



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SA2040 / 2SC5707 — PNP / NPN Epitaxial Planar Silicon Transistors

### High Current Switching Applications

#### Applications

- DC / DC converter, relay drivers, lamp drivers, motor drivers, flash.

#### Features

- Adoption of FBET and MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

#### Specifications ( ) : 2SA2040

##### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-50)100	V
Collector-to-Emitter Voltage	V <sub>CES</sub>		(-50)100	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)50	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-)6	V
Collector Current	I <sub>C</sub>		(-)8	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)11	A
Base Current	I <sub>B</sub>		(-)2	A
Collector Dissipation	P <sub>C</sub>		1.0	W
		T <sub>C</sub> =25°C	15	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

##### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =(-)40V, I <sub>E</sub> =0A			(-)0.1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)500mA	200		560	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)500mA		(290)330		MHz

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**SANYO Electric Co., Ltd. Semiconductor Company**

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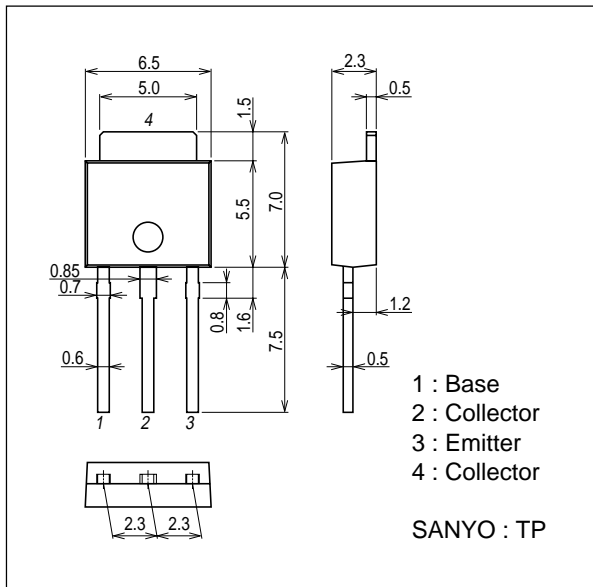
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	Cob	$V_{CB} = (-)10V, f = 1MHz$		(50)28		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C = (-)3.5A, I_B = (-)175mA$		(-230)160	(-390)240	mV
	$V_{CE(sat)2}$	$I_C = (-)2A, I_B = (-)40mA$		(-240)110	(-400)170	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)2A, I_B = (-)40mA$		(-)0.83	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0A$	(-50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = (-)100\mu A, R_{BE} = 0\Omega$	(-50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0A$	(-)6			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(40)30		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(225)420		ns
Fall Time	$t_f$	See specified Test Circuit.		25		ns

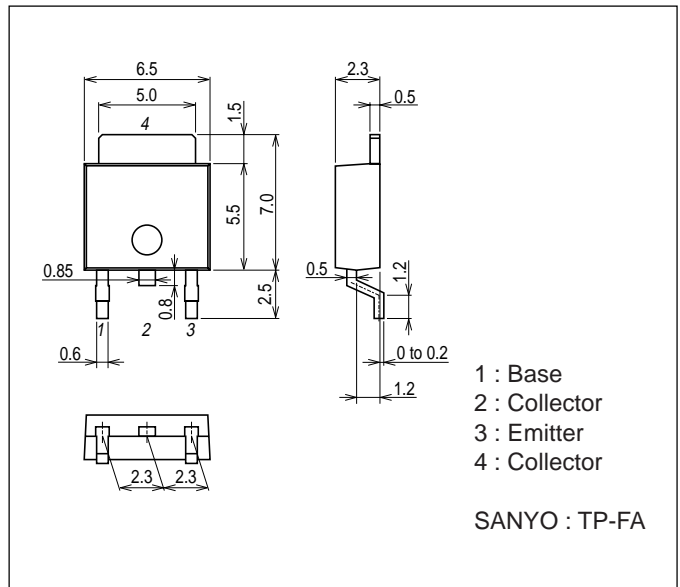
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unit : mm  
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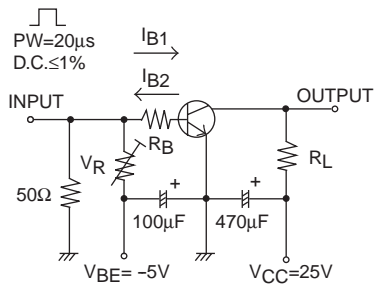


