

## 75 Ω VIDEO LINE DRIVER

### FEATURES

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

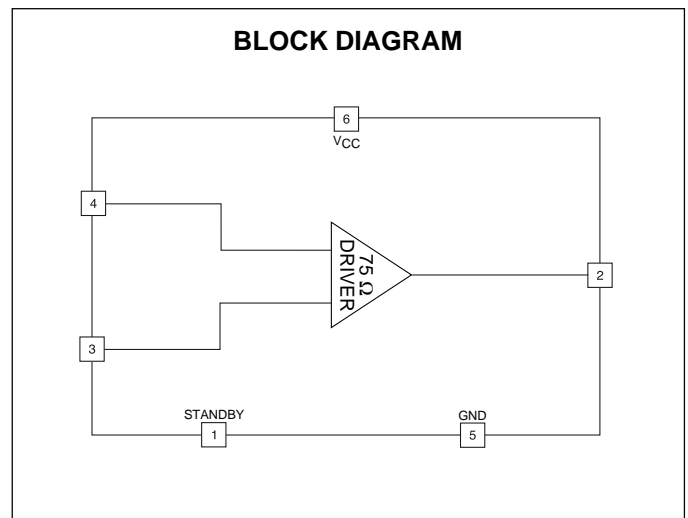
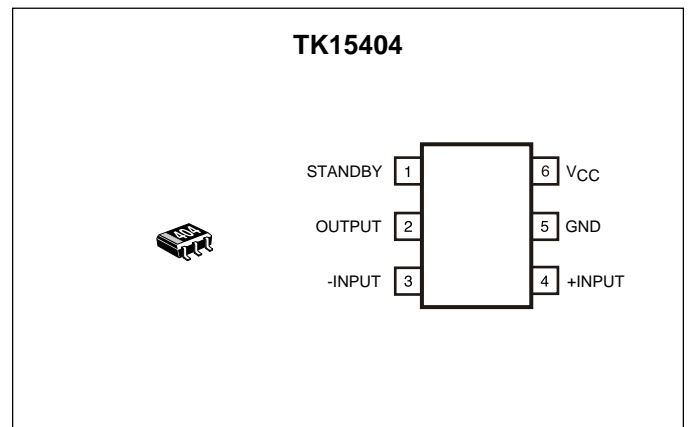
### APPLICATIONS

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

### DESCRIPTION

Operating from a single +5 V supply, the TK15404 is a single-channel video driver IC that takes a standard video signal as the analog input and provides a buffered analog output for driving a 150 Ω load (series 75 Ω resistor and 75 Ω cable load). The standard video input signal (1 V<sub>P-P</sub>) is typically amplified 6 dB using external components to produce a 2 V<sub>P-P</sub> signal into an AC-coupled 150 Ω load. During standby (Pin 1 grounded), the TK15404 consumes only 120 μW of power. Nominal power dissipation (no input) is typically 32 mW.

The TK15404M is available in the very small SOT23-6 surface mount package.



