



SANYO Semiconductors

DATA SHEET

SPA13003

(13003 series)

NPN Triple Diffused Planar Silicon Transistor

Switching Regulator Applications

Features

- High breakdown voltage.
- High-speed switching.
- Wide ASO.
- Adoption of MBIT process.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		700	V
Collector-to-Emitter Voltage	V_{CES}		700	V
Collector-to-Emitter Voltage	V_{CEO}		400	V
Emitter-to-Base Voltage	V_{EBO}		8	V
Collector Current	I_C		1	A
Collector Current (Pulse)	I_{CP}	$PW \leq 300\mu\text{s}$, duty cycle $\leq 10\%$	2	A
Base Current	I_B		0.5	A
Collector Dissipation	P_C		0.6	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}	$V_{CB}=400\text{V}$, $I_E=0\text{A}$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0\text{A}$			10	μA
DC Current Gain	h_{FE1}	$V_{CE}=5\text{V}$, $I_C=0.1\text{A}$	15		35	
	h_{FE2}	$V_{CE}=5\text{V}$, $I_C=0.5\text{A}$	5			
	h_{FE3}	$V_{CE}=5\text{V}$, $I_C=1\text{mA}$	7			

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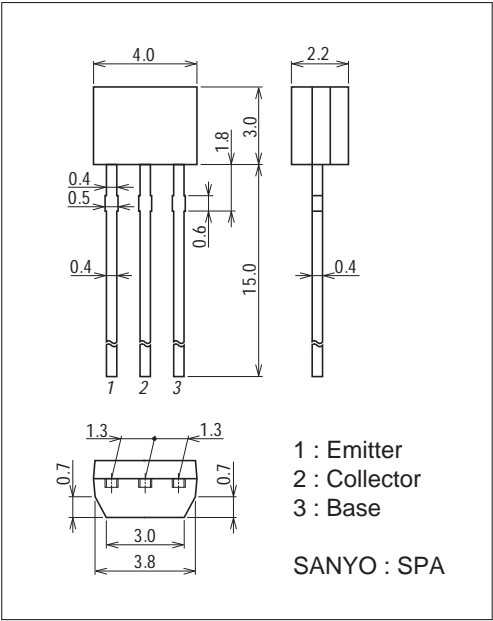
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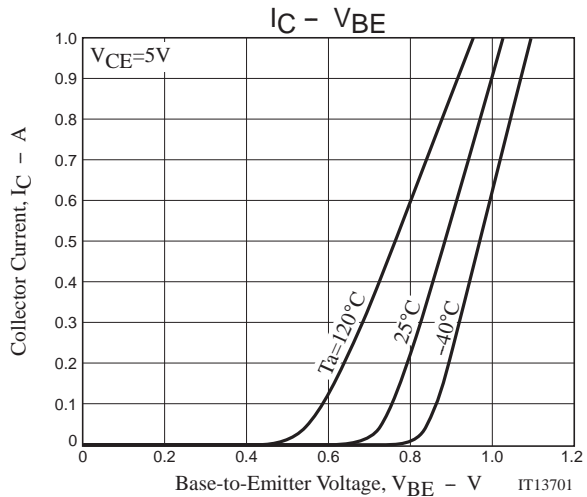
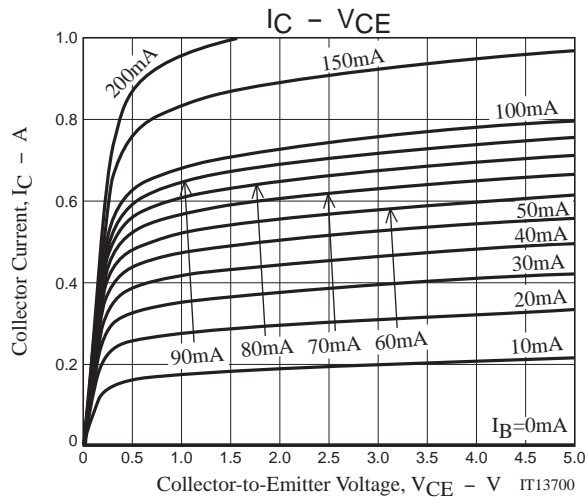
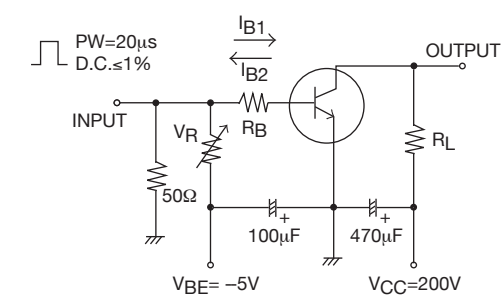
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	$V_{CE}=10V, I_C=0.1A$		20		MHz
Output Capacitance	Cob	$V_{CB}=10V, f=1MHz$		10		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=0.5A, I_B=0.1A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=0.5A, I_B=0.1A$			0.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0A$	700			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=100\mu A, R_{BE}=0\Omega$	700			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=5mA, R_{BE}=\infty$	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0A$	8			V
Turn-On Time	t_{on}	$I_C=0.5A, I_{B1}=0.05A, I_{B2}=-0.5A, R_L=400\Omega, V_{CC}=200V$			1.0	μs
Storage Time	t_{stg}	$I_C=0.5A, I_{B1}=0.05A, I_{B2}=-0.5A, R_L=400\Omega, V_{CC}=200V$			1.0	μs
Fall Time	t_f	$I_C=0.5A, I_{B1}=0.05A, I_{B2}=-0.5A, R_L=400\Omega, V_{CC}=200V$			0.3	μs

