# 75 Ω VIDEO LINE DRIVER

## FEATURES

- **Internal 75 Ω Driver**
- **Active High ON/OFF Control with Internal Pull-up**
- **Very Low Standby Current (typ. $I_{STBY} \leq 25$ μA)**
- **Very Small SOT23-6 Package**
- **Single +5 V Power Supply Operation**

## APPLICATIONS

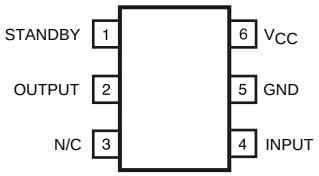
- **Video Equipment**
- **Digital Cameras**
- **CCD Cameras**
- **TV Monitors**
- **Video Tape Recorders**
- **LCD Projectors**

## DESCRIPTION

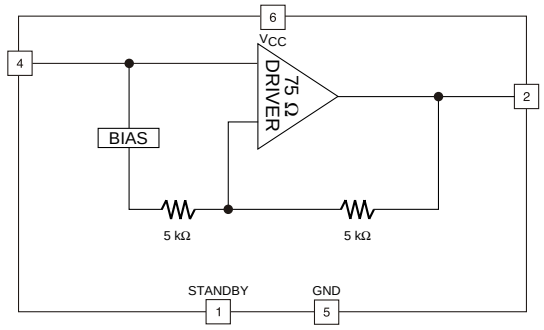
Operating from a single +5 V supply, the TK15406 is a single-channel video line driver IC that takes a standard video analog input and provides a buffered analog output for driving a 150 Ω load. The standard video input signal (1 $V_{P-P}$ typical) is internally biased at 2.5 V and amplified 6 dB to produce 2 $V_{P-P}$ (typical) into a series 75 Ω resistor and 75 Ω cable load. During standby (Pin 1 grounded), the TK15406 consumes only 120 μW of power. Nominal power dissipation (no input) is typically 32 mW.

The TK15406M is available in the very small SOT23-6 surface mount package.

**TK15406**




**BLOCK DIAGRAM**




## ORDERING INFORMATION

TK15406M □□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

## TK15406M ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... 6 V
Operating Voltage ..... 4.5 to 5.5 V
Power Dissipation (Note 1) ..... 150 mW
Storage Temperature Range ..... -55 to +150 °C
Operating Temperature Range .....-25 to +75 °C

