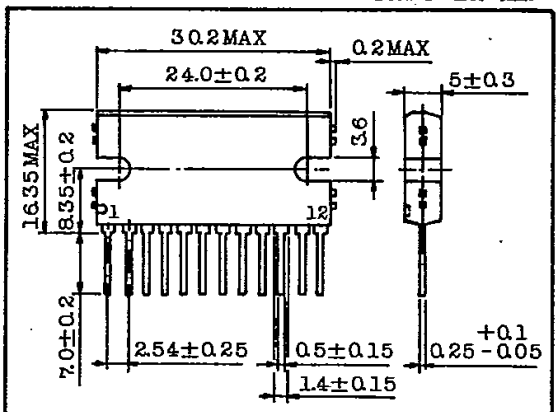
TA7294P
TA7295P

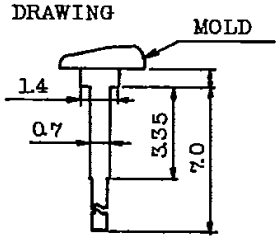
T-74-05-01

BTL AUDIO POWER AMPLIFIER

Unit in mm



LEAD DETALL DRAWING



JEDEC	—
TOSHIBA	S12AP-P

Weight : 4.9g

The TA7294P/TA7295P is BTL audio power amplifier for consumer application.
This IC provides high output power of 23W and also provides wide output power band width.
Normal (TA7294P) and Reverse (TA7295P) for easier layout design of PC-board when used in BTL-Stereo application.

- High Output Power
  : $P_{OUT(1)}$=23W (V_{CC}=13.2V, R_L=4Ω, THD=10%, f=1kHz)
  : $P_{OUT(2)}$=30W (V_{CC}=13.2V, R_L=2Ω, THD=10%, f=1kHz)
- Excellent Output Power Band Width
  : $P_{OUT(3)}$=18W (V_{CC}=13.2V, R_L=4Ω, THD=1%
  f=50Hz to 20kHz)
- Low Distortion
  : THD=0.015% (V_{CC}=13.2V, R_L=4Ω, f=1kHz,
  P_{OUT}=4W, without Noise)
- Built In Protector Circuit
  Thermal Shut Down, Over Voltage Protection (TYP. V_{CC}=21V)
  ASO Protection (R_L Short, Out to GND, Out to V_{CC})
- Operating Supply Voltage Range : $V_{CC(opr)}$=9~18V

MAXIMUM RATINGS (Ta=25°C)

