

<b>SANYO</b>	No.341G	<b>2SB632, 632K/2SD612, 612K</b>
		PNP/NPN Epitaxial Planar Silicon Transistors 25V/35V, 2A Low-Frequency Power Amp Applications

**Features**

- High collector dissipation and wide ASO.

( ): 2SB632, 632K

Absolute Maximum Ratings at Ta = 25°C		2SB632, D612	2SB632K, D612K	unit
Collector-to-Base Voltage	V <sub>CB0</sub>	(-)25	(-)35	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>	(-)25	(-)35	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-)5	V
Collector Current	I <sub>C</sub>		(-)2	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)3	A
Collector Dissipation	P <sub>C</sub>		1	W
		T <sub>c</sub> = 25°C		
Junction Temperature	T <sub>j</sub>		10	W
Storage Temperature	T <sub>stg</sub>		150	°C
			-55 to +150	°C

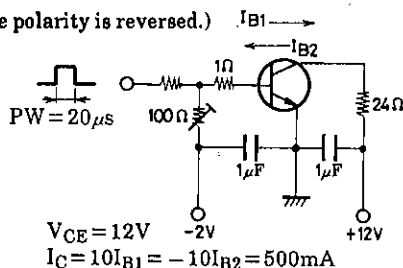
Electrical Characteristics at Ta = 25°C			min	typ	max	unit
C-B Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> = (-)10μA, I <sub>E</sub> = 0	B632, D612 (-)25			V
			B632K, D612K (-)35			V
C-E Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = (-)1mA, R <sub>BE</sub> = ∞	B632, D612 (-)25			V
			B632K, D612K (-)35			V
E-B Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> = (-)10μA, I <sub>C</sub> = 0		(-)5		V
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> = (-)20V, I <sub>E</sub> = 0			(-)1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> = (-)4V, I <sub>C</sub> = 0			(-)1	μA
DC Current Gain	h <sub>FE</sub> (1)	V <sub>CE</sub> = (-)2V, I <sub>C</sub> = (-)500mA	60※		320※	
	h <sub>FE</sub> (2)	V <sub>CE</sub> = (-)2V, I <sub>C</sub> = (-)1.5A	30			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = (-)10V, I <sub>C</sub> = (-)50mA		100		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = (-)10V, f = 1MHz		(45)30		pF
C-E Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = (-)1.5A, I <sub>B</sub> = (-)0.15A		(-0.4)(-0.9)		V
				0.3	0.8	
B-E Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = (-)1.5A, I <sub>B</sub> = (-)0.15A		(-)1.1(-)1.5		V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		(60)50		ns
Fall Time	t <sub>f</sub>	"		(80)100		ns
Storage Time	t <sub>stg</sub>	"		400		ns

※ : The 2SB632/2SD612 are classified by 500mA h<sub>FE</sub> as follows.

60	D	120	100	E	200	160	F	320
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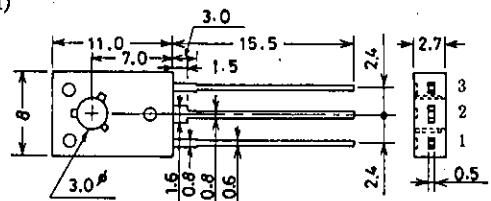
**Switching Time Test Circuit**

(For PNP, the polarity is reversed.)



**Package Dimensions 2009B**

(unit : mm)



