APPLICATION MANUAL

High Current Dual OP Amp
TK17030M

CONTENTS

MEETING YOUR NEEDS
TOKO, INC.

High Current Dual OP Amp
TK17030M

1. DESCRIPTION

The TK17030M is a high current dual operational amplifier.

The features are low voltage operation, high power output currents and a small package.

It is suitable for use with battery powered portable equipment.

2. FEATURES

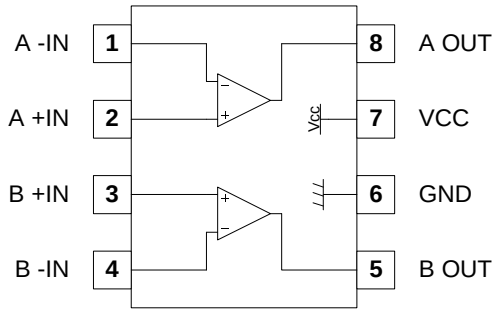
- Low Voltage Operation V_{OP}=1.8V to 10V
- Low Supply Current I_{CC}=2.4mA
- Hi Output Current I_{SI}=110mA, I_{SO}=90mA
- Slew Rate SR=1.0V/µsec
- Unity Gain Bandwidth GB=2.0MHz
- Small Package SOT23L-8

3. APPLICATIONS

- General Purpose
- Portable Equipment
- Low Operating Voltage Equipment

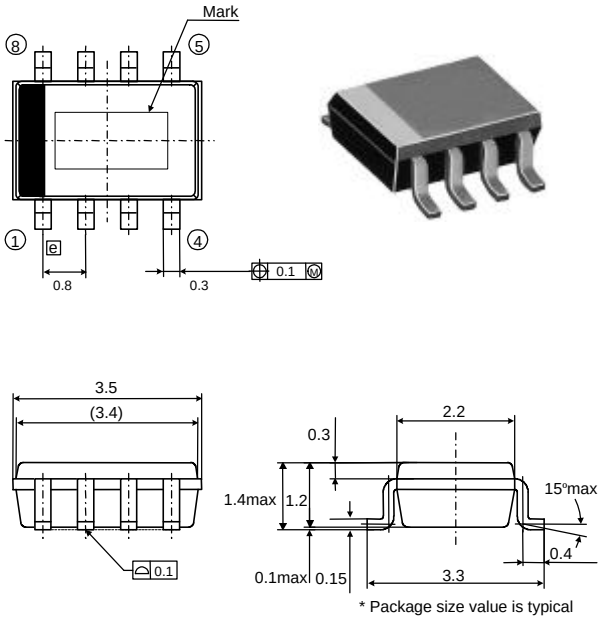
4. PIN CONFIGURATION

TK17030M (SOT23L-8)



5. PACKAGE OUTLINE

■ SOT23L-8



6. ABSOLUTE MAXIMUM RATINGS

T_a=25°C

Parameter	Symbol	Rating	Units	Conditions
Supply Voltage	V_{CC}	12	V	
Power Dissipation	P_D	400	mW	*
Storage Temperature Range	T_{stg}	-55 ~ +150	°C	
Operating Temperature Range	T_{OP}	-40 ~ +85	°C	
Operating Voltage Range	V_{OP}	1.8 ~ 10	V	

* P_D must be decreased at the rate of 3.2mW/°C for operation above 25°C.
When the substrate is mounted, P_D becomes 600mW.

