

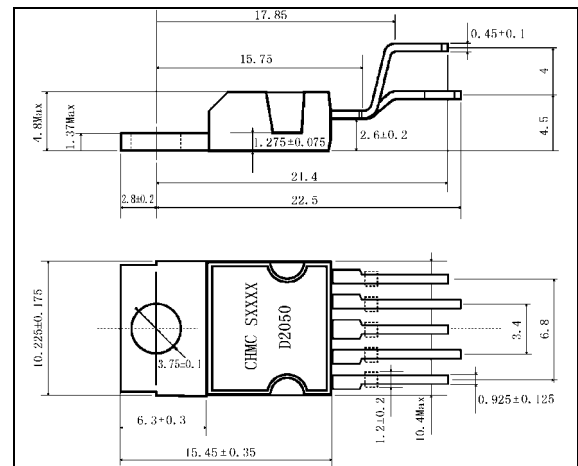
32W Hi-Fi AUDIO POWER AMPLIFIER TDA2050

DESCRIPTION

The TDA2050 is a monolithic integrated circuit in Pentawatt package, intended for use as an audio class AB audio amplifier. Thanks to its high power capability the TDA2050 is able to provide up to 35W true rms power into 4 ohm load @ THD = 10%, $V_s = \pm 18V$, $f = 1KHz$ and up to 32W into 8ohm load @ THD = 10%, $V_s = \pm 22V$, $f = 1KHz$. Moreover, the TDA2050 delivers typically 50W music power into 4 ohm load over 1 sec at $V_s = 22.5V$, $f = 1KHz$. The high power

and very low harmonic and crossover distortion (THD = 0.05% typ, @ $V_s = \pm 22V$, $P_o = 0.1$ to 15W, $R_L = 8ohm$, $f = 100Hz$ to 15KHz) make the device most suitable for both HiFi and high class TV sets.

