2SD1470

Silicon NPN Epitaxial, Darlington

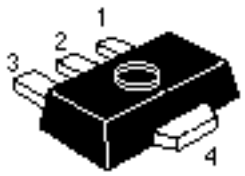
HITACHI

Application

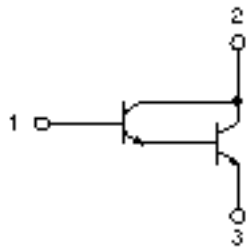
Low frequency power amplifier

Outline

UPAK



1. Base
2. Collector
3. Emitter
4. Collector (Flange)



Absolute Maximum Ratings (Ta = 25°C)

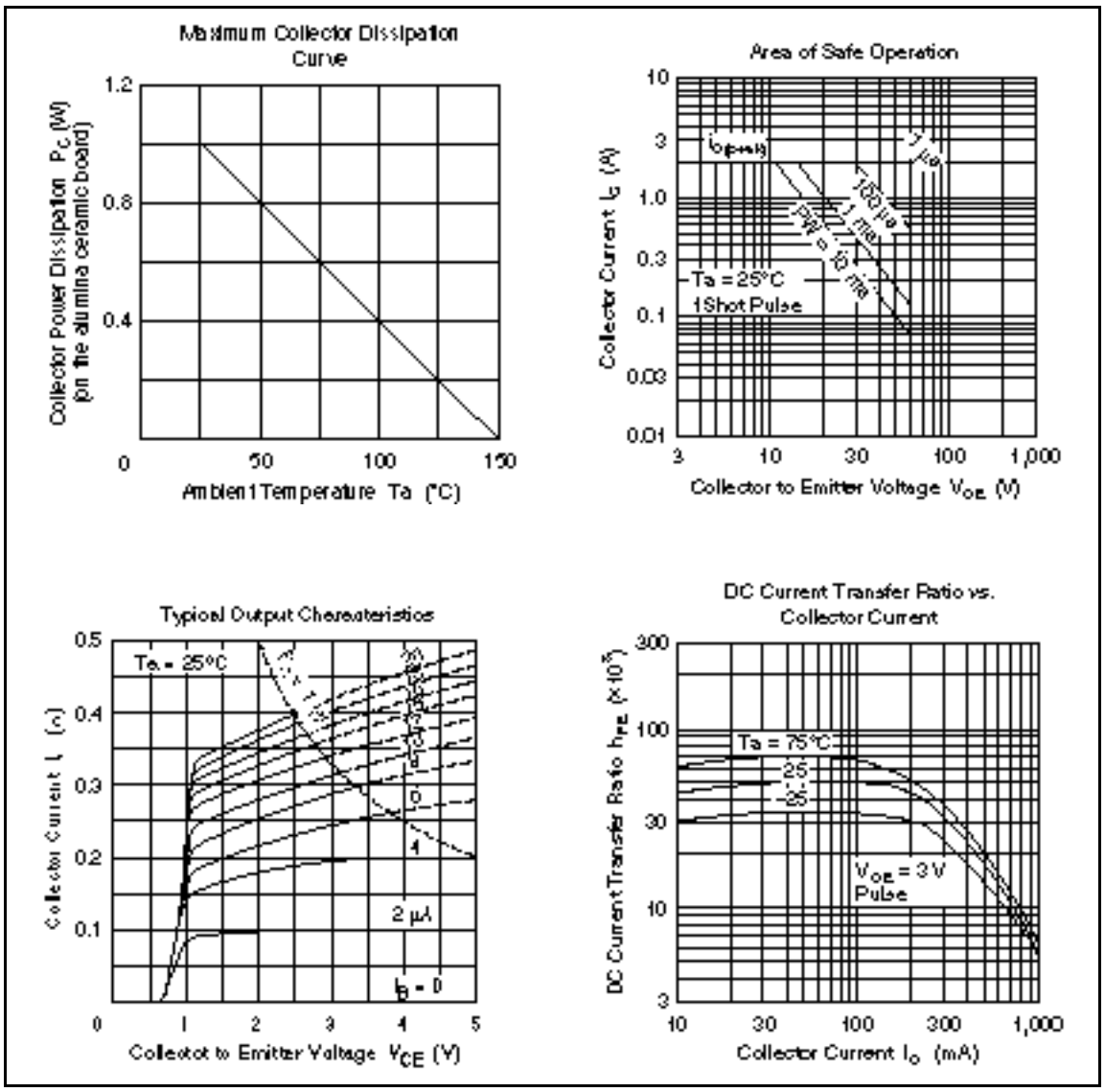
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	60	V
Collector to emitter voltage	V_{CEO}	60	V
Emitter to base voltage	V_{EBO}	7	V
Collector current	I_C	1	A
Collector peak current	$i_{C(peak)}$*[1]	2	A
Collector power dissipation	P_C*[2]	1	W
Junction temperature	Tj	150	°C
Storage temperature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

