BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC2500H

45 W AF POWER AMPLIFIER

DESCRIPTION

The μPC2500H is an audio power amplifier in a 12-lead single in-line package, specifically designed for car stereo applications.

Typically it provides output power of 45 W at 14.4 V or 40 W at 13.2 V to a 2 Ω load.

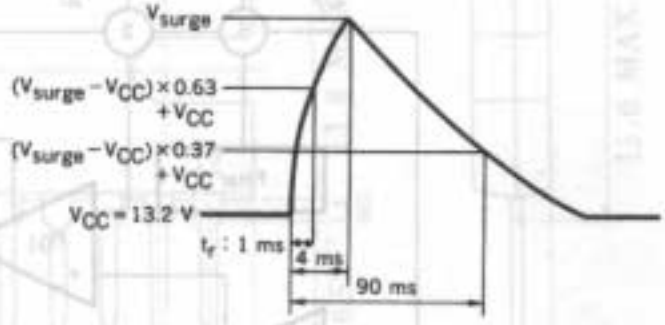
This IC can be used without output capacitors, because its two output terminals have the same potential and it includes original short circuit protection function which protects internal output power transistors and a speaker at the same time when one output terminal is shorted to ground or V_{CC}.

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 = 45 W (TYP.) @ R_L = 2 Ω, V_{CC} = 14.4 V, THD = 10 %
  P_O = 40 W (TYP.) @ R_L = 2 Ω, V_{CC} = 13.2 V, THD = 10 %
- Very low distortion : THD = 0.025 % (TYP.) @ R_L = 2 Ω, V_{CC} = 13.2 V, P_O = 8 W, f = 1 kHz
- 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.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Supply Voltage (Note)	$V_{CC\ surge}$	60*	V
Supply Voltage (Operational)	V_{CC}	18	V
Output Current (Instantaneous)	I_o	8	A
Power Dissipation	P_D	50	W
Operating Temperature	T_{opt}	−30 to +85	°C
Storage Temperature	T_{stg}	−40 to +150	°C