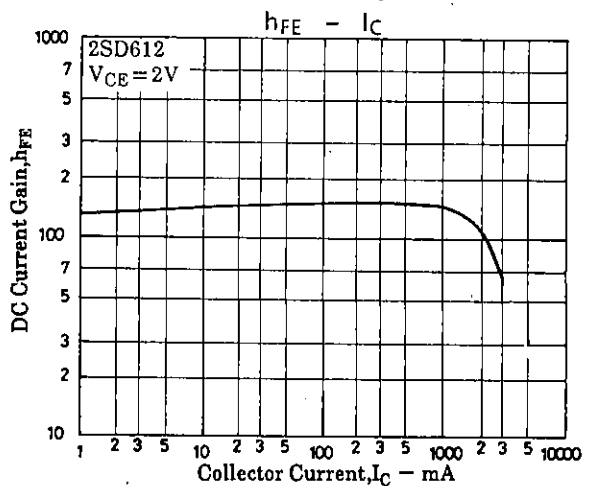
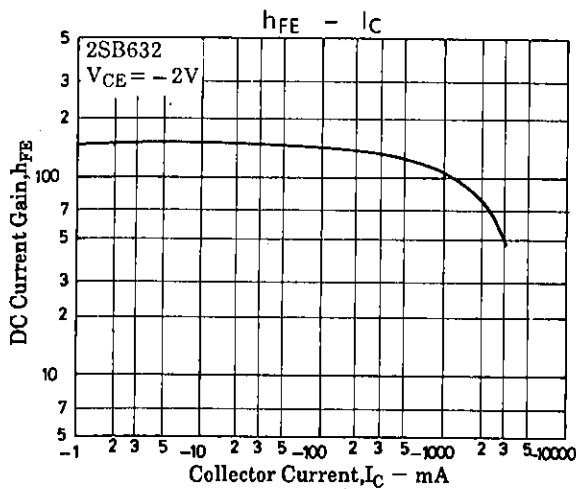
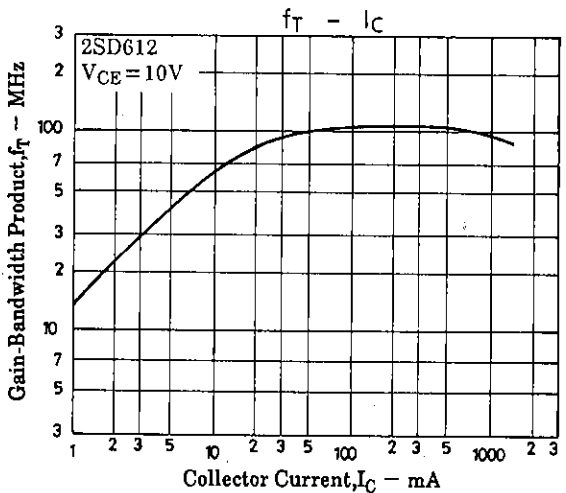
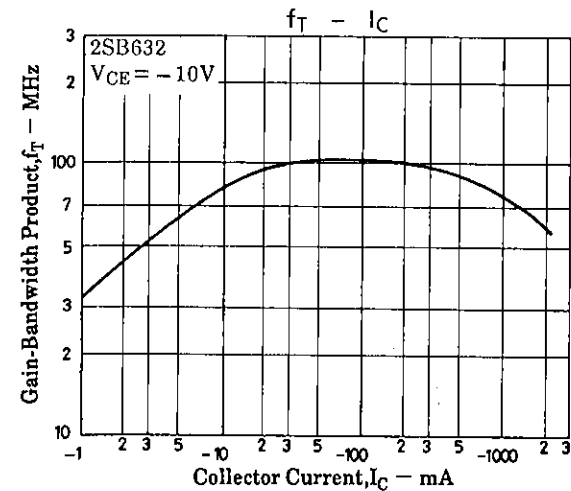
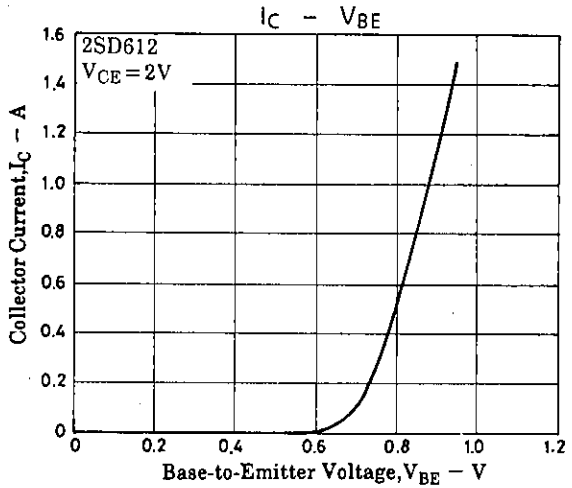
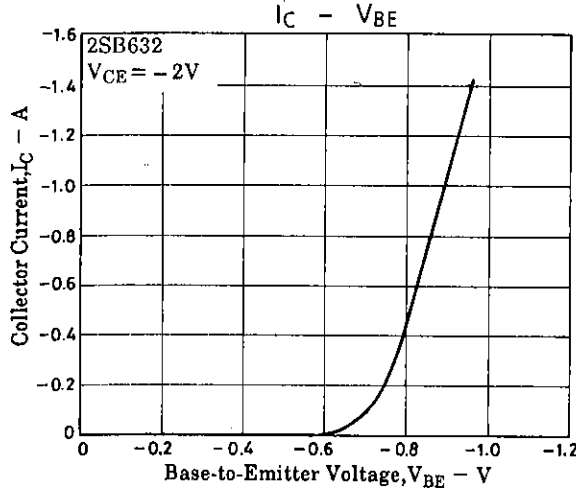
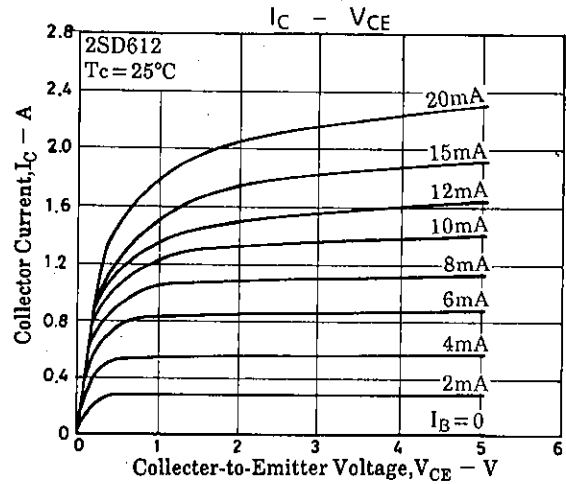
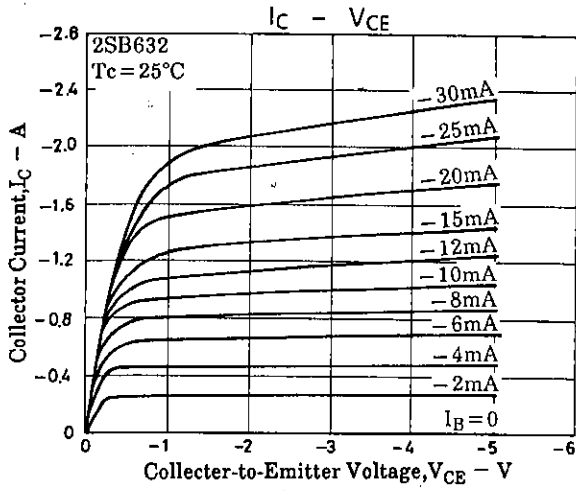
JEDEC: TO-126

