



# 2SA1641

## High-Current Switching Applications

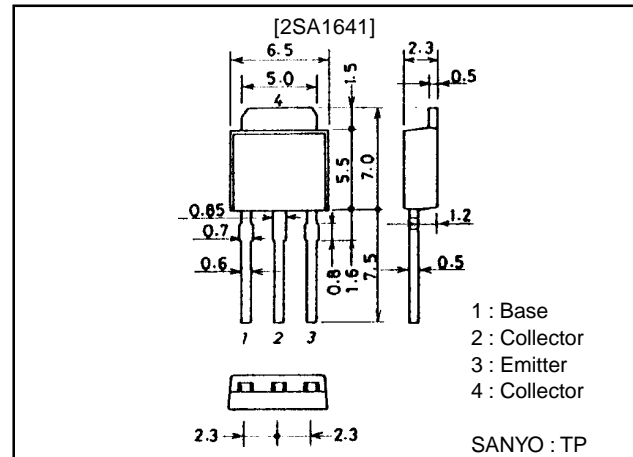
### Features

- Adoption of FBET, MBIT processes.
- Low saturation voltage.
- Fast switching speed.
- Large current capacity.
- Small and slim package making it easy to make 2SA1641-used set smaller.

### Package Dimensions

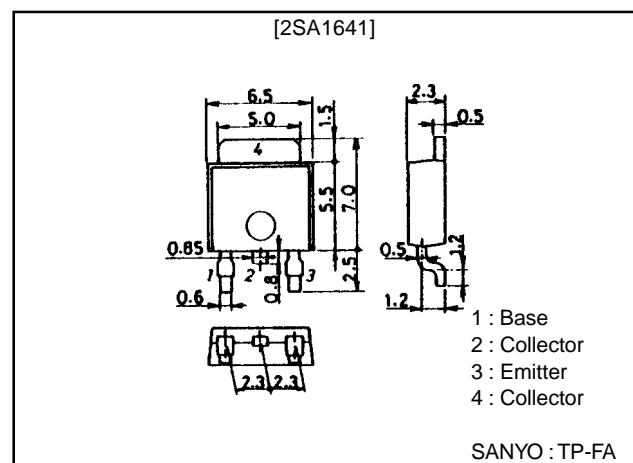
unit:mm

2045B



unit:mm

2044B



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# 2SA1641

## Specifications

### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		-25	V
Collector-to-Emitter Voltage	$V_{CEO}$		-20	V
Emitter-to-Base Voltage	$V_{EBO}$		-5	V
Collector Current	$I_C$		-8	A
Collector Current (Pulse)	$I_{CP}$		-12	A
Base Current	$I_B$		-1.5	A
Collector Dissipation	$P_C$		1	W
		$T_c=25^\circ\text{C}$	15	W
Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

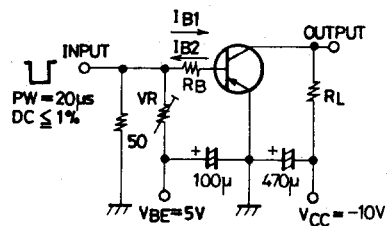
### Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-20\text{V}, I_E=0$			-1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			-1	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$	100*		400*	
	$h_{FE2}$	$V_{CE}=-2\text{V}, I_C=-6\text{A}$	60			
Gain-Bandwidth Product	$f_T$	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$		200		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-5\text{A}, I_B=-250\text{mA}$	-220		-400	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-5\text{A}, I_B=-250\text{mA}$	-1		-1.3	V
Collector Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		85		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-25			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, R_{BE}=\infty$	-20			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5			V
Turn-ON Time	$t_{on}$	See specified Test Circuit		30	300	ns
Storage Time	$t_{stg}$	See specified Test Circuit		200	800	ns
Fall Time	$t_f$	See specified Test Circuit		15	150	ns

\* : The 2SA1641 is classified by 500mA  $h_{FE}$  as follows :

