



M2904

LINEAR INTEGRATED CIRCUIT

DUAL OPERATIONAL AMPLIFIER

■ DESCRIPTION

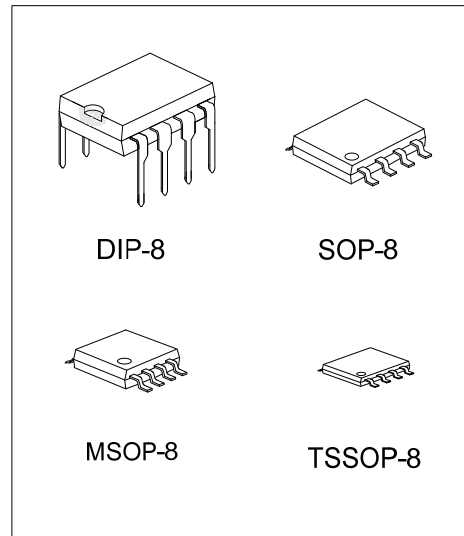
The UTC **M2904** consists of two independent, high gain, internally frequency compensated operation amplifiers which were designed specifically to operate from a single power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

■ FEATURES

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

■ ORDERING INFORMATION

Order Number		Package	Packing
Lead Free	Halogen Free		
M2904L-D08-T	M2904G-D08-T	DIP-8	Tube
M2904L-S08-R	M2904G-S08-R	SOP-8	Tape Reel
M2904L-SM1-R	M2904G-SM1-R	MSOP-8	Tape Reel
M2904L-P08-R	M2904G-P08-R	TSSOP-8	Tape Reel

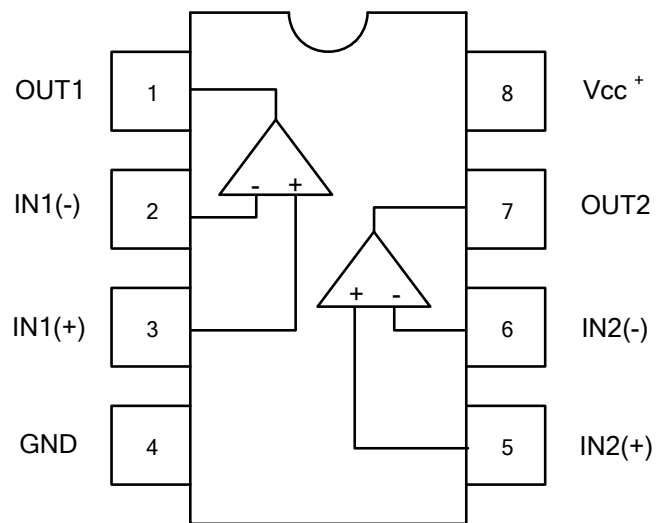


<p>M2904G-D08-T</p>	<p>(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8, SM1: MSOP-8, P08: TSSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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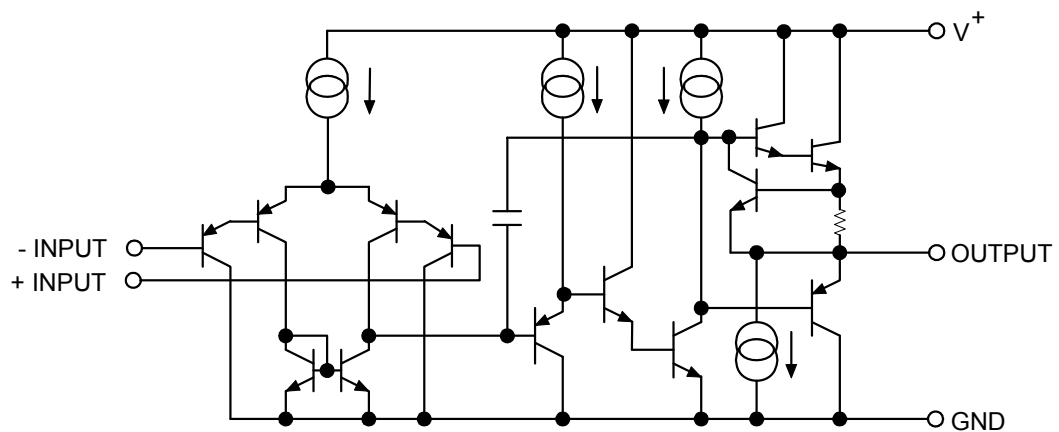
■ MARKING

PACKAGE	MARKING
DIP-8	
SOP-8 / MSOP-8	
TSSOP-8	

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT (1/2 shown)



