



## High-Current Switching Applications

### Applications

- Relay drivers, lamp drivers, motor drivers.

### Features

- Adoption of MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.

### Specifications

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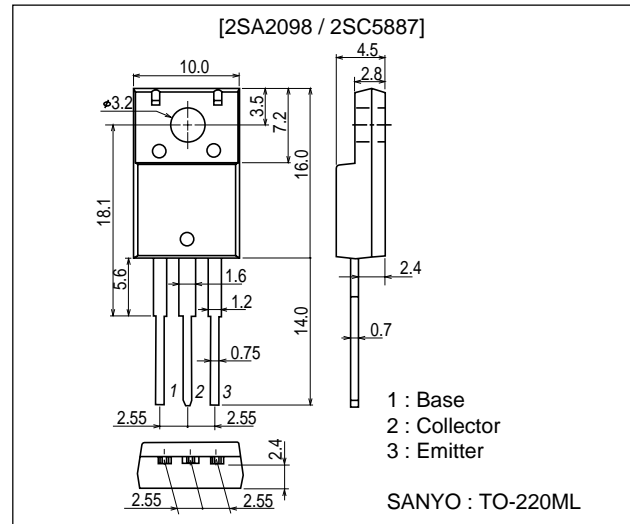
**Absolute Maximum Ratings** at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-50)60	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)50	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)15	A
Collector Current (Pulse)	$I_{CP}$		(-)20	A
Base Current	$I_B$		(-)3	A
Collector Dissipation	$P_C$		2	W
		$T_c=25^\circ\text{C}$	30	W
Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

### Package Dimensions

unit : mm

2041A



### Electrical Characteristics

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-40\text{V}, I_E=0$			(-)10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			(-)10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=-2\text{V}, I_C=-1\text{A}$	180		(400)560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=-10\text{V}, I_C=-1\text{A}$		(200)300		MHz

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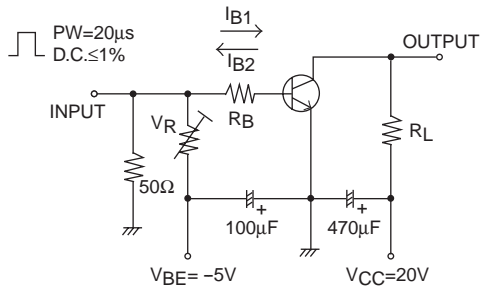
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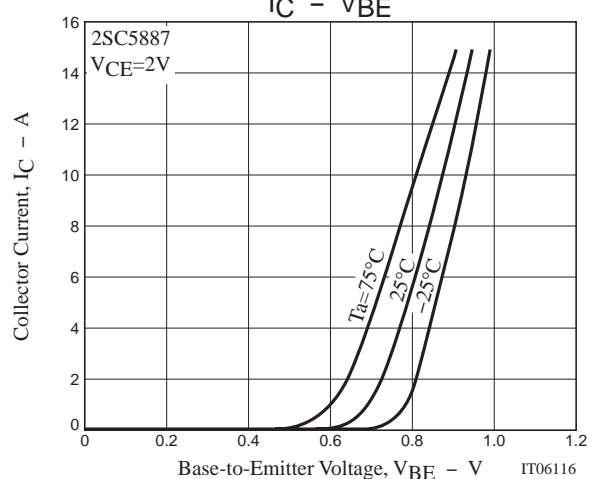
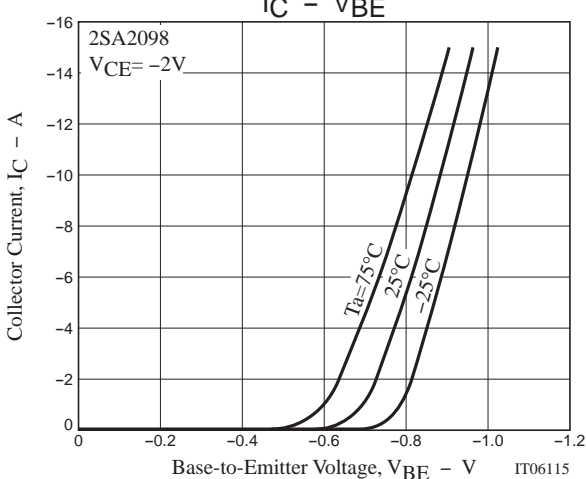
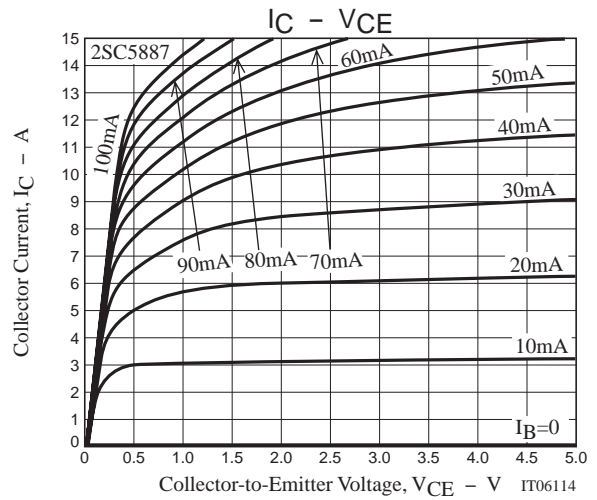
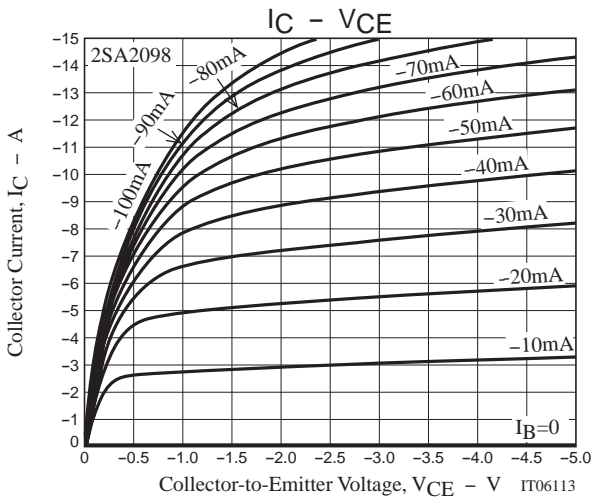
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10V, f = 1MHz$		(200)100		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)7A, I_B = (-)350mA$		(-200)160	(-500)400	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)7A, I_B = (-)350mA$		(-)0.94	(-)1.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)100\mu A, I_E = 0$	(-50)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)100\mu A, I_C = 0$	(-)6			V
Turn-ON Time	$t_d(on)$	See specified Test Circuit.		(80)50		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(400)700		ns
Fall Time	$t_f$	See specified Test Circuit.		(30)40		ns

