2SB1387

Silicon PNP Epitaxial, Darlington

HITACHI

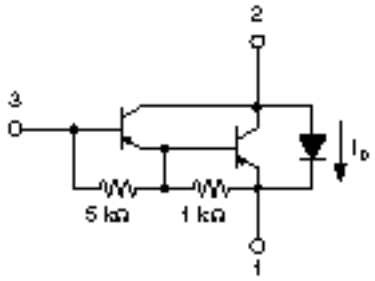
Application

- Low frequency power amplifier
- Complementary pair with 2SD1978

Outline

TO-92MOD

1. Emitter
2. Collector
3. Base



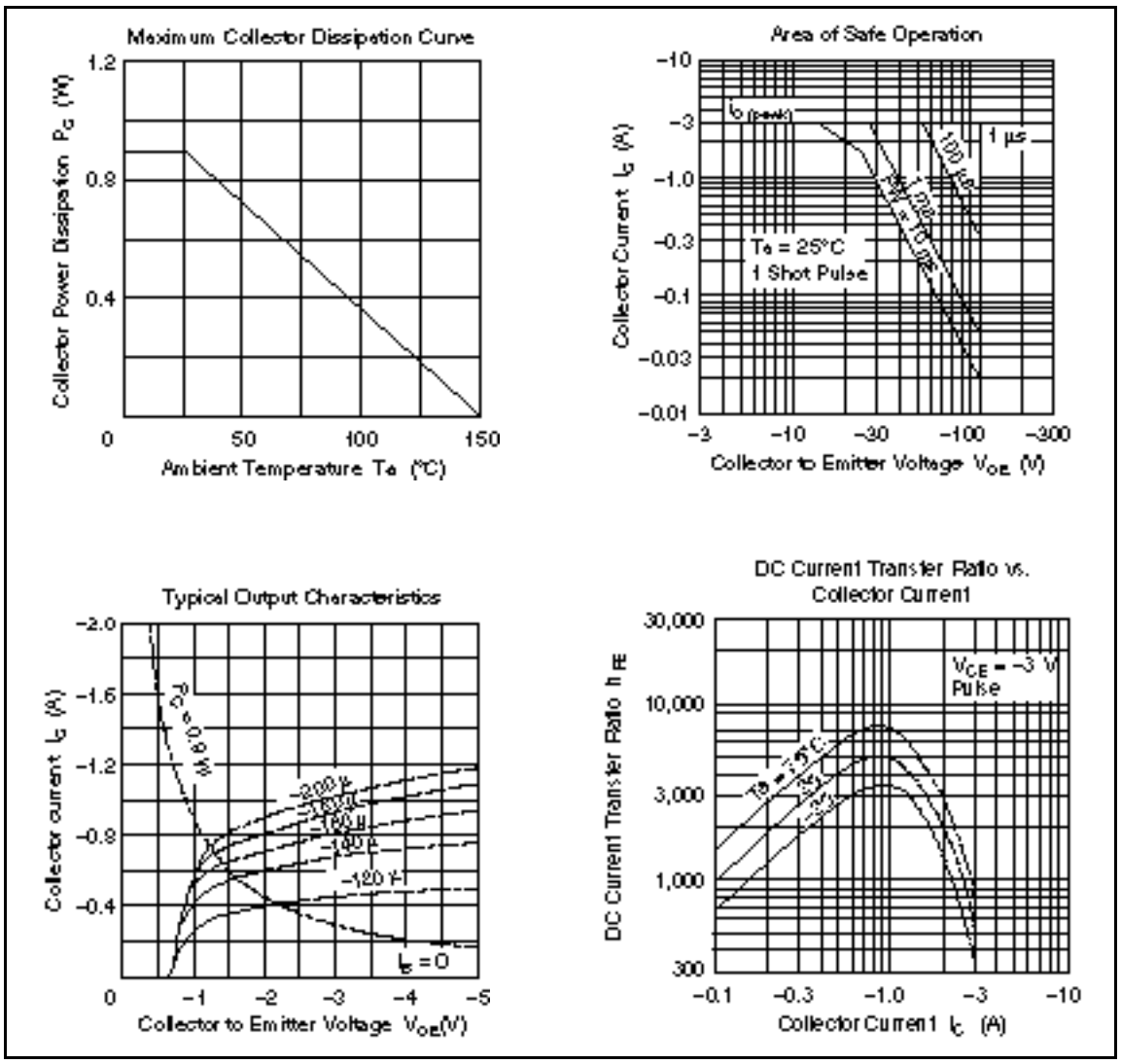
Absolute Maximum Ratings (Ta = 25°C)

