



2SB1168/2SD1725

Large Current Switching Applications

An ON Semiconductor Company

Features

- Relay drivers, high-speed inverters, converters.

Features

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

Specifications

() : 2SB1168

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)120	V
Collector-to-Emitter Voltage	V_{CEO}		(-)100	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)4	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}	$V_{CB}=(-)100\text{V}, I_E=0$			(-)1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	μA
DC Current Gain	h_{FE1}	$V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$	70*		400*	
	h_{FE2}	$V_{CE}=(-)5\text{V}, I_C=(-)3\text{A}$	40			
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10\text{V}, I_C=(-)0.5\text{A}$		(130)		MHz
				180		MHz

* : The 2SB1168/2SD1725 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

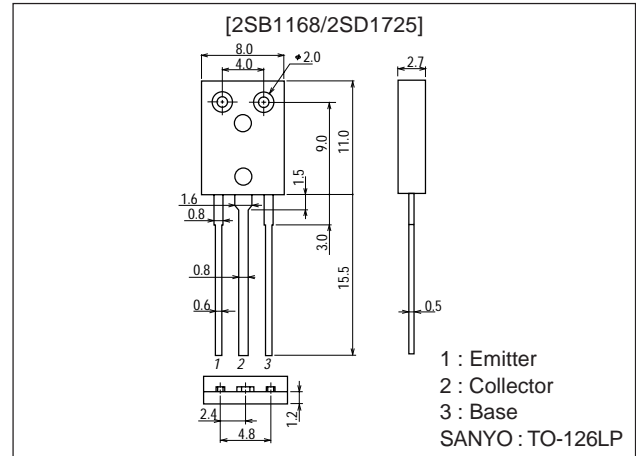
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Package Dimensions

