composite video output. The luminance (Y) input is clamped at 1.25 V and amplified 6 dB; the chromanance (C) input is biased at 2.0 V and amplified 6 dB. The internal 1.5 kΩ SAG function resistor provides gain compensation for low frequency signals. During standby (Pin 5 grounded), the TK15409 consumes only 127 μW of power. Nominal power dissipation (no input) is typically 90 mW.

The TK15409M is available in the very small SOT23L-8 surface mount package.

TK15409



BLOCK DIAGRAM



ORDERING INFORMATION

TK15409M □□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... 6 V
Operating Voltage Range..... 4.5 to 5.5 V
Power Dissipation (Note 1) ..... 350 mW
Input Frequency ..... 10.0 MHz
Storage Temperature Range ..... -55 to +150 °C
Operating Temperature Range .....-25 to +85 °C

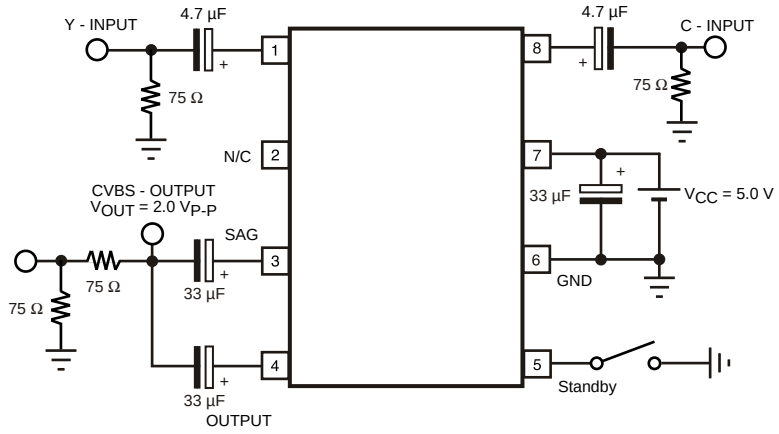
TK15409M ELECTRICAL CHARACTERISTICS

Test conditions: V_{CC} = 5.0 V, V_{IN} = 1.0 V_{P-P}, R_L = 150 Ω, T_A = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{CC}	Supply Current	No input		18.0	26.0	mA
I_{STBY}	Standby Supply Current	Pin 5 Grounded		25.3	50.0	µA
I_{OS}	Standby Terminal Current	Pin 5 in Standby mode		25.3	50.0	µA
V_{THL}	Threshold Voltage (High to Low)	Pin 5 Operating to Standby mode	GND		0.3	V
V_{TLH}	Threshold Voltage (Low to High)	Pin 5 Standby to Operating mode	1.8		V_{CC}	V
V_{CMP}	Clamp Voltage	Pin 1 Y signal input terminal	1.10	1.28	1.50	V
V_{BIAS}	Bias Voltage	Pin 8 C signal input terminal	1.70	2.00	2.30	V
GVA-Y1	Voltage Gain Y ch-1	f_{IN} = 1 MHz, Y signal input	5.2	5.7	6.2	dB
GVA-Y2	Voltage Gain Y ch-2	f_{IN} = 15 kHz, Y signal input	5.2	5.7	6.2	dB
GVA-C1	Voltage Gain C ch-1	f_{IN} = 1 MHz, C signal input	5.1	5.6	6.1	dB
GVA-C2	Voltage Gain C ch-1	f_{IN} = 15 kHz, C signal input	5.1	5.6	6.1	dB
DG	Differential Gain	Staircase signal input	-3.0	-1.2	+3.0	%
DP	Differential Phase	Staircase signal input	-3.0	-0.4	+3.0	deg
fr	Frequency Response	f_{in} = 1 MHz / 5 MHz		-0.5		dB

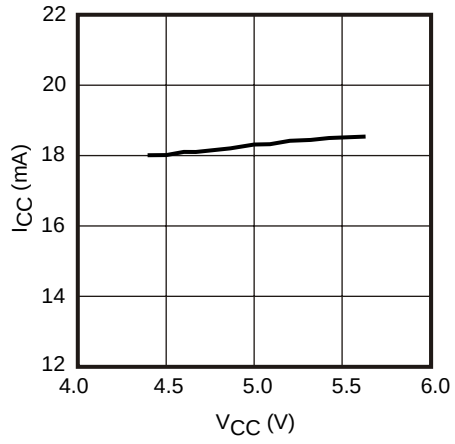
Note 1: Power dissipation is 350 mW in free air. Derate at 2.8 mW/°C for operation above 25°C.

