To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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# 2SD2124(L)/(S)

Silicon NPN Epitaxial

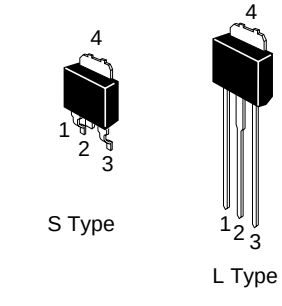
ADE-208-927 (Z)
1st. Edition
September 2000

## Application

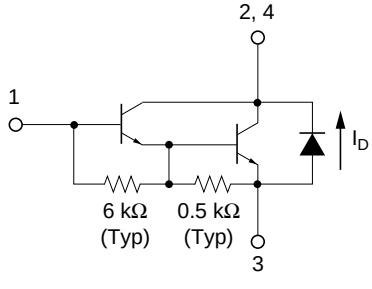
Low frequency power amplifier

## Outline

DPAK




1. Base
2. Collector
3. Emitter
4. Collector



## Absolute Maximum Ratings (Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 120 | V |
| Collector to emitter voltage | $V_{CEO}$ | 120 | V |
| Emitter to base voltage | $V_{EBO}$ | 7 | V |
| Collector current | $I_C$ | 1.5 | A |
| Collector peak current | $I_{C(peak)}$ | 3.0 | A |
| Collector power dissipation | $P_C$*[1] | 18 | W |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |
| C to E diode forward current | $I_D$*[1] | 1.5 | A |

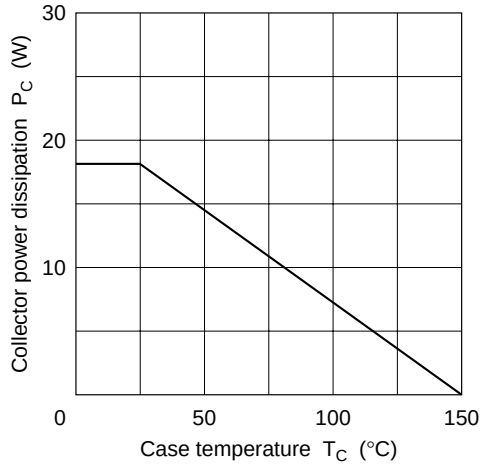
Note: 1. Value at $T_C$ = 25°C.

## Electrical Characteristics (Ta = 25°C)

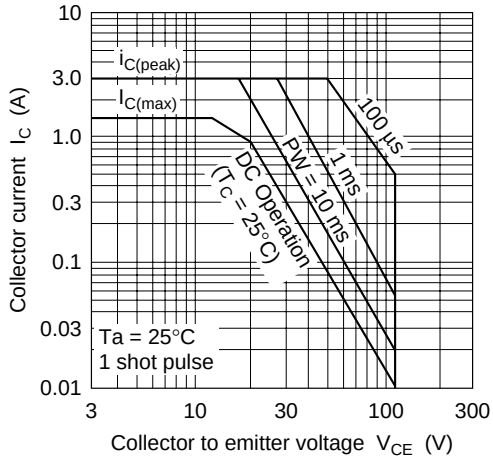
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | 120 | — | — | V | $I_C$ = 0.1 mA, $I_E$ = 0 |
| Collector to emitter breakdown voltage | $V_{(BR)CEO}$ | 120 | — | — | V | $I_C$ = 10 mA, $R_{BE}$ = ∞ |
| Emitter to base breakdown voltage | $V_{(BR)EBO}$ | 7 | — | — | V | $I_E$ = 50 mA, $I_C$ = 0 |
| Collector cutoff current | $I_{CBO}$ | — | — | 10 | µA | $V_{CB}$ = 100 V, $I_E$ = 0 |
| | $I_{CEO}$ | — | — | 10 | | $V_{CE}$ = 100 V, $R_{BE}$ = ∞ |
| DC current transfer ratio | $h_{FE}$ | 2000 | — | 30000 | | $V_{CE}$ = 3 V, $I_C$ = 1 A*[1] |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | — | 1.5 | V | $I_C$ = 1 A, $I_B$ = 1 mA*[1] |
| | $V_{CE(sat)}$ | — | — | 2.0 | | $I_C$ = 1.5 A, $I_B$ = 1.5 mA*[1] |
| Base to emitter saturation voltage | $V_{BE(sat)}$ | — | — | 2.0 | V | $I_C$ = 1 A, $I_B$ = 1 mA*[1] |
| | $V_{BE(sat)}$ | — | — | 2.5 | | $I_C$ = 1.5 A, $I_B$ = 1.5 mA*[1] |
| C to E diode forward voltage | $V_D$ | — | — | 3.0 | V | $I_D$ = 1.5 A*[1] |
| Turn on time | $t_{on}$ | — | 0.5 | — | µs | $I_C$ = 1 A, $I_{B1}$ = $-I_{B2}$ = 1 mA |
| Turn off time | $t_{off}$ | — | 2.0 | — | µs | |