unit:mm

2043B

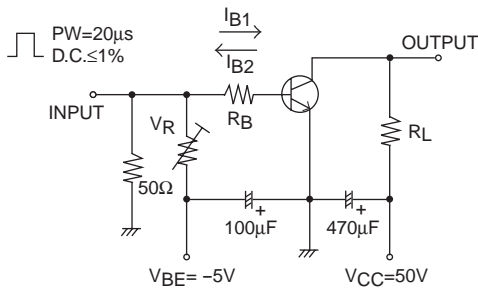


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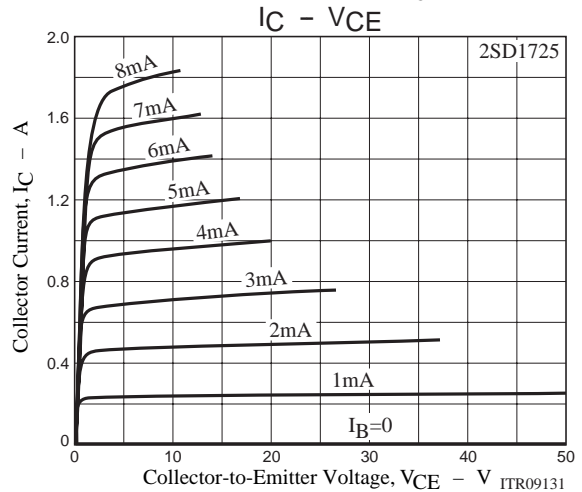
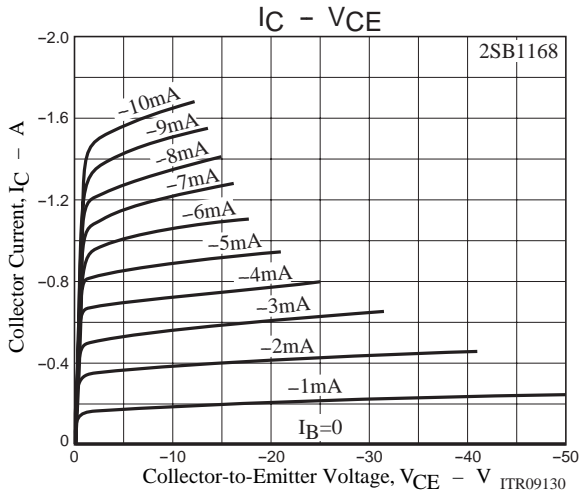
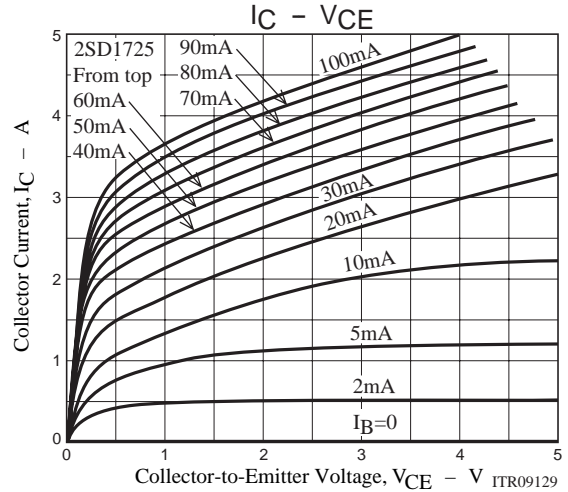
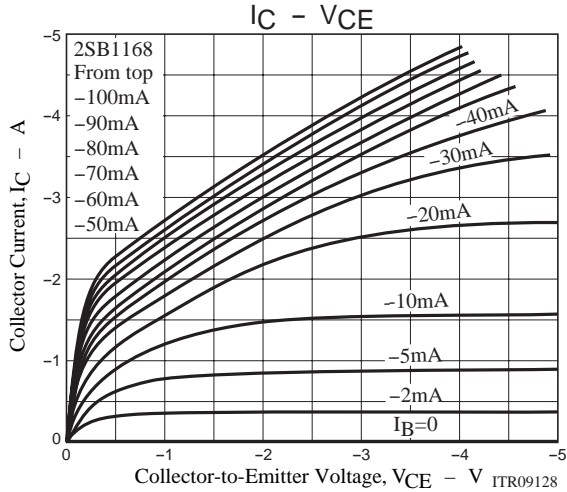
Parameter	Symbol	Conditions	Ratings			Unit	
			min	typ	max		
Output Capacitance	C_{ob}	$V_{CB}=(-)10V, f=1MHz$		40(65)		pF	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)2A, I_B=(-)0.2A$		(-200)	(-500)	mV	
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)2A, I_B=(-)0.2A$		150	400	mV	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-)120			V	
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)100			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		(100)		ns	
					100		ns
Storage Time	t_{stg}				900		ns
					(800)		ns
Fall Time	t_f				50(50)		ns

