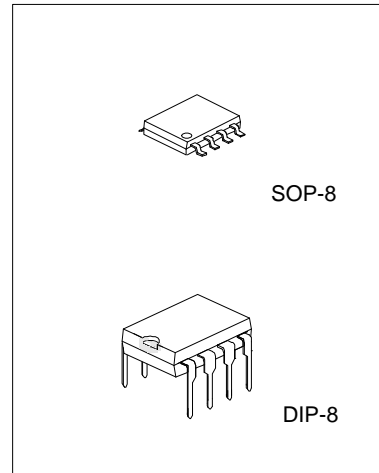# UTC TL062   LINEAR INTEGRATED CIRCUIT

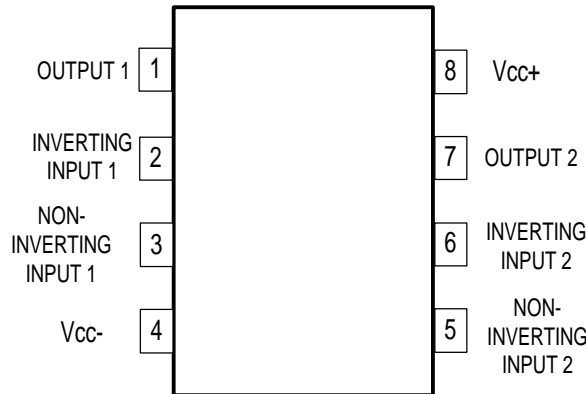## LOW POWER DUAL J-FET OPERATIONAL AMPLIFIER

DESCRIPTION

The TL062 is a high speed J-FET input dual operational amplifier. It incorporates well matched, high voltage J-FET and bipolar transistors in a monolithic integrated circuit. The device features high slew rates, low input bias and offset currents, and low offset voltage temperature coefficient.
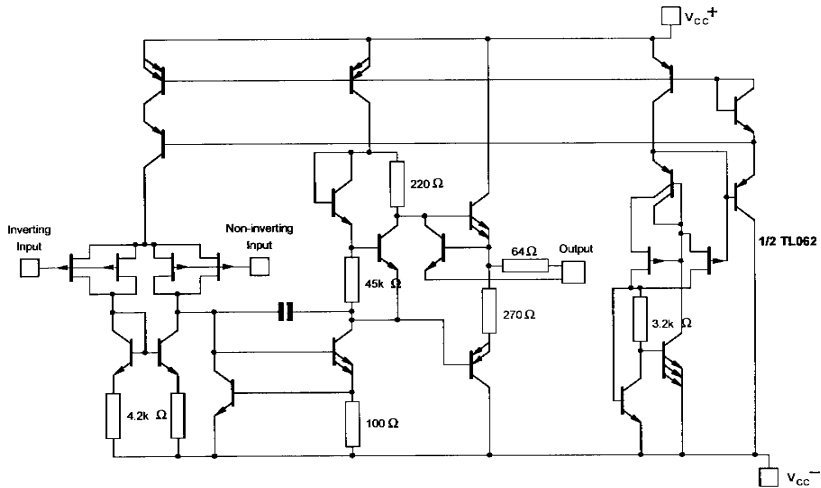
FEATURES

*Very low power consumption
*Wide common-mode (up to Vcc+) and differential voltage range
*Low input bias and offset current
*Output short-circuit protection
*High input impedance J-FET input stage
*Internal frequency compensation
*Latch up free operation
*High slew rate: 3.5V/μs(typ)
*Typical supply current: 200μA

SOP-8

DIP-8

PIN CONFIGURATIONS

OUTPUT 1	1	8 Vcc+
INVERTING INPUT 1	2	7 OUTPUT 2
NON-INVERTING INPUT 1	3	6 INVERTING INPUT 2
Vcc-	4	5 NON-INVERTING INPUT 2

