



2SB632, 632K/2SD612, 612K

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

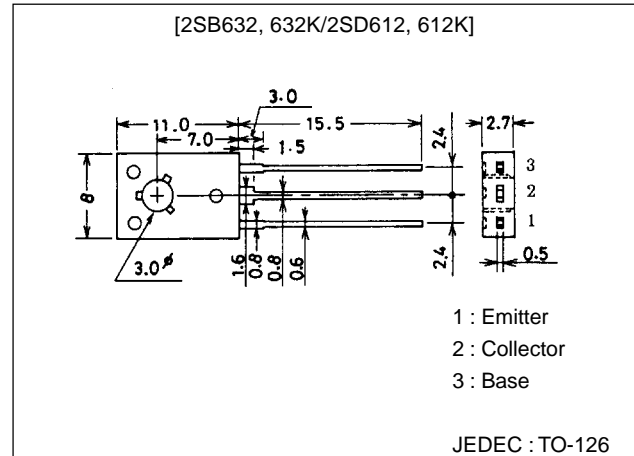
Features

- High collector dissipation and wide ASO.

Package Dimensions

unit:mm

2009B



() : 2SB632, 632K

Specifications

Absolute Maximum Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | 2SB632, D612 | 2SB632K, D612K | Unit |
|------------------------------|-----------|------------------------|--------------|----------------|------|
| Collector-to-Base Voltage | V_{CB0} | | (-)25 | (-)35 | V |
| Collector-to-Emitter Voltage | V_{CE0} | | (-)25 | (-)35 | V |
| 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 | °C |
| Storage Temperature | T_{stg} | | | -55 to +150 | °C |

Electrical Characteristics at Ta = 25°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 |

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

| | | | | | | | | |
|----|---|-----|-----|---|-----|-----|---|-----|
| 60 | D | 120 | 100 | E | 200 | 160 | F | 320 |
|----|---|-----|-----|---|-----|-----|---|-----|

