



# UNISONIC TECHNOLOGIES CO., LTD

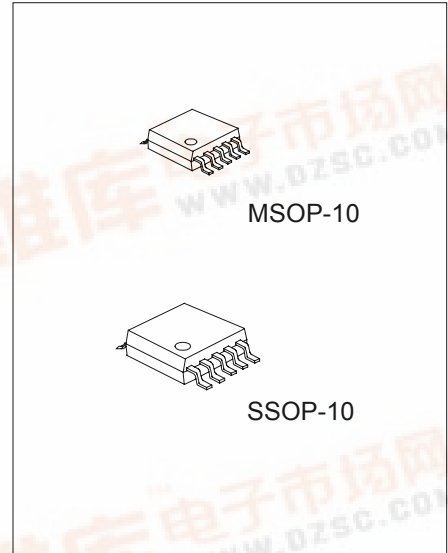
## A4533

### LINEAR INTEGRATED CIRCUIT

## LOW POWER AMPLIFIER FOR HEADPHONE STEREOS

### FEATURES

- \* Low current consumption.
- \* 16Ω load drive capability.
- \* Excellent reduced voltage characteristics.
- \* High power supply ripple rejection.
- \* Fewer external components required.
- \* High voltage gain.
- \* Less harmonic interference in radio band.
- \* Built in power switch and muting function.



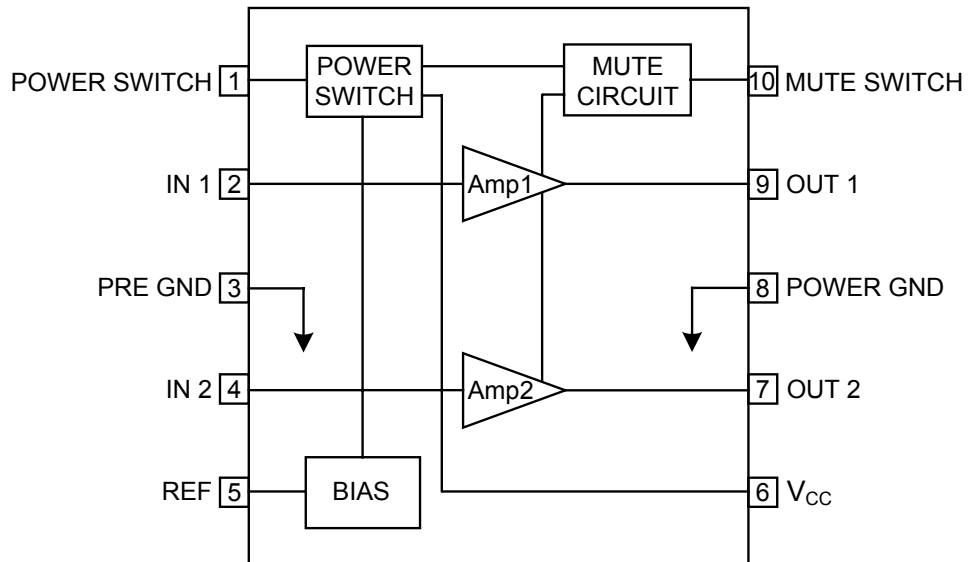
\*Pb-free plating product number: A4533L

### ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
A4533-SM2-R	A4533L-SM2-R	MSOP-10	Tape & Reel
A4533-SM2-T	A4533L-SM2-T	MSOP-10	Tube
A4533-R10-R	A4533L-R10-R	SSOP-10	Tape & Reel
A4533-R10-T	A4533L-R10-T	SSOP-10	Tube



### ■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Power Supply Voltage	$V_{CC}$	4.5	V
Power Dissipation	$P_D$	300	mW
Junction Temperature	$T_J$	125	
Operating Temperature	$T_{OPR}$	0 ~ +70	
Storage Temperature	$T_{STG}$	-40 ~ +150	

Note 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. The device is guaranteed to meet performance specification within 0 ~ 70 operating temperature range and assured by design from -20 ~ 85 .

