

# 2SD2151

## Silicon NPN epitaxial planar type

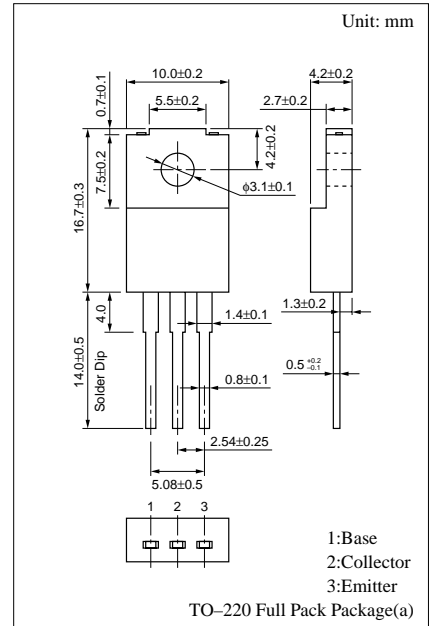
For power switching

### Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- Large collector current  $I_C$
- Full-pack package which can be installed to the heat sink with one screw

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

Parameter	Symbol	Ratings	Unit	
Collector to base voltage	$V_{CBO}$	130	V	
Collector to emitter voltage	$V_{CEO}$	80	V	
Emitter to base voltage	$V_{EBO}$	7	V	
Peak collector current	$I_{CP}$	20	A	
Collector current	$I_C$	10	A	
Collector power dissipation	$P_C$	$T_C=25^\circ\text{C}$	30	W
		$T_a=25^\circ\text{C}$	2	
Junction temperature	$T_j$	150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	



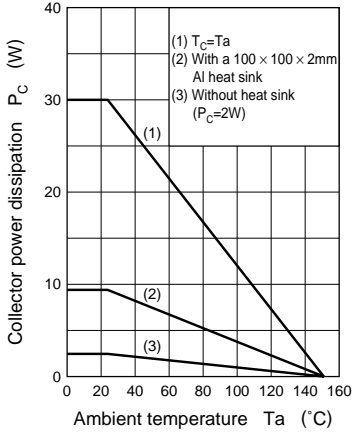
### Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 100\text{V}, I_E = 0$			10	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$			50	$\mu\text{A}$
Collector to emitter voltage	$V_{CEO}$	$I_C = 10\text{mA}, I_B = 0$	80			V
Forward current transfer ratio	$h_{FE1}$	$V_{CE} = 2\text{V}, I_C = 0.1\text{A}$	45			
	$h_{FE2}^*$	$V_{CE} = 2\text{V}, I_C = 3\text{A}$	90		260	
	$h_{FE3}$	$V_{CE} = 2\text{V}, I_C = 6\text{A}$	30			
Collector to emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 6\text{A}, I_B = 0.3\text{A}$			0.5	V
	$V_{CE(sat)2}$	$I_C = 10\text{A}, I_B = 1\text{A}$			1.5	V
Base to emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 6\text{A}, I_B = 0.3\text{A}$			1.5	V
	$V_{BE(sat)2}$	$I_C = 10\text{A}, I_B = 1\text{A}$			2.5	V
Transition frequency	$f_T$	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}, f = 1\text{MHz}$		20		MHz
Turn-on time	$t_{on}$	$I_C = 6\text{A}, I_{B1} = 0.6\text{A}, I_{B2} = -0.6\text{A}, V_{CC} = 50\text{V}$		0.5		$\mu\text{s}$
Storage time	$t_{stg}$			2.0		$\mu\text{s}$
Fall time	$t_f$			0.2		$\mu\text{s}$