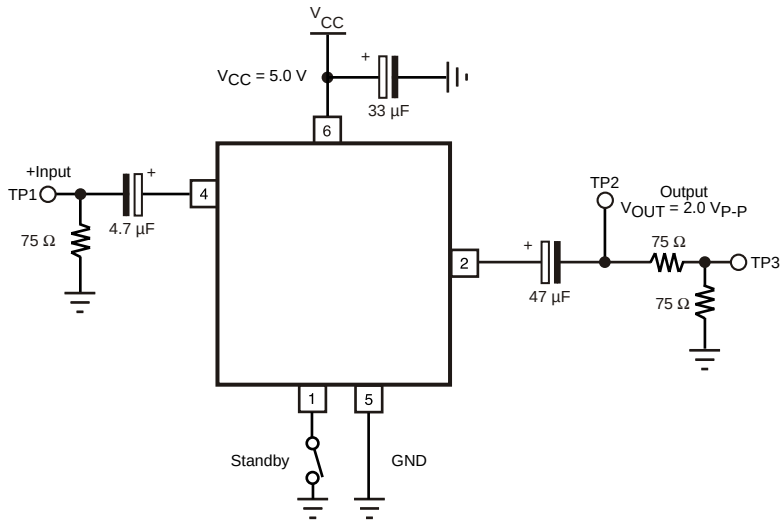
## TK15406M ELECTRICAL CHARACTERISTICS

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 | | 6.3 | 8.5 | mA |
| $I_{STBY}$ | Standby Supply Current | Pin 1 Grounded | | 24.0 | 50.0 | µA |
| $I_{OS}$ | Standby Terminal Current | Pin 1 in Standby mode | | 24.0 | 50.0 | µA |
| $V_{THL}$ | Standby Threshold Voltage (High to Low) | Pin 1 Operating to Standby mode | GND | 0.1 | 0.3 | V |
| $V_{TLH}$ | Standby Threshold Voltage (Low to High) | Pin 1 Standby to Operating mode | 1.8 | 2.0 | $V_{CC}$ | V |
| $V_{BIAS}$ | Bias Voltage | Pin 4 Input terminal | 2.15 | 2.45 | 2.75 | V |
| GVA | Voltage Gain | $f_{in}$ = 1 MHz | 5.2 | 5.7 | 6.2 | dB |
| fr | Frequency Response | $f_{in}$ = 1 MHz / 5 MHz | | -0.5 | | dB |
| THD | Total Harmonic Distortion | $f_{in}$ = 1.0 kHz | | 0.2 | 1.0 | % |
| $V_{OUT(MAX)}$ | Maximum Output Voltage | THD = 10% point | 1.0 | 1.2 | | Vrms |

Note 1: Power dissipation is 150 mW in free air. Derate at 1.2 mW/°C for operation above 25°C.

## TEST CIRCUIT




**MEASUREMENT METHOD**

1. Supply Current ($I_{CC}$)
The Pin 6 current is measured with no input signal and the Standby Pin (Pin 1) open.

2. Standby Supply Current ($I_{STBY}$)
The Pin 6 current is measured when the Standby Pin (Pin 1) is connected to ground.

3. Standby Terminal Current ($I_{OS}$)
The Pin 1 current is measured when Pin 1 is connected to ground.

4. Threshold Voltage (High to Low) ($V_{THL}$)
The Pin 1 voltage is measured at the point which changes the device from operating mode into standby mode.

5. Threshold Voltage (Low to High) ($V_{TLH}$)
The Pin 1 voltage is measured at the point which changes the device from standby mode into operating mode.

6. Bias Voltage ($V_{BIAS}$)
The DC voltage at Pin 4 is measured with no input signal.

7. Voltage Gain (GVA)
The voltage gain equation is as follows:
GVA = 20 $\log_{10}$ V2/V1
Where V1 is the input voltage at TP1 and V2 is the measured output voltage at TP2.

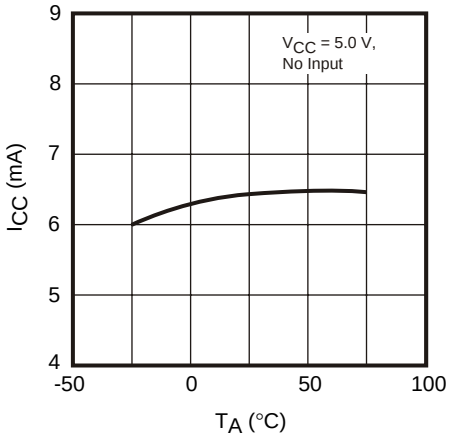
8. Frequency Response (fr)
The frequency response equation is as follows:
fr = 20 $\log_{10}$ V2/V1
Where V1 is the measured TP3 voltage when the TP1 input frequency is set to 1 MHz and V2 is the measured TP3 voltage when the TP1 input frequency is set to 5 MHz.

9. Total Harmonic Distortion (THD)
The TP3 signal is measured when a 1 kHz 1 $V_{P-P}$ input signal is applied to TP1.

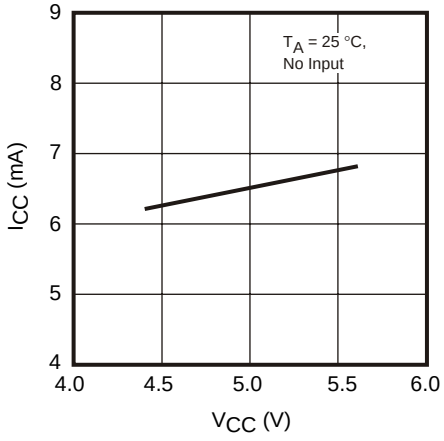
10. Maximum Output Voltage ($V_{OUT(MAX)}$)
A 1 kHz input signal is applied to TP1 and the amplitude is slowly increased. The output voltage at TP2 is measured at the point the THD reaches 10%.

