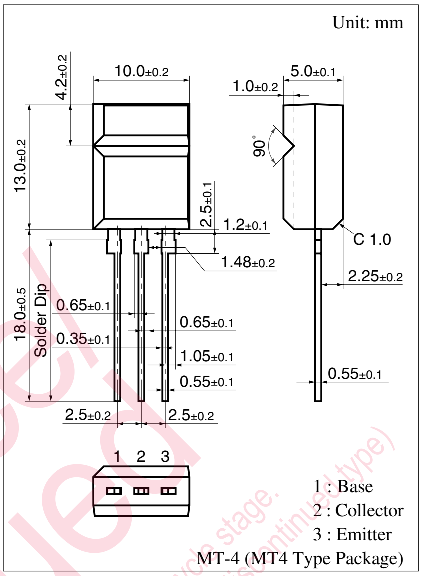
2SB1417, 2SB1417A

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 $T_C = 25°C$

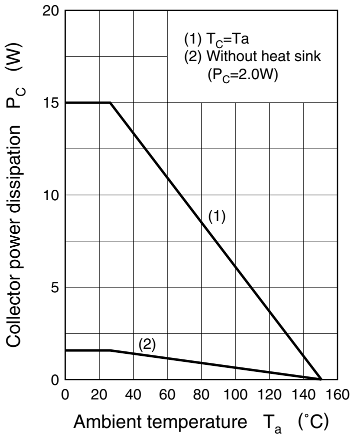
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SB1417	I_{CES}	$V_{CE} = -60$ V, $V_{BE} = 0$			−100	µA
	2SB1417A		$V_{CE} = -80$ V, $V_{BE} = 0$			−100	
Collector cutoff current	2SB1417	I_{CEO}	$V_{CE} = -30$ V, $I_B = 0$			−100	µA
	2SB1417A		$V_{CE} = -60$ V, $I_B = 0$			−100	
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,		0.3		µs
Storage time		t_{stg}	$V_{CC} = -50$ V		1.0		µs
Fall time		t_f			0.2		µs

