



2SB632, 632K/2SD612, 612K

25V/35V, 2A Low-Frequency Power Amplifier Applications

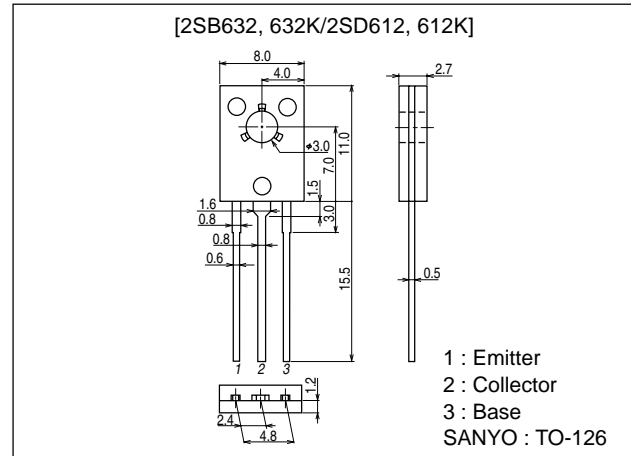
Features

- High collector dissipation and wide ASO.

Package Dimensions

unit:mm

2009B



() : 2SB632, 632K

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}	B632, D612	(-) 25	V
		B632K, D612K	(-) 35	
Collector-to-Emitter Voltage	V_{CEO}	B632, D612	(-) 25	V
		B632K, D612K	(-) 35	
Emitter-to-Base Voltage	V_{EBO}		(-) 5	V
Collector Current	I_C		(-) 2	A
Collector Current (Pulse)	I_{CP}		(-) 3	A
Collector Dissipation	P_C		1	W
		$T_c=25^\circ\text{C}$	10	W
Junction Temperature	T_J		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0$	B632, D612	(-) 25		V
			B632K, D612K	(-) 35		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	B632, D612	(-) 25		V
			B632K, D612K	(-) 35		V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0$	(-) 5		V	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)20\text{V}, I_E=0$			(-) 1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}, I_C=0$			(-) 1	μA

Continued on next page.

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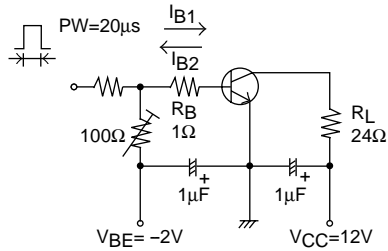
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	h_{FE1}	$V_{CE}=(-)2V, I_C=(-)500mA$	60*		320*	
	h_{FE2}	$V_{CE}=(-)2V, I_C=(-)1.5A$	30			
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10V, I_C=(-)50mA$		100		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10V, f=1MHz$		(45)30		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1.5A, I_B=(-)0.15A$		(-0.4)	(-0.9)	V
				0.3	0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1.5A, I_B=(-)0.15A$		(-1.1)	(-1.5)	V
Turn-ON Time	t_{on}	See specified Test Circuit		(60)50		ns
Fall Time	t_f	See specified Test Circuit		(80)		ns
				100		ns
Storage Time	t_{stg}	See specified Test Circuit		400		ns

* : The 2SB632/2SD612 are classified by 500mA h_{FE} as follows :

Rank	D	E	F
h_{FE}	60 to 120	100 to 200	160 to 320

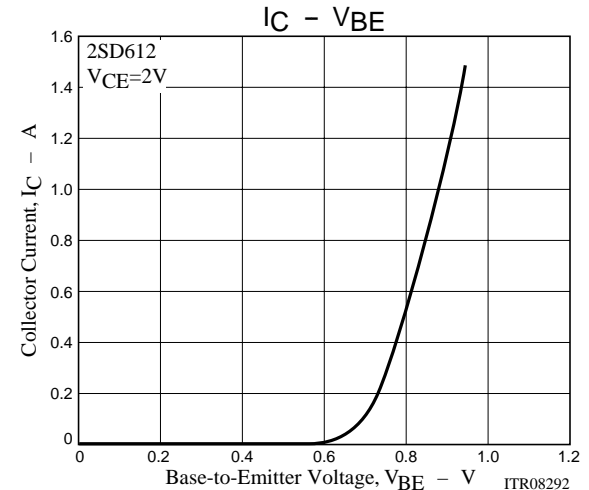
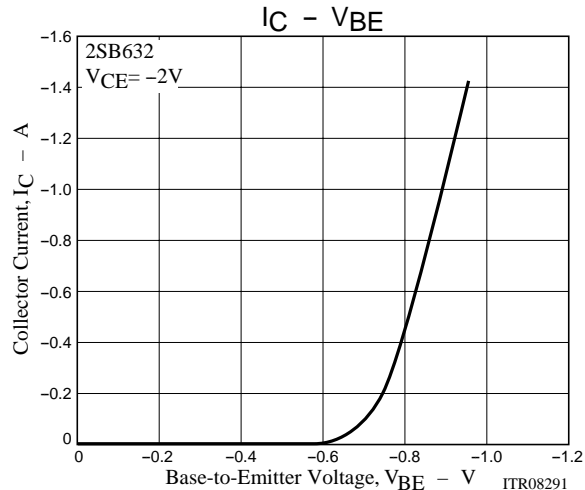
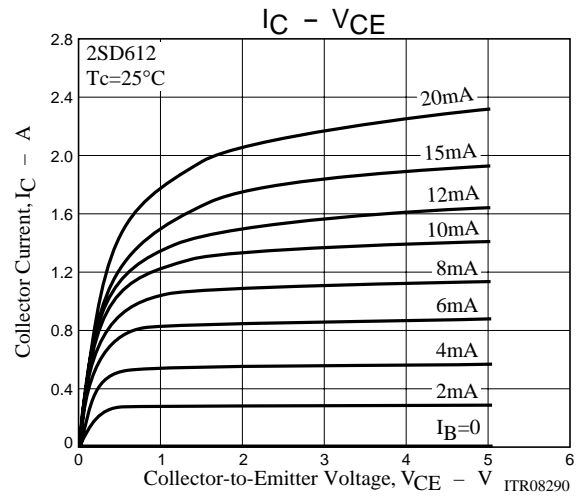
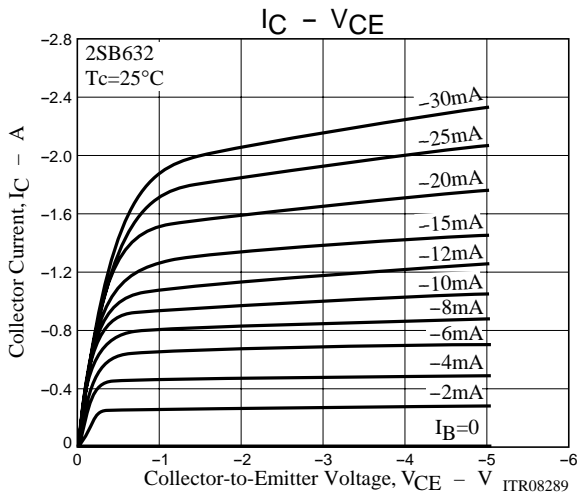
Switching Time Test Circuit