TEST CIRCUIT

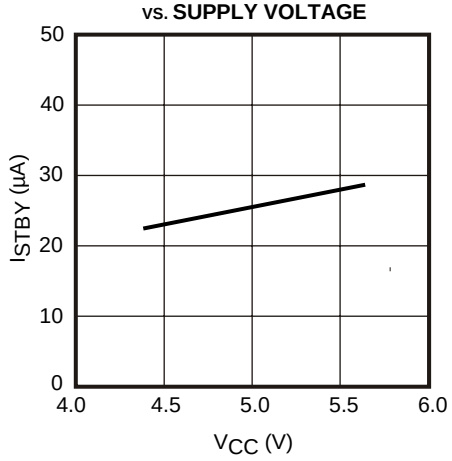


TYPICAL PERFORMANCE CHARACTERISTICS

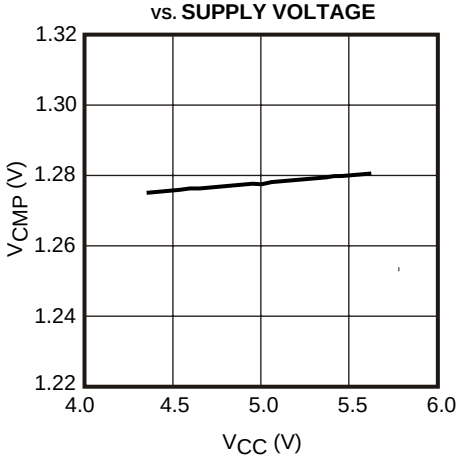
SUPPLY CURRENT vs. SUPPLY VOLTAGE



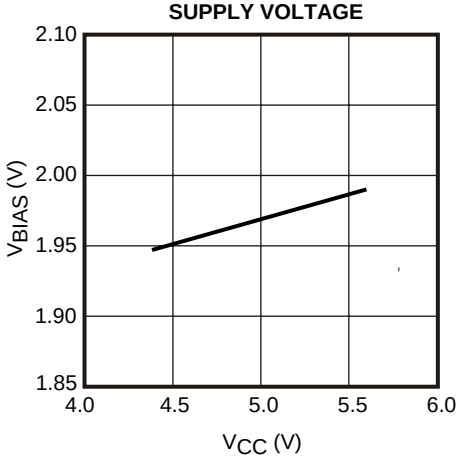
STANDBY SUPPLY CURRENT vs. SUPPLY VOLTAGE