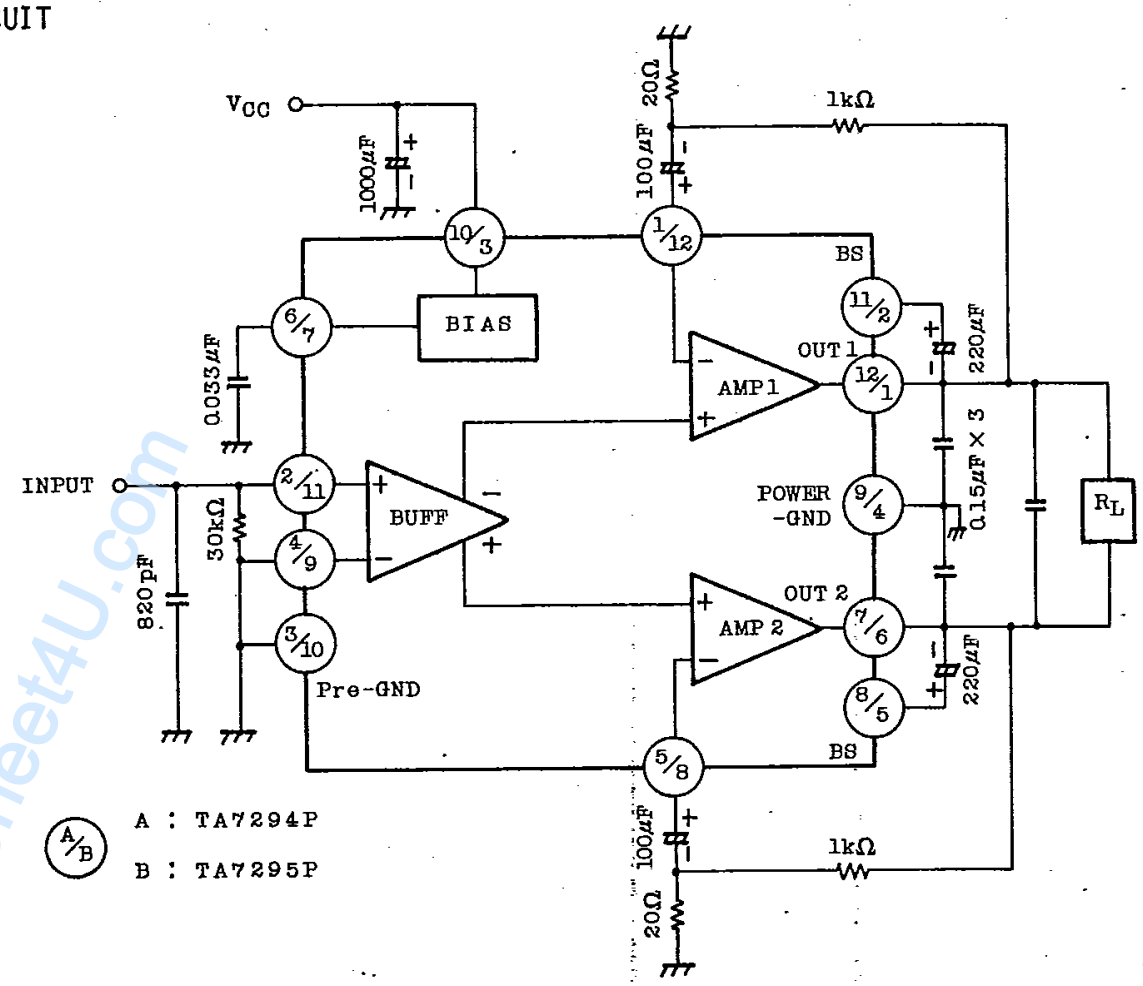
CHARACTERISTIC	SYMBOL	RATING	UNIT
Peak Supply Voltage (0.2 sec)	V_{CC} surge	50	V
DC Supply Voltage	V_{CC} DC	25	V
Operating Supply Voltage	V_{CC} opr	18	V
Output Current (peak)	I_O peak	9	A
Power Dissipation	P_D	25	W
Operating Temperature	Topr	-30~	°C
Storage Temperature	Tstg	-55~150	°C

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{CC}=13.2V, R_L=4Ω, Rg=600Ω, f=1kHz, Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	-	V_{IN}=0	-	120	200	mA
Output Power	P_{OUT}(1)	-	THD=10%	20	23	-	W
	P_{OUT}(2)	-	R_L=2Ω	-	30	-	
	P_{OUT}(3)	-	THD=1%, f=50Hz~20kHz	-	18	-	
Total Harminic Distortion	THD	-	P_{OUT}=4W	-	0.015	0.1	%
Voltage Gain	Gv	-	V_{IN}=-50dBm	39.5	41	42.5	dB
Output Noise Voltage	V_{NO}(1)	-	Rg=0, DIN45405 Noise Filter	-	0.25	-	mVrms
	V_{NO}(2)	-	Rg=10kΩ BW=20Hz~20kHz	-	0.35	0.9	
Ripple Rejection Ratio	R.R	-	f=100Hz, Vripple=0dBm	40	47	-	dB

TEST CIRCUIT



TA7294P
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TYPICAL DC VOLTAGE OF EACH TERMINAL

TERMINAL No.		1	2	3	4	5	6	7	8	9	10	11	12
DC VOLTAGE (V)	TA7294P	1.95	0.01	GND	0	1.95	6.6	6.6	12.5	GND	V_{CC}	12.5	6.6
	TA7295P	6.6	12.5	V_{CC}	GND	12.5	6.6	6.6	1.95	0	GND	0.01	1.95

APPLICATION INFORMATION

(This explanatory terminal number is for TA7294P)

