LOW VOLTAGE OPERATIONAL AMPLIFIER

FEATURES

- **Very Low and Wide Operating Voltage Range (V_{OP} = 1.0 to 7 V)**
- **Very Wide Input Signal Voltage Range (V_{IN} = 0 V to 1.4 V_{P-P})**
- **Very Large Output Signal ($V_{OUT(MAX)}$ = 1.4 V_{P-P})**
- **Very Large Output (Source) Current ($I_{OUT(MAX)}$ = 660 μA)**
- **Very Small SOT23L-6 Package**

APPLICATIONS

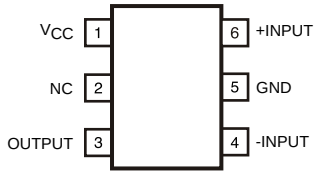
- **Battery-Powered Equipment**

DESCRIPTION

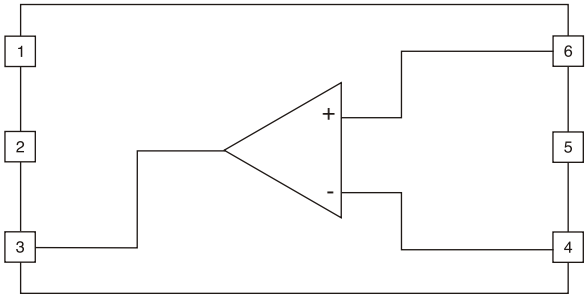
The TK17010 is a single-supply operational amplifier capable of operating from a very low and very wide supply voltage range (V_{CC} = 1.0 to 7 V). With its rail-to-rail structures, the input signal circuit can accept a very wide input voltage range (V_{IN} = 0 to 1.4 V_{P-P}). The TK17010 can also provide a very large output signal ($V_{OUT(MAX)}$ = 1.4 V_{P-P}) while operating from a single 1.5 volt supply. This makes the TK17010 ideal for battery-operated equipment.

The TK17010 is available in the very small SOT23L-6 Surface Mount Package.

TK17010



BLOCK DIAGRAM



ORDERING INFORMATION

TK17010M□□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... 8.0 V
Power Dissipation (Note 1) ..... 200 mW
Storage Temperature Range ..... -55 to +150 °C
Operating Temperature Range .....-20 to +75 °C
Operating Voltage Range..... 1.0 to 7.0 V

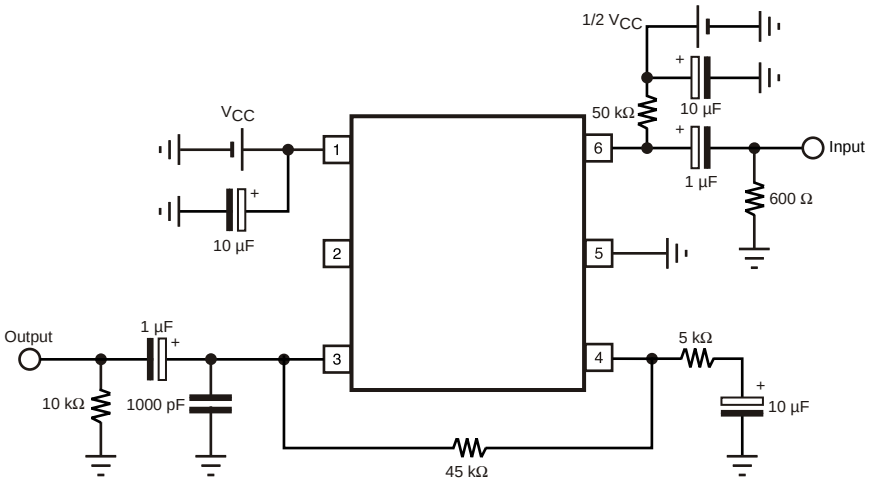
TK17010M ELECTRICAL CHARACTERISTICS

Test conditions: V_{CC} = 1.5 V, f_{IN} = 1.0 kHz, R_L = 10 kΩ, T_A = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{CC}	Supply Current			1.0	1.5	mA
$V_{IN(MAX)}$	Maximum Input Voltage	Gain = 0 dB, THD = 1%	1.2	1.4		V_{P-P}
$V_{OUT(MAX)}$	Maximum Output Voltage		1.3	1.4		V_{P-P}
I_{IB}	Input Bias Current	Pin 4, Pin 6	-0.9		+0.9	µA
$I_{OUT(MAX)}$	Maximum Output Current	Source Current	450	660		µA
GVO	Open Circuit Voltage Gain			96		dB
BW	Frequency Band Width			350		kHz
GVA	Voltage Gain	V_{IN} = 30 mV_{rms}	18.5	20.0	21.5	dB
THD	Total Harmonic Distortion	V_{IN} = 30 mV_{rms}		0.07	0.30	%
V_{ni}	Noise Voltage Referred to Input	BW = 400 Hz to 30 kHz		26	60	µV

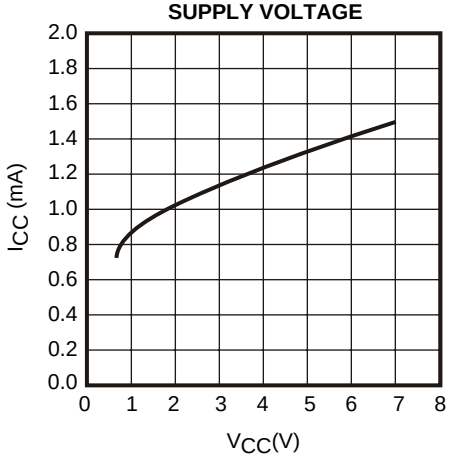
Note 1: Power dissipation is 200 mW in free air. Derate at 1.6 mW/°C for operation above 25°C.

