



2SB1168/2SD1725

Large Current Switching Applications

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	$T_c=25^\circ\text{C}$	1.2	W
			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

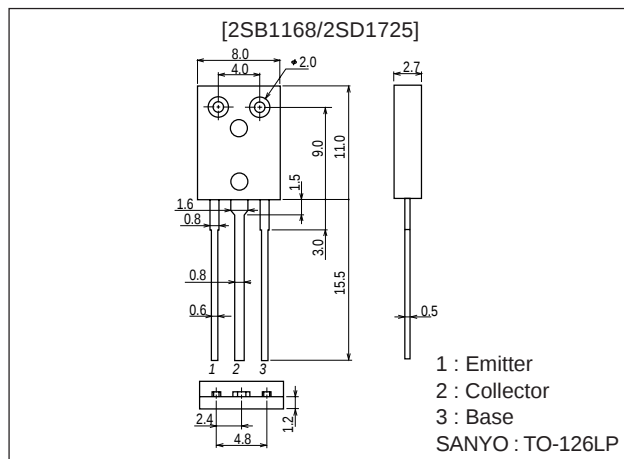
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Package Dimensions

unit:mm

2043B

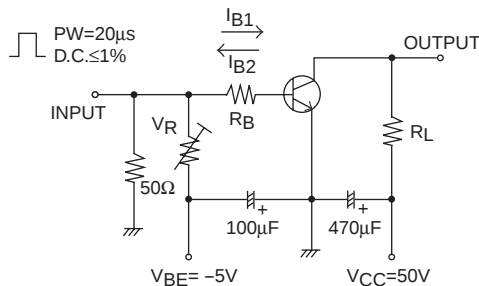


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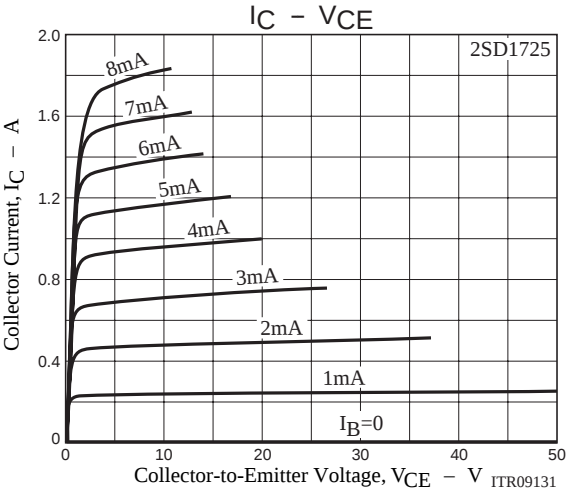
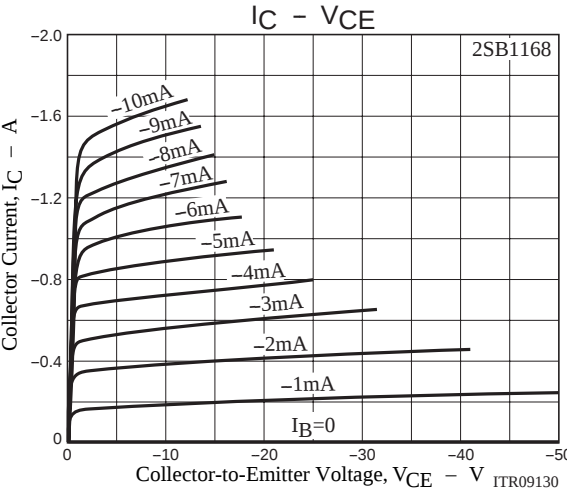
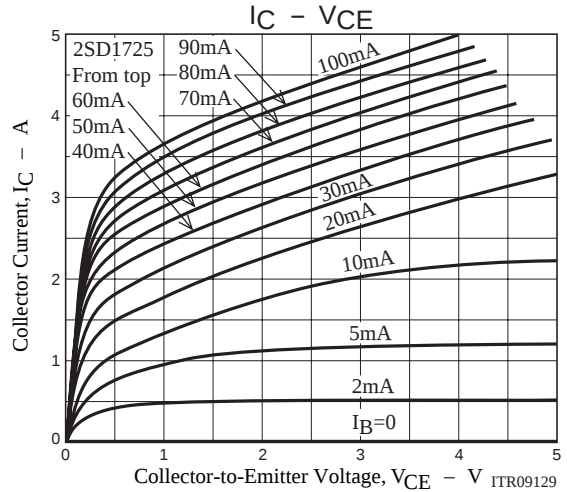
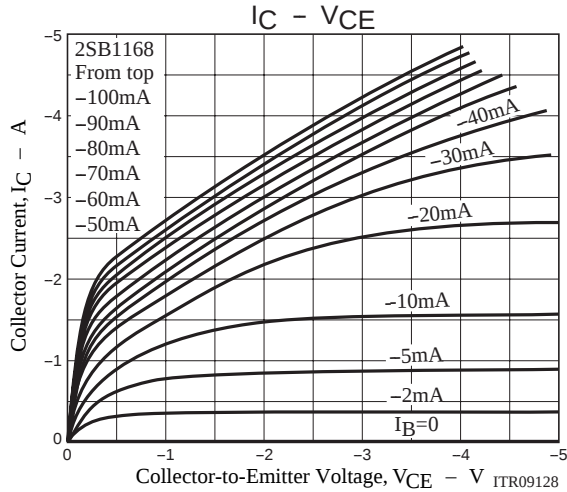
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Parameter	Symbol	Conditions	Ratings			Unit	
			min	typ	max		
Output Capacitance	C _{ob}	V _{CB} =(-)10V, f=1MHz		40(65)		pF	
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}	I _C =(-)2A, I _B =(-)0.2A		(-200)	(-500)	mV	
				150	400	mV	
Base-to-Emitter Saturation Voltage	V _{BE(sat)}	I _C =(-)2A, I _B =(-)0.2A		(-)0.9	(-)1.2	V	
Collector-to-Base Breakdown Voltage	V _{(BR)CBO}	I _C =(-)10μA, I _E =0	(-)120			V	
Collector-to-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C =(-)1mA, R _{BE} =∞	(-)100			V	
Emitter-to-Base Breakdown Voltage	V _{(BR)EBO}	I _E =(-)10μA, 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

