

**2SA2099 / 2SC5888****High-Current Switching Applications****Applications**

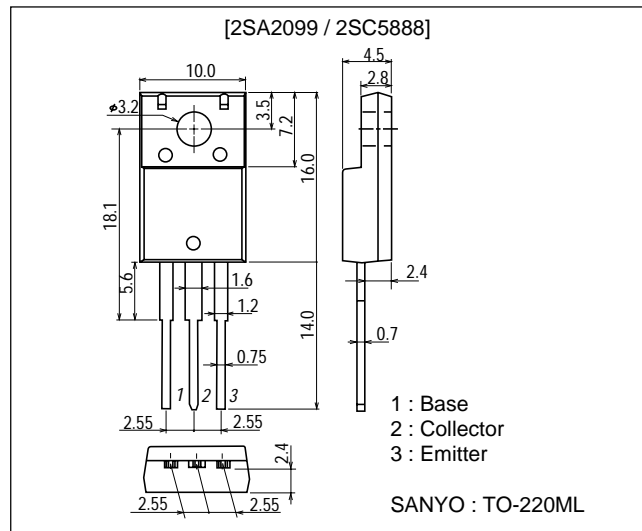
- Relay drivers, lamp drivers, motor drivers.

**Features**

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

**Package Dimensions**

unit : mm  
2041A

**Specifications**

( ) : 2SA2099

**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	$I_C$		(-10)	A
Collector Current (Pulse)	$I_{CP}$		(-13)	A
Base Current	$I_B$		(-2)	A
Collector Dissipation	$P_C$		2	W
		$T_c=25^\circ\text{C}$	25	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	$I_{CBO}$	$V_{CB}=-40\text{V}, I_E=0$			(-10)	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			(-10)	$\mu\text{A}$