UTC UNISONIC TECHNOLOGIES CO., LTD.   1

UTC TL062   LINEAR INTEGRATED CIRCUIT

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage (note 1)	Vcc	+-18	V
Input Voltage (note 2)	Vi	+-15	V
Differential Input Voltage (note 3)	Vid	+-30	V
Power Dissipation	Ptot	680	mW
Output Short-Circuit Duration (Note 4)		Infinite	
Operating Free Air Temperature	Toper	0 to 70	°C
Storage Temperature	Tstg	-65 to 150	°C

NOTES: 1. All voltage values, except differential voltage, are with respect to the zero reference level (ground) of
the supply voltages where the zero reference level is the midpoint between Vcc- and Vcc+.
2. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 volts,
whichever is less.
3. Differential voltages are at the non-inverting input terminal with respect to the inverting input terminal.
4. The output may be shorted to ground or to either supply. Temperature and/or supply voltages must be
limited to ensure that the dissipation rating is not exceeded.

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UTC TL062   LINEAR INTEGRATED CIRCUIT

TL062 ELECTRICAL CHARACTERISTICS(Vcc=+-15V, Ta=25°C, unless otherwise specified)

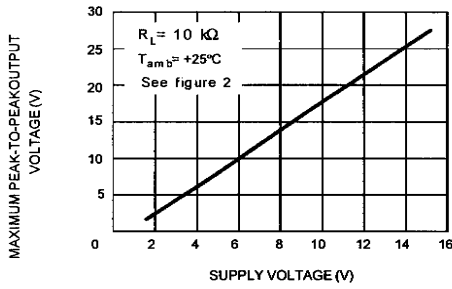| PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Input Offset Voltage(Rs=50Ω), Ta=25°C Tmin<=Ta<=Tmax	Vio		3	15 20	mV
Temperature Coefficient of Input Offset Voltage(Rs=50Ω)	Dvio		10		μV/°C
Input Offset Current* Ta=25°C Tmin<=Ta<=Tmax	Iio		5	200 5	pA nA
Input Bias Current* Ta=25°C Tmin<=Ta<=Tmax	Iib		30	400 10	pA nA
Input Common Mode Voltage	Vicm	+-11	-12~+15		V
Output Voltage Swing(RL=10kΩ,CL=100pF) Ta=25°C Tmin<=Ta<=Tmax	Vopp	20 20	27		V
Large Signal Voltage Gain(RL=10Ω, Vo=+-10V) Ta=25°C Tmin<=Ta<=Tmax	Avd	3 3	6		V/mV
Gain Bandwidth Product(Ta=25°C, RL=10kΩ, CL=100Pf)	GBP		1		MHz
Input Resistance	Ri		10^{12}		Ω
Common Mode Rejection Ratio(Rs=50Ω)	CMR	70	76		dB
Supply Voltage Rejection Ratio(Rs=50Ω)	SVR	70	95		dB
Supply Current(Ta=25°C, no load, no signal)	Icc		200	250	μA
Channel Separation(Av=100, Ta=25°C)	V_{01}/V_{02}		120		dB
Total Power Consumption(Ta=25°C, no load, no signal)	P_D		6	7.5	mW
Slew Rate(Vi=10V, RL=10kΩ, CL=100pF, Av=1)	SR	1.5	3.5		V/μs
Rise Time(Vi=20mV, RL=10kΩ, CL=100pF, Av=1)	t_r		0.2		μs
Overshoot Factor(Vi=20mV, RL=10kΩ, CL=100pF, Av=1)	Kov		10		%
Equivalent Input Noise Voltage(Rs=100Ω, f=1KHz)	e_n		42		

*The Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperature as closes to the ambient temperature as possible.