100	R	200	140	S	280	200	T	400
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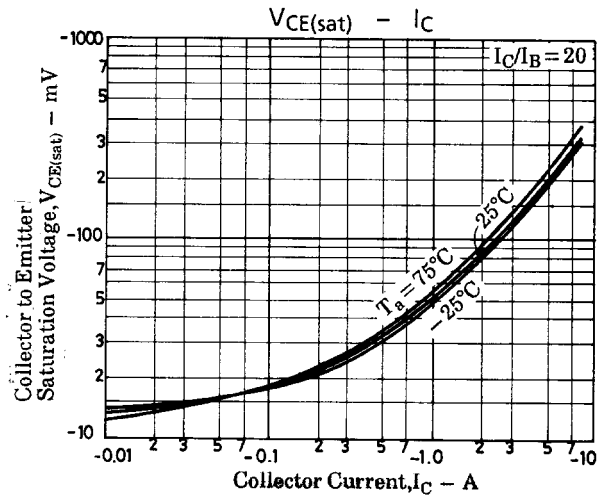
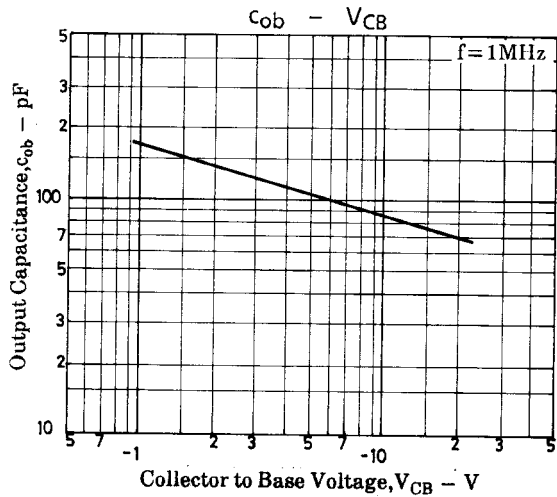
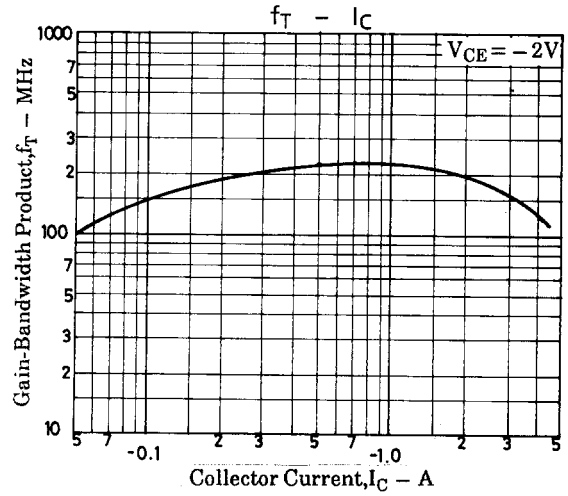
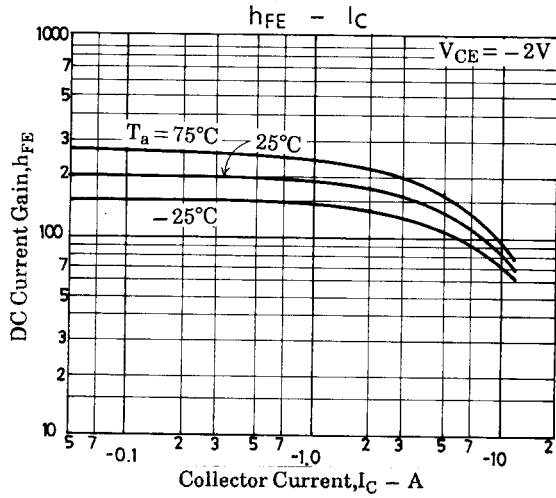
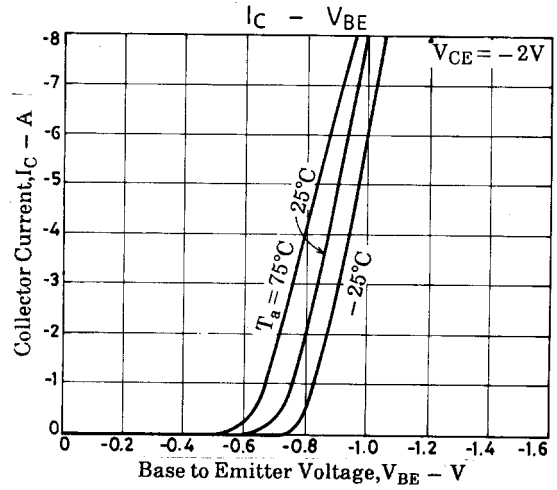
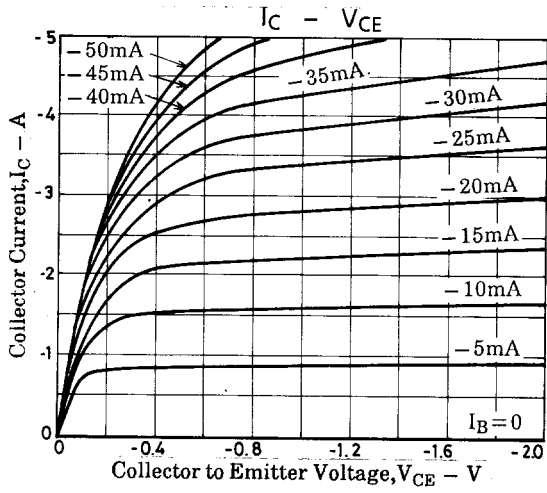
### Switching Time Test Circuit