1. VOLTAGE GAIN

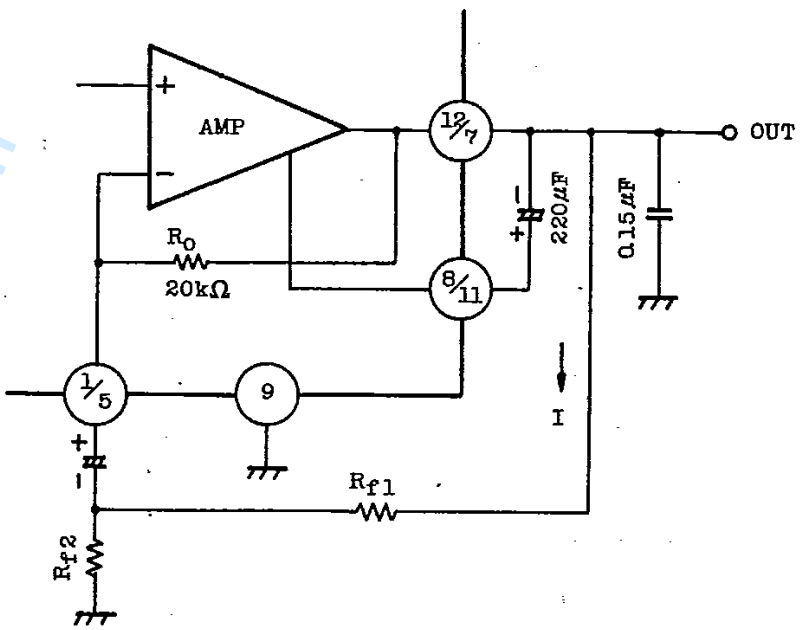
The closed loop voltage gain: G_V is determined by R_{f1}, R_{f2} and R_O.

If $R_O \geqslant R_{f1} > R_{f2}$

$$G_V = 20\log \frac{R_{f1}}{R_{f2}} + 6 \ (dB)$$

(R_O is established 20k)

Care must be taken, since the current "I" flows to R_{f1} and R_{f2} from quiescent output voltage at pin 12/7 and it is impossible decrease so much R_{f1} and R_{f2}. When G_V=40dB, it is recommended to use R_{f1} for 1kΩ and R_{f2} for 20Ω.