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UTC TL062   LINEAR INTEGRATED CIRCUIT

UTC TL062AC ELECTRICAL CHARACTERISTICS(Vcc=+-15V, Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Input Offset Voltage(Rs=50Ω, Ta=25°C Tmin<=Ta<=Tmax	Vio		3	6 7.5	mV
Temperature Coefficient of Input Offset Voltage(Rs=50Ω)	Dvio		10		μV/°C
Input Offset Current* Ta=25°C Tmin<=Ta<=Tmax	Iio		5	100 3	pA nA
Input Bias Current* Ta=25°C Tmin<=Ta<=Tmax	Iib		30	200 7	pA nA
Input Common Mode Voltage	Vicm	+-11.5	-12~+15		V
Output Voltage Swing(R$_L$=10kΩ) Ta=25°C Tmin<=Ta<=Tmax	Vopp	20 20	27		V
Large Signal Voltage Gain(R$_L$=10kΩ, Vo=+-10V) Ta=25°C Tmin<=Ta<=Tmax	Avd	4 4	6		V/mV
Gain Bandwidth Product(Ta=25°C, R$_L$=10kΩ, C$_L$=100pF)	GBP		1		MHz
Input Resistance	Ri		10^{12}		Ω
Common Mode Rejection Ratio(R$_S$=50Ω)	CMR	80	86		dB
Supply Voltage Rejection Ratio(R$_S$=50Ω)	SVR	80	95		dB
Supply Current(Ta=25°C, no load, no signal)	Icc		200	250	μA
Channel Separation(Av=100, Ta=25°C)	V$_{01}$/V$_{02}$		120		dB
Total Power Consumption(Ta=25°C, no load, no signal)	P$_D$		6	7.5	mW
Slew Rate(Vi=10V, R$_L$=10kΩ, C$_L$=100pF, Av=1)	SR	1.5	3.5		V/μs
Rise Time(Vi=20mV, R$_L$=10kΩ, C$_L$=100pF, Av=1)	tr		0.2		μs
Overshoot Factor(Vi=20mV, R$_L$=10kΩ, C$_L$=100pF, Av=1)	Kov		10		%
Equivalent Input Noise Voltage(R$_S$=100Ω, f=1KHz)	en		42		

*The Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperature as closes to the ambient temperature as possible.
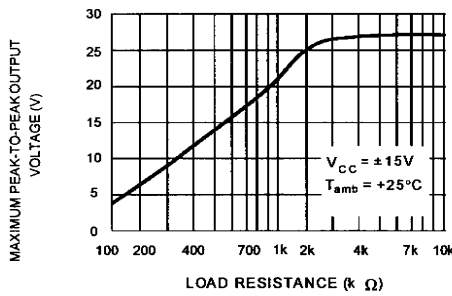
UTC TL062　　LINEAR INTEGRATED CIRCUIT

UTC TL062BC ELECTRICAL CHARACTERISTICS(Vcc=+-15V, Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Input Offset Voltage(R_S=50Ω, Ta=25°C Tmin<=Ta<=Tmax	Vio		2	3 5	mV
Temperature Coefficient　of Input Offset Voltage(R_S=50Ω)	Dvio		10		μV/°C
Input Offset Current* Ta=25°C Tmin<=Ta<=Tmax	Iio		5	100 3	pA nA
Input Bias Current* Ta=25°C Tmin<=Ta<=Tmax	Iib		30	200 7	pA nA
Input Common Mode Voltage	Vicm	+-11	-12~+15		V
Output Voltage Swing(R_L=10kΩ) Ta=25°C Tmin<=Ta<=Tmax	Vopp	20 20	27		V
Large Signal Voltage Gain(R_L=10kΩ, Vo=+-10V) Ta=25°C Tmin<=Ta<=Tmax	Avd	4 4	6		V/mV
Gain Bandwidth Product(Ta=25°C, R_L=10kΩ, C_L=100pF)	GBP		1		MHz
Input Resistance	Ri		10^{12}		Ω
Common Mode Rejection Ratio(R_S=50Ω)	CMR	80	86		dB
Supply Voltage Rejection Ratio(R_S=50Ω)	SVR	80	95		dB
Supply Current(Ta=25°C, no load, no signal)	Icc		200	250	μA
Channel Separation(Av=100, Ta=25°C)	V_{01}/V_{02}		120		dB
Total Power Consumption(Ta=25°C, no load, no signal)	P_D		6	7.5	mW
Slew Rate(Vi=10V, R_L=10kΩ, C_L=100pF, Av=1)	SR	1.5	3.5		V/μs
Rise Time(Vi=20mV, R_L=10kΩ, C_L=100pF, Av=1)	tr		0.2		μs
Overshoot Factor(Vi=20mV, R_L=10kΩ, C_L=100pF, Av=1)	Kov		10		%
Equivalent Input Noise Voltage(R_S=100Ω, f=1KHz)	en		42		

*The Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperature as closes to the ambient temperature as possible.

