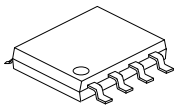
UNE5534

LINEAR INTEGRATED CIRCUIT

LOW-NOISE OPERATIONAL AMPLIFIER



SOP-8

■ DESCRIPTION

The UTC **UNE5534** is high-performance operational amplifiers with excellent DC/AC and very low noise characteristics. It features high output-drive capability, high unity-gain and maximum-output-swing bandwidths, low distortion, high slew rate.

This operational amplifier is compensated internally for a gain equal to or greater than three. Optimization of the frequency response for various applications can be obtained by use of an external compensation capacitor between COMP and COMP/BAL. The device features input-protection diodes, output short-circuit protection, and offset-voltage nulling capability with use of the BALANCE and COMP/BAL pins.

■ FEATURES

* Supply Voltage: ±5~±20V
* Supply Current/Amplifier: 8 mA (Max.)
* Input Offset Voltage: 4mV (Max)
* Slew Rate: 7.8V/μs (Typ.)
* Offset Nulling Capability
* External Compensation Capability.

■ ORDERING INFORMATION

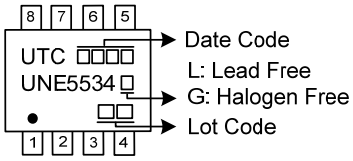
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UNE5534L-S08-R	UNE5534G-S08-R	SOP-8	Tape Reel

UNE5534G-S08-R

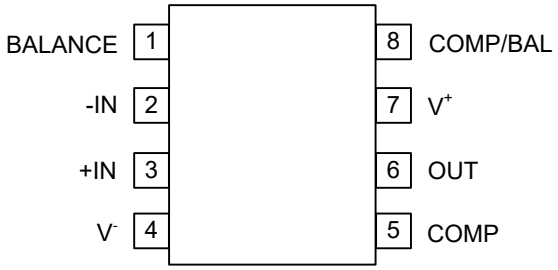
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



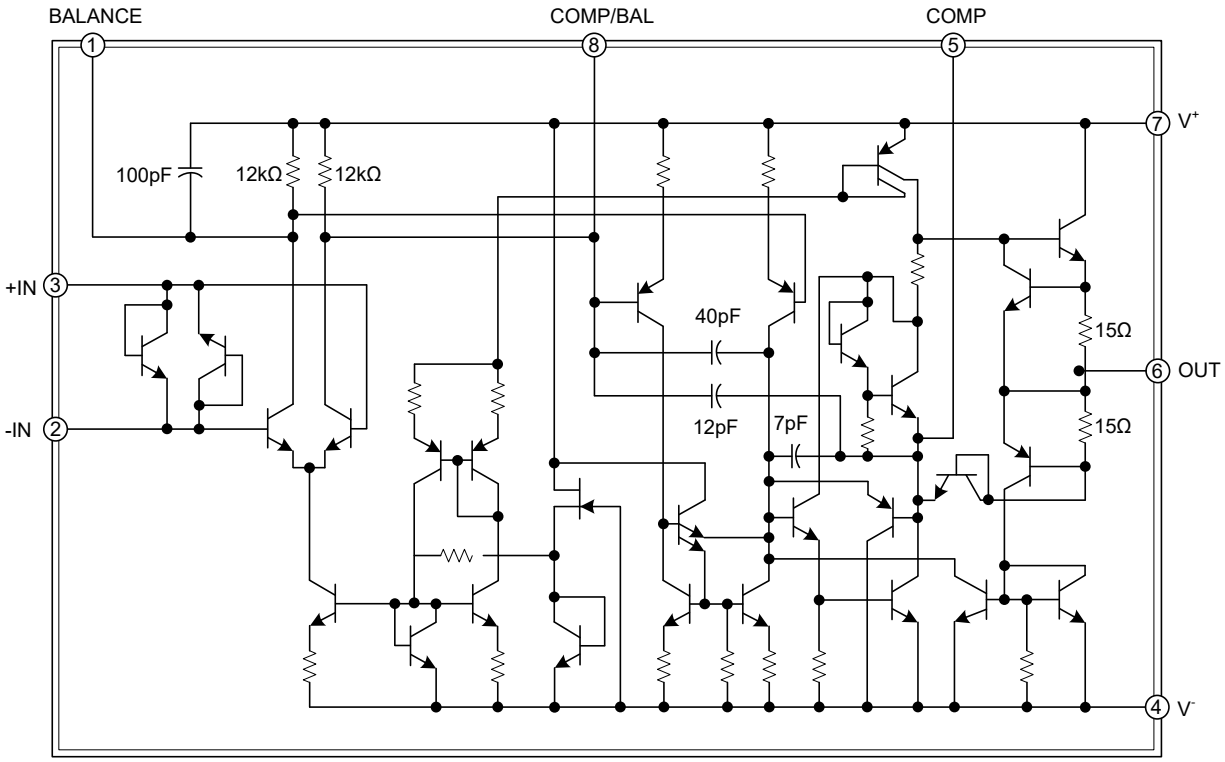
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	BALANCE	External frequency compensation
2	-IN	Inverting Input
3	+IN	Non-inverting Input
4	V^-	Negative power supply
5	COMP	External offset voltage adjustment
6	OUT	Output
7	V^+	Positive power supply
8	COMP/BAL	External offset voltage adjustment/External frequency compensation

