2SD1974

Silicon NPN Epitaxial

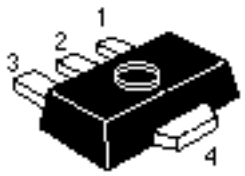
HITACHI

Application

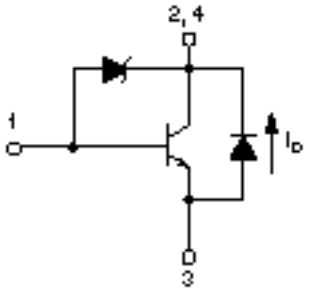
Low frequency power amplifier

Outline

UPAK



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



Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

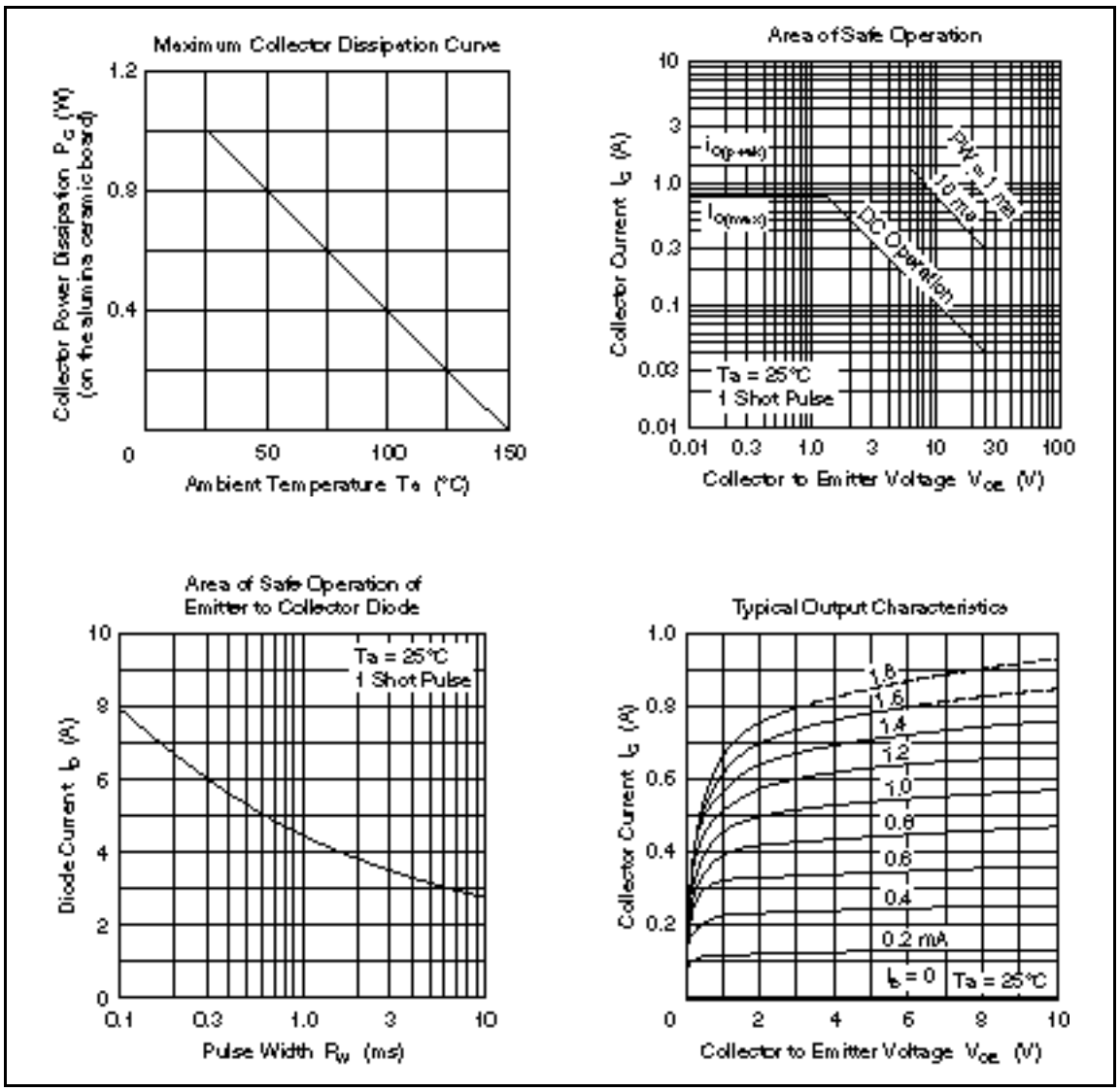
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	25	V
Collector to emitter voltage	V_{CEO}	25	V
Emitter to base voltage	V_{EBO}	6	V
Collector current	I_C	0.8	A
Collector peak current	$ic_{(peak)}$	1.5	A
E to C diode forward current	I_D	0.6	A
Collector power dissipation	P_C*[1]	1.0	W
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

