

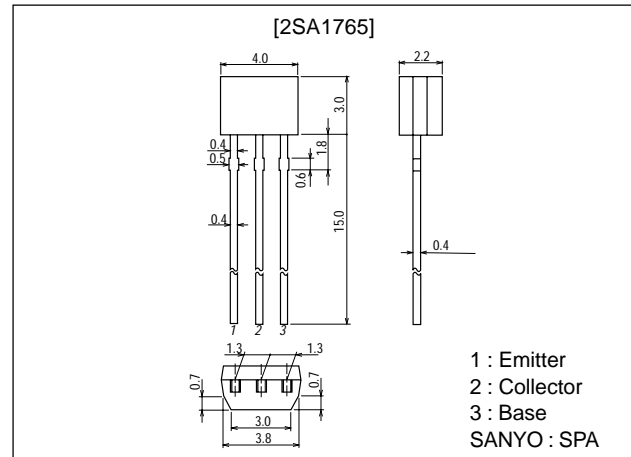
**2SA1765****High-Speed Switching Applications****Features**

- Fast switching speed.
- Low collector saturation voltage.
- High gain-bandwidth product.
- Small collector capacitance.
- Complementary pair with the 2SC4454.

**Package Dimensions**

unit:mm

2033A

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		-15	V
Collector-to-Emitter Voltage	$V_{CEO}$		-15	V
Emitter-to-Base Voltage	$V_{EBO}$		-5	V
Collector Current	$I_C$		-200	mA
Collector Current (Pulse)	$I_{CP}$		-500	mA
Base Current	$I_B$		-40	mA
Collector Dissipation	$P_C$		300	mW
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	$I_{CBO}$	$V_{CB}=-8\text{V}, I_E=0$			-0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-3\text{V}, I_C=0$			-0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=-1\text{V}, I_C=-10\text{mA}$	50	80	140	
Gain-Bandwidth Product	$f_T$	$V_{CE}=-10\text{V}, I_C=-10\text{mA}$	450	1000		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=-5\text{V}, f=1\text{MHz}$		2.0	3.0	pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$		-0.07	-0.20	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$		-0.80	-0.90	V

Continued on next page.

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**SANYO Electric Co., Ltd. Semiconductor Company**

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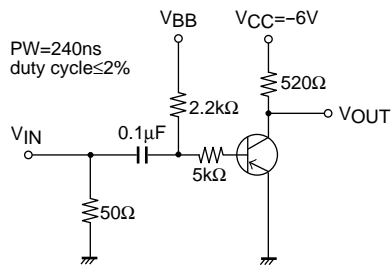
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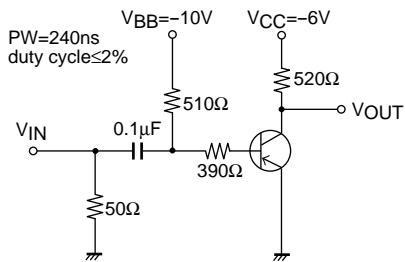
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0$	-15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1mA, R_{BE} = \infty$	-15			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-5			V
Turn-ON Time	$t_{on}$	See specified Test Circuit		11	25	ns
Storage Time	$t_{stg}$	See specified Test Circuit		21	60	ns
Turn-OFF Time	$t_{off}$	See specified Test Circuit		19	60	ns