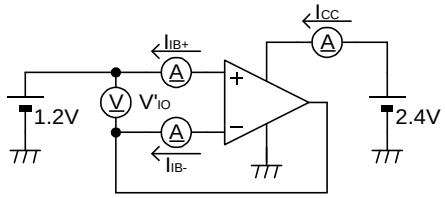
7. ELECTRICAL CHARACTERISTICS

V_{CC}=2.4V, T_a=25°C

Parameter	Symbol	Value			Units	Conditions
		MIN	TYP	MAX		
Supply Current	I_{CC}	-	2.4	4.0	mA	R_L=∞, Vin=V_{CC}/2
Input Offset Voltage	V_{IO}	-	1	10	mV	
Input Offset Current	I_{IO}	-	25	200	nA	
Input Bias Current	I_{IB}	-	0.6	2.0	µA	
Common-Mode Input Voltage Range	V_{ICMR}	0.4~ Vcc-1.0	-	-	V	
Maximum Output Voltage	V_{OM}	Vcc-0.90	Vcc-0.75	-	V	R_L =1kΩ, V_{OH}
		-	20	200	mV	R_L =1kΩ, V_{OL}
Source Current	I_{SO}	50	90	-	mA	A_V=1, V_{IN}=1V, V_O=0.8V
Sink Current	I_{SI}	60	110	-	mA	A_V=1, V_{IN}=1V, V_O=1.2V
Common-Mode Rejection Ratio	CMRR	-	90	-	dB	
Supply Voltage Rejection Ratio	SVRR	-	90	-	dB	
Open Circuit Voltage Gain	G_{VO}	-	110	-	dB	
Slew Rate	SR	-	1.0	-	V/µs	A_V=1, R_L =1kΩ
Gain-Bandwidth Product	GB	-	2.0	-	MHz	
Cross Talk	CT	-	85	-	dB	f=1kHz, A_V=1

8. TEST CIRCUIT

- Supply Current, Input Offset Voltage, Input Offset Current, Input Bias Current

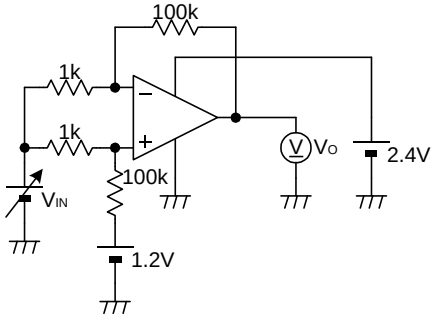


$$V_{IO} = \left|V'_{IO}\right|$$

$$I_{IO} = \left|I_{IB+} - I_{IB-}\right|$$

$$I_{IB} = \frac{I_{IB+} + I_{IB-}}{2}$$

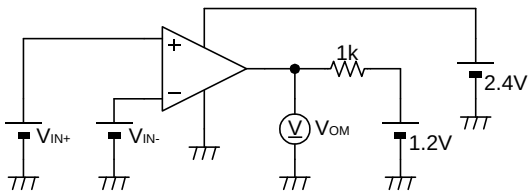
- Common-Mode Rejection Ratio, Common-Mode Input Voltage Range



$$CMRR = 20\log\left(101 \times \left|\frac{\Delta V_{IN}}{\Delta V_O}\right|\right)$$

$$V_{ICMR} : CMRR > 60dB$$

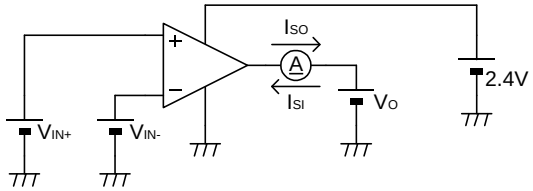
- Maximum Output Voltage



$$V_{OM+} : V_{IN+} = 1.2V, V_{IN-} = 0.8V$$

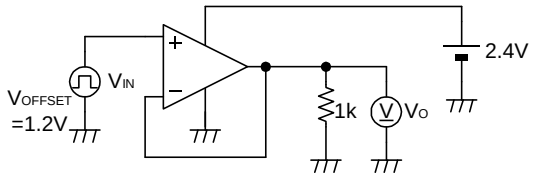
$$V_{OM-} : V_{IN+} = 0.8V, V_{IN-} = 1.2V$$