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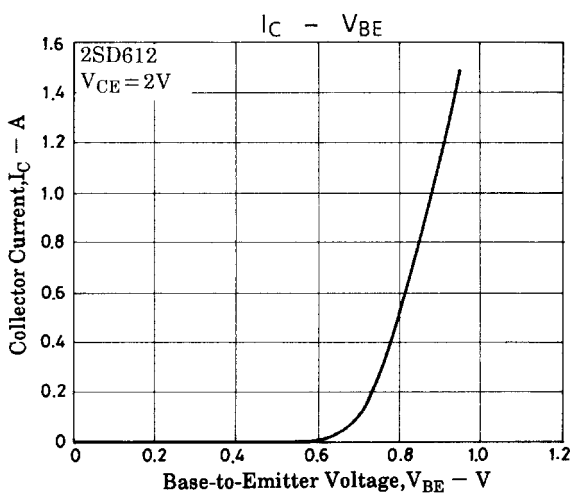
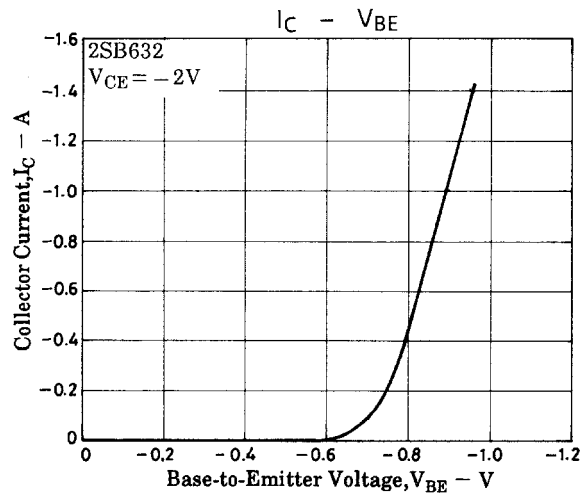
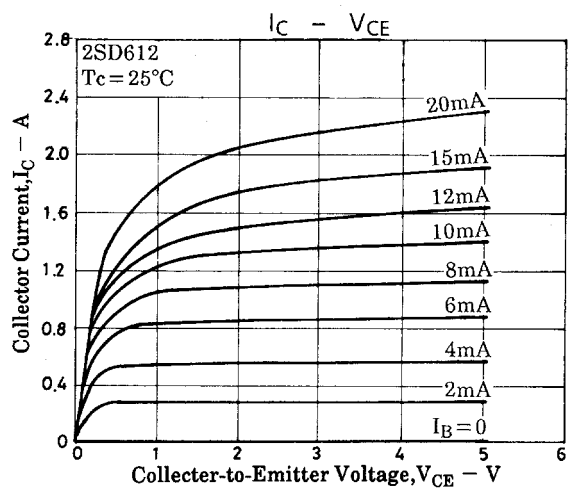
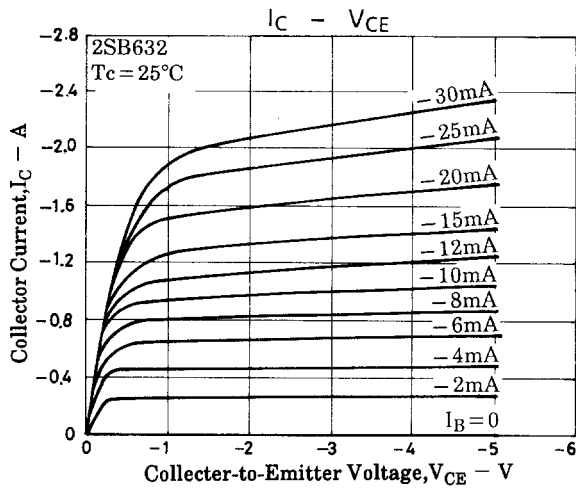
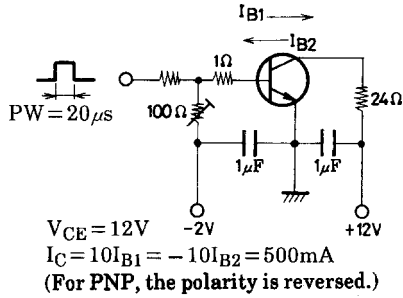
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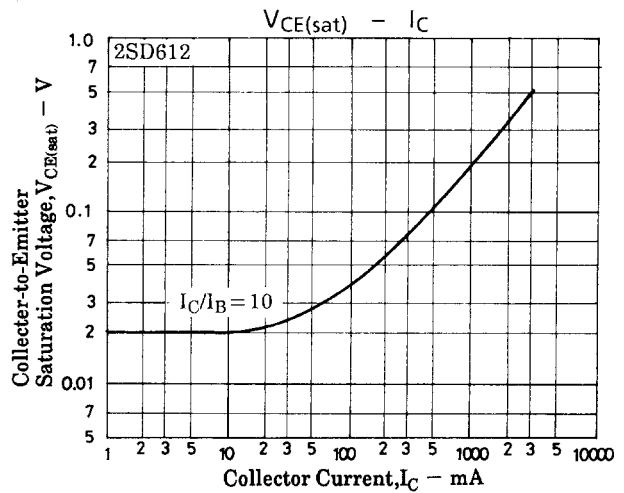
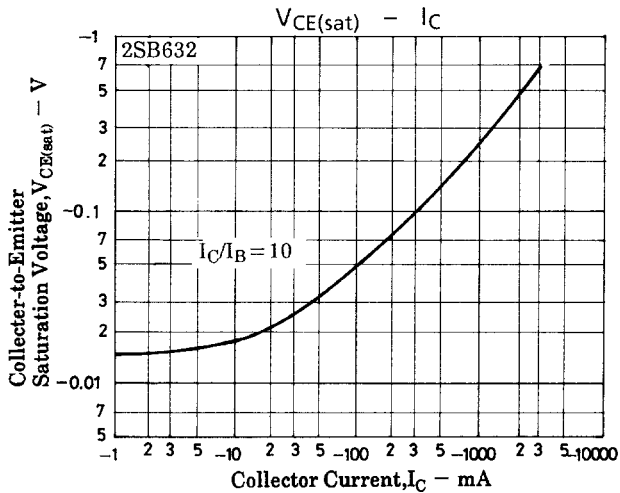
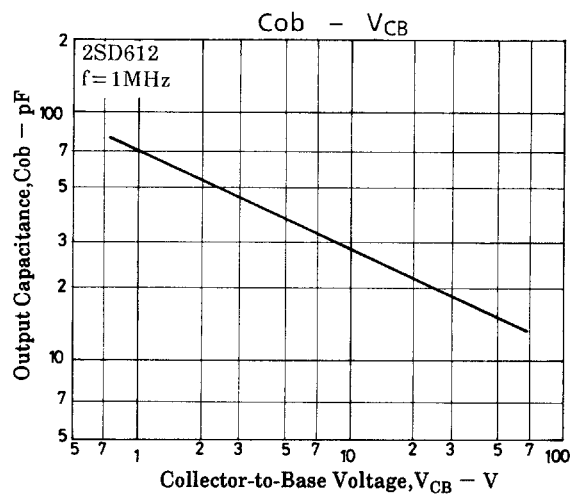
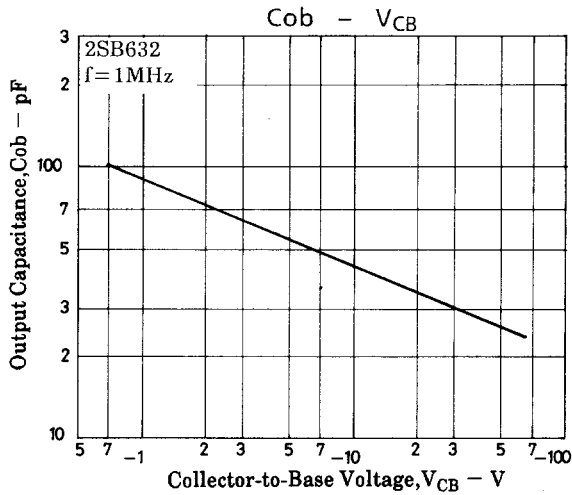
