Lyontek Inc.

LY8893

Rev. 1.4

1.4 Watt Audio power Amplifier with Active-high shutdown mode

FEATURES

- 2.5V~5.5V Power supply.
- Thermal shutdown Protection.
- Low current shutdown mode
- No capacitors and networks or bootstrap capacitors required
- Low noise during turn-on and turn-off transitions
- Headphone amplifier mode.
- Shutdown pin high active.
- Lead free and green package available. (RoHS Compliant)
- Space Saving Package
  -- 8-pin MSOP package.

APPLICATION

- Portable electronic devices
- Mobile Phones
- PDAs

GENERAL DESCRIPTION

The LY8893 is a 1.4 Watt audio power amplifier. And the LY8893 primarily designed for high quality application in other portable communication device. It is capable of driving 8Ω speaker load at a continuous average output of 1.4W / 10% distortion (THD+N) from a 5.0V power supply.

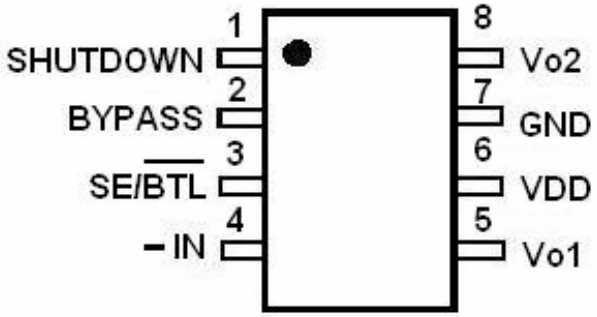
A feature of the LY8893 amplifier to switch BTL mode and headphone mode (single-ended) is accomplished using the headphone sense pin. And the LY8893 audio amplifier features low power consumption shutdown mode. It is achieved by driving the shutdown pin with logic high. Besides the LY8893 has an internal thermal shutdown protection feature.

The LY8893 amplifier was designed specifically to provide high quality output power with a minimal amount of external components. The LY8893 does not require output capacitors, and the LY8893 is ideally suited for other low voltage applications or portable electronic devices where minimal power consumption is a primary requirement.

PIN CONFIGURATION

LY8893 MSOP PACKAGE

8-PIN (TOP VIEW)



PIN DESCRIPTION

SYMBOL	PIN No.	DESCRIPTION
	MSOP	
SHUTDOWN	1	Shutdown the device.(when **HIGH** level is active the pin)
BYPASS	2	Bypass pin
SE/BTL	3	SE and BTL select pin.(when **HIGH** level is **SE** mode, when **LOW** level is **BTL** mode.)
-IN	4	Audio input
Vo1	5	Negative output
V_{DD}	6	Power supply
GND	7	Ground
Vo2	8	Positive output