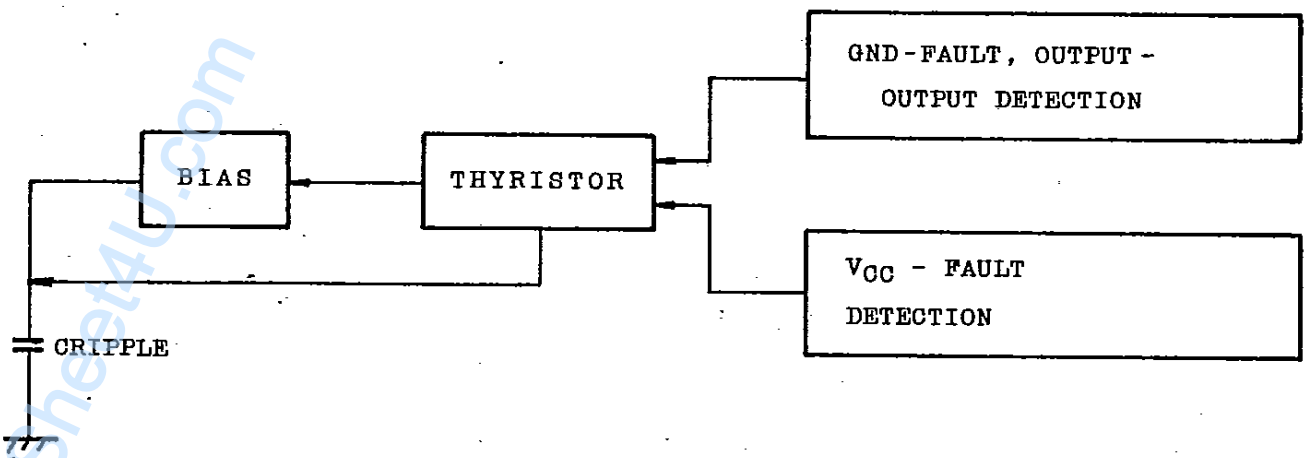


2. OSCILLATION SUPPRESSING

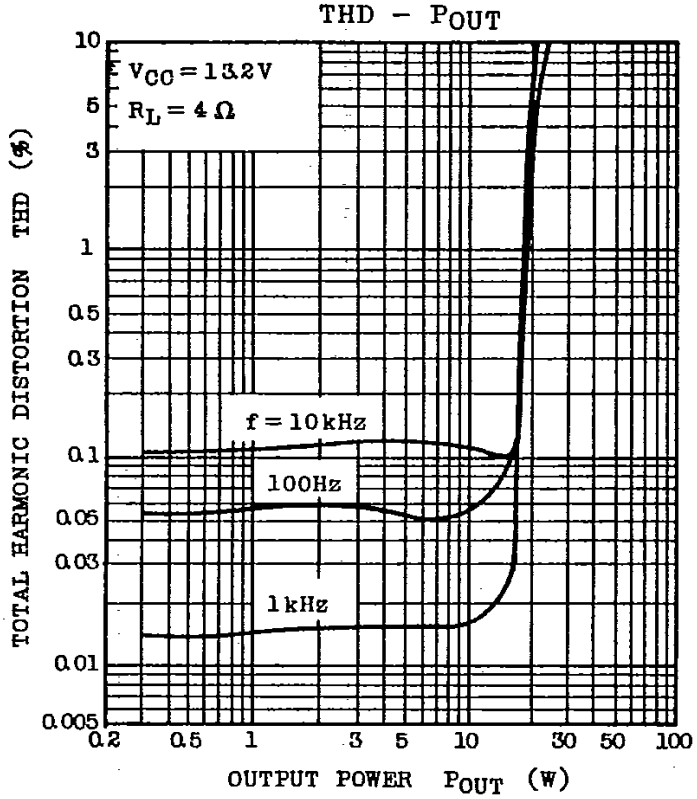
For the oscillation suppressing, the capacitors should be inserted output terminal to GND and output to another output.
These are recommended to use the polyester film capacitor which temperature characteristics are better.
If use ceramic capacitor, the characteristics is liable to be influenced by temperature, then it is better to use the capacitor of which capacity is lager than the recommended value, surely carry out the temperature test, and confirm the oscillation allowance.
Especiall when using this IC sith the voltage gain reduced or with the feedback amount increased, the phase inversion is produced in high frequency and the oscillation is liable to be generated. Therefore, use this IC at G_V=40dB or over after sufficiently checking the capacity of capacitor, type of capacitor and mounting position of capacitor.

3. ASO CIRCUIT

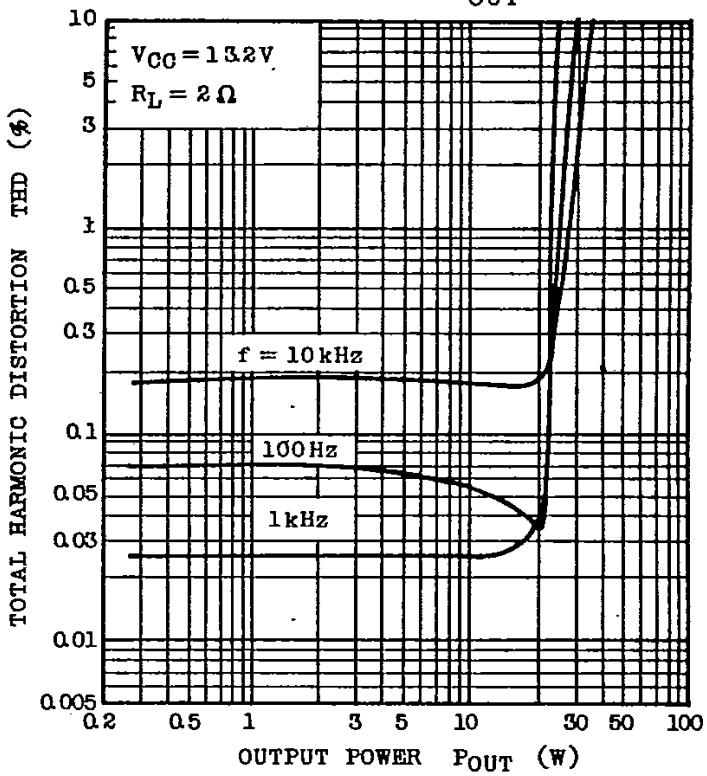
This IC incorporates the protection circuit of V_{CC}-dault, ground-fault and shorting between output and another output.



