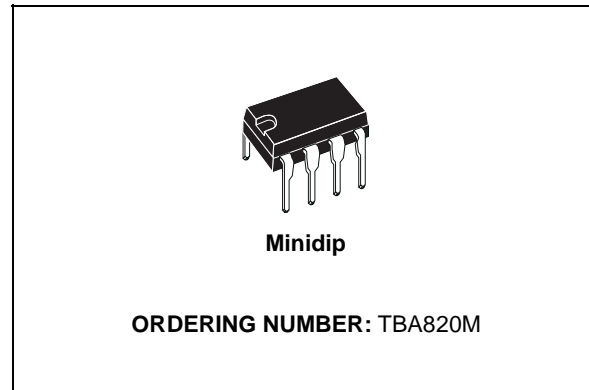


1.2W AUDIO AMPLIFIER

DESCRIPTION

The TBA820M is a monolithic integrated audio amplifier in a 8 lead dual in-line plastic package. It is intended for use as low frequency class B power amplifier with wide range of supply voltage: 3 to 16V, in portable radios, cassette recorders and players etc. Main features are: minimum working supply voltage of 3V, low quiescent current, low number of external components, good ripple rejection, no cross-over distortion, low power dissipation.

Output power: $P_o = 2W$ at $12V/8\Omega$, $1.6W$ at $9V/4\Omega$ and $1.2W$ at $9V/8\Omega$.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply voltage	16	V
I_o	Output peak current	1.5	A
P_{tot}	Power dissipation at $T_{amb} = 50^\circ C$	1	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	$^\circ C$

TEST AND APPLICATION CIRCUITS

Figure 1. Circuit diagram with load connected to the supply voltage

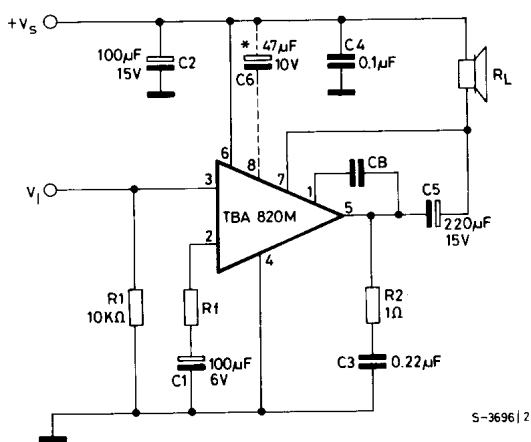
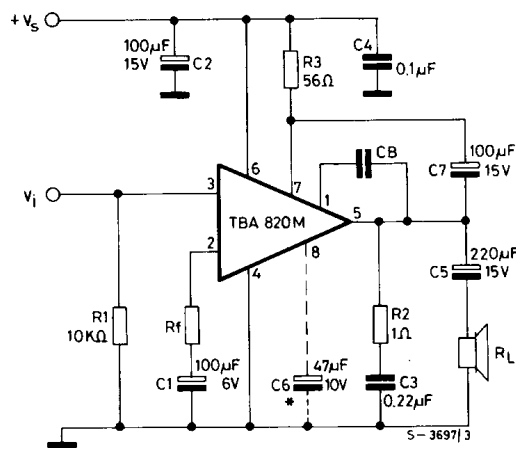


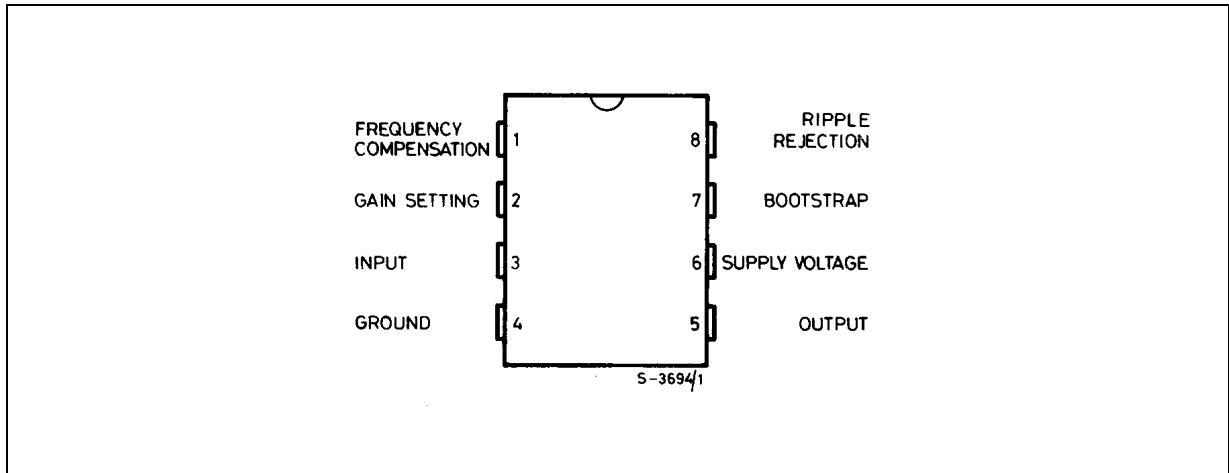
Figure 2. Circuit diagram with load connected to ground