TEST CIRCUIT

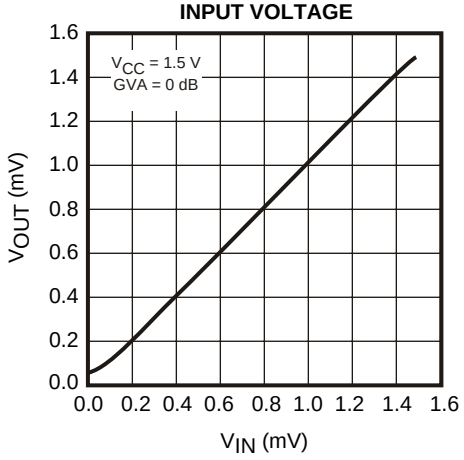


TYPICAL PERFORMANCE CHARACTERISTICS

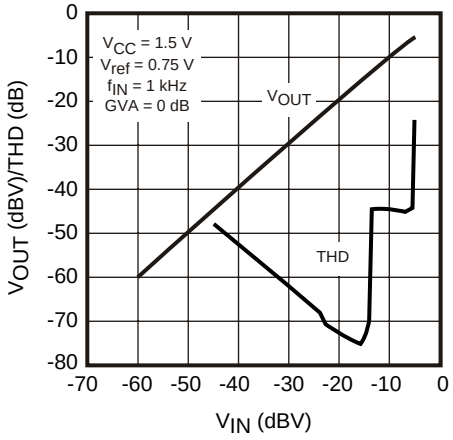
SUPPLY CURRENT vs. SUPPLY VOLTAGE



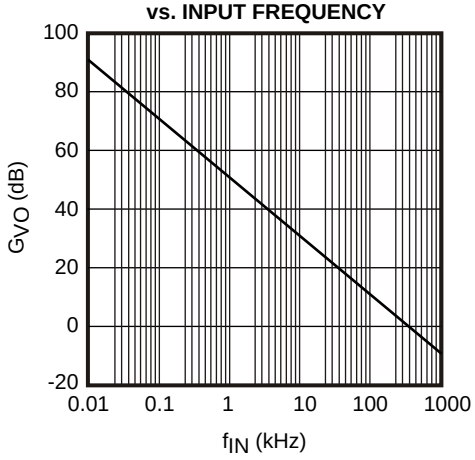
OUTPUT VOLTAGE vs. INPUT VOLTAGE



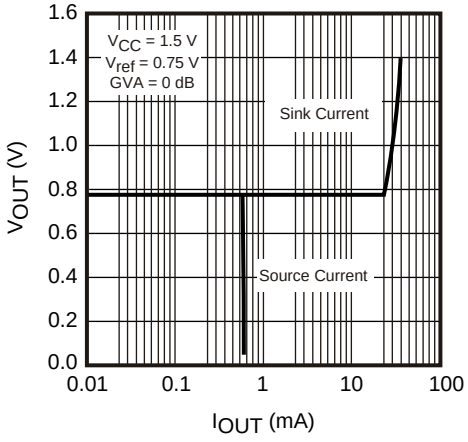
OUTPUT VOLTAGE/TOTAL HARMONIC DISTORTION vs. INPUT VOLTAGE



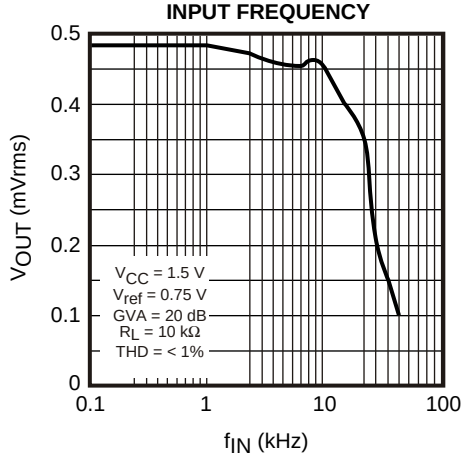
OPEN CIRCUIT VOLTAGE GAIN vs. INPUT FREQUENCY



