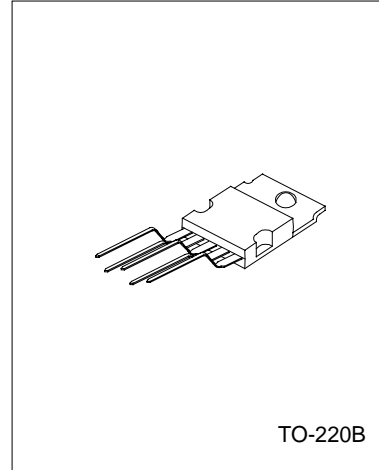


10W CAR RADIO AUDIO AMPLIFIER

DESCRIPTION

The TDA2003A has improved performance with the same pin configuration as the TDA2002. The additional features of TDA2002, very low number of external components, ease of assembly, space and cost saving, are maintained.

The device provides a high output current capacity (up to 3.5A) very low harmonic and crossover distortion. Completely safe operation is guaranteed due to protection against DC and AC short circuit between all pins and ground.



TO-220B

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

CHARACTERISTICS	SYMBOL	VALUE	UNITS
DC supply voltage V_s 22V			
Operating supply voltage	V_s	18	V
Power dissipation at $T_{case}=90^\circ\text{C}$	P_{tot}	20	W
Storage temperature	T_{stg}	-40--+150	$^\circ\text{C}$
junction temperature	T_j	-40--+150	$^\circ\text{C}$

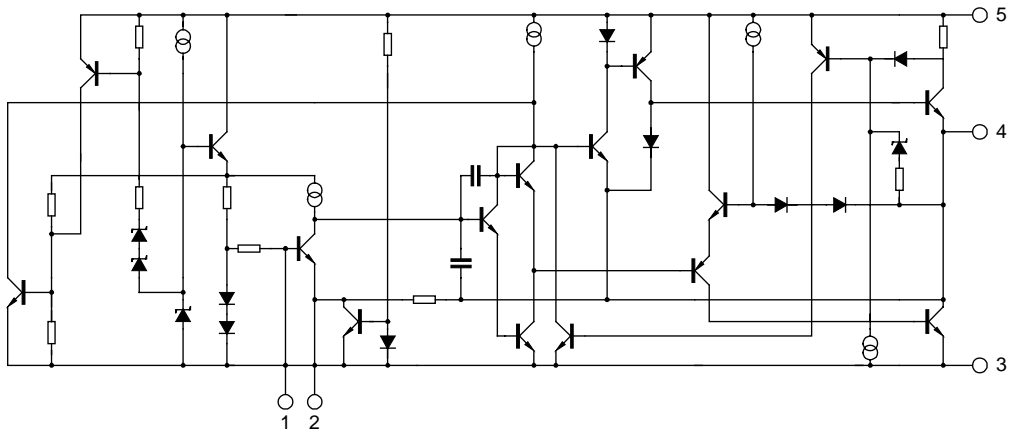
PIN CONNECTION

- 1 Non inverting input
- 2 Inverting input
- 3 Ground
- 4 Output
- 5 Supply Voltage