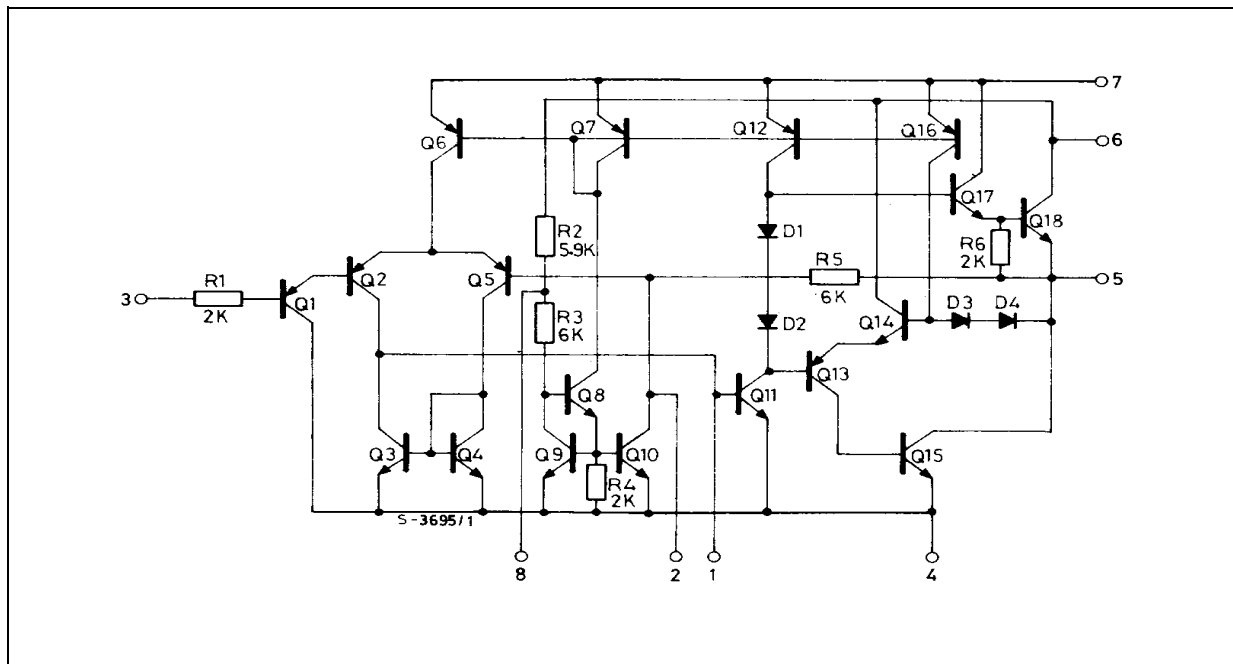
* Capacitor C6 must be used when high ripple rejection is requested.

TBA820M

PIN CONNECTION (top view)



