

# 2SB1638, 2SB1638A

Silicon PNP epitaxial planar type

For low-voltage switching

## Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- I type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

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

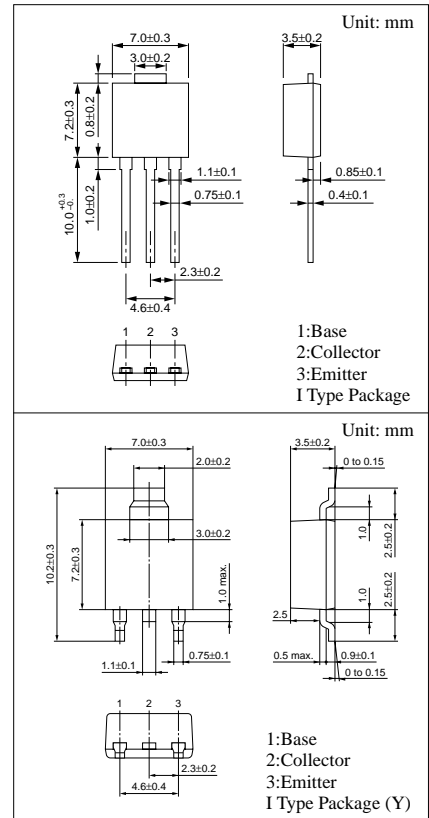
Parameter	Symbol	Rated	Unit
Collector to base voltage	2SB1638	-40	V
	2SB1638A	-50	
Collector to emitter voltage	2SB1638	-20	V
	2SB1638A	-40	
Emitter to base voltage	$V_{EBO}$	-5	V
Peak collector current	$I_{CP}$	-12	A
Collector current	$I_C$	-7	A
Collector power dissipation	$T_C=25^\circ\text{C}$	15	W
	$T_a=25^\circ\text{C}$	1.3	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

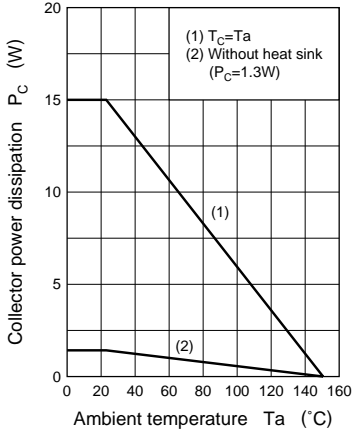
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	2SB1638	$V_{CB} = -40\text{V}, I_E = 0$			-50	$\mu\text{A}$
	2SB1638A					
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -5\text{V}, I_C = 0$			-50	$\mu\text{A}$
Collector to emitter voltage	2SB1638	$I_C = -10\text{mA}, I_B = 0$	-20			V
	2SB1638A		-40			
Forward current transfer ratio	$h_{FE1}$	$V_{CE} = -2\text{V}, I_C = -0.1\text{A}$	45			
	$h_{FE2}^*$	$V_{CE} = -2\text{V}, I_C = -2\text{A}$	90		260	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -5\text{A}, I_B = -0.16\text{A}$			-0.6	V
Base to emitter saturation voltage	$V_{BE(sat)}$	$I_C = -5\text{A}, I_B = -0.16\text{A}$			-1.5	V
Transition frequency	$f_T$	$V_{CE} = -10\text{V}, I_C = -0.5\text{A}, f = 10\text{MHz}$		150		MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$		140		pF
Turn-on time	$t_{on}$	$I_C = -2\text{A}, I_{B1} = -66\text{mA}, I_{B2} = 66\text{mA}$		0.1		$\mu\text{s}$
Storage time	$t_{stg}$		0.5	$\mu\text{s}$		
Fall time	$t_f$		0.1	$\mu\text{s}$		

