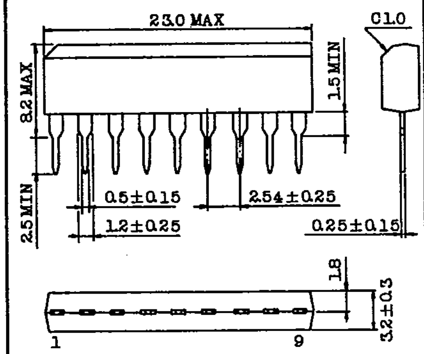
TA7318P

WIDE RANGE PEAK POWER METER DRIVER

- Dynamic Range=40dB (Typ.)
- With built-in two channels excellent in matching characteristics for stereo.
- Wide range meter for the 1/4 root compression circuit.
- Single and dual power supply operation.
- Built-in Zener diode providing stable operation to variations in supply voltage (Zener voltage: ±8.5V)

Unit in mm



Lead pitch is 2.54 and tolerance is ±0.25 against theoretical center of each lead that is obtained on the basis of No.1 lead.

JEDEC	–
TOSHIBA	S9A-P

MAXIMUM RATINGS ($Ta=25^{\circ}C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Current	I_{CC}	20	mA
Power Dissipation (Note)	P_D	700	mW
Operating Temperature	T_{opr}	-25 ~ 75	°C
Storage Temperature	T_{stg}	-55 ~ 125	°C

Note: Derated above $Ta=25^{\circ}C$ in the proportion of 7mW/°C

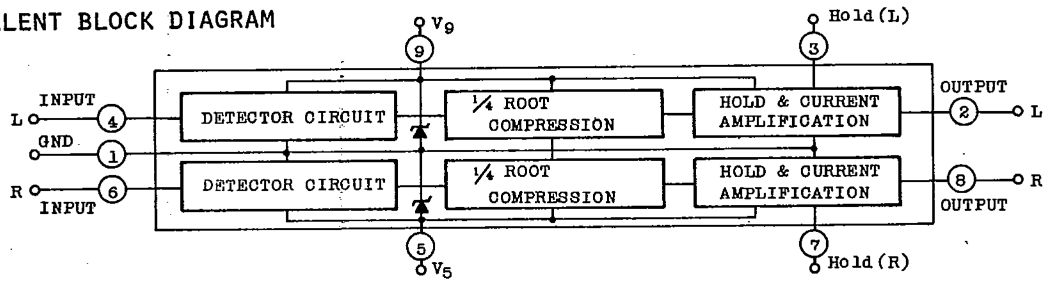
ELECTRICAL CHARACTERISTICS

($V_{CC}-V_{EE}=\pm25V$, $Ta=25^{\circ}C$, f=1kHz)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	1	$I_{IN}=0$, $V_9=7V$, $V_5=-7V$	–	2.1	3.0	mA
Quiescent Output Current	I_{OQ}	1	Input short	–	–	1	μA
Channel Balance	CH.B	1	$I_{IN}=-100\mu A$	–	–	1.4	dB
Input-Resistance	R_{IN}	1	–	–	2	–	kΩ
Channel Separation	$I_{OUT(sep)}$	1	$I_{IN}=-1mA$	–	-60	–	dB
Output Current	I_{OUT}	1	$I_{IN}=-100\mu A$	1.6	2.1	2.6	mA
Min. Input Current	$I_{IN(Min)}$	1	–	–	7	–	μA
Max. Input Current	$I_{IN(Max)}$	1	–	–	–	2	mA
Hold Terminal Voltage (Note)	V_H	2	Input short	25	–	150	mV

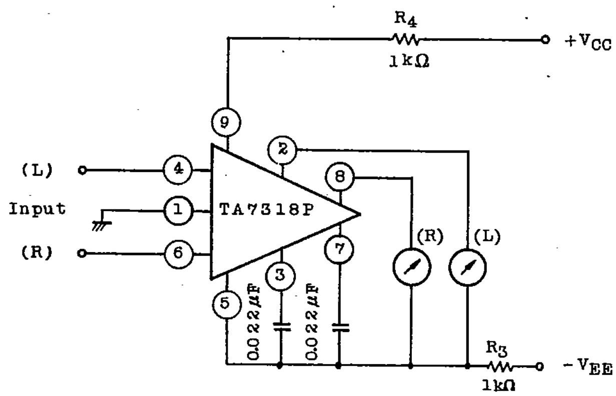
The hold terminal voltage is classified into two ranks as follows:
V_H-1 : 25 ~ 65mV, V_H-2 : 45 ~ 150mV

