SGS **TBA820M**

LINEAR INTEGRATED CIRCUIT

MINIDIP 1.2W AUDIO AMPLIFIER

The TBA 820M 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/8Ω, 1.6W at 9V/4Ω and 1.2W at 9V/8Ω.

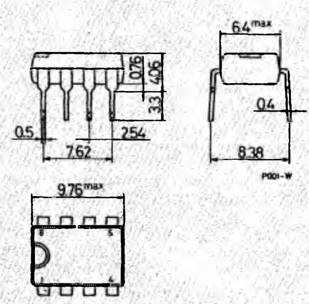
ABSOLUTE MAXIMUM RATINGS

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

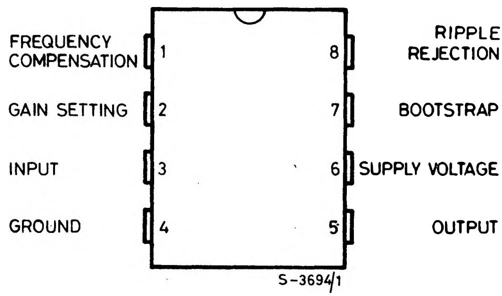
ORDERING NUMBER: TBA 820M

MECHANICAL DATA

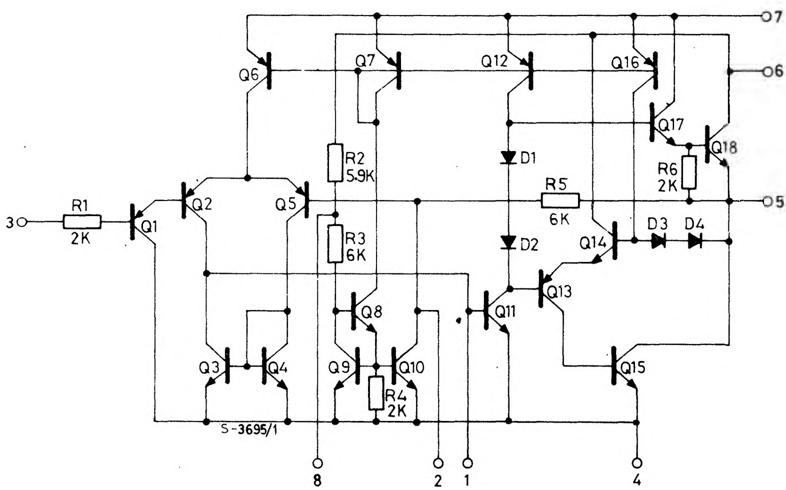
Dimensions in mm



CONNECTION DIAGRAM
(top view)



SCHEMATIC DIAGRAM



TEST AND APPLICATION CIRCUITS

Fig. 1 - Circuit diagram with load connected to the supply voltage.

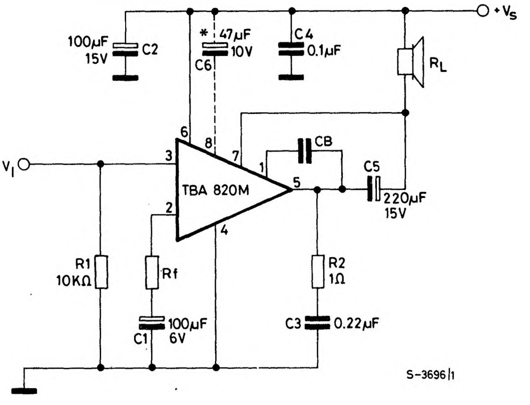
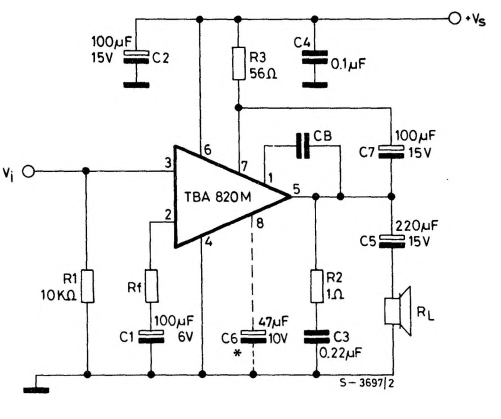


Fig. 2 - Circuit diagram with load connected to ground.