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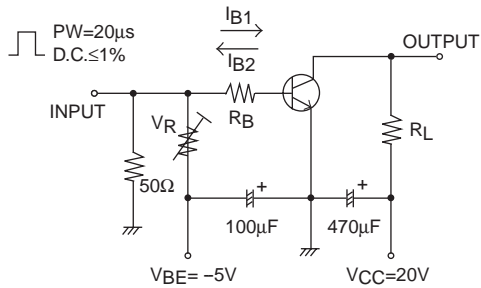
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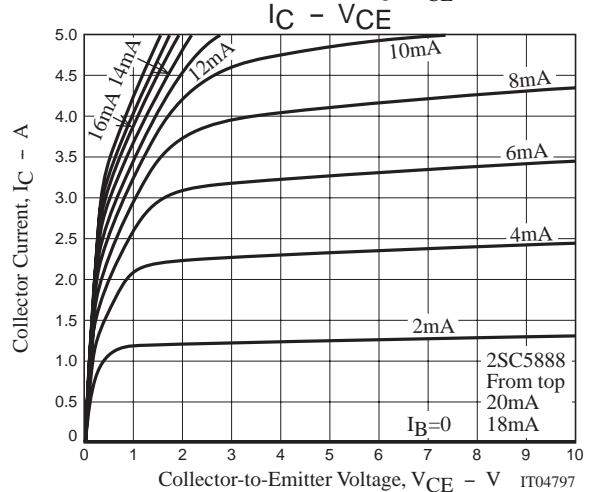
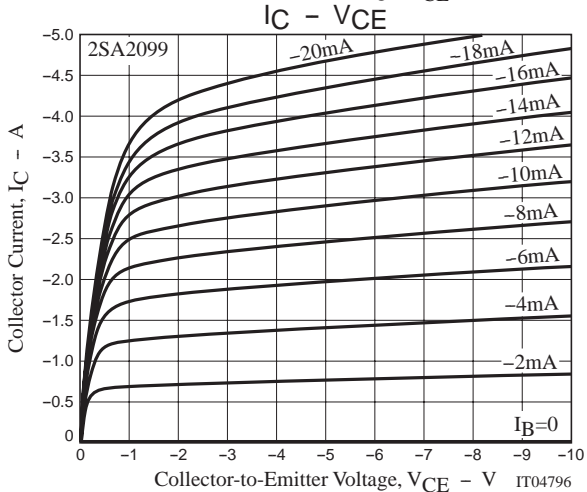
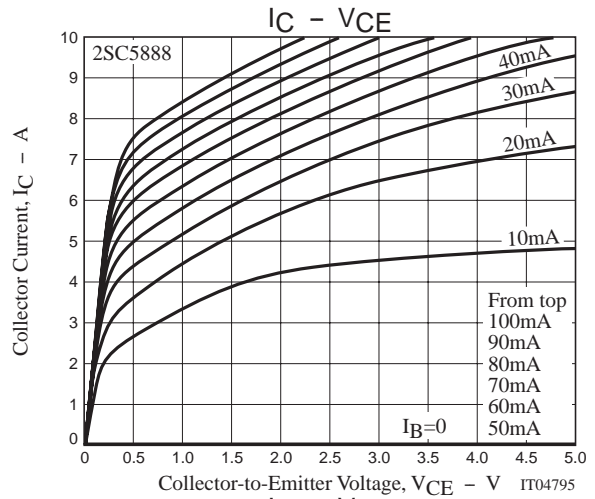
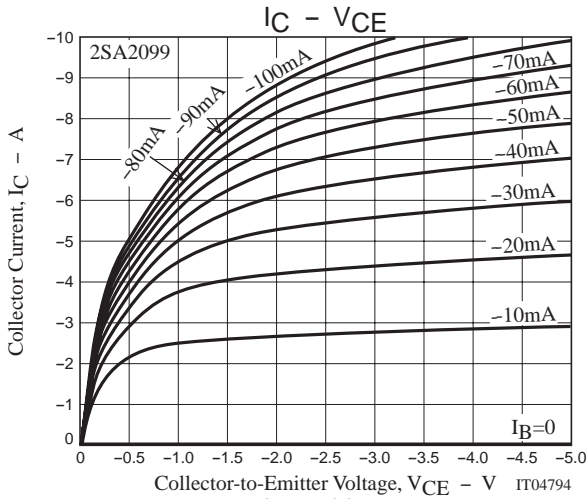
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}$	$V_{CE}=(-)2V, I_C=(-)1A$	200		(560)700	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5V, I_C=(-)1A$		(130)200		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		90(60)		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)5A, I_B=(-)250mA$		(-250)180	(-500)360	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)5A, I_B=(-)250mA$		(-)0.93	(-)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	$t_{on}$	See specified Test Circuit.		(70)40		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(650)1000		ns
Fall Time	$t_f$	See specified Test Circuit.		(60)80		ns