EQUIVALENT BLOCK DIAGRAM

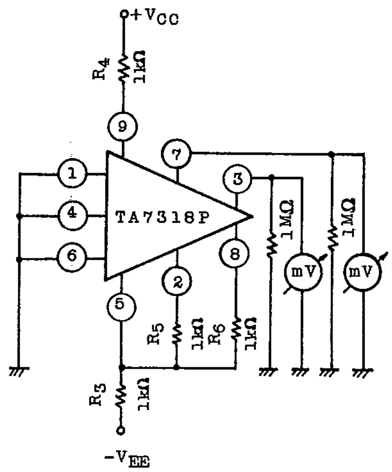


TA7318P

TEST CIRCUIT 1.

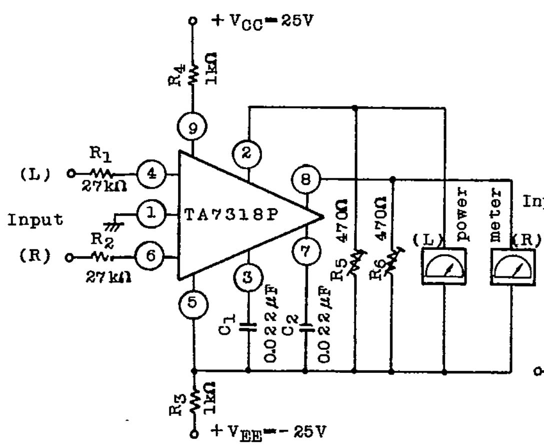


TEST CIRCUIT 2.



APPLICATION CIRCUIT

1. APPLICATION TO POWER METER
   (Use of Dual-power supply)



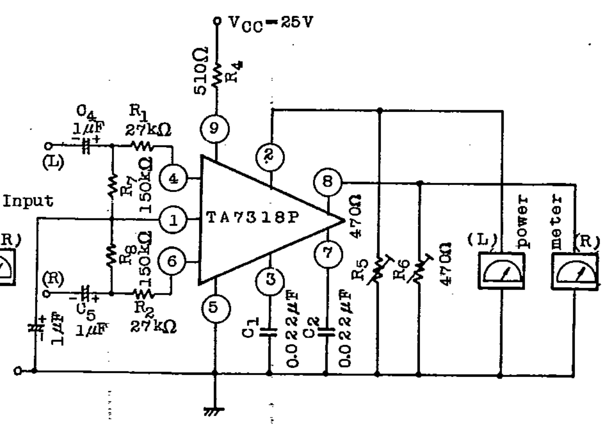
Power meter

Sensitivity: 1.1mA

Impedance: 1.5kΩ

C_1,C_2: Mylar film capacitor is used.

2. USE OF SINGLE POWER SUPPLY

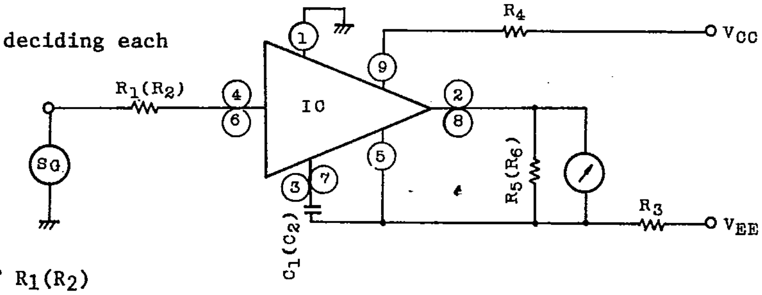


(Note) In case of using single power supply, the meter deflects the current charged to C_1 and C_2 at power ON.

TA7318P

APPLICATION

Method of deciding each constant



1. DECISION OF $R_1(R_2)$

$R_1(R_2)$ is a resistance that decides input current, by which the IC input is decided to be about 1mA. For example, when full scale is 100W, if R_L = 8Ω load, $R_1(R_2)$ is expressed as follows:

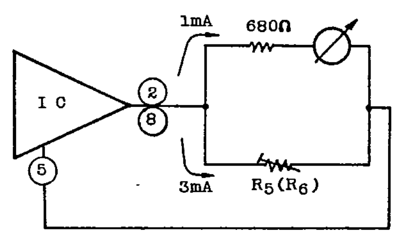
$$P_{OUT} = \frac{V^2\ (V.rms)}{R_L(8\Omega)} \qquad V = \sqrt{P \times R_L} = \sqrt{100 \times 8} = 28.28\text{Vrms}$$

$$V_{IN} = 1\text{mA} \times R_1(R_2) = 28.28\text{V}$$

$R_1(R_2)$ = 28.28kΩ ...... 27kΩ is used for $R_1(R_2)$

2. DECISION OF $R_5(R_6)$

$R_5(R_6)$ is a shunt resistance that decides angle of a meter, by which the meter is adjusted so as to become full scale when the IC input is 1mA.