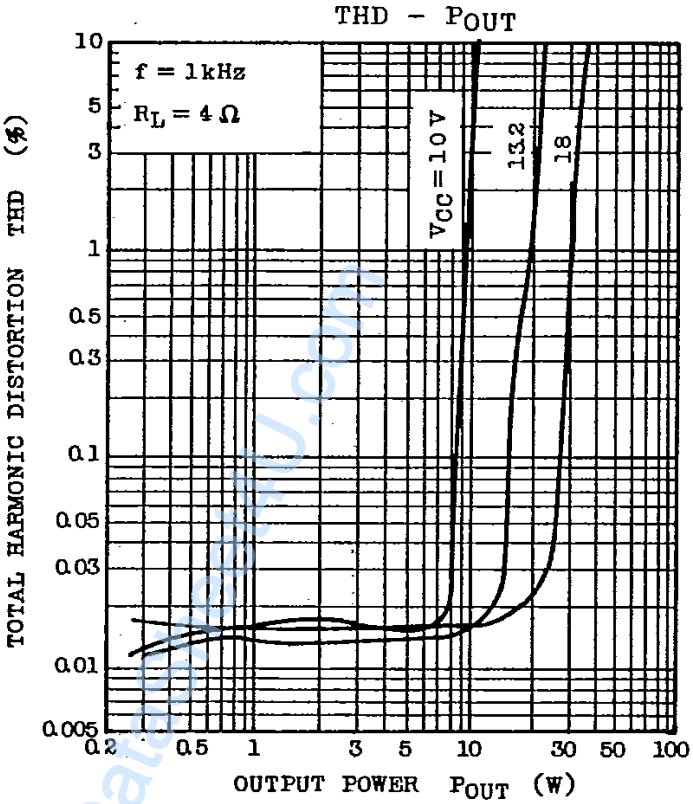
THD – P_{OUT}



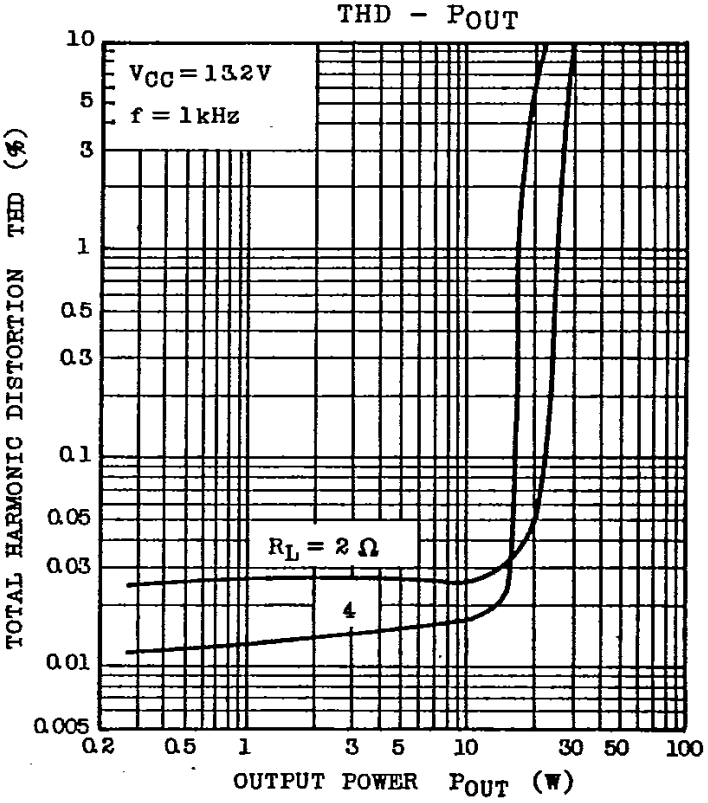
THD – P_{OUT}



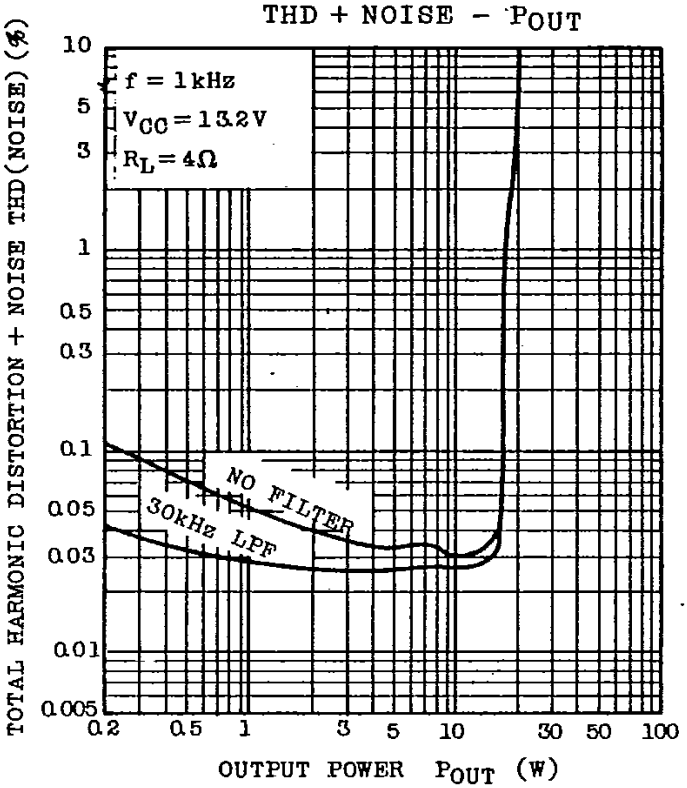
THD – P_{OUT}