Switching Time Test Circuit

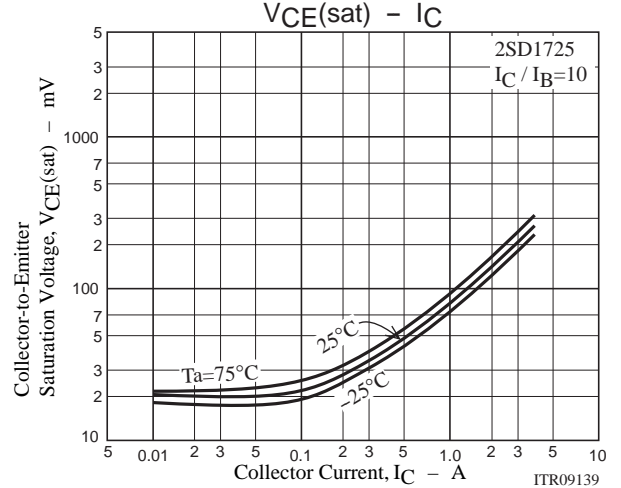
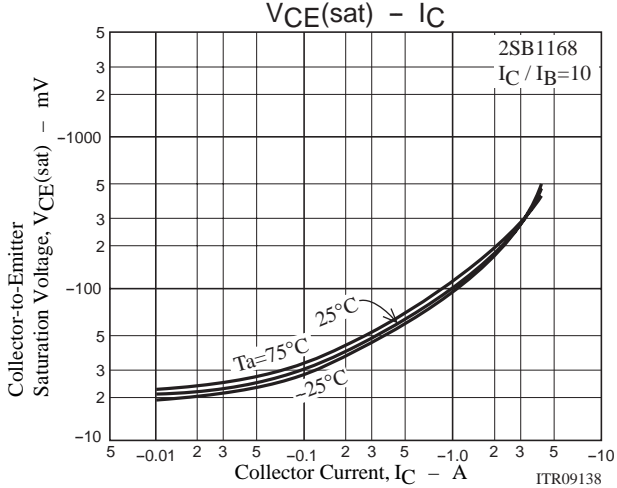
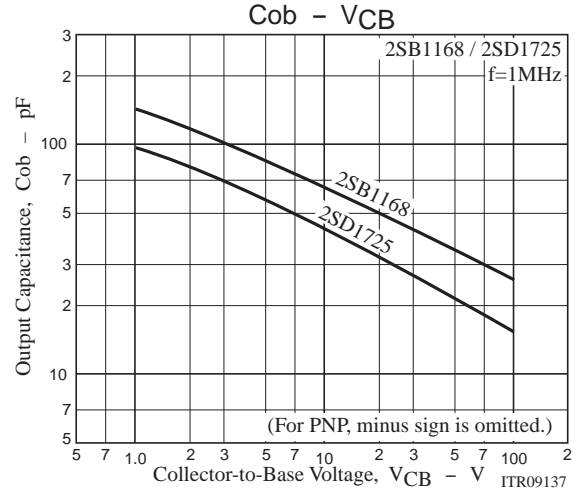
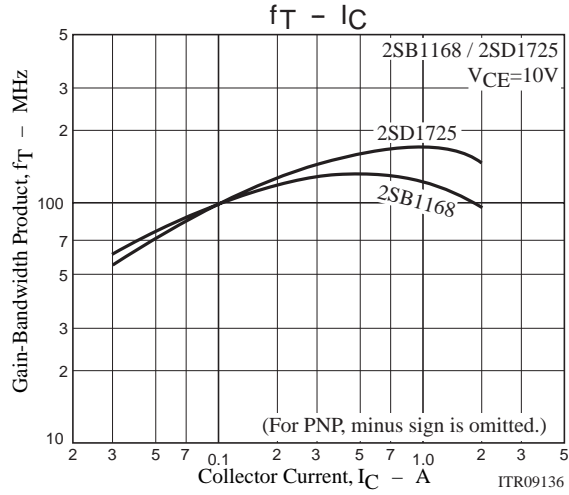