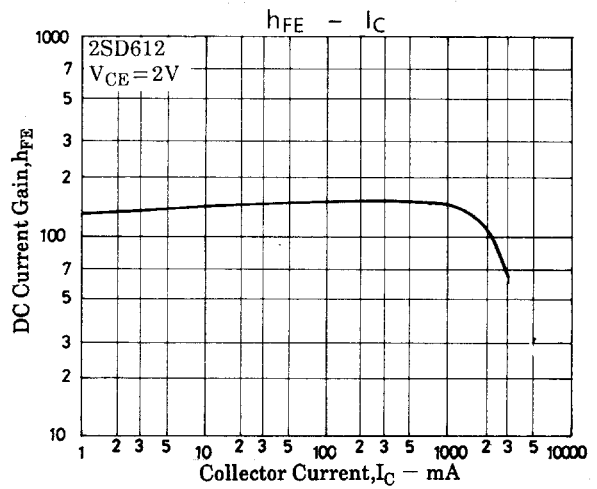
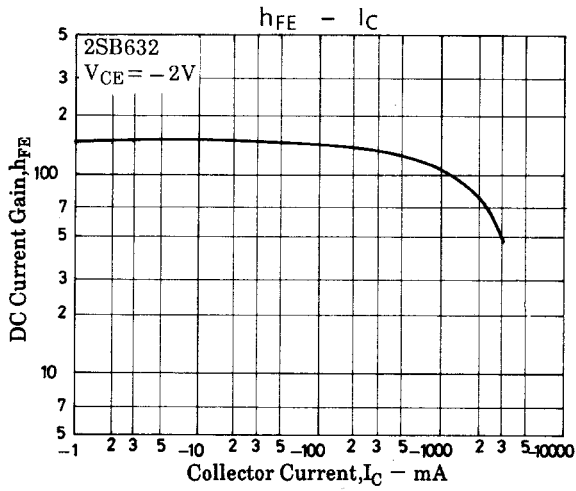
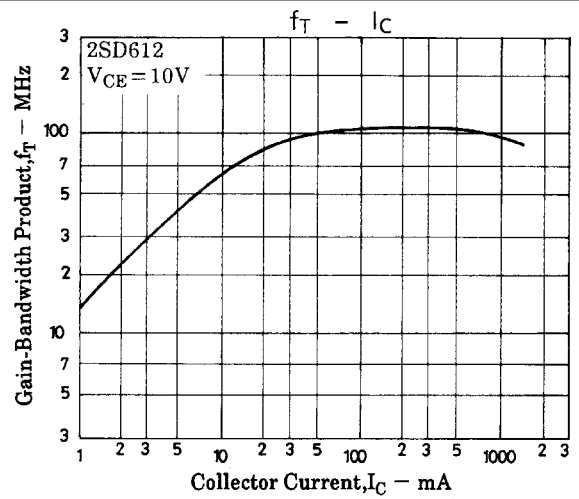
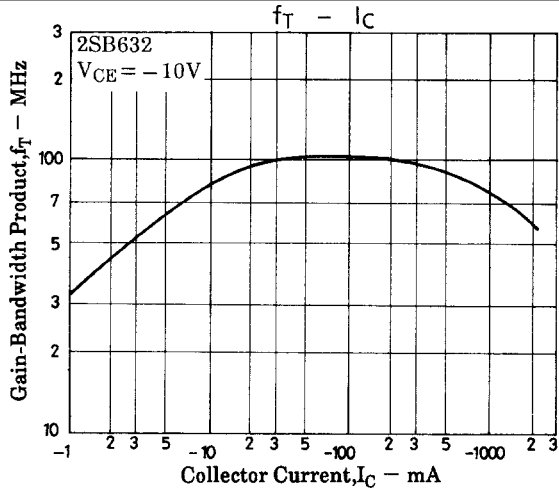
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| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|------------------------------|---------|--------|--------|------|
| | | | min | typ | max | |
| DC Current Gain | h_{FE1} | $V_{CE}=(-)2V, I_C=(-)500mA$ | 60* | | 320* | |
| | 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 |