## Package Dimensions

unit : mm  
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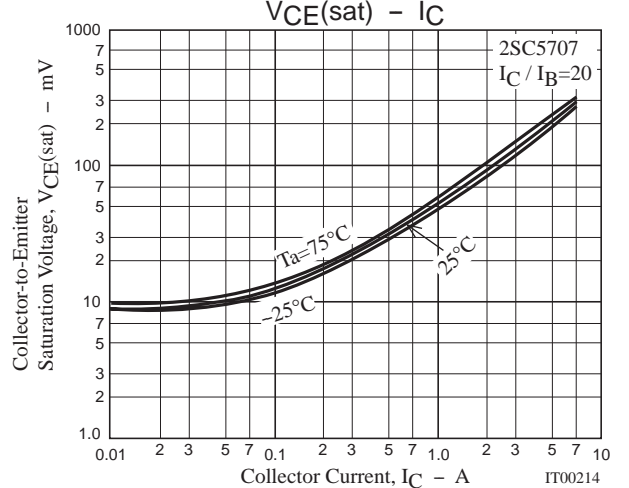
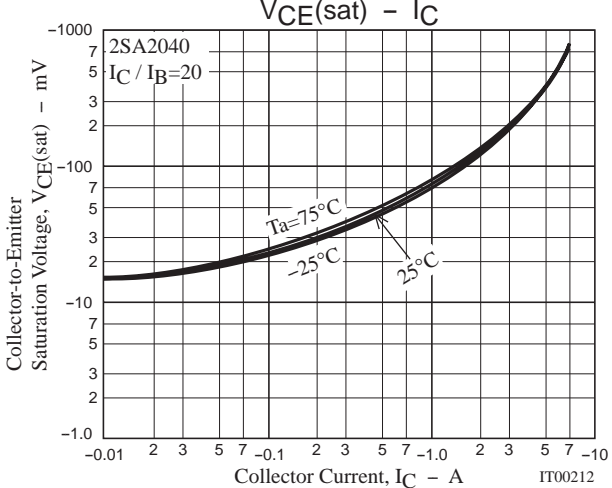
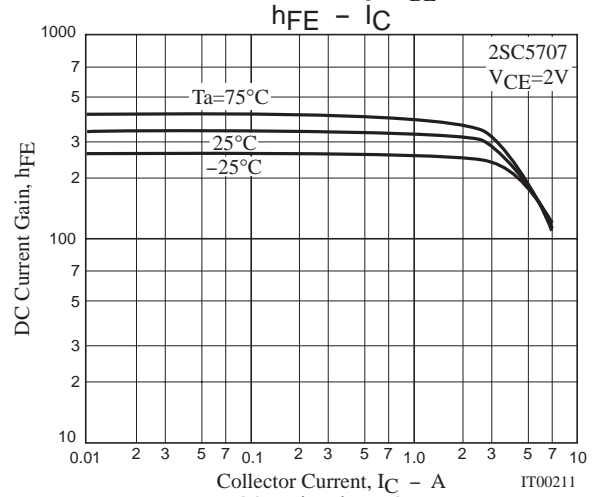
