

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 ($I_{OUT(MAX)} = 660$ μ A)
- Very Small SOT23L-6 Package

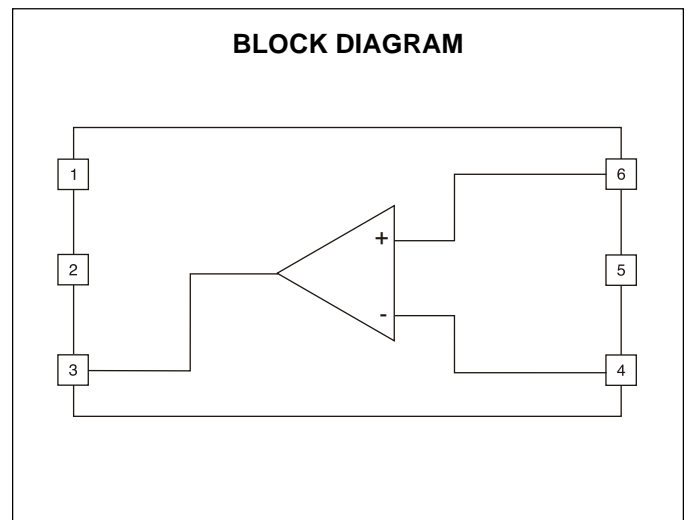
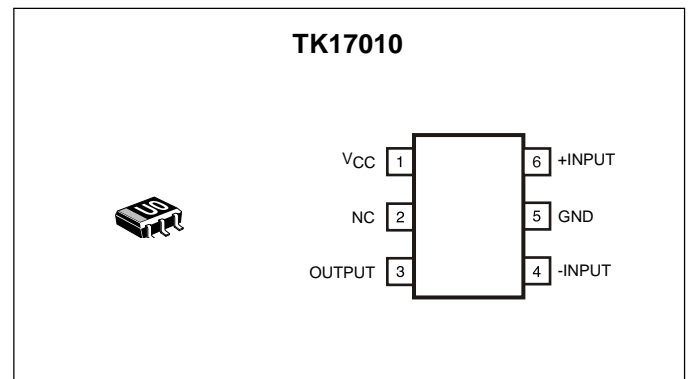
APPLICATIONS

- 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.