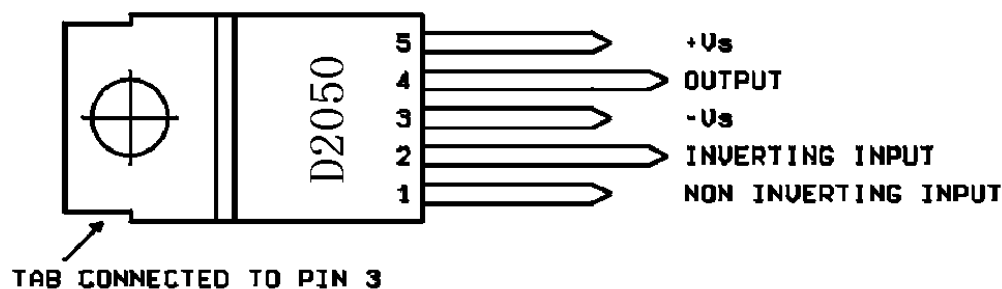
Outline Drawing

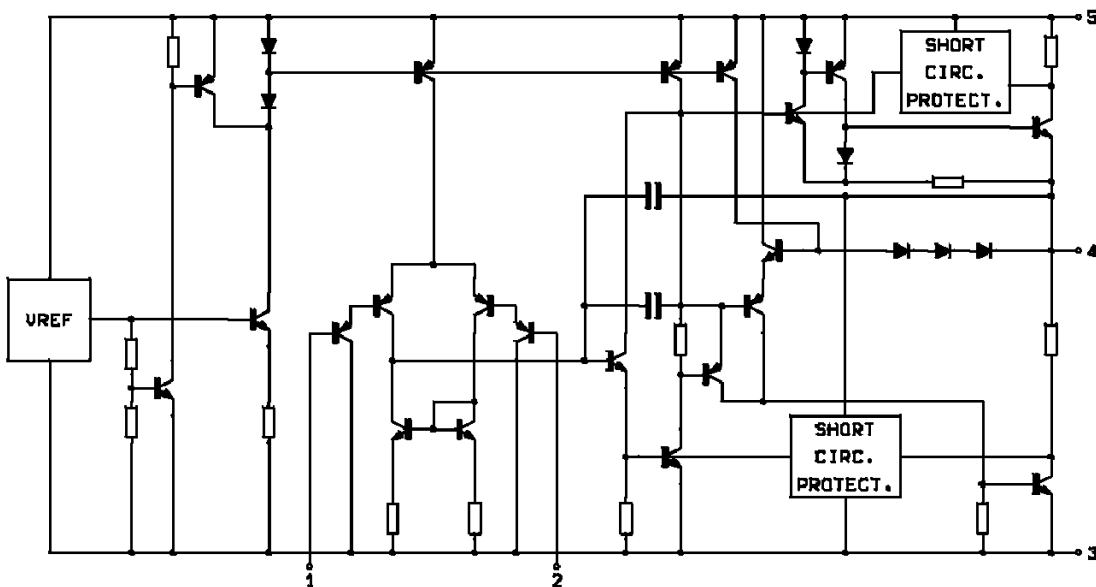


FEATURE

- High output power(50W music power IEC 268.3 RULES)
- High operating supply voltage (50V)
- Single or split supply operations
- Very low distortion
- Short circuit protection (out to GND)
- Thermal shutdown

PIN CONNECTION



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

Characteristic	Symbol	Value	Unit
Supply voltage	V_s	± 25	V
Input voltage	V_i	V_s	V
Differential input voltage	V_i	± 15	V
Output peak current(internally limited)	I_o	5	A
Power dissipation $T_{case}=75^{\circ}\text{C}$	P_{tot}	25	W
Storage and junction temperature range	T_{stg}, T_j	$-40 \sim +150$	$^{\circ}\text{C}$

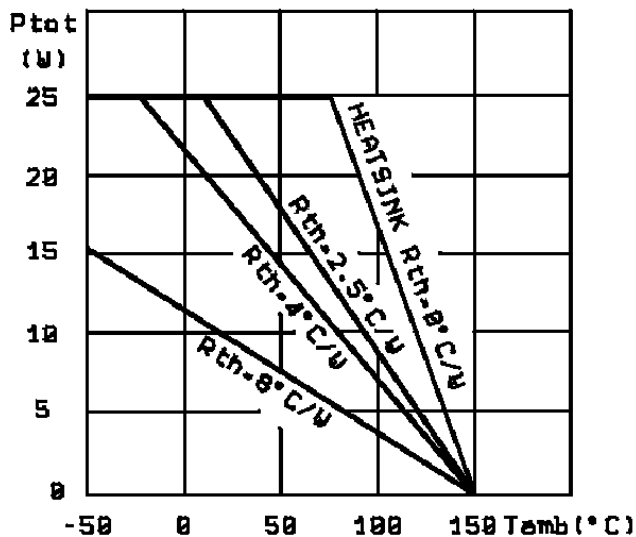
ELECTRICAL CHARACTERISTICS(Unless otherwise specified: $V_s=\pm 18\text{V}$; $f=1\text{KHz}$; $T_a=25^{\circ}\text{C}$)

Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Supply voltage range	V_s		± 4.5		± 25	V
Quiescent drain current	I_d	$V_s=\pm 4.5\text{V}$ $V_s=\pm 25\text{V}$		30 55	50 90	mA
Input bias current	I_b	$V_s=\pm 22\text{V}$		0.1	0.5	μA
Input offset voltage	V_{os}	$V_s=\pm 22\text{V}$			± 15	mV
Input offset current	I_{os}	$V_s=\pm 22\text{V}$			± 200	nA
RMS output power	P_o	$d=0.5\%$ $R_L=4\Omega$ $R_L=8\Omega$ $V_s=\pm 22\text{V } R_L=8\Omega$	24 22	28 18 25		W
		$d=10\%$ $R_L=4\Omega$ $R_L=8\Omega$ $V_s=\pm 22\text{V } R_L=8\Omega$		35 22 32		
		$d=10\%, T=1\text{s}$ $V_s=\pm 22.5\text{V } R_L=4\Omega$		50		

