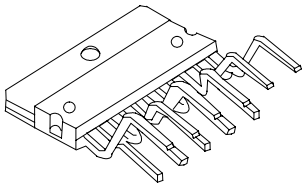
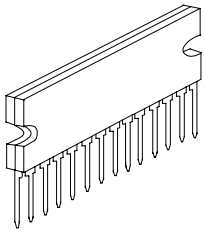
10+10W STEREO AMPLIFIER FOR CAR RADIO



HZIP-11



HSIP-14

*Pb-free plating product number: TDA2004L

■ DESCRIPTION

The UTC TDA2004 is a class B dual audio power amplifier and is designed for car radio applications.

■ FEATURES

* Low distortion.
* Low noise.

■ PIN DESCRIPTION

PIN NO.		PIN NAME
HZIP-11	HSIP-14*	
1	1	INPUT+ (1)
2	2	INPUT- (1)
3	3	SVRR
4	4	INPUT- (2)
5	5	INPUT+ (2)
6	6	GND
7	10	BOOTSTRAP 2
8	11	OUTPUT 2
9	12	+VS
10	13	OUTPUT 1
11	14	BOOTSTRAP 1

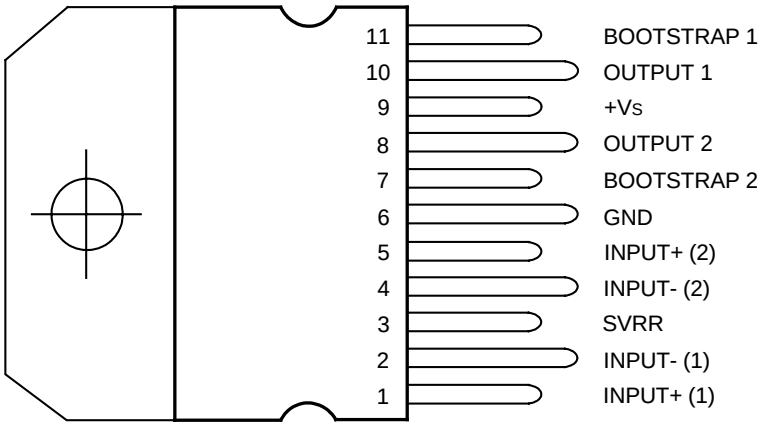
* PIN 7, 8, 9 no connection.

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
TDA2004-J11-T	TDA2004L-J11-T	HZIP-11	Tube
TDA2004-H14-T	TDA2004L-H14-T	HSIP-14	Tube

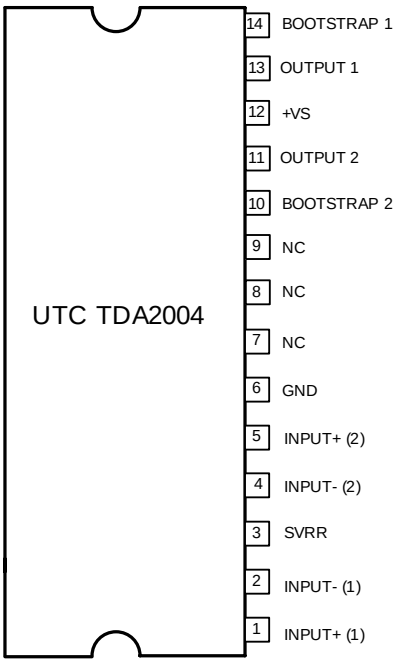
■ PIN CONFIGURATION

HZIP-11



*TAB CONNECTED TO PIN 6

HSIP-14



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Opearting Supply Voltage		Vss	18	V
DC Supply Voltage		Vss	28	V
Peak Supply Voltage (for 50ms)		Vss	40	V
Output Peak Current	non repetitive t=0.1ms	Io*	4.5	A
	repetitive f ≥10Hz	Io*	3.5	A
Power Dissipation at Tc=60℃		P_D	30	W
Junction Temperature		T_J	+125	℃
Storage Temperature		T_{STG}	-40 ~ 150	℃

* The max. output current is internally limited.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Case	θ_{JC}	3.0	℃/W