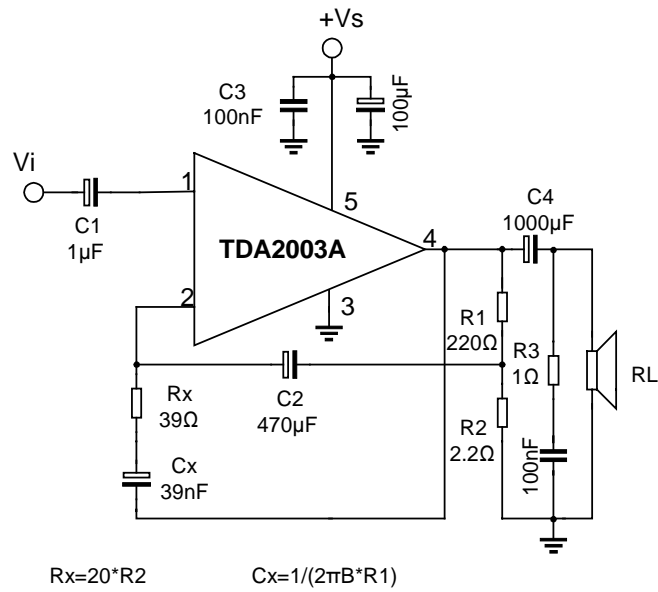
TDA2003A

LINEAR INTEGRATED CIRCUIT

SCHEMATIC DIAGRAM

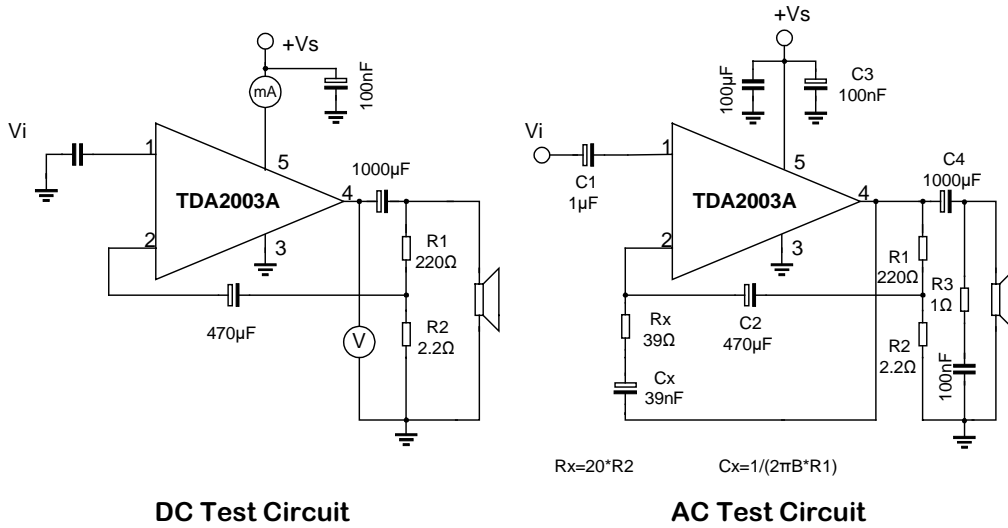


TEST CIRCUIT



TDA2003A

LINEAR INTEGRATED CIRCUIT



DC Test Circuit

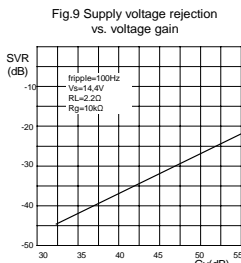
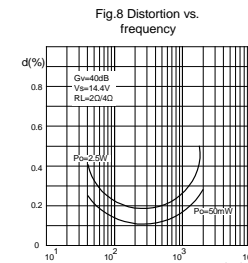
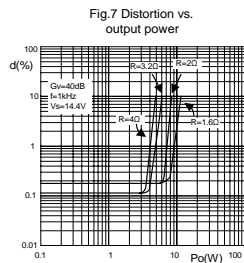
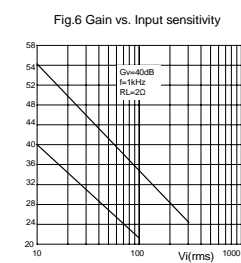
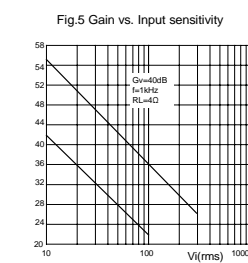
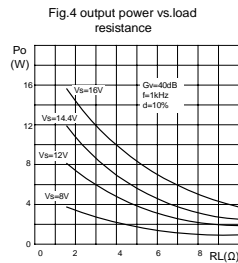
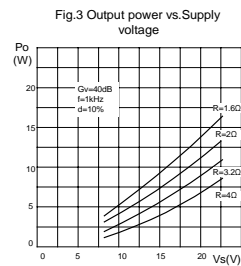
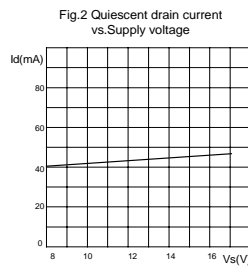
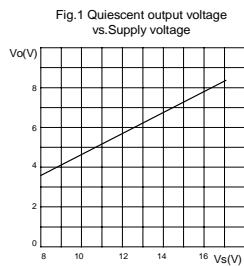
AC Test Circuit