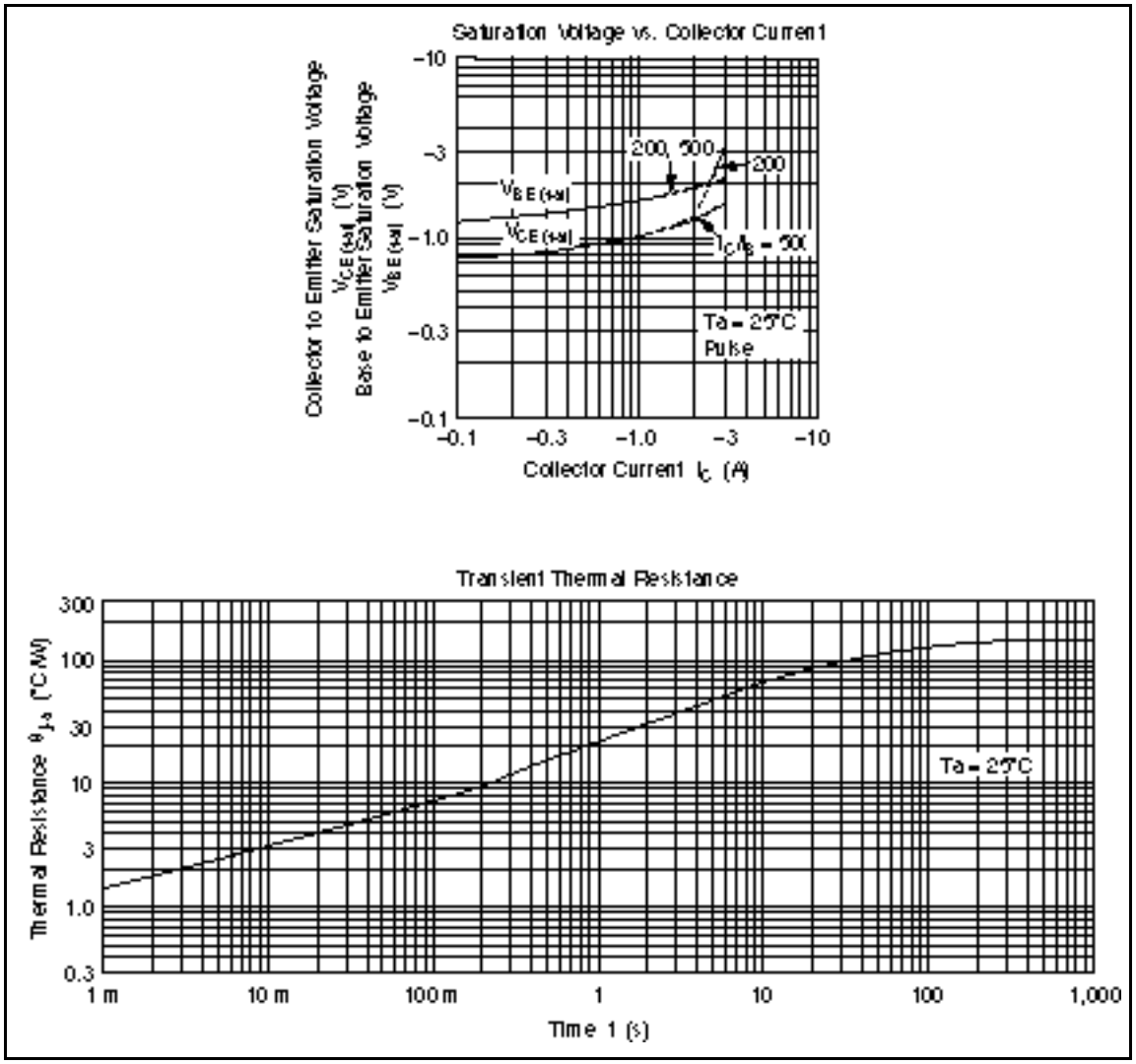
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	–120	V
Collector to emitter voltage	V_{CEO}	–120	V
Emitter to base voltage	V_{EBO}	–7	V
Collector current	I_C	–1.5	A
Collector peak current	$i_{C(peak)}$	–3.0	A
C to E diode forward current	I_D	1.5	A
Collector power dissipation	P_C	0.9	W
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°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}	—	—	–1	µA	V_{CB} = –100 V, I_E = 0
	I_{CEO}	—	—	–10	µA	V_{CE} = –100 V, R_{BE} = ∞
DC current transfer ratio	h_{FE}	2000	—	10000		V_{CE} = –3 V, I_C = –1 A*[1]
Collector to emitter saturation voltage	$V_{CE(sat)1}$	—	—	–1.5	V	I_C = –1 A, I_B = –1 mA*[1]
	$V_{CE(sat)2}$	—	—	–2.0	V	I_C = –1.5 A, I_B = –1.5 mA*[1]
Base to emitter saturation voltage	$V_{BE(sat)1}$	—	—	–2.0	V	I_C = –1 A, I_B = –1 mA*[1]
	$V_{BE(sat)2}$	—	—	–2.5	V	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]

Note: 1. Pulse test


Maximum Collector Dissipation Curve
Collector Power Dissipation P_C (W)
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
$I_{C(peak)}$
1 µs
100 µs
10 ms (1 shot)
Ta = 25°C
1 Shot Pulse
−3
−10
−30
−100
−300
Collector to Emitter Voltage V_{CE} (V)
Typical Output Characteristics
Collector current I_C (A)
−2.0
−1.6
−1.2
−0.8
−0.4
0
−1
−2
−3
−4
−5
P_C = 0.9 W
−200 µA
−160 µA
−140 µA
−120 µA
I_B = 0
Collector to Emitter Voltage V_{CE}(V)
DC Current Transfer Ratio vs. Collector Current
DC Current Transfer Ratio h_{FE}
30,000
10,000
3,000
1,000
300
V_{CE} = −3 V
Pulse
Ta = 75°C
25
−25
−0.1
−0.3
−1.0
−3
−10
Collector Current I_C (A)


Saturation Voltage vs. Collector Current
Collector to Emitter Saturation Voltage
Base to Emitter Saturation Voltage
$V_{CE(sat)}$ (V)
$V_{BE(sat)}$ (V)
−10
−3
−1.0
−0.3
−0.1
200, 300
200
$V_{BE(sat)}$
$V_{CE(sat)}$
I_C/I_B = 300
Ta = 27°C
Pulse
−0.1
−0.3
−1.0
−3
−10
Collector Current I_C (A)
Transient Thermal Resistance
Thermal Resistance θ_{j-a} (°C/W)
300
100
30
10
3
1.0
0.3
Ta = 27°C
1 m
10 m
100 m
1
10
100
1,000
Time t (s)

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