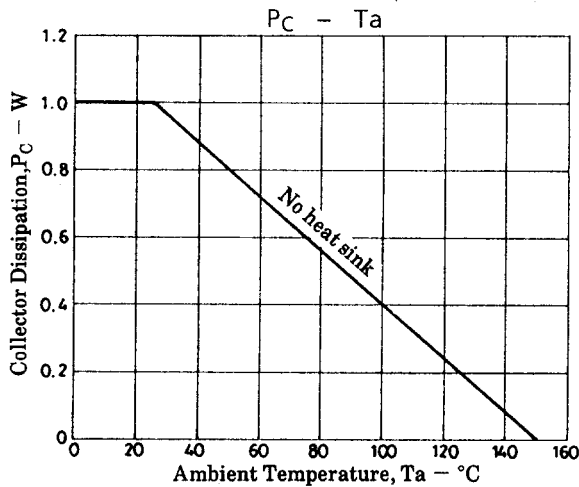
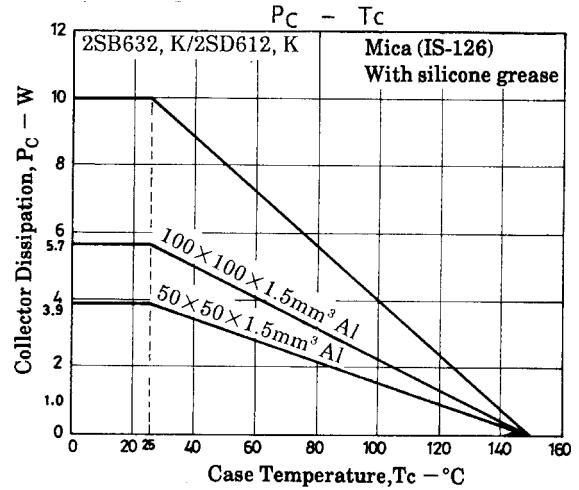
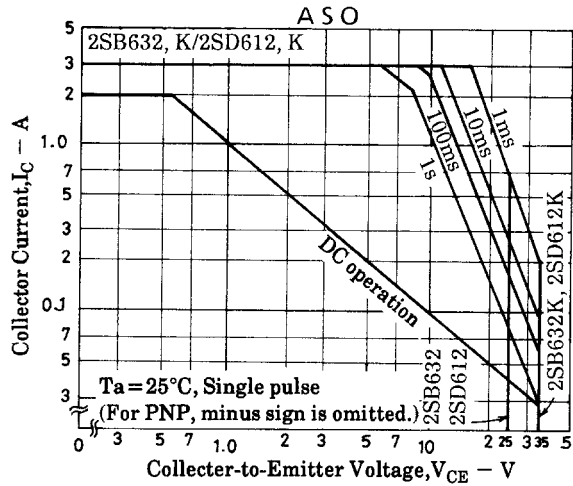
Switching Time Test Circuit