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

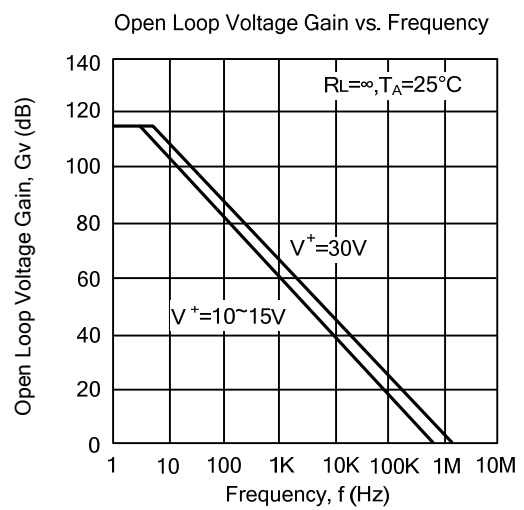
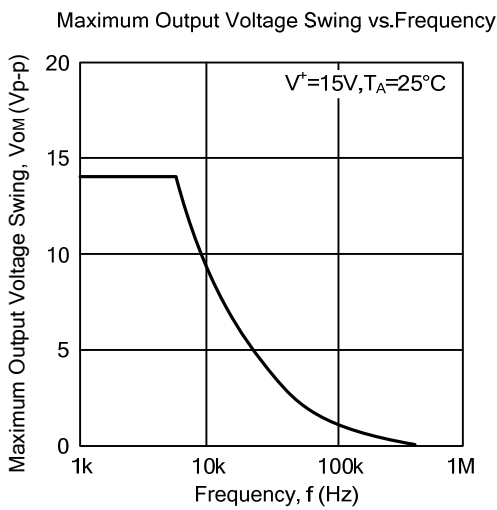
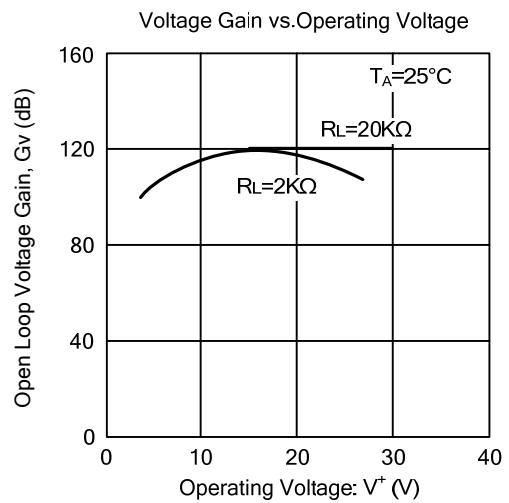
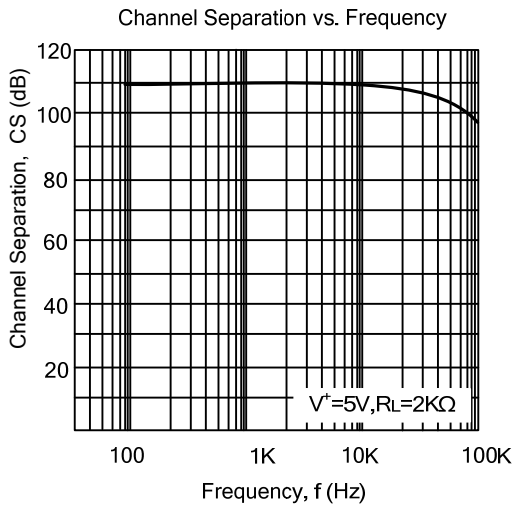
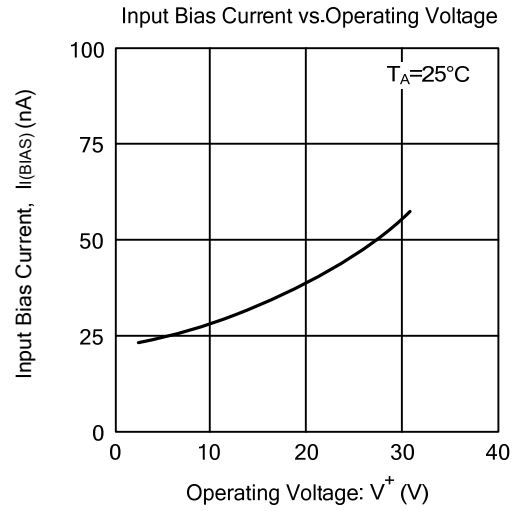
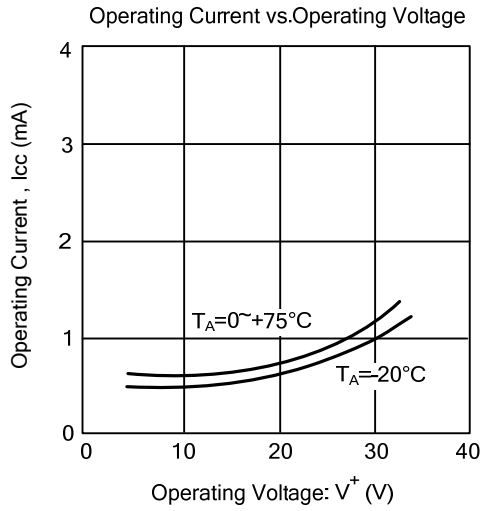
PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V ⁺ (V ⁺ /V)	32(or±16)	V
Differential Input Voltage		V _{I(DIFF)}	±32	V
Input Voltage		V _{IN}	-0.3 ~ +32	V
Power Dissipation	DIP-8	P _D	625	mW
	SOP-8		450	mW
	TSSOP-8		360	mW
	MSOP-8		300	mW
Junction Temperature		T _J	+150	°C
Operating Temperature		T _{OPR}	-40 ~ +125	°C
Storage Temperature		T _{STG}	-40 ~ +150	°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.

