

OPERATIONAL AMPLIFIER WITH 75 Ω DRIVER

FEATURES

- Fixed Gain (6 dB typ.)
- Internal 75 Ω Driver
- Active High ON/OFF Control with Internal Pull-up
- Very Low Standby Current (typ. $I_{STBY} \le 25 \mu A$)
- Very Small Output Capacitor Using SAG Function Pin
- Very Small SOT23-6 Package
- Single +5 V Power Supply Operation

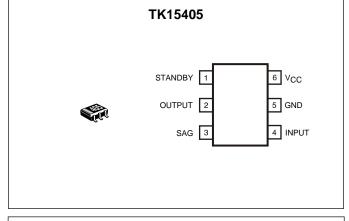
APPLICATIONS

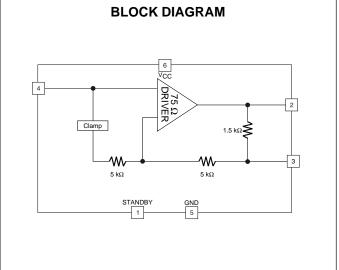
- Video Equipment
- Digital Cameras
- CCD Cameras
- **TV Monitors**
- **■** Video Tape Recorders
- **LCD Projectors**

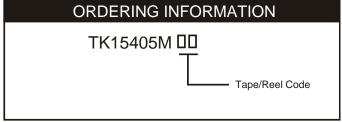
DESCRIPTION

Operating from a single +5 V supply, the TK15405 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 clamped at 1.25 V and amplified 6 dB to produce 2 V_{p-p} (typical) into a series 75 Ω resistor and 75 Ω cable load. The internal 1.5 k SAG function resistor provides gain compensation for low frequency signals. During standby (Pin 1 grounded), the TK15405 consumes only 120 μW of power. Nominal power dissipation (no input) is typically 38 mW.

The TK15405M is available in the very small SOT23-6 surface mount package.







TAPE/REEL CODE TL: Tape Left

TK15405M ABSOLUTE MAXIMUM RATINGS

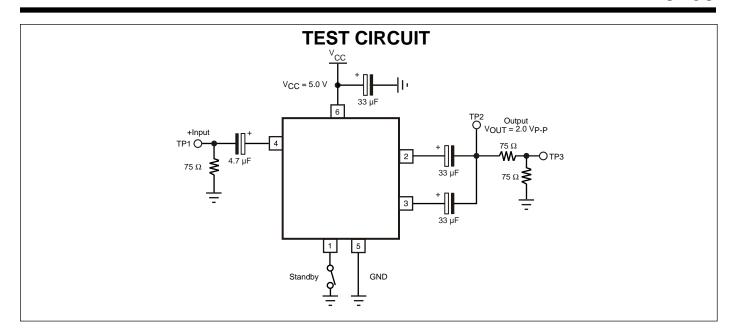
Supply Voltage 6 V	Storage Temperature Range55 to +150 °C
Operating Voltage 4.5 to 5.5 V	Operating Temperature Range25 to +85 °C
Power Dissipation (Note 1)	

TK15405M 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		7.5	10.0	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 _{CMP}	Clamp Voltage	Pin 4 Input terminal	1.05	1.25	1.45	V
GVA	Voltage Gain	f _{in} = 1 MHz	5.4	5.9	6.4	dB
DG	Differential Gain	Staircase signal input	-3.0	-0.6	+3.0	%
DP	Differential Phase	Staircase signal input	-3.0	-0.2	+3.0	deg
fr	Frequency Response	f _{IN} = 1 MHz / 5 MHz		-0.5		dB

Note 1: Power dissipation is 150 mW in free air. Derate at 1.2 mW/ $^{\circ}$ C for operation above 25 $^{\circ}$ C.



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. Clamp Voltage (V_{CMP}) 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. Differential Gain (DG)

The differential gain is measured at TP3 when a staircase waveform of 10 steps is applied to TP1.

9. Differential Phase (DP)

The differential phase is measured at TP3 when a staircase waveform of 10 steps is applied to TP1.