SCHEMATIC DIAGRAM



THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th-j-amb}$	Thermal resistance junction-ambient	max 100	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS (Refer to the test circuits $V_s = 9V$, $T_{amb} = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_s	Supply voltage		3		16	V
V_o	Quiescent output voltage (pin 5)		4	4.5	5	V
I_d	Quiescent drain current			4	12	mA
I_b	Bias current (pin 3)			0.1		μA
P_o	Output power	$d = 10\%$ $f = 1\text{ kHz}$ $R_f = 120\Omega$ $V_s = 12V$ $R_L = 8\Omega$ $V_s = 9V$ $R_L = 4\Omega$ $V_s = 9V$ $R_L = 8\Omega$ $V_s = 6V$ $R_L = 4\Omega$ $V_s = 3.5V$ $R_L = 4\Omega$	0.9	2 1.6 1.2 0.75 0.25		W W W W W
R_i	Input resistance (pin 3)	$f = 1\text{ kHz}$		5		$M\Omega$
B	Frequency response (-3 dB)	$R_L = 8\Omega$ $C_5 = 1000\ \mu\text{F}$ $R_f = 120\Omega$	$C_B = 680\ \text{pF}$	25 to 7,000		Hz
			$C_B = 220\ \text{pF}$	25 to 20,000		
d	Distortion	$P_o = 500\text{ mW}$ $R_L = 8\Omega$ $f = 1\text{ kHz}$	$R_f = 33\Omega$	0.8		%
			$R_f = 120\Omega$	0.4		
G_v	Voltage gain (open loop)	$f = 1\text{ kHz}$ $R_L = 8\Omega$		75		dB
G_v	Voltage gain (closed loop)	$R_L = 8\Omega$ $R_f = 33\Omega$		45		dB
		$f = 1\text{ kHz}$ $R_f = 120\Omega$		34		
e_N	Input noise voltage (*)			3		μV
i_N	Input noise current (*)			0.4		nA
$\frac{S+N}{N}$	Signal to noise ratio (*)	$P_o = 1.2W$ $R_L = 8\Omega$ $G_v = 34\text{ dB}$	$R_1 = 10K\Omega$	80		dB
			$R_1 = 50\text{ k}\Omega$	70		
SVR	Supply voltage rejection (test circuit of fig. 2)	$R_L = 8\Omega$ $f_{(ripple)} = 100\text{ Hz}$ $C_6 = 47\ \mu\text{F}$ $R_f = 120\Omega$		42		dB

(*) B = 22 Hz to 22 KHz

Figure 3. Output power vs. supply voltage

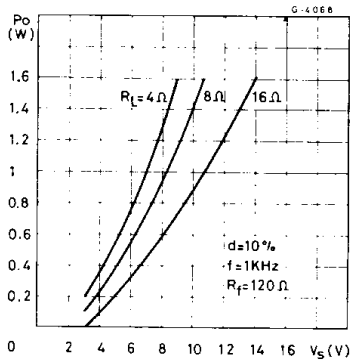


Figure 4. Harmonic distortion vs. output power

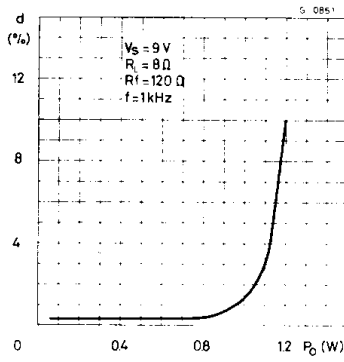


Figure 5. Power dissipation and efficiency vs. output power

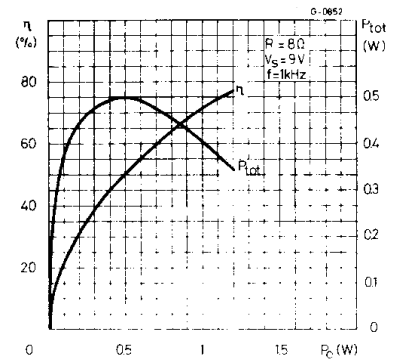


Figure 6. Maximum power dissipation (sine wave operation)

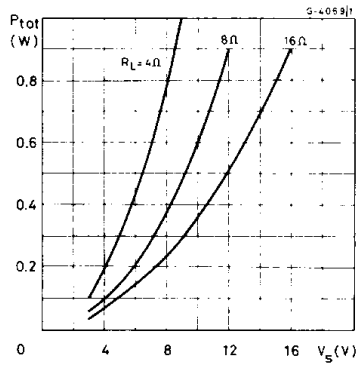


Figure 7. Suggested value of CB vs. Rf

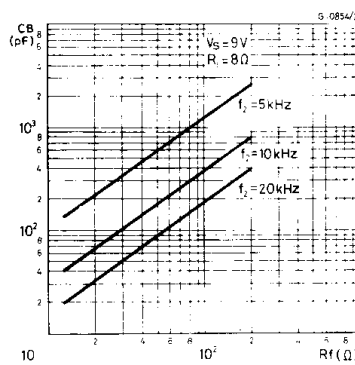


Figure 8. Frequency response

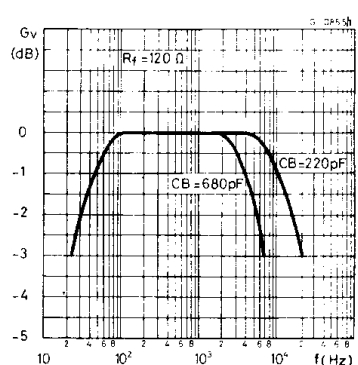


Figure 9. Harmonic distortion vs. frequency

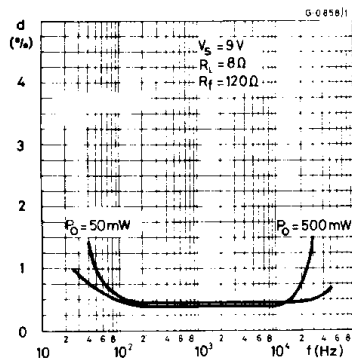


Figure 10. Supply voltage rejection (Fig. 2 circuit)

