



2SB1165/2SD1722

50V/5A Switching Applications

Applications

- Relay drivers, high-speed inverters, converters.

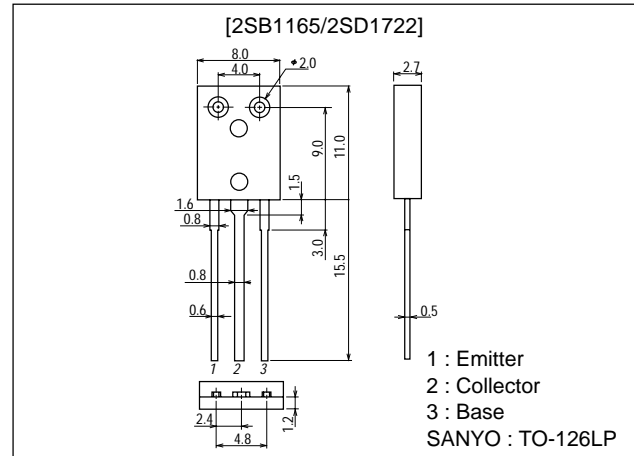
Features

- Low collector-to-emitter saturation voltage.
- High f_T .
- Excellent linearity of h_{FE} .
- Fast switching time.

Package Dimensions

unit:mm

2043B



() : 2SB1165

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		(-)60	V
Collector-to-Emitter Voltage	V_{CEO}		(-)50	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)5	A
Collector Current (Pulse)	I_{CP}		(-)8	A
Collector Dissipation	P_C		1.2	W
		$T_c=25^\circ\text{C}$	20	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}	$V_{CB}=-40\text{V}, I_E=0$			(-)1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-4\text{V}, I_C=0$			(-)1	μA
DC Current Gain	h_{FE1}	$V_{CE}=-2\text{V}, I_C=-0.5\text{A}$	70*		400*	
	h_{FE2}	$V_{CE}=-2\text{V}, I_C=-4\text{A}$	35			
Gain-Bandwidth Product	f_T	$V_{CE}=-5\text{V}, I_C=-1\text{A}$		180		MHz
				(130)		MHz

* : The 2SB1165/2SD1722 are classified by 0.5A h_{FE} as follows :

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Rank	Q	R	S	T
h_{FE}	70 to 140	100 to 200	140 to 280	200 to 400

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SANYO Electric Co., Ltd. Semiconductor Company