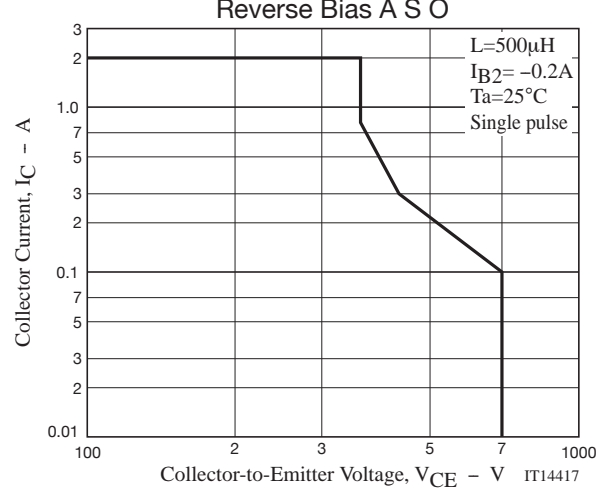
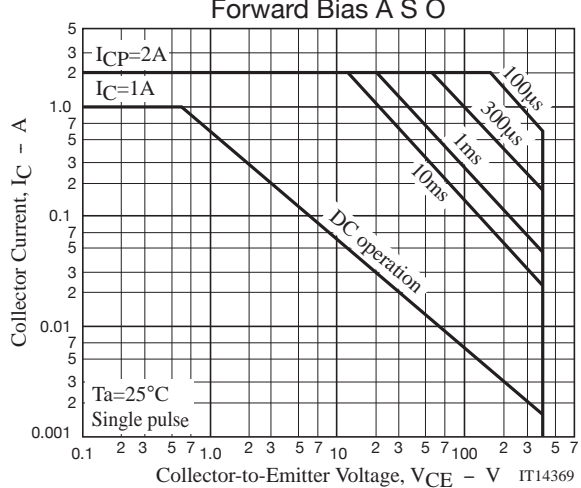
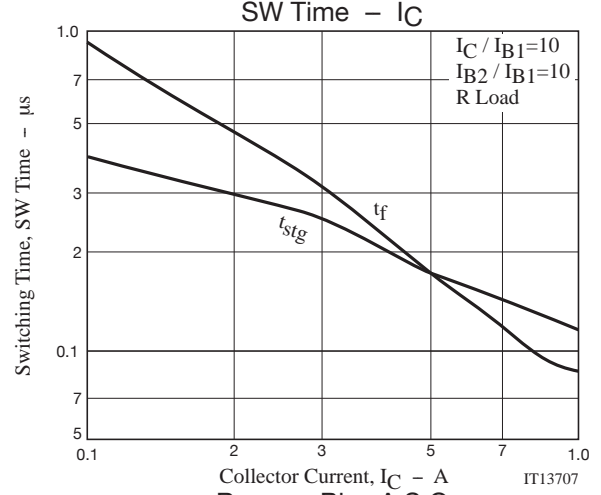
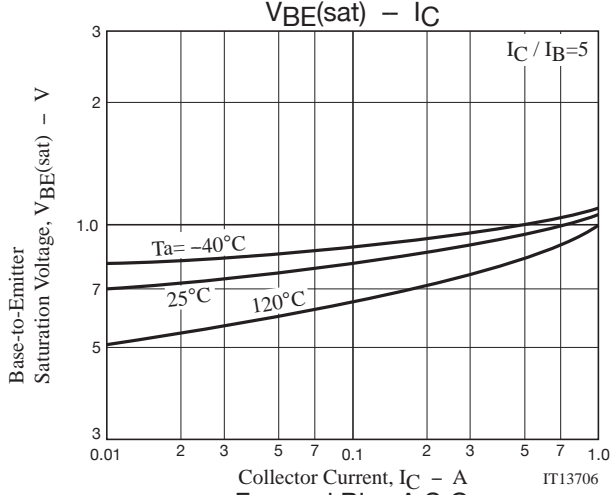
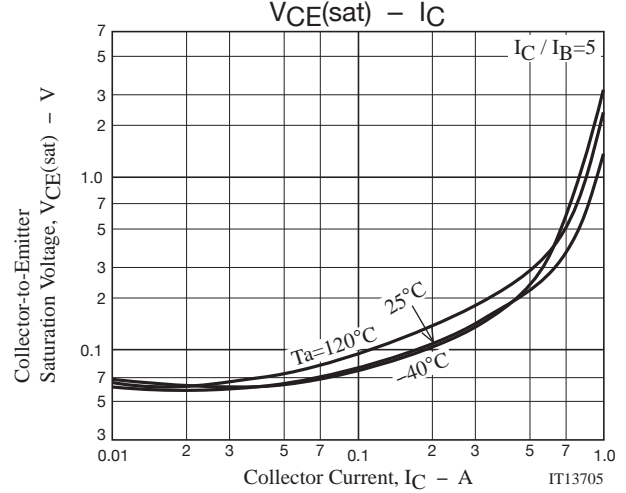
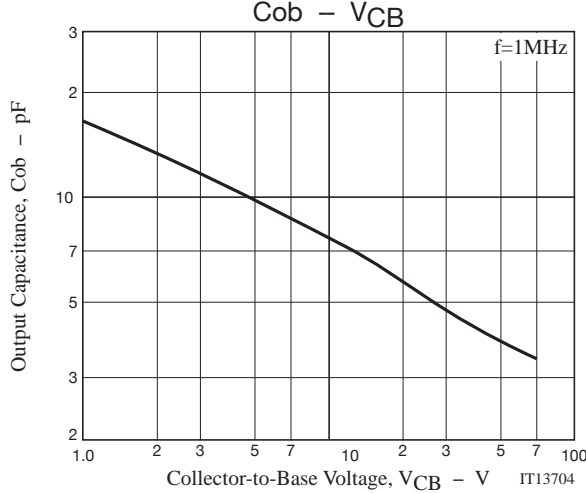