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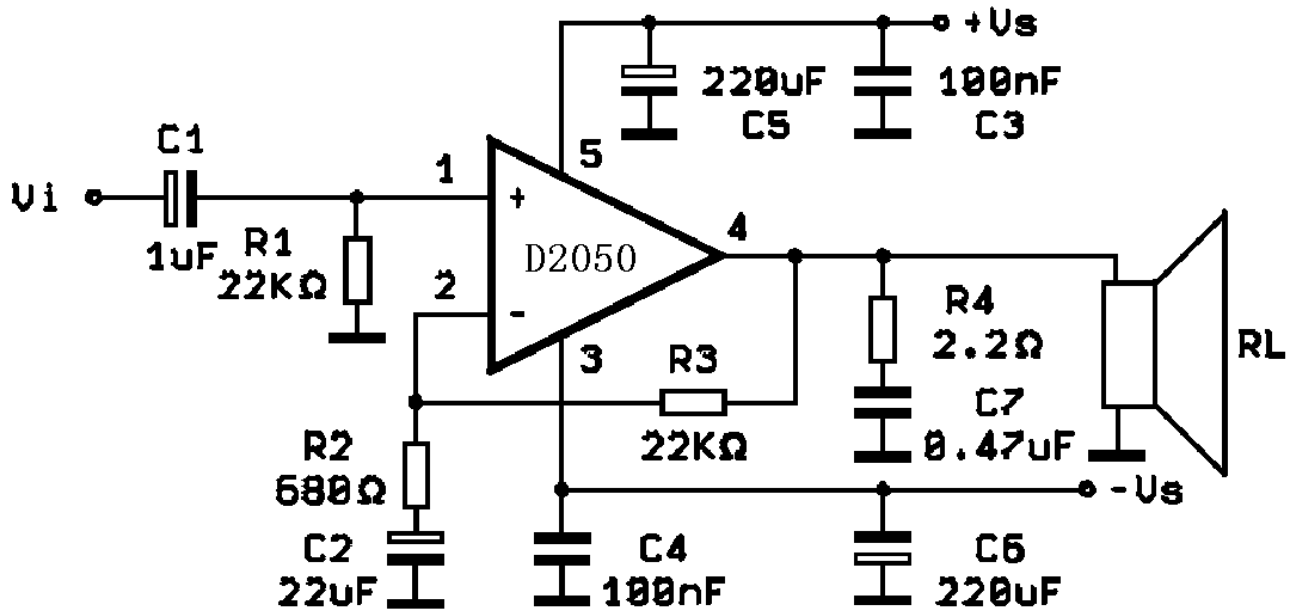
Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Total harmonic distortion	d	$R_L=4\Omega$ $f=1\text{kHz}, P_o=0.1$ to 24W $f=100\text{Hz}$ to $10\text{kHz}, P_o=0.1$ to 18W		0.03	0.5 0.5	%
		$V_S=\pm 22\text{V}$ $R_L=8\Omega$ $f=1\text{kHz}, P_o=0.1$ to 20W $f=100\text{Hz}$ to $10\text{kHz}, P_o=0.1$ to 15W		0.02	0.5	%
Slew Rate	SR		5	8		$\text{V}/\mu\text{s}$
Open loop voltage gain	G_v			80		dB
Closed loop voltage gain	G_v		30	30.5	31	dB
Power bandwidth(-3dB)	BW	$R_L=4\Omega$ $V_i=200\text{mV}$	20 to 80000			Hz
Total input noise	e_N	Curve A $B=22\text{Hz}$ to 22kHz		4 5	10	μV
Input resistance(pin 1)	R_i		500			$\text{k}\Omega$
Supply voltage rejection	SVR	$R_s=22\text{k}\Omega; f=100\text{Hz}$ $V_{\text{ripple}}=0.5\text{V}_{\text{rms}}$		45		dB
Efficiency	η	$P_o=28\text{W}; R_L=4\Omega$		65		%
		$P_o=25\text{W}; R_L=8\Omega$ $V_S=\pm 22\text{V}$		67		%
Thermal shut-down Junction temperature	$T_{\text{sd-j}}$			150		$^{\circ}\text{C}$