## Switching Time Test Circuit

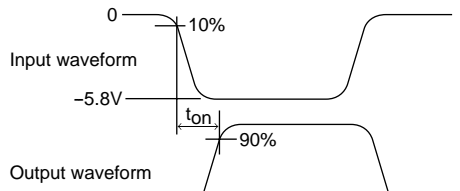
$t_{on}, t_{off}$  Test Circuit



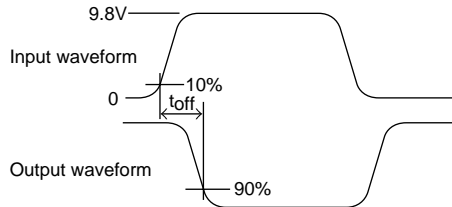
$t_{stg}$  Test Circuit



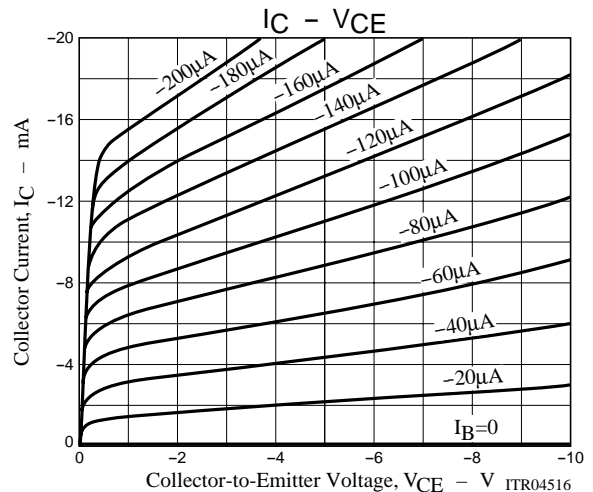
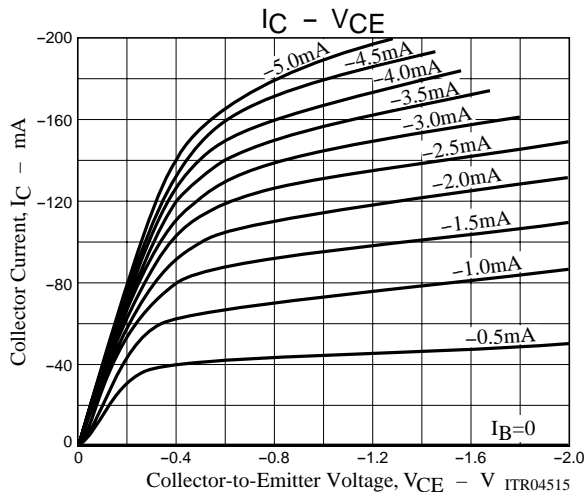
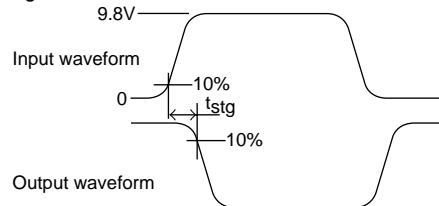
$t_{on}$  Test Waveform ( $V_{BB} = GND$ )



