

# 2SD1445, 2SD1445A

## Silicon NPN epitaxial planar type

For power amplification, power switching and low-voltage switching

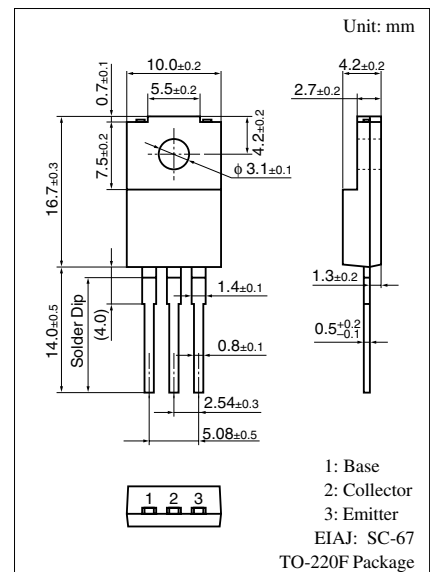
Complementary to 2SB0948 (2SB948) and 2SB0948A (2SB948A)

### ■ Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- High-speed switching
- 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	Rating	Unit
Collector to base voltage	2SD1445	$V_{CBO}$	40	V
	2SD1445A		50	
Collector to emitter voltage	2SD1445	$V_{CEO}$	20	V
	2SD1445A		40	
Emitter to base voltage		$V_{EBO}$	5	V
Peak collector current		$I_{CP}$	20	A
Collector current		$I_C$	10	A
Collector power dissipation	$T_C = 25^{\circ}\text{C}$	$P_C$	40	W
	$T_a = 25^{\circ}\text{C}$		2	
Junction temperature		$T_j$	150	$^{\circ}\text{C}$
Storage temperature		$T_{\text{stg}}$	-55 to +150	$^{\circ}\text{C}$



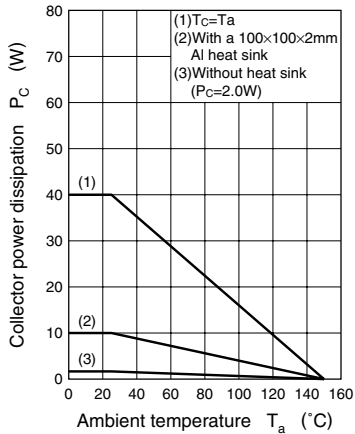
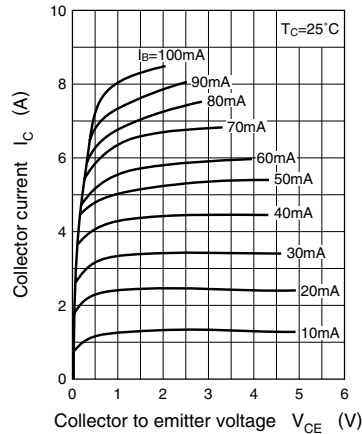
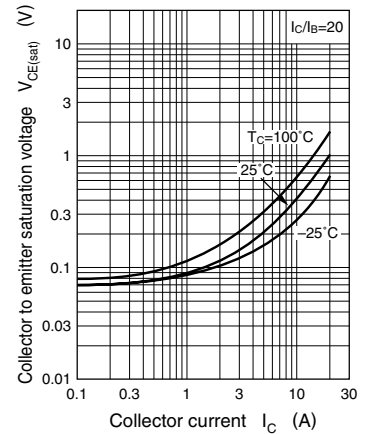
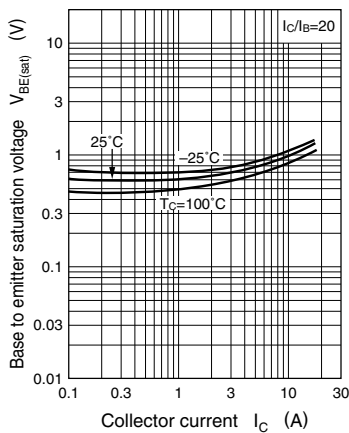
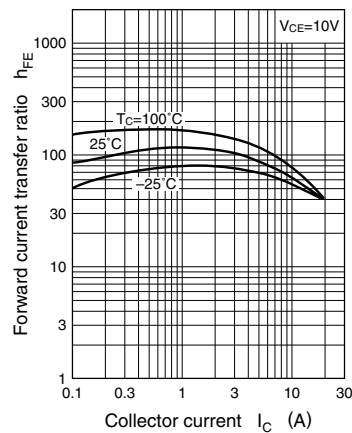
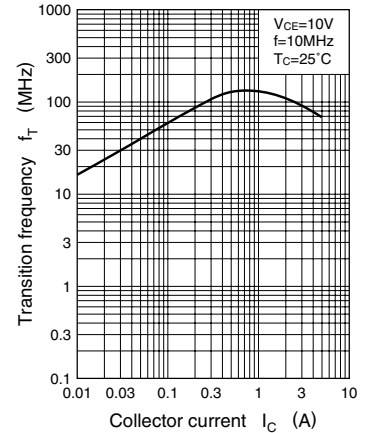
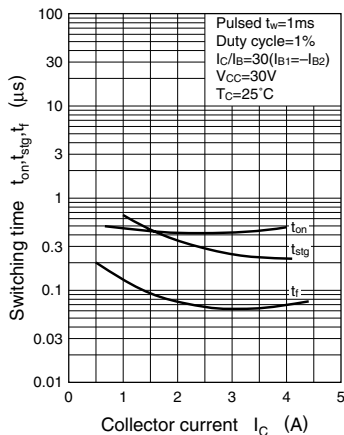
### ■ Electrical Characteristics $T_C = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	2SD1445 2SD1445A	$I_{CBO}$ $V_{CB} = 40\text{ V}, I_E = 0$			50	$\mu\text{A}$
					50	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$			50	$\mu\text{A}$
Collector to emitter voltage	2SD1445 2SD1445A	$V_{CEO}$ $I_C = 10\text{ mA}, I_B = 0$	20			V
			40			V
Forward current transfer ratio	$h_{FE1}$ $h_{FE2}^*$	$V_{CE} = 2\text{ V}, I_C = 0.1\text{ A}$ $V_{CE} = 2\text{ V}, I_C = 3\text{ A}$	45			
			90		260	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{ A}, I_B = 0.33\text{ A}$			0.6	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10\text{ A}, I_B = 0.33\text{ A}$			1.5	V
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}, I_C = 0.5\text{ A}, f = 10\text{ MHz}$		120		MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$		200		pF
Turn-on time	$t_{on}$	$I_C = 3\text{ A}, I_{B1} = 0.1\text{ A}, I_{B2} = -0.1\text{ A}, V_{CC} = 20\text{ V}$		0.3		$\mu\text{s}$
Storage time	$t_{stg}$			0.4		$\mu\text{s}$
Fall time	$t_f$			0.1		$\mu\text{s}$

