# 2SD2128

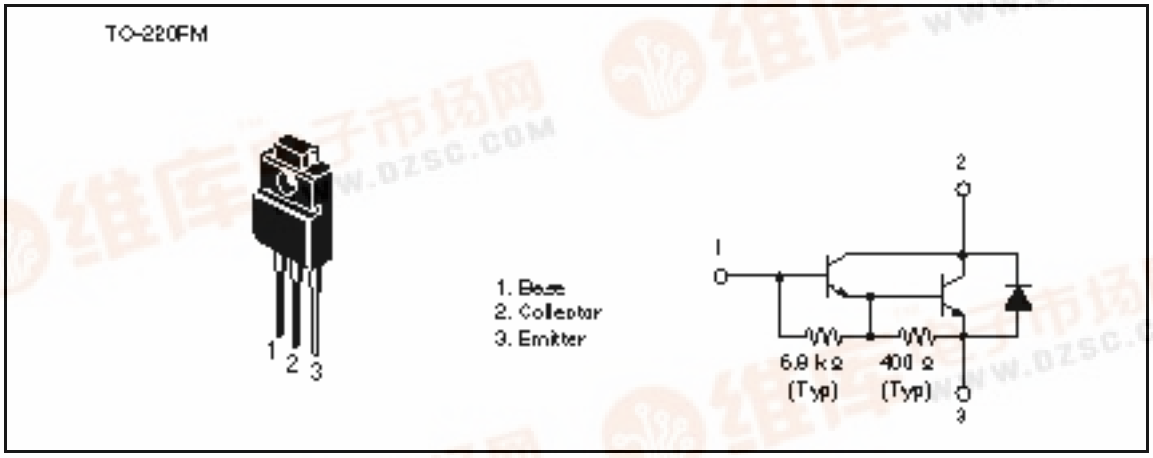
Silicon NPN Triple Diffused

HITACHI

## Application

Low frequency power amplifier

## Outline



# 2SD2128

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

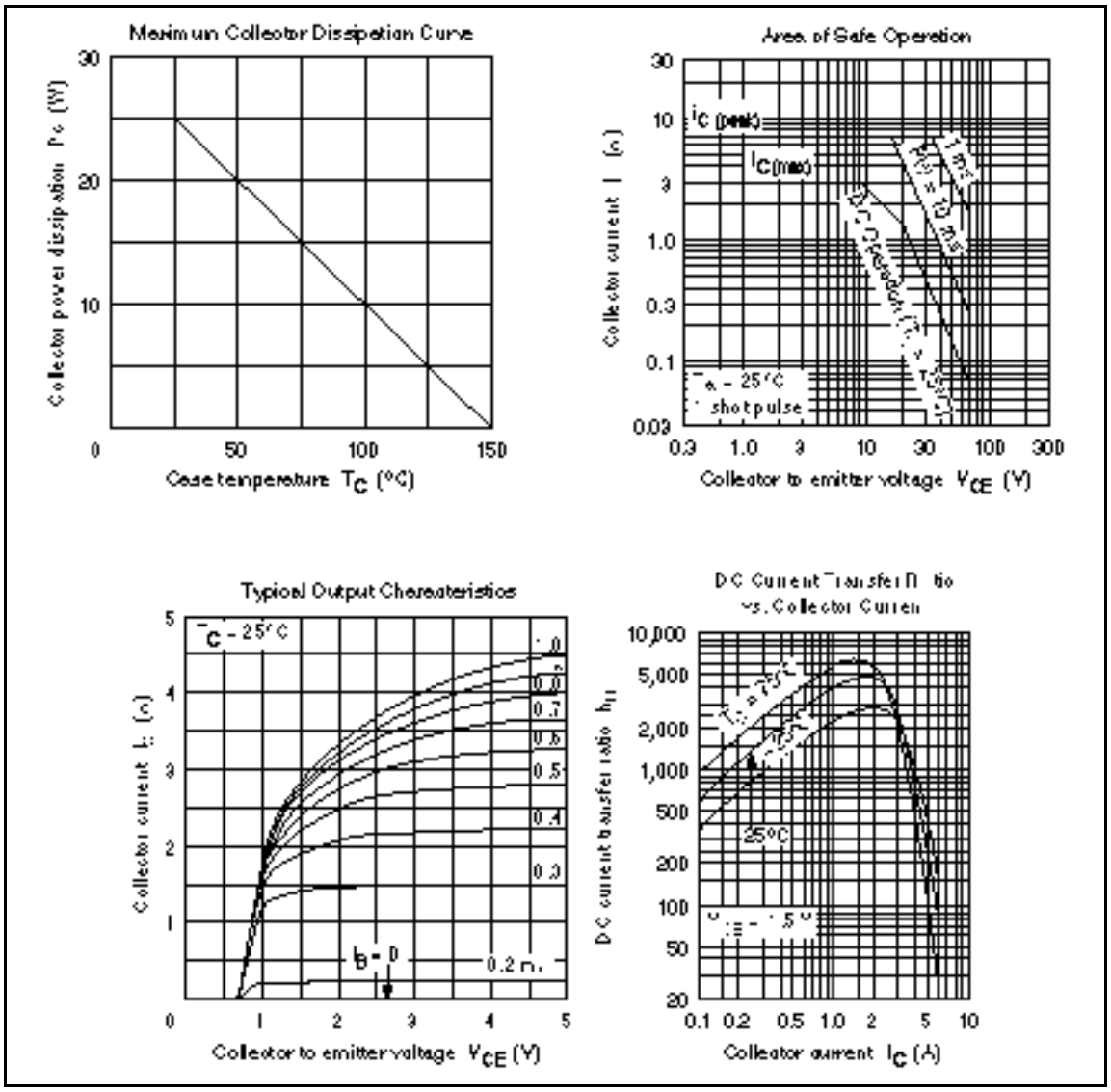
| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 60 | V |
| Collector to emitter voltage | $V_{CEO}$ | 60 | V |
| Emitter to base voltage | $V_{EBO}$ | 7 | V |
| Collector current | $I_C$ | 3 | A |
| Collector peak current | $I_{C(peak)}$ | 6 | A |
| Collector power dissipation | $P_C$ | 2 | W |
| | $P_C$*[1] | 25 | |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