■ ELECTRICAL CHARACTERISTICS

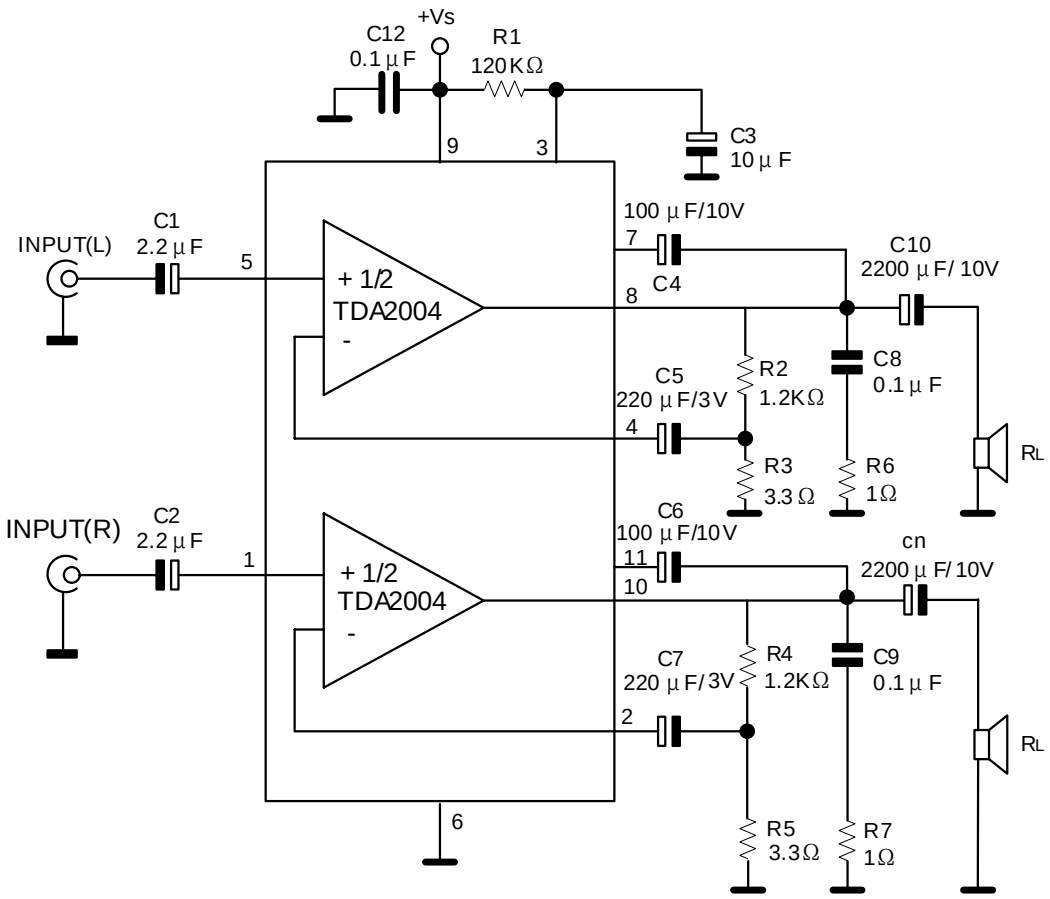
(Refer to the test circuit, Ta=25℃, Gv=50Db, Rth(heatsink)=4℃/W, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITONS	MIN	TYP	MAX	UNIT
Supply Voltage	Vss		8		18	V
Quiescent Output Voltage	V_{OUT}	Vss=14.4V Vss=13.2V	6.6 6.0	7.2 6.6	7.8 7.2	V
Total Quiescent Drain Current	I_D	Vss=14.4V Vss=13.2V		65 62	120 120	mA
Stand-by Current	I_{STAY-B}	Pin 3 grounded		5		mA
Output Power (each channel) f=1KHz, THD=10%	P_{OUT}	Vss=14.4V R_L=4Ω R_L=3.2Ω R_L=2Ω R_L=1.6Ω	 6 7 9 10	 6.5 8 10* 11		W
		Vss=13.2V R_L=3.2Ω R_L=1.6Ω	 6 9	 6.5 10		W
		Vss=16V, R_L=2Ω		12		W
Total Harmonic Distortion (each channel) f=1KHz	THD	Vss=14.4V, R_L=4Ω P_{OUT}=50mW ~ 4W		0.2	1	%
		Vss=14.4V, R_L=2Ω P_{OUT}=50mW ~ 6W		0.3	1	%
		Vss=13.2V, R_L=3.2Ω P_{OUT}=50mW ~ 3W		0.2	1	%
		Vs=13.2V, R_L=1.6Ω P_{OUT}=50mW ~ 6W		0.3	1	%
Cross Talk	C_T	Vss=14.4V V_{OUT}=4Vrms, R_L=4Ω f=1KHz f=10kHz, R_G=5KΩ	 50 40	 60 45		 dB dB
Input Saturation Voltage	V_{IN}		300			mV
Input Resistance (non inverting input)	R_{IN}	f=1kHz	70	200		kΩ
Low Frequency Roll Off (-3dB)	f_L	R_L=4Ω R_L=2Ω R_L=3.2Ω R_L=1.6Ω			35 50 40 55	Hz
High Frequency Roll Off (-3dB)	f_H	R_L=1.6Ω ~ 4Ω	15			kHz