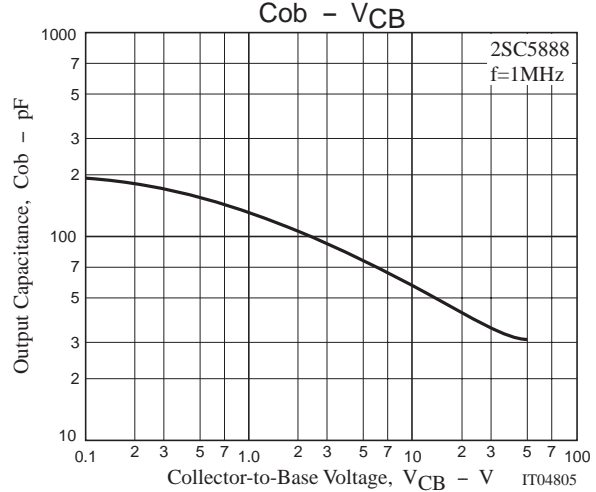
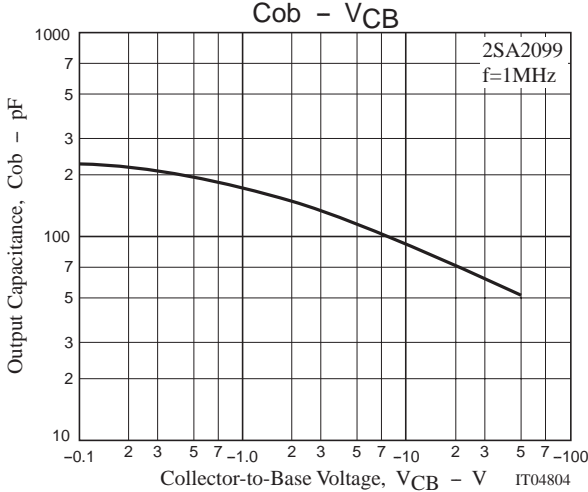
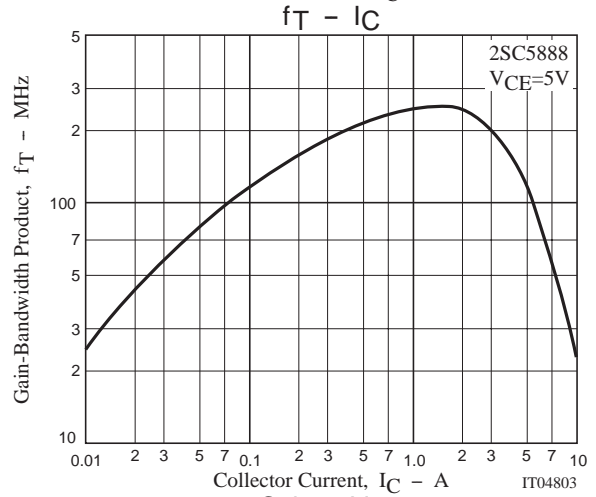
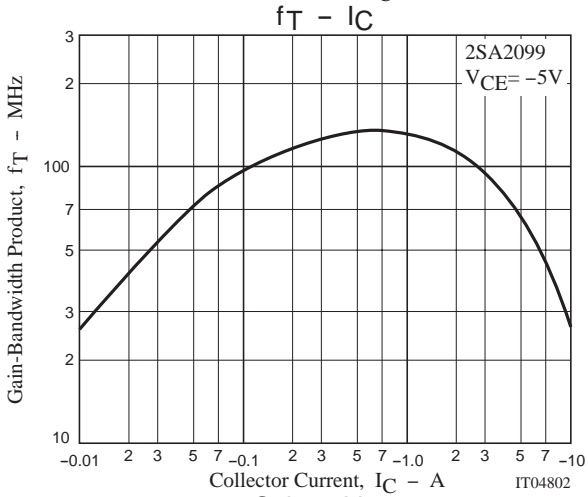
