



LM2902B

LINEAR INTEGRATED CIRCUIT

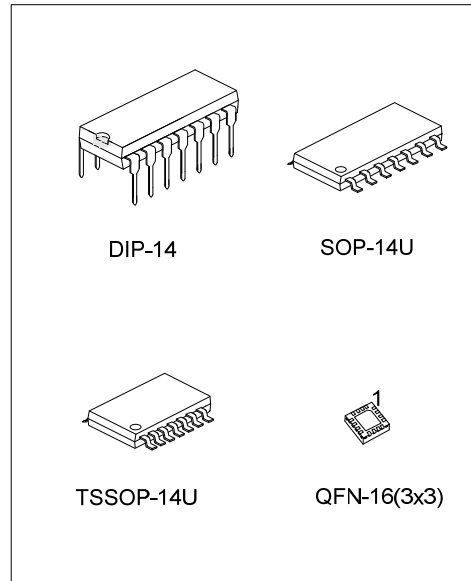
QUAD OPERATIONAL AMPLIFIERS

DESCRIPTION

The UTC **LM2902B** consists of four independent, high gain internally frequency compensated operational amplifiers which are designed specifically to operated from a single power supply over a wide voltage range. Operation from split power supplies is also possible. Application areas include transducer amplifier, DC gain blocks and all the conventional OP amp circuits which now can be easily implemented in single power supply system.

FEATURES

- *Internally frequency compensated for unity gain
- *Large DC voltage gain :100dB
- *Wide operating supply range ($V_{CC}=3V\sim 36V$)
- *Input common-mode voltage includes ground
- *Large output voltage swing: From 0V to $V_{CC}-1.5V$