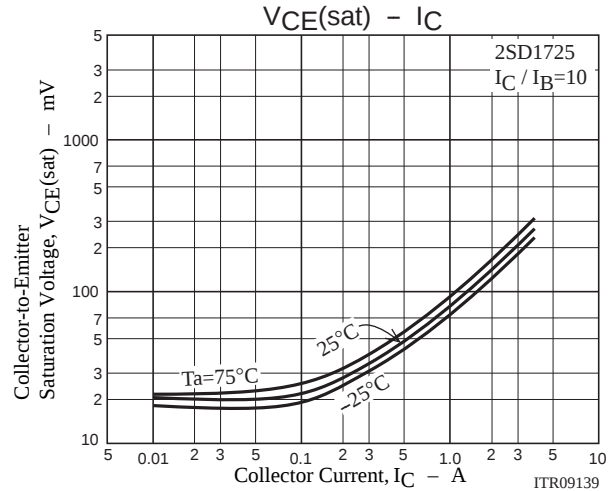
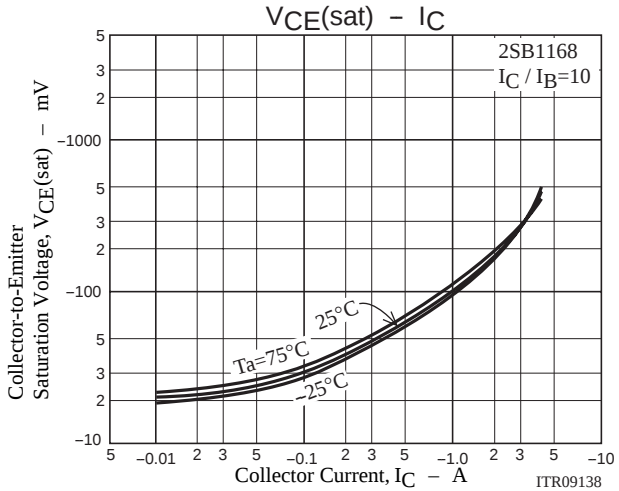
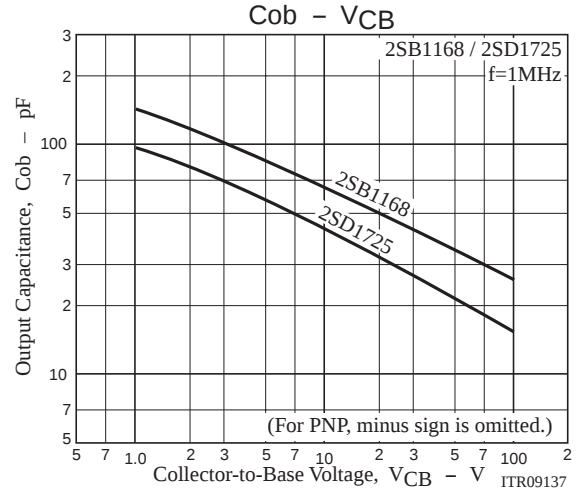
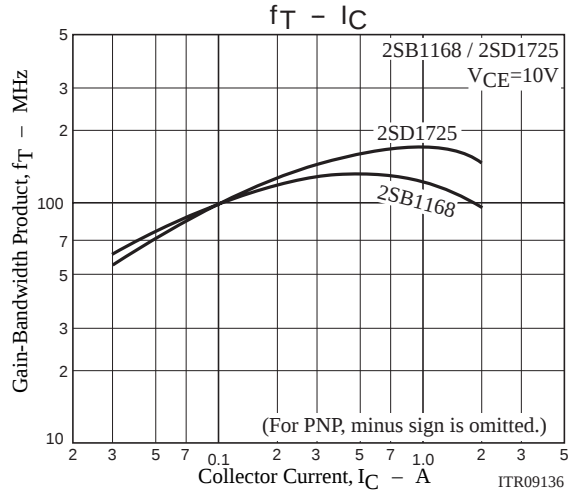