**ORDERING INFORMATION**

TK15404M

└─ Tape/Reel Code

TAPE/REEL CODE  
TL: Tape Left

# TK15404

## TK15404M ABSOLUTE MAXIMUM RATINGS

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

## TK15404M ELECTRICAL CHARACTERISTICS

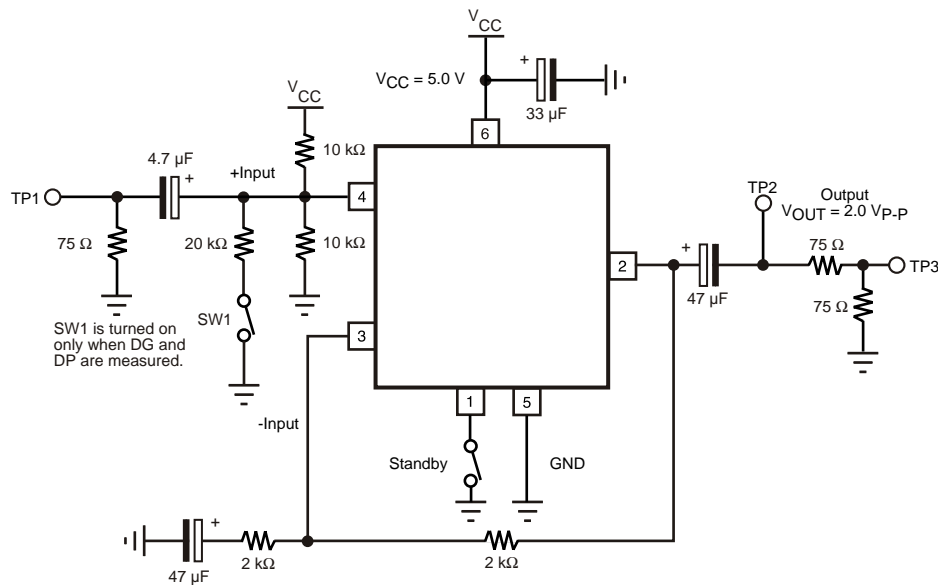
Test conditions:  $V_{CC} = 5.0\text{ V}$ ,  $V_{IN} = 1.0\text{ V}_{P-P}$ ,  $R_L = 150\ \Omega$ ,  $T_A = 25\text{ °C}$  unless otherwise specified.

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	$\mu\text{A}$
$I_{OS}$	Standby Terminal Current	Pin 1 in Standby mode		24.0	50.0	$\mu\text{A}$
$V_{THL}$	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
GVA	Voltage Gain	$f_{in} = 1\text{ MHz}$ (Note 2)	5.7	6.0	6.3	dB
fr 1	Frequency Response 1	$f_{in} = 1\text{ MHz} / 5\text{ MHz}$		0.0		dB
fr 2	Frequency Response 2	$f_{in} = 1\text{ MHz} / 10\text{ MHz}$		-0.6		dB
THD	Total Harmonic Distortion	$f_{in} = 1.0\text{ kHz}$		0.2	1.0	%
$V_{OUT(MAX)}$	Maximum Output Voltage	THD = 10% point	1.0	1.2		Vrms
S/N	Signal to Noise Ratio	Pedestal signal		-70		dB
DG	Differential Gain	Staircase signal input	-3.0		+3.0	%
DP	Differential Phase	Staircase signal input	-3.0		+3.0	deg
GVO	Open Circuit Voltage Gain			40		dB
BW	Frequency Band Width			20		MHz
SR	Slew Rate			70		V/ $\mu\text{s}$
$C_{IN}$	Input Capacitance			9		pF
$R_{IN}$	Input Resistance			1.6		M $\Omega$

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

Note 2: Set by external components.

## 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. Voltage Gain (GVA)

The voltage gain equation is as follows:

$$GVA = 20 \log_{10} V_2/V_1$$

Where  $V_1$  is the input voltage at TP1 and  $V_2$  is the measured output voltage at TP2.

## 7. Frequency Response (fr)

The frequency response equation is as follows:

$$fr = 20 \log_{10} V_2/V_1$$

Where  $V_1$  is the measured TP3 voltage when the TP1 input frequency is set to 1 MHz and  $V_2$  is the measured TP3 voltage when the TP1 input frequency is set to 5 MHz. Furthermore,  $V_1$  is the measured TP3 voltage when the TP1 input frequency is set to 1 MHz and  $V_2$  is the measured TP3 voltage when the TP1 input frequency is set to 10 MHz.

## MEASUREMENT METHOD

### 8. Total Harmonic Distortion (THD)

The TP3 signal is measured when a 1 kHz 1  $V_{p-p}$  input signal is applied to TP1.

### 9. 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%.

### 10. Signal to Noise Ratio (S/N)

The signal to noise ratio is measured at TP3 when a pedestal input signal is applied to TP1.