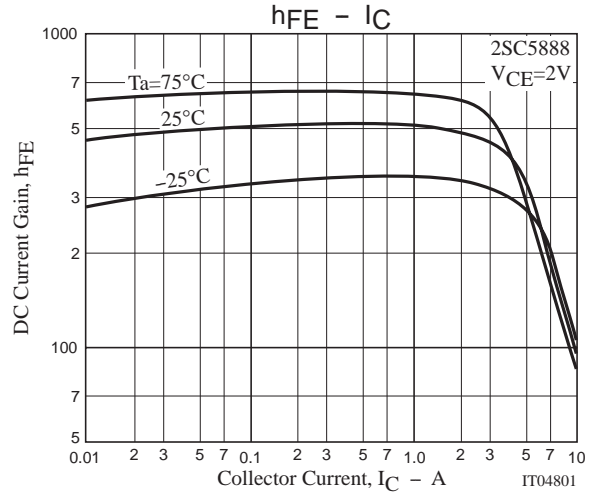
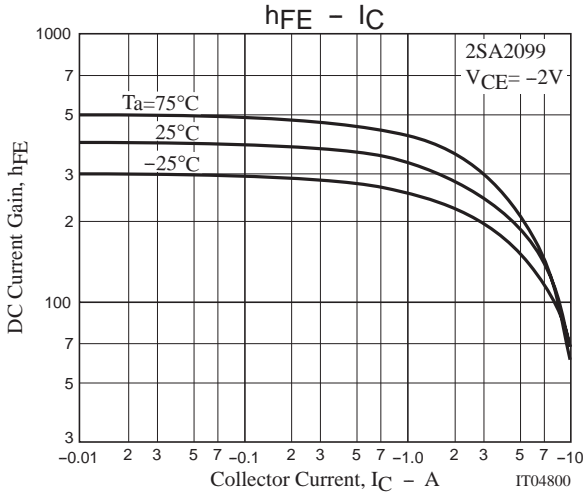
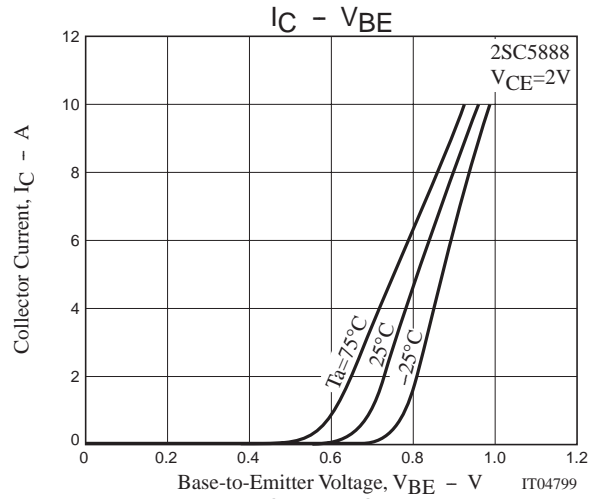
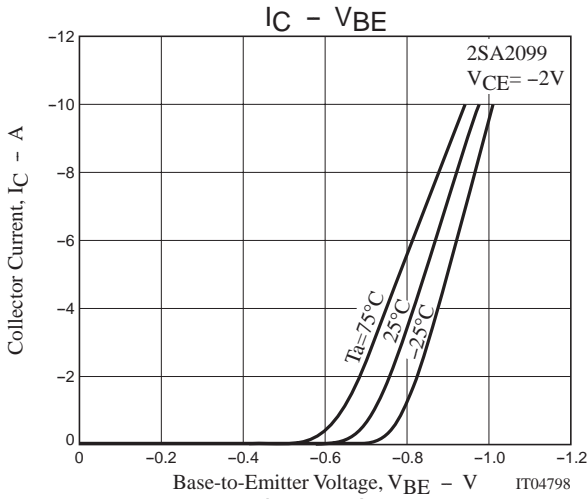
## Switching Time Test Circuit