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	3	V
Operating Voltage Range	$V_{OPR}$	1.6 ~ 4	V
Load Resistance	$R_L$	16 ~ 32	$\Omega$

■ ELECTRICAL CHARACTERIS ( $T_a = 25^\circ\text{C}$ ,  $R_L=16\Omega$ ,  $R_g=600\Omega$ , Unless Otherwise specified)

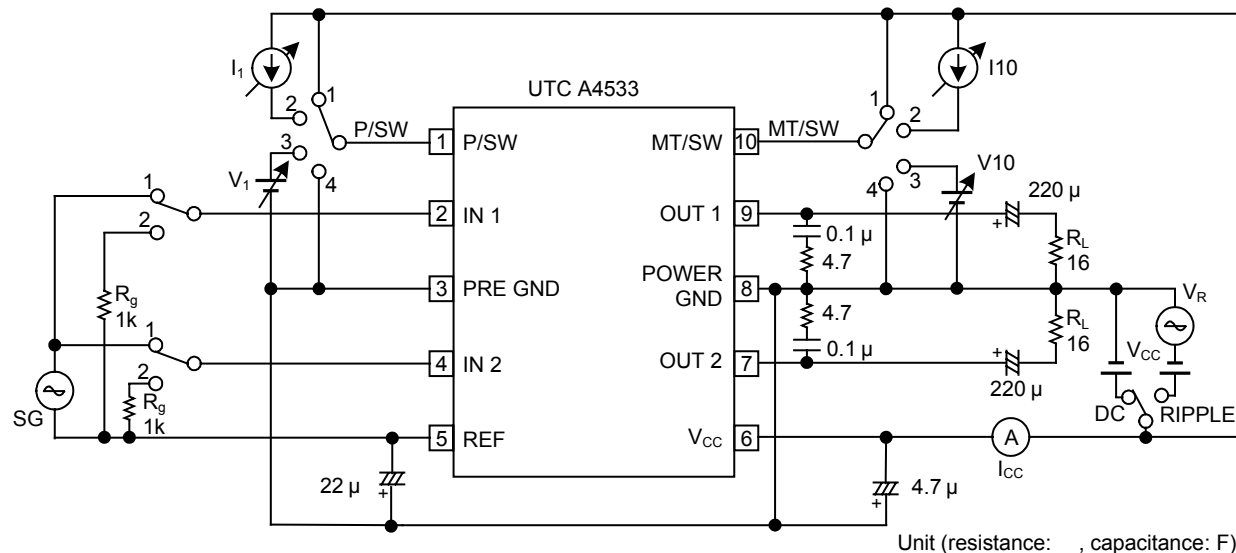
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Current	$I_{Q1}$	$V_{CC}=2.4V$		5.4	10	mA
	$I_{Q2}$	$V_{CC}=4.5V$ , Mute =GND		1.1	2.0	mA
	$I_{Q3}$	$V_{CC}=4.5V$ , PS = GND			1.0	$\mu\text{A}$
Voltage Gain	$G_{V1}$	$V_{CC}=2.4V$ , $f=1\text{kHz}$ , $V_{OUT}=-10\text{dBm}$	30	32	34	dB
	$G_{V2}$	$V_{CC}=1.6V$ , $f=1\text{kHz}$ , $V_{OUT}=-20\text{dBm}$	29	32	34	dB
Voltage Gain Difference	$\Delta G_{V1}$	$V_{CC}=2.4V$ , $f=1\text{kHz}$ , $V_{OUT}=-10\text{dBm}$			1.0	dB
	$\Delta G_{V2}$	$V_{CC}=1.6V$ , $f=1\text{kHz}$ , $V_{OUT}=-20\text{dBm}$			1.0	dB
Total Harmonic Distortion	THD	$V_{CC}=2.0V$ , $f=1\text{kHz}$ , $P_{OUT}=1\text{mW}$		0.5	1.5	%
Output Power	$P_{OUT}$	$V_{CC}=3.0V$ , $f=1\text{kHz}$ , THD=10%	20	40		mW
Cross Talk	CT	$V_{CC}=2.4V$ , $f=100\text{Hz}$ , $R_g=1\text{k}\Omega$ , $V_{OUT}=-10\text{dB}$	40	50		dB
Ripple Rejection	RR	$V_{CC}=1.6V$ , $f=100\text{Hz}$ , $R_g=1\text{k}\Omega$ , $V_R=-20\text{dBm}$ , BPF=100Hz	45	60		dB
Output Noise Voltage	eN	$V_{CC}=4.5V$ , $R_g=1\text{k}\Omega$ , BPF=20Hz ~ 20kHz		62	100	$\mu\text{V}$
Power Off Effect	$V_{O(OFF)}$	$V_{CC}=1.6V$ , $f=100\text{Hz}$ , PS = GND, $V_{IN}=-10\text{dB}$			-80	dB
Muting Effect	$V_{O(MT)}$	$V_{CC}=1.6V$ , $f=100\text{Hz}$ , Mute = GND, $V_{IN}=-10\text{dB}$			-80	dB
Power On Current Sensitivity	$I_{PS(ON)}$	$V_{CC}=1.5V$ , $V_{REF}\geq 0.85V$		0.05	1.0	$\mu\text{A}$
Power Off Voltage Sensitivity	$V_{PS(OFF)}$	$V_{CC}=1.5V$ , $V_{REF}\leq 0.1V$	0.5	0.6		V
Muting Off Current Sensitivity	$I_{MUTE(OFF)}$	$V_{CC}=1.5V$ , $V_{REF}\geq 0.85V$		0.2	1.0	$\mu\text{A}$
Muting On Voltage Sensitivity	$V_{MUTE(ON)}$	$V_{CC}=1.5V$ , $V_{REF}\leq 0.1V$	0.5	0.65		V