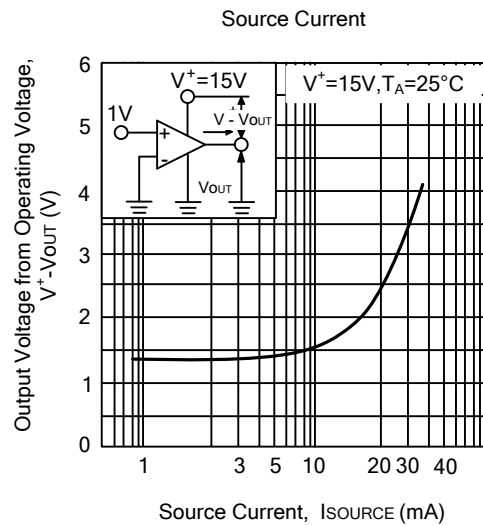
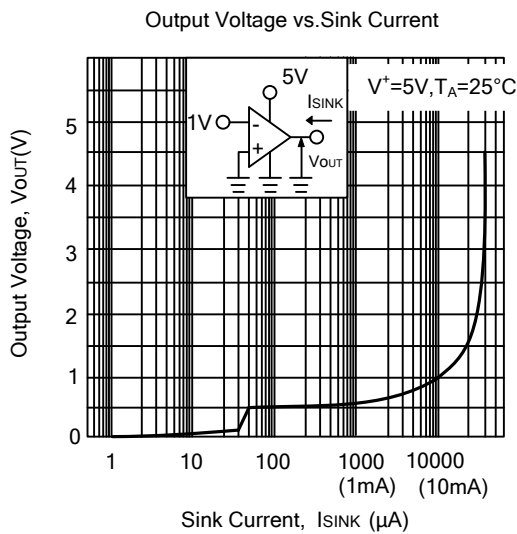
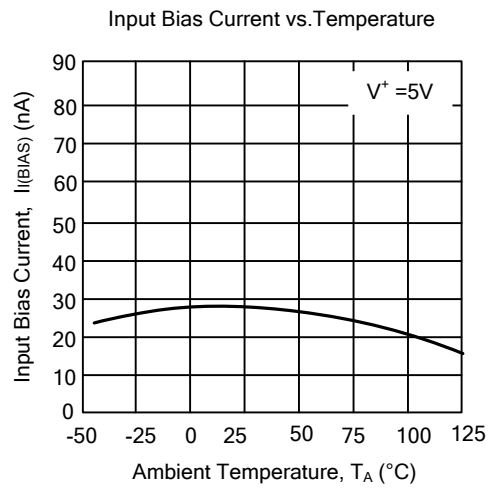
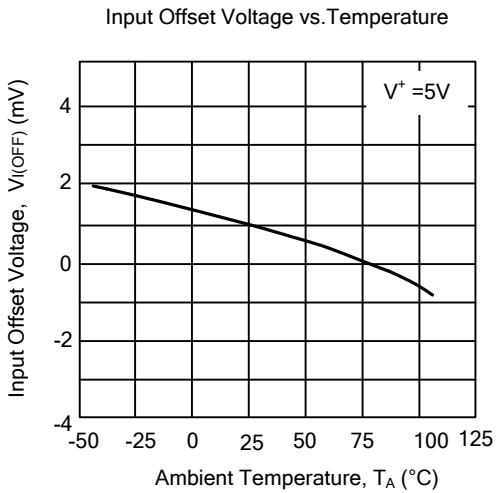
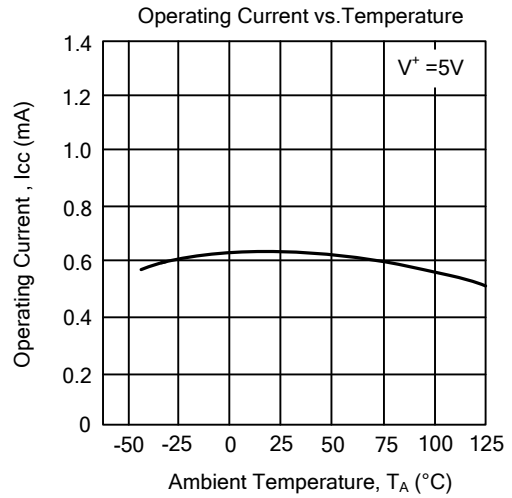
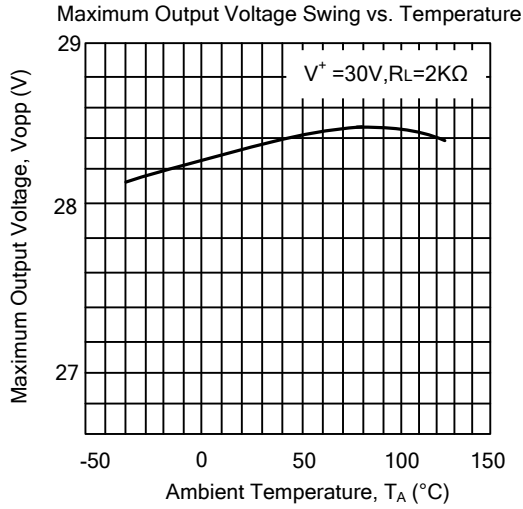
■ ELECTRICAL CHARACTERISTICS (V⁺=5V, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V _{I(OFF)}	R _S =0Ω		2	7	mV
Input Offset Current	I _{I(OFF)}			5	50	nA
Input Bias Current	I _{I(BIAS)}			25	250	nA
Large Signal Voltage Gain	G _V	R _L ≥2kΩ		100		dB
Maximum Output Voltage Swing	V _{OM}	R _L =2kΩ	3.5			V
Input Common Mode Voltage	V _{I(CM)}		0~3.5			V
Common Mode Rejection Ratio	RR			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 ~20kHz, Input Referred		120		dB
Operating Current	I _{CC}	R _L =∞		0.7	1.2	mA
Slew Rate	SR	V ⁺ /V=±15V		0.5		V/μs
Unity Gain Bandwidth	f _T	V ⁺ /V=±15V		0.2		MHz