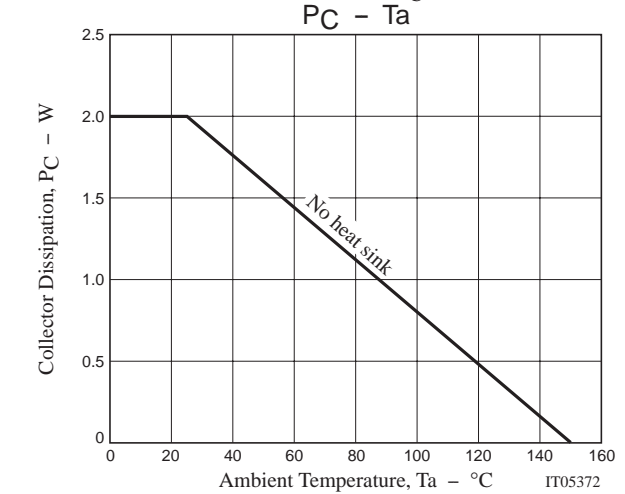
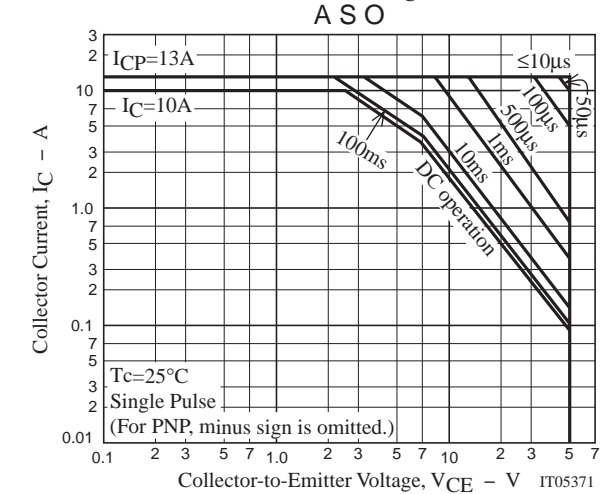
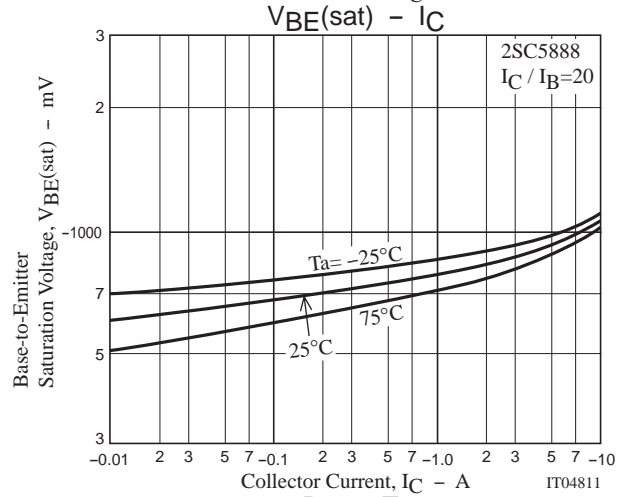
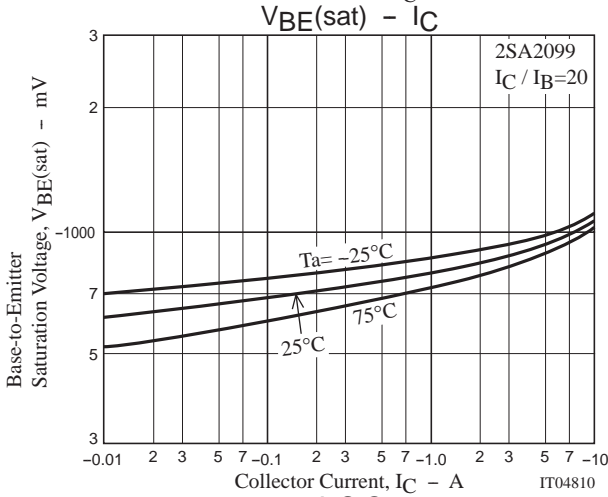
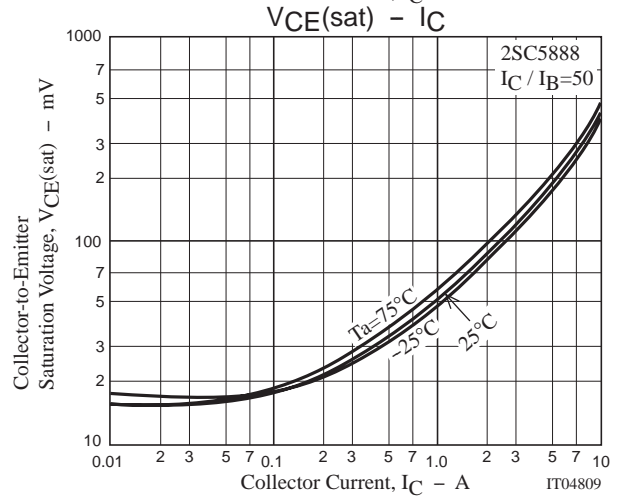
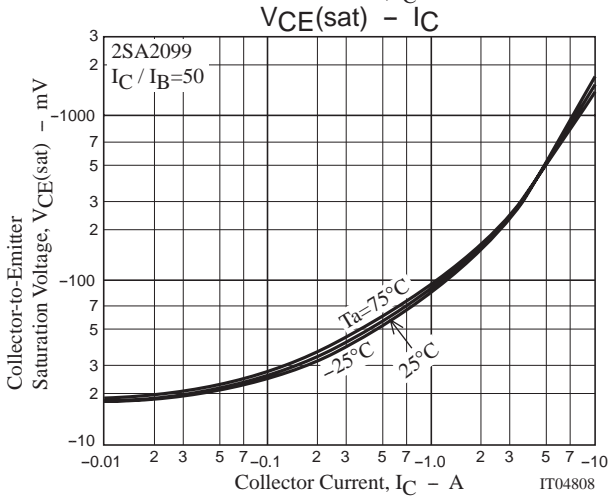