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MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS SUPPLY VOLTAGE
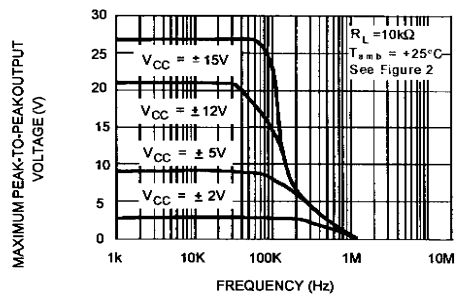

MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREE AIR TEMP.
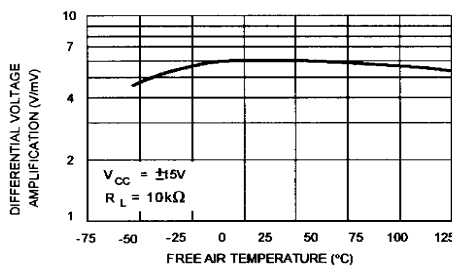

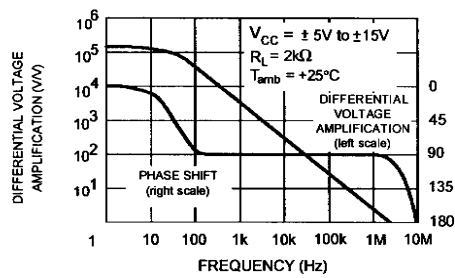**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS LOAD RESISTANCE**

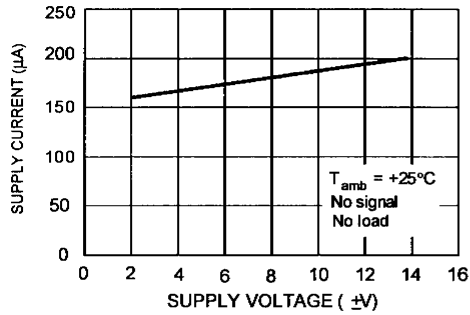**MAXIMUM PEAK-TO-PEAK OUTPUT VOLTAGE VERSUS FREQUENCY**
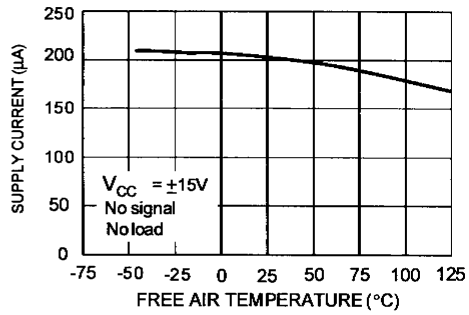

DIFFERENTIAL VOLTAGE AMPLIFICATION VERSUS FREE AIR TEMPERATURE

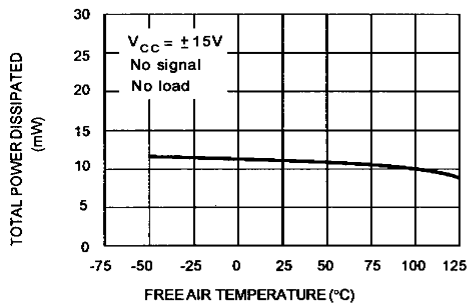**LARGE SIGNAL DIFFERENTIAL VOLTAGE AMPLIFICATION AND PHASE SHIFT VERSUS FREQUENCY**
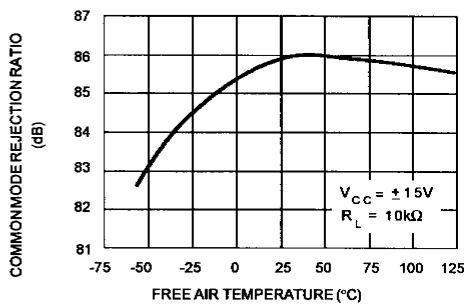
SUPPLY CURRENT PER AMPLIFIER VERSUS SUPPLY VOLTAGE