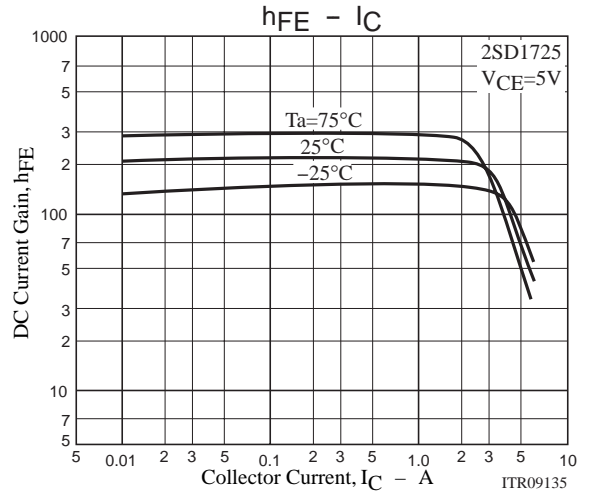
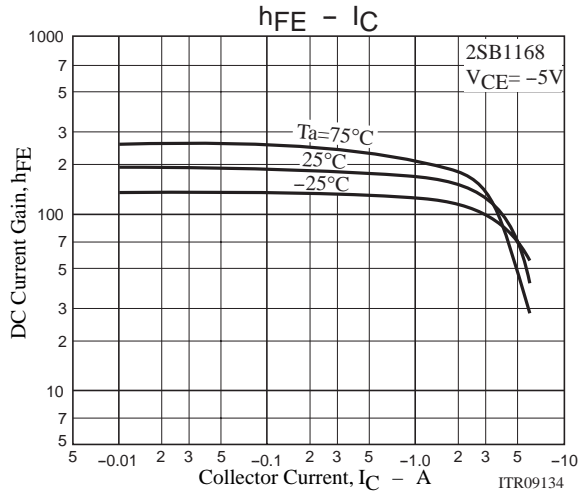
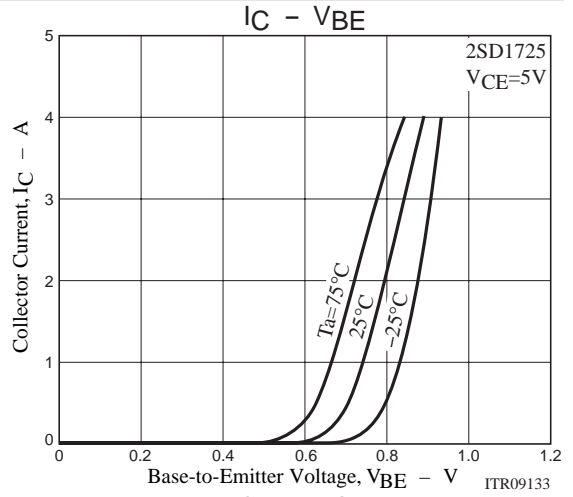
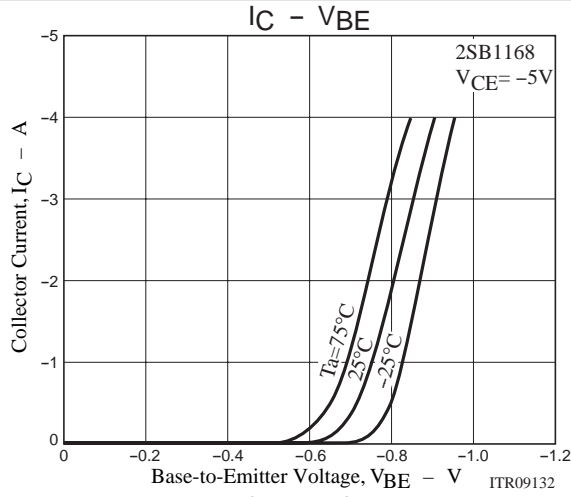