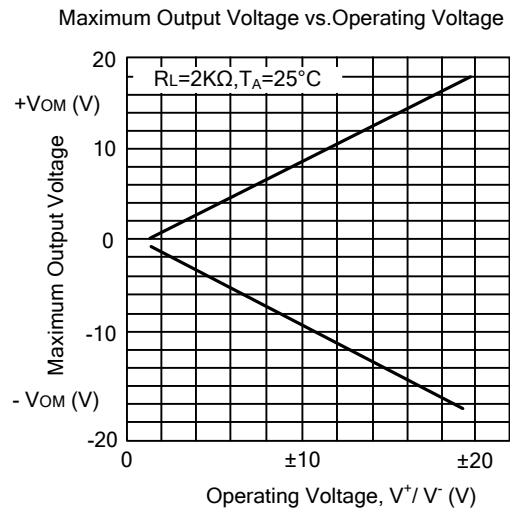
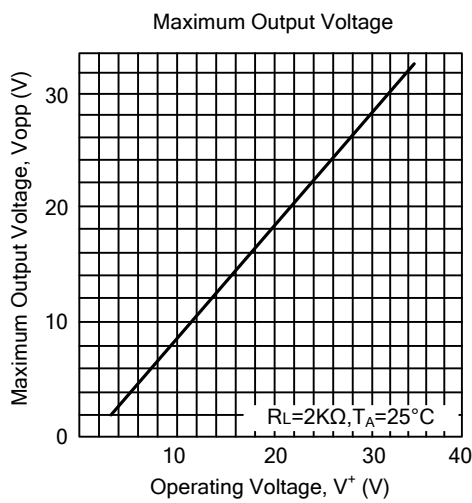
■ TYPICAL CHARACTERISTICS



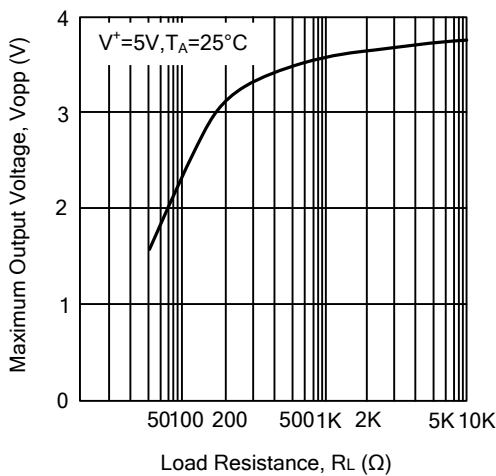
■ TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



Maximum Output Voltage Swing vs. Load Resistance



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