### 11. Differential Gain (DG)

SW1 is closed to change the input bias voltage.

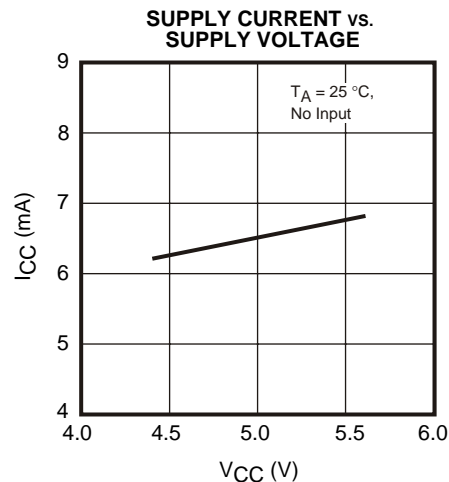
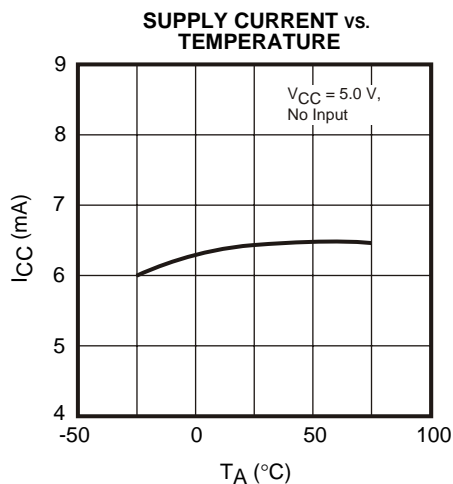
The differential gain is measured at TP3 when a staircase waveform of 10 steps is applied to TP1.