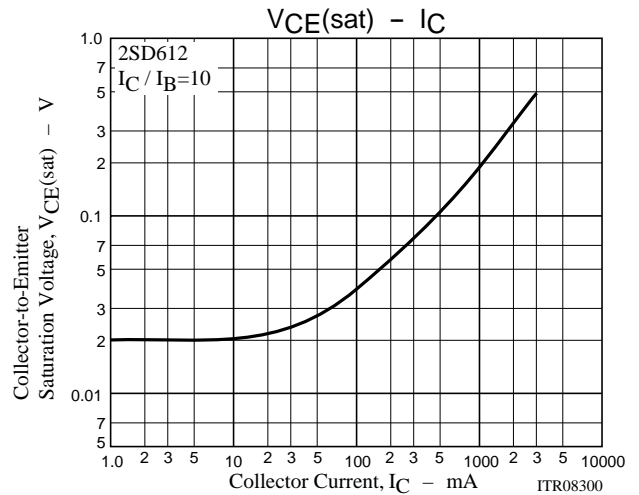
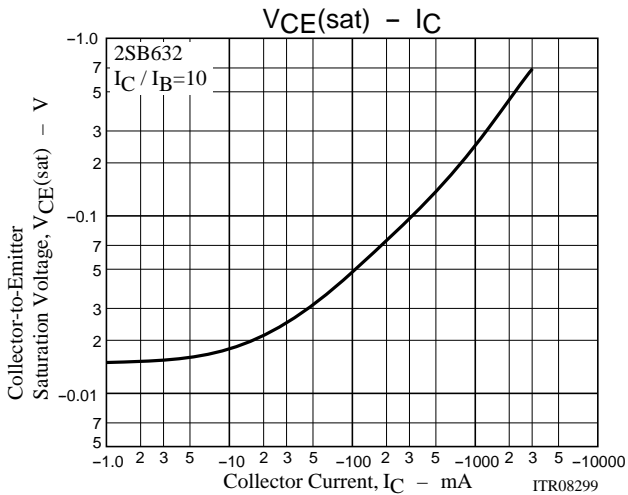
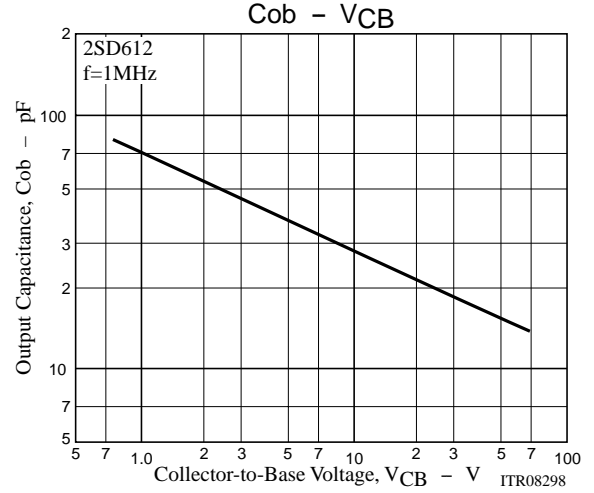
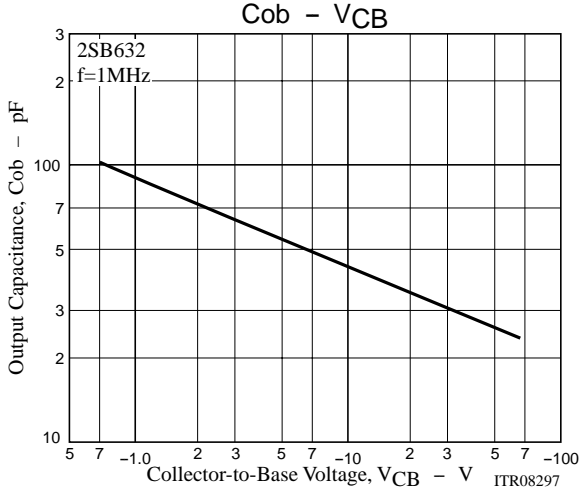