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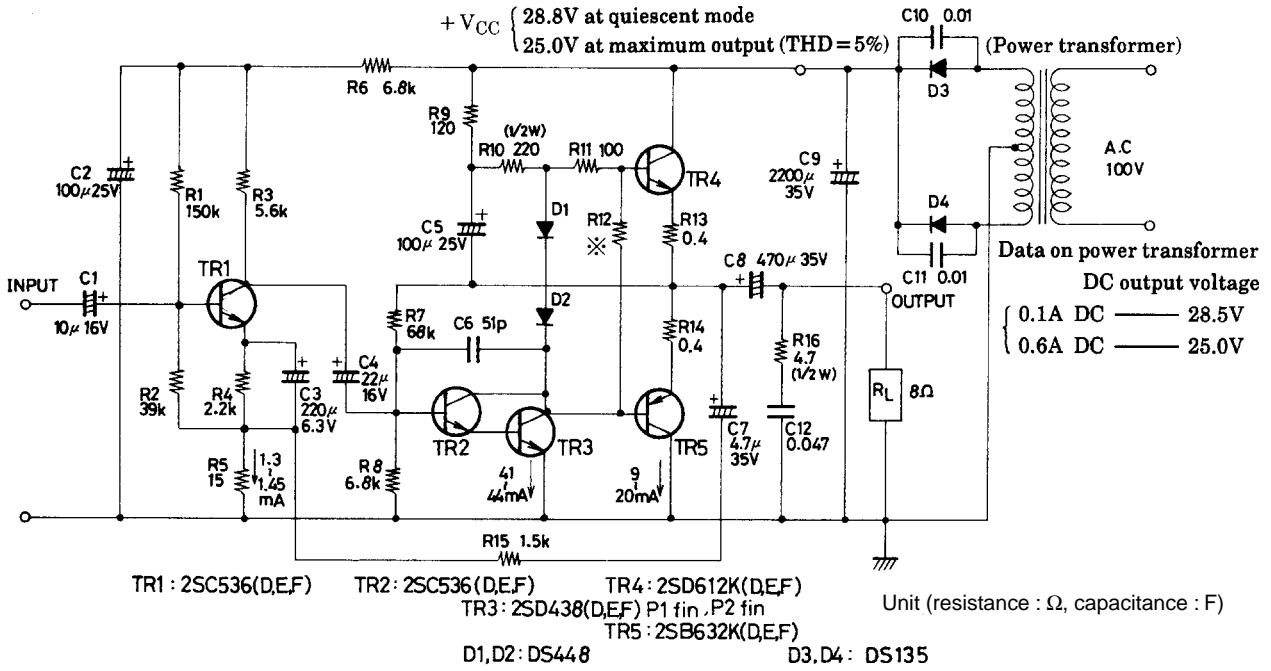
Sample Application Circuit 1 : 8W pure complementary amplifier using the 2SB632K/2SD612K

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

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

| 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 | $P_O=1\text{W}$ | 0.05 | % |
| Input Resistance | r_i | $P_O=1\text{W}$ | 60 | k Ω |
| Output Resistance | r_o | $P_O=1\text{W}$ | 0.2 | Ω |