PARAMETER	SYMBOL	TEST CONDITONS	MIN	TYP	MAX	UNIT
Voltage Gain (open loop)	G_V	f=1kHz		90		dB
Voltage Gain (closed loop)		f=1KHz	48	50	51	dB
Closed Loop Gain Matching				0.5		dB
Total Input Noise Voltage	e_N	R_G=10kΩ**		1.5	5	μV
Supply Voltage Rejection	SVR	f_{RIPPLE}=100Hz, R_G=10kΩ C3=10μF, V_{RIPPLE}=0.5Vrms	35	45		dB
Efficiency	η	Vss=14.4V, f=1kHz R_L=4Ω, Po=6.5W R_L=2Ω, Po=10W		 70 60		 % %
		Vss=13.2V, f=1kHz R_L=3.2Ω, Po=6.5W R_L=1.6Ω, Po=10W		 70 60		 % %
Thermal Shut-down Junction Temperature	T_J			145		℃

Notes: * 9.3W without Bootstrap
** Bandwith Filter: 22Hz ~ 22KHz.

■ TEST AND APPLICATION CIRCUIT



■ TYPICAL CHARACTORISTICS

Figure 1. Quiescent Output Voltage vs. Supply Voltage

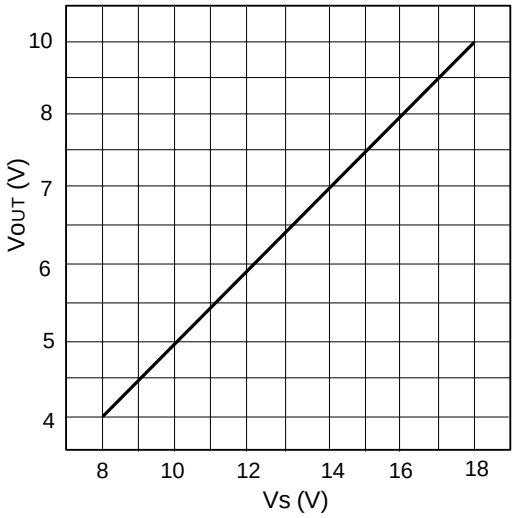


Figure 2. Quiescent Drain Current vs Supply Voltage

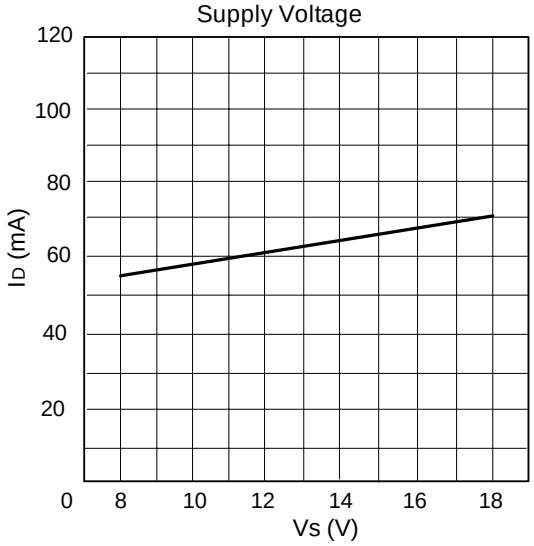


Figure 3. Distortion vs. Output Power

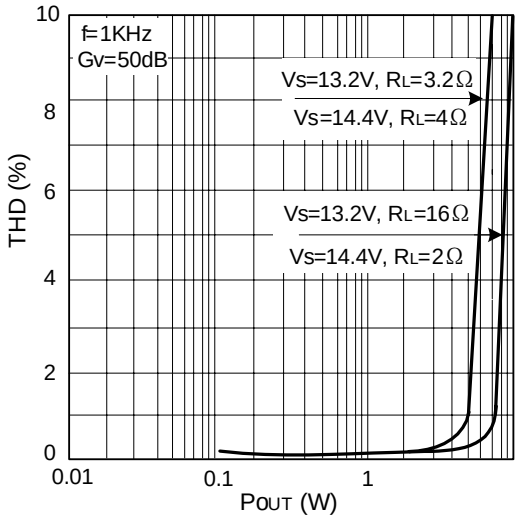


Figure 4. Output Power vs. Supply Voltage

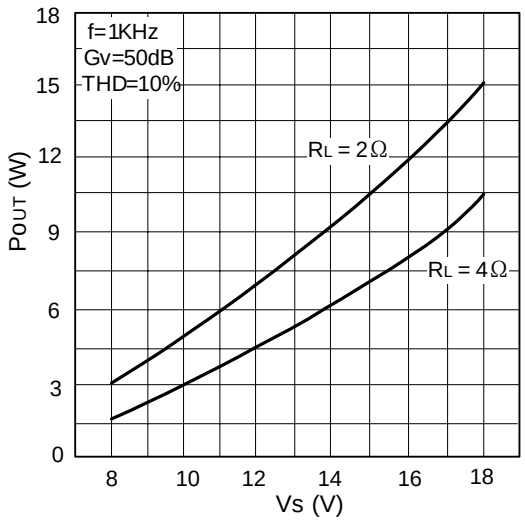


Figure 5. Output Power vs. SupplyVoltage

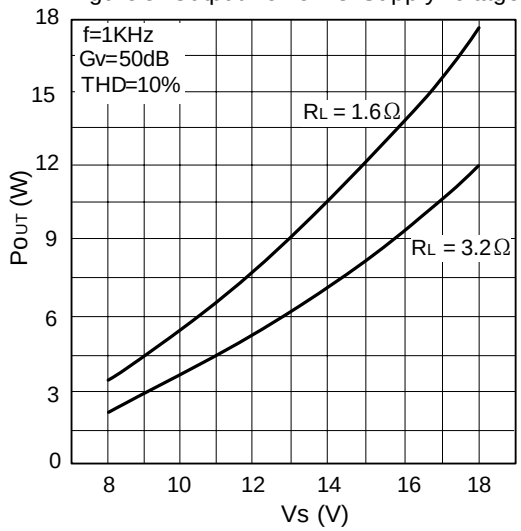
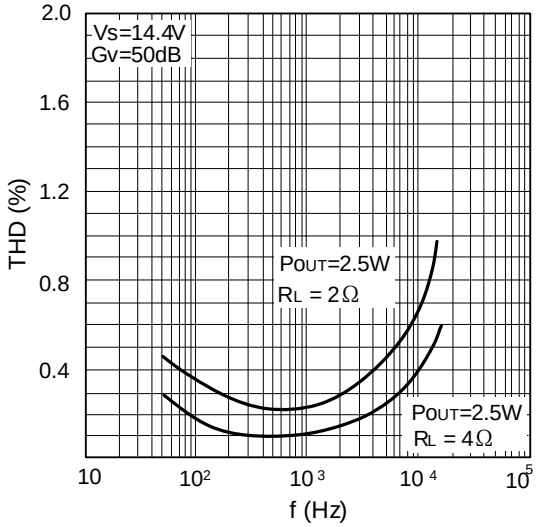


Figure 6. Distortion vs Frequency



■ TYPICAL CHARACTORISTICS (cont.)