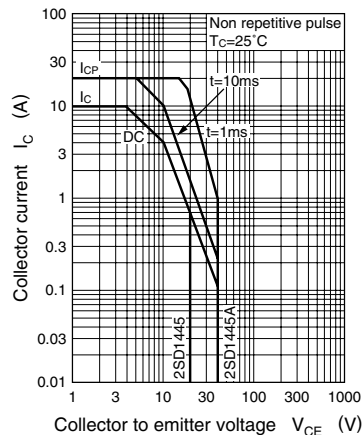
Note) \*: Rank classification

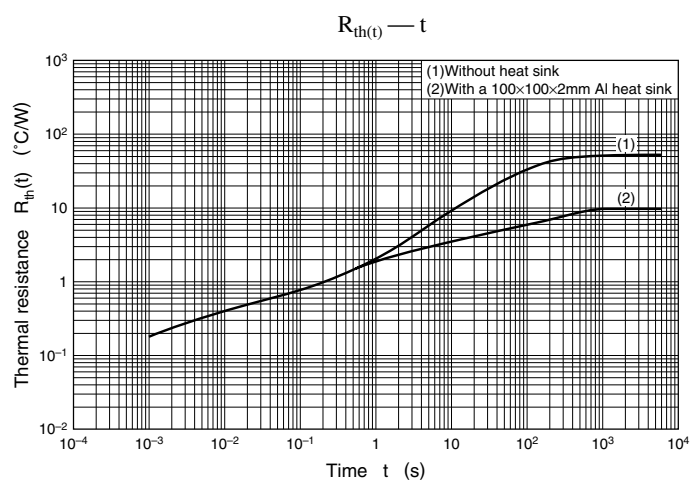
Rank	Q	P
$h_{FE2}$	90 to 180	130 to 260

Note) The part numbers in the parenthesis show conventional part number. Ordering can be made by the common rank ( $PQ$  rank  $h_{FE2} = 90$  to 260) in the rank classification. (2SD1445A only)

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

Area of safe operation (ASO)





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