



## 3404

## LINEAR INTEGRATED CIRCUIT

### SINGLE-SUPPLY DUAL OPERATIONAL AMPLIFIER

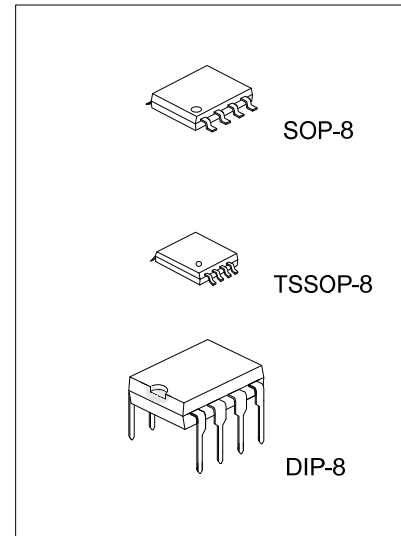
#### DESCRIPTION

The UTC **3404** is high performance single supply dual operational amplifier.

The UTC **3404** is improved version of the UTC M2904 on slew rate & cross-over distortion.

#### FEATURES

- \*Single supply
- \*Operating voltage: +4v~+36v
- \*Low operating current: 2.0ma (typ.)
- \*Slew rate: 1.2v/μs (typ.)



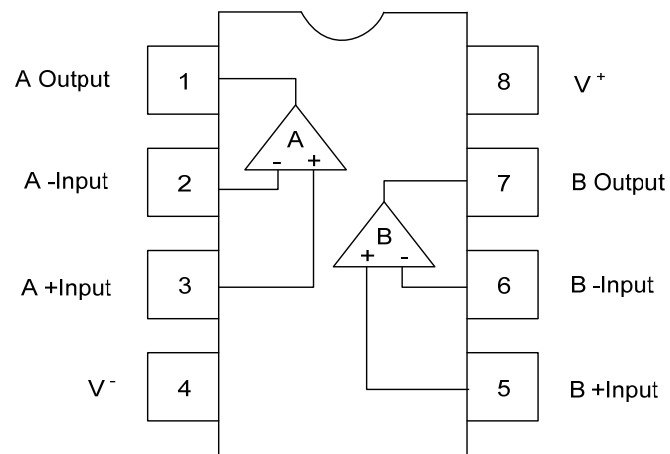
\*Pb-free plating product number: 3404L

#### ORDERING INFORMATION

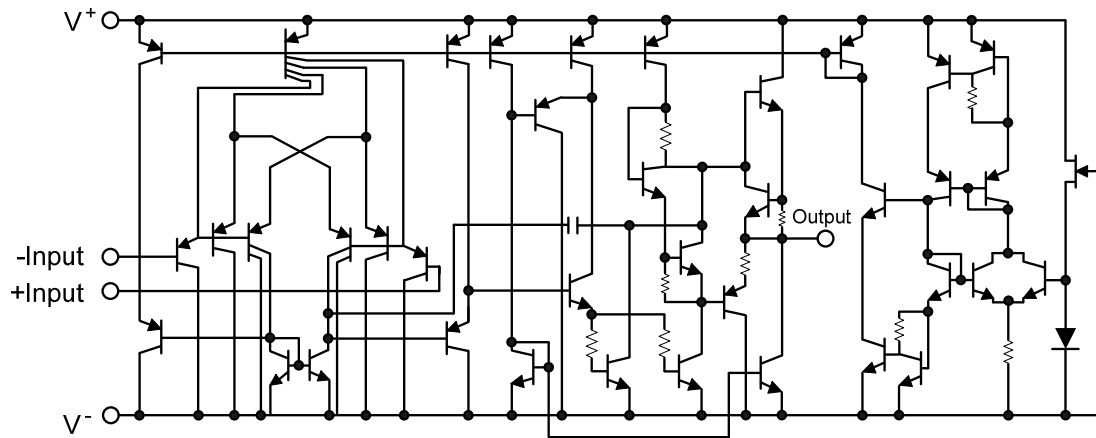
Ordering Number		Package	Packing
Normal	Lead Free Plating		
3404-D08-T	3404L-D08-T	DIP-8	Tube
3404-P08-R	3404L-P08-R	TSSOP-8	Tape Reel
3404-P08-T	3404L-P08-T	TSSOP-8	Tube
3404-S08-R	3404L-S08-R	SOP-8	Tape Reel
3404-S08-T	3404L-S08-T	SOP-8	Tube

