2SB1417, 2SB1417A

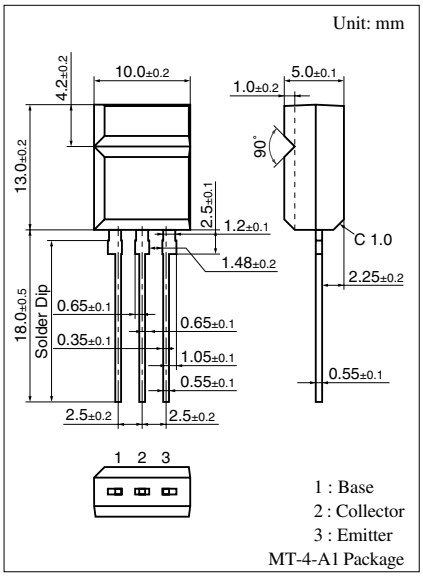
Silicon PNP epitaxial planar type

For power amplification

Complementary to 2SD2137 and 2SD2137A

■ Features

- High forward current transfer ratio h_{FE} which has satisfactory linearity
- Low collector to emitter saturation voltage $V_{CE(sat)}$
- Allowing automatic insertion with radial taping



■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector to base voltage	2SB1417	V_{CBO}	−60	V
	2SB1417A		−80	
Collector to emitter voltage	2SB1417	V_{CEO}	−60	V
	2SB1417A		−80	
Emitter to base voltage		V_{EBO}	−6	V
Peak collector current		I_{CP}	−5	A
Collector current		I_C	−3	A
Collector power dissipation	$T_C = 25°C$	P_C	15	W
	$T_a = 25°C$		2.0	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

■ Electrical Characteristics $T_C = 25°C$

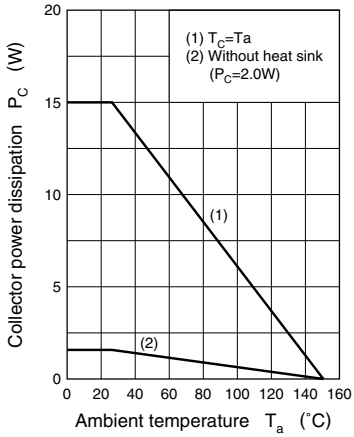
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SB1417	I_{CES}	$V_{CE} = -60$ V, $V_{BE} = 0$			−100	µA
	2SB1417A		$V_{CE} = -80$ V, $V_{BE} = 0$			−100	
Collector cutoff current	2SB1417	I_{CEO}	$V_{CE} = -30$ V, $I_B = 0$			−100	µA
	2SB1417A		$V_{CE} = -60$ V, $I_B = 0$			−100	
Emitter cutoff current		I_{EBO}	$V_{EB} = -6$ V, $I_C = 0$			−100	µA
Collector to emitter voltage	2SB1417	V_{CEO}	$I_C = -30$ mA, $I_B = 0$	−60			V
	2SB1417A			−80			
Forward current transfer ratio		h_{FE1} *	$V_{CE} = -4$ V, $I_C = -1$ A	70		250	
		h_{FE2}	$V_{CE} = -4$ V, $I_C = -3$ A	10			
Base to emitter voltage		V_{BE}	$V_{CE} = -4$ V, $I_C = -3$ A			−1.8	V
Collector to emitter saturation voltage		$V_{CE(sat)}$	$I_C = -3$ A, $I_B = -0.375$ A			−1.2	V
Transition frequency		f_T	$V_{CE} = -5$ V, $I_C = -0.2$ A, f = 10 MHz		30		MHz
Turn-on time		t_{on}	$I_C = -1$ A, $I_{B1} = -0.1$ A, $I_{B2} = 0.1$ A, $V_{CC} = -50$ V		0.3		µs
Storage time		t_{stg}			1.0		µs
Fall time		t_f			0.2		µs

Note) ∗: Rank classification

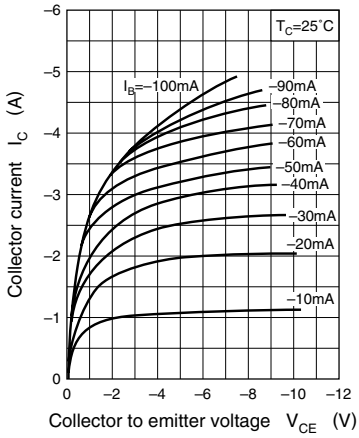
Rank	Q	P
h_{FE1}	70 to 150	120 to 250

Ordering can be made by the common rank (PQ rank h_{FE1} = 70 to 250) in the rank classification.

