TOKO

TK15403

75 Ω VIDEO LINE DRIVER

FEATURES

- Internal 75 Ω Drivers
- 20 MHz Gain Band Width
- 2 Channel High Speed Operational Amplifiers
- Very Small SOT23L-8 Package
- Single +5 V Power Supply Operation

APPLICATIONS

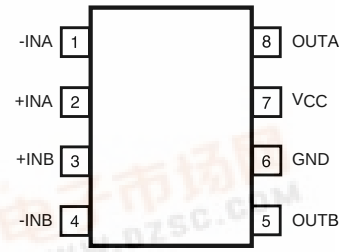
- Video Equipment
- Digital Cameras
- CCD Cameras
- TV Monitors
- Video Tape Recorders
- LCD Projectors

DESCRIPTION

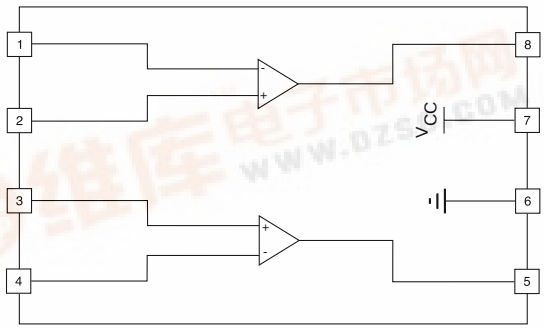
Operating from a single +5 V supply, the TK15403M is a dual video line driver IC that takes standard video signals as analog inputs and provides buffered analog outputs for driving 150 Ω loads (series 75 Ω resistor and 75 Ω cable load). The standard video input signals (1 V_{P-P}) are typically amplified 6 dB using external components to produce a 2 V_{P-P} signal into an AC-coupled 150 Ω load. Nominal power dissipation (no input) is typically 56 mW.

The TK15403M is available in the very small SOT23L-8 surface mount package.

TK15403



BLOCK DIAGRAM



ORDERING INFORMATION

TK15403M □□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... 6 V
Operating Voltage ..... 4.5 to 5.5 V
Power Dissipation (Note 1) ..... 200 mW
Storage Temperature Range ..... -55 to +150 °C
Operating Temperature Range .....-25 to +75 °C

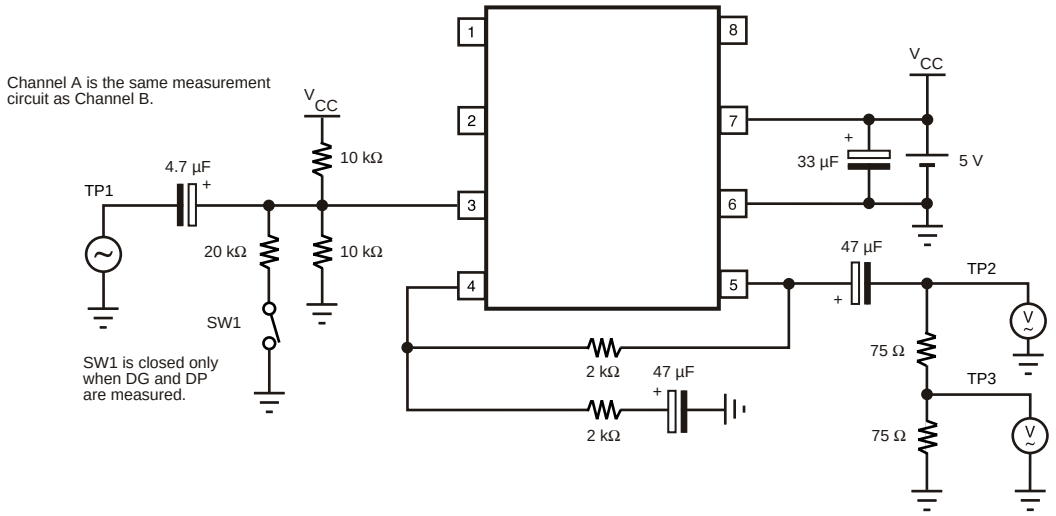
TK15403M ELECTRICAL CHARACTERISTICS

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		11.1	16.0	mA
GVA	Voltage Gain	f_{in} = 1 MHz (Note 2)	5.7	6.0	6.3	dB
fr 1	Frequency Response 1	f_{in} = 1 MHz / 5 MHz		0.4		dB
fr 2	Frequency Response 2	f_{in} = 1 MHz / 10 MHz		-1.2		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
CT	Cross Talk	f_{in} = 1 MHz		-57	-40	dB
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/µS
C_{IN}	Input Capacitance			9		pF
R_{IN}	Input Resistance			1.6		MΩ

Note 1: Power dissipation is 200 mW in free air. Derate at 1.6 mW/°C for operation above 25°C.
Note 2: Set by external components.