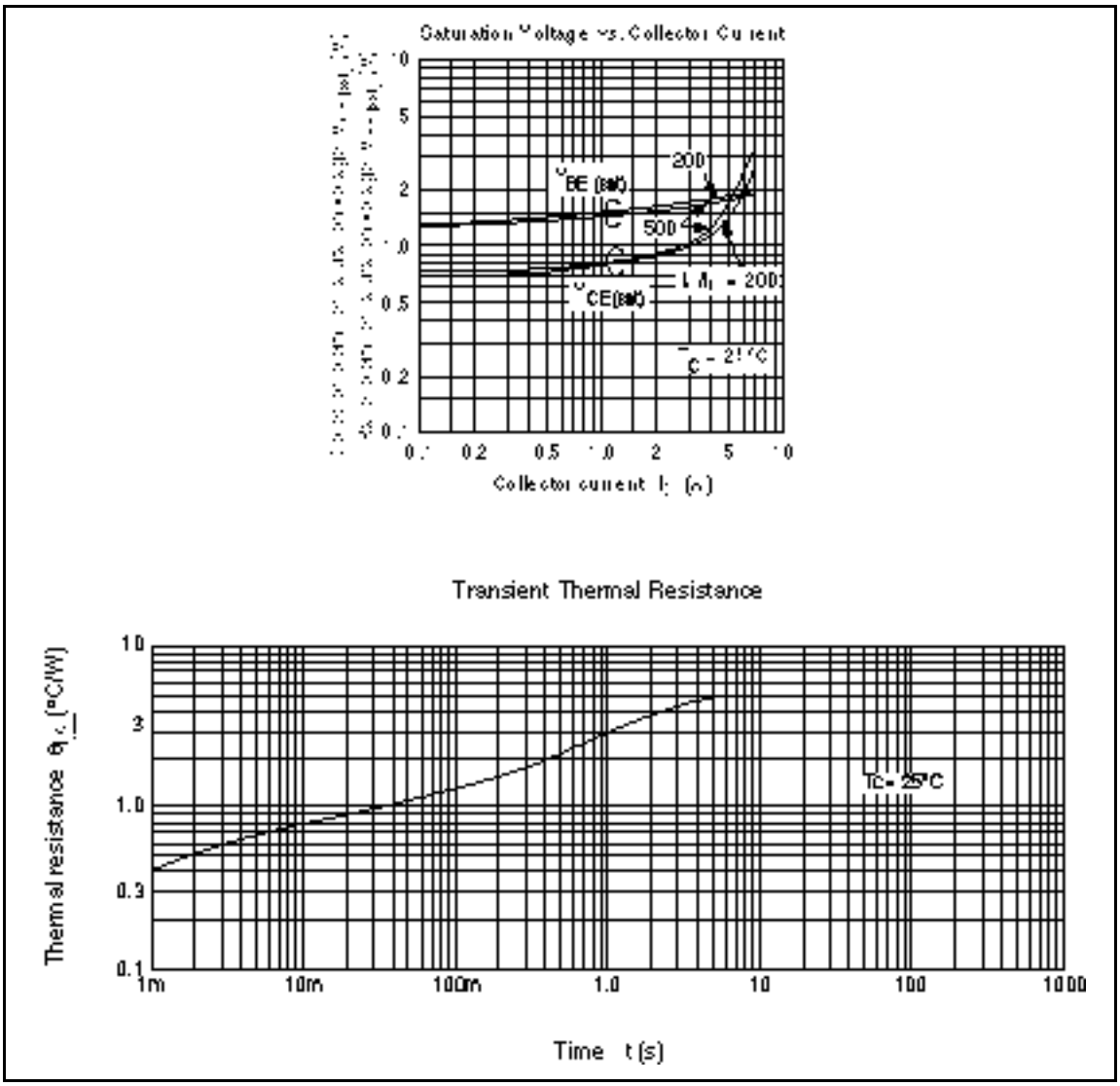
Note: 1. Value at $T_C$ = 25°C.

## Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | 60 | — | — | V | $I_C$ = 0.1 mA, $I_E$ = 0 |
| Collector to emitter breakdown voltage | $V_{(BR)CEO}$ | 60 | — | — | V | $I_C$ = 25 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 | $V_{CB}$ = 50 V, $I_E$ = 0 |
| | $I_{CEO}$ | — | — | 10 | | $V_{CE}$ = 50 V, $R_{BE}$ = ∞ |
| DC current transfer ratio | $h_{FE}$ | 1000 | — | 20000 | | $V_{CE}$ = 3 V, $I_C$ = 1.5 A*[1] |
| Collector to emitter saturation | $V_{CE(sat)1}$ | — | — | 1.2 | V | $I_C$ = 1.5 A, $I_B$ = 3 mA*[1] |
| voltage | $V_{CE(sat)2}$ | — | — | 2.5 | | $I_C$ = 3 A, $I_B$ = 30 mA*[1] |
| Base to emitter saturation | $V_{BE(sat)1}$ | — | — | 2.0 | V | $I_C$ = 1.5 A, $I_B$ = 3 mA*[1] |
| voltage | $V_{BE(sat)2}$ | — | — | 3.5 | | $I_C$ = 3 A, $I_B$ = 30 mA*[1] |

Note: 1. Pulse test.


Maximum Collector Dissipation Curve
Collector power dissipation $P_C$ (W)
30
20
10
0
50
100
150
Case temperature $T_C$ (°C)
Area of Safe Operation
Collector current $I_C$ (A)
$I_{C(peak)}$
$I_{C(max)}$
1 ms
10 ms
DC Operation
$T_C$ = 25°C
1 shot pulse
30
10
3
1.0
0.3
0.1
0.03
0.3
1.0
3
10
30
100
300
Collector to emitter voltage $V_{CE}$ (V)
Typical Output Characteristics
$T_C$ = 25°C
Collector current $I_C$ (A)
0.8
0.7
0.6
0.5
0.4
0.3
$I_B$ = 0
0.2 mA
5
4
3
2
1
0
1
2
3
4
5
Collector to emitter voltage $V_{CE}$ (V)
DC Current Transfer Ratio
vs. Collector Current
DC current transfer ratio $h_{FE}$
10,000
5,000
2,000
1,000
500
200
100
50
20
75°C
25°C
$V_{CE}$ = 5 V
0.1
0.2
0.5
1.0
2
5
10
Collector current $I_C$ (A)


Saturation Voltage vs. Collector Current
200
500
Collector current
Transient Thermal Resistance
Thermal resistance
Time t (s)
1m
10m
100m
1.0
10
100
1000

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