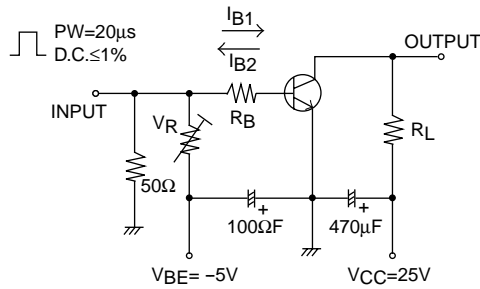
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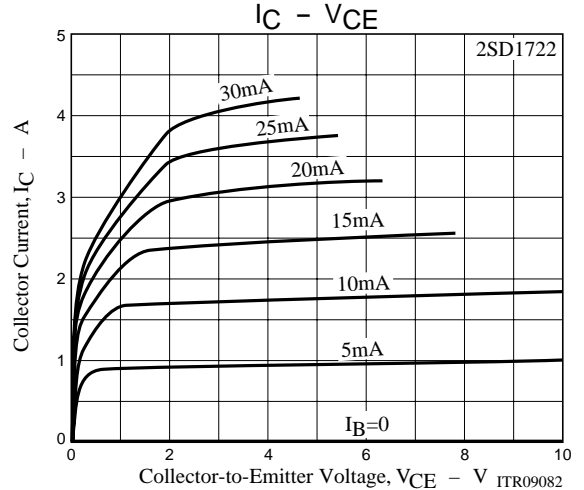
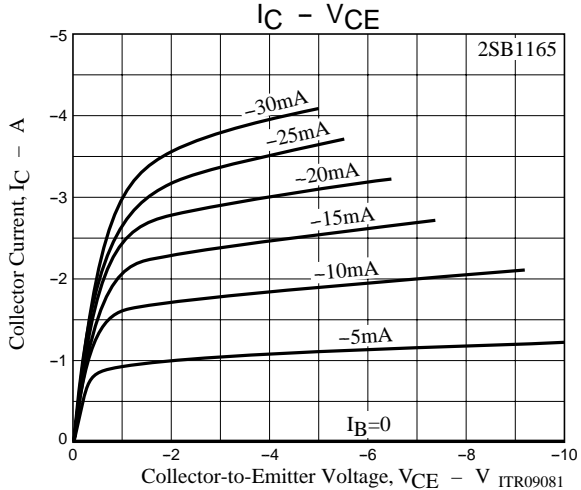
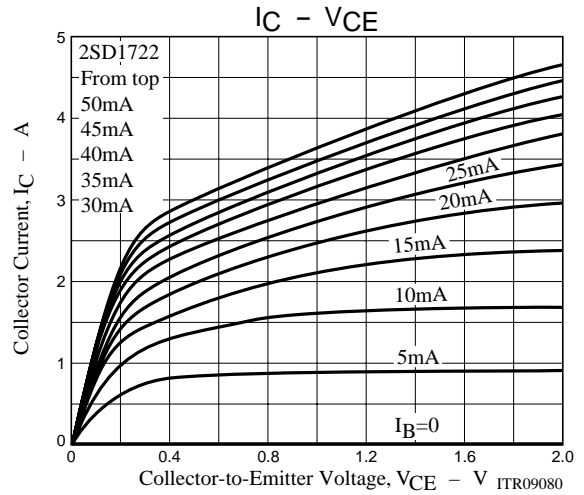
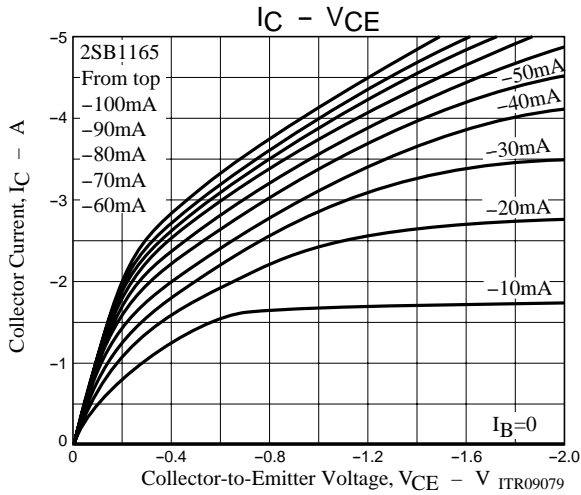
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	C_{ob}	$V_{CB}(-)10V, f=1MHz$		40(60)		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C(-)3A, I_B(-)0.15A$		220	400	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C(-)3A, I_B(-)0.15A$		(-280)	(-550)	mV
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C(-)10\mu A, I_E=0$	(-60)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C(-)1mA, R_{BE}=\infty$	(-50)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E(-)10\mu A, I_C=0$	(-6)			V
Turn-ON Time	t_{on}	See specified Test Circuit		(50)50		ns
Storage Time	t_{stg}	See specified Test Circuit		500		ns
Fall Time	t_f	See specified Test Circuit		(450)		ns
				20(20)		ns