TEST CIRCUIT



MEASUREMENT METHOD

1. Supply Current (I_{CC})
The Pin 7 current is measured with no input signal.

2. 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 voltage at TP2.

3. Frequency Response (fr1 and fr2)
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.
For fr1 V2 is the measured TP3 voltage when the TP1 input frequency is set to 5 MHz.
For fr2 V2 is the measured TP3 voltage when the TP1 input frequency is set to 10 MHz.
These measurements and calculations are taken for both channels.

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

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

6. Cross Talk (CT)
The Cross Talk equation is as follows:
CT = 20 $\log_{10}$ V1/V2
V1 is measured at output B when a 1 MHz input frequency and 1 V_{P-P} input signal voltage is applied to Input A, V2 is measured at Output B when a 1 MHz input frequency and 1 V_{P-P} input signal voltage is applied to Input B.
CT is also calculated at the opposite side when V1 is measured at Output A when input signal is applied to Input B and V2 is measured at Output A when input signal is applied to Input A.

MEASUREMENT METHOD (CONT.)

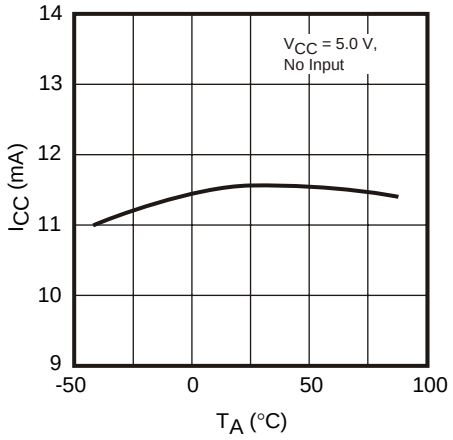
7. Signal to Noise Ratio (S/N)
The signal to noise ratio is measured at TP3 when the pedestal signal input is applied to TP1.

8. 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.

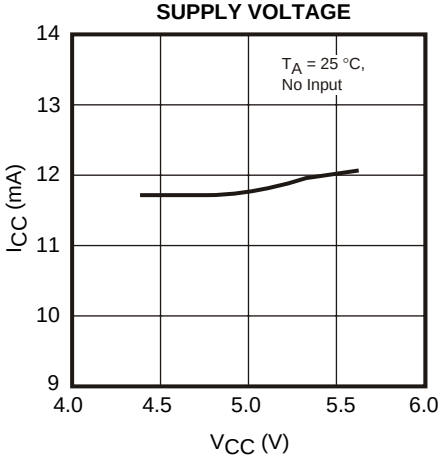
9. Differential Phase (DP)
SW1 is closed to change the input bias voltage.
The differential phase is measured at TP3 when a staircase waveform of 10 steps is applied to TP1.