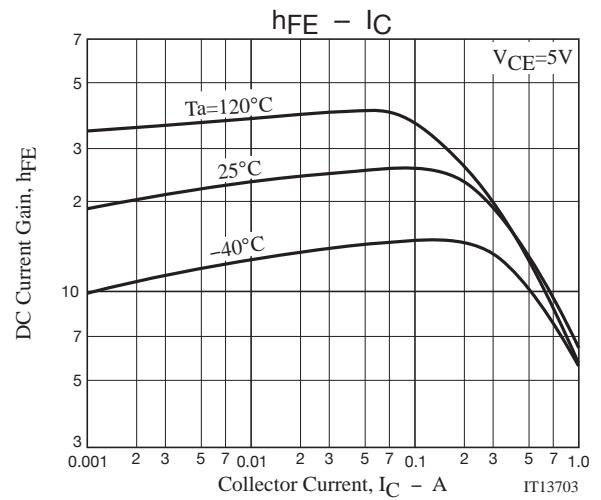
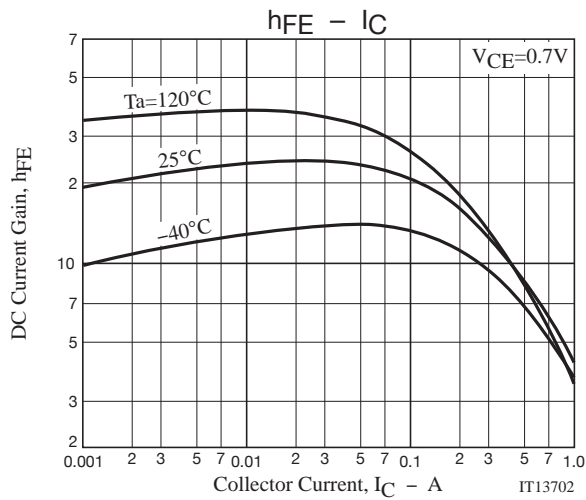
Package Dimensions

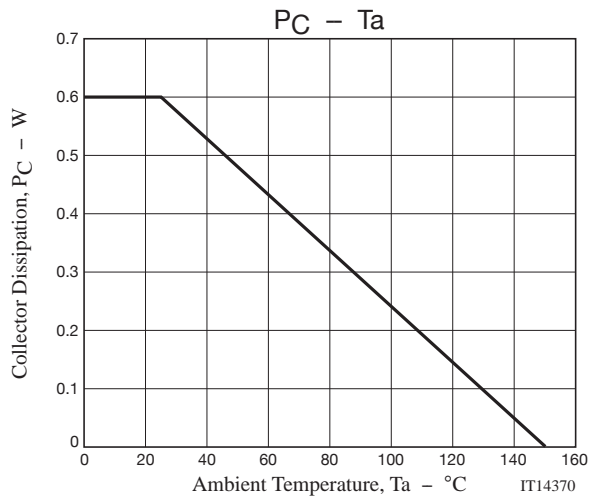
unit : mm (typ)
7524-004



Switching Time Test Circuit







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