

2SB1604, 2SB1604A

Silicon PNP epitaxial planar type

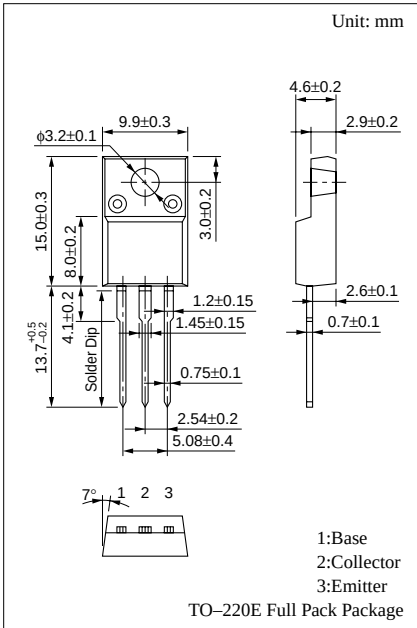
For low-voltage switching

■ Features

- Low collector to emitter saturation voltage $V_{CE(sat)}$
- High-speed switching
- Full-pack package with outstanding insulation, 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}	−40	V
2SB1604A		−50	
Collector to emitter voltage	V_{CEO}	−20	V
2SB1604A		−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	P_C	40	W
$T_C=25^\circ\text{C}$		2	
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	−55 to +150	$^\circ\text{C}$



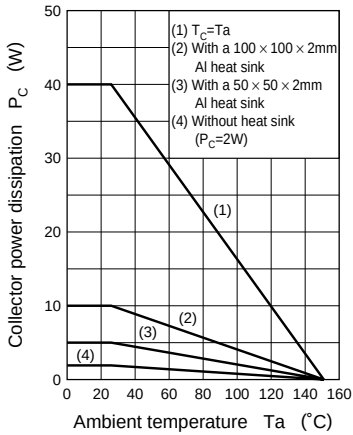
■ Electrical Characteristics ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -40\text{V}, I_E = 0$			−50	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$			−50	μA
Collector to emitter voltage	V_{CEO}	$I_C = -10\text{mA}, I_B = 0$	−20			V
2SB1604A			−40			
Forward current transfer ratio	h_{FE1}	$V_{CE} = -2\text{V}, I_C = -0.1\text{A}$	45			
	h_{FE2}^*	$V_{CE} = -2\text{V}, I_C = -3\text{A}$	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	$V_{CE} = -10\text{V}, I_C = -0.5\text{A}, f = 10\text{MHz}$		100		MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$		400		pF
Turn-on time	t_{on}	$I_C = -3\text{A}, I_{B1} = -0.1\text{A}, I_{B2} = 0.1\text{A}$		0.1		μs
Storage time	t_{stg}			0.5		μs
Fall time	t_f			0.1		μs

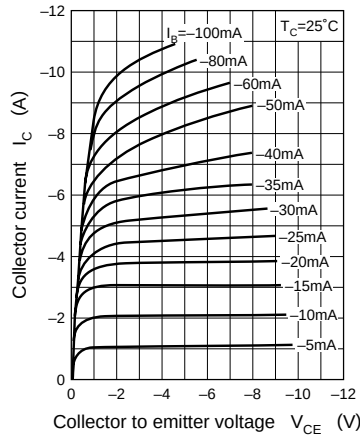
* h_{FE2} Rank classification

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

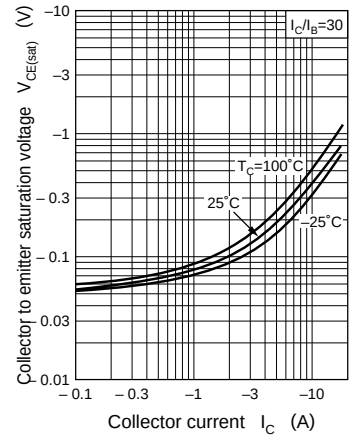
$P_C - T_a$



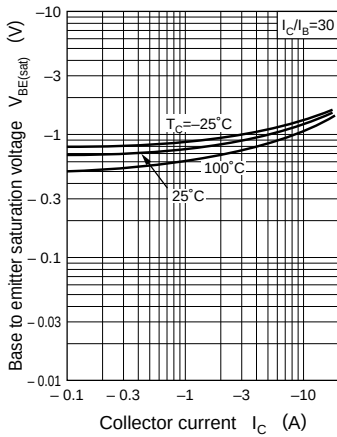
$I_C - V_{CE}$



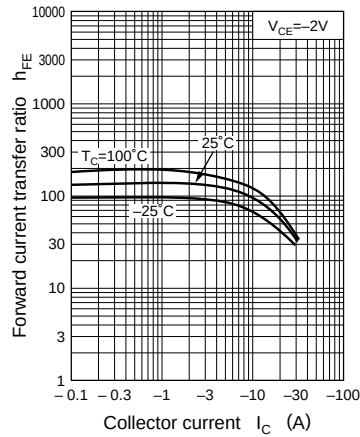
$V_{CE(sat)} - I_C$



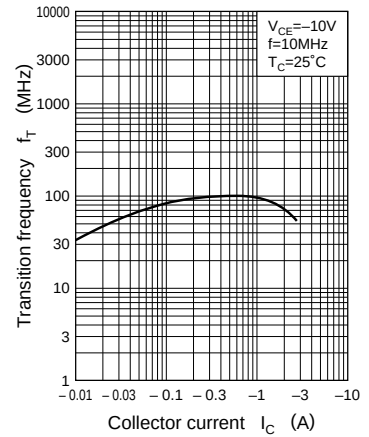
$V_{BE(sat)} - I_C$



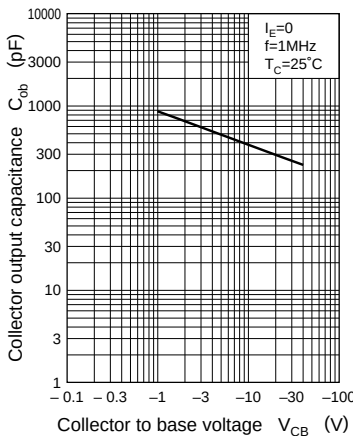
$h_{FE} - I_C$



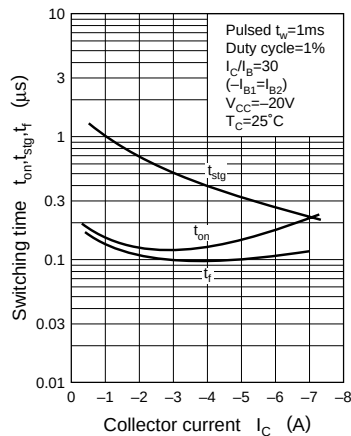
$f_T - I_C$



$C_{ob} - V_{CB}$



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



Area of safe operation (ASO)