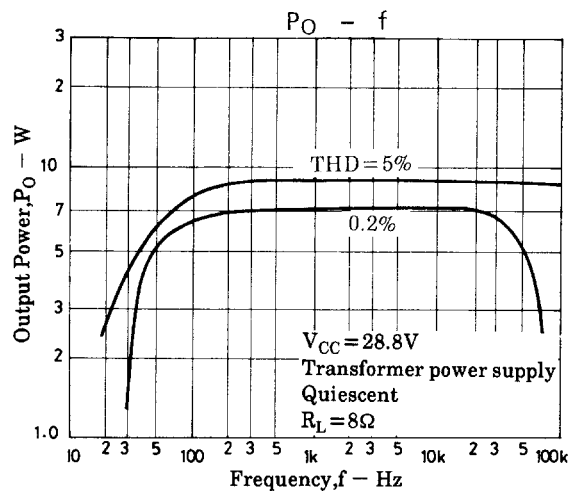
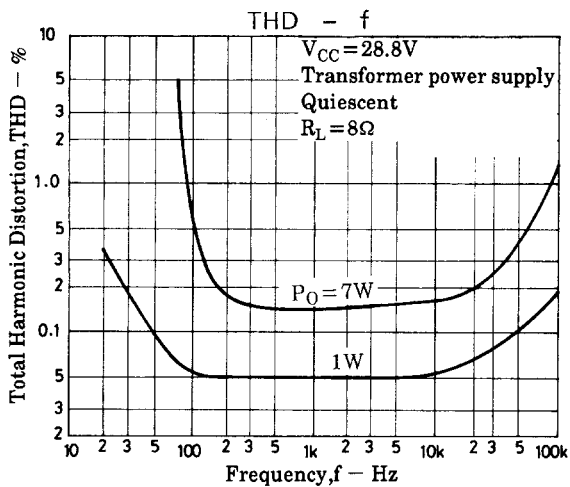
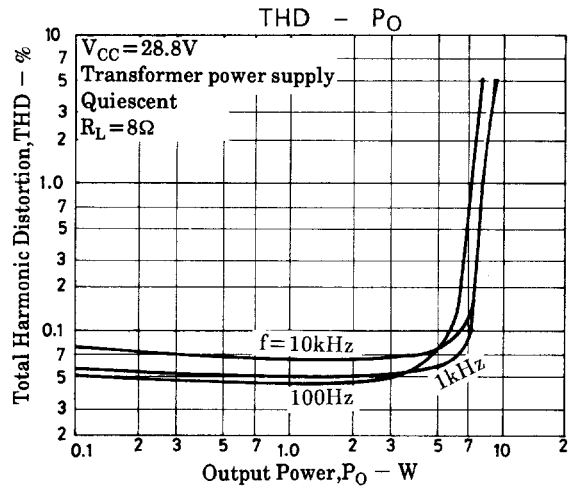
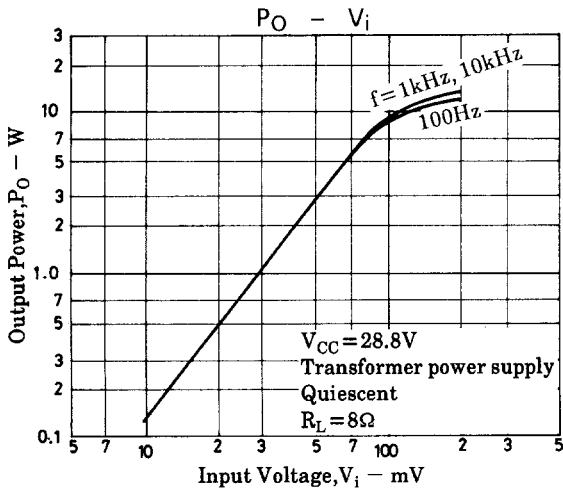
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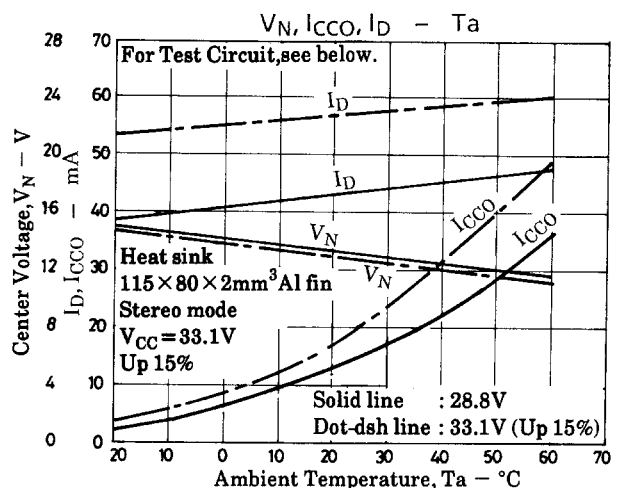
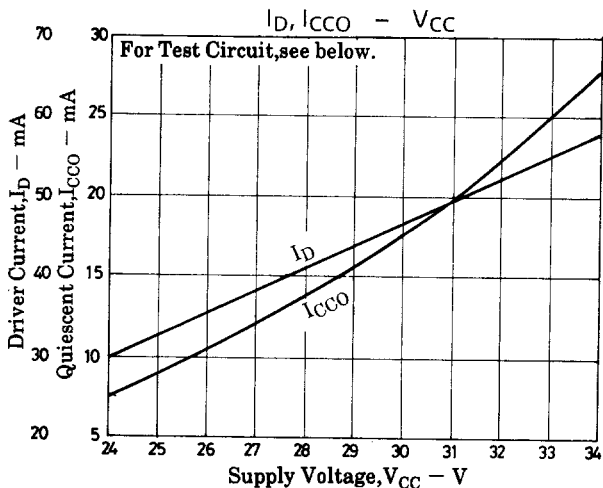
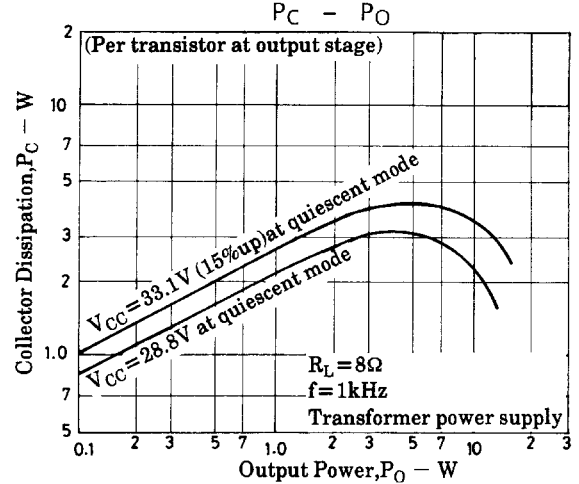
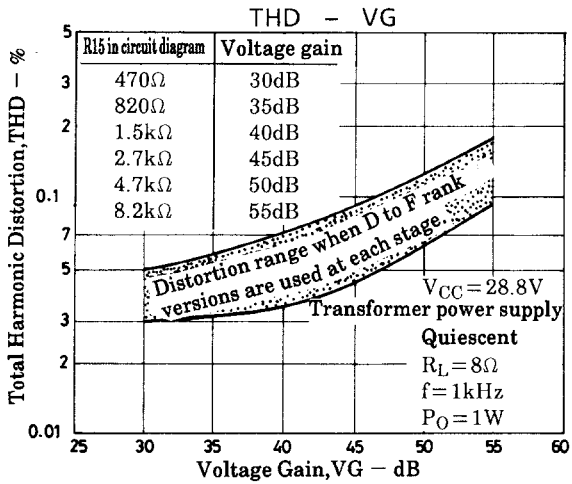
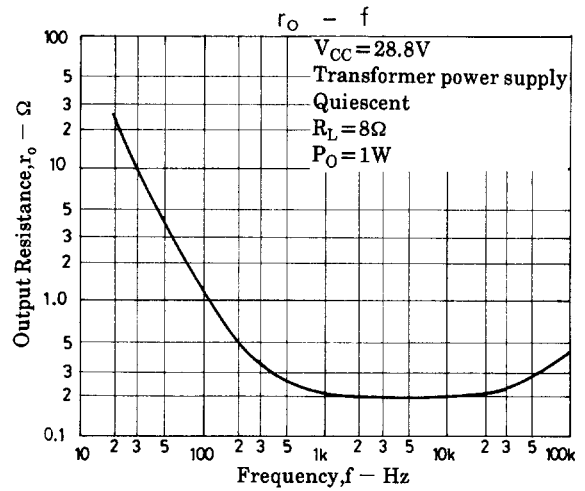
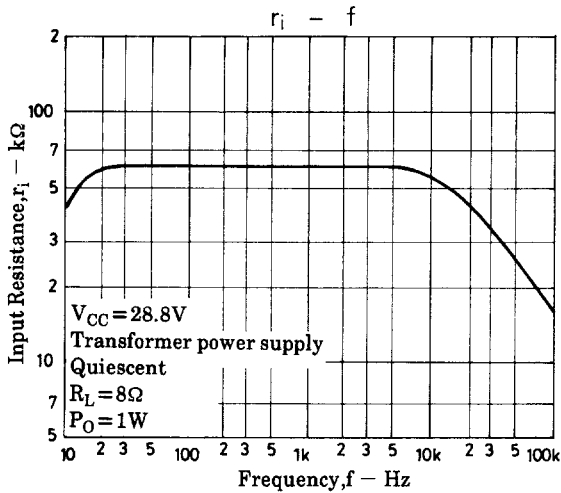
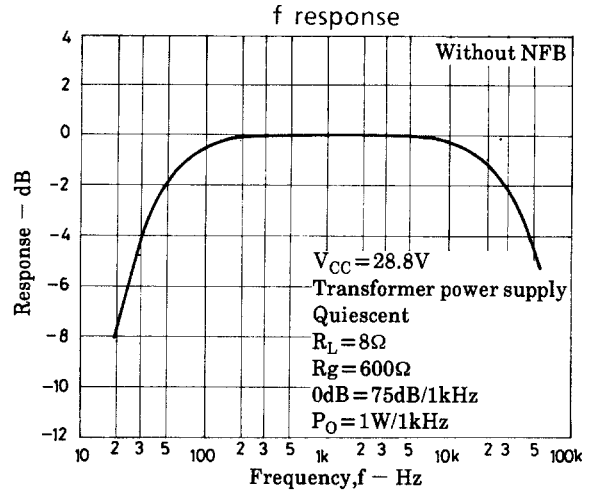
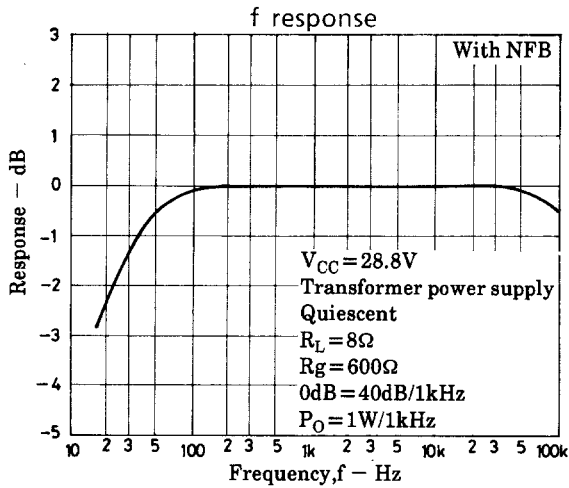
Note : TR3 : With P1 fin or P2 fin