For example, when 1mA enters the input, the output is about. 4mA. (Refer to $I_{IN} - I_{OUT}$ characteristics shown in the attached sheet.) Therefore, if a meter of 1mA in meter sensitivity and 680Ω in internal impedance is used, the following equation is expressed:

$$R_5(R_6) = \frac{680}{3} = 226.7 \doteqdot 220\Omega$$

Since $R_5(R_6)$ has meter variations, the use of variable resistance enables right and left adjustments to be made more easily.

3. DECISION OF $R_3(R_4)$

$R_3(R_4)$ is a resistance that decides supply current, by which pin 9 and pin 5 are fixed to GND (Pin 1) at ±8.5V respectively. Therefore, the value of $R_3(R_4)$ should be decided so that the current flown into IC by supply voltage may become 10mA ~ 20mA.

For example, when $R_3(R_4)$ is used at V_{CC}= 25V and V_{EE} =-25V, if it has 10% supply voltage variation, the following equation is obtained:

$$R_3(R_4) \geqq \frac{25 \times 1.1 - 8.5V}{20mA} k\Omega = 0.95k\Omega$$

If $R_3(R_4)$ is 1kΩ, the supply current becomes 19mA.

In this case, if $R_3(R_4)$ is 1.2kΩ by taking the power and variation into consideration, the supply current is expressed as follows:

$$I = \frac{25 - 8.5}{1.2k\Omega} = 13.8mA$$

Since $P = I^2R = 13.8^2mA \times 1.2k\Omega \doteqdot 230mW$, the resistance of 1/4W type is sufficient. (Refer to I_{CC}- I_{OUT} shown in the data sheet.)

4. DECISION OF $C_1(C_2)$

$C_1(C_2)$ is a capacity that decides the recovery time of a meter. A capacitor to be used should be lower in variation; for example, it is recommended that mylar film capacitor be used. The capacitor is classified into two ranks according to recovery time variations.

The typical values are shown as follows: (The recovery time from 0dB → -40dB is about. 2 ~ 4sec.)

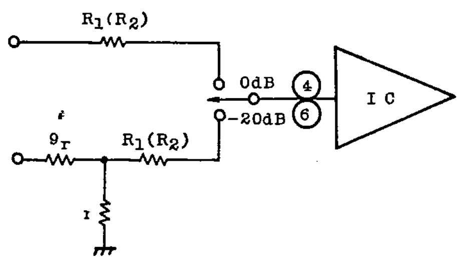
Classification	C_1 (C_2)
TA7318P-1	0.0068μF
TA7318P-2	0.022μF

(Refer to $C_1(C_2)$-T_{RECA} shown in the data sheet.)

TA7318P

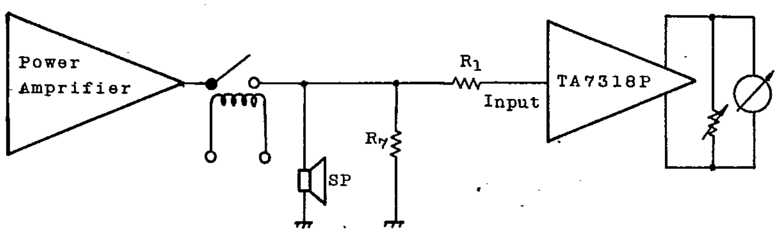
5. PRECAUTIONS AT TURN OF METER SENSITIVITY

When the signal scurce impeaance $R_1(R_2)$ is remarkably changed, the variations in amplification at the time of small input to the meter are apt to generate; therefore, these variations must be attenuated without changing the impedance.



In this case, however, $r < R_1(R_2)$.