- 1: Emitter
- 2: Collector
- 3: Base

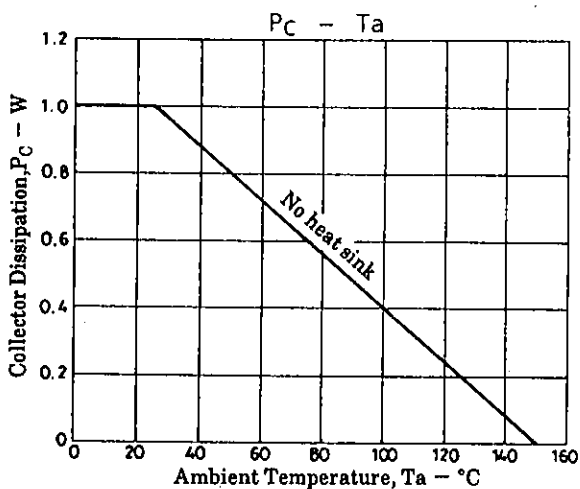
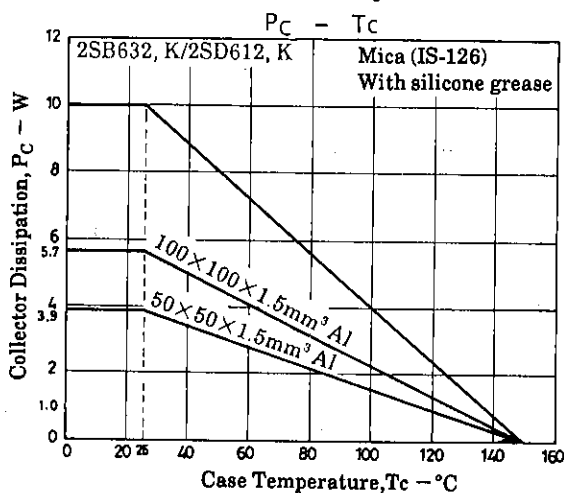
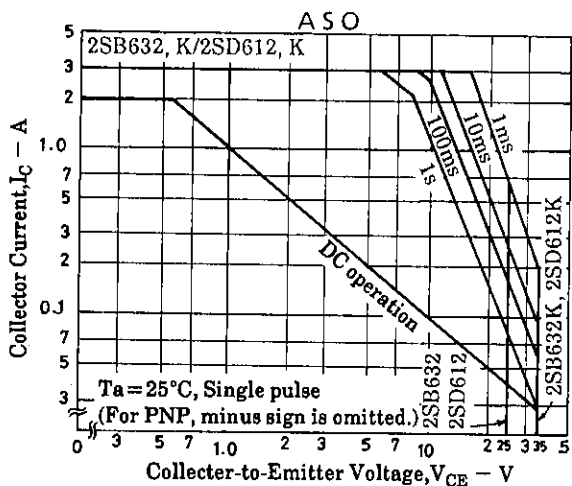
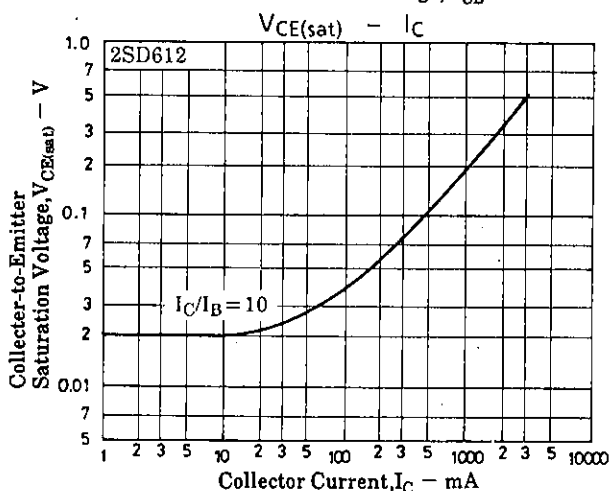
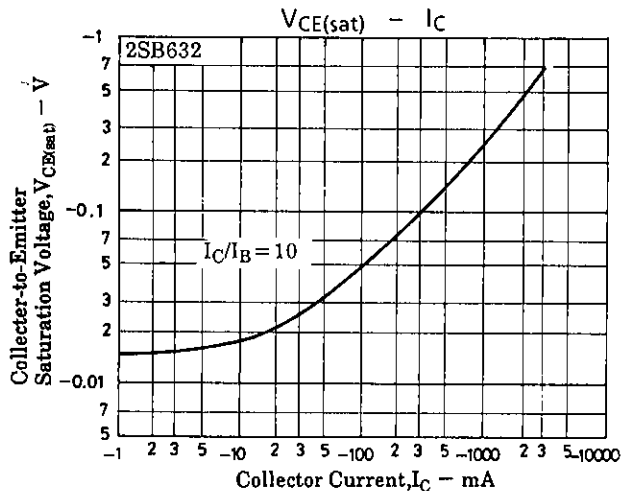
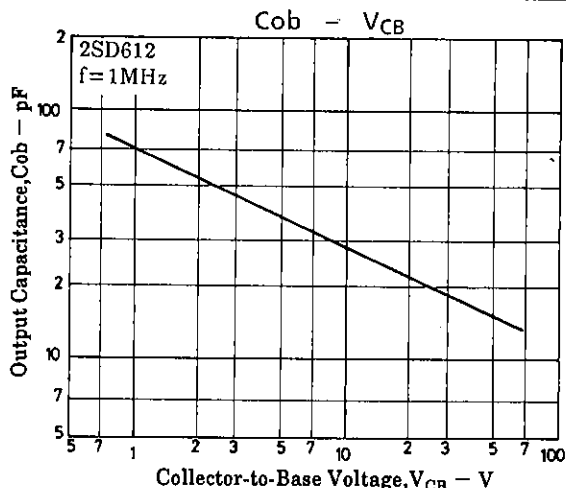
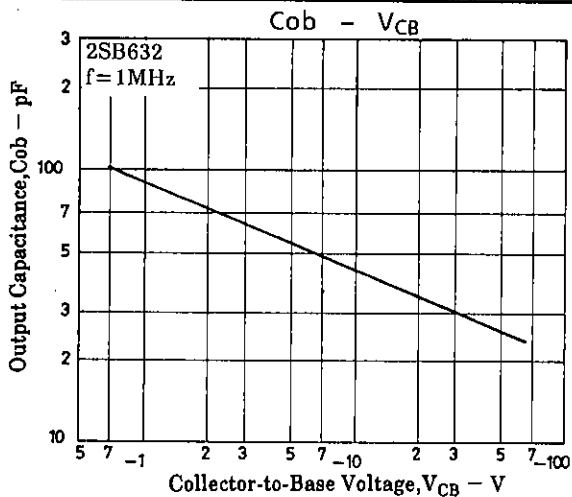
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TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