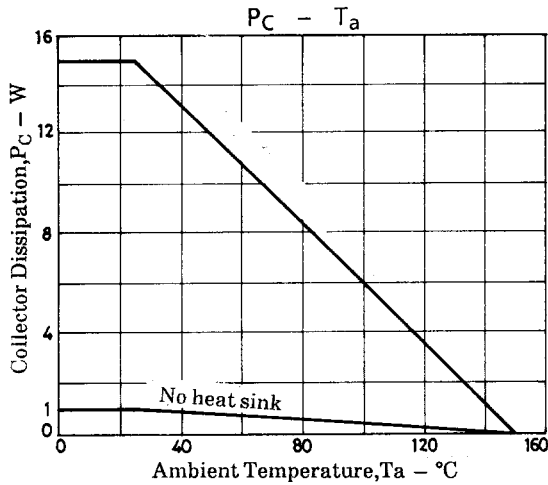
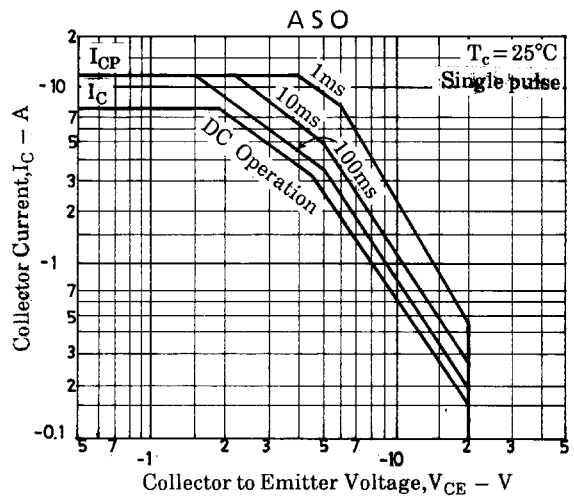
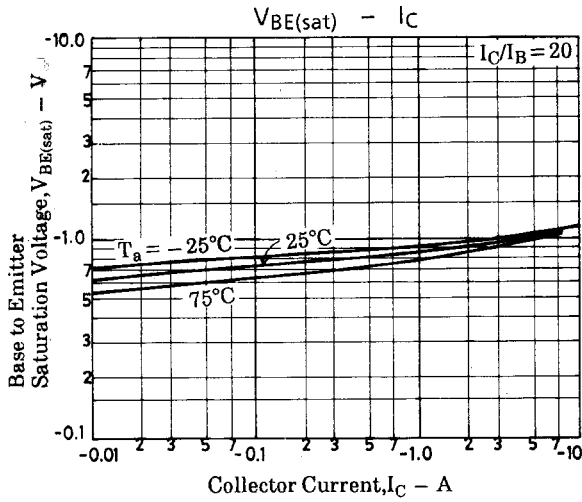
$$20I_{B1} = -20I_{B2} = I_C = -5\text{A}$$

Unit (resistance :  $\Omega$ , capacitance : F)

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