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

THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	100	°C/W

ELECTRICAL CHARACTERISTICS (Refer to the test circuits V_s= 9V, T_{amb}= 25°C unless otherwise specified)

	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 kHz				
		R_f= 120Ω					
		V_s= 12V	R_L= 8Ω		2		W
		V_s= 9V	R_L= 4Ω		1.6		W
		V_s= 9V	R_L= 8Ω	0.9	1.2		W
		V_s= 6V	R_L= 4Ω		0.75		W
		V_s= 3.5V	R_L= 4Ω		0.25		W
		V_s= 3V	R_L= 4Ω		0.20		W
$V_{i\ (rms)}$	Input sensitivity	P_o= 1.2W R_L= 8Ω f = 1 kHz	R_f= 33Ω		16		mV
			R_f= 120Ω		60		mV
		P_o= 50 mW R_L= 8Ω f = 1 kHz	R_f= 33Ω		3.5		mV
			R_f= 120Ω		12		mV
R_i	Input resistance (pin 3)	f = 1 kHz			5		MΩ
B	Frequency response (-3 dB)	R_L= 8Ω C_5 = 1000 μF R_f= 120Ω	C_B= 680 pF	25 to 7,000			Hz
			C_B= 220 pF	25 to 20,000			Hz
d	Distortion	P_o= 500 mW R_L= 8Ω f = 1 kHz	R_f= 33Ω		0.8		%
			R_f= 120Ω		0.4		%
G_v	Voltage gain (open loop)	f = 1 kHz	R_L= 8Ω		75		dB

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions		Min.	Typ.	Max.	Unit
G_v	Voltage gain (closed loop)	R_L= 8Ω	R_f= 33Ω		45		dB
		f = 1 kHz	R_f= 120Ω		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= 8Ω G_v= 34 dB	R1= 10KΩ		80		dB
			R1= 50 kΩ		70		
SVR	Supply voltage rejection (test circuit of fig. 2)	R_L= 8Ω f (ripple) = 100 Hz C6= 47 μF R_f= 120Ω			42		dB

(*) B = 22 Hz to 22 KHz

Fig. 3 - Output power vs. supply voltage

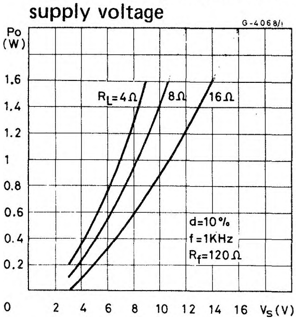


Fig. 4 - Harmonic distortion vs. output power

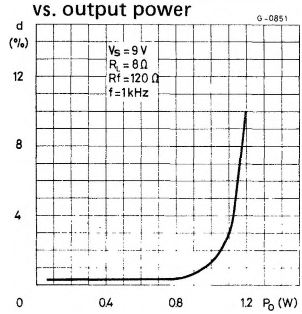


Fig. 5 - Power dissipation and efficiency vs. output power

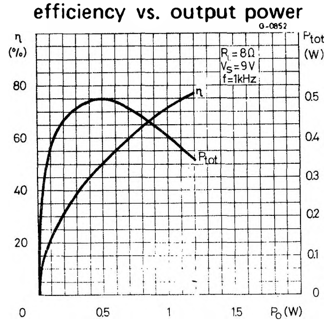


Fig. 6 - Maximum power dissipation (sine wave operation)