$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

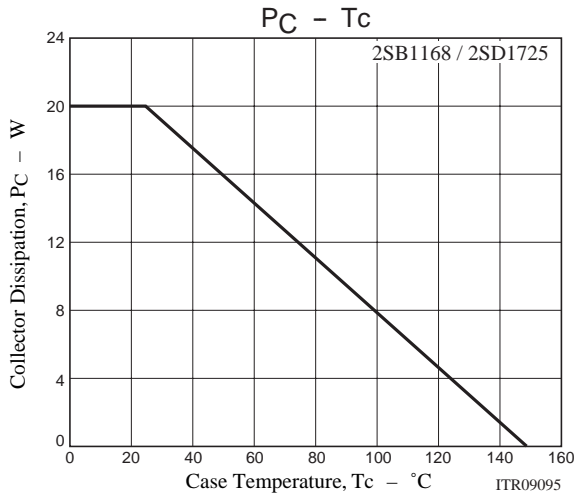
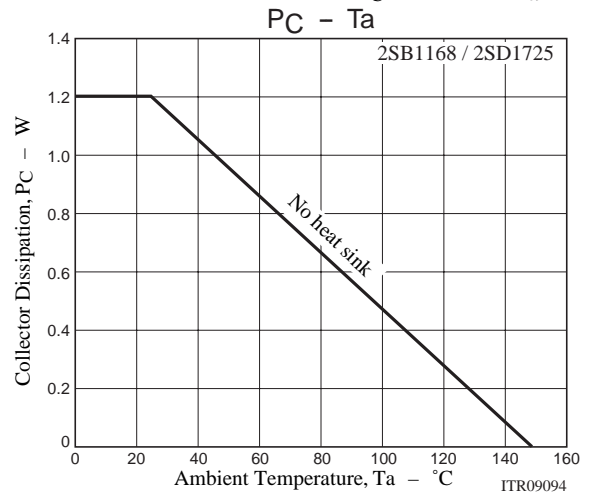
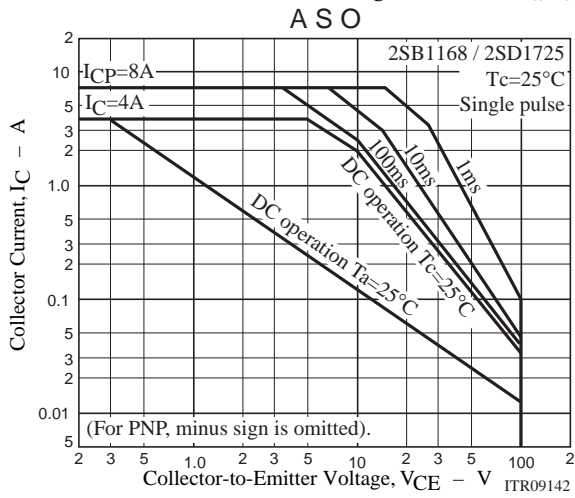
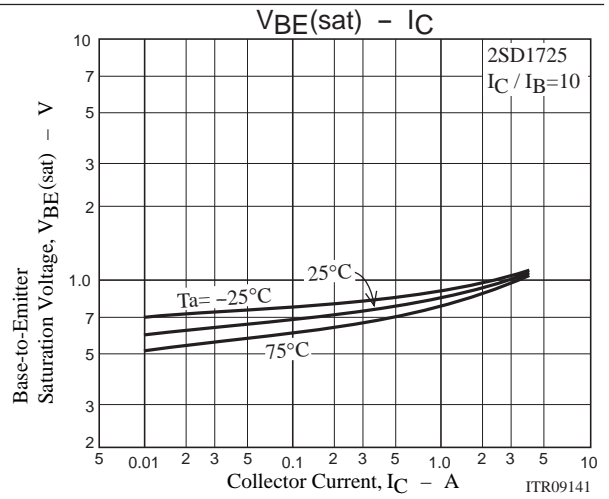
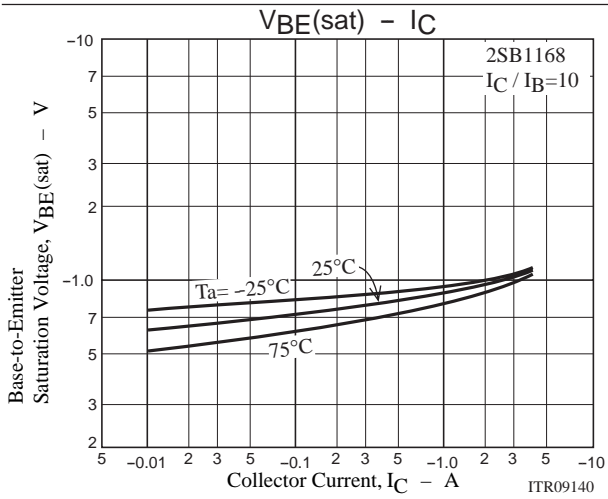
For PNP, the polarity is reversed.



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