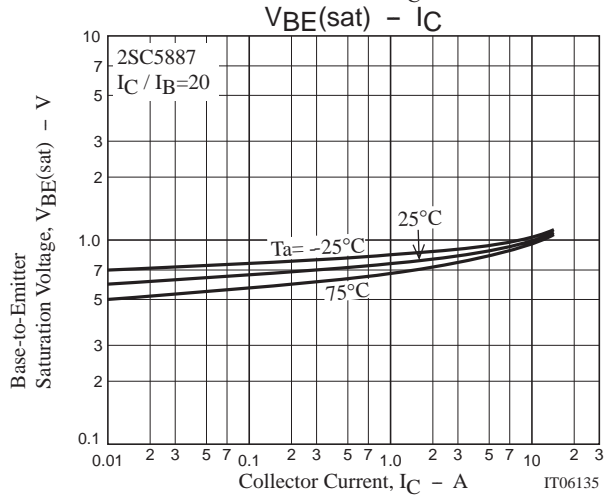
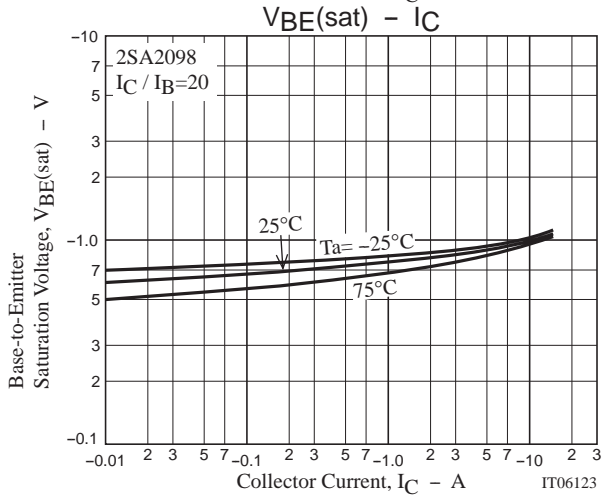
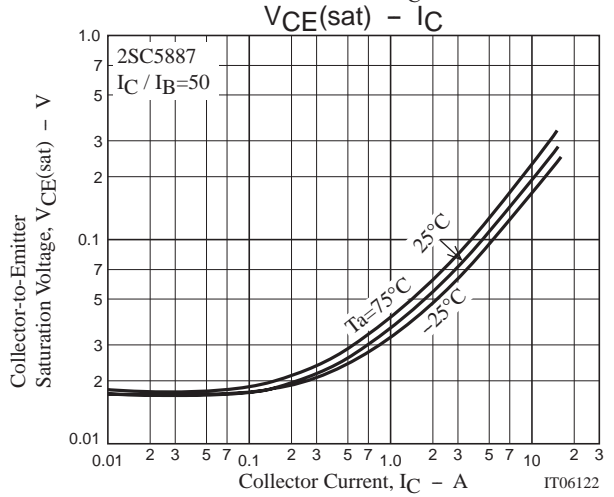
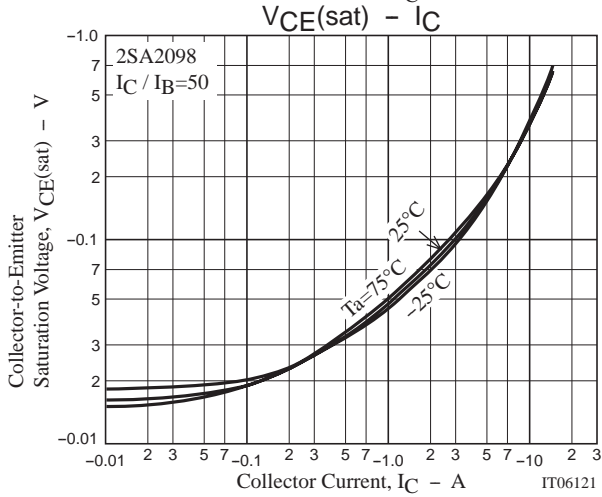