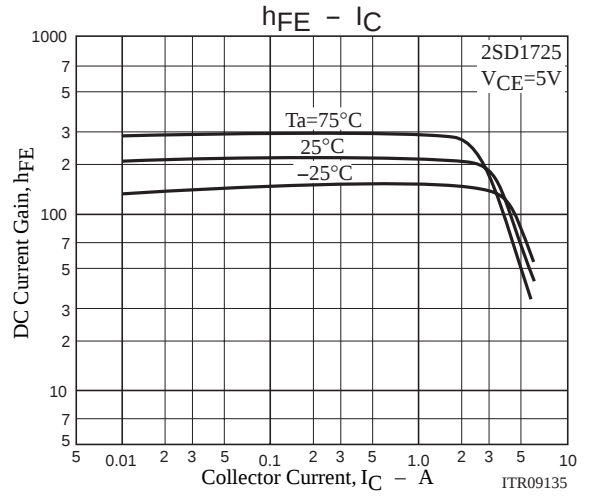
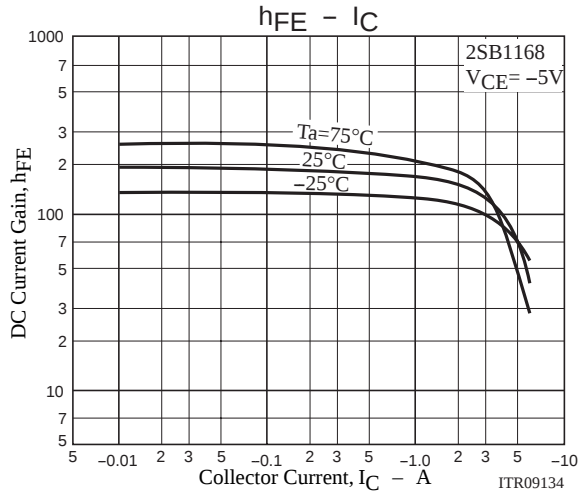
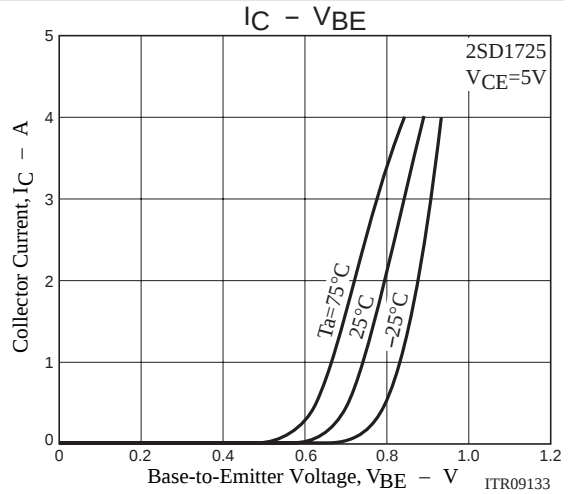
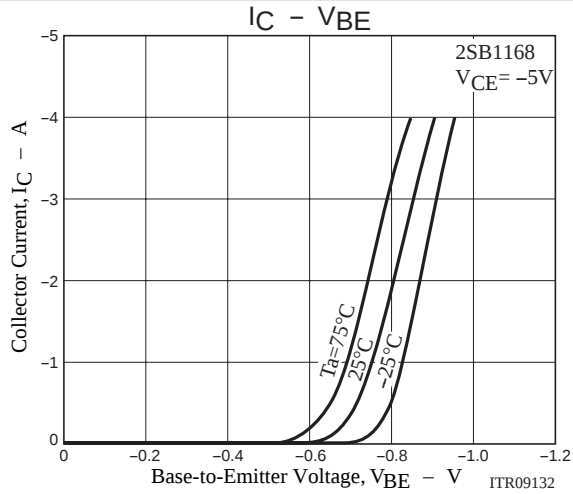
Switching Time Test Circuit