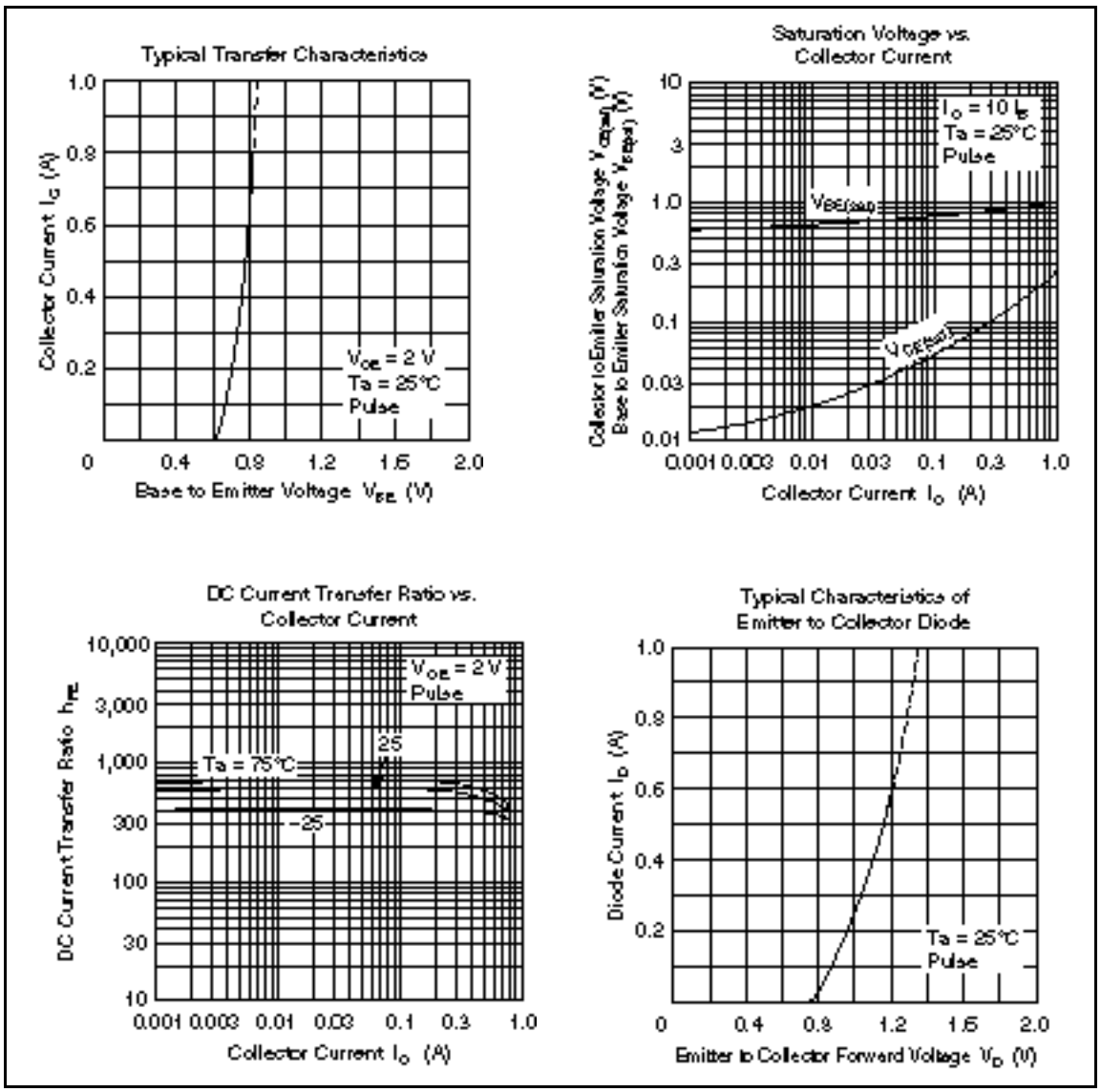
Note: 1. Value on the alumina ceramic board (12.5 x 20 x 0.7 mm)