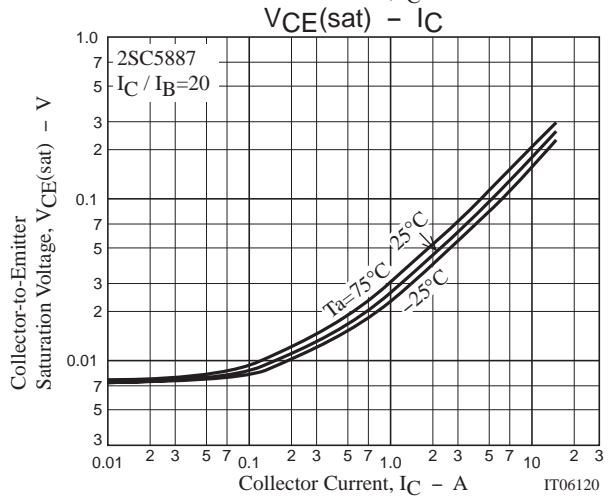
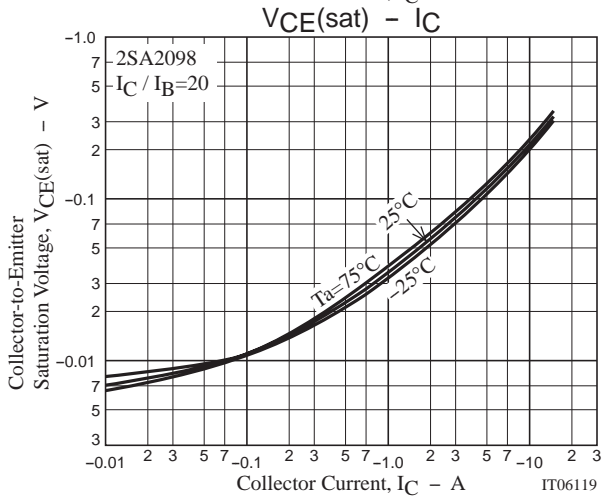
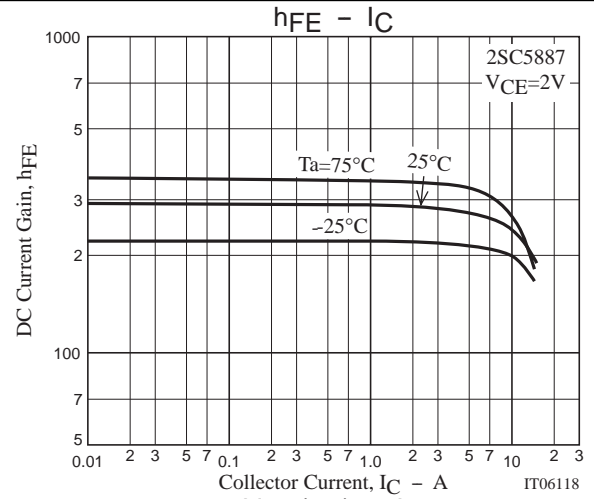
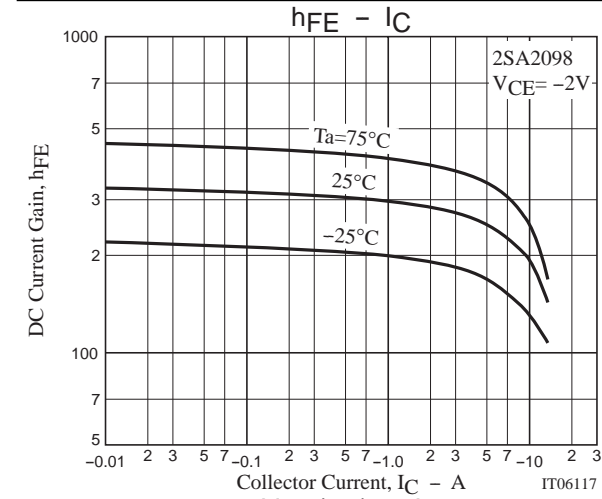
## Switching Time Test Circuit