- *Power drain suitable for battery operation
- *High ESD (2kV, HBM)



ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen-Free		
LM2902BL-D14-T	LM2902BG-D14-T	DIP-14	Tube
LM2902BL-UEA-R	LM2902BG-UEA-R	SOP-14U	Tape Reel
LM2902BL-UEB-R	LM2902BG-UEB-R	TSSOP-14U	Tape Reel
LM2902BL-Q16-3030-R	LM2902BG-Q16-3030-R	QFN-16(3×3)	Tape Reel

<p>LM2902BG-D14-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) DIP: DIP-14, UEA: SOP-14U, UEB: TSSOP-14U Q16-3030: QFN-16(3×3) (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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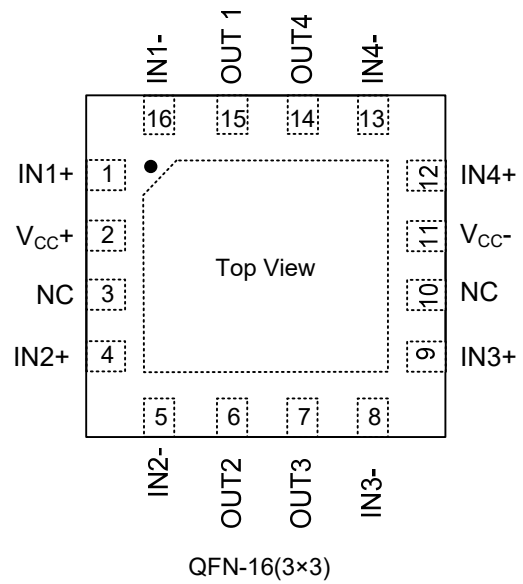
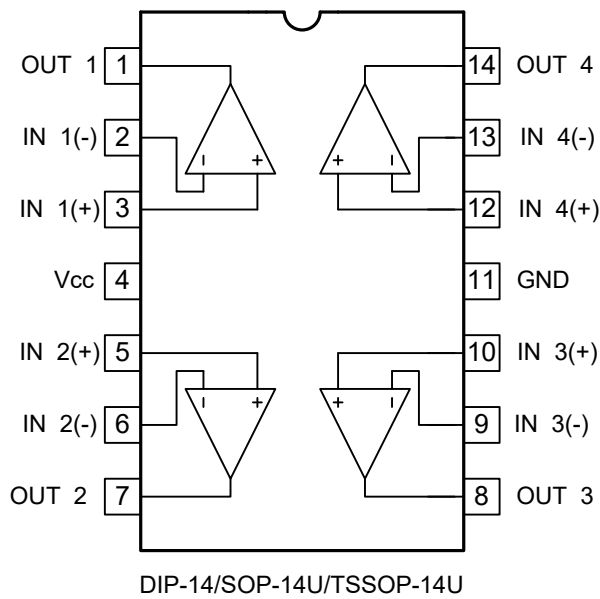
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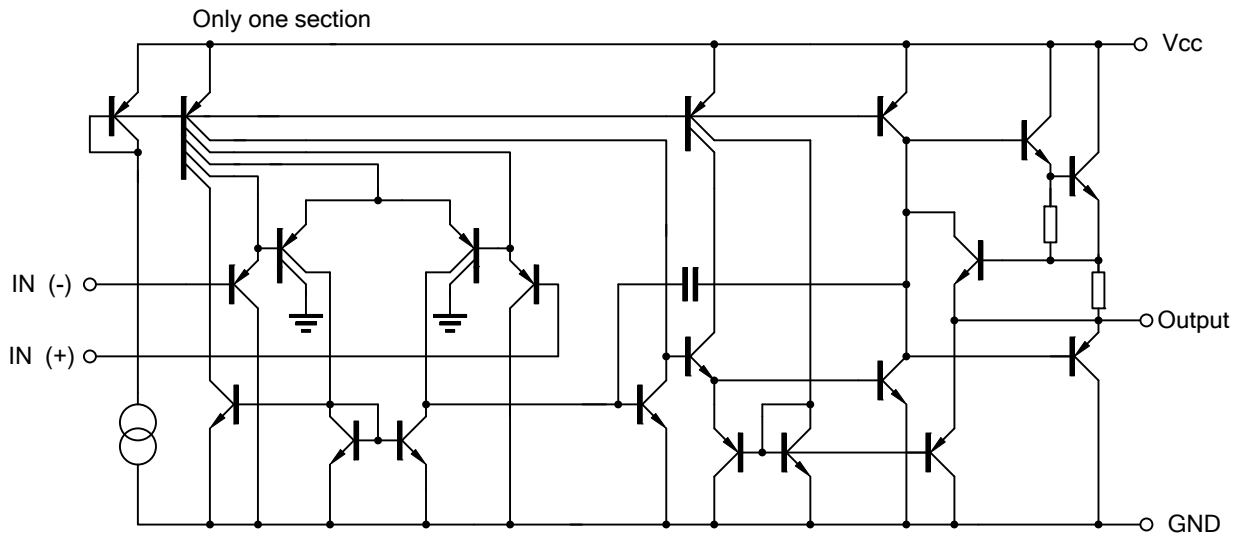
MARKING