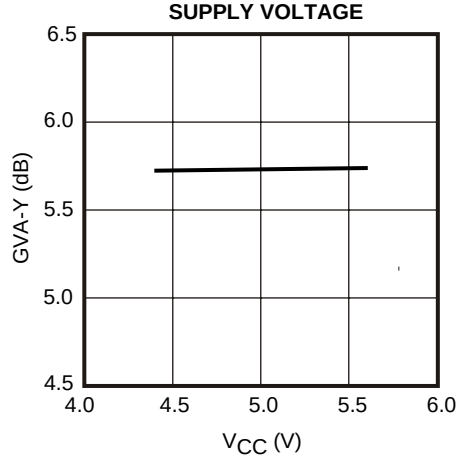
CLAMP VOLTAGE vs. SUPPLY VOLTAGE



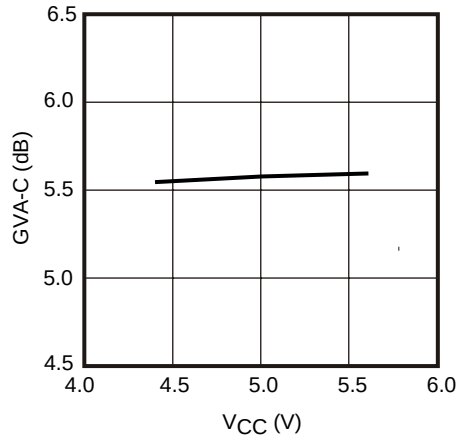
BIAS VOLTAGE vs. SUPPLY VOLTAGE



VOLTAGE GAIN Y vs. SUPPLY VOLTAGE

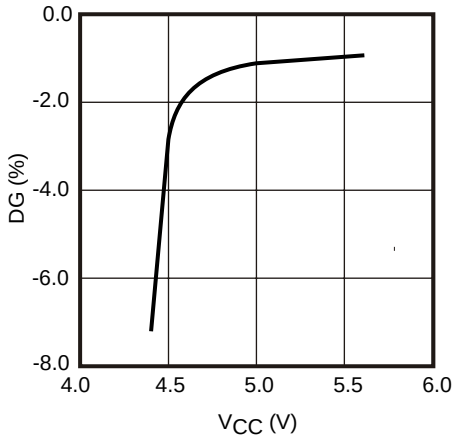


VOLTAGE GAIN C vs. SUPPLY VOLTAGE

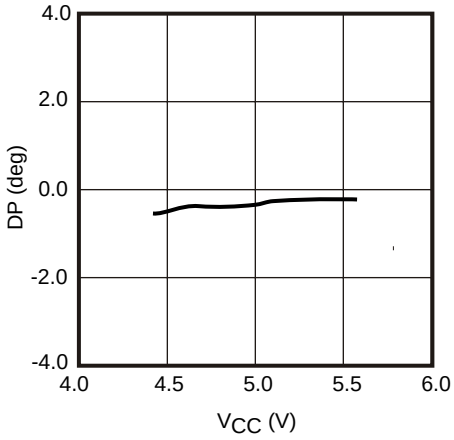


TYPICAL PERFORMANCE CHARACTERISTICS

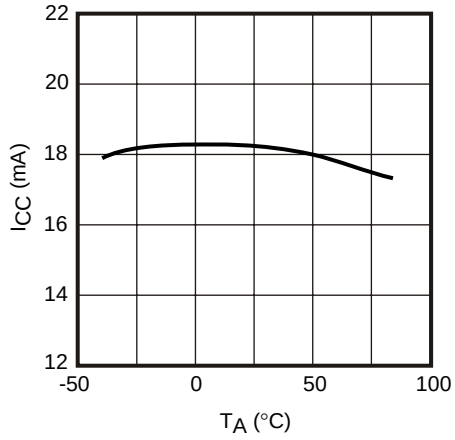
DIFFERENTIAL GAIN vs. SUPPLY VOLTAGE



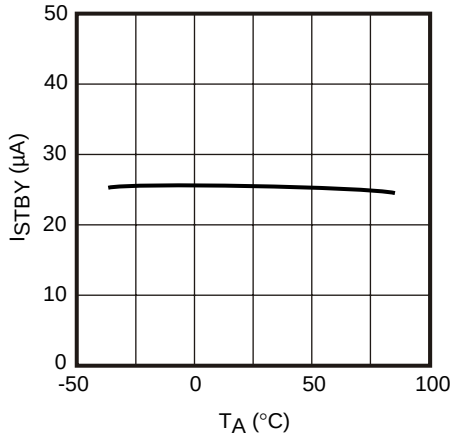
DIFFERENTIAL PHASE vs. SUPPLY VOLTAGE



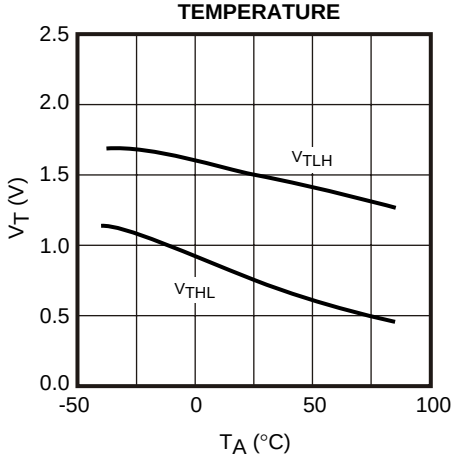
SUPPLY CURRENT vs. TEMPERATURE



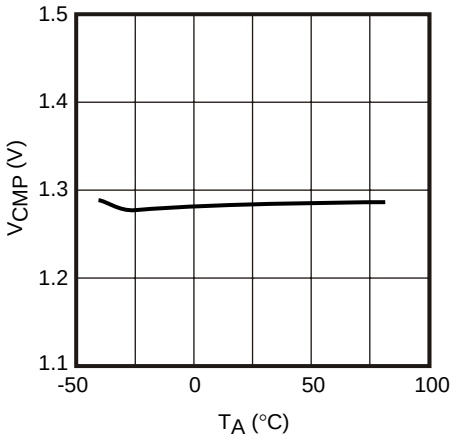
STANDBY SUPPLY CURRENT vs. TEMPERATURE



THRESHOLD VOLTAGE vs. TEMPERATURE

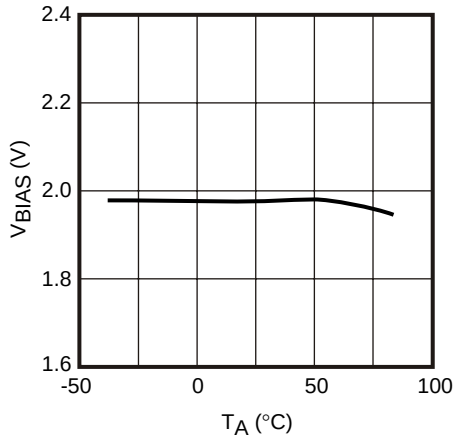


CLAMP VOLTAGE vs. TEMPERATURE

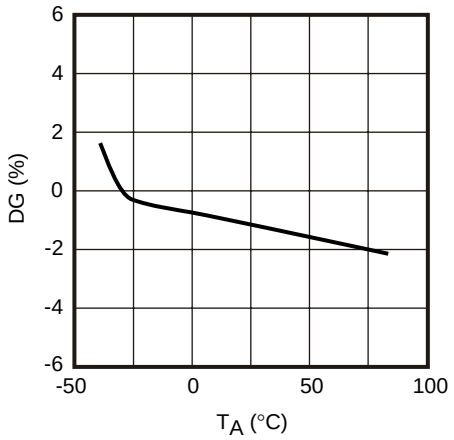


TYPICAL PERFORMANCE CHARACTERISTICS

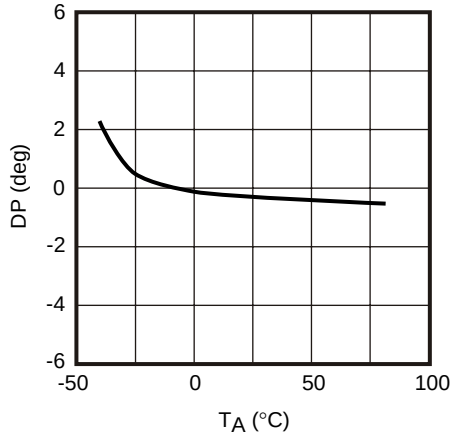
BIAS VOLTAGE vs. TEMPERATURE



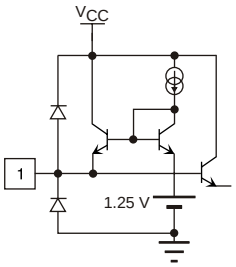
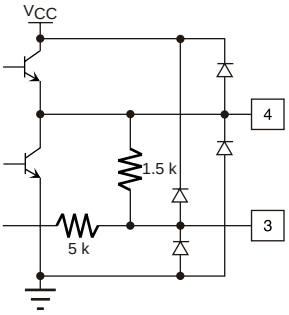
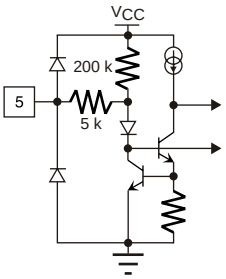
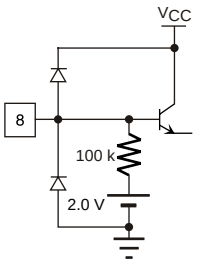