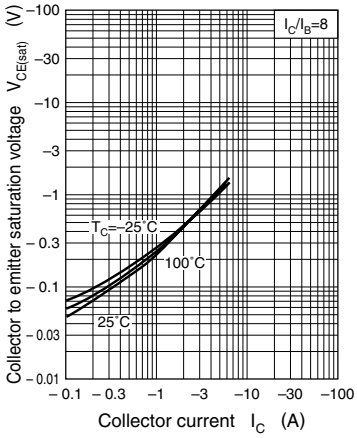
P_C — T_a



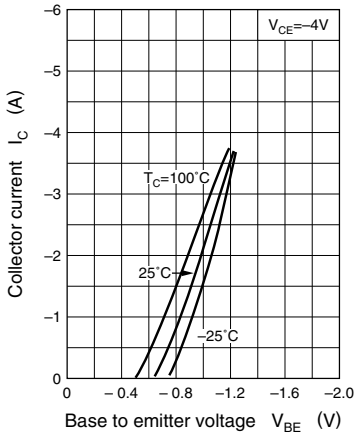
I_C — V_{CE}



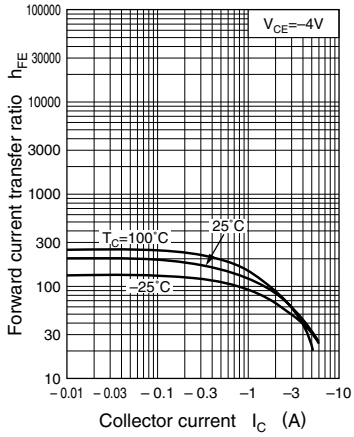
$V_{CE(sat)}$ — I_C



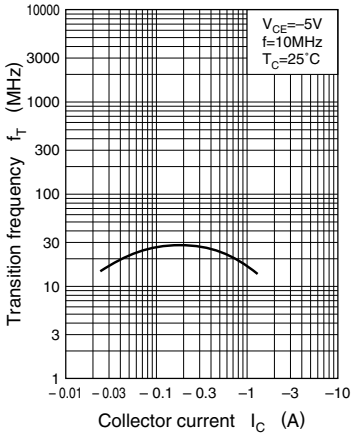
I_C — V_{BE}



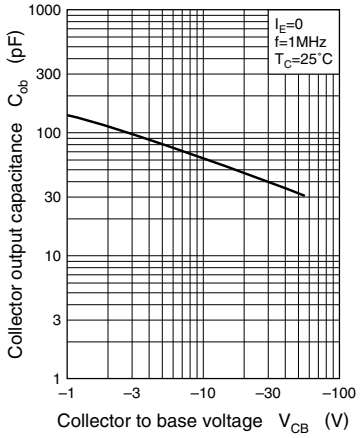
h_{FE} — I_C



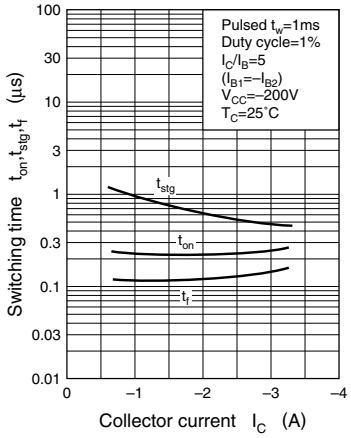
f_T — I_C



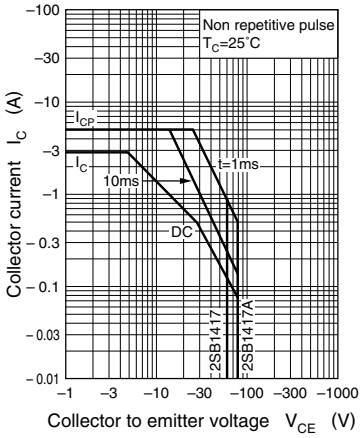
C_{ob} — V_{CB}



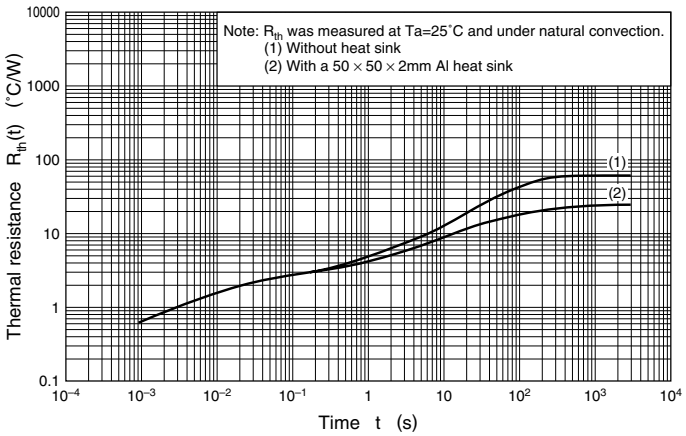
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t


Note: R_{th} was measured at Ta=25˚C and under natural convection.
(1) Without heat sink
(2) With a 50 × 50 × 2mm Al heat sink
Thermal resistance R_{th}(t) (˚C/W)
10000
1000
100
10
1
0.1
(1)
(2)
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)

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