BIPOLAR ANALOG INTEGRATED CIRCUIT
μPC1308V

18 W AF POWER AMPLIFIER
SILICON BIPOLAR MONOLITHIC INTEGRATED CIRCUIT

DESCRIPTION

The μPC1308V is an audio power amplifier in a 14-lead vertical dual in-line package, specifically designed for car stereo applications.

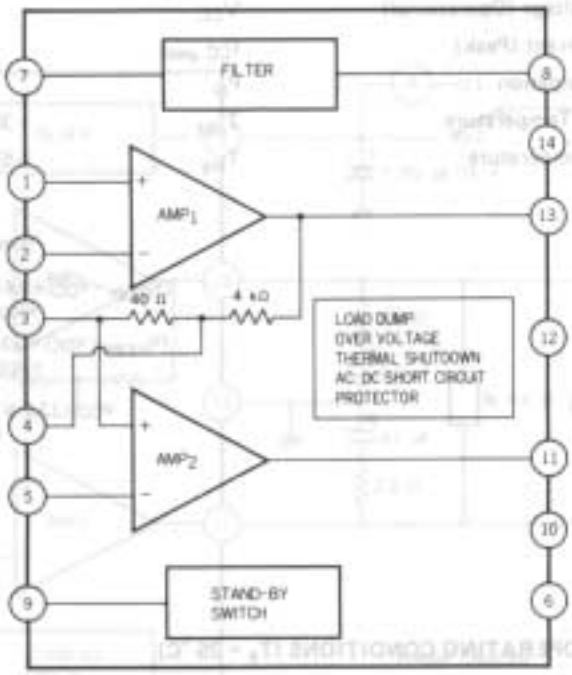
Typically it provides output power of 18 W at 14.4 V or 15 W at 13.2 V to a 4 Ω load.

This IC can be used without output capacitors, because its two output terminals have the same potential and it includes an original short circuit protection function which protects internal output power transistors and a speaker at the same time when one output terminal is shorted to ground.

FEATURES

- Internal stand-by switch circuit; CMOS drive possible.
- Can be used as OCL connection.
- Very low output offset voltage : V_{offset} = 150 mV (MAX.)
- High output power : P_O = 18 W (TYP.) @ R_L = 4 Ω, V_{CC} = 14.4 V, THD = 10 %
  P_O = 15 W (TYP.) @ R_L = 4 Ω, V_{CC} = 13.2 V, THD = 10 %
- Very low distortion : THD = 0.1 % (TYP.)
- Following protection circuits are included.
  (1) Load dump voltage surge protection circuit.
  (2) Thermal shut down protection circuit.
  (3) Output terminal short circuit protection circuit. (V_{CC} to OUT, OUT to GND, OUT to OUT)
  (4) Loudspeaker protection circuit.

BLOCK DIAGRAM

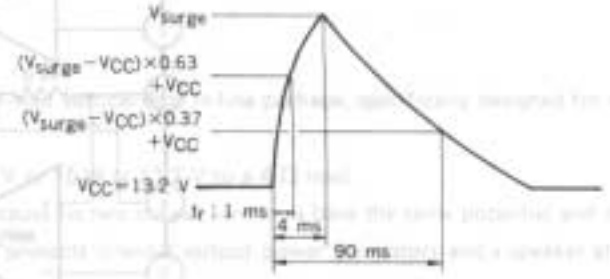


CONNECTION DIAGRAM

PIN No.	CONNECTION	PIN No.	CONNECTION
1	Input $_1$	8	V_{CC}
2	NFB $_1$	9	Stand-by switch
3	GND (Input)	10	NC
4	Output $_1$ Devided	11	Output $_2$
5	NFB $_2$	12	GND (Output)
6	GND (Output)	13	Output $_1$
7	Filter	14	NC

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Supply Voltage (Note1)	$V_{CC\ surge}$	60	V
Supply Voltage (Operational)	V_{CC}	18	V
Circuit Current (Peak)	$I_{CC\ peak}$	4.5	A
Power Dissipation	P_D	20	W
Operating Temperature	T_{opt}	−30 to +75	°C
Storage Temperature	T_{stg}	−55 to +150	°C



Surge Pulse Waveform

RECOMMENDED OPERATING CONDITIONS (T_a = 25 °C)

