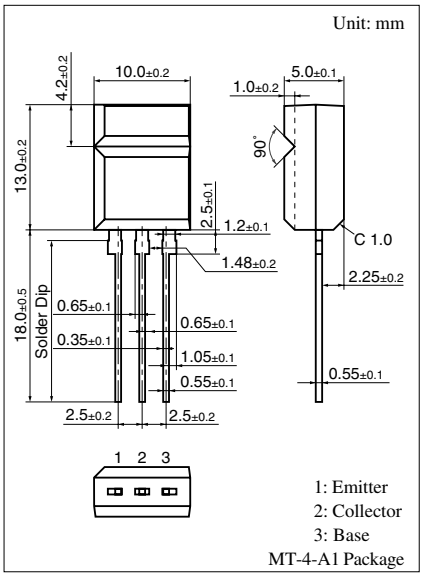
2SD2137, 2SD2137A

Silicon NPN triple diffusion planar type

For power amplification

Complementary to 2SB1417 and 2SB1417A



■ Features

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

■ Absolute Maximum Ratings $T_C = 25°C$

Parameter		Symbol	Rating	Unit
Collector to base voltage	2SD2137	V_{CBO}	60	V
	2SD2137A		80	
Collector to emitter voltage	2SD2137	V_{CEO}	60	V
	2SD2137A		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	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

■ Electrical Characteristics $T_C = 25°C$

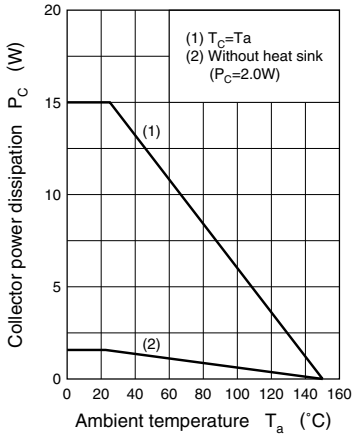
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SD2137	I_{CES}	$V_{CE} = 60$ V, $V_{BE} = 0$			100	µA
	2SD2137A		$V_{CE} = 80$ V, $V_{BE} = 0$			100	
Collector cutoff current	2SD2137	I_{CEO}	$V_{CE} = 30$ V, $I_B = 0$			100	µA
	2SD2137A		$V_{CE} = 60$ V, $I_B = 0$			100	
Emitter cutoff current		I_{EBO}	$V_{EB} = 6$ V, $I_C = 0$			100	µA
Collector to emitter voltage	2SD2137	V_{CEO}	$I_C = 30$ mA, $I_B = 0$	60			V
	2SD2137A			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		2.5		µs
Fall time		t_f			0.2		µs