Surge Pulse Waveform

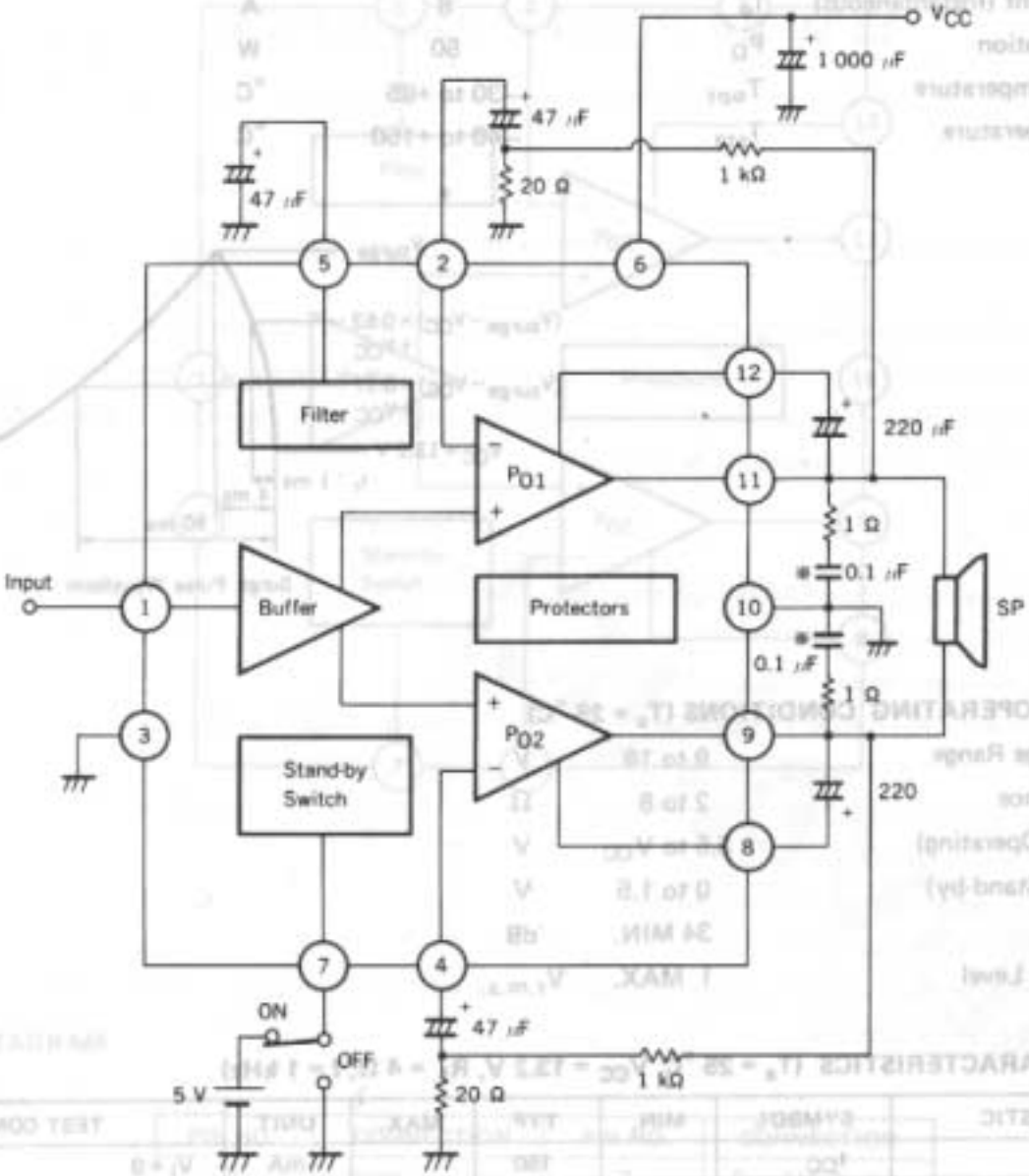
RECOMMENDED OPERATING CONDITIONS (T_a = 25 °C)

Supply Voltage Range	9 to 16	V
Load Impedance	2 to 8	Ω
Pin Voltage (Operating)	3.5 to V_{CC}	V
Pin Voltage (Stand-by)	0 to 1.5	V
Voltage Gain	34 MIN.	dB
Input Voltage Level	1 MAX.	$V_{r.m.s.}$

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

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Quiescent Current	I_{CC}		150		mA	V_i = 0
Output Offset Voltage	V_{offset}		0	±150	mV	V_i = 0
Output Power	P_{O1}		40		W	R_L = 2 Ω, THD = 10 %
	P_{O2}		45		W	R_L = 2 Ω, THD = 10 %, V_{CC} = 14.4 V
	P_{O3}		24		W	R_L = 4 Ω, THD = 10 %
	P_{O4}		30		W	R_L = 2 Ω, THD = 1 %
	P_{O5}		19		W	R_L = 4 Ω, THD = 1 %
Voltage Gain	A_v		40		dB	P_O = 2 W
Total Harmonic Distortion	THD_1		0.025		%	R_L = 2 Ω, P_O = 8 W
	THD_2		0.025		%	R_L = 4 Ω, P_O = 4 W
Output Noise Level	V_n		0.35		mV	R_G = 10 kΩ, BW = 20 Hz to 20 kHz
Supply Voltage Rejection Ratio	SVR		54		dB	R_G = 0, f_{rip} = 100 Hz, V_{rip} = 1.0 V
Input Resistance	R_i		30		kΩ	
Roll-off Frequency	f_H		250		kHz	A_v = −3 dB from 1 kHz Ref High
	f_L		5		Hz	A_v = −3 dB from 1 kHz Ref Low
Stand-by Current	$I_{CC(SB)}$		2		μA	0 ≤ V_7 ≤ 1.5 V

TYPICAL APPLICATION



*Mylar Capacitor