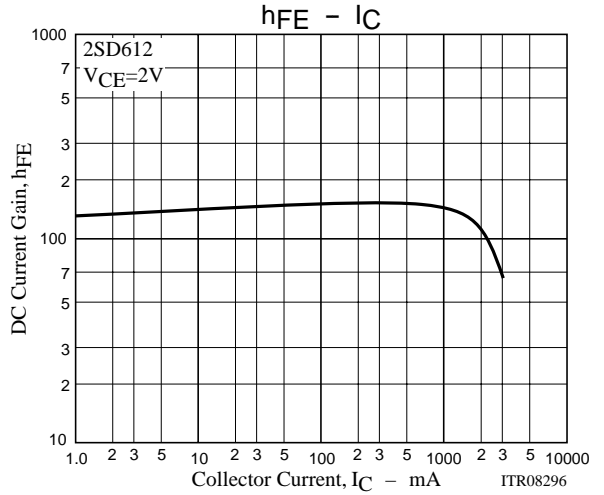
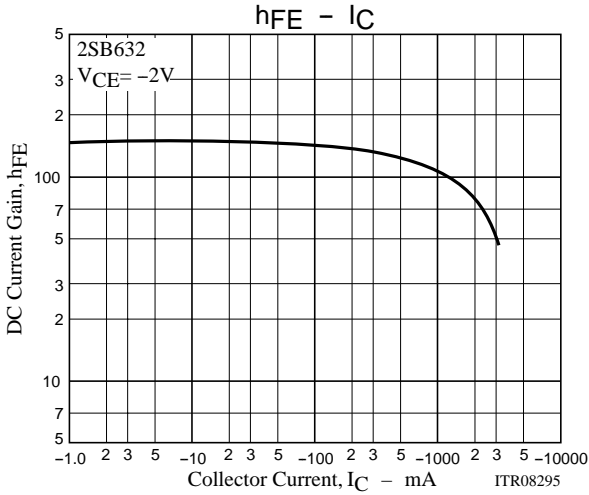
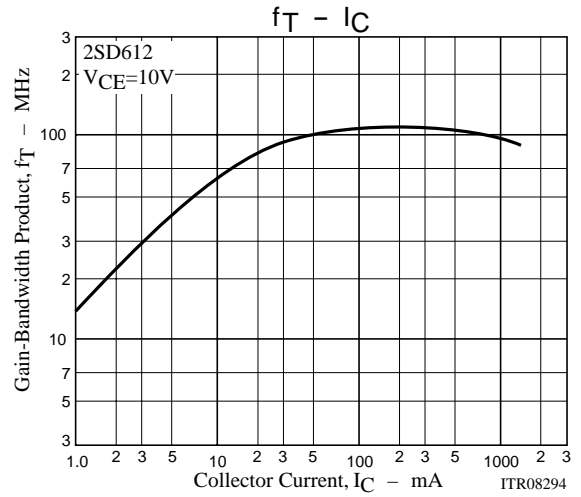
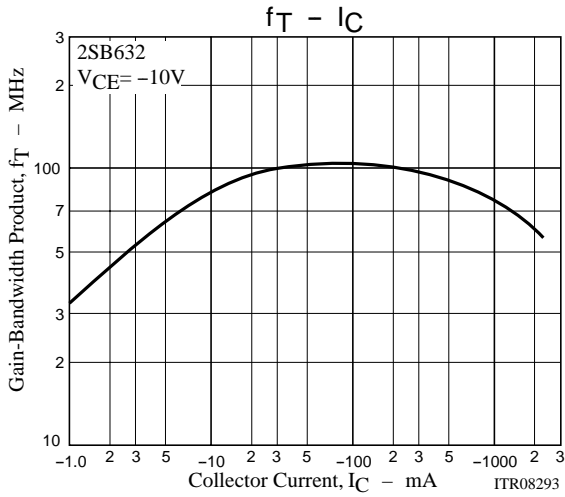
$$V_{CE}=12V$$