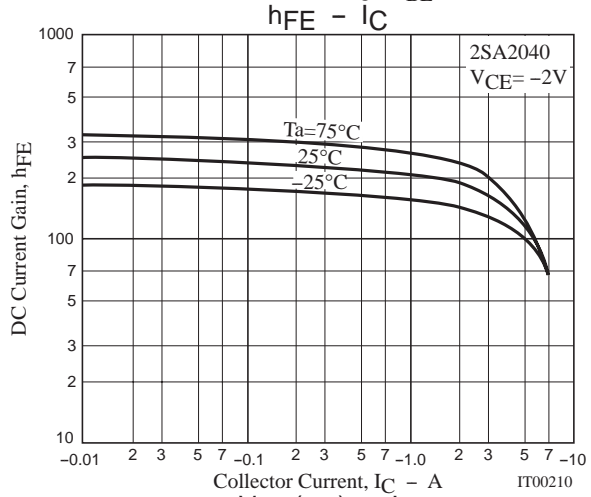
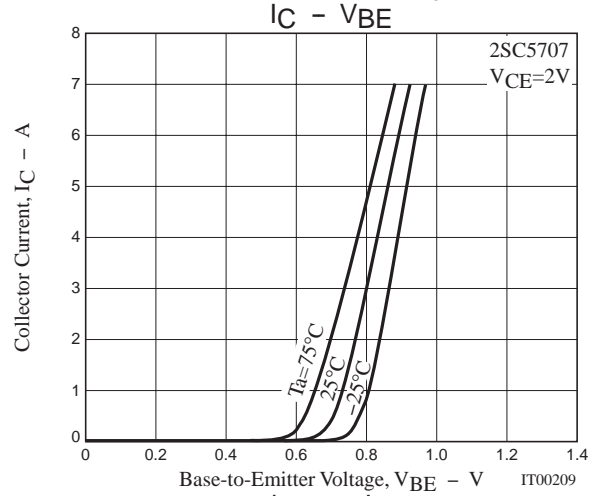
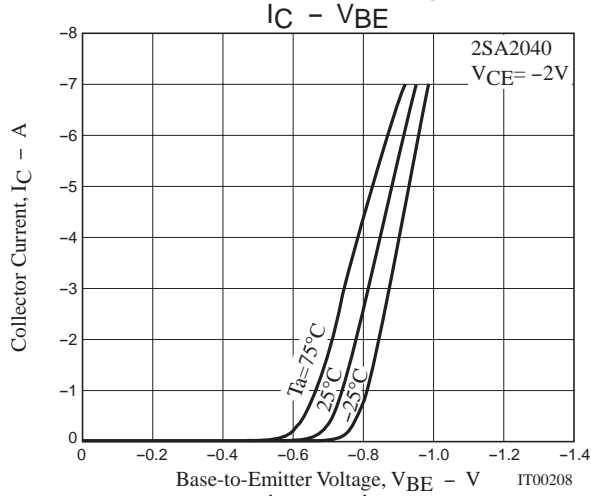
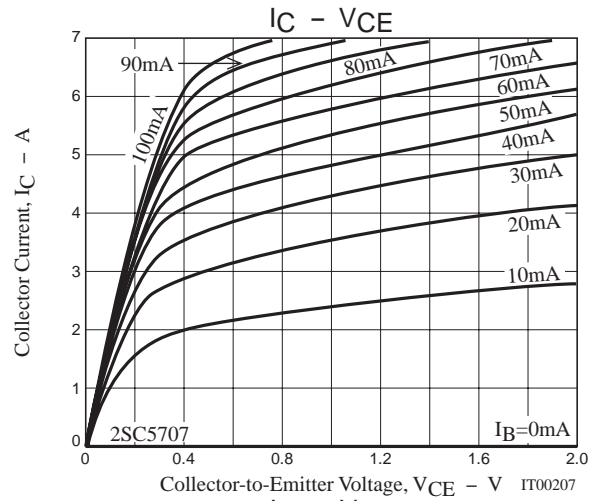
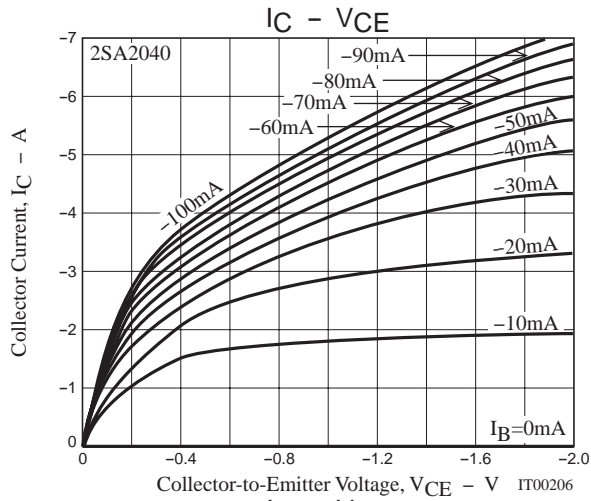


