

# UTC M2904 LINEAR INTEGRATED CIRCUIT

## SINGLE-SUPPLY DUAL OPERATIONAL AMPLIFIER

### DESCRIPTION

The UTC M2904 consists of two independent, high gain, internally frequency compensated operation amplifiers which were designed specifically to operate from a single power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

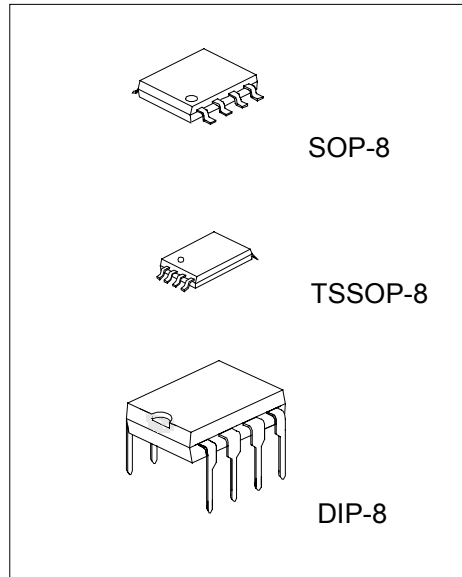
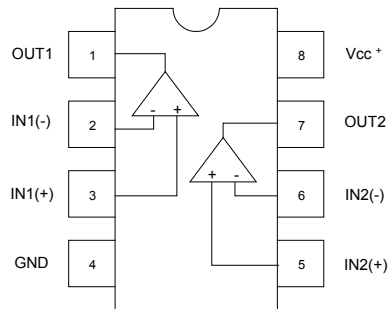
### FEATURES

- \*Single Supply
- \*Operating Voltage: +3V~+32V
- \*Low Operating Current: 0.7mA (typ.)
- \*Slew Rate: 0.5V/μs (typ.)

### APPLICATIONS

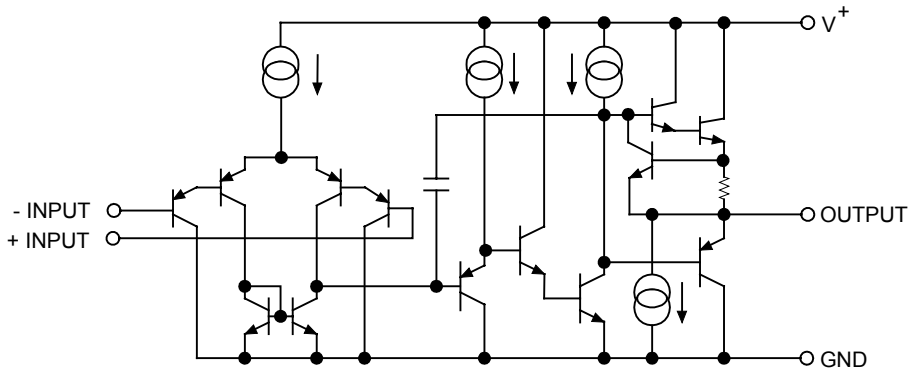
\*transducer amplifiers, DC gain blocks, and all the conventional op amp circuits which now can be more easily implemented in single power supply systems.

### PIN CONFIGURATION



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EQUIVALENT CIRCUIT (1/2 shown)



## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

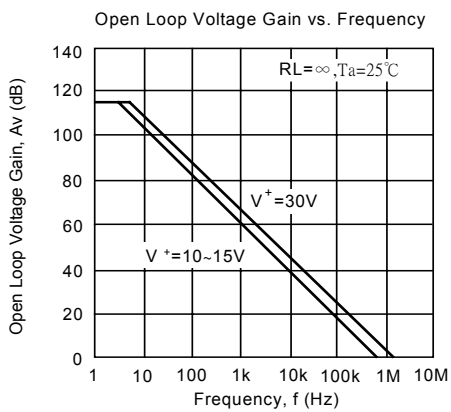
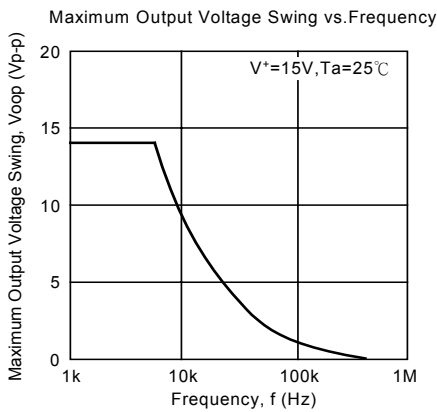
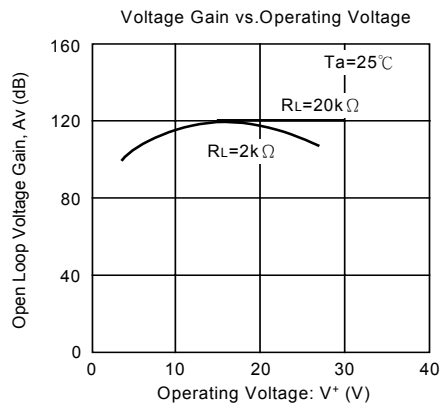
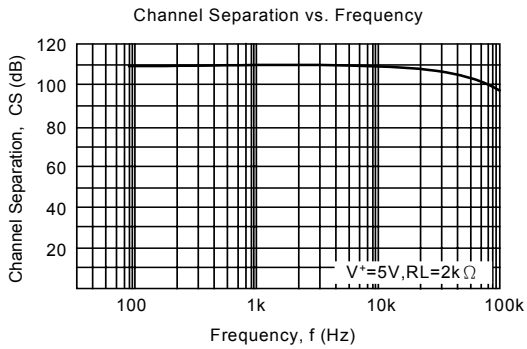
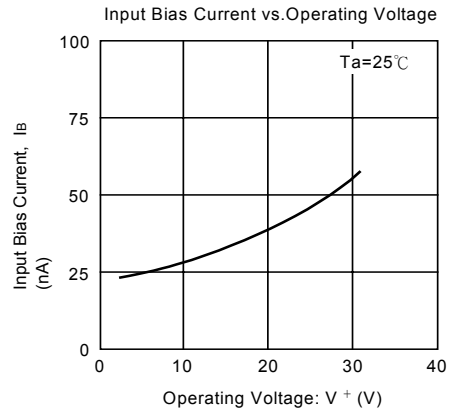
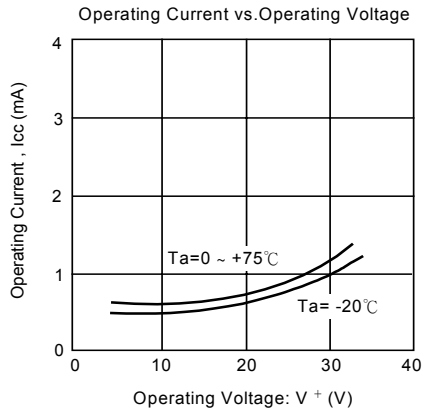
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+(V^+/V^-)$	32 (or $\pm 16$ )	V
Differential Input Voltage	$V_{ID}$	32	V
Input Voltage	$V_{IC}$	-0.3 ~ +32	V
Power Dissipation	$P_D$	500	mW
DIP-8		300	
SOP-8 TSSOP-8		300	
Operating Temperature Range	$T_{opr}$	-40 ~ +85	°C
Storage Temperature Range	$T_{stg}$	-50 ~ +125	°C