$$I_C=10I_{B1} = -10I_{B2}=500mA$$

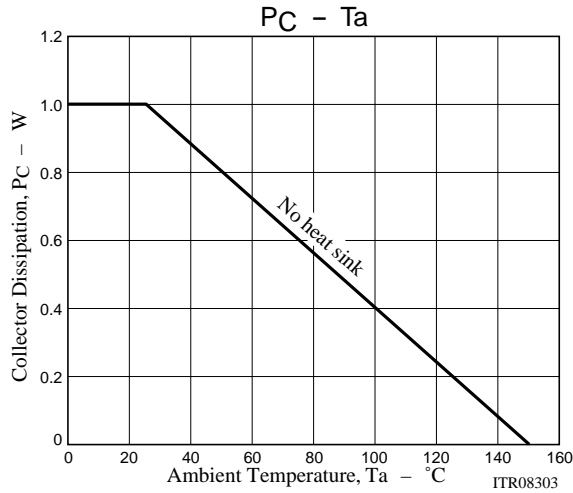
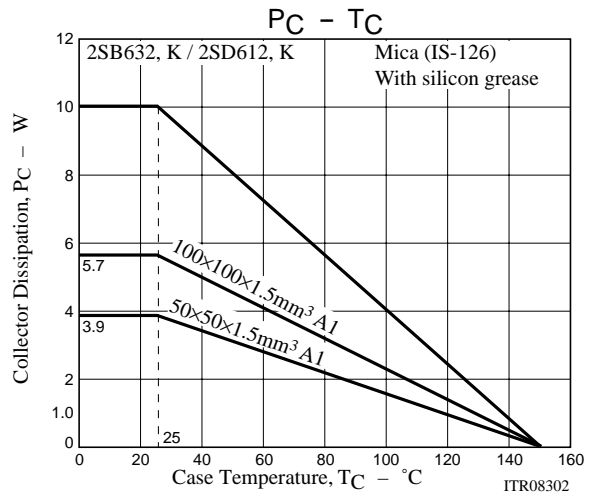
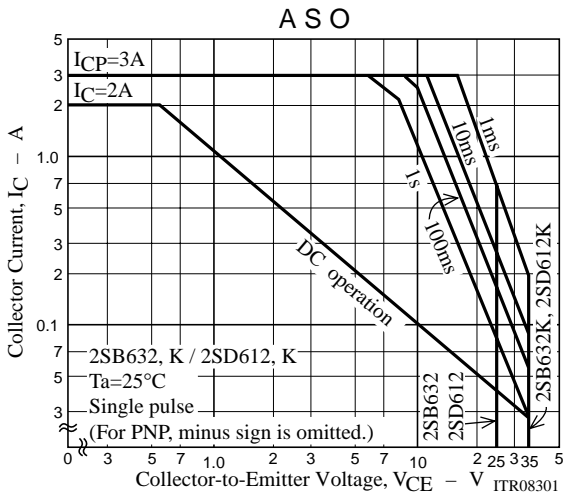
For PNP, the polarity is reversed.



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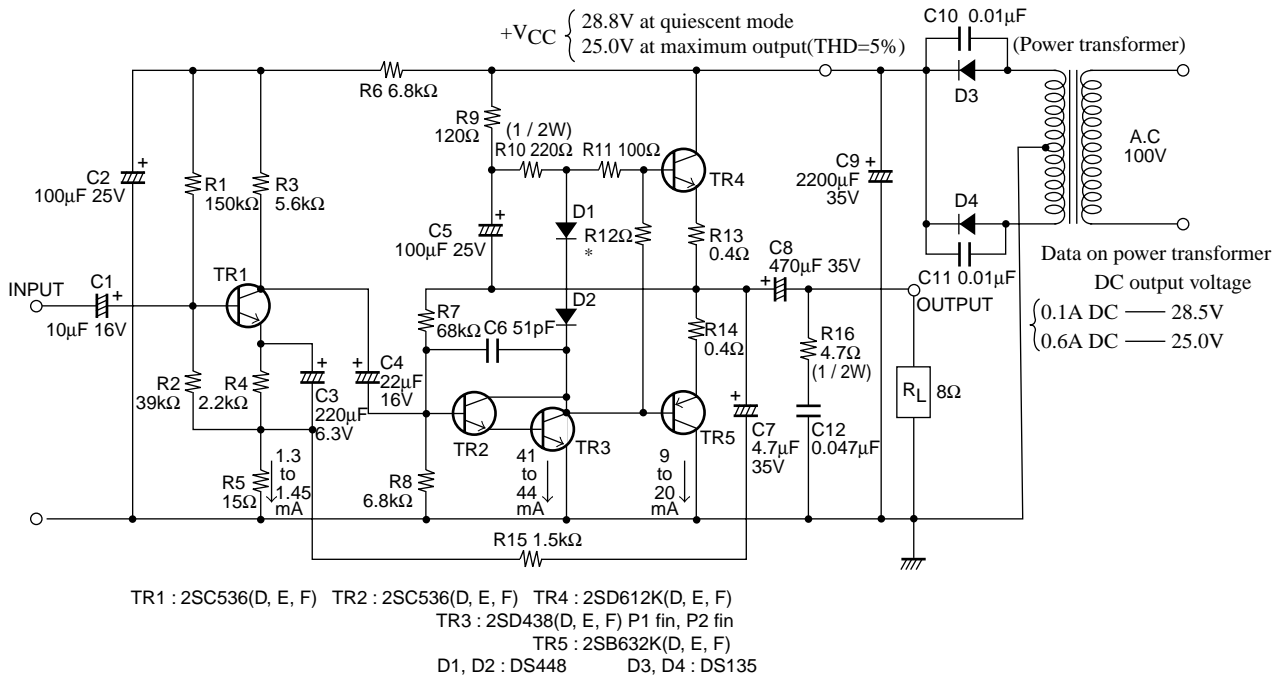
Sample Application Circuit 1 : 8W pure complementary amplifier using the 2SB632K/2SD612K