## TYPICAL PERFORMANCE CHARACTERISTICS

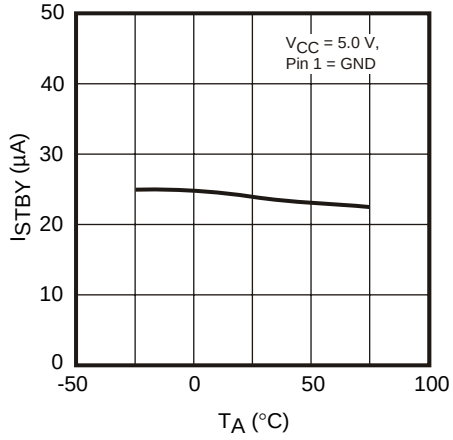
**SUPPLY CURRENT vs. TEMPERATURE**



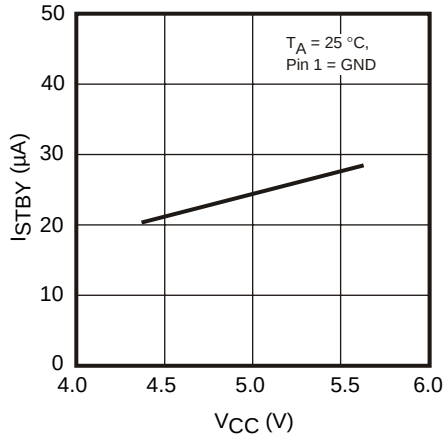

**SUPPLY CURRENT vs. SUPPLY VOLTAGE**



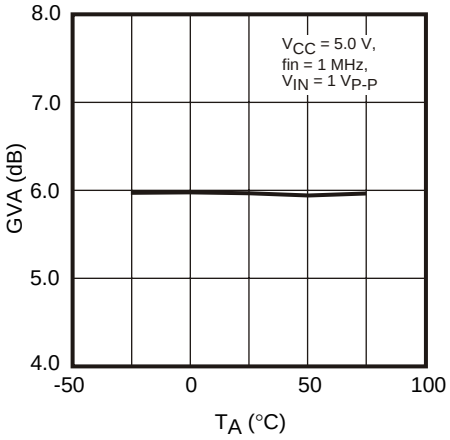

**STANDBY SUPPLY CURRENT vs. TEMPERATURE**



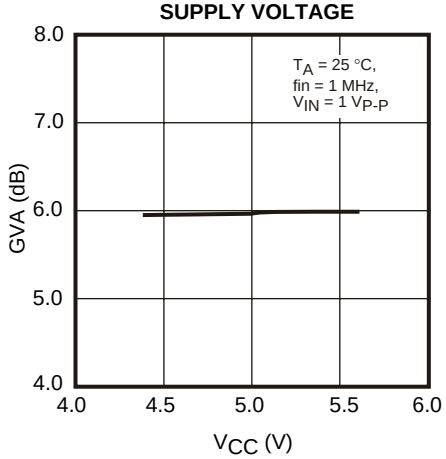

**STANDBY SUPPLY CURRENT vs. SUPPLY VOLTAGE**




**VOLTAGE GAIN vs. TEMPERATURE**

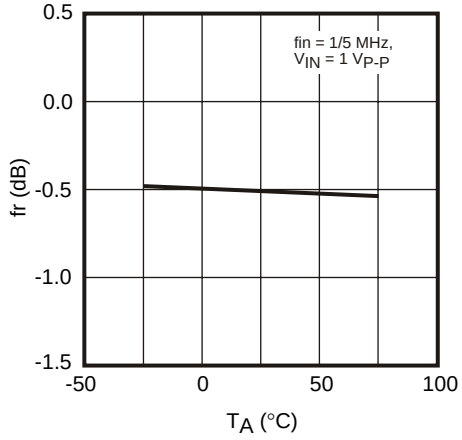



**VOLTAGE GAIN vs. SUPPLY VOLTAGE**

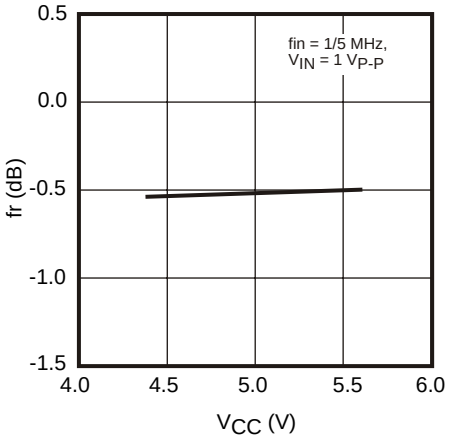


## TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

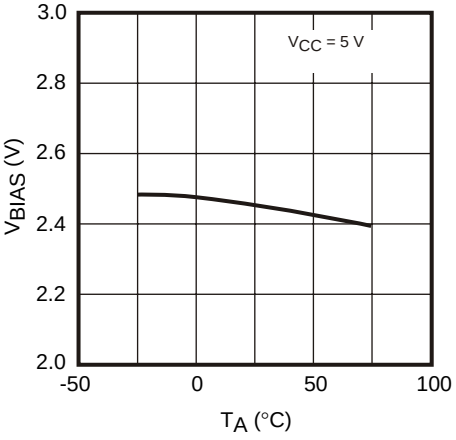
**FREQUENCY RESPONSE vs. TEMPERATURE**



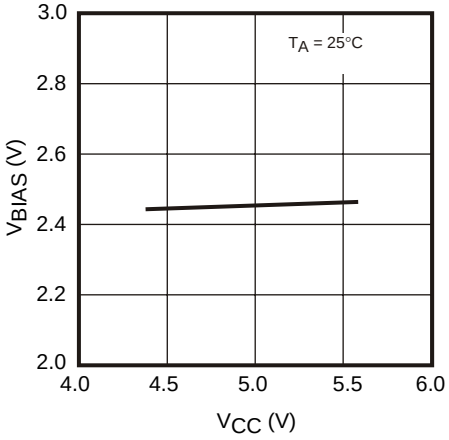