- Source Current, Sink Current



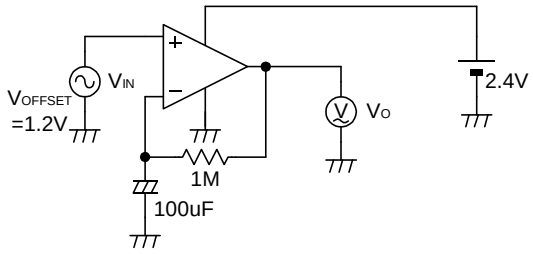
$$I_{SO} : V_{IN+} = 1.2V, V_{IN-} = 0.8V, V_O = 0.8V$$
$$I_{SI} : V_{IN+} = 0.8V, V_{IN-} = 1.2V, V_O = 1.2V$$

- Slew Rate



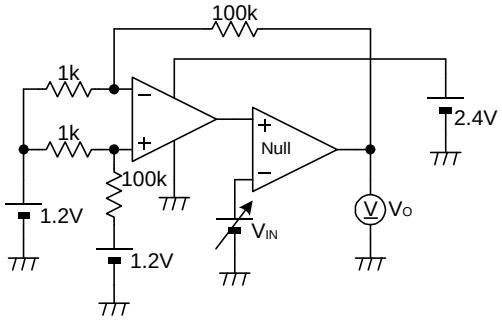
$$SR = \frac{\Delta V_O}{\Delta T_{RISE}}$$

- Gain-Bandwidth Product



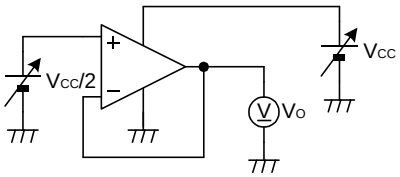
$$GB = \frac{V_O(f_T)}{V_{IN}(f_T)} \times f_T$$

- Open Circuit Voltage Gain



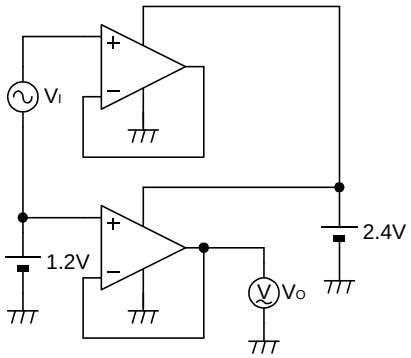
$$G_{VO} = 20\log\left(101 \times \frac{-\Delta V_{IN}}{\Delta V_O}\right)$$

- Supply Voltage Rejection Ratio



$$SVRR = 20\log\frac{\Delta V_{CC}}{\Delta V_O}$$

- Cross Talk

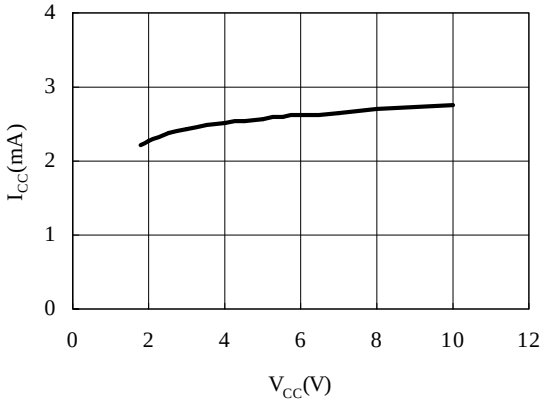


$$CT = 20\log\frac{\Delta V_I}{\Delta V_O}$$

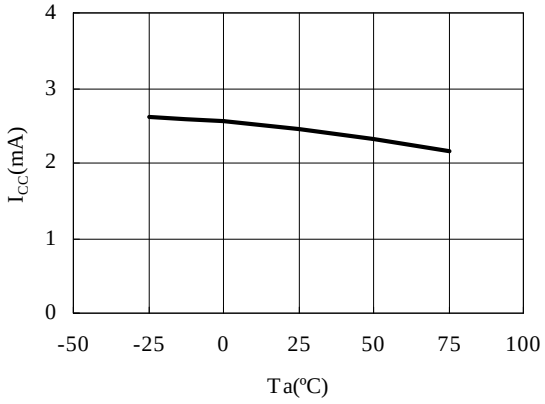
9. TYPICAL CHARACTERISTICS

(Ta=25°C,Vcc=2.4V)