<p>3404L-D08-R</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) D08: DIP-8, P08: TSSOP-8, S08: SOP-8 (3) L: Lead Free Plating, Blank: Pb/Sn</p>
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## ■ PIN CONFIGURATION



## ■ EQUIVALENT CIRCUIT (1/2 SHOWN)



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C)

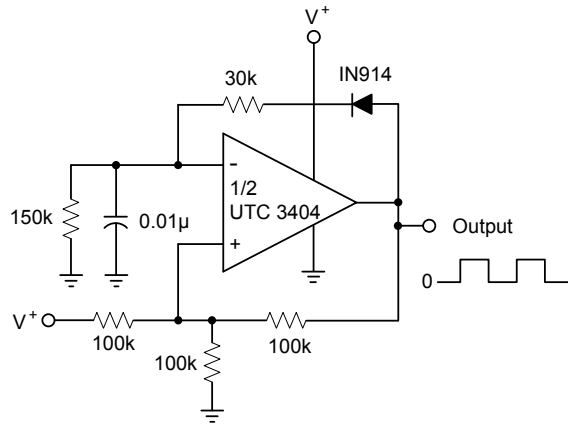
PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sup>+</sup> (V <sup>+</sup> /V)	36V (or±18)	V
Differential Input Voltage		V <sub>I(DIFF)</sub>	36	V
Input Voltage		V <sub>IN</sub>	-0.3 ~ 36	V
Power Dissipation	DIP-8	P <sub>D</sub>	500	mW
	SOP-8		300	
	TSSOP8		250	
Operating Temperature Range		T <sub>OPR</sub>	-40 ~+85	°C
Storage Temperature Range		T <sub>STG</sub>	-40 ~+125	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

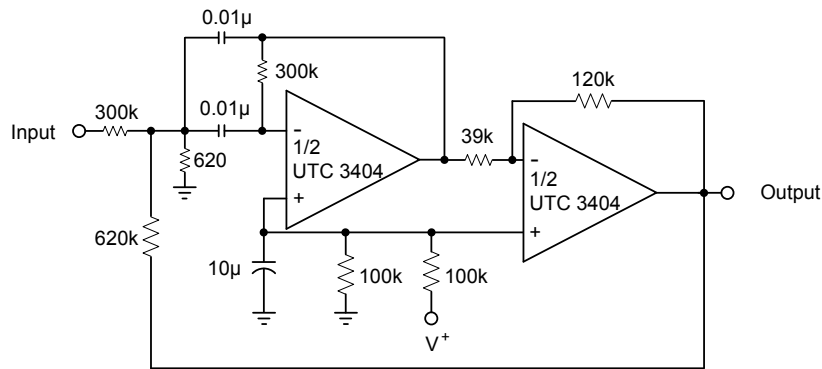
■ ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C, V<sup>+</sup>/V<sup>-</sup> =±15V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V <sub>I(OFF)</sub>	R <sub>s</sub> =0Ω		2	5	mV
Input Offset Current	I <sub>I(OFF)</sub>			5	50	nA
Input Bias Current	I <sub>I(BIAS)</sub>			70	200	nA
Large Signal Voltage Gain	G <sub>V</sub>	R <sub>L</sub> >2KΩ	88	100		dB
Maximum Output Voltage Swing	V <sub>OM</sub>	R <sub>L</sub> =2KΩ	±13	±14		V
Input Common Mode Voltage Range	V <sub>I(CM)</sub>		-15 ~+13			V
Common Mode Rejection Ratio	CMR	DC	70	90		dB
Supply Voltage Rejection Ratio	SVR		80	94		dB
Operating Current	I <sub>CC</sub>	R <sub>L</sub> =∞		2.0	3.5	mA
Output Source Current	I <sub>SOURCE</sub>	V <sub>IN+</sub> =1V, V <sub>IN-</sub> =0V	20	30		mA
Output Sink Current	I <sub>O(SINK)</sub>	V <sub>IN+</sub> =0V, V <sub>IN-</sub> =1V	10	20		mA
Slew Rate	SR			1.2		V/μs
Unity Gain Bandwidth	f <sub>T</sub>			1.2		MHz