TYPICAL PERFORMANCE CHARACTERISTICS

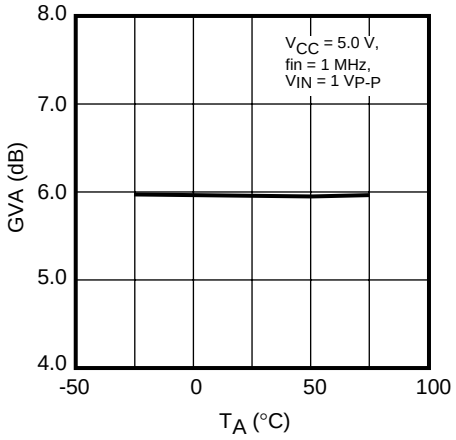
SUPPLY CURRENT vs. TEMPERATURE



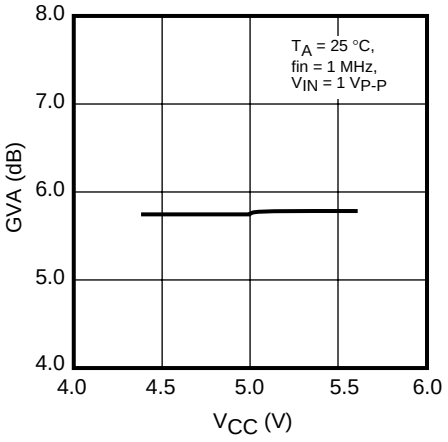
SUPPLY CURRENT vs. SUPPLY VOLTAGE



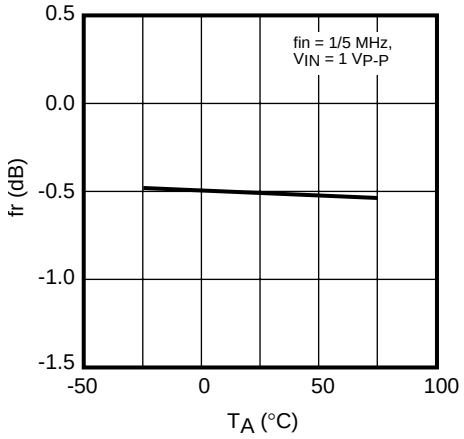
VOLTAGE GAIN vs. TEMPERATURE



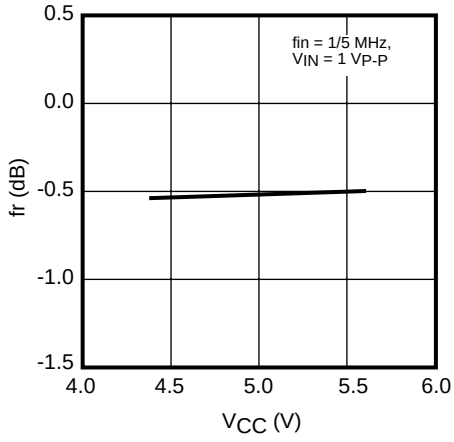
VOLTAGE GAIN vs. SUPPLY VOLTAGE



FREQUENCY RESPONSE vs. TEMPERATURE

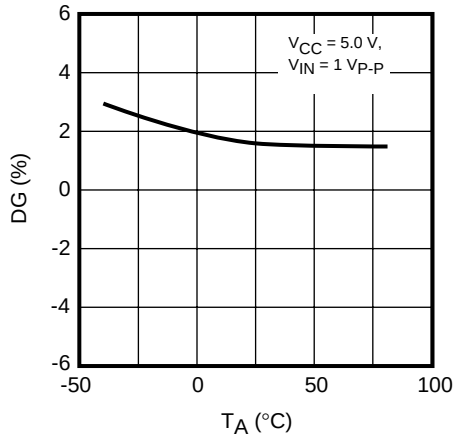


FREQUENCY RESPONSE vs. SUPPLY VOLTAGE

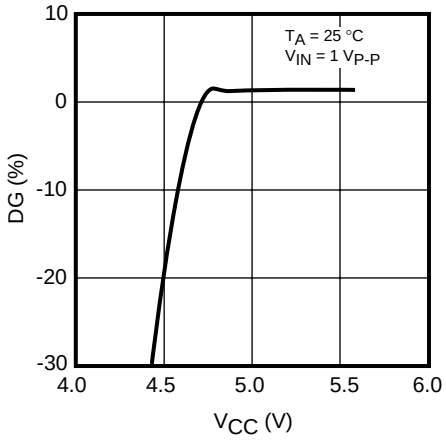


TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

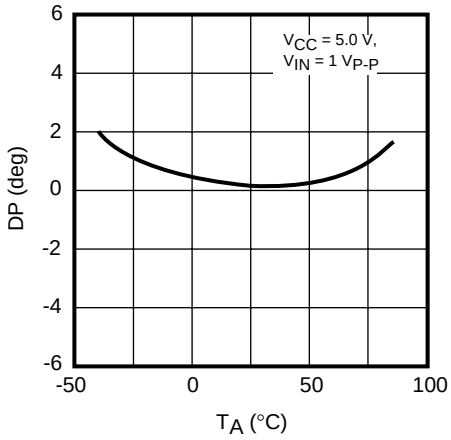
DIFFERENTIAL GAIN vs. TEMPERATURE



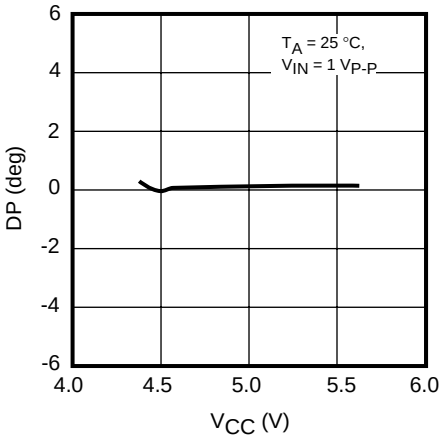
DIFFERENTIAL GAIN vs. SUPPLY VOLTAGE



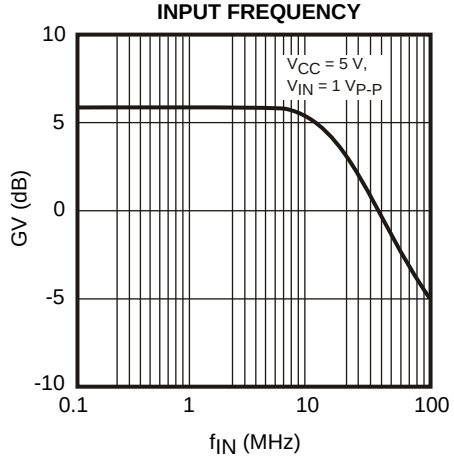
DIFFERENTIAL PHASE vs. TEMPERATURE



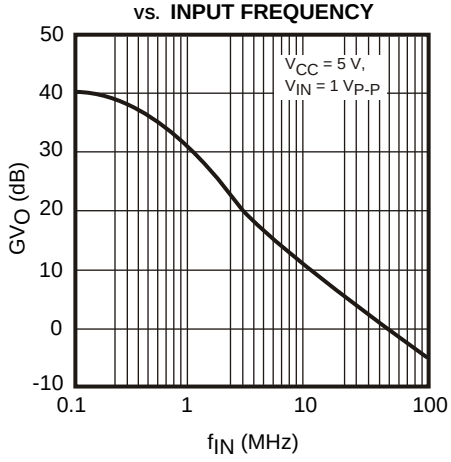
DIFFERENTIAL PHASE vs. SUPPLY VOLTAGE

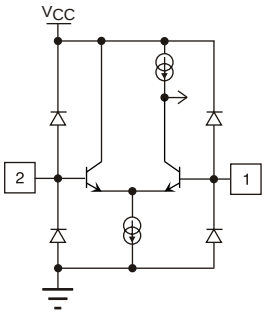
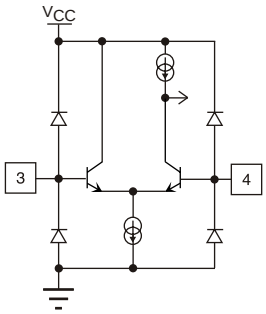