## Switching Time Test Circuit

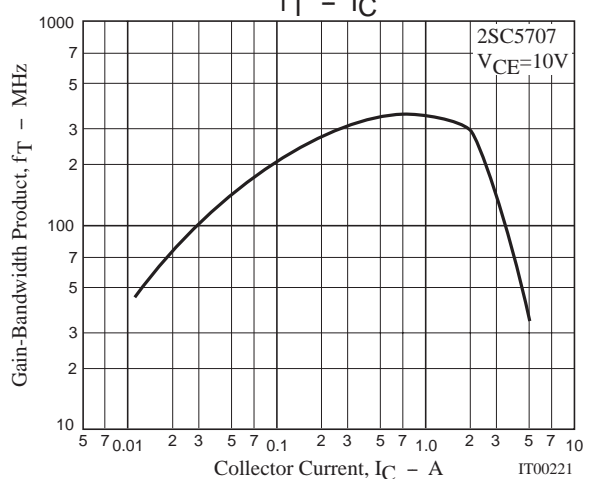
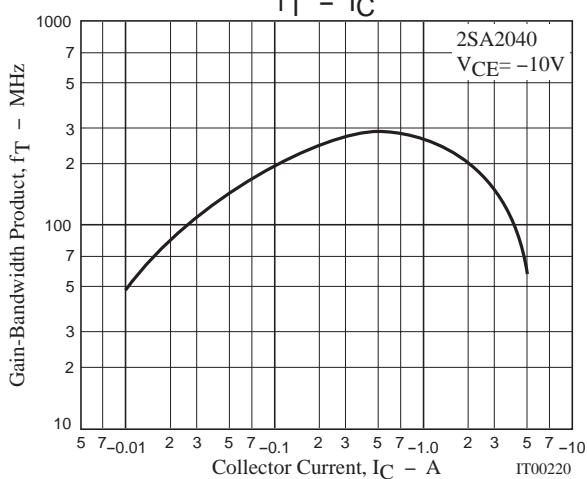
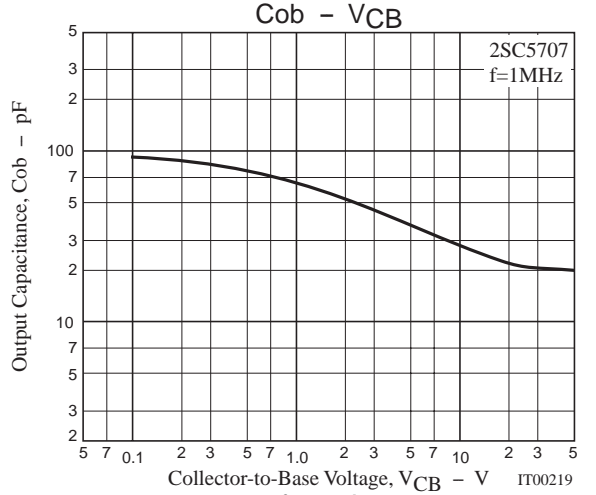
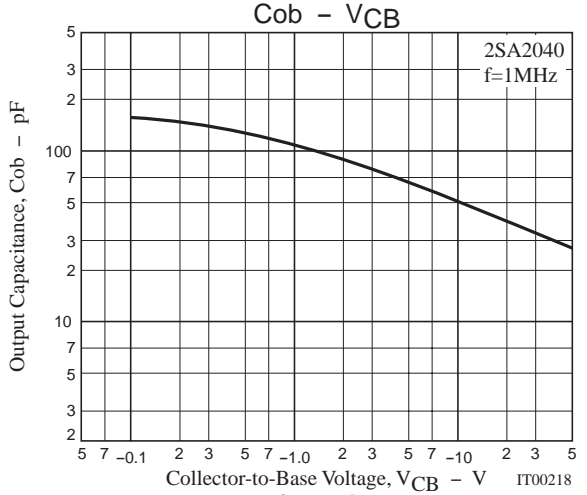