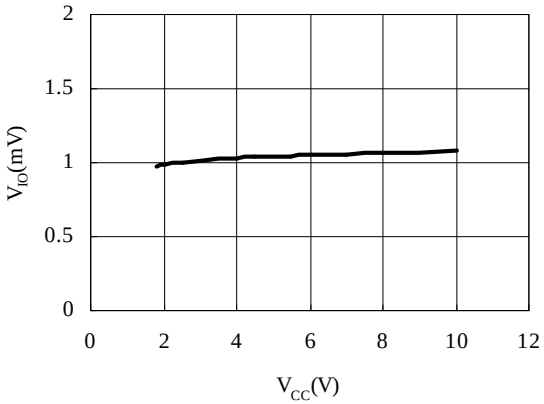
- Supply Current vs. Supply Voltage



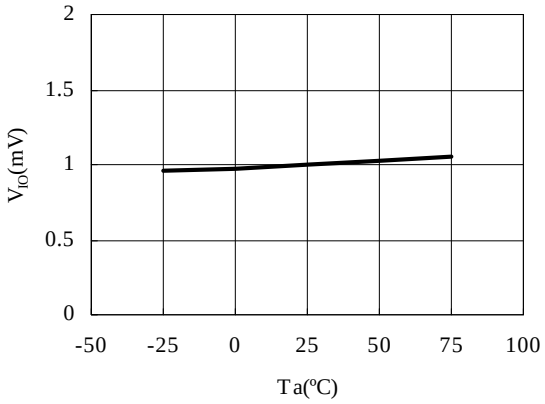
- Supply Current vs. Temperature



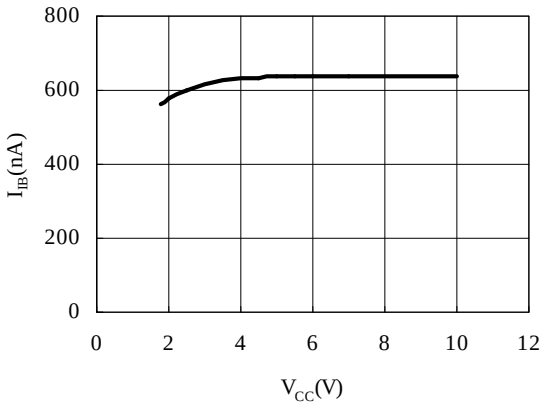
- Input Offset Voltage vs. Supply Voltage