※ TR4, TR5 : D, E rank version R12=560Ω
 F rank version R12=470Ω

Must be paired in the same rank.



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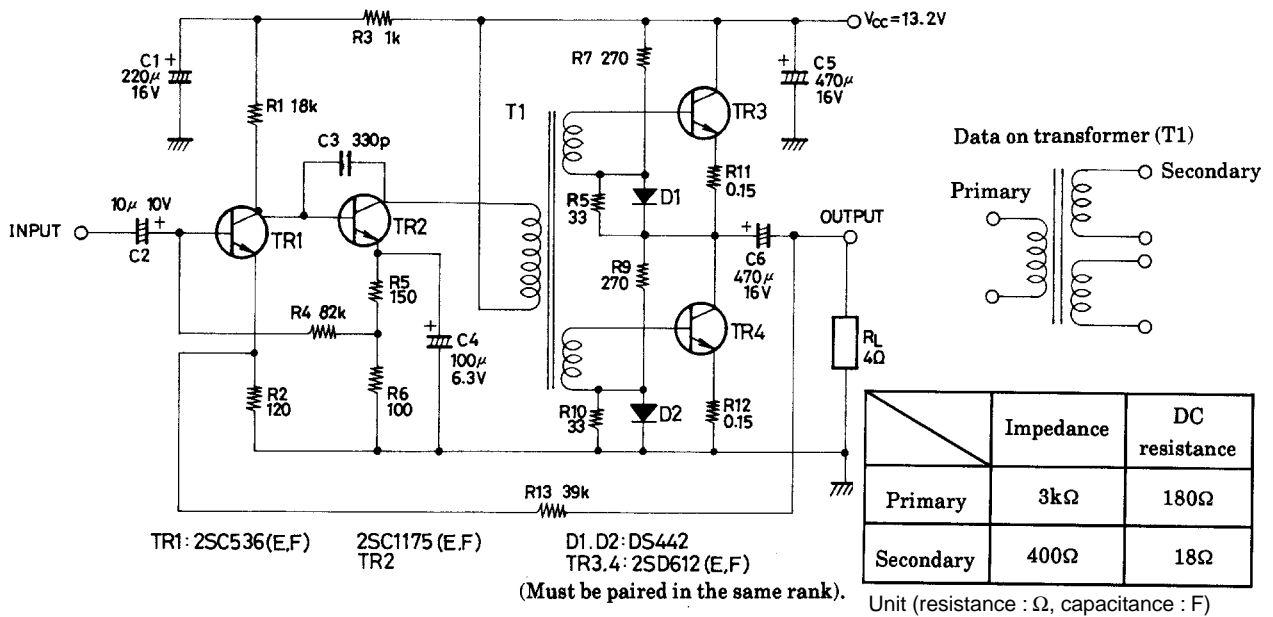
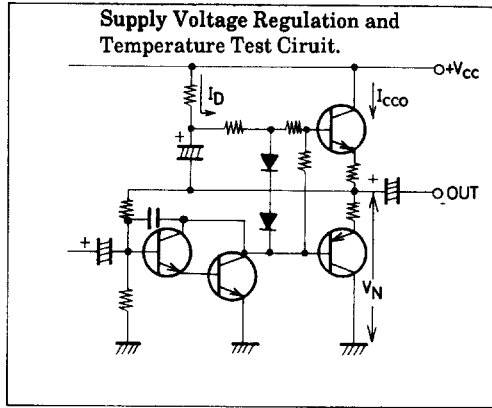
Sample Application Circuit 2 : 2SD612-Used

4W Input Transformer coupling Amplifier for Car Use.