**FREQUENCY RESPONSE vs. SUPPLY VOLTAGE**



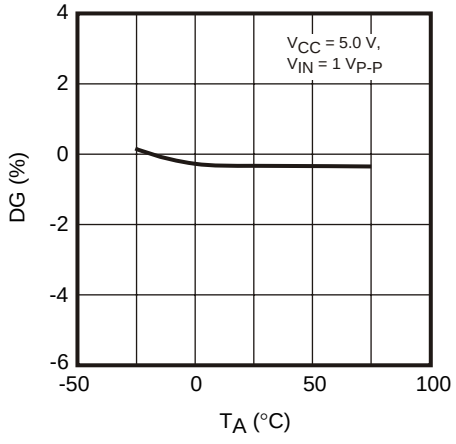

**BIAS VOLTAGE vs. TEMPERATURE**



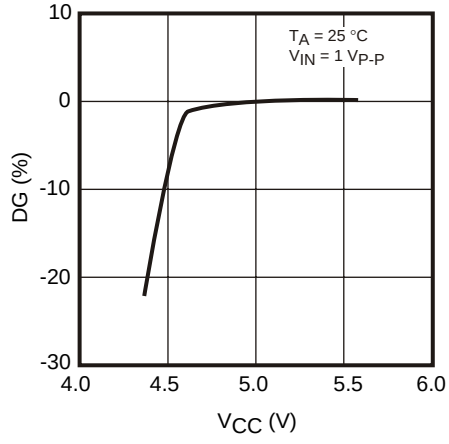

**BIAS VOLTAGE vs. SUPPLY VOLTAGE**




**DIFFERENTIAL GAIN vs. TEMPERATURE**

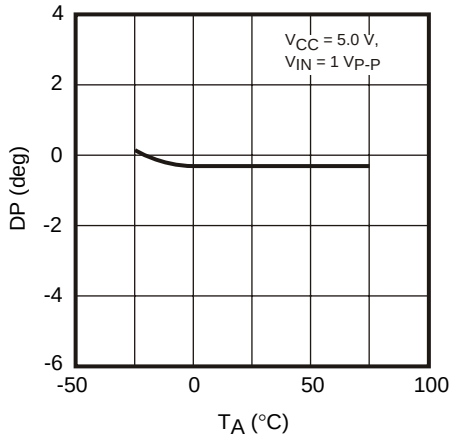



**DIFFERENTIAL GAIN vs. SUPPLY VOLTAGE**

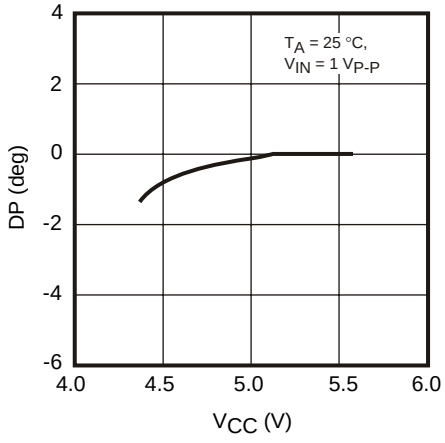


## TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

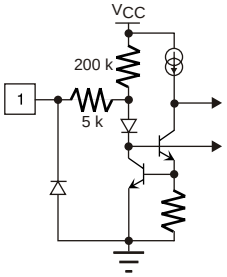
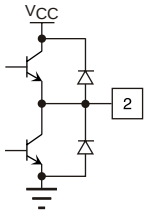
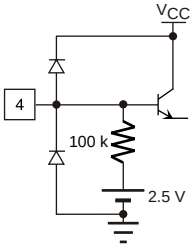
**DIFFERENTIAL PHASE vs. TEMPERATURE**




**DIFFERENTIAL PHASE vs. SUPPLY VOLTAGE**

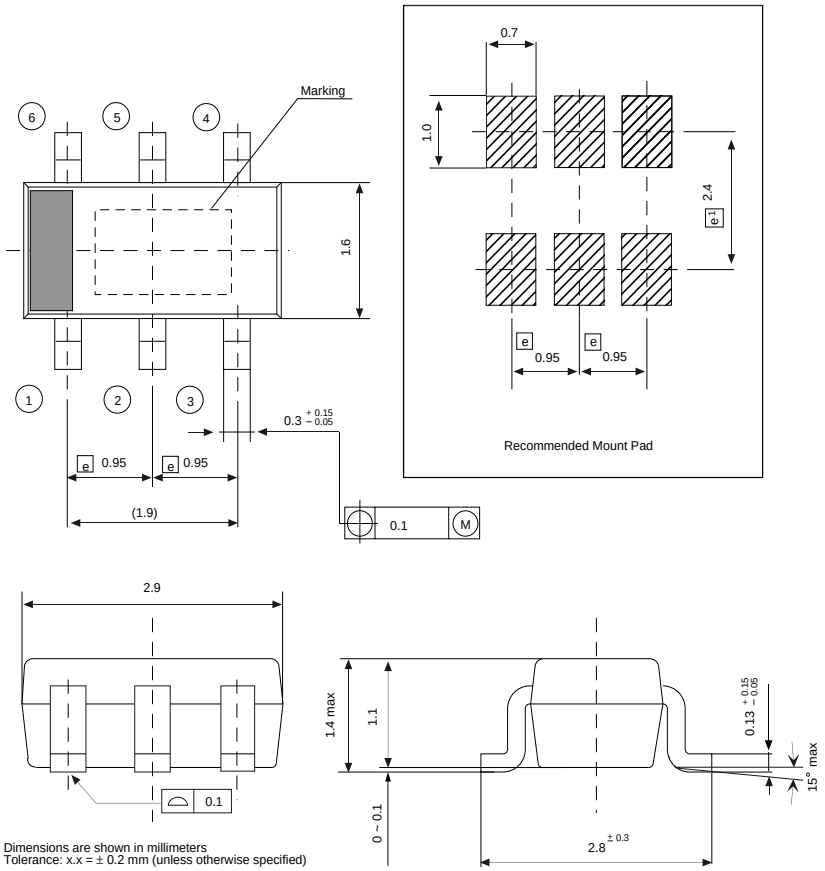


## PIN FUNCTION DESCRIPTION

| TERMINAL | | | INTERNAL EQUIVALENT CIRCUIT | DESCRIPTION |
|---|---|---|---|---|
| PIN NO. | SYMBOL | VOLTAGE | | |
| 1 | STANDBY | 1.4 V |  | Standby Logic Terminal. The device is in the standby mode when Pin 1 is connected to Low. The device is in the operating mode when Pin 1 is connected to High or Open. |
| 2 | OUTPUT | 2.5 V |  | Output Terminal. The output is available to drive a 75 Ω + 75 Ω load. |
| 3 | NC | | | No Connection Terminal |
| 4 | INPUT | 2.5 V |  | Input Terminal. The input signal is biased to 2.5 V by a 100 kΩ bias resistor. |
| 5 | GND | GND | | GND Terminal |
| 6 | $V_{CC}$ | $V_{CC}$ | | Power Supply Terminal |

# PACKAGE OUTLINE

## SOT23-6







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

### Marking Information

| | Marking |
|---|---|
| TK15406 | 406 |

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