[Specifications] Power supply : 100V AC supply transformer with no signal=28.8V,

Maximum output=(THD=5%)=25V, $f=1kHz$, $R_L=8\Omega$, $R_g=600\Omega$

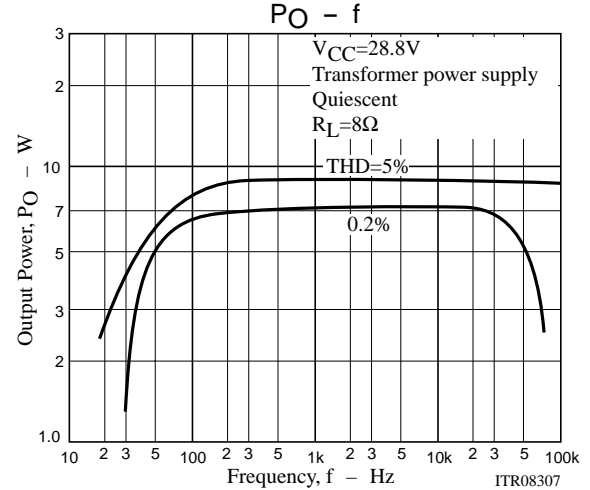
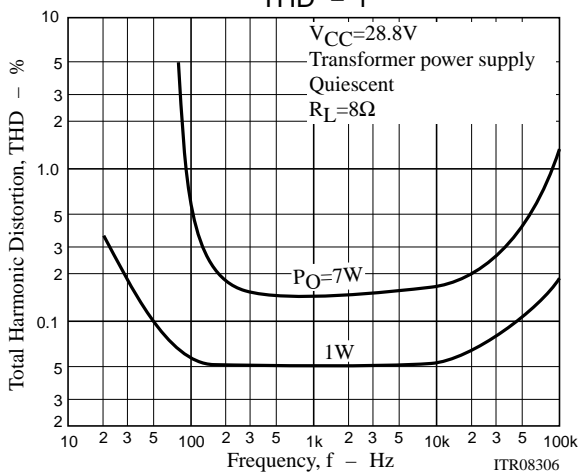
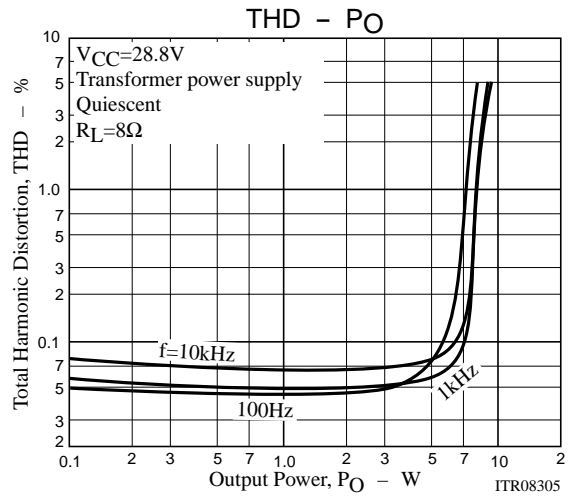
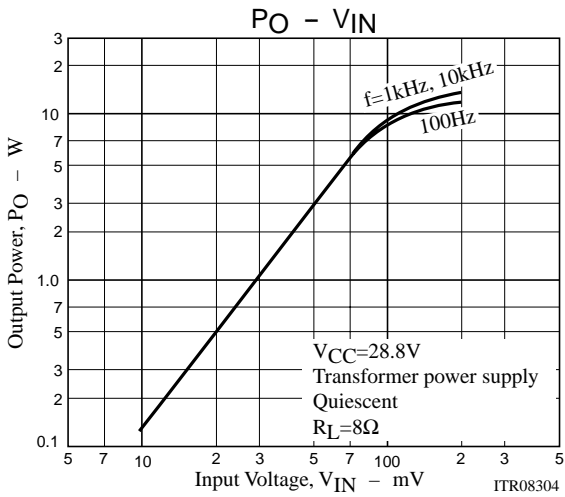
Parameter	Symbol	Conditions	typ	Unit
Quiescent Current (Collector Current)	I_{CCO}	Output stage	14.0	mA
	I_D	Drive stage	42.0	mA
	I_C	First stage	1.4	mA
Voltage Gain	V_G	Without NFB	75	dB
	V_G	With NFB	40	dB
Output Power	P_O	THD=5%	8.7	W
Total Harmonic Distortion	THD	$P_O=1W$	0.05	%
Input Resistance	r_i	$P_O=1W$	60	k Ω
Output Resistance	r_o	$P_O=1W$	0.2	Ω