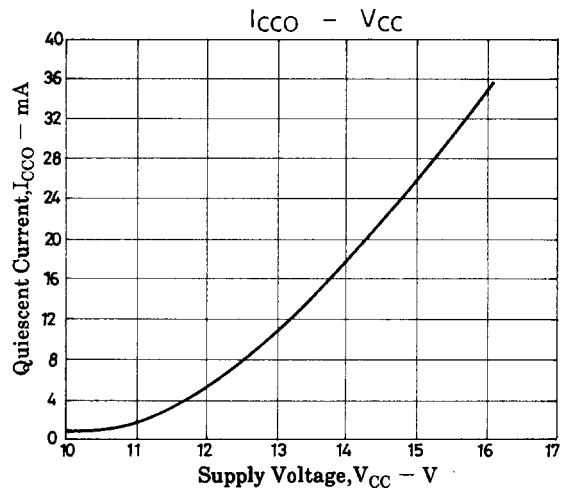
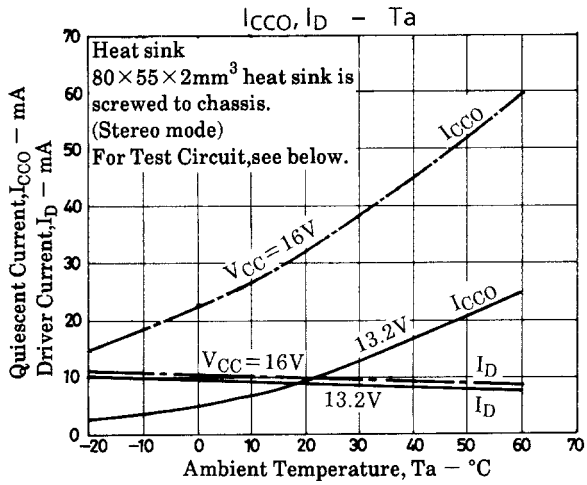
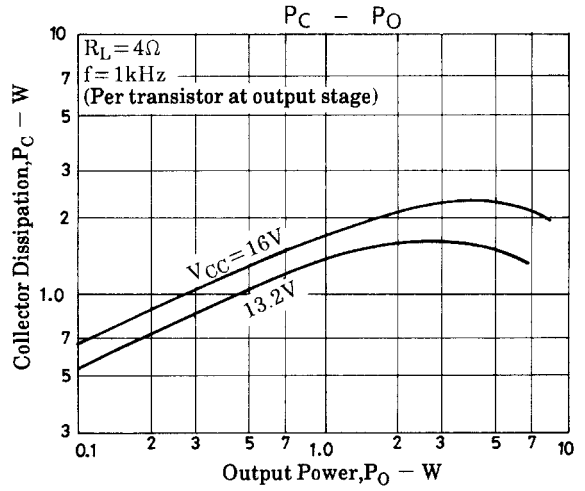
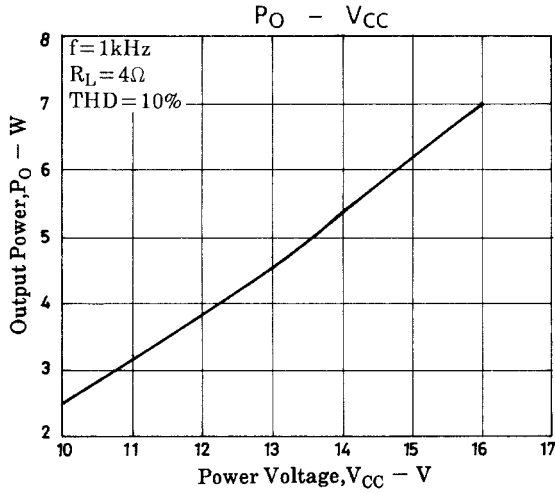
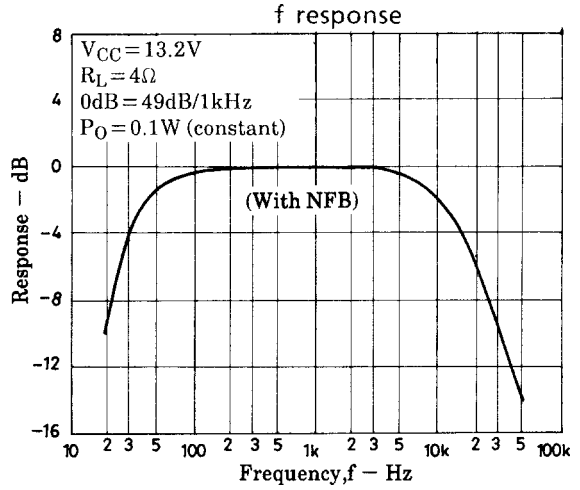
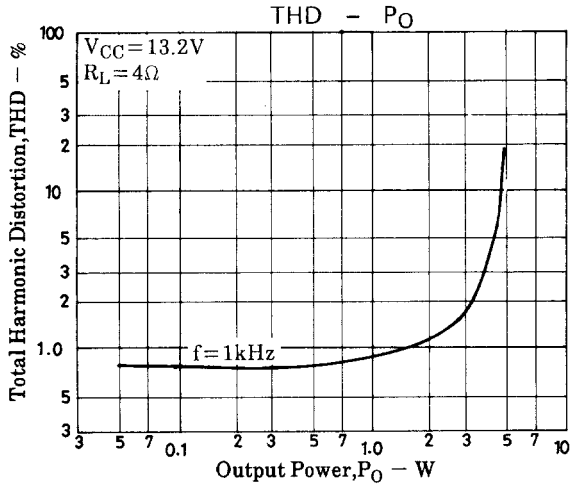
[Specifications] $V_{CC}=13.2V$, $R_L=4\Omega$, $R_g=600\Omega$, $f=1kHz$.

| Parameter | Symbol | Conditions | typ | Unit |
|---|-----------|--------------|------|------------|
| Quiescent Current (Collector Current) Voltage Gain | 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 |

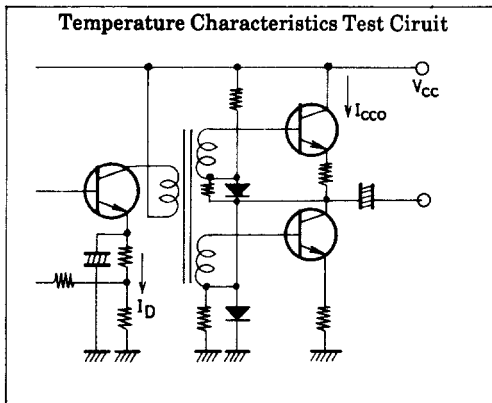
Test Circuit



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Test Circuit



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