2SB632, 632K/2SD612, 612K



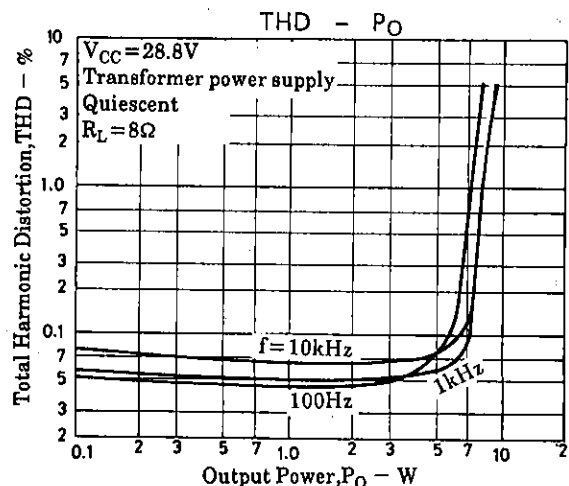
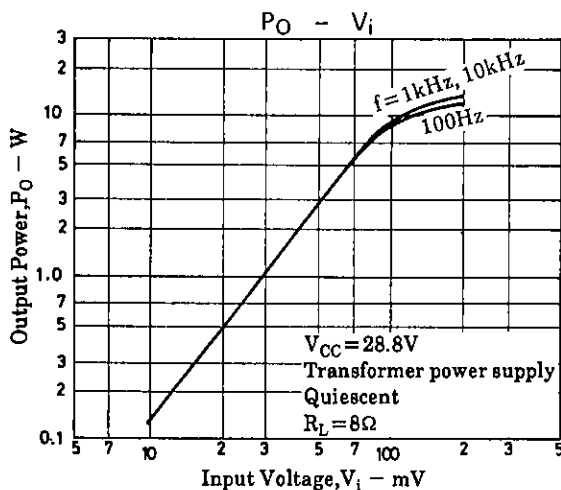
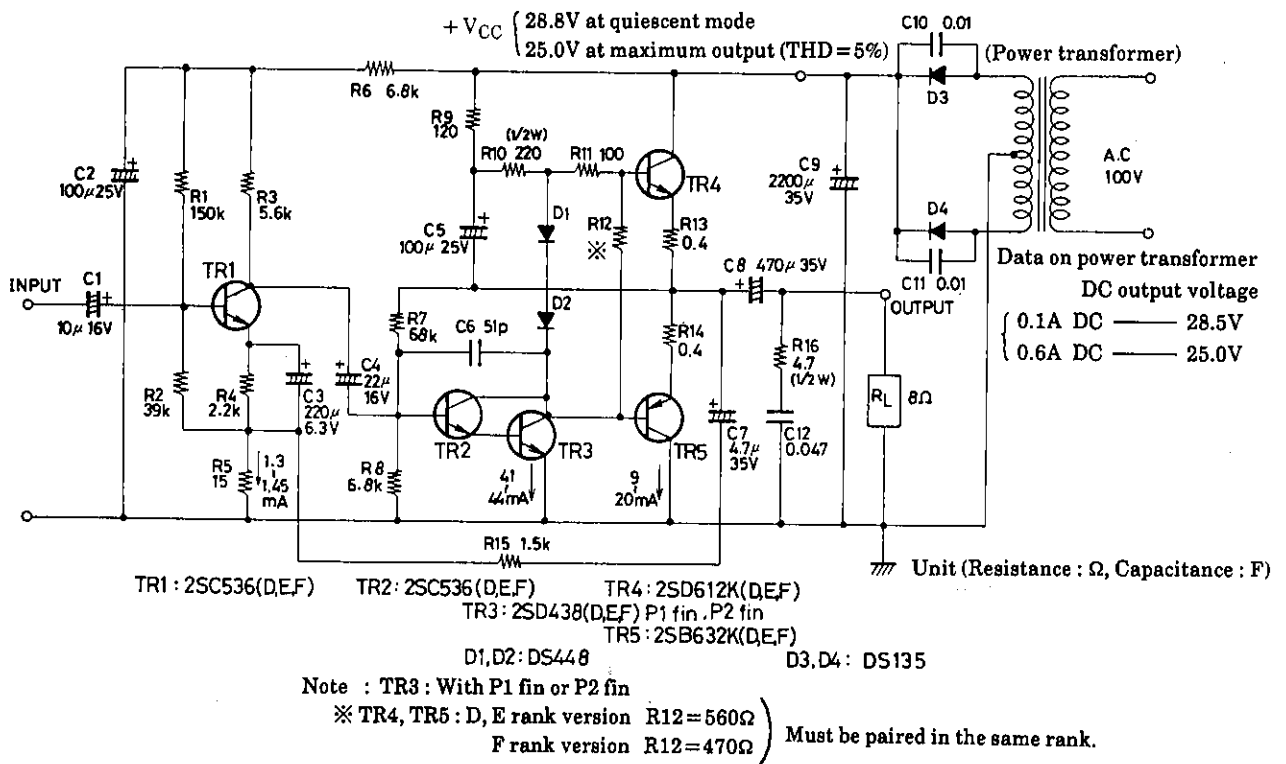
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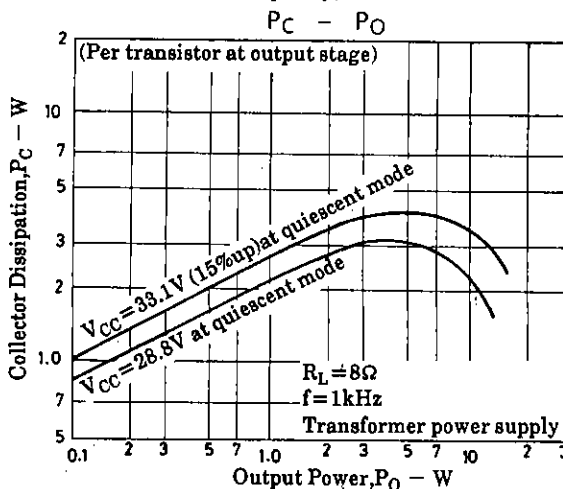
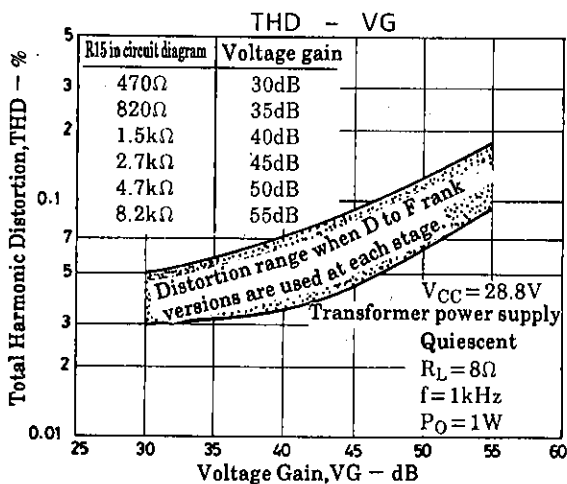