Figure 7. Distortion vs Frequency

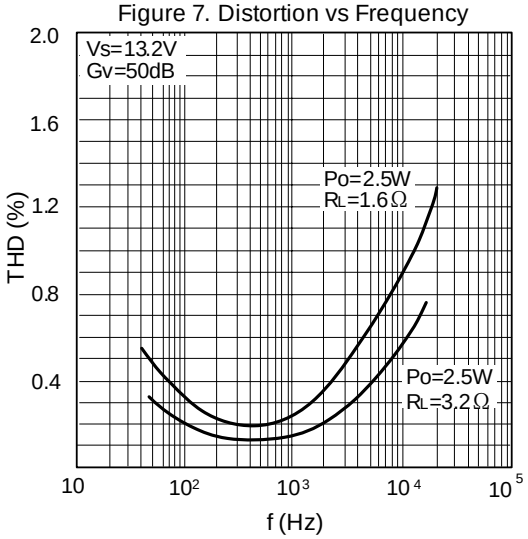


Figure 8. Supply Voltage Rejection vs C3

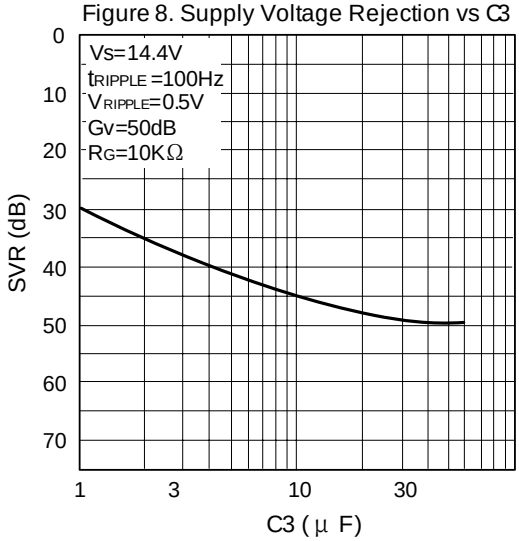


Figure 9. Supply Voltage Rejection vs Frequency.