6. CONNECTION OF R_1 AND R_7 TO CIRCUIT WHICH RELAY IS USED FOR OUTPUT TERMINAL

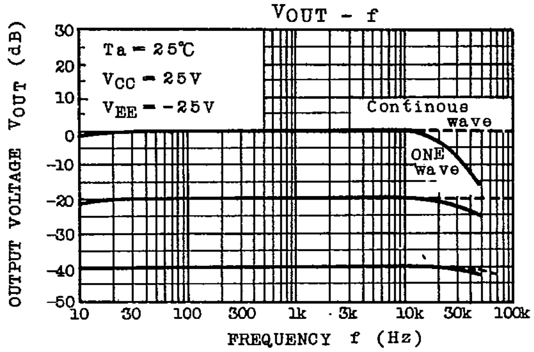


The resistance (R_7) should be inserted between input and ground as shown in the above figure. This is because the resistance prevents the ocurrence of such a phenomenon as, as long as the relay is turned OFF, the input impedance of TA7318P becomes high to be liable to receive the surrounding noise.

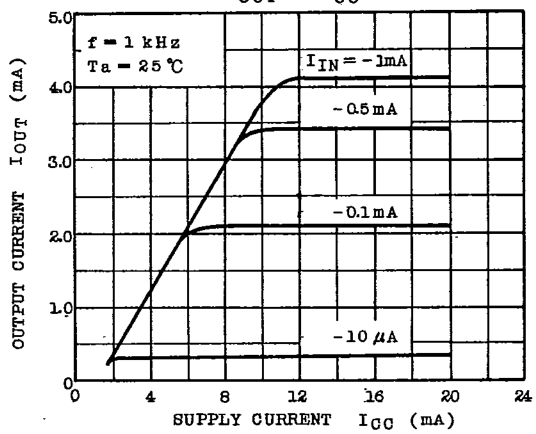
It is recommended that R_1 and R_7 be arranged close to the IC as far as possible.

TA7318P

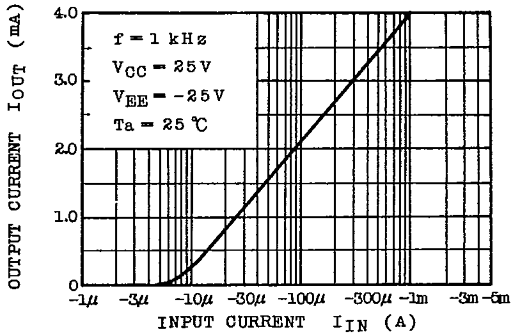
V_{OUT} - f



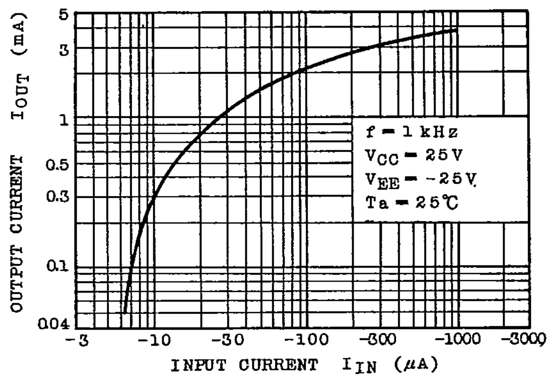
I_{OUT} — I_{CC}



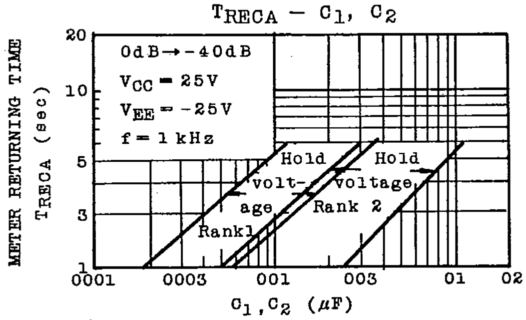
I_{IN} - I_{OUT}



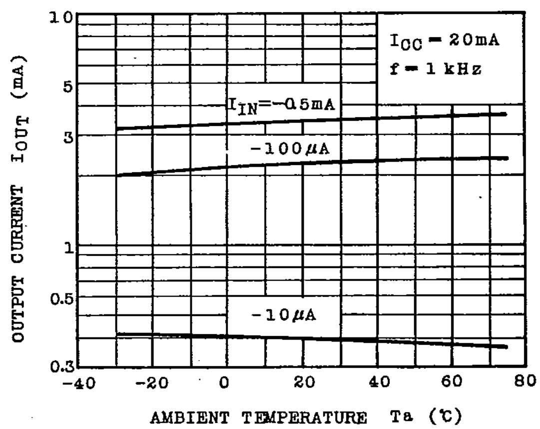
I_{OUT} — I_{IN}



T_{RECA} — C_1, C_2



Ta - I_{OUT}



P_D - Ta