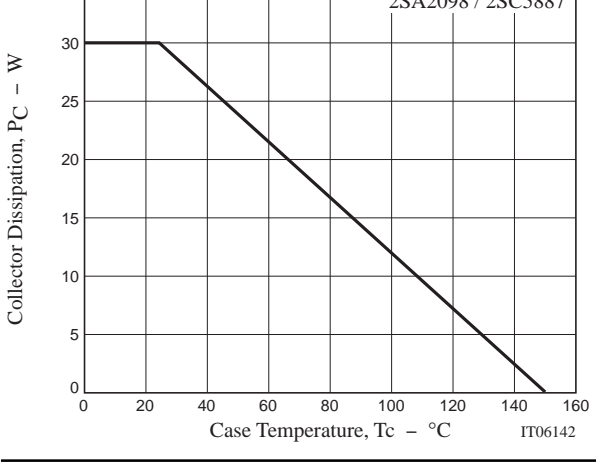
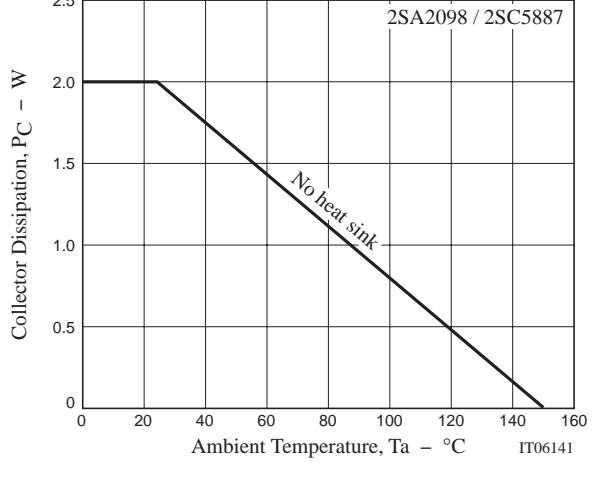
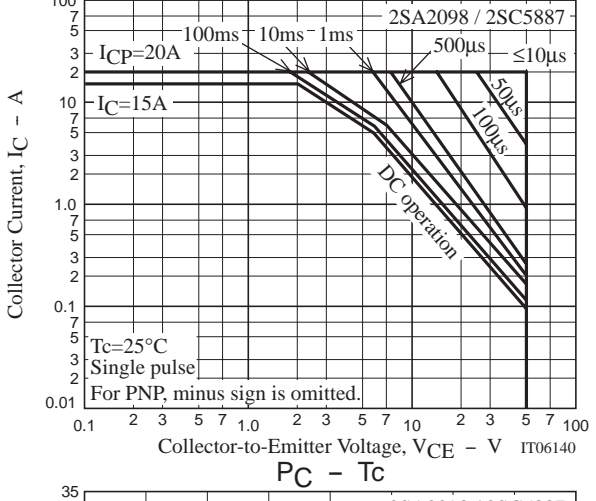
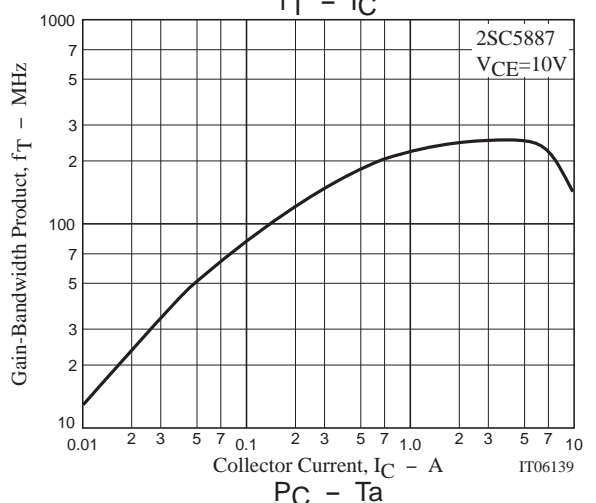
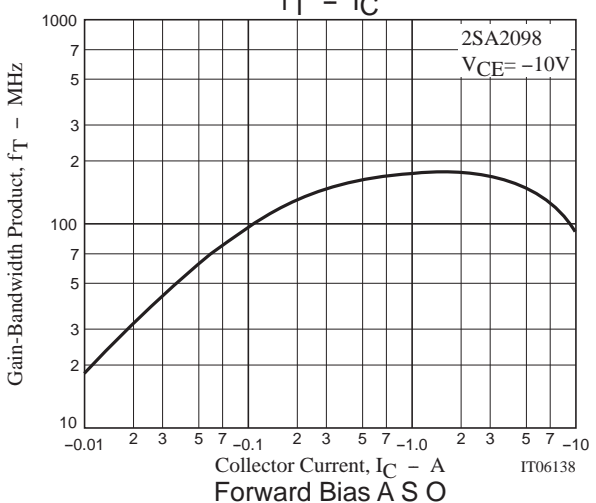