Note) ∗: Rank classification

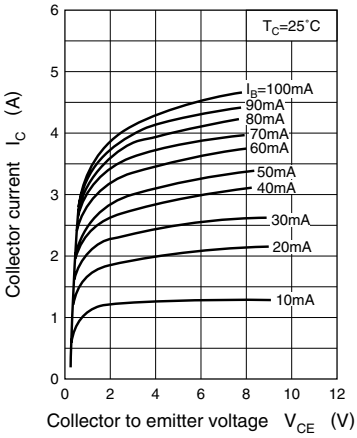
Rank	Q	R
h_{FE1}	70 to 150	120 to 250

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

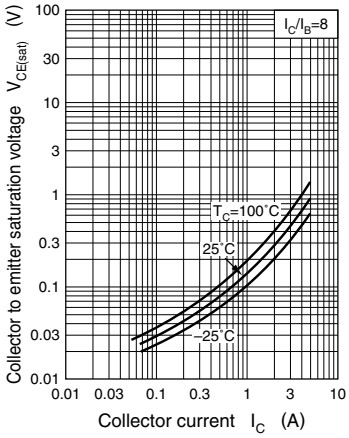
P_C — T_a



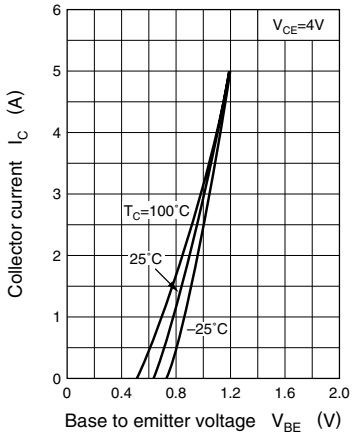
I_C — V_{CE}



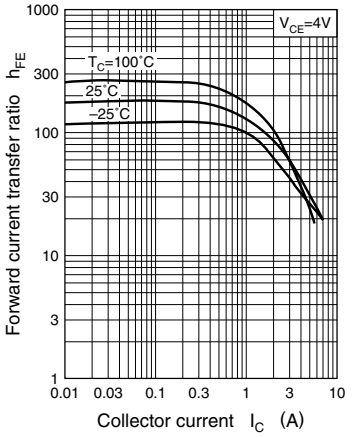
$V_{CE(sat)}$ — I_C



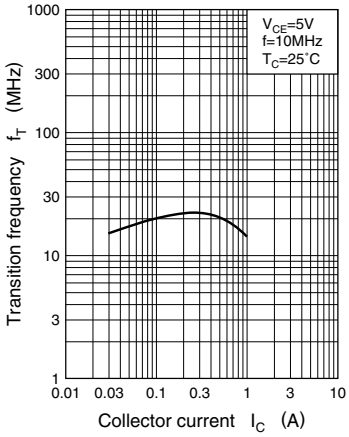
I_C — V_{BE}



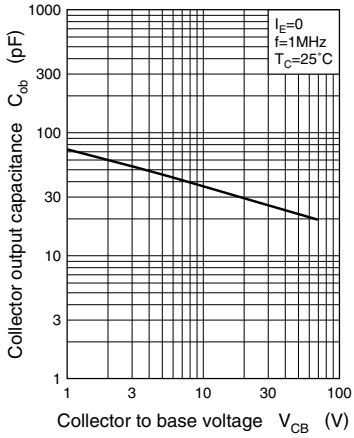
h_{FE} — I_C



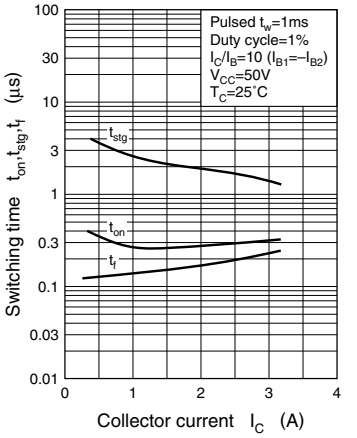
f_T — I_C



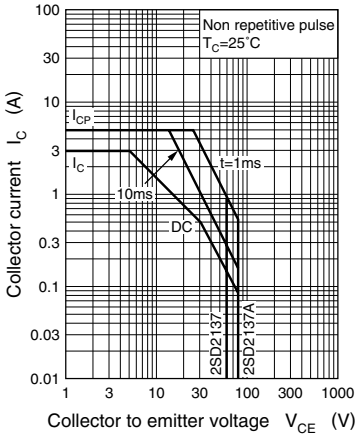
C_{ob} — V_{CB}



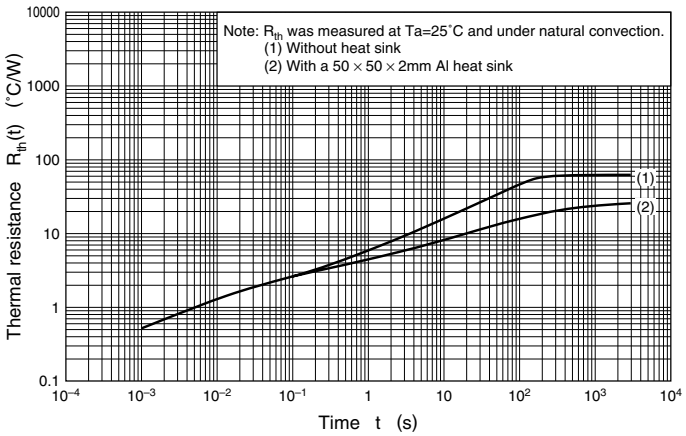
t_{on}, t_{stg}, t_f — I_C



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
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
Time t (s)
(1)
(2)

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