ORDERING INFORMATION

TK17010M□□

Tape/Reel Code

TAPE/REEL CODE
TL: Tape Left

TK17010

ABSOLUTE MAXIMUM RATINGS

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

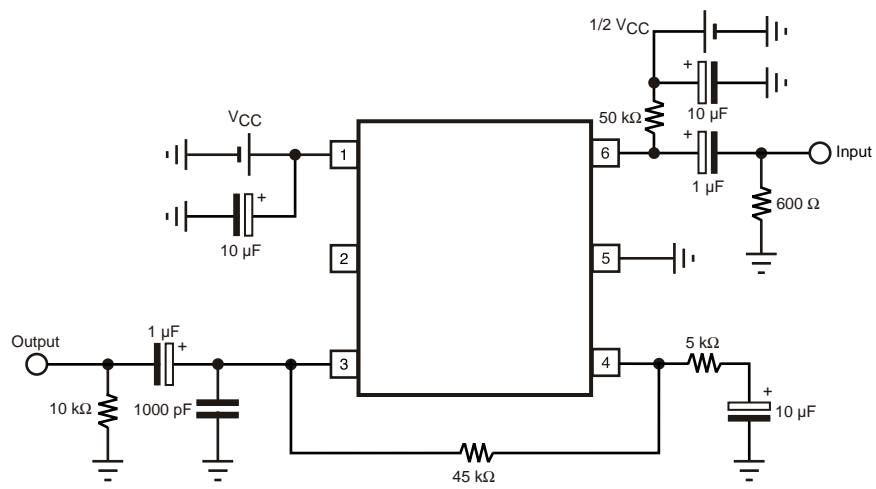
TK17010M ELECTRICAL CHARACTERISTICS

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

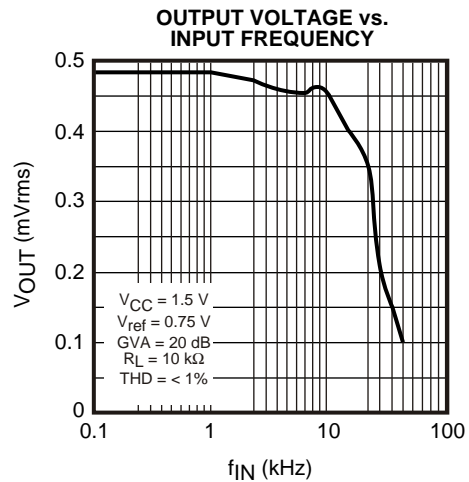
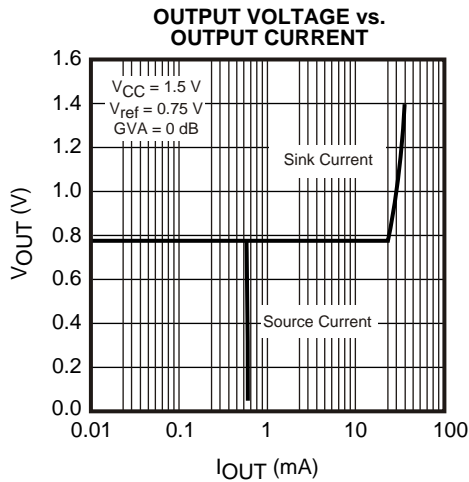
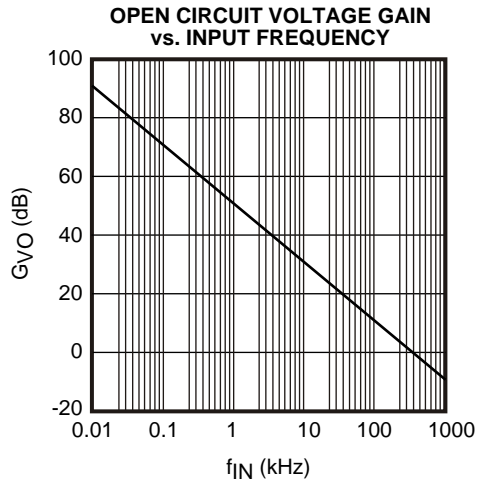
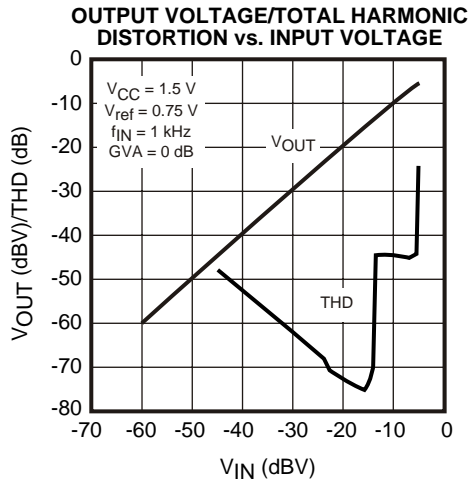
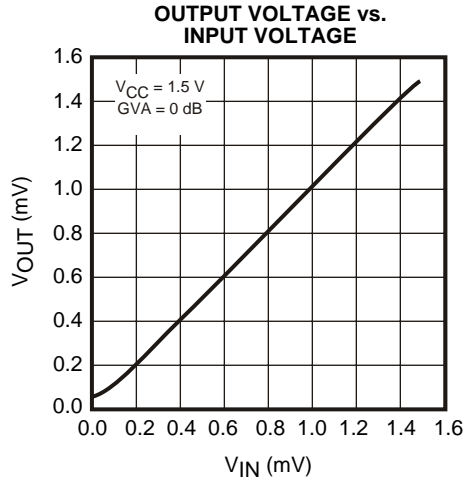
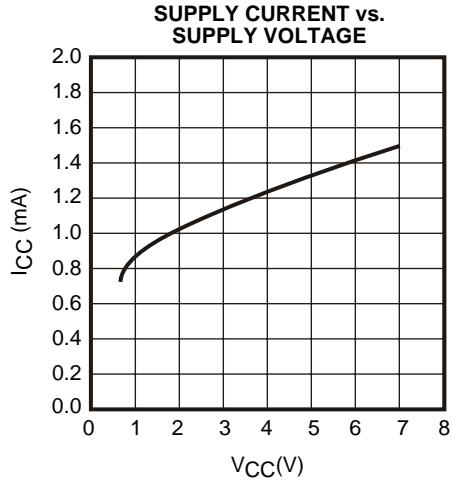
| SYMBOL | PARAMETER | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|----------------|---------------------------------|-------------------------------|------|------|------|---------------|
| I_{CC} | Supply Current | | | 1.0 | 1.5 | mA |
| $V_{IN(MAX)}$ | Maximum Input Voltage | Gain = 0 dB, THD = 1% | 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 | $V_{IN} = 30\text{ mV}_{rms}$ | 18.5 | 20.0 | 21.5 | dB |
| THD | Total Harmonic Distortion | $V_{IN} = 30\text{ mV}_{rms}$ | | 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.