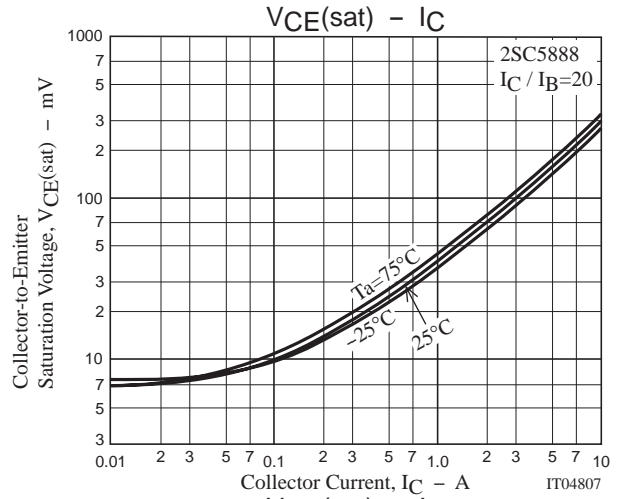
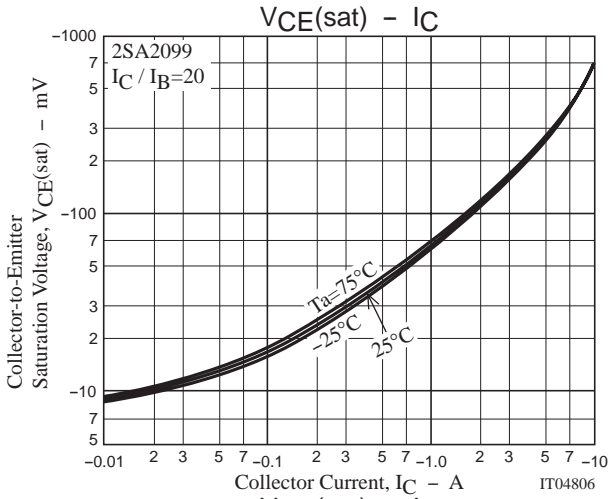
$I_C = 20I_{B1} = -20I_{B2} = 3A$   
 (For PNP, the polarity is reversed.)

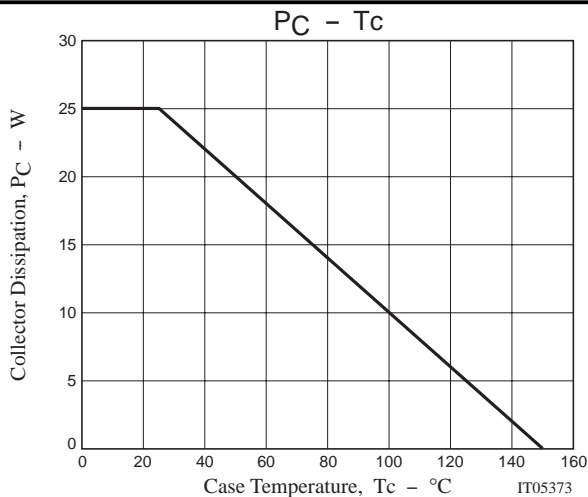


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