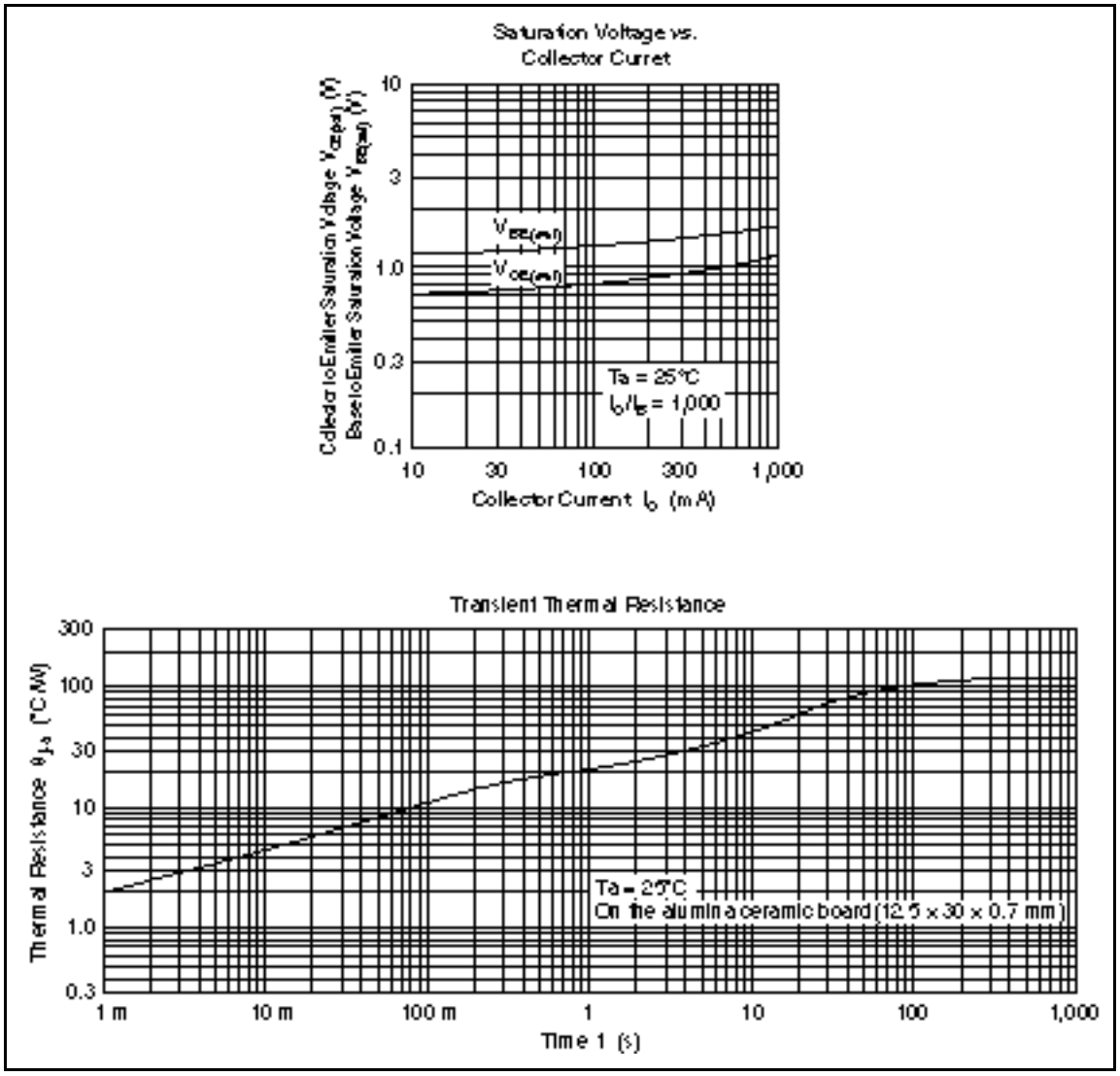
Notes: 1. PW ≤ 10 ms, Duty cycle ≤ 20%
2. Value on the alumina ceramic board (12.5 x 30 x 0.7 mm)

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 = 10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	60	—	—	V	I_C = 1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	7	—	—	V	I_E = 10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 60 V, I_E = 0
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 7 V, I_C = 0
DC current transfer ratio	h_{FE}	2000	—	100000		V_{CE} = 3 V, I_C = 0.5 A*[1]
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.5	V	I_C = 500 mA, I_B = 0.5 mA*[1]
Base to emitter saturation voltage	$V_{BE(sat)}$	—	—	2.0	V	I_C = 500 mA, I_B = 0.5 mA*[1]

Notes: 1. Pulse test
2. Marking is “AT”.


Maximum Collector Dissipation Curve
Collector Power Dissipation P_C (W) (on the alumina ceramic board)
1.2
0.8
0.4
0
50
100
150
Ambient Temperature Ta (°C)
Area of Safe Operation
Collector Current I_C (A)
10
3
1.0
0.3
0.1
0.03
0.01
$I_{B(peak)}$
7 μs
100 μs
1 ms
PW = 10 ms
Ta = 25°C
1 Shot Pulse
3
10
30
100
1,000
Collector to Emitter Voltage V_{CE} (V)
Typical Output Characteristics
Collector Current I_C (A)
0.5
0.4
0.3
0.2
0.1
Ta = 25°C
10
8
6
4
2 μA
I_B = 0
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} ($\times 10^3$)
300
100
30
10
3
Ta = 75°C
25
−25
V_{CE} = 3 V
Pulse
10
30
100
300
1,000
Collector Current I_C (mA)


Saturation Voltage vs.
Collector Curret
Collector to Emitter Saturation Voltage $V_{CE(sat)}$ (V)
Base to Emitter Saturation Voltage $V_{BE(sat)}$ (V)
10
3
1.0
0.2
0.1
$V_{BE(sat)}$
$V_{CE(sat)}$
Ta = 25°C
I_C/I_B = 1,000
10
30
100
300
1,000
Collector Current I_C (mA)
Transient Thermal Resistance
Thermal Resistance θ_{j-a} (°C/W)
300
100
30
10
3
1.0
0.3
Ta = 25°C
On the alumina ceramic board (12.5 × 30 × 0.7 mm)
1 m
10 m
100 m
1
10
100
1,000
Time t (s)

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