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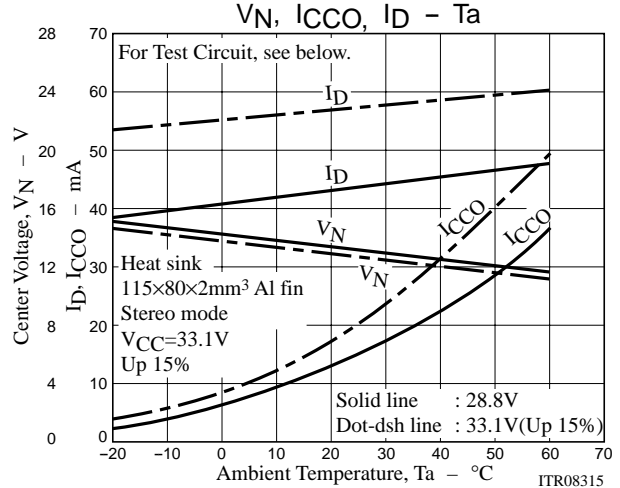
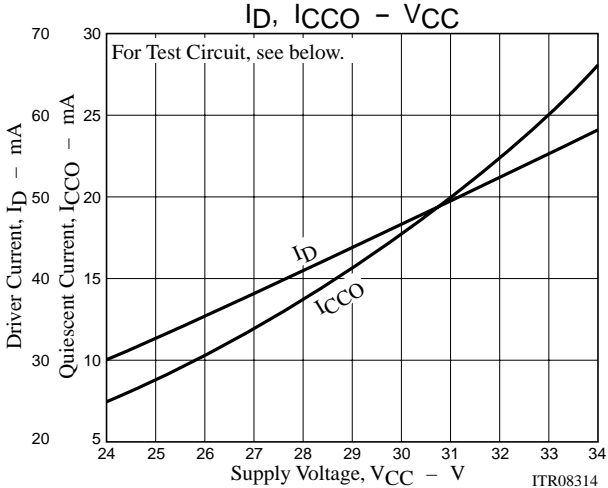
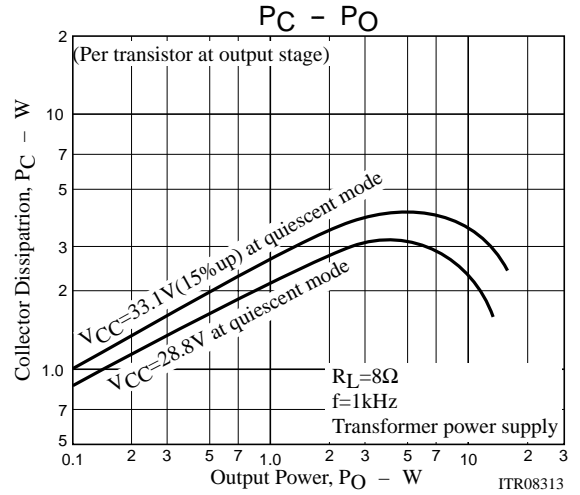
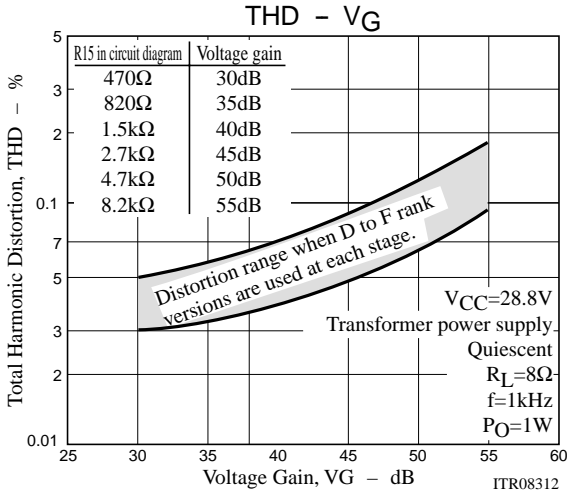
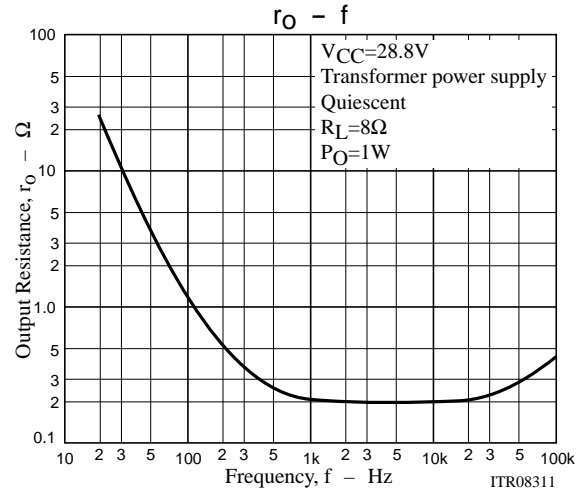
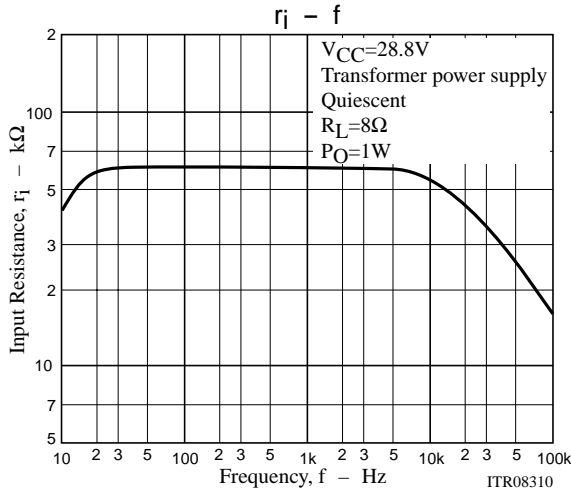
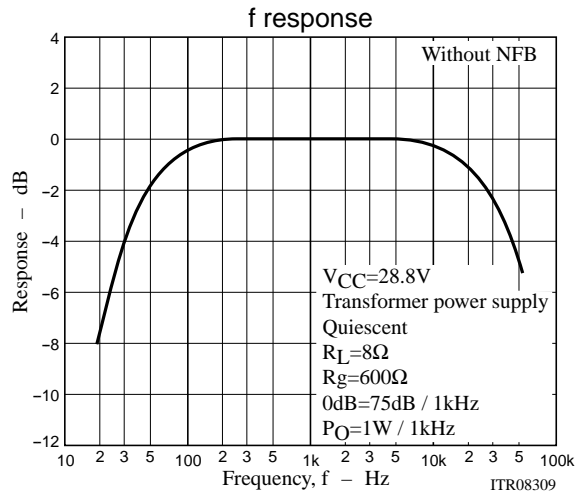
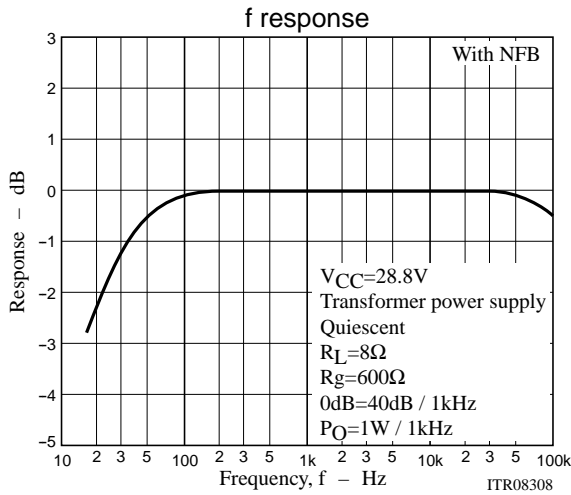