\* $h_{FE2}$  Rank classification

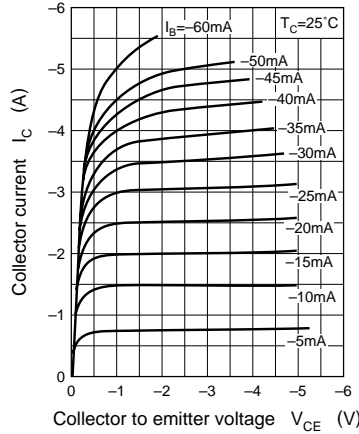
Rank	Q	P
$h_{FE2}$	90 to 180	130 to 260



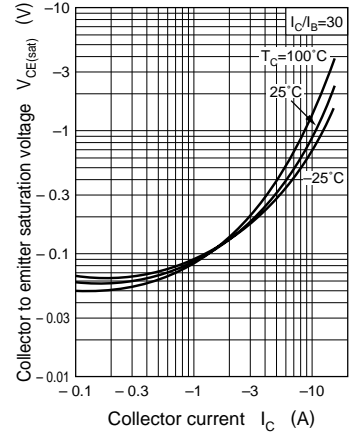
$P_C - T_a$



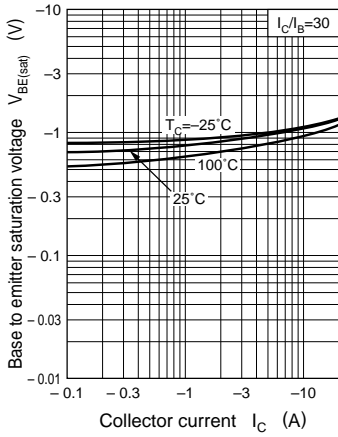
$I_C - V_{CE}$



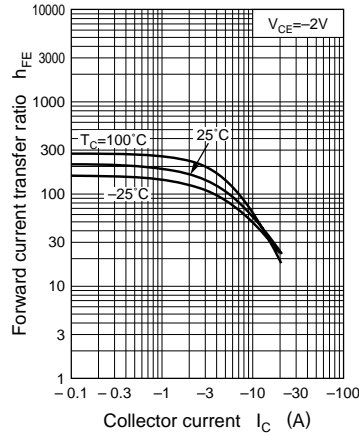
$V_{CE(sat)} - I_C$



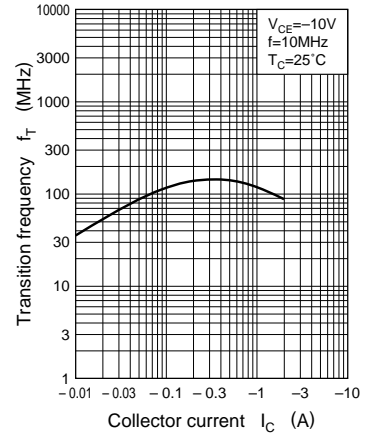
$V_{BE(sat)} - I_C$



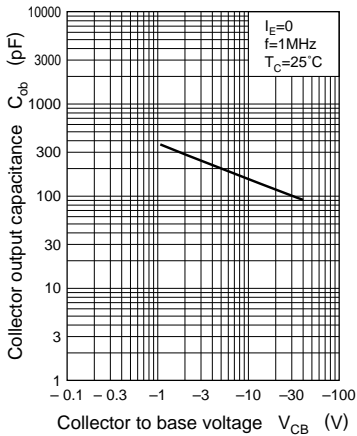
$h_{FE} - I_C$



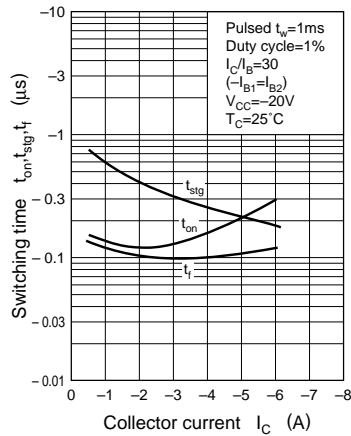
$f_T - I_C$



$C_{ob} - V_{CB}$



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



Area of safe operation (ASO)