### 12. Differential Phase (DP)

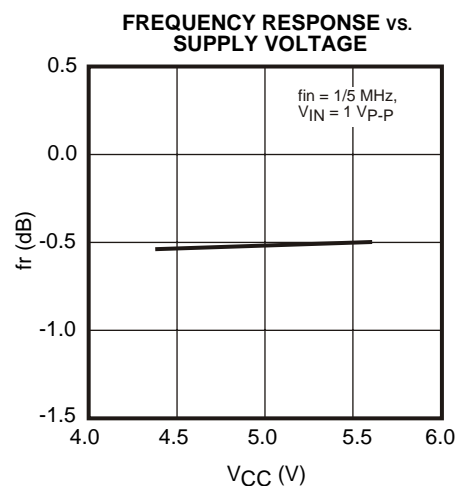
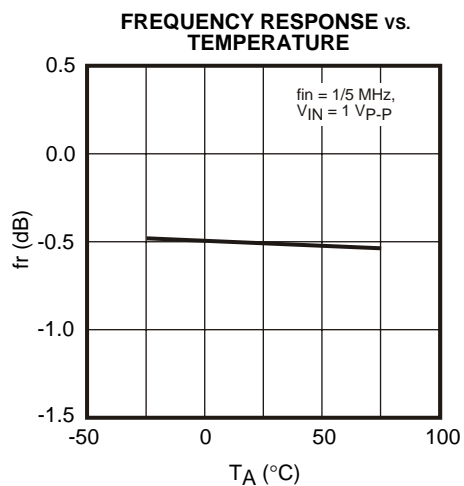
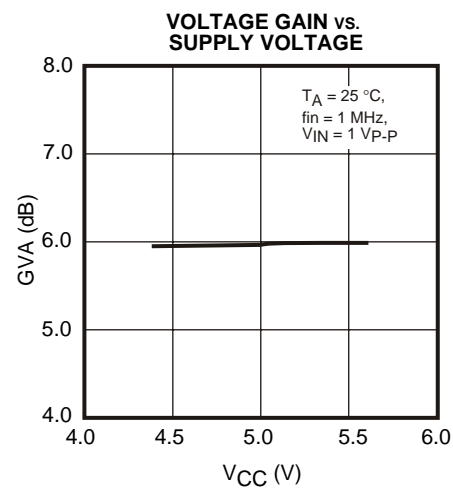
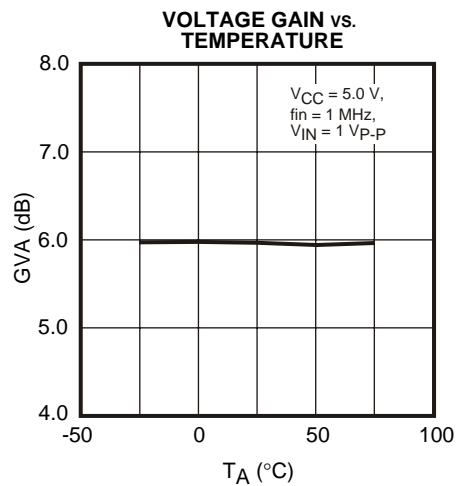
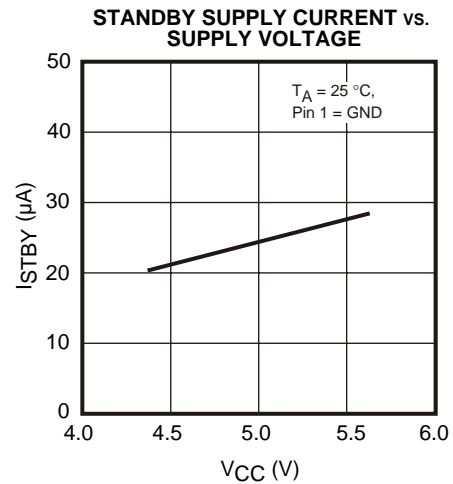
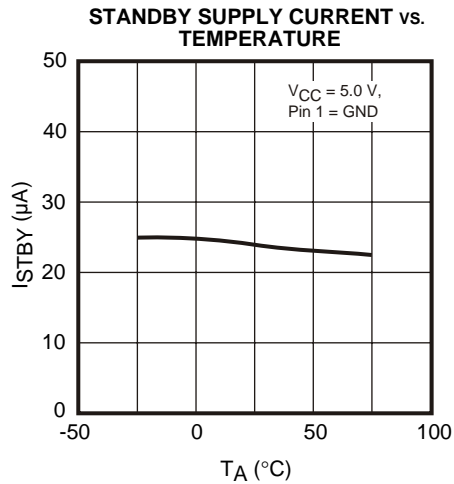
SW1 is closed to change the input bias voltage.