Maximum Allowable Power Dissipation vs. Ambient Temperature

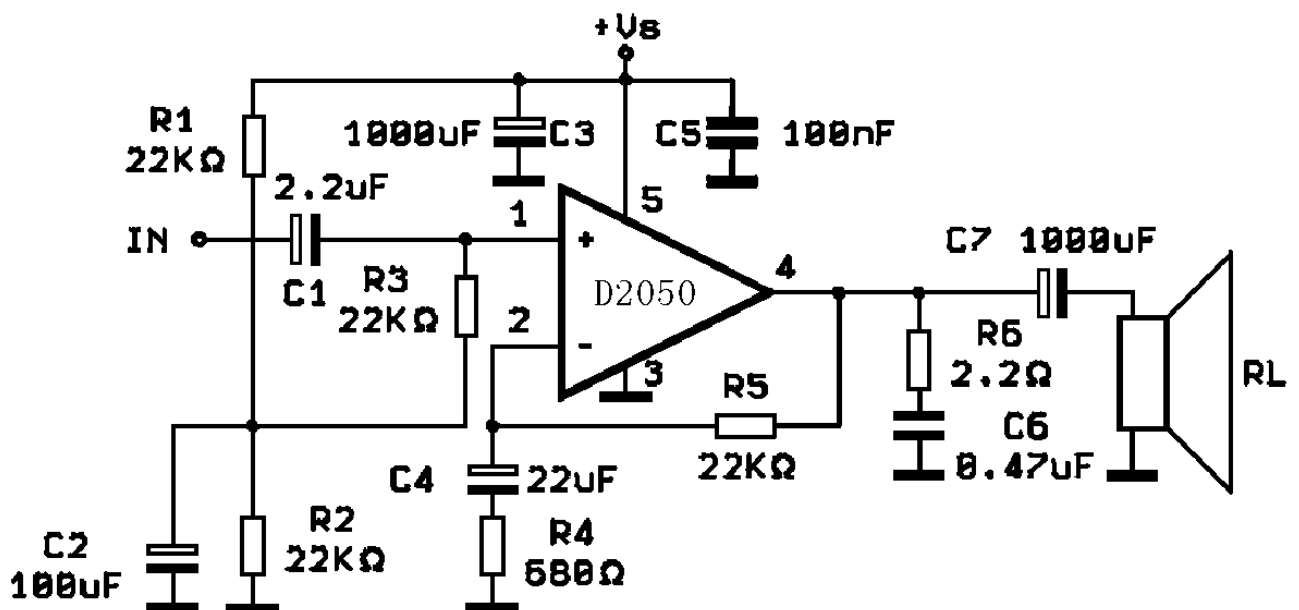


APPLICATION CIRCUIT

Split Supply Typical Application Circuit

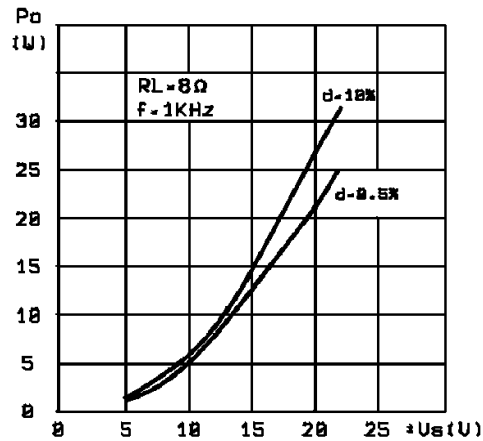


Single Supply Typical Application Circuit

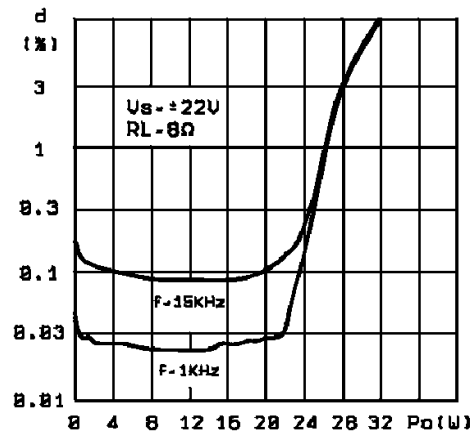


CHARACTERISTIC CURVES

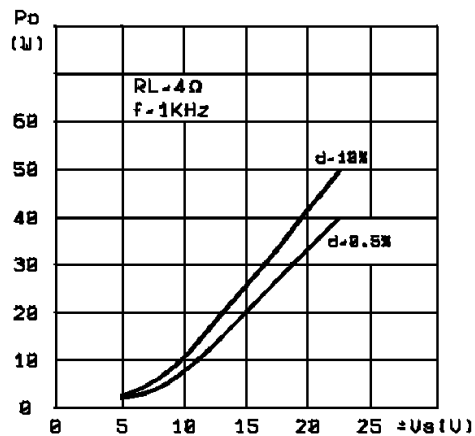
Output Power vs. Supply Voltage



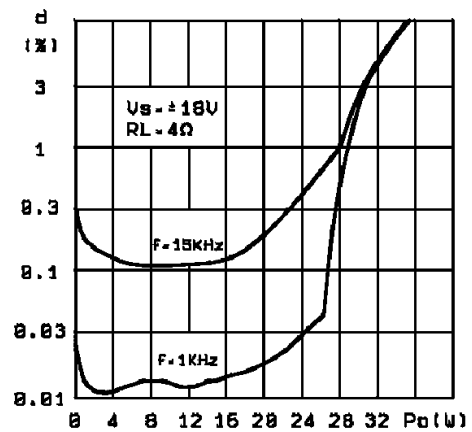