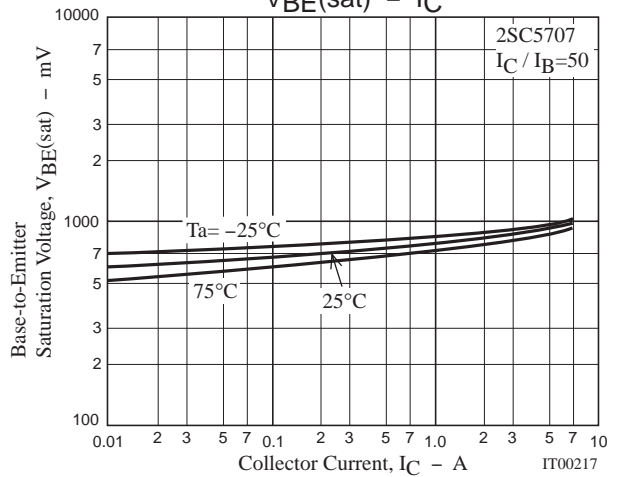
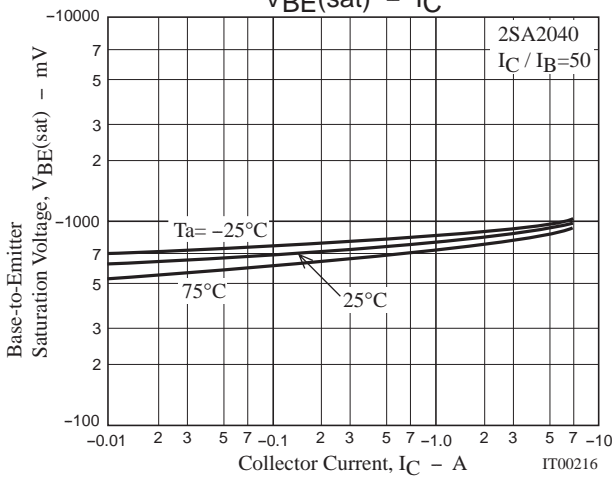
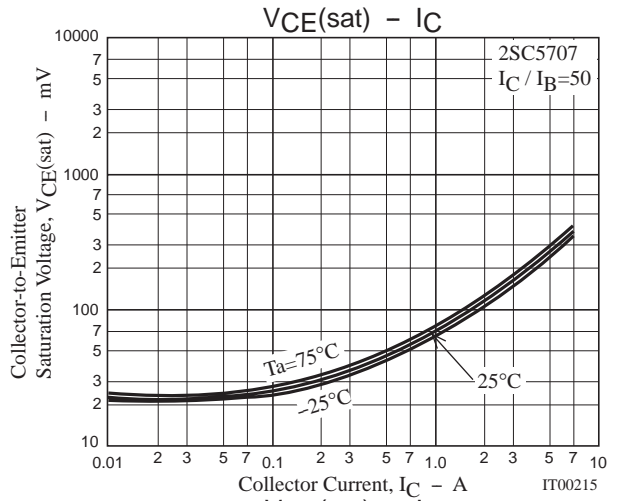
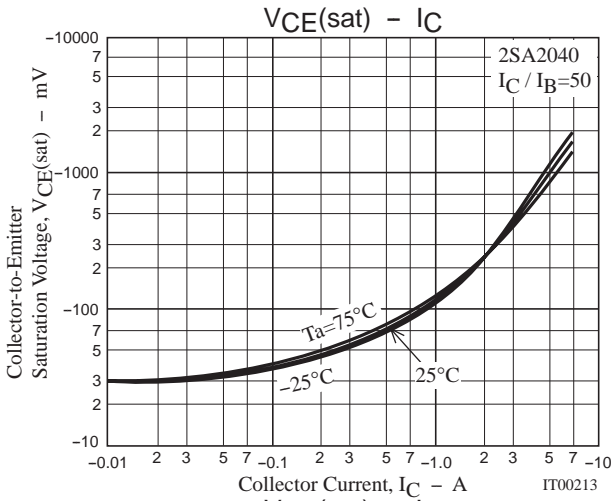