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

over operating free-air temperature range (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (Note 1)	V^+	0 ~ 22	V
	V^-	-22 ~ 0	V
Differential Input Voltage t (Note 2, 3)	V_{ID}	Supply Voltage	V
Input Current (Note 4)		-10 ~ 10	mA
Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Notes: 1. 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.
2. All voltage values, except differential voltages, are with respect to the midpoint between V^+ and V^-.
3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage.
4. Excessive input current will flow if a differential input voltage in excess of approximately 0.6V is applied between the inputs, unless some limiting resistance is used.
5. The output may be shorted to ground or either power supply. Temperature and/or supply voltages must be limited to ensure the maximum dissipation rating is not exceeded.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V^+	5		15	V
Supply Voltage	V^-	-5		-15	V
Operating Free-Air Temperature	T_{OPR}	-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	125	°C/W

■ ELECTRICAL CHARACTERISTICS ($V^{\pm}$ = ±15V, T_A=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Supply Current/Amplifier	I_Q	V_O=0, No Load.			3	8	mA
Power Supply Rejection Ratio	PSRR	$V^{\pm}$ =±9V ~ ±15V, V_O=0		80	115		dB
Input Offset Voltage (Note)	V_{OS}	V_O=0			1	4	mV
Input Bias Current	I_B	V_O=0			700	1500	nA
Input Offset Current	I_{OS}	V_O=0			40	300	nA
Common-Mode Voltage Range	V_{CM}			- 12		12	V
Common-Mode Rejection Ratio	CMRR	-12V < V_{IC} < 12V		70	100		dB
Large Signal Voltage Gain	A_V	R_L ≥ 2kΩ, V_O=±10V		80	97		dB
		R_L ≥ 600Ω, V_O=±10V		80	95		dB
Output Voltage	V_O	R_L ≥ 600Ω	V_{OH}	12	13.5		V
			V_{OL}		-12.9	-12	V
Short-Circuit Current	I_{SC}	Sourcing			43		mA
		Sinking			25		mA
Slew Rate	SR	C_C=0			7.8		V/μs
		C_C=22pF			4		V/μs
Gain-Bandwidth Product	GBW	C_C=0			9		MHz
		C_C=22pF			5.5		MHz
Input-Referred Voltage Noise	e_n	f=1kHz			5		nV/$\sqrt{Hz}$
Input-Referred Current Noise	i_n	f=1kHz			1		pA/$\sqrt{Hz}$

Note: Input offset voltage measurements are according Figure 2, use external resistors to balance the resistance values from V^+ to Pin1 (BALANCE) and Pin8 (COMP/BAL) then measure.

■ SIMPLIFIED SCHEMATIC

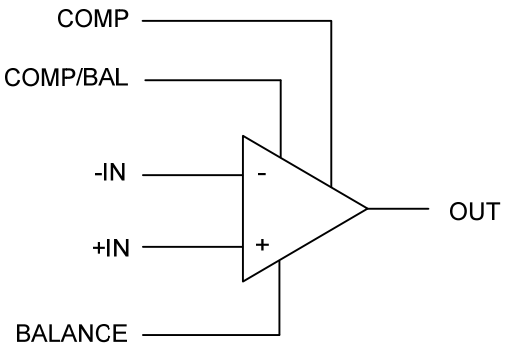


Figure 1. Simplified Schematic

■ TYPICAL APPLICATION CIRCUIT

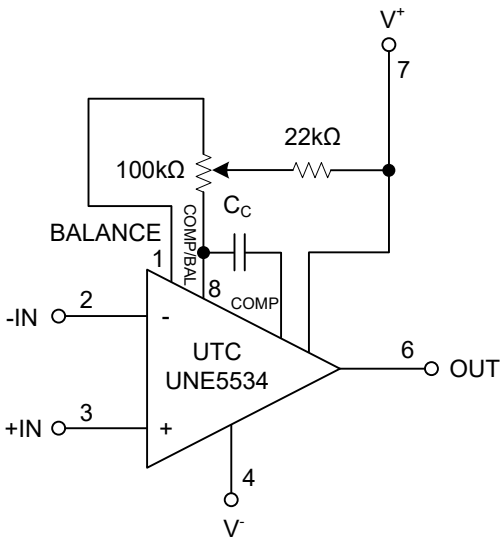
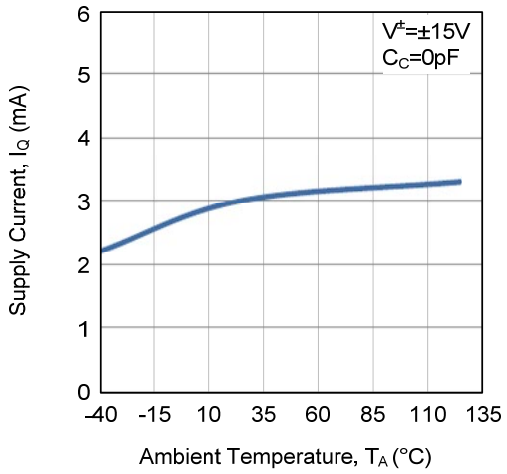


