

**2SB1140****20V/5A Switching Applications****Applications**

- Strobes, power supplies, relay drivers, lamp drivers.

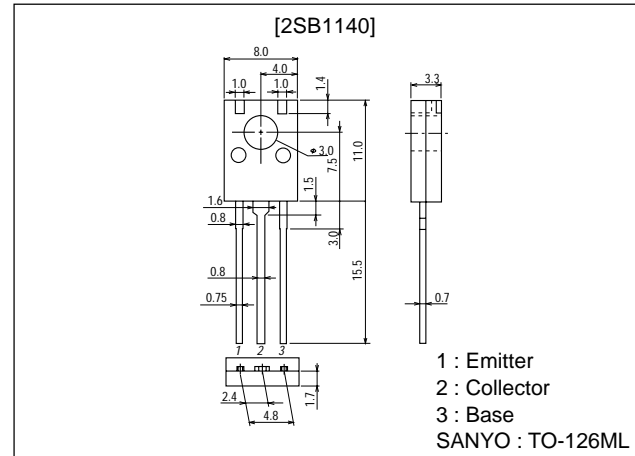
Features

- Adoption of FBET, MBIT processes.
- Low saturation voltage.
- Large current capacity.
- Short switching time.

Package Dimensions

unit:mm

2042B

**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_{CE0}		-20	V
Emitter-to-Base Voltage	V_{EB0}		-5	V
Collector Current	I_C		-5	A
Collector Current (Pulse)	I_{CP}		-8	A
Base Current	I_B		-0.5	A
Collector Dissipation	P_C		1.5	W
		$T_c=25^\circ\text{C}$	10	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_{CB0}	$V_{CB}=-20\text{V}, I_E=0$			-500	nA
Emitter Cutoff Current	I_{EB0}	$V_{EB}=-4\text{V}, I_C=0$			-500	nA
DC Current Gain	h_{FE1}	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$	100*		400*	
	h_{FE2}	$V_{CE}=-2\text{V}, I_C=-4\text{A}$	60			
Gain-Bandwidth Product	f_T	$V_{CE}=-5\text{V}, I_C=-200\text{mA}$		320		MHz

* : The 2SB1140 is classified by 500mA h_{FE} as follows :