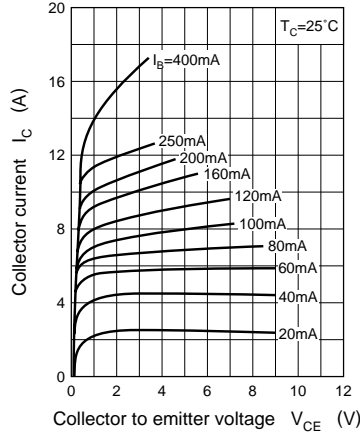
\* $h_{FE2}$  Rank classification

Rank	Q	P
$h_{FE2}$	90 to 180	130 to 260

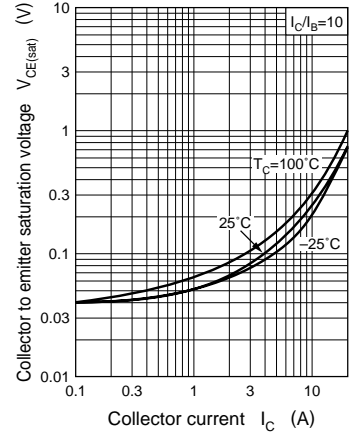
$P_C - T_a$



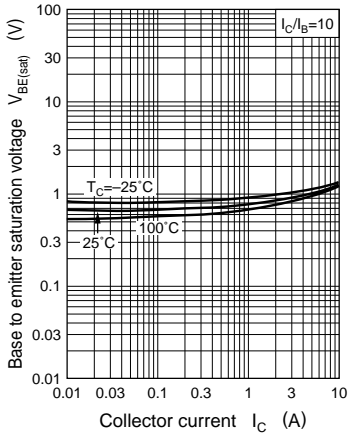
$I_C - V_{CE}$



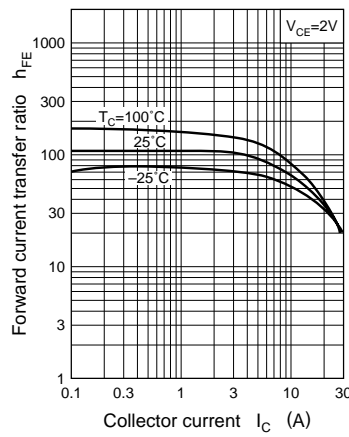
$V_{CE(sat)} - I_C$



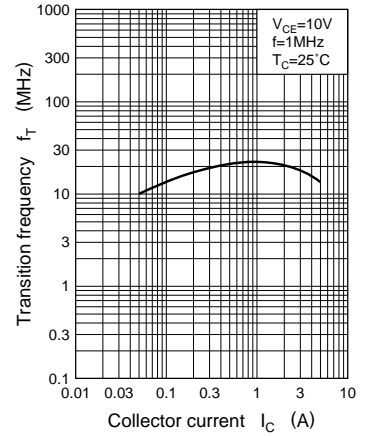
$V_{BE(sat)} - I_C$



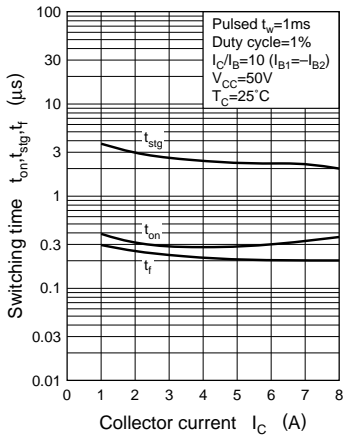
$h_{FE} - I_C$



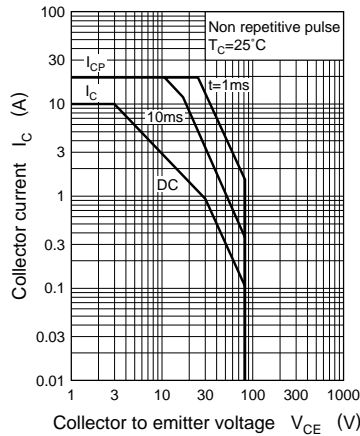
$f_T - I_C$



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



Area of safe operation (ASO)



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