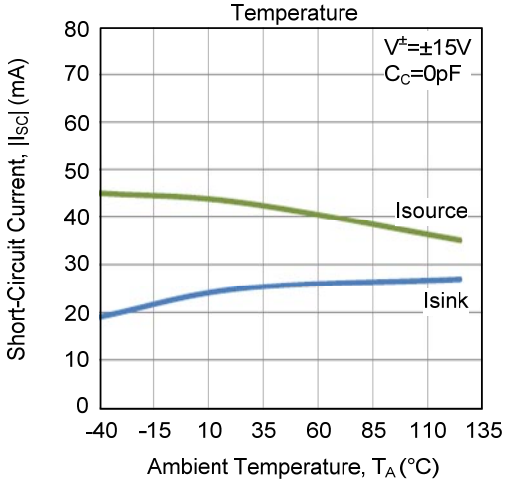
Figure 2. Input Offset-Voltage Null Circuit

■ TYPICAL CHARACTERISTICS

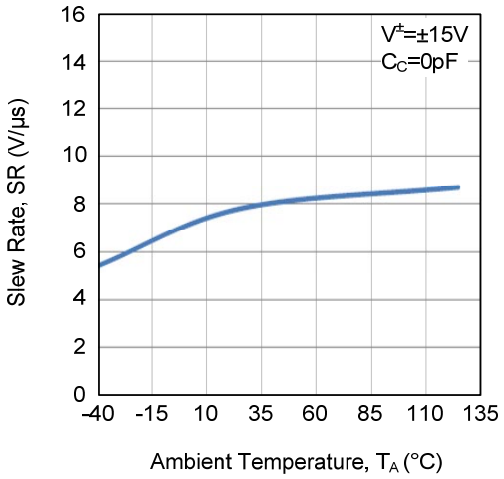
Supply Current vs. Temperature



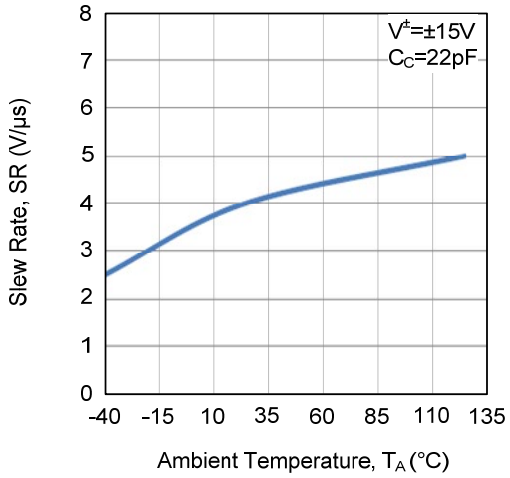
Output Short Circuit Current vs. Temperature



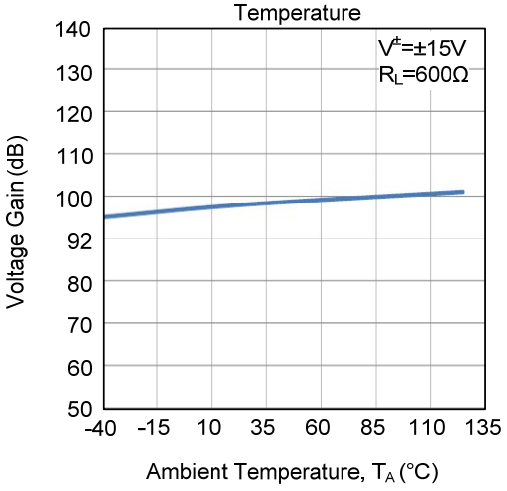
Slew Rate vs. Temperature



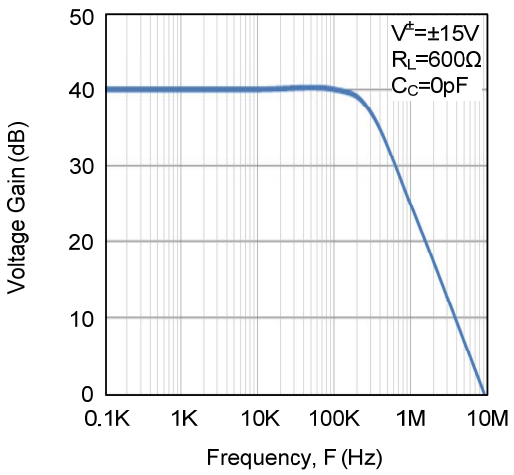
Slew Rate vs. Temperature



Large Signal Voltage Gain vs. Temperature



Voltage Gain vs. Frequency



■ TYPICAL CHARACTERISTICS (Cont.)