PACKAGE	MARKING
DIP-14	<p> UTC □□□□ LM2902B□ □□ </p> <p> Date Code L: Lead Free G: Halogen Free Lot Code </p>
SOP-14U TSSOP-14U	<p> UTC □□□□ LM2902B□ □□ </p> <p> Date Code L: Lead Free G: Halogen Free Lot Code </p>
QFN-16(3×3)	<p> UTC LM2902B□ □□□□□ </p> <p> L: Lead Free G: Halogen Free Date Code Lot Code </p>

PIN DESCRIPTION



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	± 20 or 40	V
Differential Input Voltage		$V_{I(DIFF)}$	± 40	V
Input Voltage		V_{IN}	-0.3 ~ +40	V
Power Dissipation	DIP-14	P_D	800	mW
	SOP-14U		580	mW
	TSSOP-14U		460	mW
	QFN-16(3×3)		1300	mW
Electrostatic Discharge	Human-Body Model (HBM) Per JESD22-A114/115	$V_{(ESD)}$	2000	V
Operating Temperature		T_{OPR}	-40 ~ +125	°C
Storage Temperature		T_{STG}	-65 ~ +150	°C

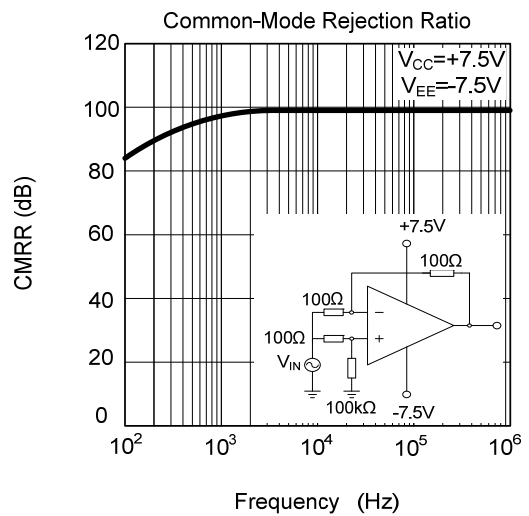
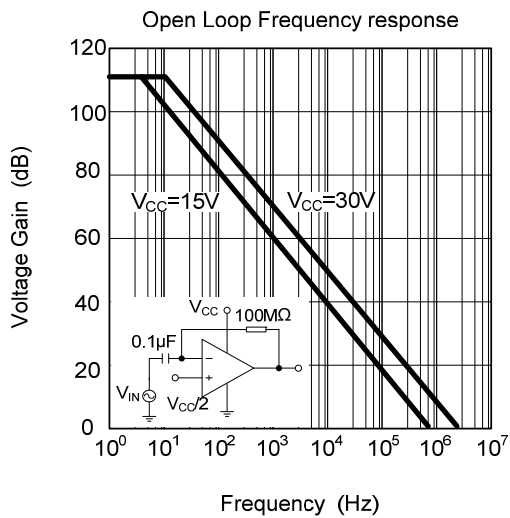
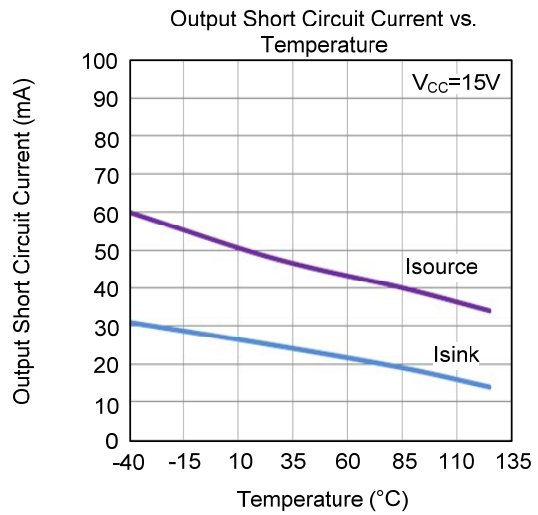
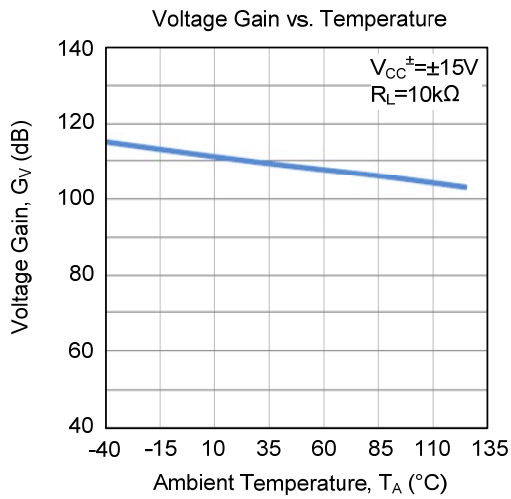
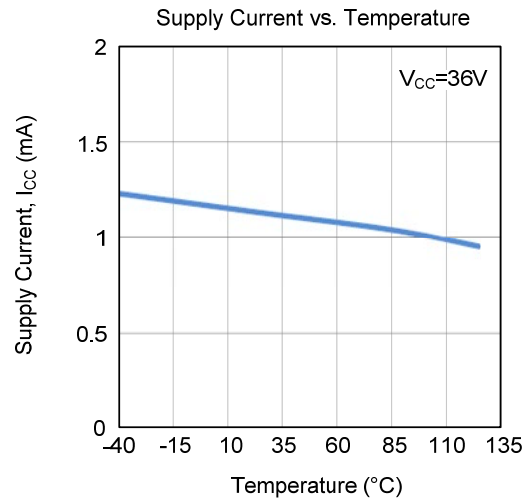
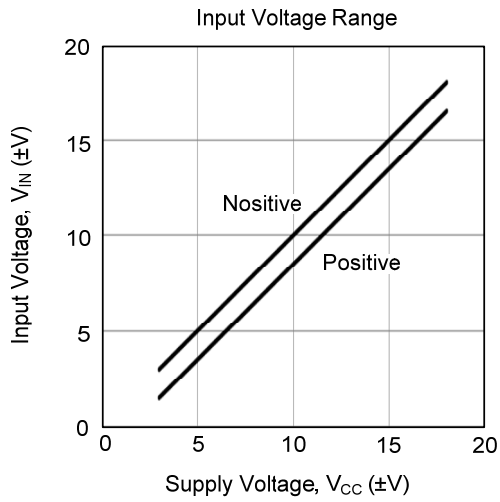
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS

($V_{CC}=5.0V$, All voltage referenced to GND unless otherwise specified.)