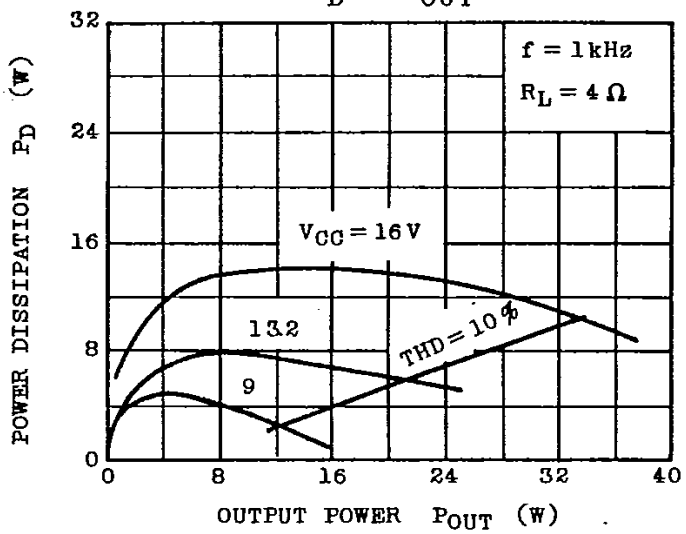
THD – P_{OUT}



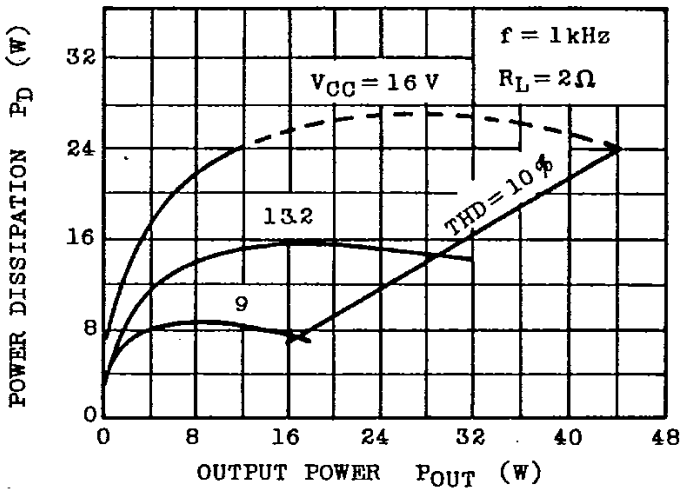
THD + NOISE – P_{OUT}



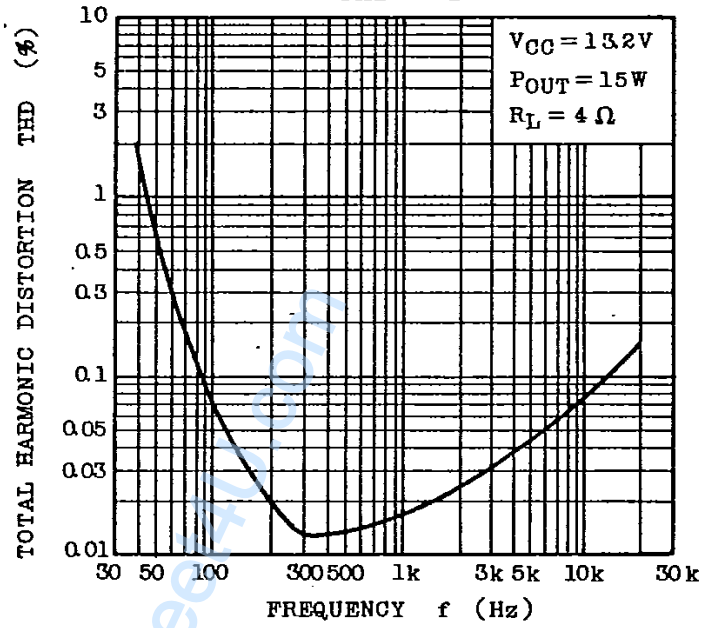
P_D – P_{OUT}