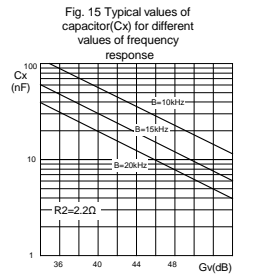
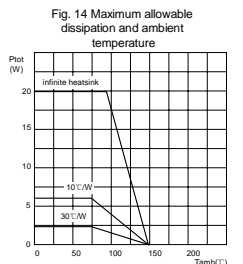
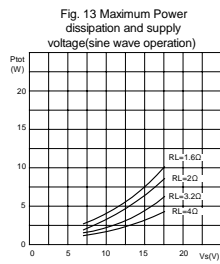
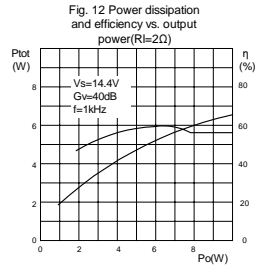
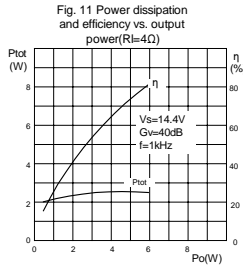
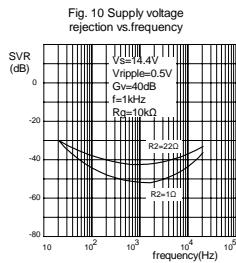
ELECTRICAL CHARACTERISTICS(Refer to the test circuit, $V_s = 15V, T_a = 25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DC CHARACTERISTICS						
Supply Voltage	V_s		8		18	V
Quiescent Output Voltage	V_o		6.1	6.9	7.7	V
Quiescent drain current	I_d			44	50	mA
AC CHARACTERISTICS						
Output power	P_o	$d=10\%, f=1kHz$				W
		$R_L=8\Omega$	5.5	6		
		$R_L=2\Omega$	9	10		
		$R_L=3.2\Omega$		7.5		
Input sensitivity	V_i	$f=1kHz$				mV
		$P_o=0.5W, R_L=4\Omega$		14		
		$P_o=6W, R_L=4\Omega$		55		
		$P_o=0.5W, R_L=2\Omega$		10		
Input saturation voltage	$V_i(rms)$			300		mV
Frequency response(-3dB)	B	$P_o=1W, R_L=4\Omega$	40		15000	Hz
Distortion	D	$f=1kHz$				%
		$P_o=0.05$ to $4.5W, R_L=4\Omega$		0.15		
		$P_o=0.05$ to $7.5W, R_L=2\Omega$		0.15		

(continued)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Resistance(pin 1)	R _i	open loop, f=1kHz	70	150		kΩ
Input noise current	e _N			60	200	pA
Input noise voltage	I _N			1	5	μV
open loop voltage gain	G _{vo}	f=1kHz		80		dB
		f=10kHz		60		dB
closed loop voltage gain	G _{vc}	f=1kHz, R _L =4Ω	39.3	40	40.3	dB
Efficiency	η	f=1kHz P _o =6W, R _L =4Ω		69		%
		P _o =10W, R _L =2Ω		65		%
Supply voltage rejection	SVR	f=100Hz, V _{ripple} =0.5V R _g =10kΩ, R _L =4Ω	30	36		dB