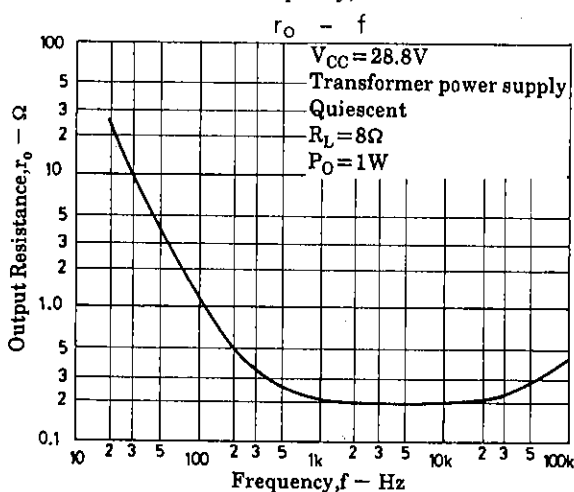
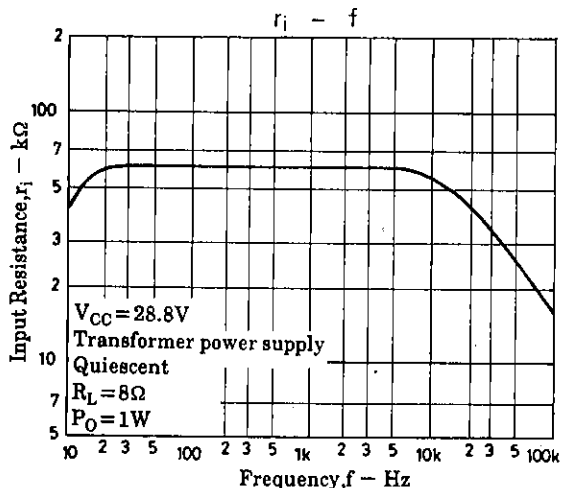
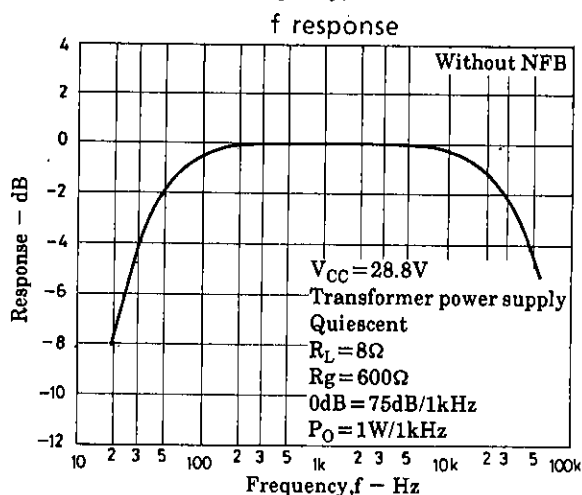
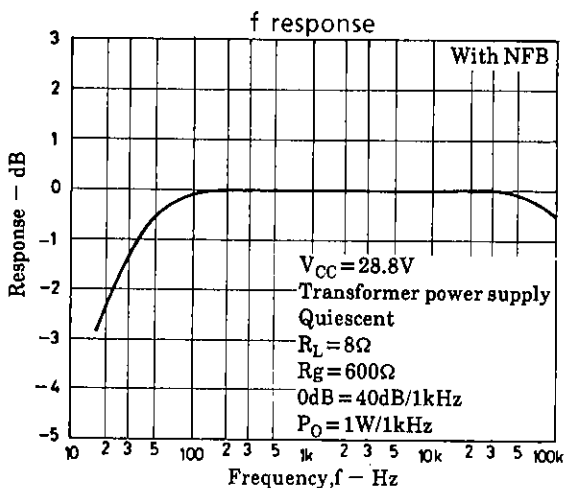
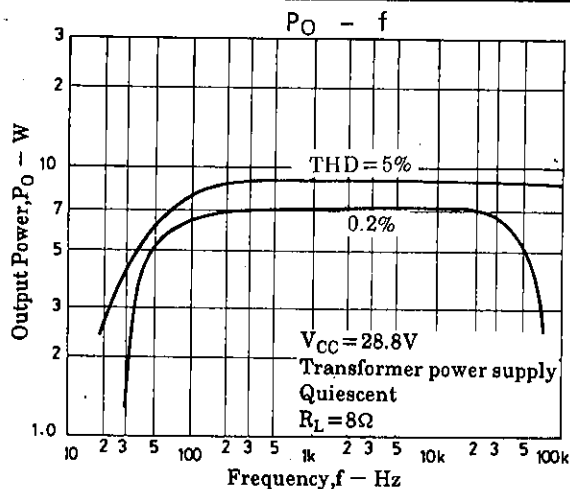
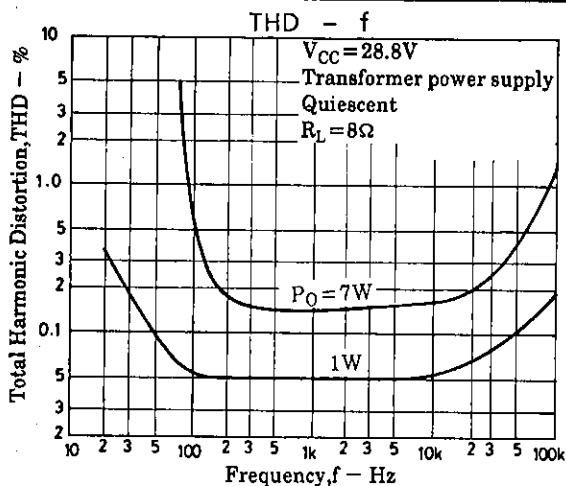
## 2SB632, 632K/2SD612, 612K