APPLICATION CIRCUIT

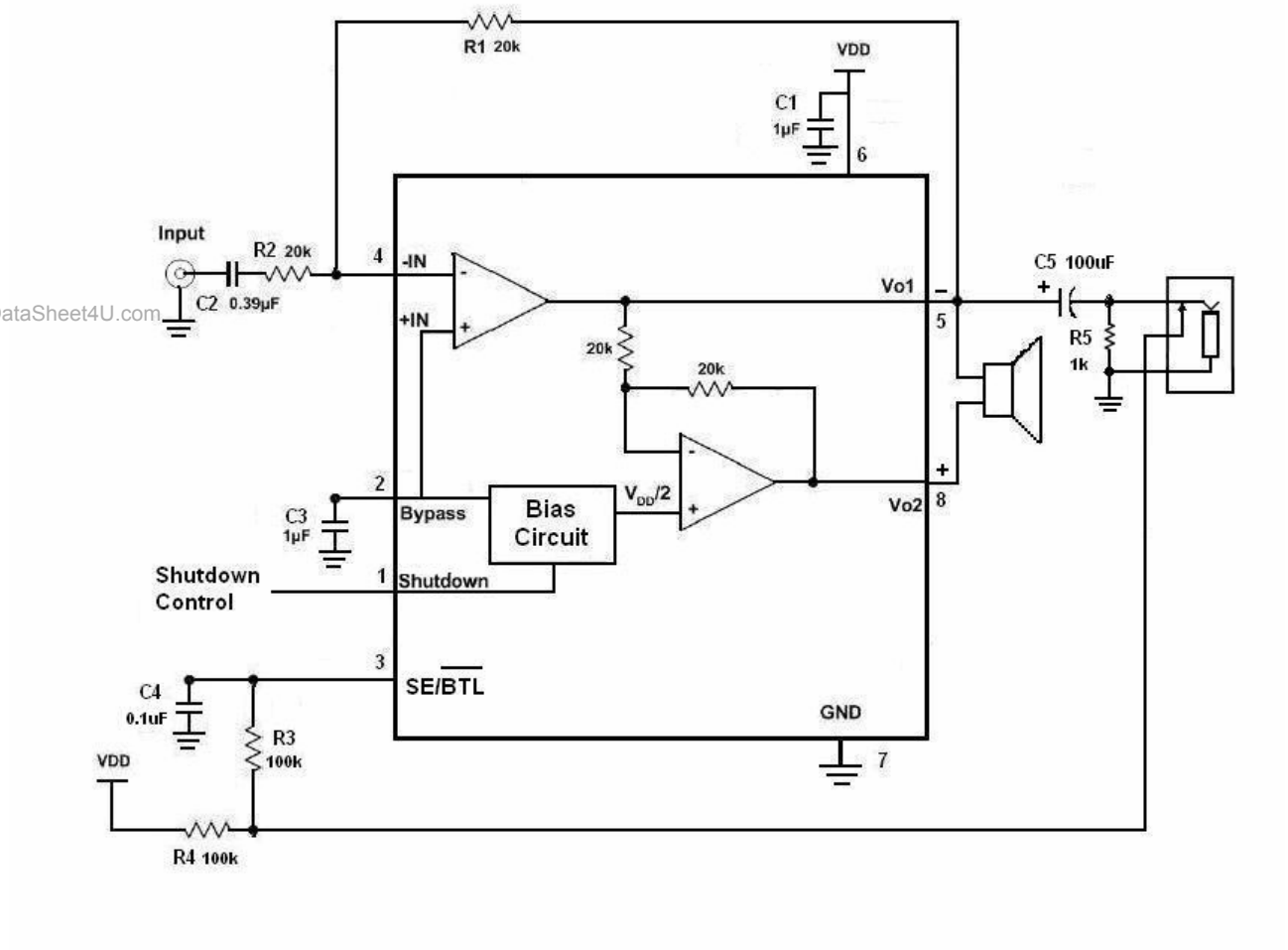


Figure 1. Audio Amplifier Typical Application Circuit

ABSOLUTE MAXIMUN RATINGS*

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	6.0	V
Operating Temperature	T_A	-40 to 85 (I grade)	℃
Input Voltage	V_I	-0.3V to V_{DD} +0.3V	V
Storage Temperature	T_{STG}	-65 to 150	℃
Power Dissipation	P_D	Internally Limited	W
ESD Susceptibility	V_{ESD}	2000	V
Junction Temperature	T_{JMAX}	150	℃
Soldering Temperature (under 10 sec)	T_{SOLDER}	260	℃

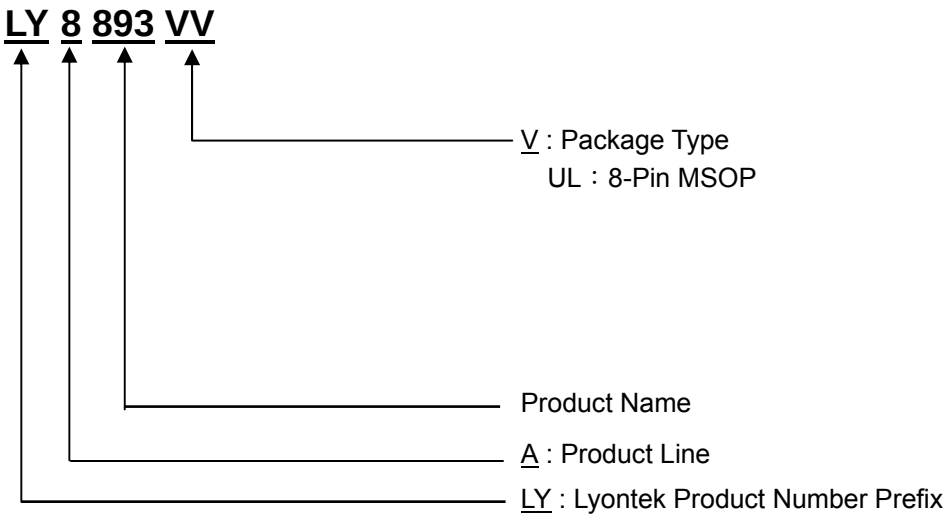
DC ELECTRICAL CHARACTERISTICS (V_{DD}=5V, T_A=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power Supply Current	I_{DD}	V_{IN} = 0V, I_O = 0A, No Load	-	3.5	9.0	mA
		V_{IN} = 0V, I_O = 0A, 8Ω Load	-	4.0	10.0	mA
Shutdown Current	I_{SD}	$V_{SHUTDOWN}$ = 0V	-	0.1	2.0	μA
HP Sense high input voltage	V_{IH}		0.8xV_{DD}	-	-	V
HP Sense low input voltage	V_{IL}		-	-	0.2xV_{DD}	V
Wake-up time	T_{WU}	Bypass cap. = 1.0uF	-	176		ms
Output Offset Voltage	V_{OS}		-	7.0	50.0	mV
Output Power	Po	THD = 10% , f = 1 kHz R_L = 8Ω, HP Sense < 0.2xV_{DD}		1.4		W
		THD = 1% , f = 1 kHz R_L = 8Ω, HP Sense < 0.2xV_{DD}	-	1.0	-	W
		THD = 1% (max), f = 1kHz, R_L = 32Ω, HP Sense > 0.8xV_{DD}	-	90		mW
Total Harmonic Distortion+ Noise	THD+N	Po = 0.4 Wrms; f = 1kHz	-	0.13		%
Power Supply Rejection Ratio	PSRR	Vripple = 200mV sine p-p Input terminated with 10Ω to GND	-	62 (f = 217Hz) 66 (f = 1kHz)	-	dB
Thermal Shutdown Temperature	T_{SD}		150	170	190	℃
Shut Down Time	T_{SDT}	8 Ω load		1.0		ms