■ TYPICAL APPLICATIONS



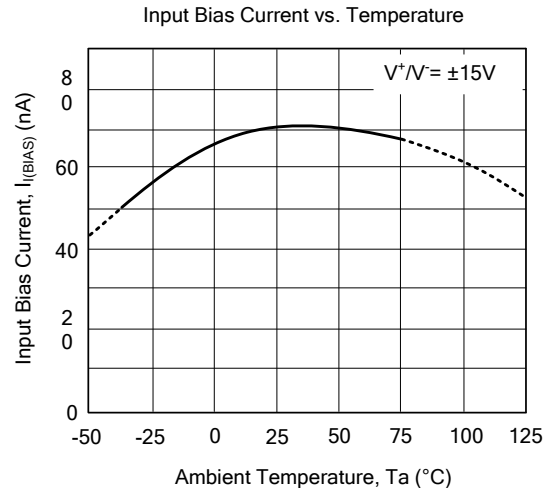
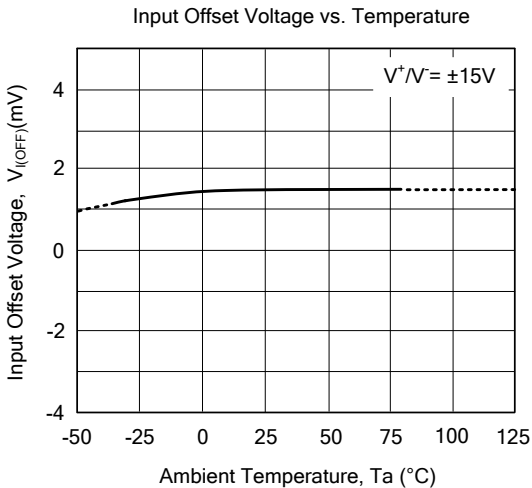
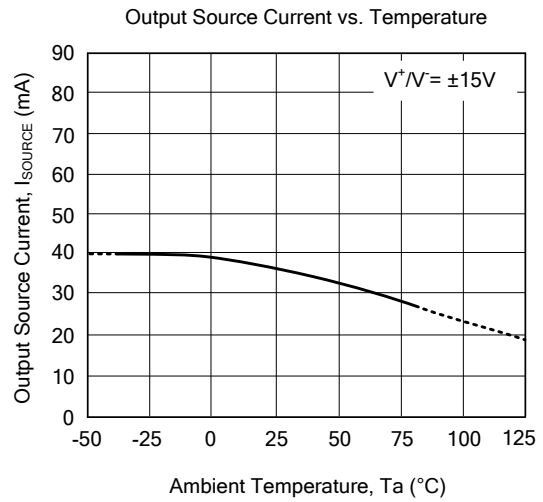