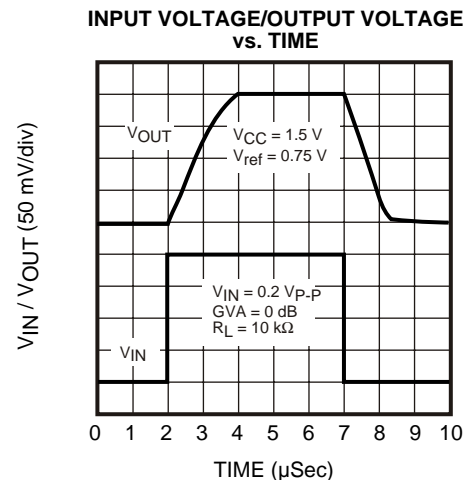
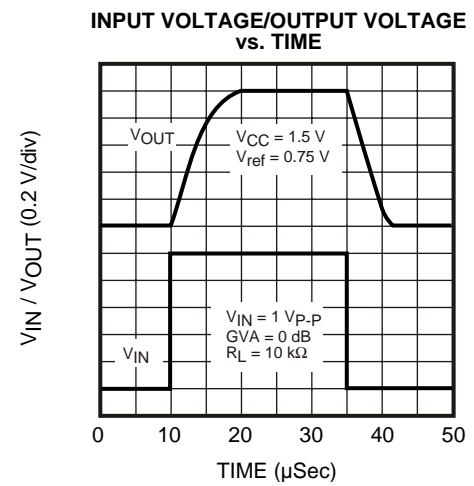
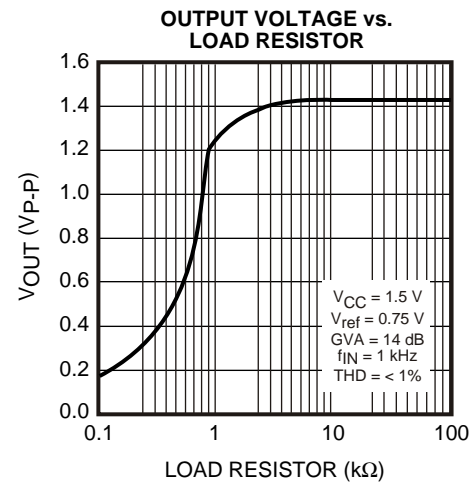
TEST CIRCUIT



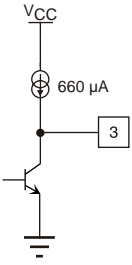
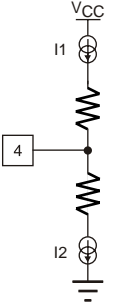
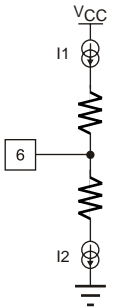
TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (CONT.)