DIFFERENTIAL GAIN vs. TEMPERATURE



DIFFERENTIAL PHASE vs. TEMPERATURE

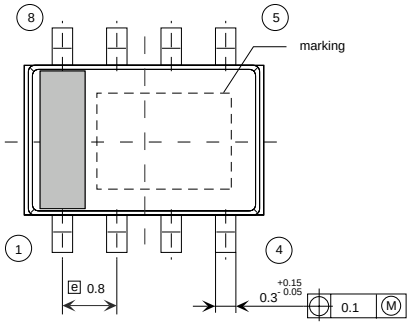


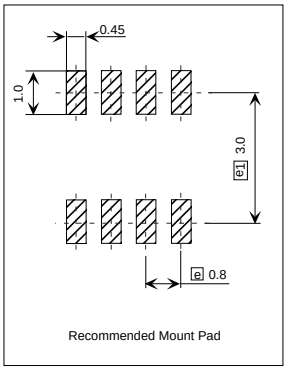
PIN FUNCTION DESCRIPTION

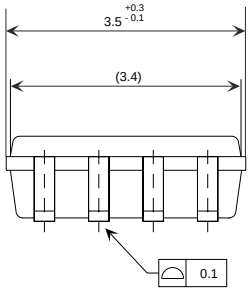
PIN NO.	SYMBOL	INTERNAL EQUIVALENT CIRCUIT	DESCRIPTION
1	Y-INPUT		Luminance Input Terminal. The luminance input signal is clamped at 1.25 V.
2	NC		No Connection Terminal
3 4	SAG OUTPUT		Pin 4: Signal Output Terminal. The output is available to drive a 75 Ω + 75 Ω load. Pin 3: SAG Terminal.
5	STANDBY		Standby Logic Terminal. The device is in the standby mode when Pin 5 is connected to Low. The device is in the operation mode when Pin 5 is connected to High or Open.
6	GND		GND Terminal
7	V_{CC}		Power Supply Terminal
8	C-INPUT		Chromanance Input Terminal. The chromanance input signal is biased to 2.0 V by a 100 kΩ bias resistor.

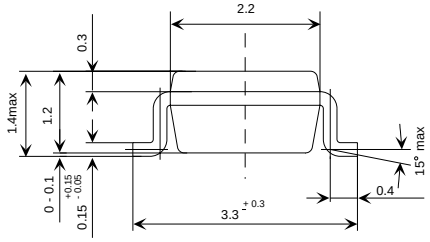
PACKAGE OUTLINE

SOT23L-8









Dimensions are shown in millimeters
Tolerance: x.x = ± 0.2 mm (unless otherwise specified)

Marking Information

	Marking
TK15409	409

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