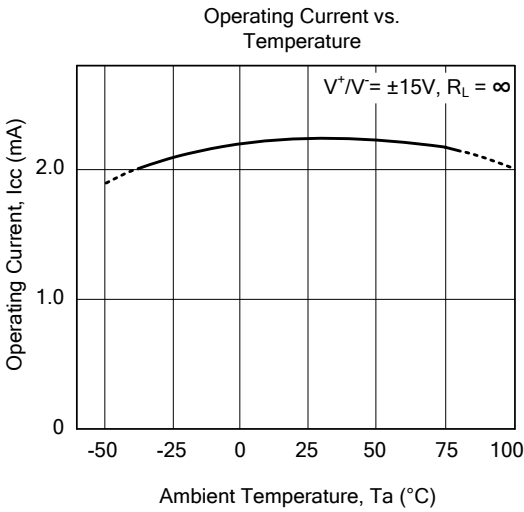
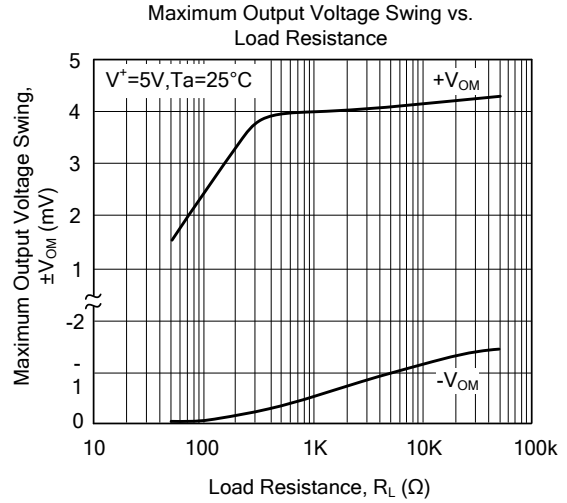
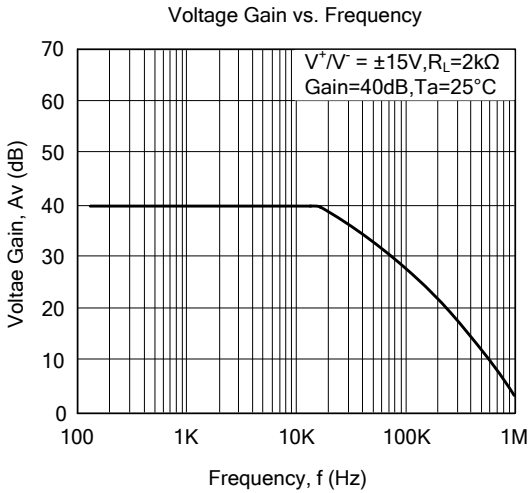
Square Wave Oscillator