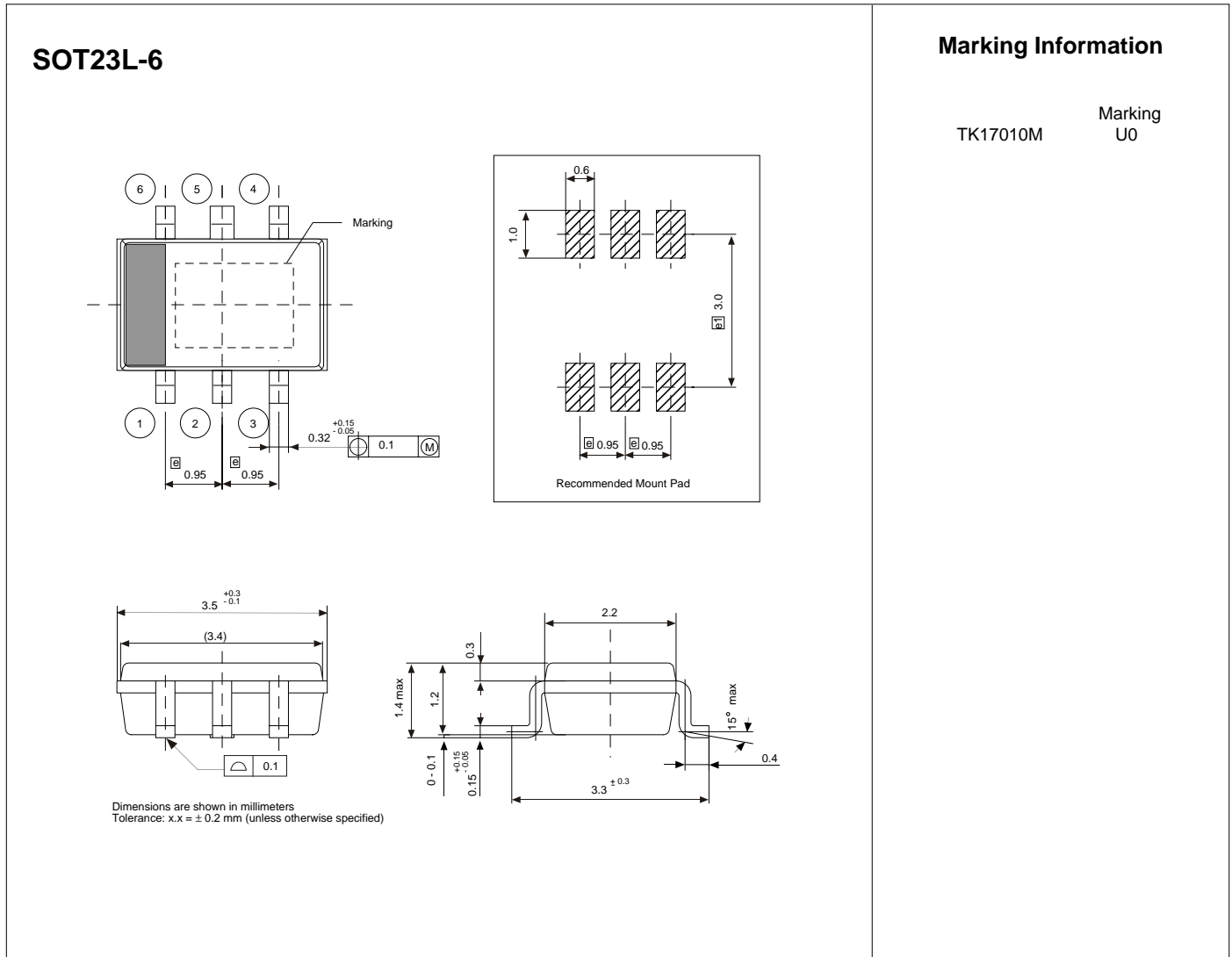


TERMINAL VOLTAGE AND CIRCUIT

| 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



Toko America, Inc. Headquarters
1250 Feehanville Drive, Mount Prospect, Illinois 60056
Tel: (847) 297-0070 Fax: (847) 699-7864

TOKO AMERICA REGIONAL OFFICES

Midwest Regional Office
Toko America, Inc.
1250 Feehanville Drive
Mount Prospect, IL 60056
Tel: (847) 297-0070
Fax: (847) 699-7864

Western Regional Office
Toko America, Inc.
2480 North First Street, Suite 260
San Jose, CA 95131
Tel: (408) 432-8281
Fax: (408) 943-9790

Eastern Regional Office
Toko America, Inc.
107 Mill Plain Road
Danbury, CT 06811
Tel: (203) 748-6871
Fax: (203) 797-1223

Semiconductor Technical Support
Toko Design Center
4755 Forge Road
Colorado Springs, CO 80907
Tel: (719) 528-2200
Fax: (719) 528-2375

Visit our Internet site at <http://www.tokoam.com>

The information furnished by TOKO, Inc. is believed to be accurate and reliable. However, TOKO reserves the right to make changes or improvements in the design, specification or manufacture of its products without further notice. TOKO does not assume any liability arising from the application or use of any product or circuit described herein, nor for any infringements of patents or other rights of third parties which may result from the use of its products. No license is granted by implication or otherwise under any patent or patent rights of TOKO, Inc.