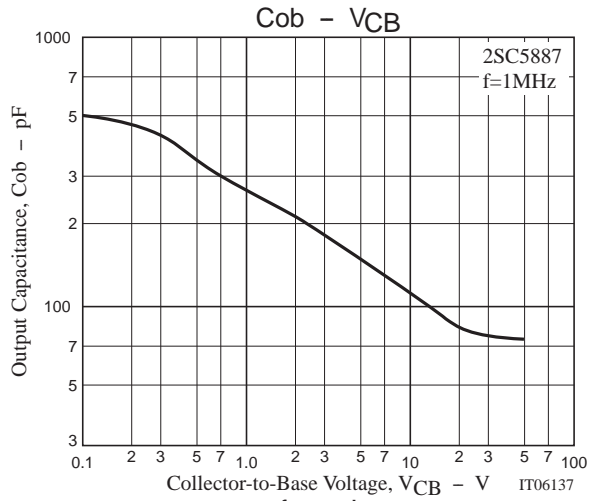
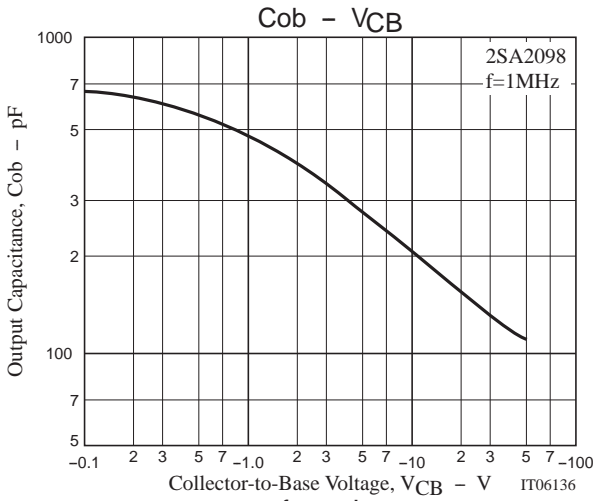
$I_C = 20I_{B1} = -20I_{B2} = 5A$   
 (For PNP, minus sign is omitted.)



2SA2098 / 2SC5887



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