

# 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 tapering

### ■ Absolute Maximum Ratings $T_C = 25^\circ\text{C}$

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	$T_C = 25^{\circ}\text{C}$	$P_C$	15	W
	$T_a = 25^{\circ}\text{C}$		2.0	
Junction temperature		$T_j$	150	$^{\circ}\text{C}$
Storage temperature		$T_{\text{stg}}$	-55 to +150	$^{\circ}\text{C}$

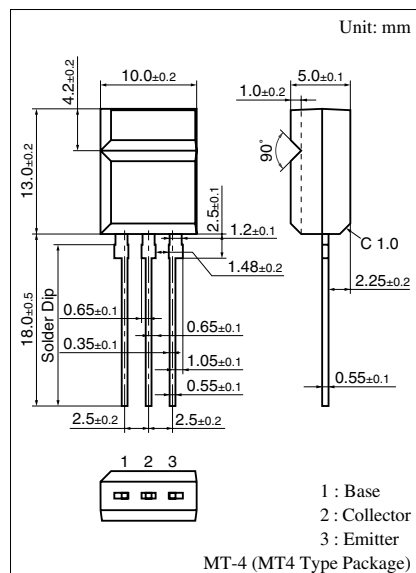
### ■ Electrical Characteristics $T_C = 25^\circ\text{C}$

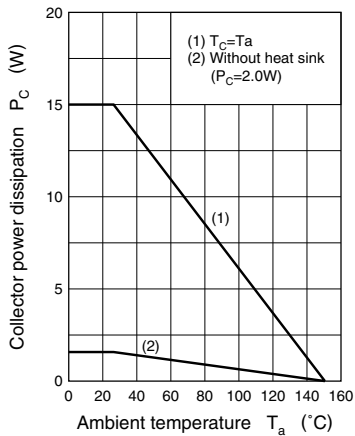
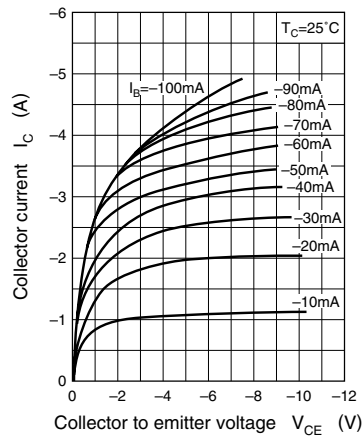
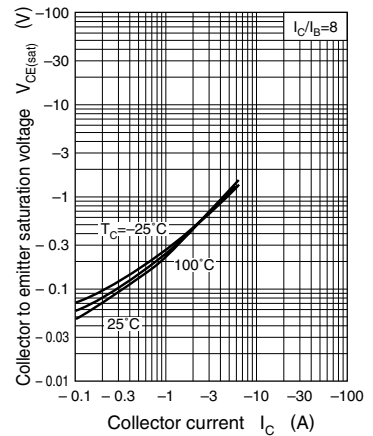
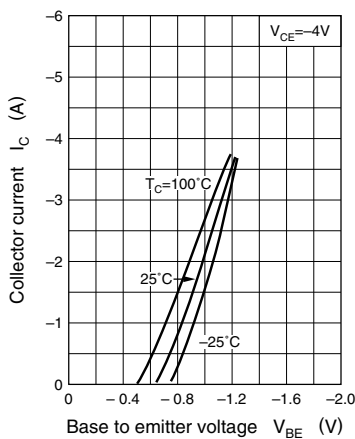
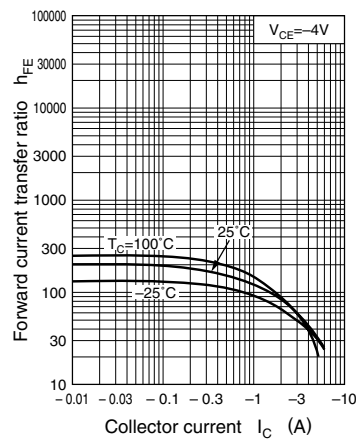
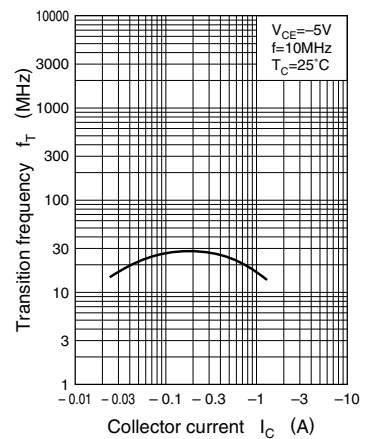
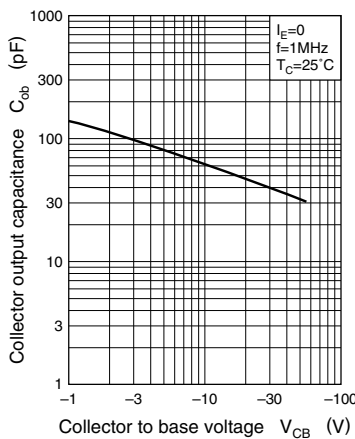
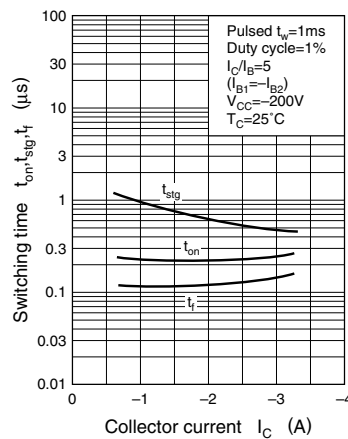
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SB1417 2SB1417A	$I_{CES}$ $V_{CE} = -60\text{ V}, V_{BE} = 0$			-100	$\mu\text{A}$
					-100	
Collector cutoff current	2SB1417 2SB1417A	$I_{CEO}$ $V_{CE} = -30\text{ V}, I_B = 0$			-100	$\mu\text{A}$
					-100	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -6\text{ V}, I_C = 0$			-100	$\mu\text{A}$
Collector to emitter voltage	2SB1417 2SB1417A	$V_{CEO}$ $I_C = -30\text{ mA}, I_B = 0$	-60			V
			-80			
Forward current transfer ratio	$h_{FE1}^*$ $h_{FE2}$	$V_{CE} = -4\text{ V}, I_C = -1\text{ A}$ $V_{CE} = -4\text{ V}, I_C = -3\text{ A}$	70		250	
			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		$\mu\text{s}$