Switching Time Test Circuit

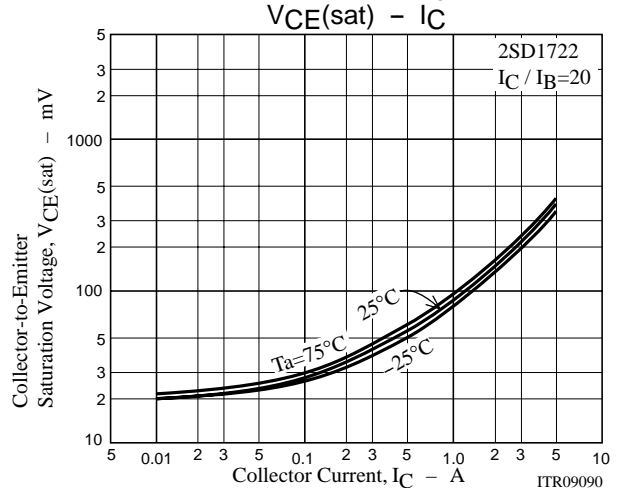
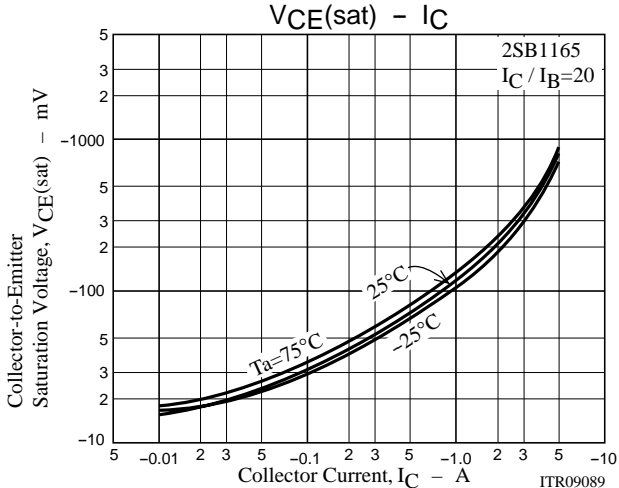
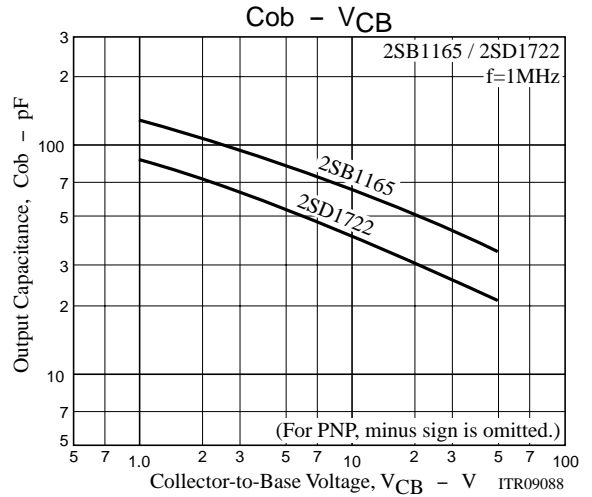
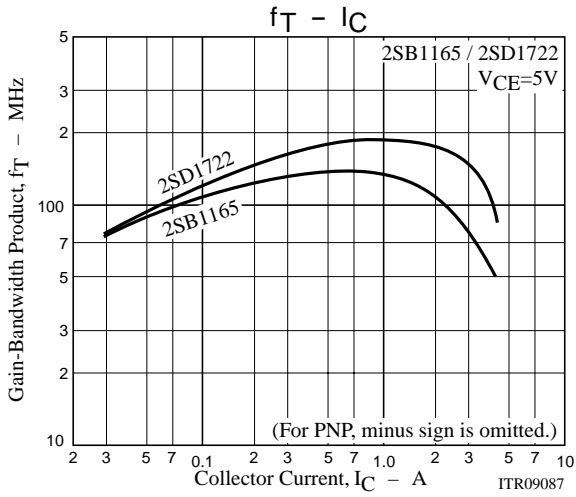