APPLICATION INFORMATION

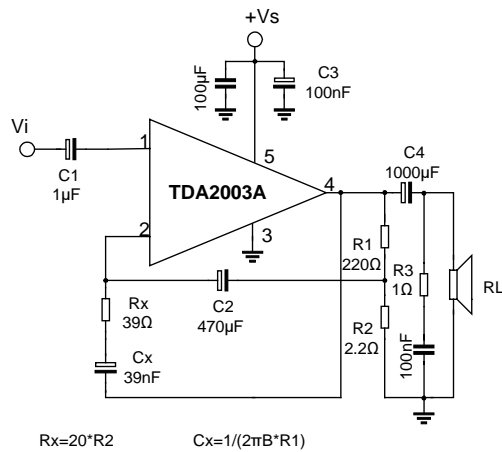


Fig 16 Typical application circuit

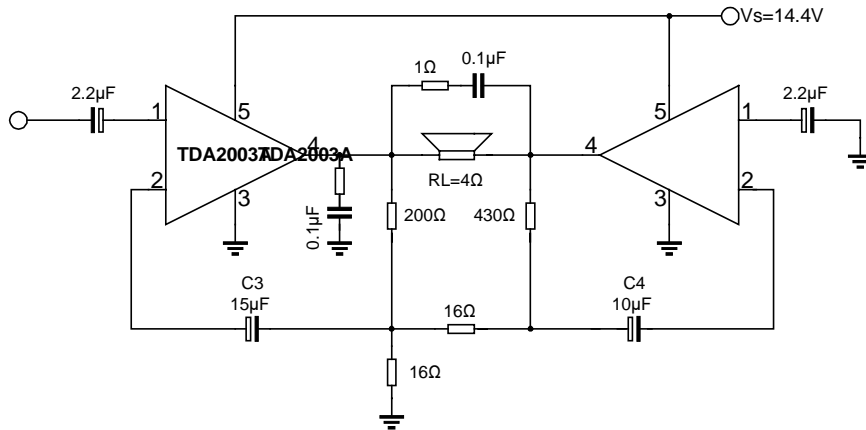


Fig.18 20W Bridge configuration application

The Values of the capacitors C3 and C4 are different to optimize the SVR(Typ. 40dB)

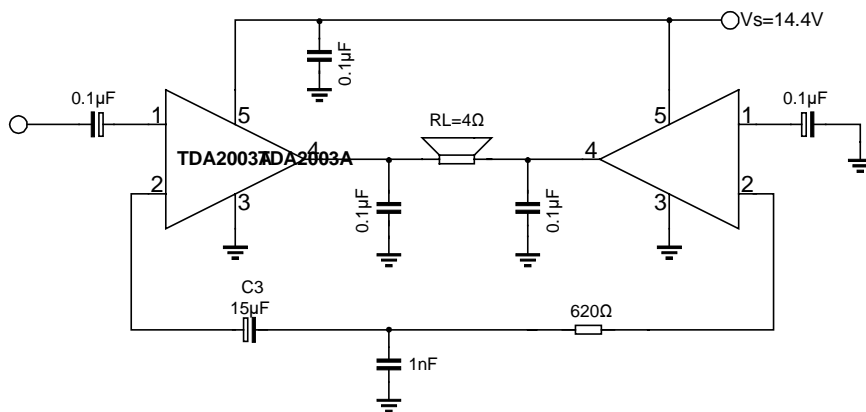


Fig.20 Low cost bridge configuration application circuit(Po=18W)

BUILT-IN PROTECTION SYSTEMS

Load dump voltage surge

The TDA2003A has a circuit which enables it to withstand a voltage pulse train, on pin 5, of the type shown in Fig.23.

APPLICATION SUGGESTION

The recommended values of the components are those shown on application circuit of Fig.16. Different values can be used. The following table can help the designer.

Component	Recommended value	Purpose	Large than recommended value	Large than recommended value
R1	$(Gv-1)*R2$	gain setting.		increase of Gain
R2	2.2Ω	gain and SVR setting.	Decrease of SVR	
R3	1Ω	Frequency stability	Danger of oscillation at high frequencies with inductive loads.	
Rx	$\approx 20*R2$	Upper frequency cutoff	Poor high frequencies attenuation	Dange of oscillation
C1	$2.2\mu F$	Input DC decoupling		Noise at switch-on switch-off
C2	$470\mu F$	Ripple rejection		Decrease of SVR
C3	$0.1\mu F$	Supply voltage bypass		Dange of oscillation
C4	$100\mu F$	Supply voltage bypass		Higher low frequency cutoff
C5	$0.1\mu F$	Frequency stability		Danger of oscillation at high frequencies with inductive loads.
Cx	$\approx / (2 \pi * B * R1)$	Upper frequency cutoff	smaller bandwidth	Larger bandwidth