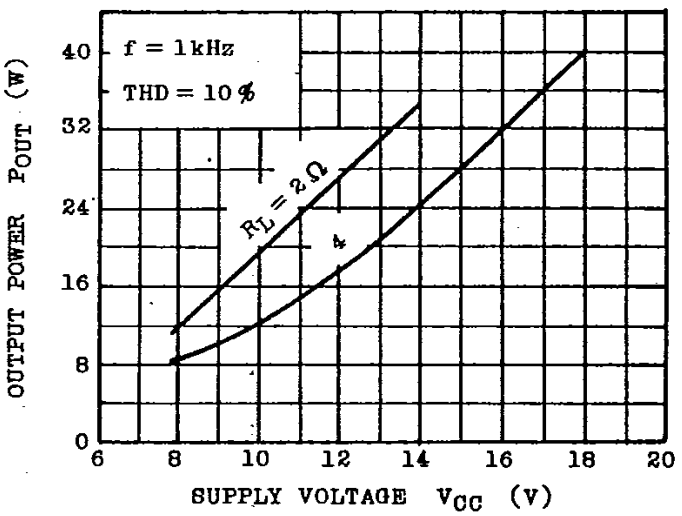
P_D – P_{OUT}



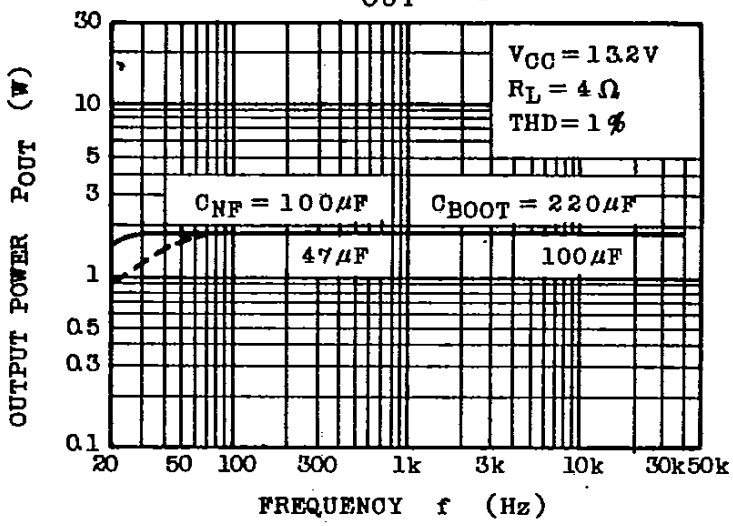
THD – f



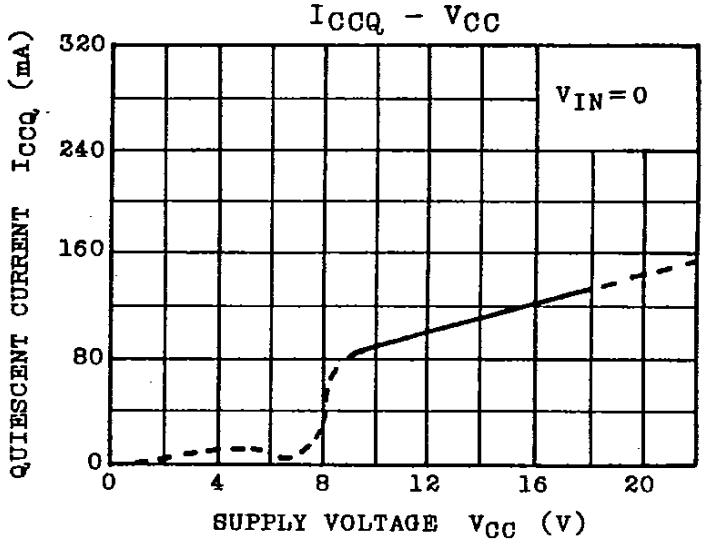
P_{OUT} – V_{CC}



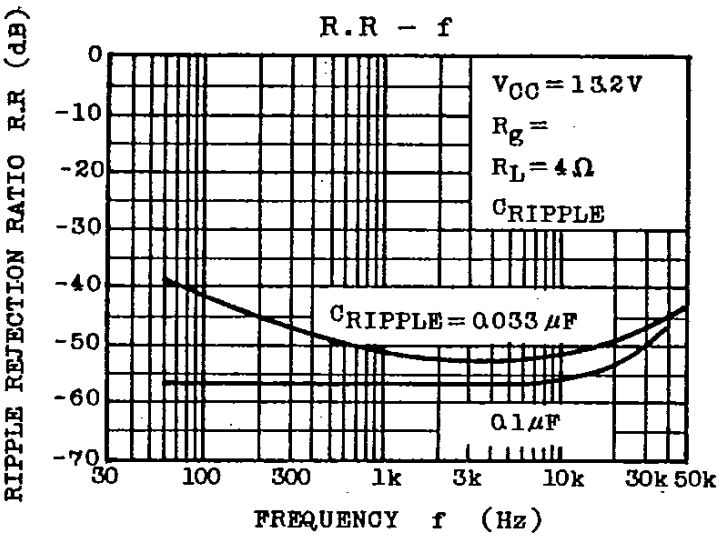