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

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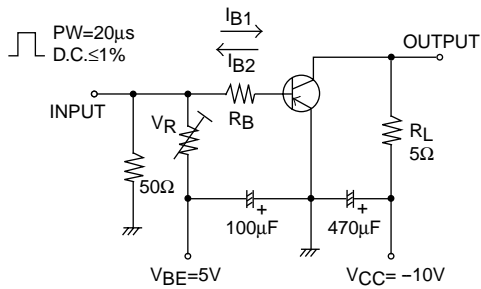
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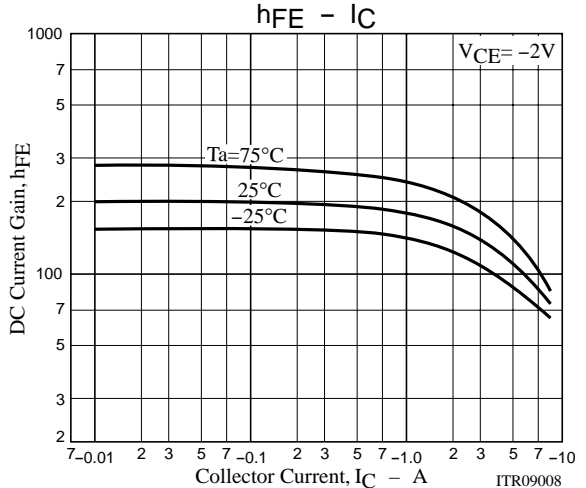
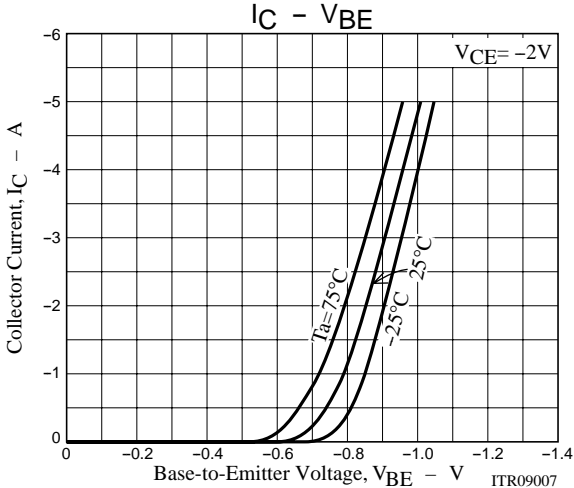
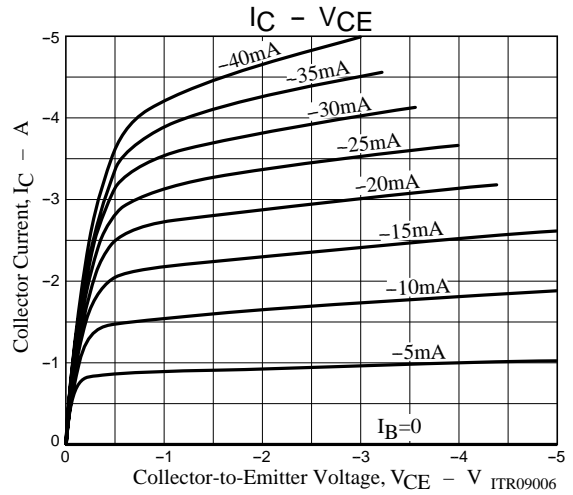
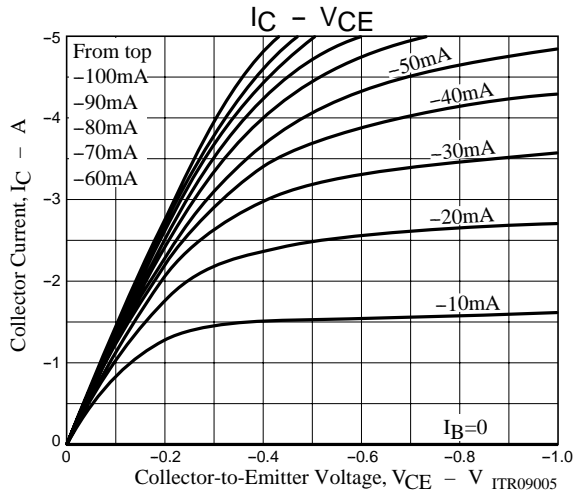
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	C_{ob}	$V_{CB}=-10V, f=1MHz$		60		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-3A, I_B=-60mA$		-250	-500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-3A, I_B=-60mA$		-1.0	-1.3	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	-25			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	-20			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.		40		ns
Storage Time	t_{stg}	See specified Test Circuit.		200		ns
Fall Time	t_f	See specified Test Circuit.		10		ns