**Sample Application Circuit 1 : 8W pure complementary amplifier using the 2SB632K/2SD612K**  
 [Specifications] Power supply : 100V AC supply transformer with no signal = 28.8V,  
 Maximum output = (THD = 5%) = 25V,  $f = 1\text{kHz}$ ,  $R_L = 8\Omega$ ,  $R_g = 600\Omega$

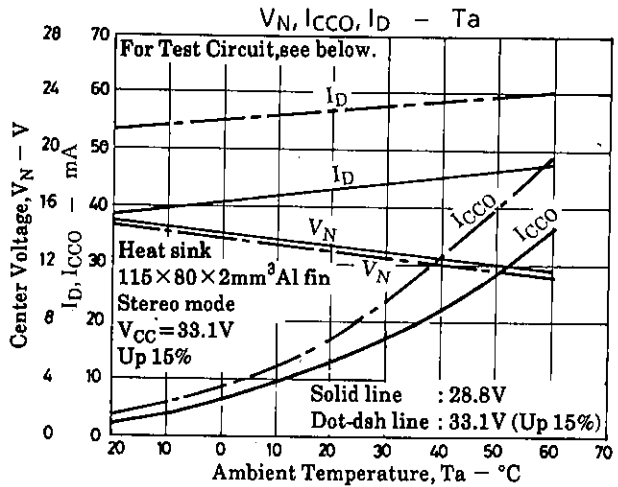
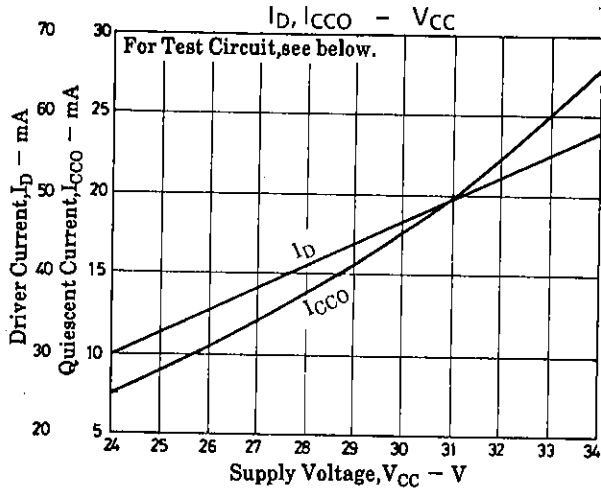
	typ	uint
Quiescent Current (Collector Current)	$I_{CC0}$ Output stage	14.0 mA
	$I_D$ Drive stage	42.0 mA
	$I_C$ First stage	1.4 mA
Voltage Gain	VG Without NFB	75 dB
	VG With NFB	40 dB
Output Power	$P_O$ THD = 5%	8.7 W
Total Harmonic Distortion	THD $P_O = 1\text{W}$	0.05 %
Input Resistance	$r_i$ $P_O = 1\text{W}$	60 $k\Omega$
Output Resistance	$r_o$ $P_O = 1\text{W}$	0.2 $\Omega$