SUPPLY CURRENT PER AMPLIFIER VERSUS FREE AIR TEMPERATURE
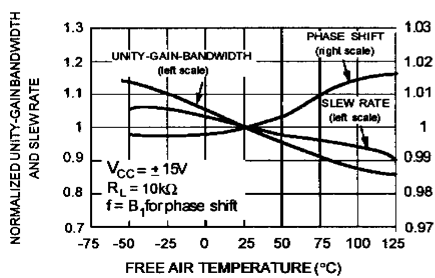

TOTAL POWER DISSIPATED VERSUS FREE AIR TEMPERATURE
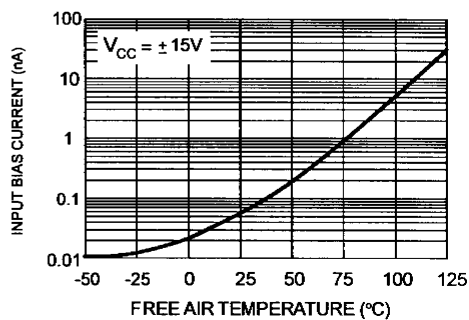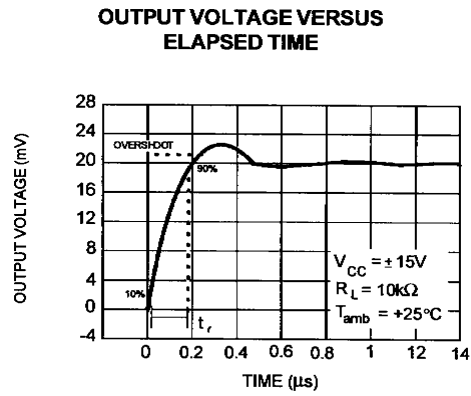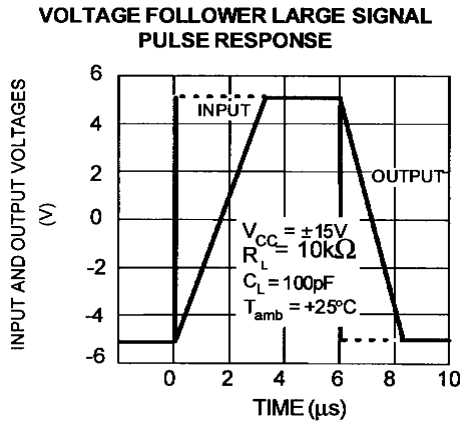

COMMON MODE REJECTION RATIO VERSUS FREE AIR TEMPERATURE

NORMALIZED UNITY GAIN BANDWIDTH SLEW RATE, AND PHASE SHIFT VERSUS TEMPERATURE

INPUT BIAS CURRENT VERSUS FREE AIR TEMPERATURE

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VOLTAGE FOLLOWER LARGE SIGNAL PULSE RESPONSE

OUTPUT VOLTAGE VERSUS ELAPSED TIME
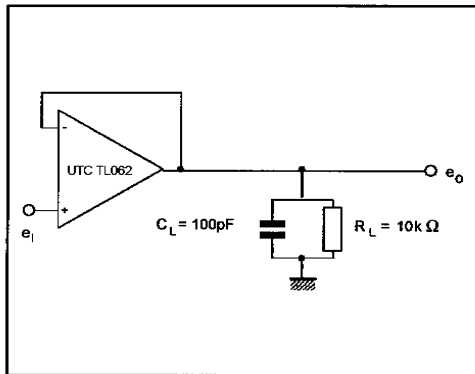

PARAMETER MEASUREMENT INFORMATION

Figure 1 : Voltage follower

Figure 2 : Gain-of-10 inverting amplifier