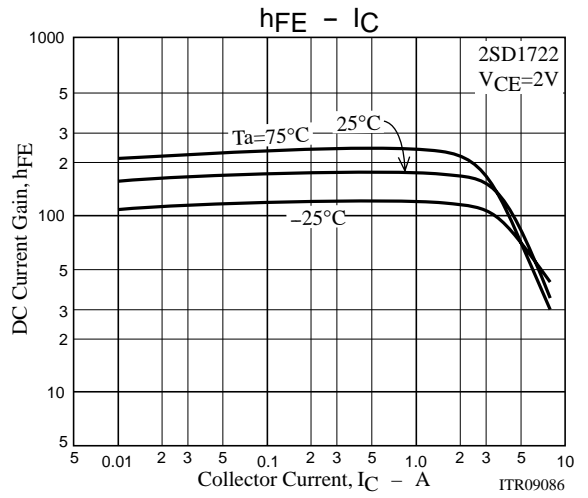
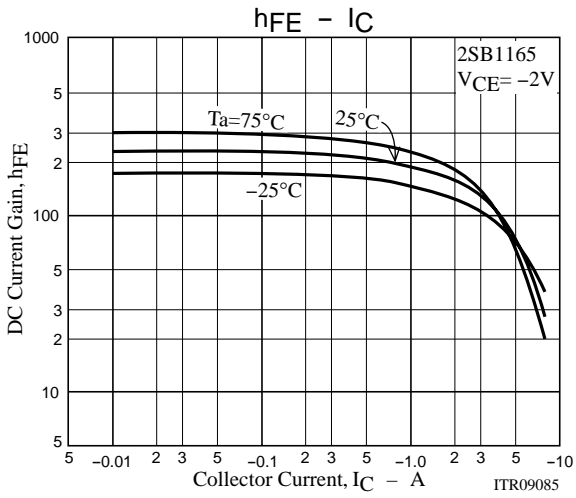
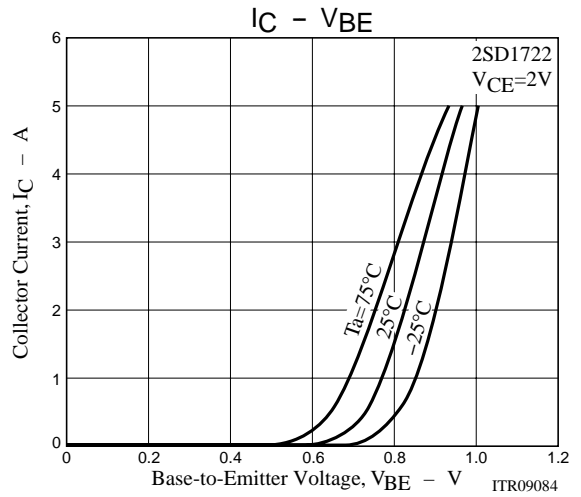
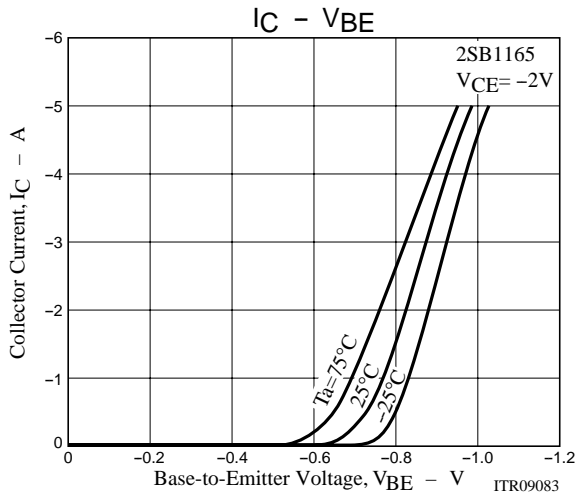