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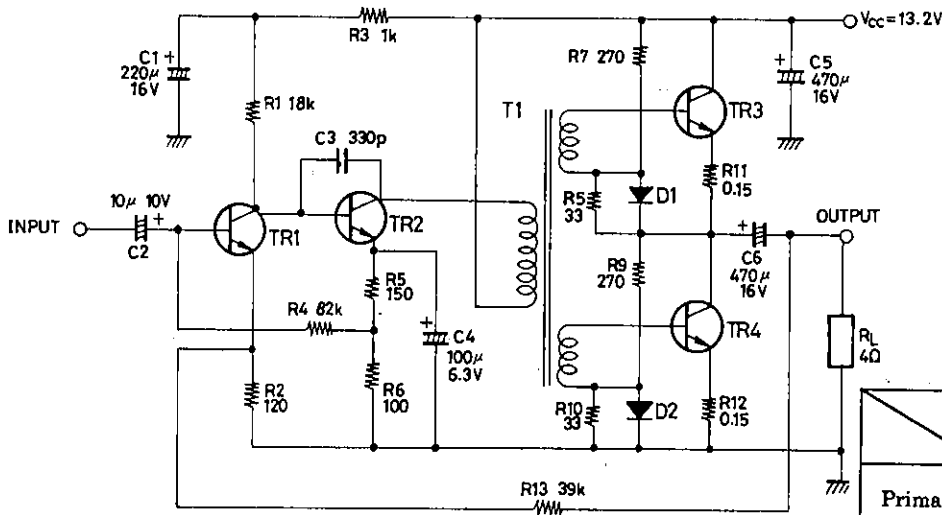
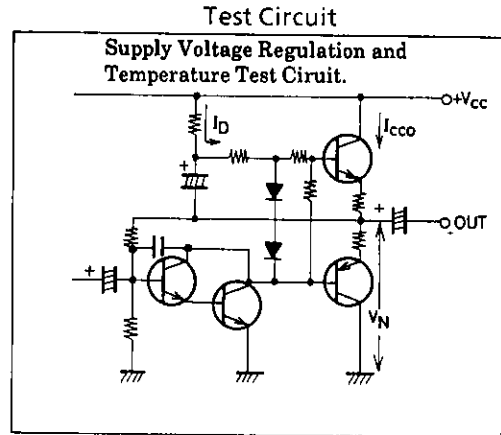
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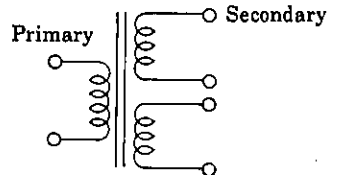
### Sample Application Circuit 2 : 2SD612-Used 4W Input Transformer Coupling Amp for Car Use.

[Specifications]  $V_{CC} = 13.2 \text{ V}$ ,  $R_L = 4 \Omega$ ,  $R_g = 600 \Omega$ ,  $f = 1 \text{ kHz}$

Quiescent Current (Collector Current)	$I_{CCO}$	Output stage	12.0	mA
	$I_D$	Drive stage	9.0	mA
Voltage Gain	$V_G$	Without NFB	66	dB
	$V_G$	With NFB	49	dB
Output Power	$P_O$	THD = 10%	4.7	W
Total Harmonic Distortion	THD	$P_O = 0.5 \text{ W}$	0.8	%
Input impedance	$r_i$	$P_O = 0.5 \text{ W}$	60	k $\Omega$