Note) \*: Rank classification

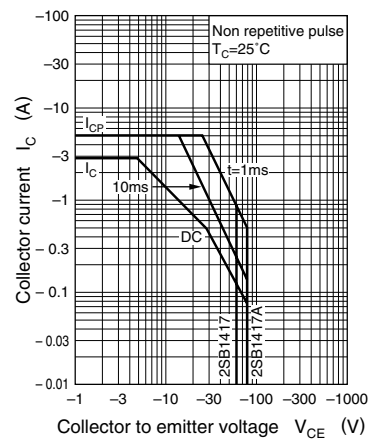
Rank	Q	P
$h_{FE1}$	70 to 150	120 to 250

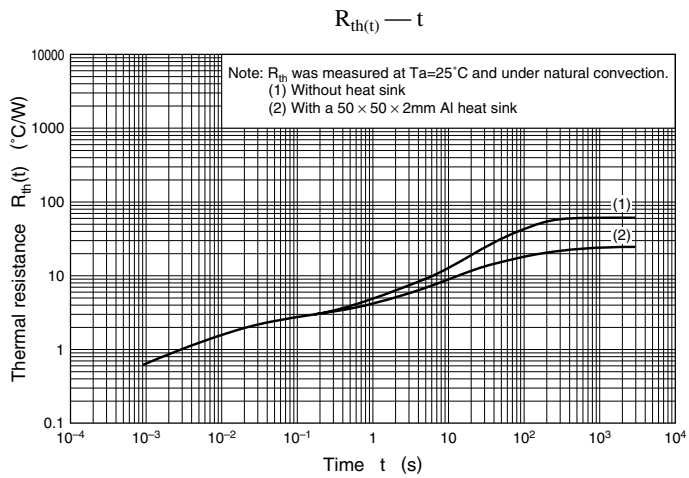
Ordering can be made by the common rank (PQ rank  $h_{FE1} = 70$  to 250) in the rank classification.



$P_C - T_a$  $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $I_C - V_{BE}$  $h_{FE} - I_C$  $f_T - I_C$  $C_{ob} - V_{CB}$  $t_{on}, t_{stg}, t_f - I_C$ 

Area of safe operation (ASO)





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