P_{OUT} – f



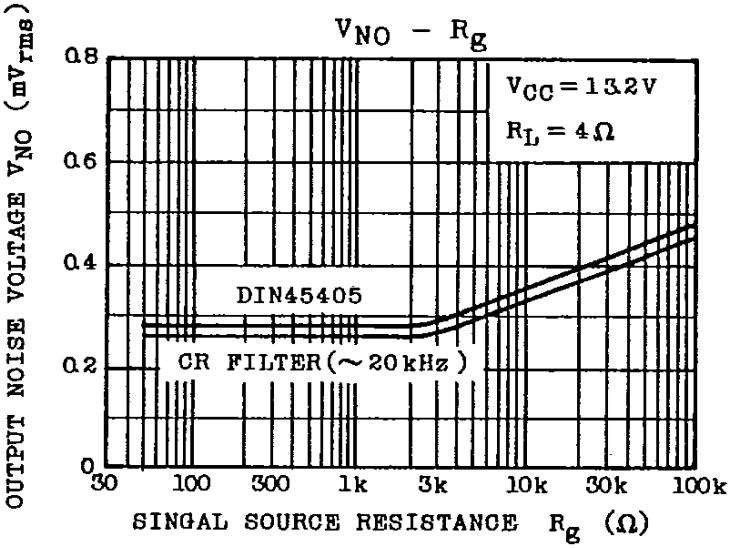
I_{CCQ} – V_{CC}



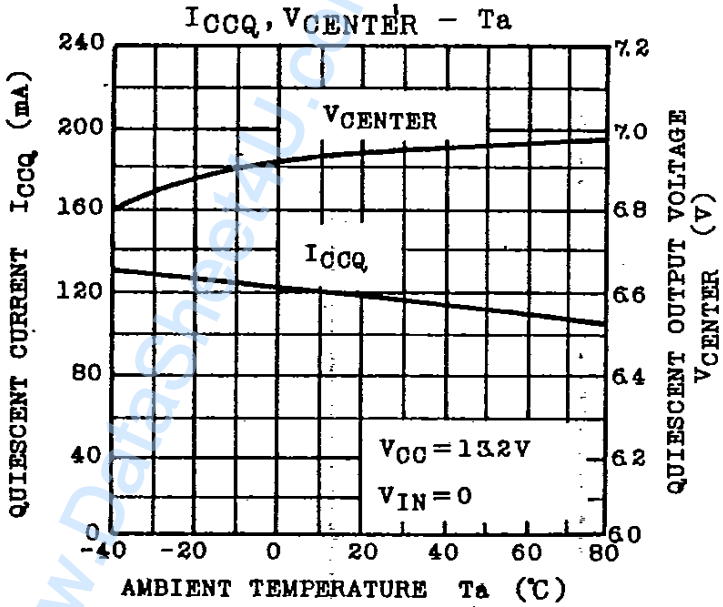
R.R – f



V_{NO} – R_g



I_{CCQ}, V_{CENTER} – Ta



P_D MAX – Ta