

# 2SB1417, 2SB1417A

Silicon PNP epitaxial planar type

For power amplification

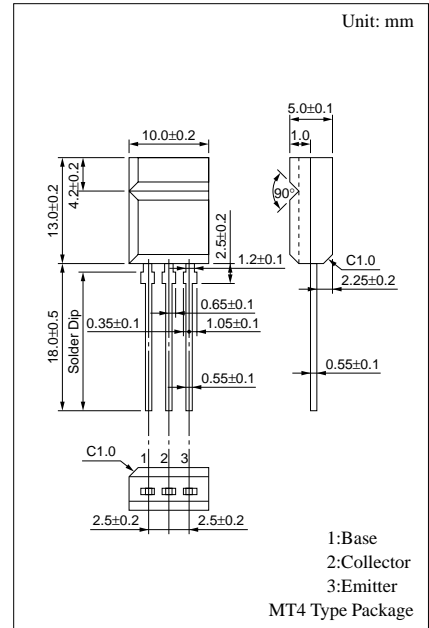
Complementary to 2SD2137 and 2SD2137A

## 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 ( $T_C=25^\circ\text{C}$ )

Parameter	Symbol	Rated	Unit
Collector to base voltage	$V_{CBO}$	-60	V
2SB1417			
2SB1417A		-80	
Collector to emitter voltage	$V_{CEO}$	-60	V
2SB1417			
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	$P_C$	15	W
$T_C=25^\circ\text{C}$			
$T_a=25^\circ\text{C}$		2.0	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$



## Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

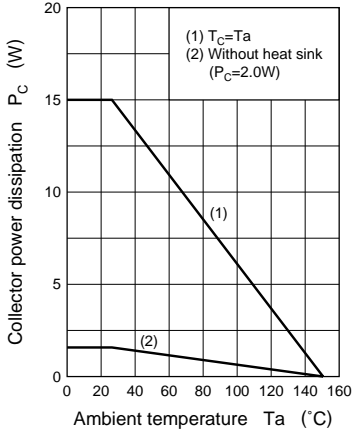
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	$I_{CES}$	$V_{CE} = -60\text{V}, V_{BE} = 0$			-100	$\mu\text{A}$
2SB1417A		$V_{CE} = -80\text{V}, V_{BE} = 0$			-100	
Collector cutoff current	$I_{CEO}$	$V_{CE} = -30\text{V}, I_B = 0$			-100	$\mu\text{A}$
2SB1417A		$V_{CE} = -60\text{V},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

\* $h_{FE1}$  Rank classification

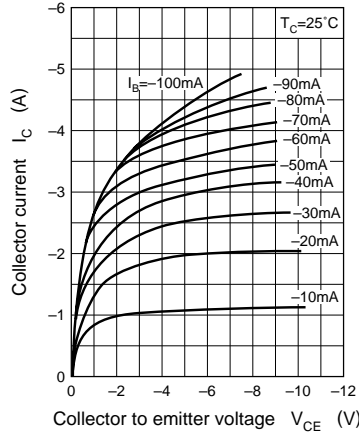
Rank	Q	P
$h_{FE1}$	70 to 150	120 to 250

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

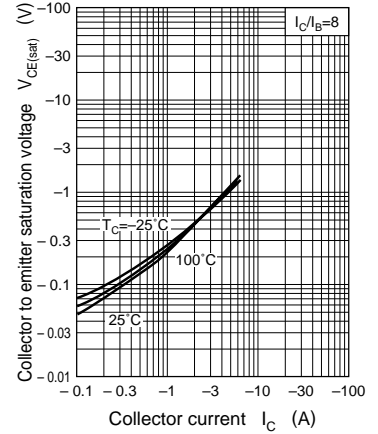
$P_C - T_a$



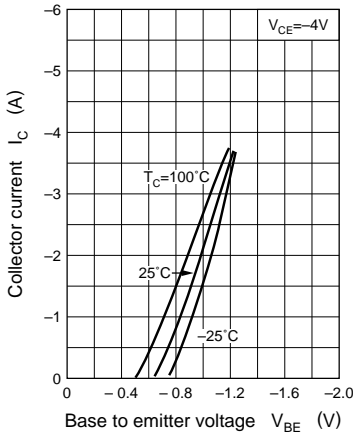
$I_C - V_{CE}$



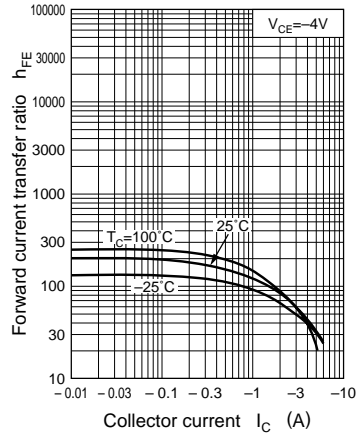
$V_{CE(sat)} - I_C$



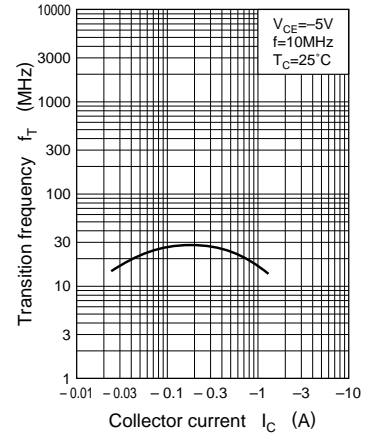
$I_C - V_{BE}$



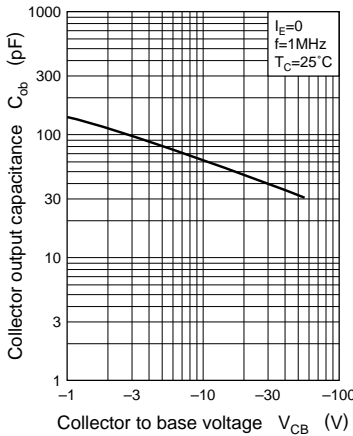
$h_{FE} - I_C$



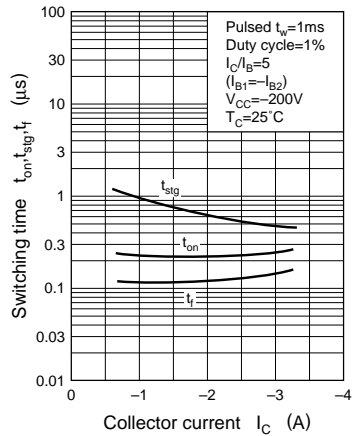
$f_T - I_C$



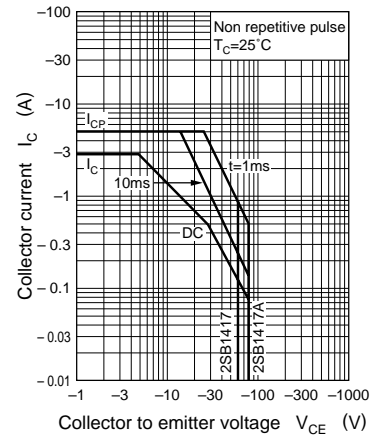
$C_{ob} - V_{CB}$



$t_{on}, t_{stg}, t_f - I_C$



Area of safe operation (ASO)



$$R_{th(t)} - t$$