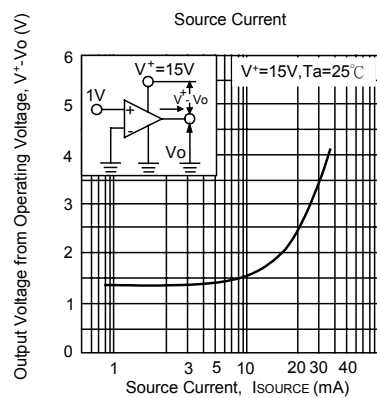
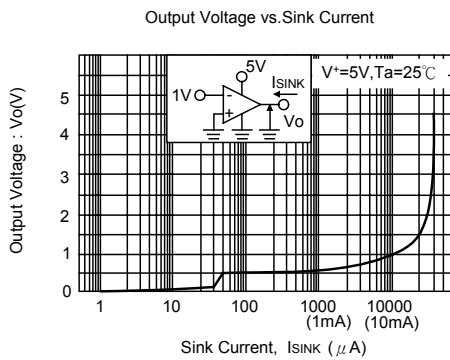
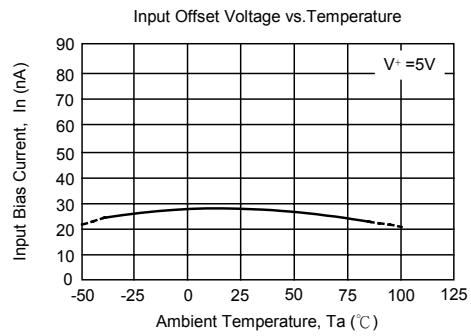
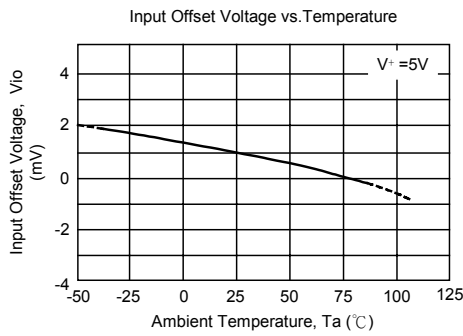
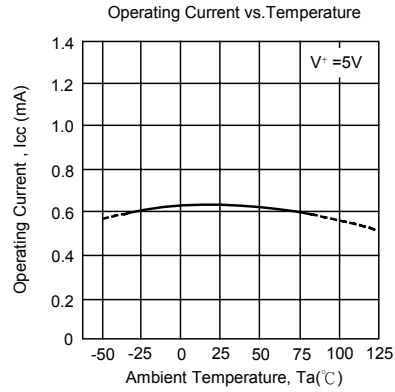
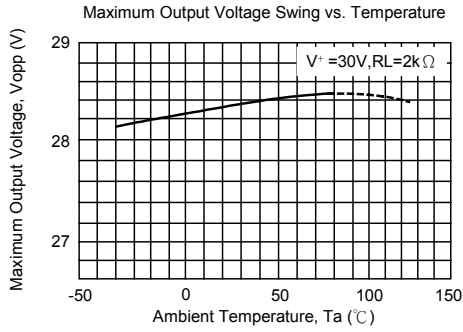
## ELECTRICAL CHARACTERISTICS (Ta=25°C, V+=5V)