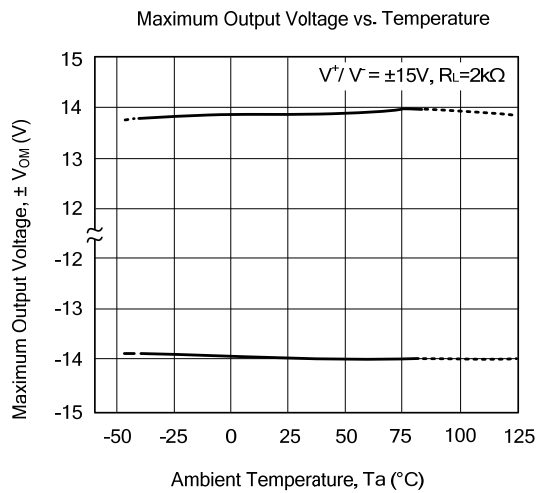
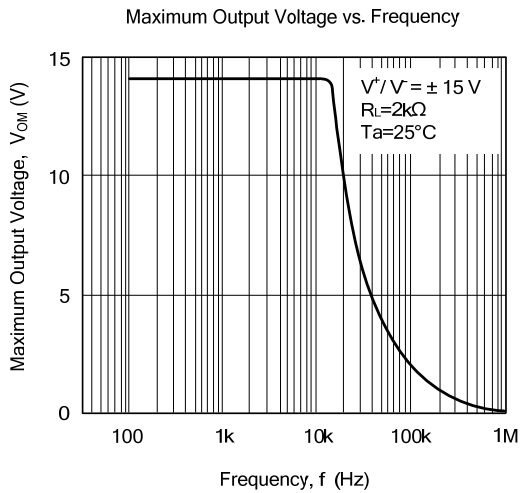
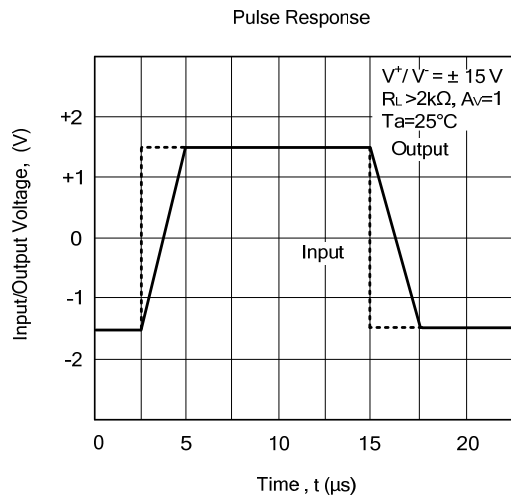
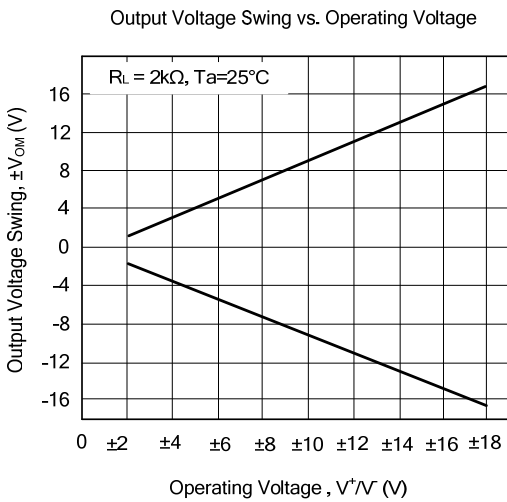
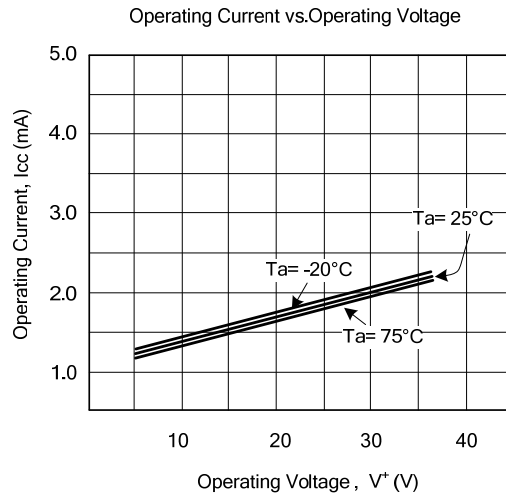
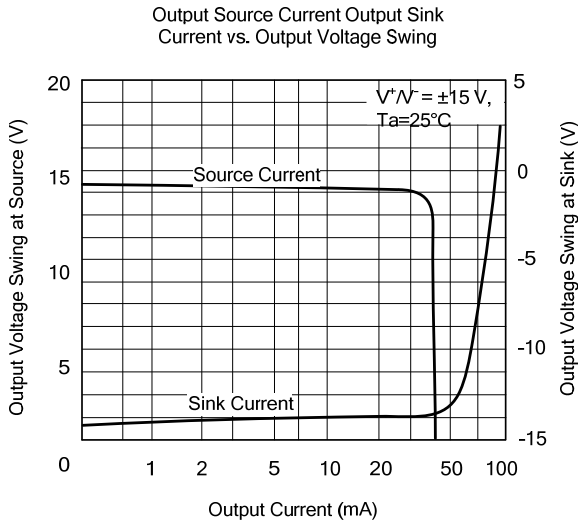
$f_o=1\text{kHz}$

Bandpass Filter

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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