DC ELECTRICAL CHARACTERISTICS (V_{DD}=3V, T_A=25℃)

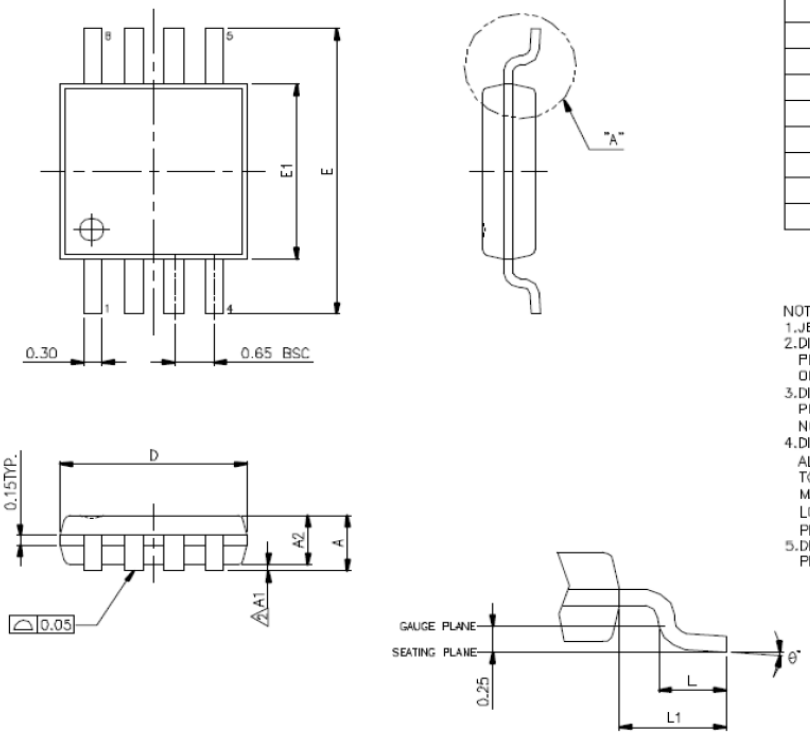
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power Supply Current	I_{DD}	V_{IN} = 0V, I_O = 0A, No Load	-	3.0	8.0	mA
		V_{IN} = 0V, I_O = 0A, 8Ω Load	-	3.5	9.0	mA
Shutdown Current	I_{SD}	$V_{SHUTDOWN}$ = 0V	-	0.1	2.0	μA
HP Sense high input voltage	V_{IH}		0.8xV_{DD}	-	-	V
HP Sense low input voltage	V_{IL}		-	-	0.2xV_{DD}	V
Output Offset Voltage	V_{OS}		-	7.0	50.0	mV
Wake-up time	T_{WU}		-	114		ms
Output Power	Po	THD = 10% , f = 1 kHz R_L = 8Ω, HP Sense < 0.2xV_{DD}		0.46		W
		THD = 1% , f = 1 kHz R_L = 8Ω, HP Sense < 0.2xV_{DD}	-	0.375		W
		THD = 1% (max), f = 1kHz, R_L = 32Ω, HP Sense > 0.8xV_{DD}	-	35		mW
Total Harmonic Distortion+ Noise	THD+N	Po = 0.25 W_{rms} , f = 1kHz	-	0.13	-	%
Power Supply Rejection Ratio	PSRR	V_{ripple} = 200mV sine p-p Input terminated with 10Ω to GND	-	56 (f = 217Hz) 62 (f = 1kHz)	-	dB
Thermal Shutdown Temperature	T_{SD}		150	170	190	℃

ORDERING INFORMATION



PACKAGE OUTLINE DIMENSION

8 pin 25.6 mil MSOP Package Outline Dimension



SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.10
A1	0.00	–	0.15
A2	0.75	0.85	0.95
D		3.00 BSC	
E		4.90 BSC	
E1		3.00 BSC	
L	0.40	0.60	0.80
L1		0.95 REF	
θ°	0	–	8

UNIT : MM

NOTES:
1.JEDEC OUTLINE : MO-187 AA
2.DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE.
3.DIMENSION "E1" DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 PER SIDE.
4.DIMENSION "0.22" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 MM TOTAL IN EXCESS OF THE "0.22" DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT. MINIMUM SPAC BETWEEN PROTRUSION AND ADJACENT LEAD IS 0.07 MM.
5.DIMENSIONS "D" AND "E1" TO BE DETERMINED AT DATUM PLANE ⊞ .