

# 2SD2136

## Silicon NPN triple diffusion planar type

For power amplification

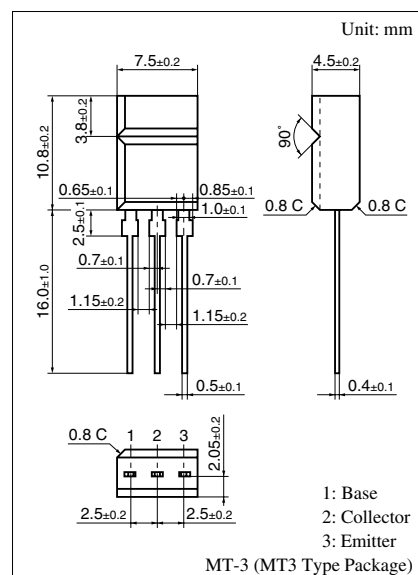
Complementary to 2SB1416

### ■ 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 $T_C = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector to base voltage	$V_{CBO}$	60	V
Collector to emitter voltage	$V_{CEO}$	60	V
Emitter to base voltage	$V_{EBO}$	6	V
Peak collector current	$I_{CP}$	5	A
Collector current	$I_C$	3	A
Collector power dissipation	$P_C$	1.5	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

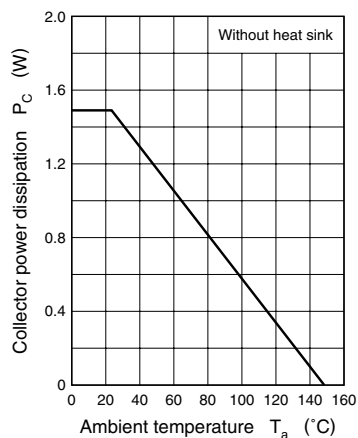
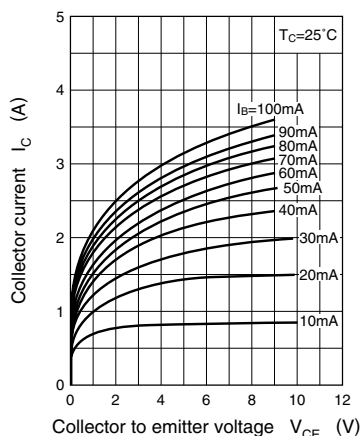
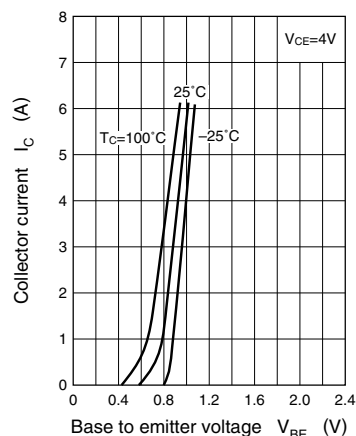
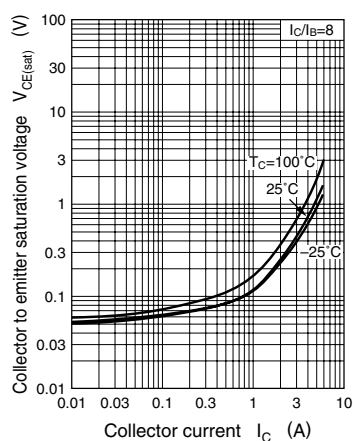
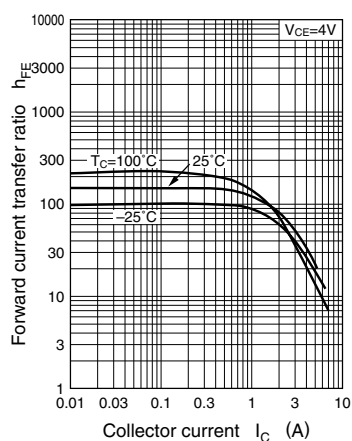
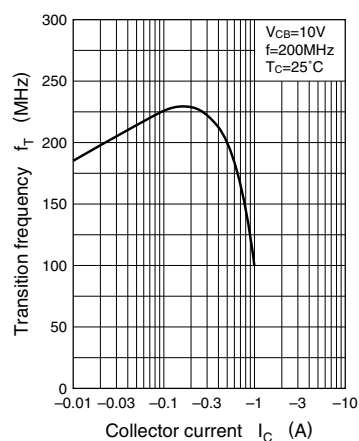


### ■ Electrical Characteristics $T_C = 25^\circ\text{C}$

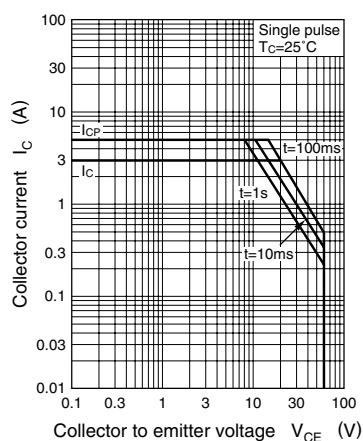
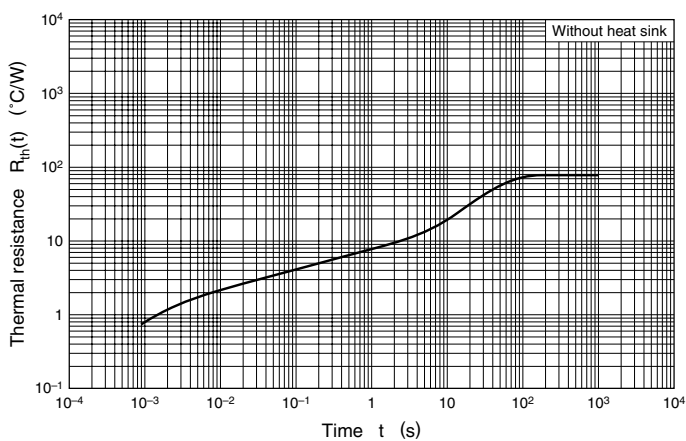
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	$I_{CES}$	$V_{CE} = 60\text{ V}, V_{BE} = 0$			200	$\mu\text{A}$
	$I_{CEO}$	$V_{CE} = 60\text{ V}, I_B = 0$			300	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 6\text{ V}, I_C = 0$			1	mA
Collector to emitter voltage	$V_{CEO}$	$I_C = 30\text{ mA}, I_B = 0$	60			V
Forward current transfer ratio	$h_{FE1}^*$	$V_{CE} = 4\text{ V}, I_C = 1\text{ A}$	40		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	$f_T$	$V_{CE} = 5\text{ V}, I_E = -0.1\text{ A}, f = 200\text{ MHz}$		220		MHz
Turn-on time	$t_{on}$	$I_C = 1\text{ A}, I_{B1} = 0.1\text{ A}, I_{B2} = -0.1\text{ A}$		0.5		$\mu\text{s}$
Storage time	$t_{stg}$			2.5		$\mu\text{s}$
Fall time	$t_f$			0.4		$\mu\text{s}$

Note) \*: Rank classification

Rank	P	Q	R
$h_{FE1}$	40 to 90	70 to 150	120 to 250

$P_C - T_a$  $I_C - V_{CE}$  $I_C - V_{BE}$  $V_{CE(sat)} - I_C$  $h_{FE} - I_C$  $f_T - I_C$ 

Area of safe operation (ASO)

 $R_{th(t)} - t$ 

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