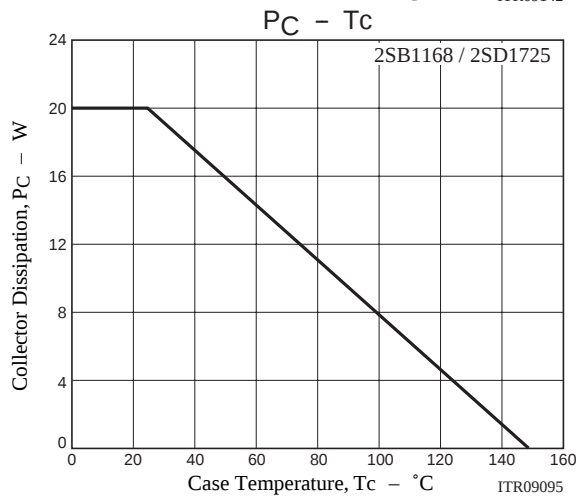
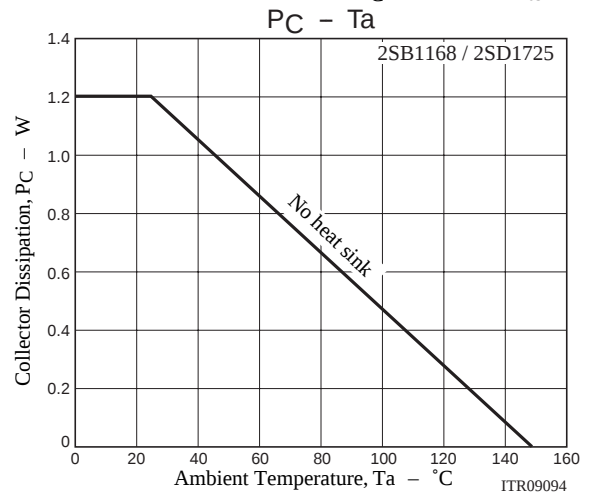
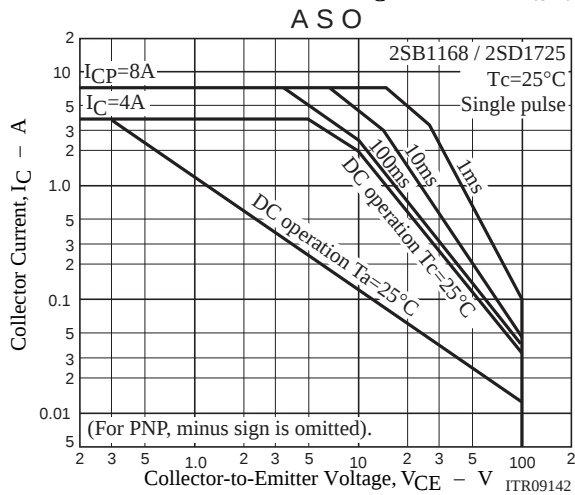
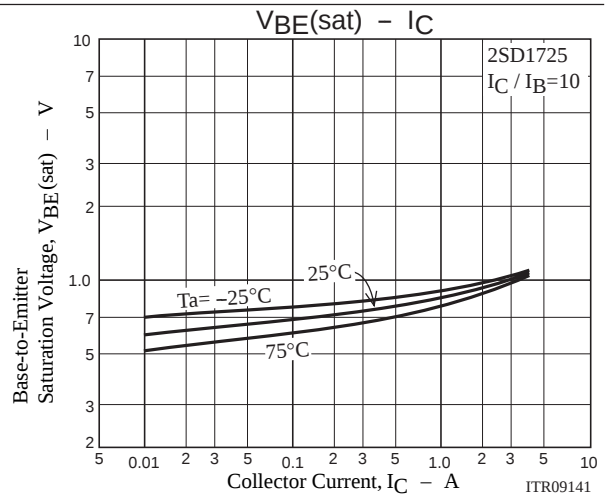
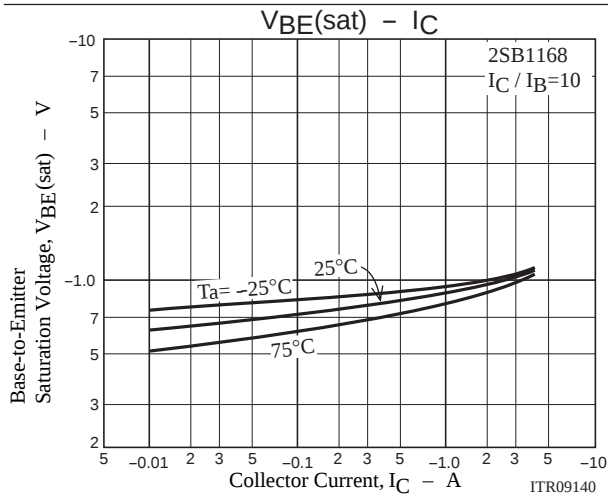
$I_C=10I_{B1}=-10I_{B2}=2A$
For PNP, the polarity is reversed.



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