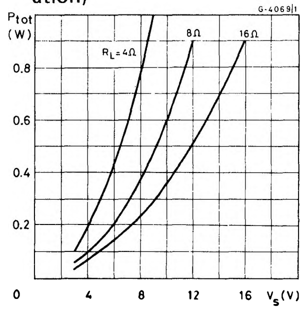


Fig. 7 - Suggested value of C_B vs. R_f

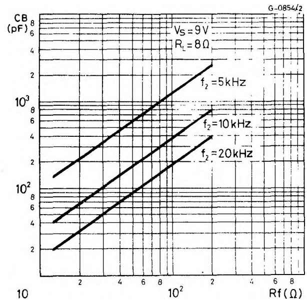


Fig. 8 - Frequency response

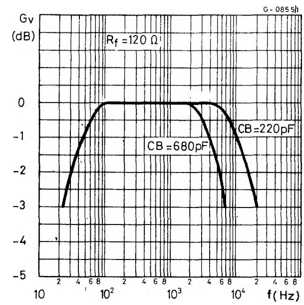


Fig. 9 - Input sensitivity vs. R_f

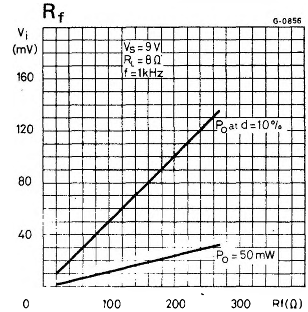


Fig. 10 - Voltage gain (closed loop) vs. R_f

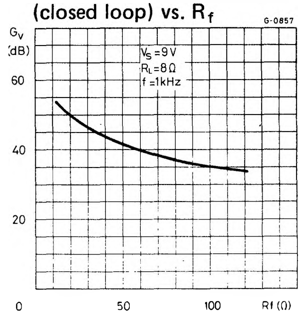


Fig. 11 - Harmonic distortion vs. frequency

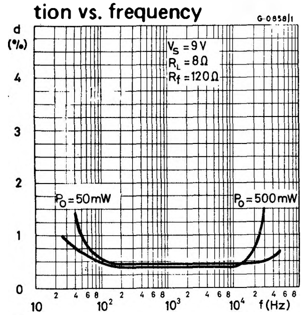


Fig. 12 - Supply voltage rejection (fig. 2 circuit)

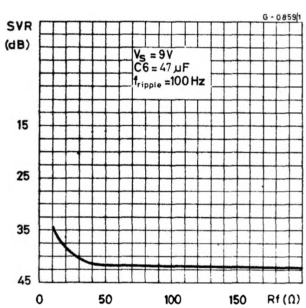


Fig. 13 - Quiescent output voltage at pin 5 vs. supply voltage

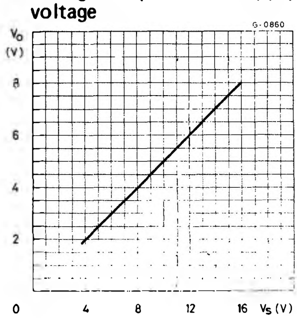
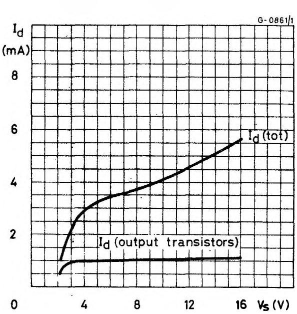


Fig. 14 - Quiescent current vs. supply voltage



APPLICATION INFORMATION

Fig. 15 - Low cost toy AM radio (0,5 to 1,5 MHz)

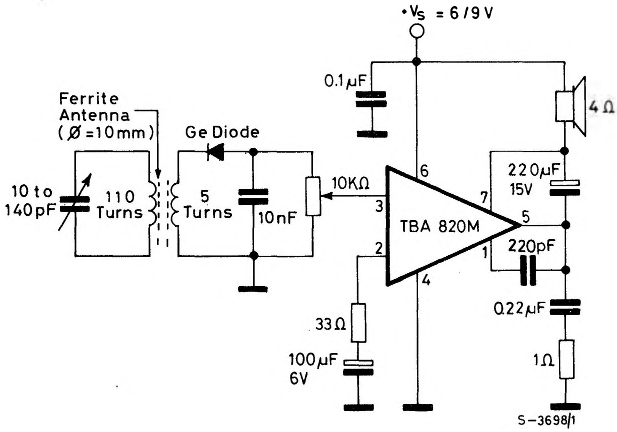
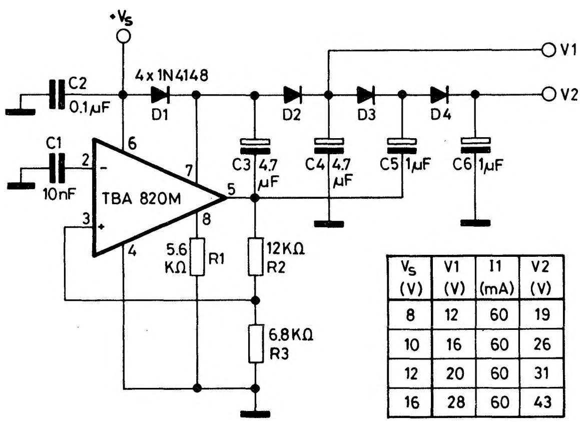


Fig. 16 - 1.5W DC/DC converter (f = 40 KHz)



Vs (V)	V1 (V)	I1 (mA)	V2 (V)
8	12	60	19
10	16	60	26
12	20	60	31
16	28	60	43

S-3700