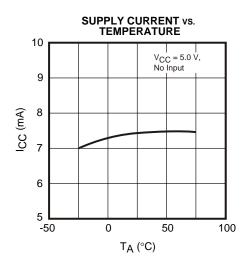
10. Frequency Response (fr)

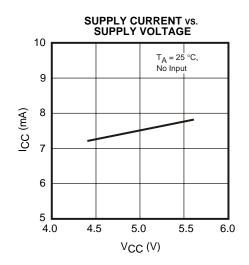
The frequency response equation is as follows:

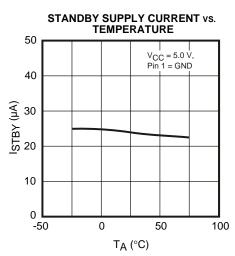
 $fr = 20 \log_{10} V2/V1$

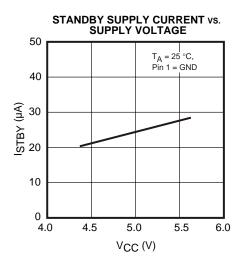
Where V1 is the measured TP3 voltage when the TP1 input frequency is set to 1 MHz and V2 is the measured TP3 voltage when the TP1 input frequency is set to 5 MHz.

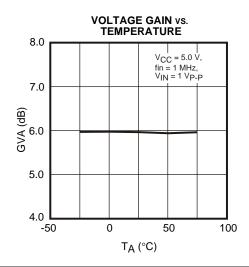
TYPICAL PERFORMANCE CHARACTERISTICS

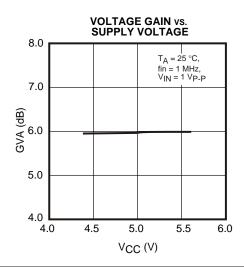




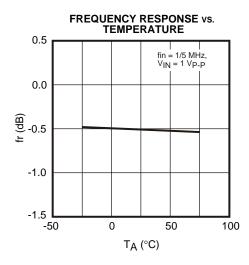


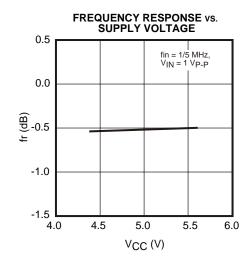


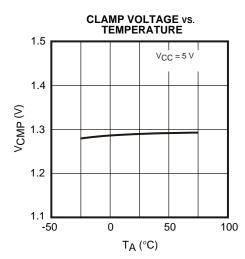


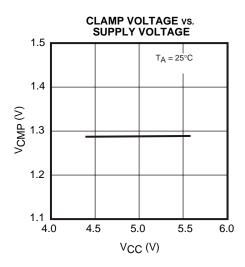


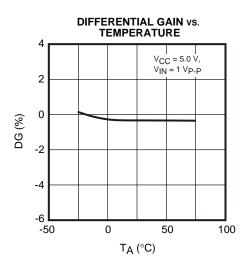
TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

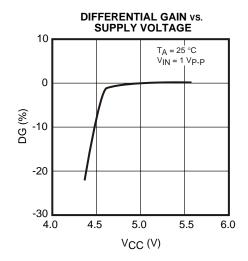




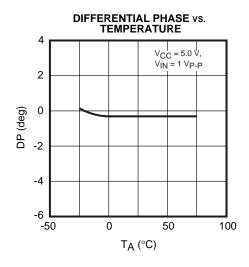


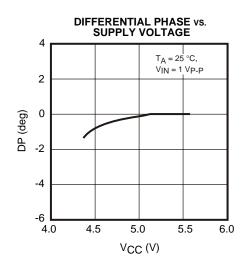






TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)





PIN FUNCTION DESCRIPTION

TERMINAL					
PIN NO.	SYMBOL	VOLTAGE	INTERNAL EQUIVALENT CIRCUIT	DESCRIPTION	
1	STANDBY	1.4 V	200 k	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 3	OUTPUT SAG	1.25 V 1.25 V	V _{CC} 2 1.5 k 3	Pin 2: Output Terminal. Pin 2 is available to drive a 75 Ω + 75 Ω load. Pin 3: SAG Terminal.	
4	INPUT	1.25 V	1.25 V T	Input Terminal. The luminance input signal is clamped at 1.25 V.	
5	GND	GND		GND Terminal	
6	V _{cc}	V _{cc}		Power Supply Terminal	

PACKAGE OUTLINE

SOT23-6 TK15405 (4) 2.4 e_1 9. e 0.95 (1) (2) (3) 0.3 + 0.15 Recommended Mount Pad e 0.95 e 0.95 (M) 0.1 2.9 0.1 2.8^{± 0.3} Dimensions are shown in millimeters Tolerance: $x.x = \pm 0.2$ mm (unless otherwise specified)

Marking Information

Marking 405

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