$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

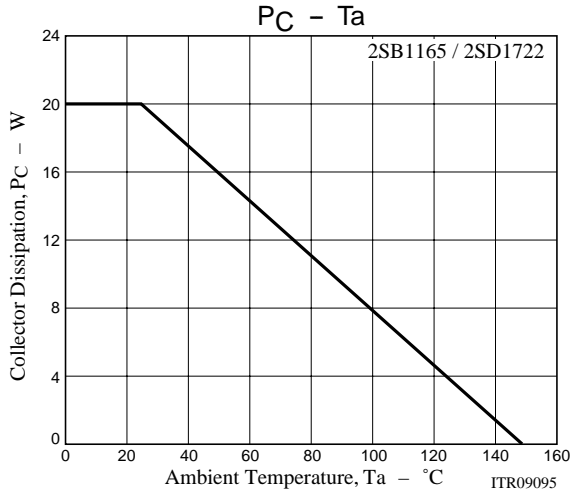
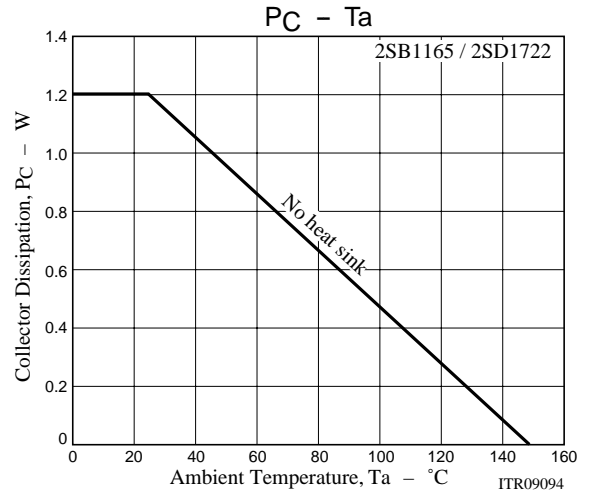
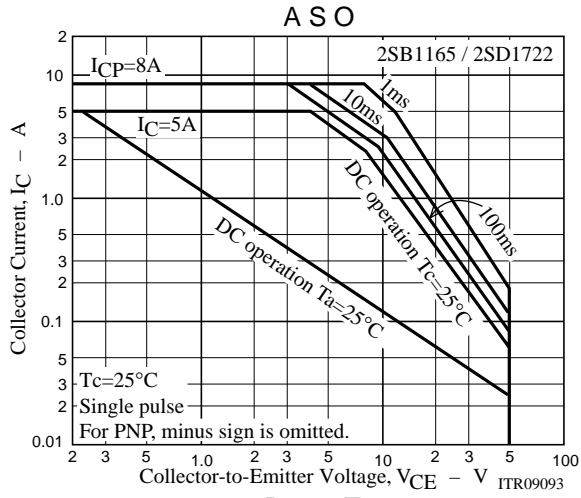
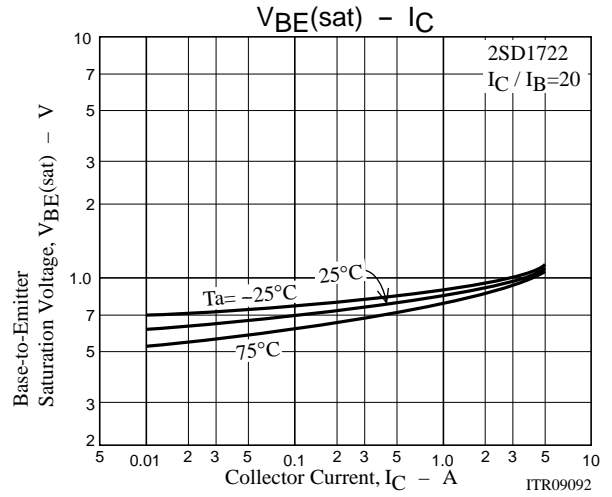
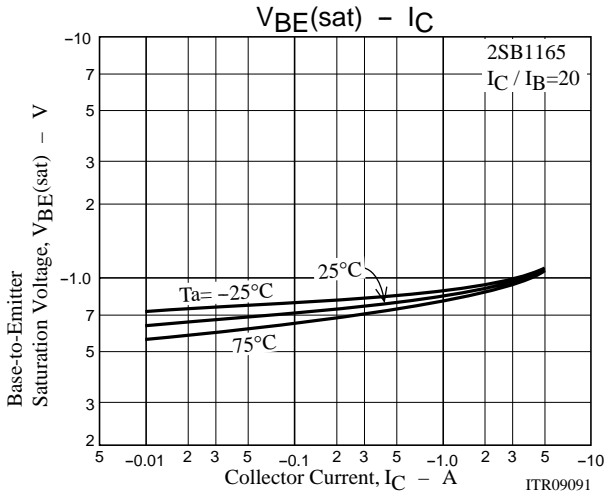
(For PNP, the polarity is reversed.)



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