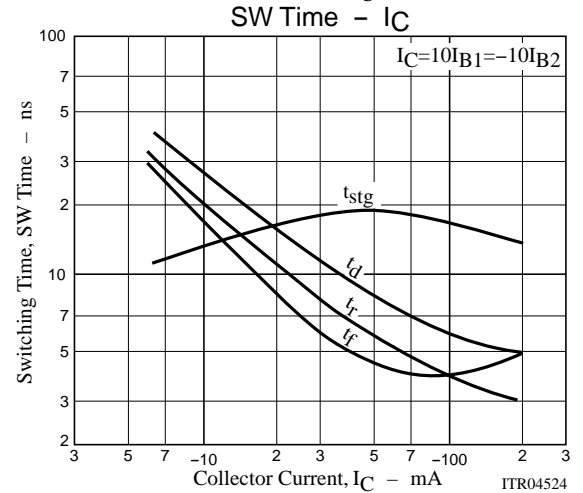
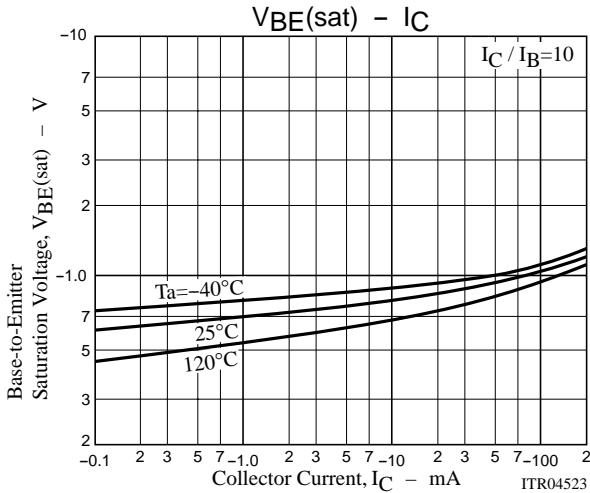
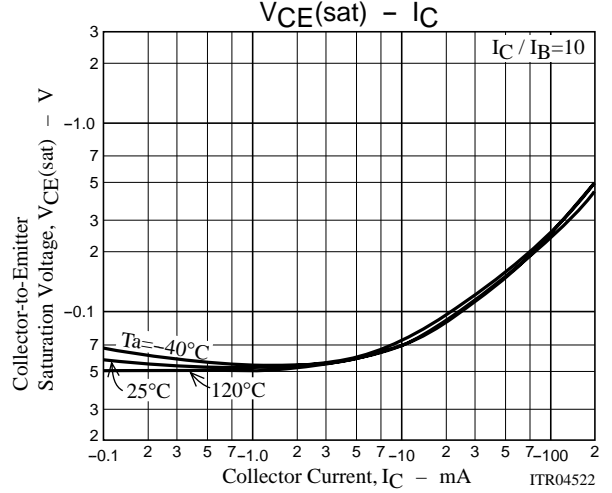
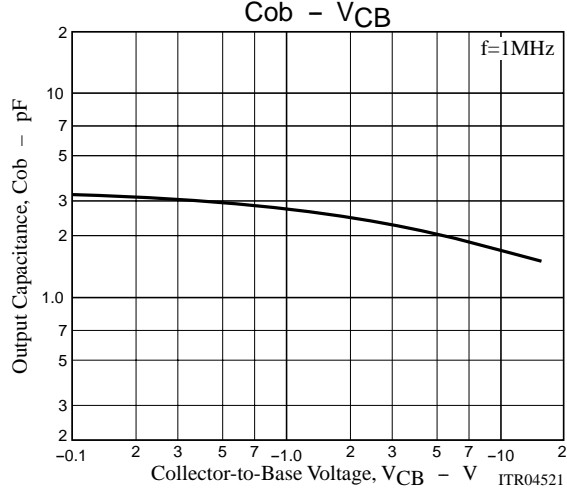
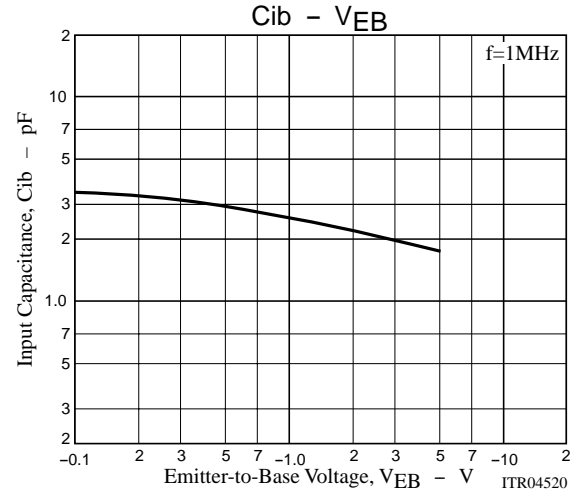
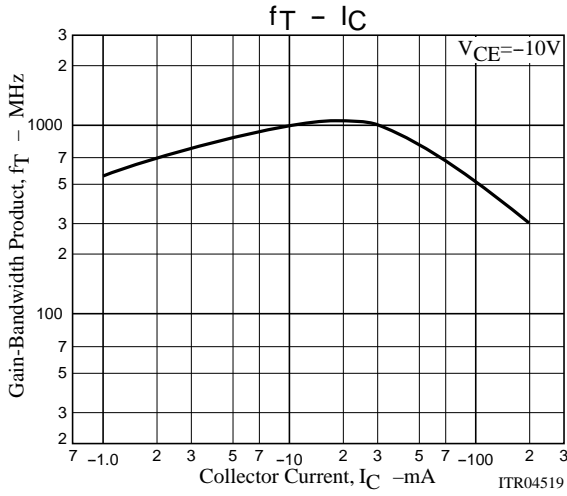
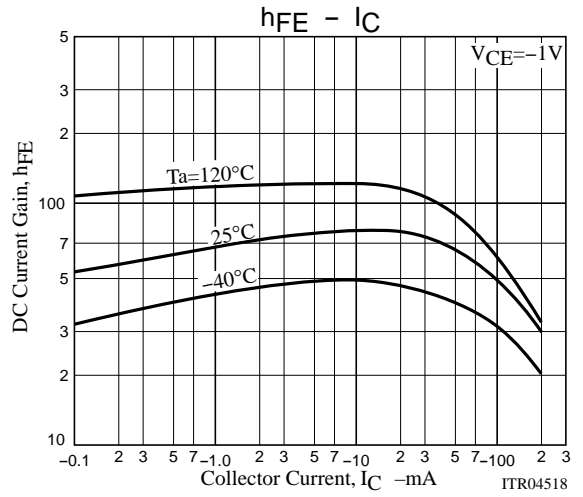
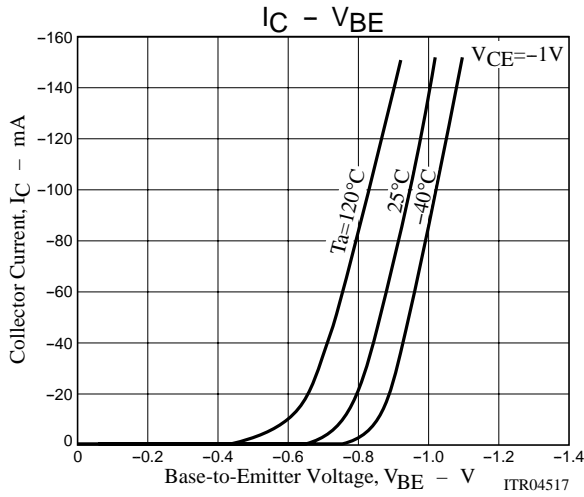
$t_{off}$  Test Waveform ( $V_{BB} = -8.0V$ )



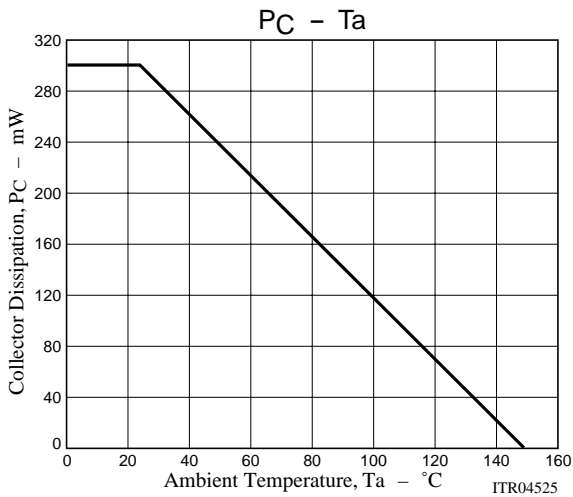
$t_{stg}$  Test Waveform



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## 2SA1765



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