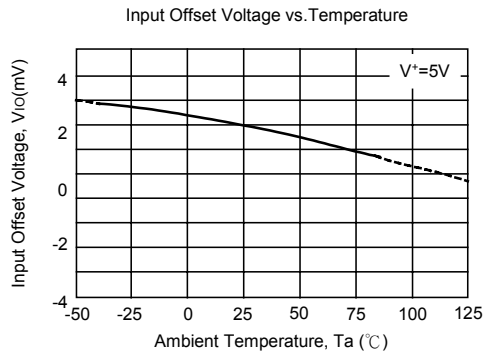
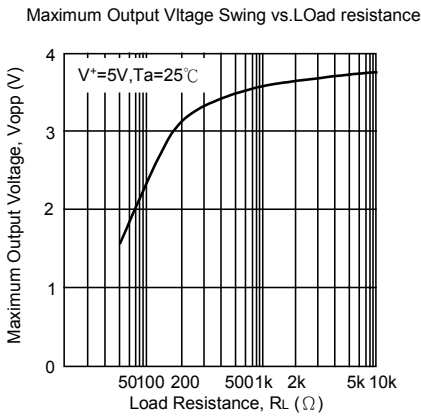
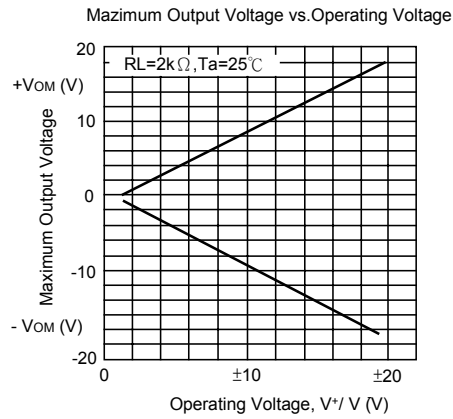
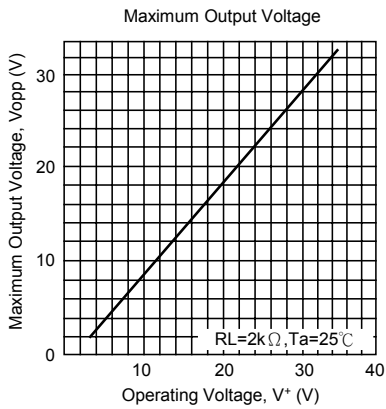
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	$V_{IO}$	$R_s=0\ \Omega$		2	7	mV
Input Offset Current	$I_{IO}$			5	50	nA
Input Bias Current	$I_B$			25	250	nA
Large Signal Voltage Gain	$A_v$	$R_L \geq 2k\ \Omega$		100		dB
Maximum Output Voltage Swing	$V_{OM}$	$R_L=2k\ \Omega$	3.5			V
Input Common Mode Voltage Range	$V_{ICM}$		0~3.5			V
Common Mode Rejection Ratio	CMR			85		dB
Supply Voltage Rejection Ratio	SVR			100		dB
Output Source Current	$I_{SOURCE}$	$V_{IN^+}=1V, V_{IN^-}=0V$	20	30		mA
Output Sink Current	$I_{SINK}$	$V_{IN^+}=0V, V_{IN^-}=1V$	8	20		mA
Channel Separation	CS	$f=1k \sim 20kHz, \text{Input Referred}$		120		dB
Operating Current	$I_{CC}$	$R_L=\infty$		0.7	1.2	mA
Slew Rate	SR	$V^+/V^-=\pm 15V$		0.5		V/ $\mu s$
Unity Gain Bandwidth	$f_T$	$V^+/V^-=\pm 15V$		0.2		MHz

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## TYPICAL CHARACTERISTICS







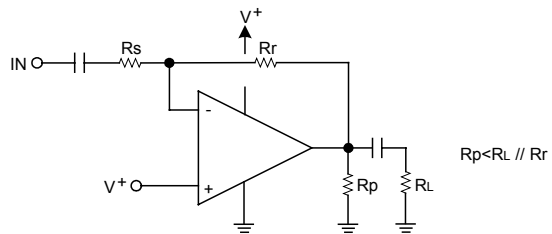
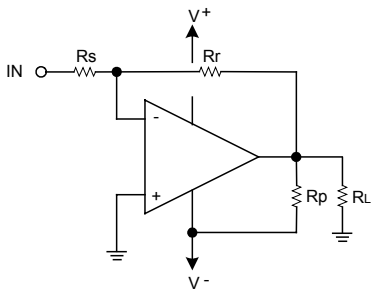
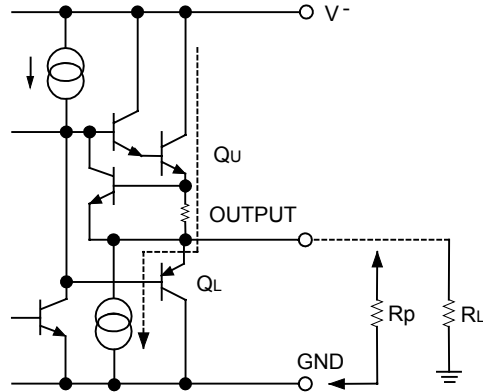
APPLICATION

The UTC M2904, in its static state (No in and output condition) when design, QU being biased by constant current (break down beam) yet, QL stays OFF.

While using with both power source mode, the cross-over distortion might occur instantly when QL ON.

There might be cases when application for amplifier of audio signals, not only distortion but also the apparent frequency bandwidth being narrowed remarkably. It is adjustable especially when using both power source mode, constantly to use with higher on QU than the load current (including feedback current), and then connect the pull-down resistor RP at the part between output and GND pins.

Improvement of Cross-over Distortion  
Equivalent circuit at the output stage



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