Note : TR3 : With P1 fin or P2 fin
 * TR4, TR5 : D, E rank version R12=560Ω) Must be paired in the same rank.
 F rank version R12=470Ω)

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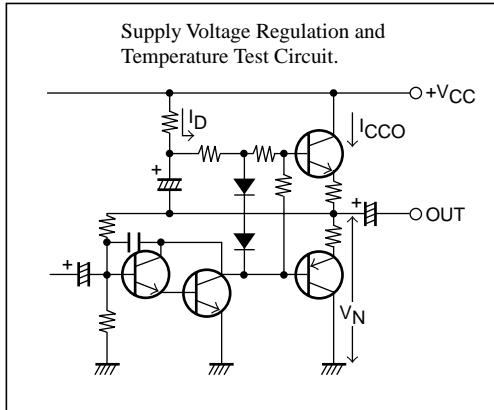
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Sample Application Circuit 2 : 2SD612-Used 4W Input Transformer coupling Amplifier for Car Use.

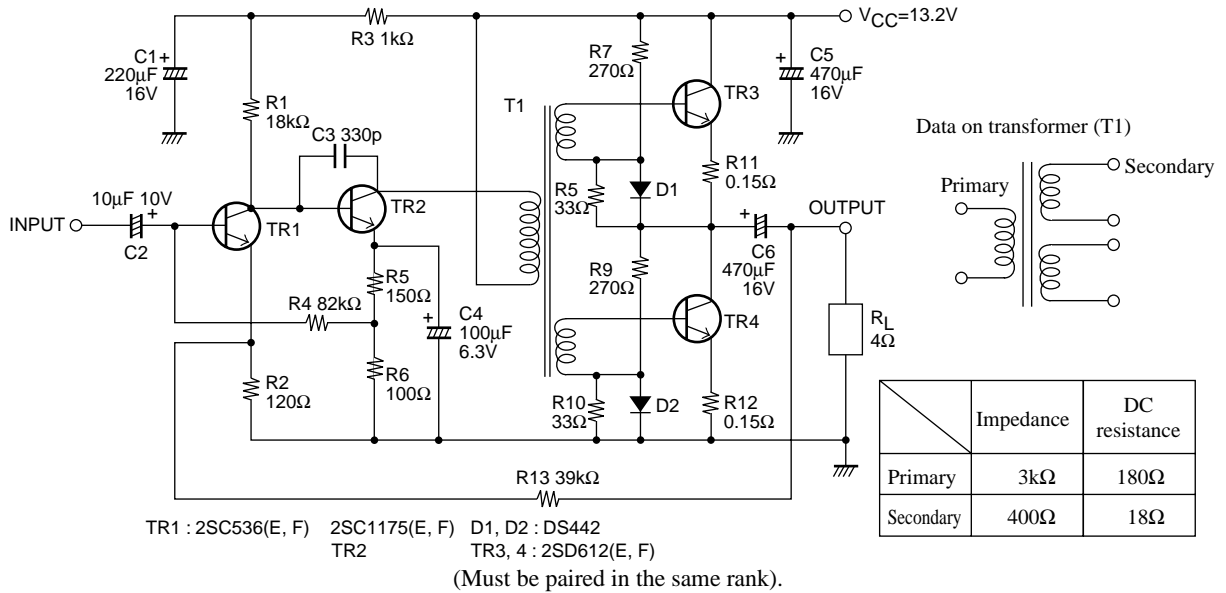
[Specifications] $V_{CC}=13.2V$, $R_L=4\Omega$, $R_g=600\Omega$, $f=1kHz$.

Parameter	Symbol	Conditions	typ	Unit
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	$P_O=0.5W$	0.8	%
Input Impedance	r_i	$P_O=0.5W$	60	k Ω