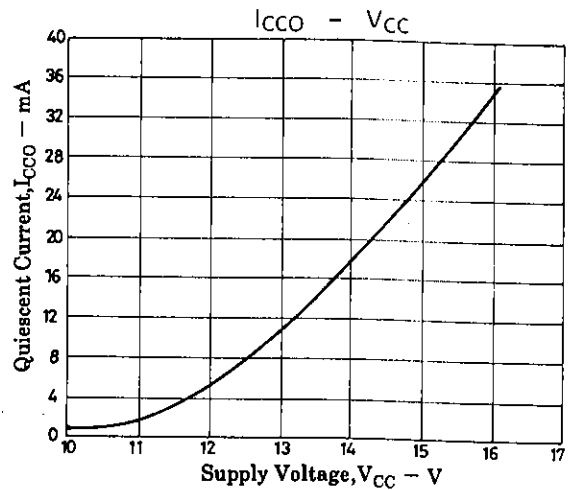
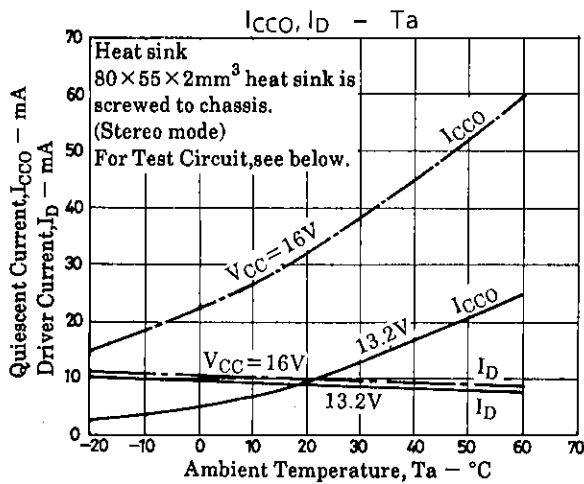
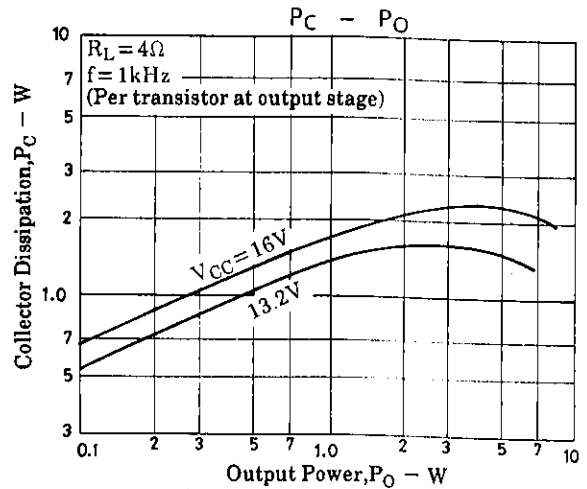
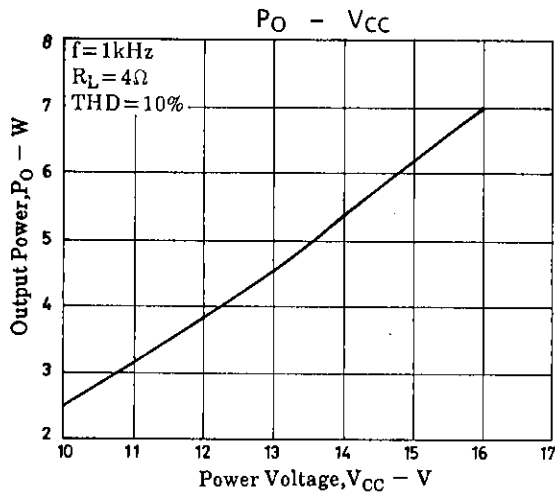
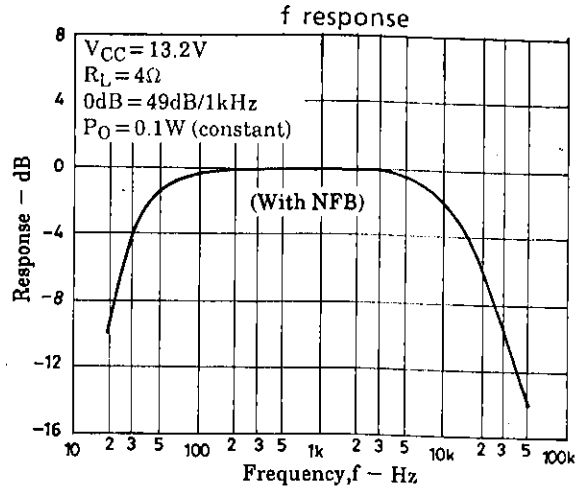
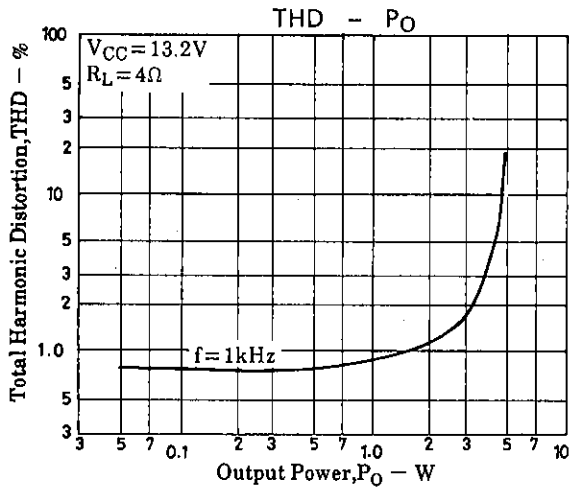
Data on transformer (T1)



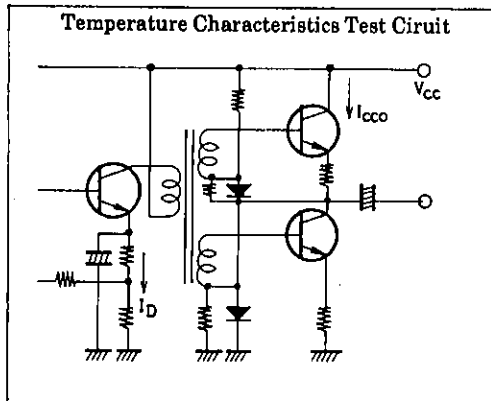
	Impedance	DC resistance
Primary	3k $\Omega$	180 $\Omega$
Secondary	400 $\Omega$	18 $\Omega$

(Must be paired in the same rank).

Unit (Resistance :  $\Omega$ , Capacitance : F)



**Test Circuit**



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