Note: The quiescent current is represented by the current flowing into pin 6. The respective maximum currents flowing into pin 1 and pin 10 are calculated by (pin voltage -0.5) / 16 [V/k $\Omega$ ] and the total current increases by these current values.

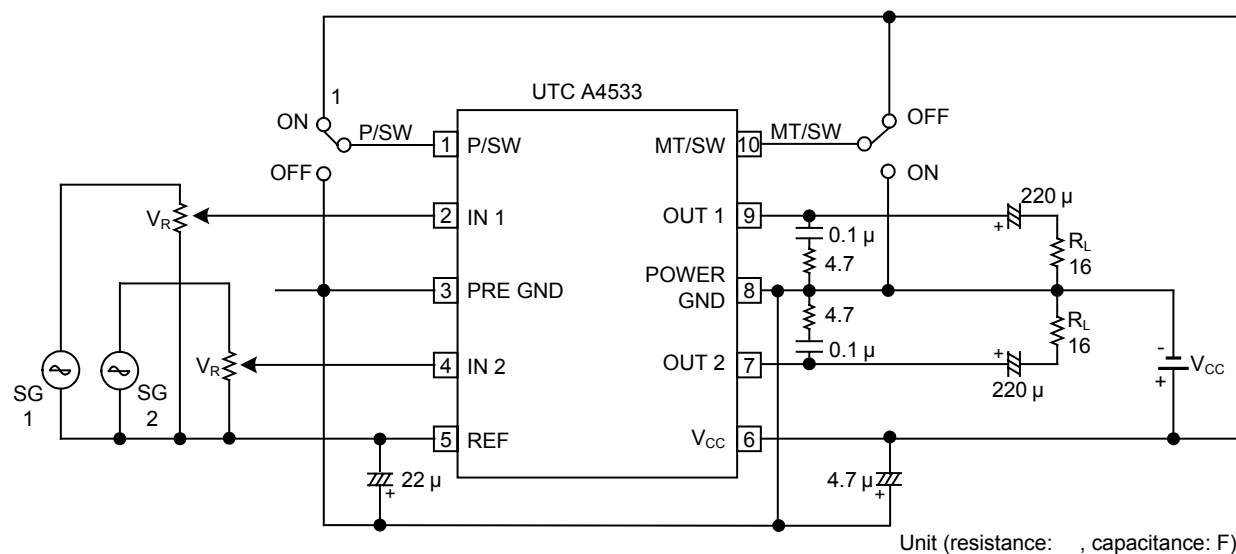
# A4533

## LINEAR INTEGRATED CIRCUIT

### TEST CIRCUIT



### ■ TYPICAL APPLICATION CIRCUIT



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