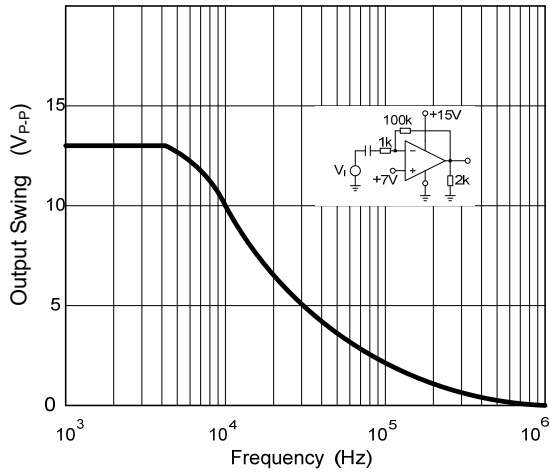
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Supply Current	I_{CC}	$R_L=\infty, V_{CC}=36V$		1.0	3.0	mA
		$V_{CC}=5V$		0.7	1.2	mA
Power Supply Rejection Ratio	PSRR		65	100		dB
Input Offset Voltage	$V_{I(OFF)}$	$V_{CM}=0V$ to $V_{CC}-1.5V$ $V_{O(P)}=1.4V, R_S=0\Omega$		0.5	3.0	mV
Input Offset Current	$I_{I(OFF)}$			1.5	10	nA
Input Bias Current	$I_{I(BIAS)}$				50	nA
Input Common Mode Voltage	$V_{I(CM)}$	$V_{CC}=36V$	0		$V_{CC}-1.5$	V
Common Mode Rejection Ratio	CMRR		65	90		dB
Large Signal Voltage Gain	G_V	$V_{CC}=15V, R_L \geq 10K\Omega$ $V_{O(P)}=1V \sim 11V$	50	100		V/mV
Output Voltage Swing	V_{OH}	$I_O=50\mu A$	$V_{CC}-1.6$	$V_{CC}-1.4$		V
		$I_O=1mA$	$V_{CC}-1.7$	$V_{CC}-1.5$		V
		$I_O=5mA$	$V_{CC}-1.8$	$V_{CC}-1.6$		V
	V_{OL}	$I_O=50\mu A$			150	
$I_O=1mA$				0.75	1	V
Output Current	I_{SOURCE}	$V_I(+)=1V, V_I(-)=0V$ $V_{CC}=15V, V_O=GND$	-20	-45		mA
	I_{SINK}	$V_I(+)=0V, V_I(-)=1V$ $V_{CC}=15V, V_O=V_{CC}$	10	25		mA
Slew Rate	SR			1.1		V/ μs
Gain-Bandwidth Product	GBW			1.7		MHz

TYPICAL CHARACTERISTICS

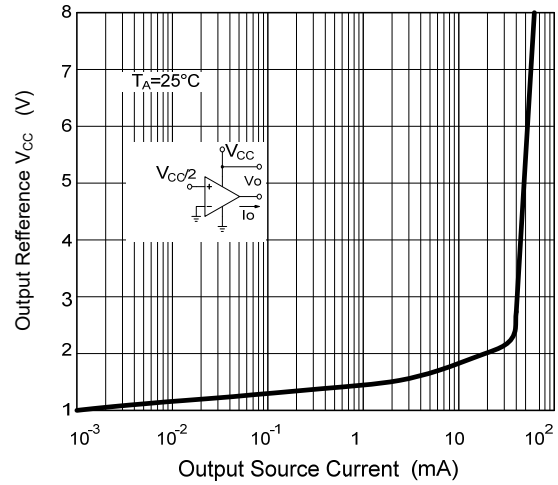


■ TYPICAL CHARACTERISTICS (Cont.)

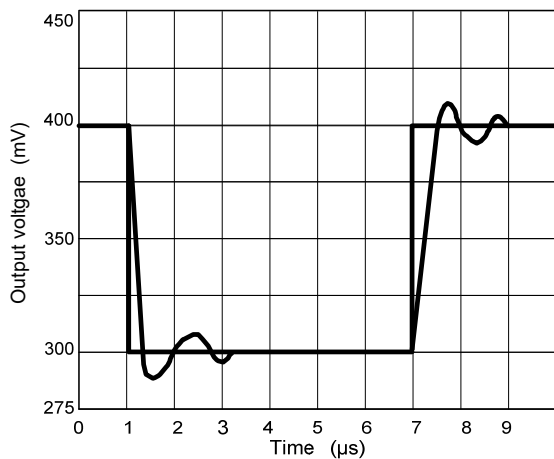
Large Signal Frequency Response



Output Characteristics Current Sourcing



Voltage Follower pulse response (small signal)



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