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

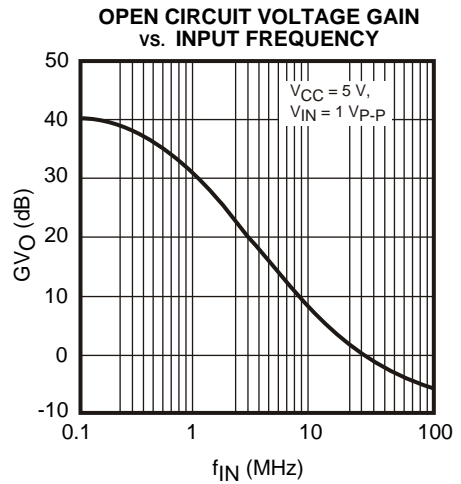
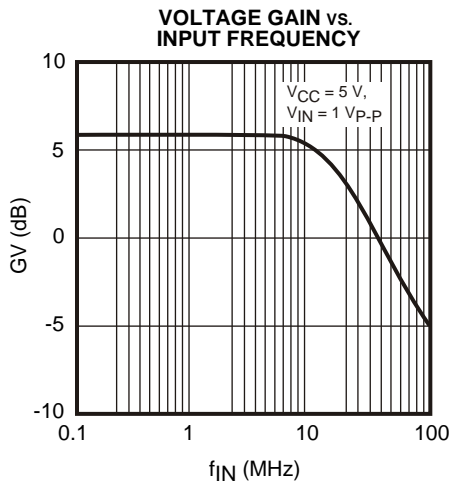
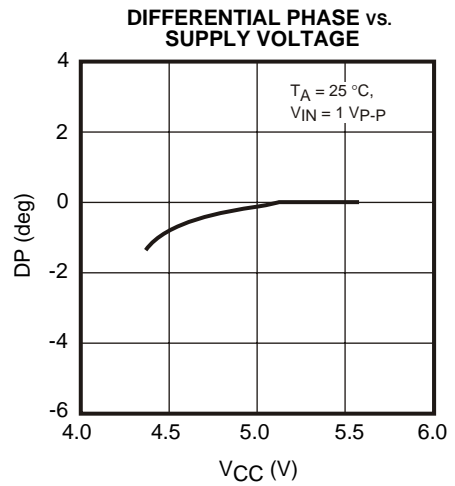
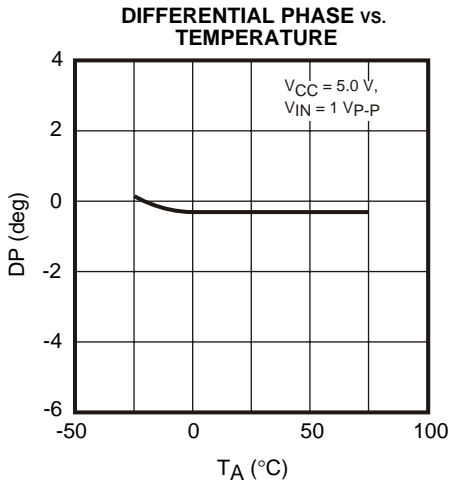
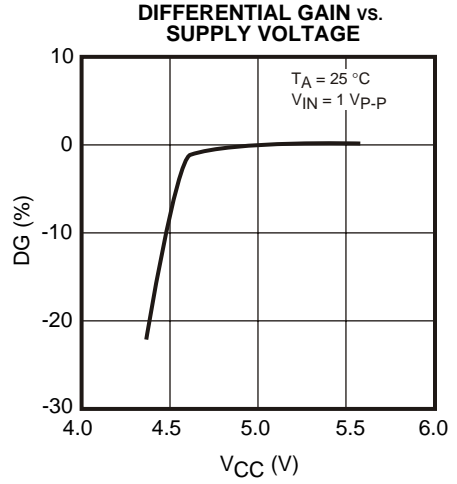
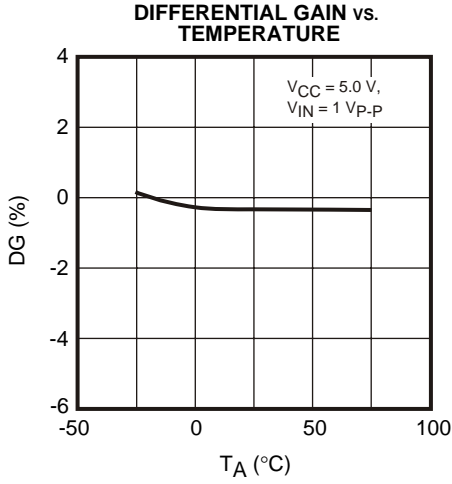
## TYPICAL PERFORMANCE CHARACTERISTICS



## TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)



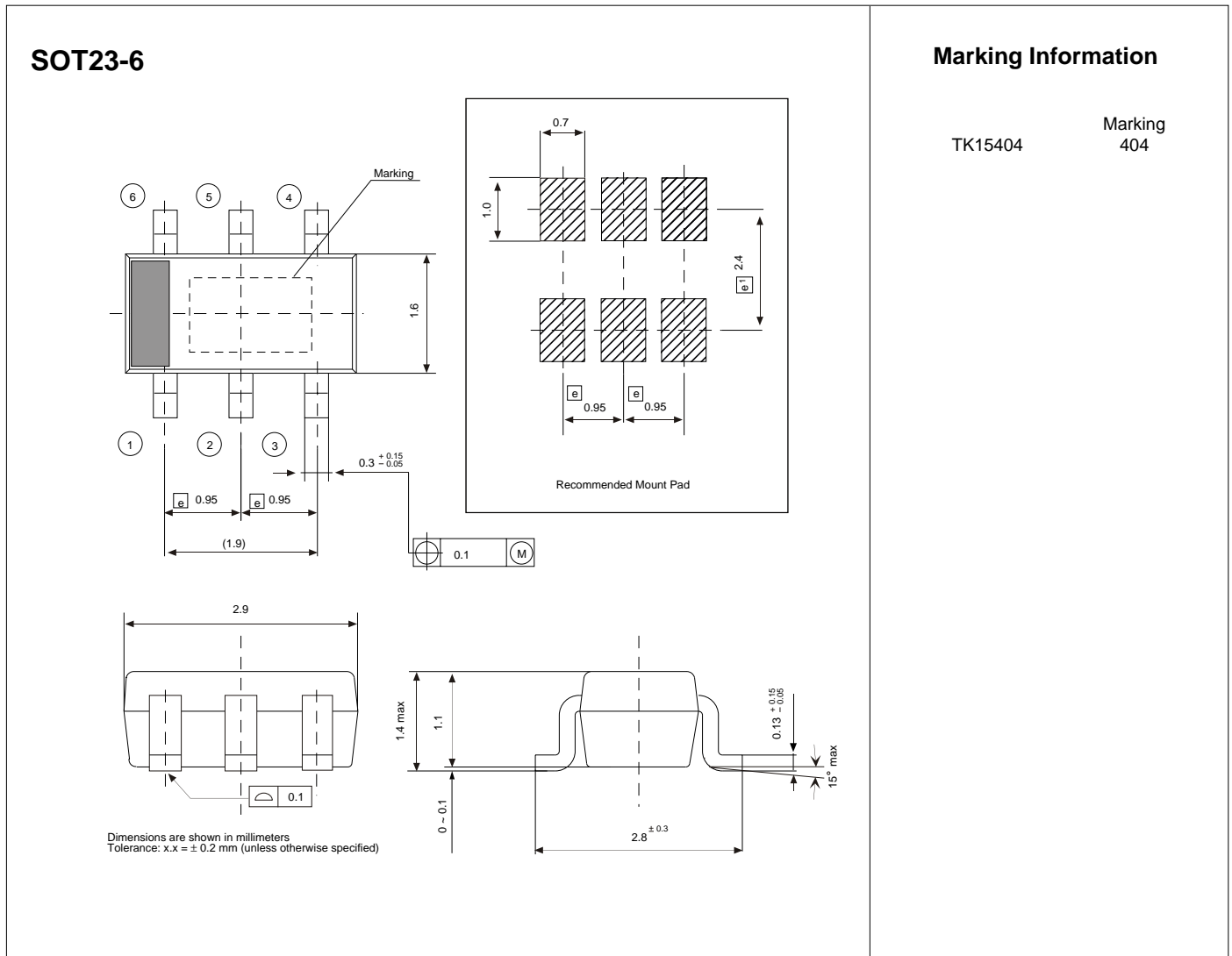
TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)



## 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			Output Terminal. The output is available to drive a 75 Ω + 75 Ω load.
3 4	-INPUT +INPUT			Pin 3: Inverting Signal Input Terminal. Pin 4: Non-inverting Input Terminal.
5	GND	GND		GND Terminal
6	V <sub>CC</sub>	V <sub>CC</sub>		Power Supply Terminal

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