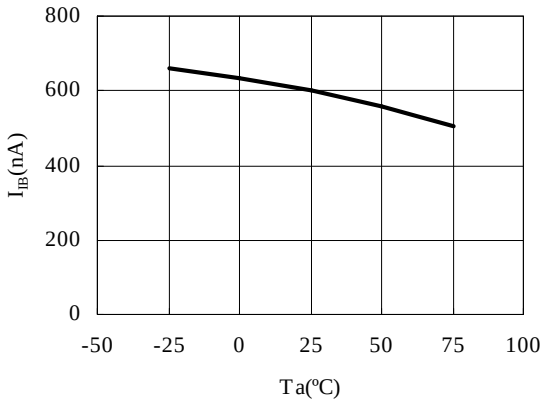
- Input Offset Voltage vs. Temperature



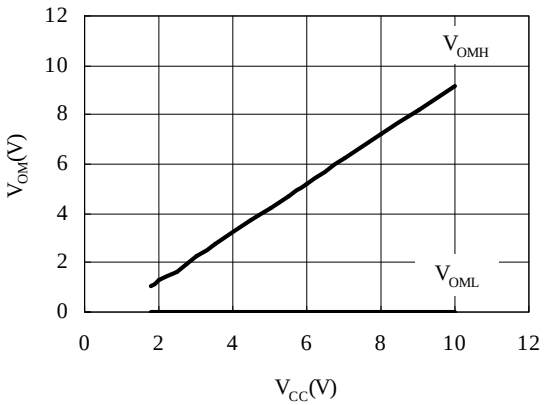
- Input Bias Current vs. Supply Voltage



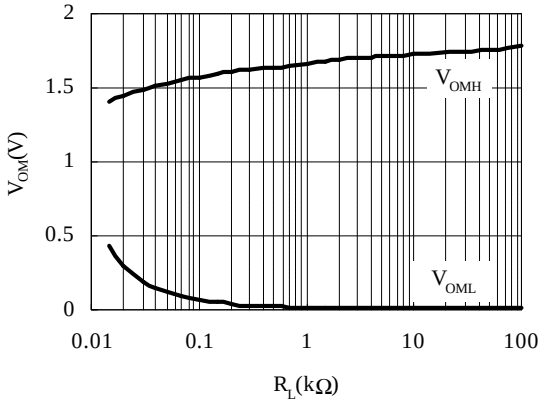
- Input Bias Current vs. Temperature



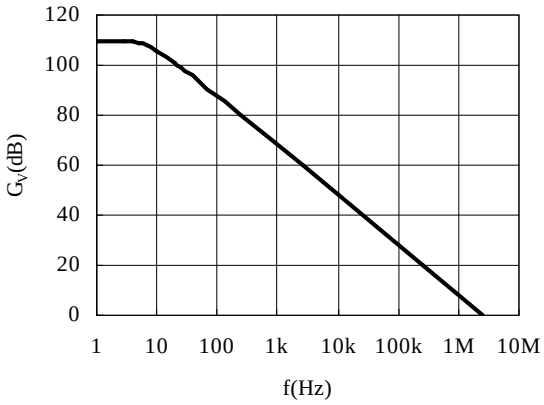
- Maximum Output Voltage vs. Supply Voltage (R_L=1kΩ)



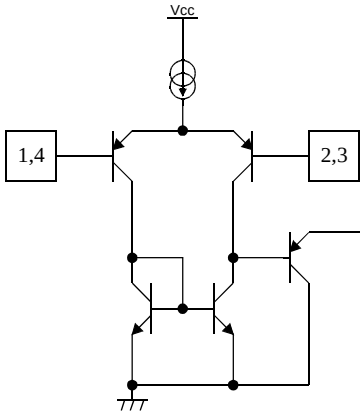
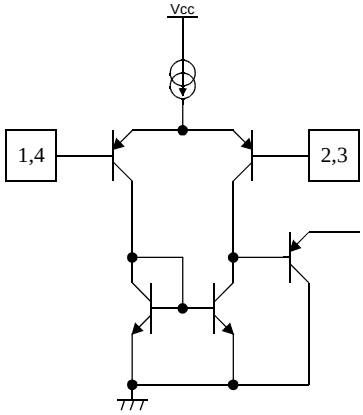
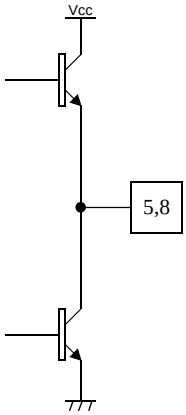
- Maximum Output Voltage vs. Load Resistance (V_{CC}=2.4V)



- Open Circuit Voltage Gain vs. Frequency



10. PIN DESCRIPTION

Pin No.	Pin Description	Internal Equivalent Circuit	Description
1 4	A-IN B-IN		Inverting Input Terminals.
2 3	A+IN B+IN		Non-Inverting Input Terminals.
5 8	BOUT AOUT		Output Terminals.
6	GND		Ground Terminal
7	V_{CC}		Supply Voltage Terminal

11. NOTES

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- Power drive products for automobile, ship or aircraft transport systems; steering and navigation systems, emergency signal communications systems, and any system other than those mentioned above which include electronic sensors, measuring, or display devices, and which could cause major damage to life, limb or property if misused or failure to function.
- Medical devices for measuring blood pressure, pulse, etc., treatment units such as coronary pacemakers and heat treatment units, and devices such as artificial organs and artificial limb systems which augment physiological functions.
- Electrical instruments, equipment or systems used in disaster or crime prevention.

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■ None of the ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

12. OFFICES

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