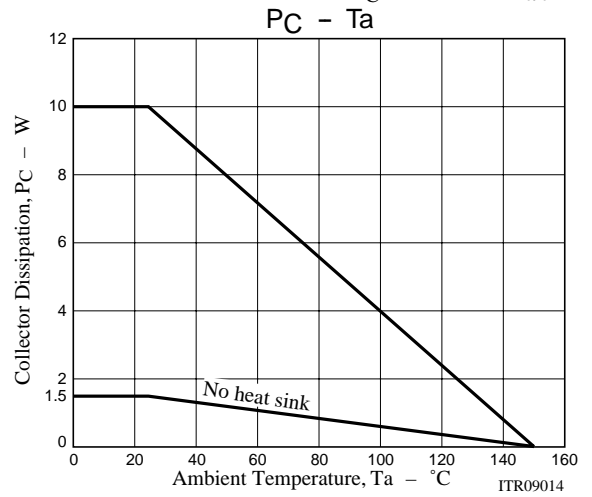
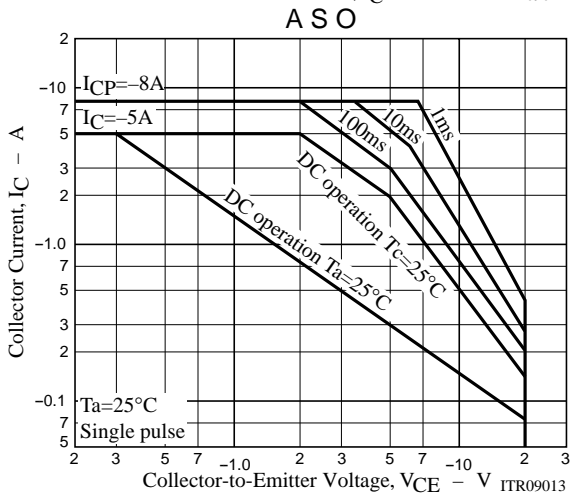
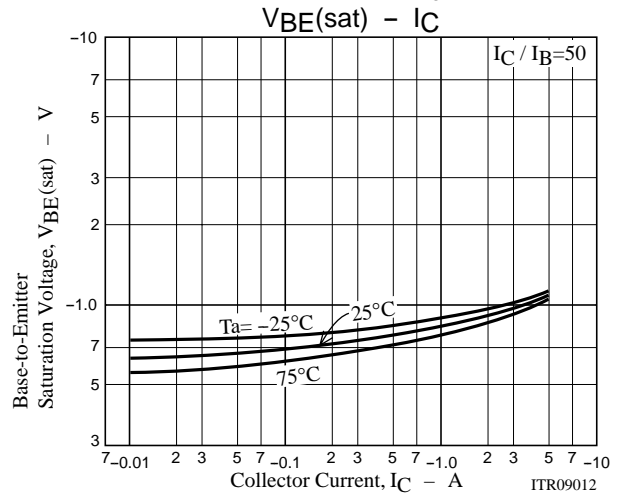
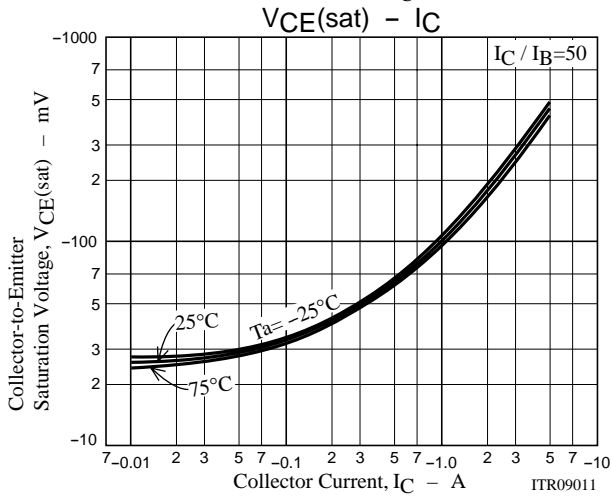
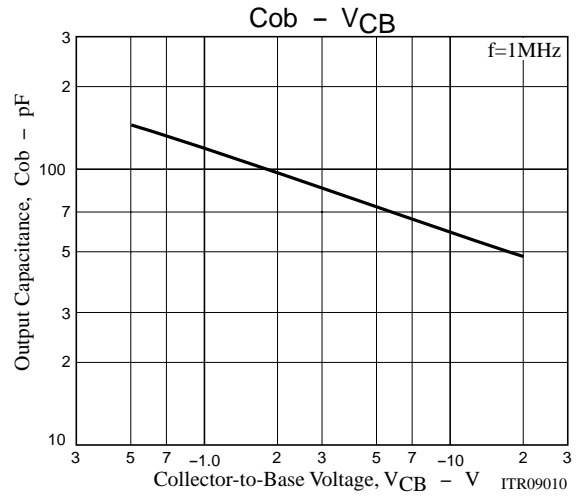
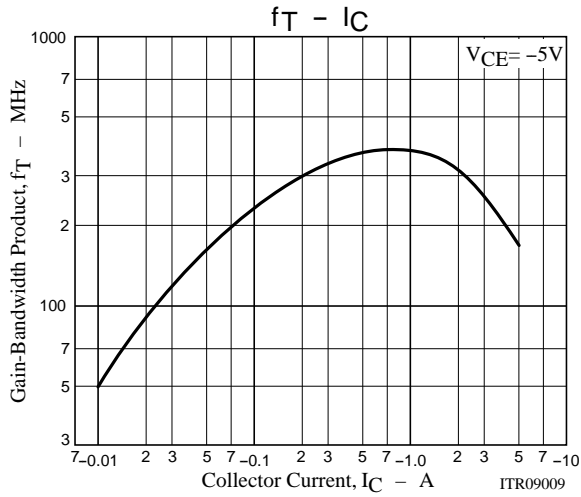
Switching Time Test Circuit



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



2SB1140



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