OUTPUT VOLTAGE vs. OUTPUT CURRENT

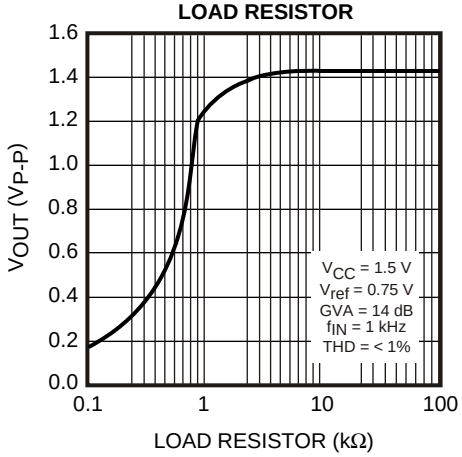


OUTPUT VOLTAGE vs. INPUT FREQUENCY

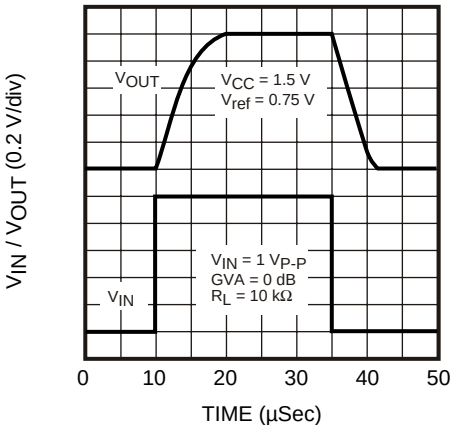


TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

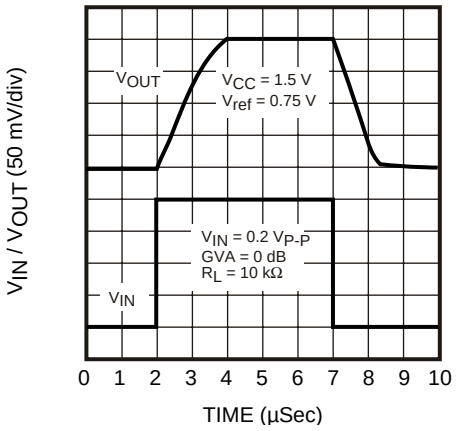
OUTPUT VOLTAGE vs. LOAD RESISTOR



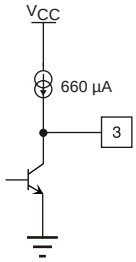
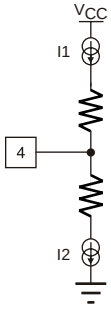
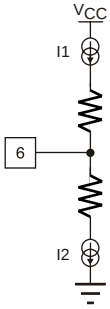
INPUT VOLTAGE/OUTPUT VOLTAGE vs. TIME



INPUT VOLTAGE/OUTPUT VOLTAGE vs. TIME



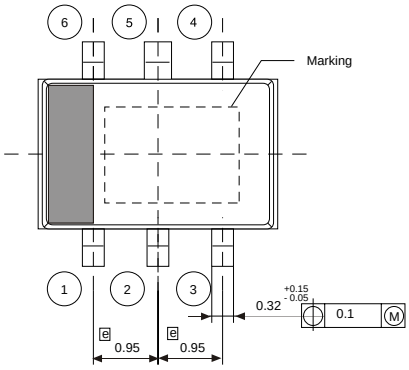
TERMINAL VOLTAGE AND CIRCUIT

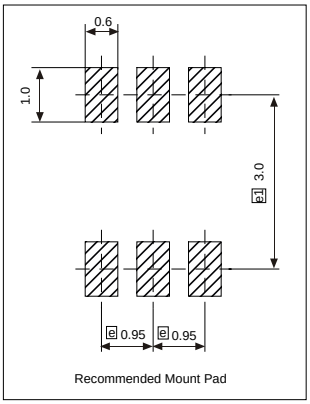
TERMINAL			INTERNAL EQUIVALENT CIRCUIT	DESCRIPTION
PIN NO.	SYMBOL	VOLTAGE		
1	V_{CC}	V_{CC}		Power Supply terminal.
2	NC			
3	OUTPUT	1/2 V_{CC}		Output terminal. The output can approach the supply voltage according to a Class A output system.
4	-INPUT	1/2 V_{CC}		Inverted Input Signal terminal. It has a Level Shifter for low operating voltage.
5	GND	0 V		GND terminal.
6	+INPUT	Approximately V_{OUT}		Non-inverted Input Signal terminal. It has a Level Shifter for low operating voltage.

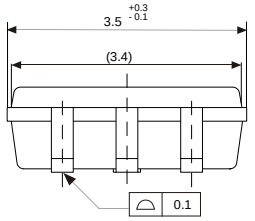
NOTES

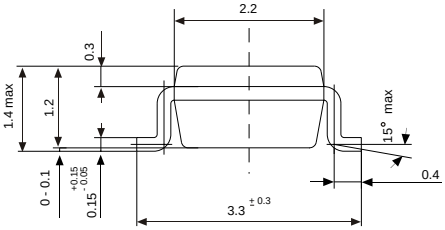
PACKAGE OUTLINE

SOT23L-6









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

Marking Information

	Marking
TK17010M	U0

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