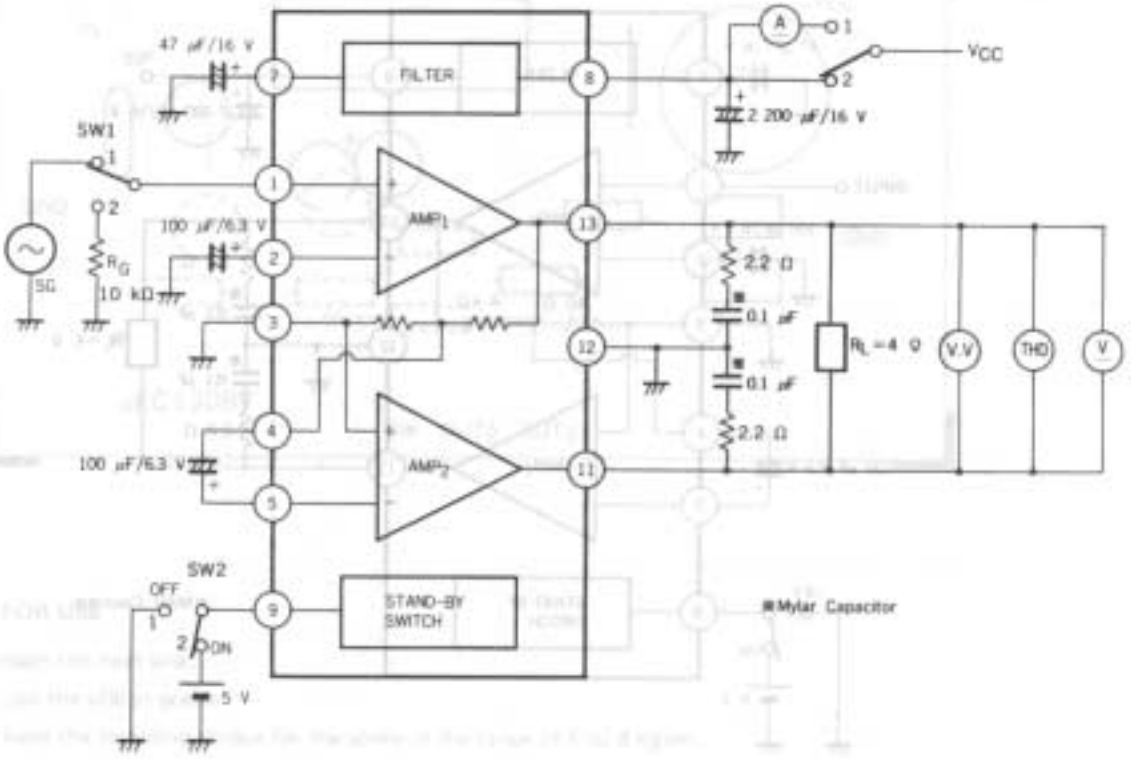
Supply Voltage Range	9 to 16	V
Load Impedance	3.2 to 16	Ω
Pin 9 Voltage (Operating)	3.5 to V_{CC}	V
Pin 9 Voltage (Stand-by)	0 to 1.5	V

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, V_{CC} = 13.2 V, R_L = 4 Ω, f = 1 kHz, Using 4 °C/W heat sink)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Quiescent Current	I_{CC}		90	150	mA	V_i = 0
Output Offset Voltage	V_{offset}		0	±150	mV	V_i = 0
Output Power	P_O		18		W	V_{CC} = 14.4 V, THD = 10 %**
		12	15		W	V_{CC} = 13.2 V, THD = 10 %**
Voltage Gain	A_V	44	46	48	dB	
Total Harmonic Distortion	THD		0.1	0.5	%	P_O = 1 W
Output Noise Level	V_n		0.45	1.5	$mV_{r.m.s.}$	R_G = 10 kΩ, BW = 20 Hz to 20 kHz
Supply Voltage Rejection Ratio	SVR	40	46		dB	R_G = 0, f_{rip} = 100 Hz, V_{rip} = 0.5 V
Input Resistance	R_i	45	65		kΩ	
Roll-off Frequency	f_H		80		kHz	A_V = −3 dB from 1 kHz Ref High
	f_L		10		Hz	A_V = −3 dB from 1 kHz Ref Low
Stand-by Current	$I_{CC(SB)}$		0.32	0.5	mA	0 ≤ V_g ≤ 1.5 V

(**Using a Voltmeter: HP-400FL)

TEST CIRCUIT



SWITCH POSITION

CHARACTERISTIC	SYMBOL	SW 1	SW 2	SW 3
Quiescent Current	I_{CC}	2	2	1
Output Offset Voltage	V_{offset}	2	2	2
Voltage Gain	A_V	1	2	2
Output Power	P_O	1	2	2
Total Harmonic Distortion	THD	1	2	2
Output Noise Level	V_n	2	2	2
Stand-by Current	$I_{CC(SB)}$	1	1	1

14 PIN V-DIP PACKAGE DIMENSIONS (Unit : mm)