Test Circuit

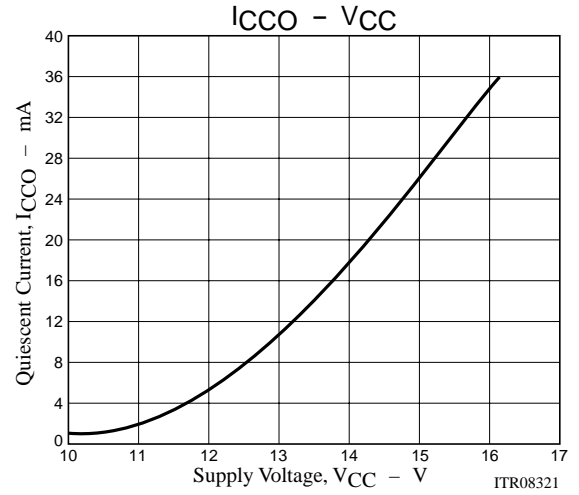
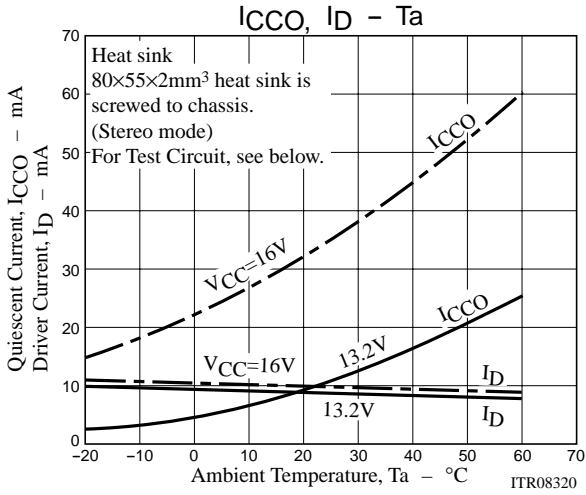
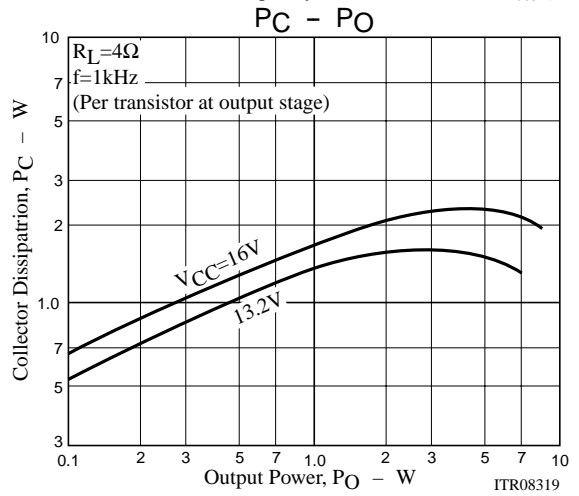
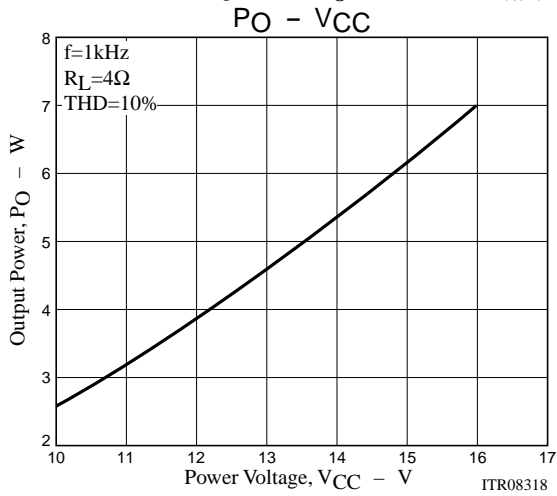
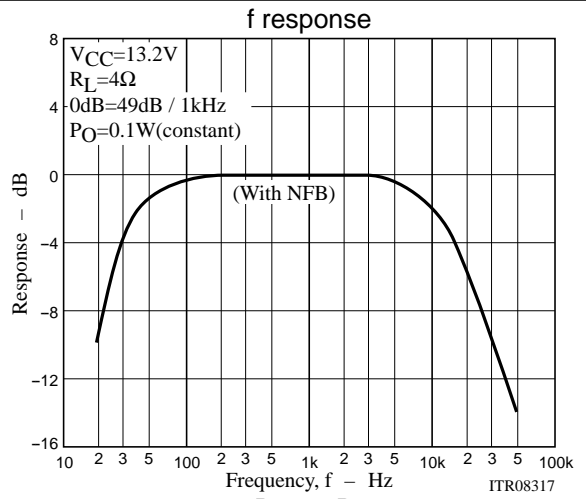
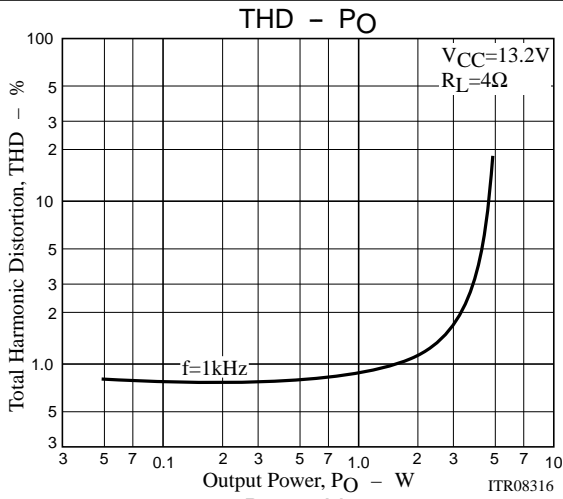


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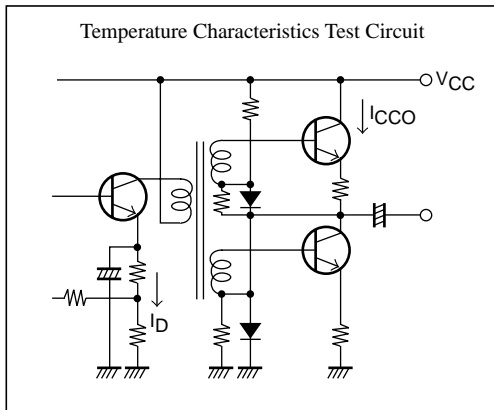


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Test Circuit



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