Note) *: Rank classification

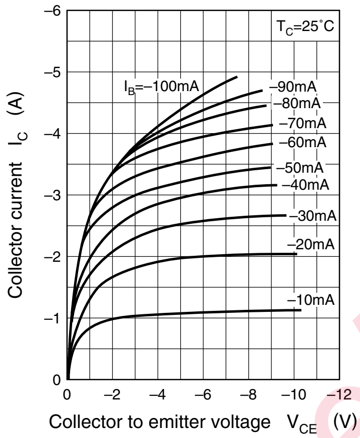
Rank	Q	P
h_{FE1}	70 to 150	120 to 250

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

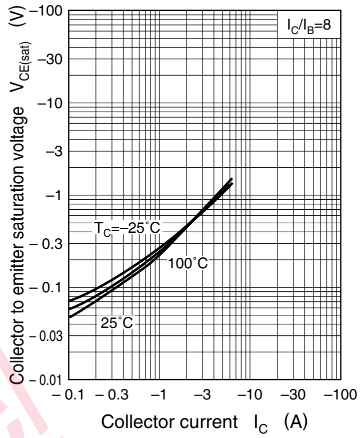
P_C — T_a



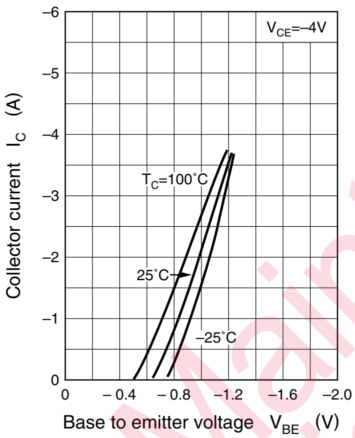
I_C — V_{CE}



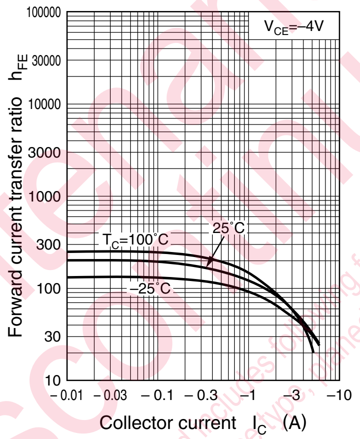
$V_{CE(sat)}$ — I_C



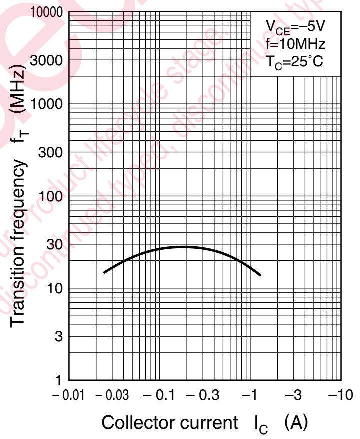
I_C — V_{BE}



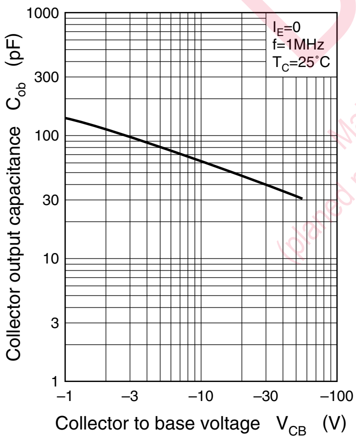
h_{FE} — I_C



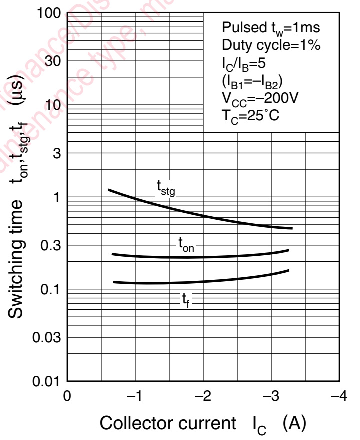
f_T — I_C



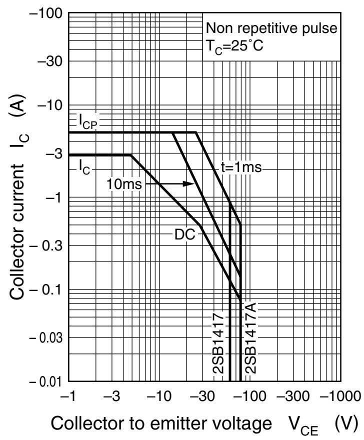
C_{ob} — V_{CB}



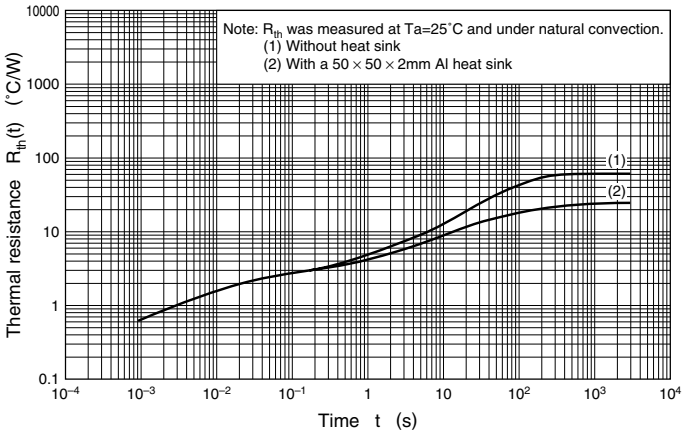
t_{on}, t_{stg}, t_f — I_C



Area of safe operation (ASO)



$R_{th(t)}$ — t



Request for your special attention and precautions in using the technical information and semiconductors described in this book

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.

20080805