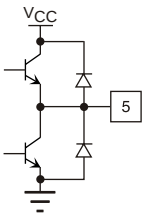
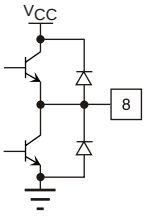


VOLTAGE GAIN vs. INPUT FREQUENCY



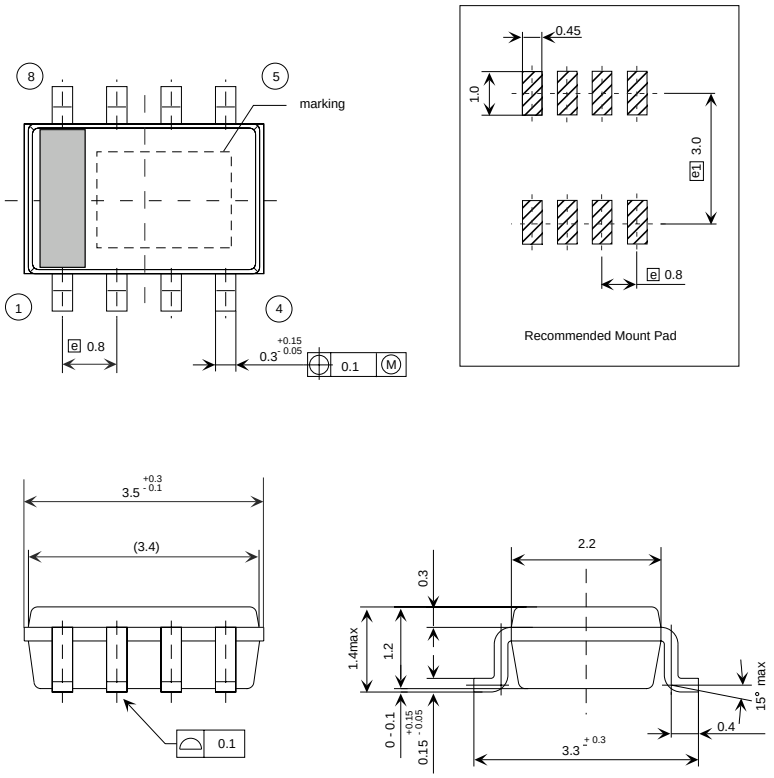
OPEN CIRCUIT VOLTAGE GAIN vs. INPUT FREQUENCY



TERMINAL			INTERNAL EQUIVALENT CIRCUIT	DESCRIPTION
PIN NO.	SYMBOL	VOLTAGE		
1 2	-INPUT +INPUT			Pin 1 is the inverting input for Channel A. Pin 2 is the non-inverting input for Channel A.
3 4	+INPUT -INPUT			Pin 3 is the non-inverting input for Channel B. Pin 4 is the inverting input for Channel B.
5	OUTPUT			Output terminal for Channel B. Pin 5 is available to drive 75 Ω + 75 Ω load.
6	GND	GND		GND terminal.
7	V_{CC}	V_{CC}		Power supply terminal.
8	OUTPUT			Output terminal for Channel A. Pin 8 is available to drive 75 Ω + 75 Ω load.

PACKAGE OUTLINE

SOT23L-8



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

Marking Information

	Marking
TK15403	403

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