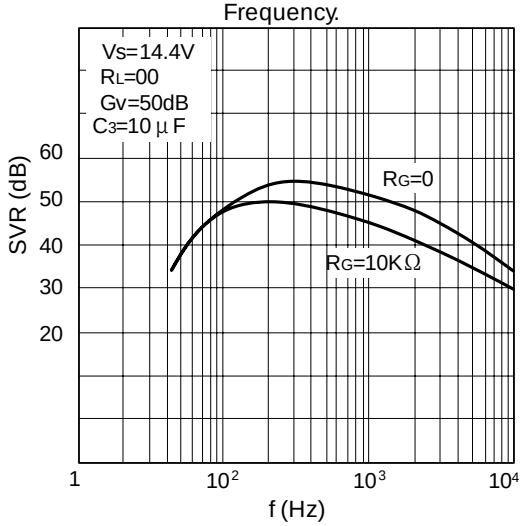


Figure 10. Supply Voltage Rejection vs Values of Capacitors C2 and C3

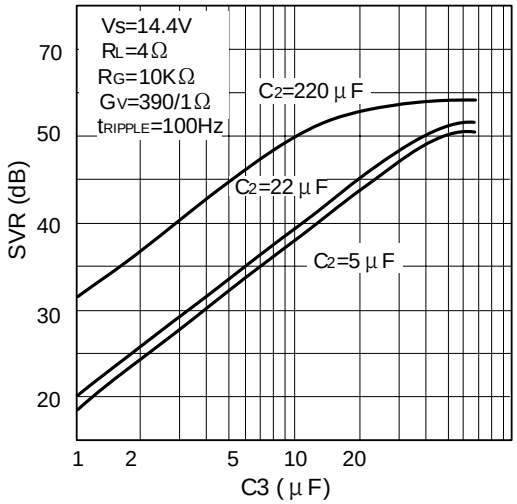


Figure 11. Supply Voltage Rejection vs Values of Capacitors C2 and C3

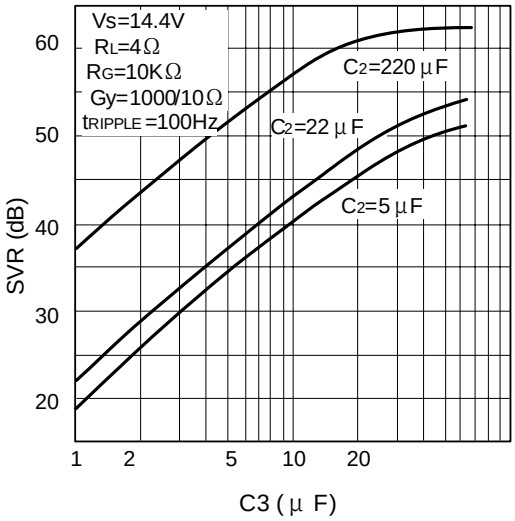
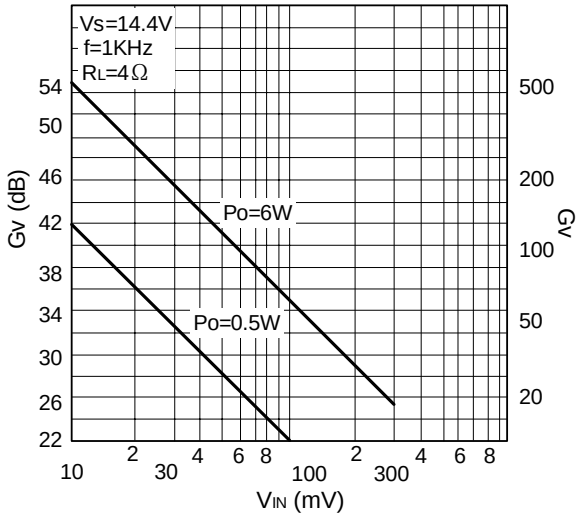


Figure 12. Gain vs. Input Sensitivity



■ TYPICAL CHARACTORISTICS (cont.)

Figure 13. Maximum Allowable Power Dissipation vs. Ambient Temperature

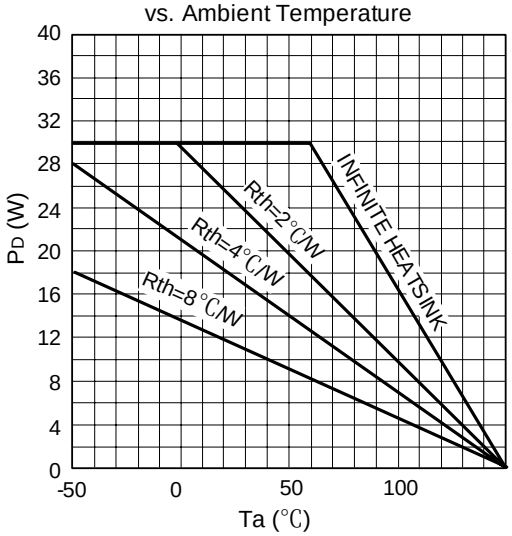


Figure 14. Total Power Dissipation and Efficiency vs. Output Power

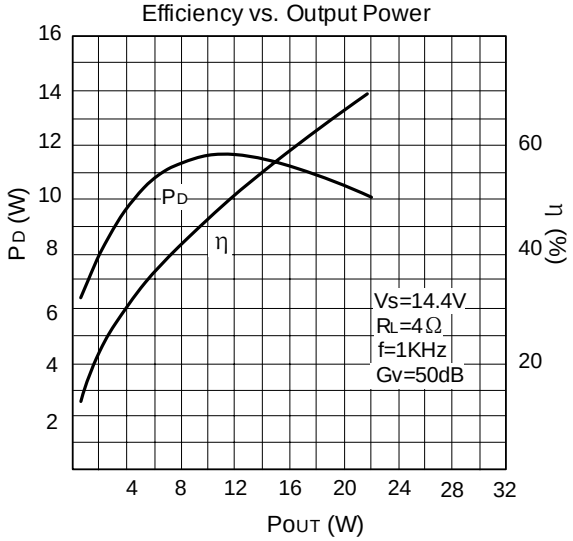


Figure 15. Total Power Dissipation and Efficiency vs. Output Power