$20I_{B1} = -20I_{B2} = I_C = 2.5A$   
For PNP, the polarity is reversed.

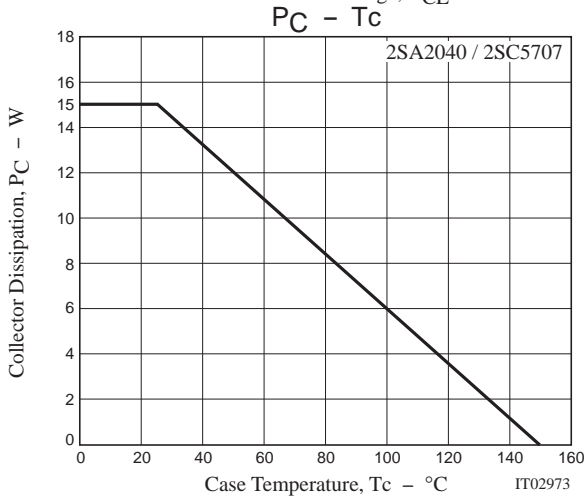
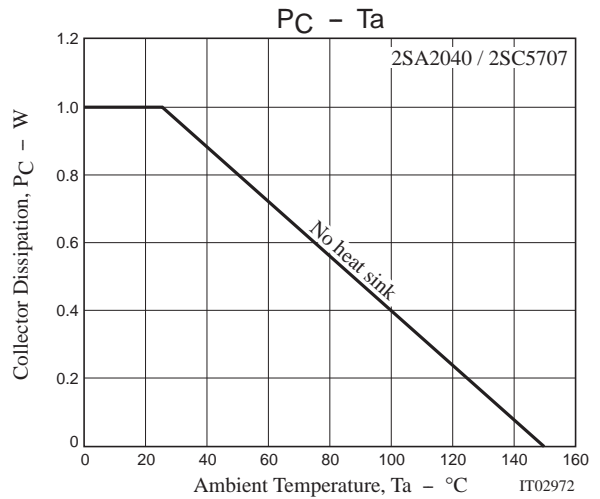
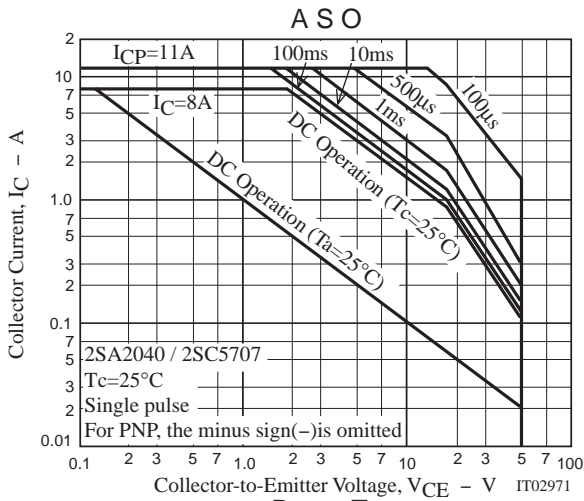
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