Distortion vs. Output Power



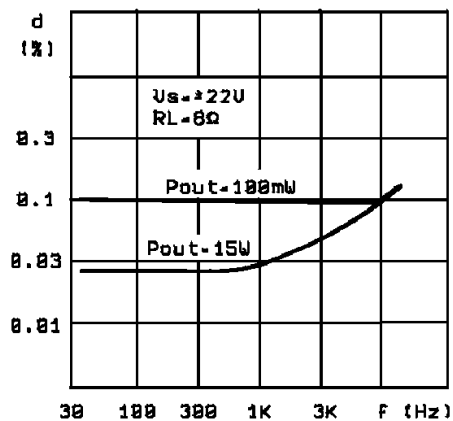
Output Power vs. Supply Voltage



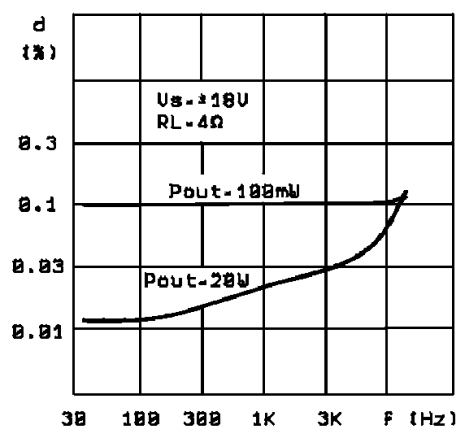
Distortion vs. Output Power



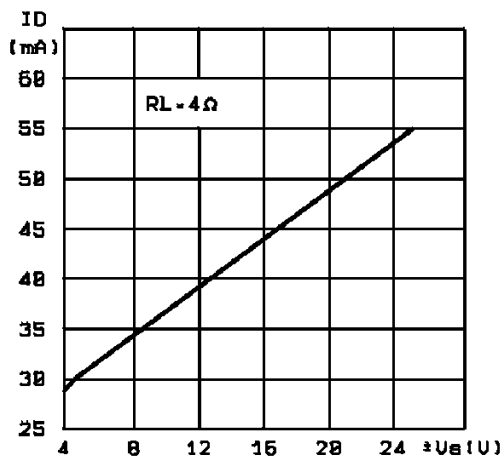
Distortion vs. Frequency



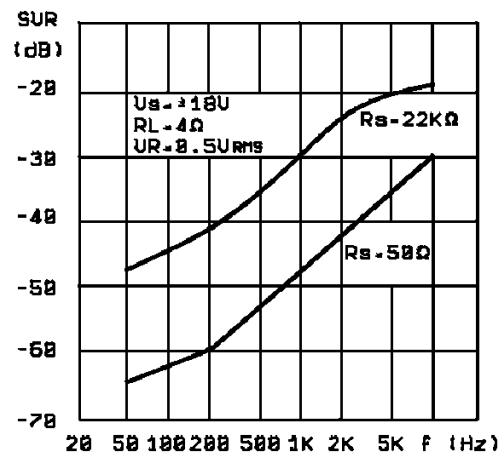
Distortion vs. Frequency



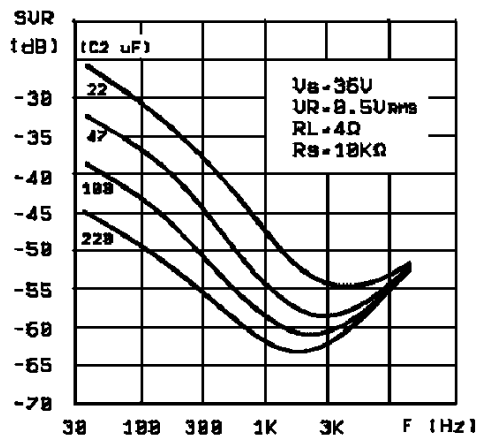
Quiescent Current vs. Supply Voltage



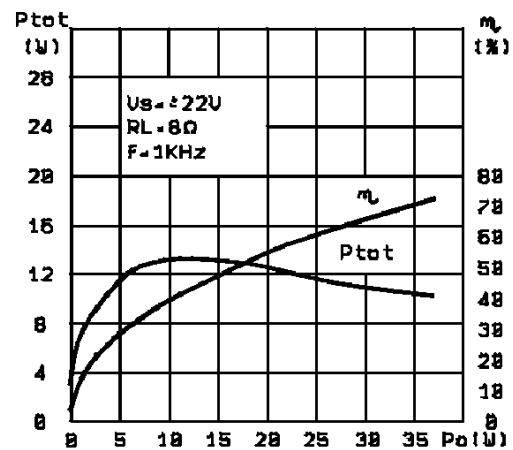
Supply Voltage Rejection vs. Frequency



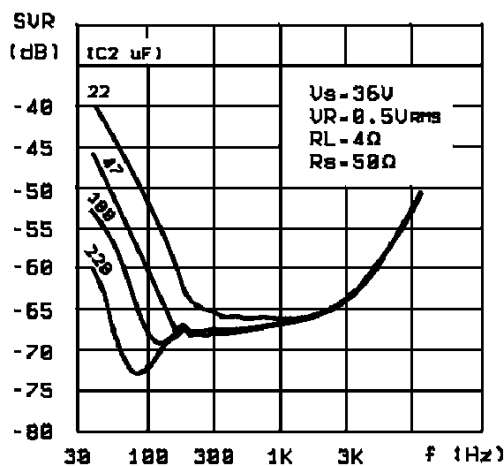
Supply Voltage Rejection vs. Frequency (Single supply) for Different values of C2 (circuit of fig. 3)



Total Power Dissipation and Efficiency vs. Output Power



Supply Voltage Rejection vs. Frequency (Single supply) for Different values of C2 (circuit of fig. 3)



Total Power Dissipation and Efficiency vs. Output Power