Note: 1. Pulse test.

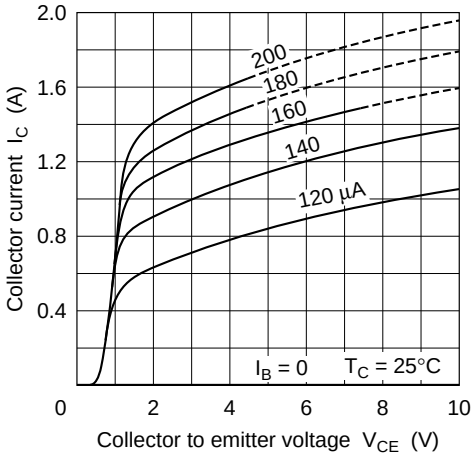
Maximum Collector Dissipation Curve



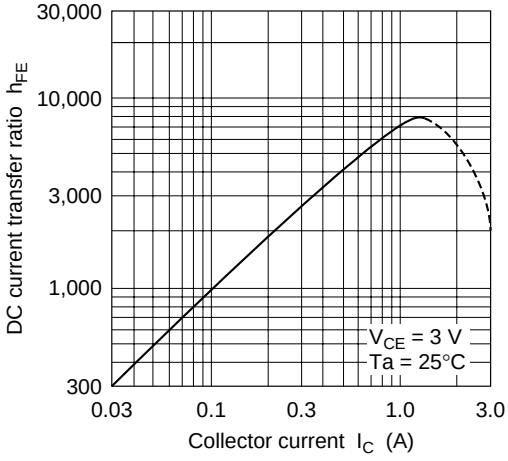

Area of Safe Operation

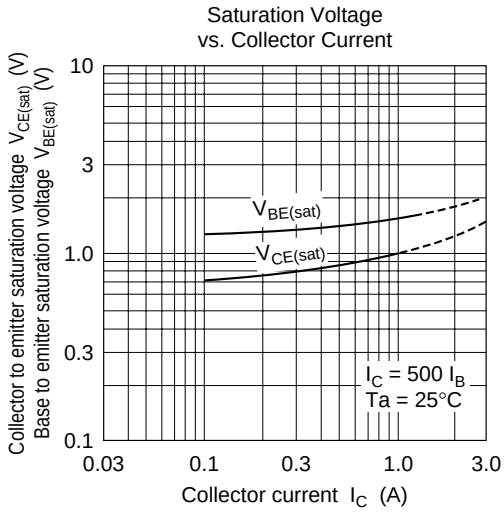



Typical Output Characteristics




DC Current Transfer Ratio vs. Collector Current




Saturation Voltage
vs. Collector Current
Collector to emitter saturation voltage $V_{CE(sat)}$ (V)
Base to emitter saturation voltage $V_{BE(sat)}$ (V)
10
3
1.0
0.3
0.1
$V_{BE(sat)}$
$V_{CE(sat)}$
$I_C$ = 500 $I_B$
Ta = 25°C
0.03
0.1
0.3
1.0
3.0
Collector current $I_C$ (A)

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