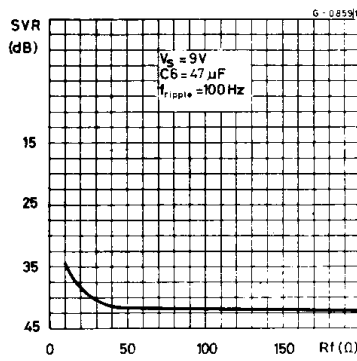
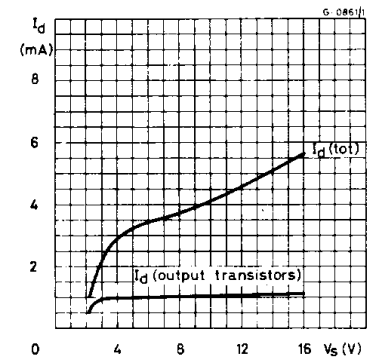
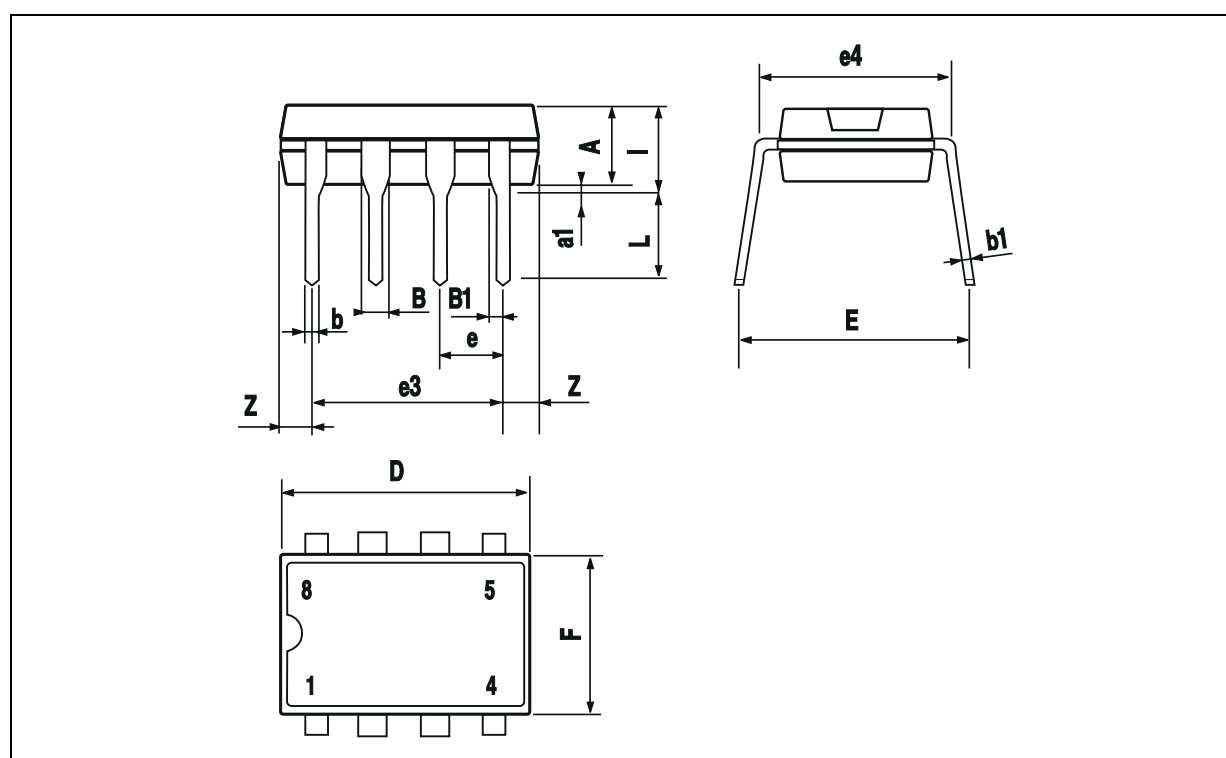


Figure 11. Quiescent current vs. supply voltage



MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060



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