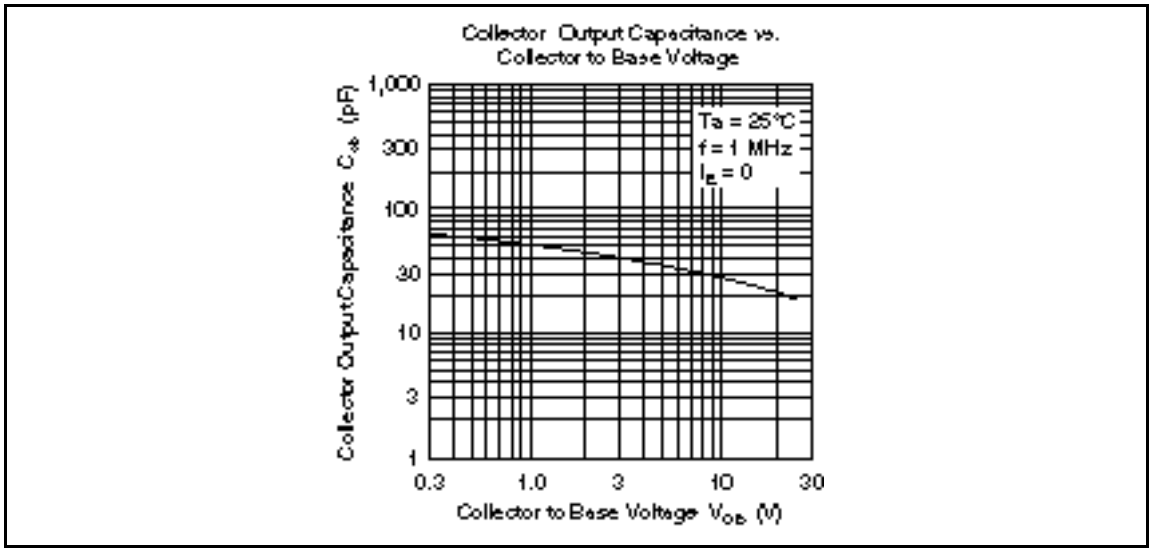
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	25	—	—	V	I_C = 10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	25	—	35	V	I_C = 1 mA, R_{BE} = ∞
Collector to emitter sustaining voltage	$V_{CEO(sus)}$	25	—	35	V	I_C = 0.8 A, R_{BE} = ∞, L = 20 mH
Emitter to base breakdown voltage	$V_{(BR)EBO}$	6	—	—	V	I_E = 10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	0.2	µA	V_{CB} = 20 V, I_E = 0
	I_{CEO}	—	—	0.5	µA	V_{CE} = 20 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	0.2	µA	V_{EB} = 5 V, I_C = 0
DC current transfer ratio	h_{FE}	250	—	1200		V_{CE} = 2 V, I_C = 0.1 A*[1]
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.4	V	I_C = 0.8 A, I_B = 80 mA*[1]
E to C diode forward voltage	V_D	—	—	1.5	V	I_D = 0.6 A*[1]

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


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
$i_{o(p-wk)}$
$I_{o(max)}$
PW = 1 ms
10 ms
DC Operation
Ta = 25°C
1 Shot Pulse
0.01
0.3
1.0
3
10
30
100
Collector to Emitter Voltage V_{CE} (V)
Area of Safe Operation of Emitter to Collector Diode
Diode Current I_D (A)
10
8
6
4
2
0
Ta = 25°C
1 Shot Pulse
0.1
0.3
1.0
3
10
Pulse Width P_W (ms)
Typical Output Characteristics
Collector Current I_C (A)
1.0
0.8
0.6
0.4
0.2
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2 mA
I_B = 0
Ta = 25°C
0
2
4
6
8
10
Collector to Emitter Voltage V_{CE} (V)


Typical Transfer Characteristics
Collector Current I_C (A)
Base to Emitter Voltage V_{BE} (V)
V_{CE} = 2 V
Ta = 25°C
Pulse
Saturation Voltage vs. Collector Current
Collector to Emitter Saturation Voltage $V_{CE(sat)}$ (V)
Base to Emitter Saturation Voltage $V_{BE(sat)}$ (V)
I_C = 10 I_B
Ta = 25°C
Pulse
$V_{BE(sat)}$
$V_{CE(sat)}$
Collector Current I_C (A)
DC Current Transfer Ratio vs. Collector Current
DC Current Transfer Ratio h_{FE}
V_{CE} = 2 V
Pulse
Ta = 75°C
25
-25
Collector Current I_C (A)
Typical Characteristics of Emitter to Collector Diode
Diode Current I_D (A)
Ta = 25°C
Pulse
Emitter to Collector Forward Voltage V_D (V)


Collector Output Capacitance vs.
Collector to Base Voltage
Ta = 25°C
f = 1 MHz
I_E = 0
Collector Output Capacitance C_{ob} (pF)
1,000
300
100
30
10
3
1
0.3
1.0
3
10
30
Collector to Base Voltage V_{CB} (V)

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