

2SC5103F5

Transistor, NPN

Features

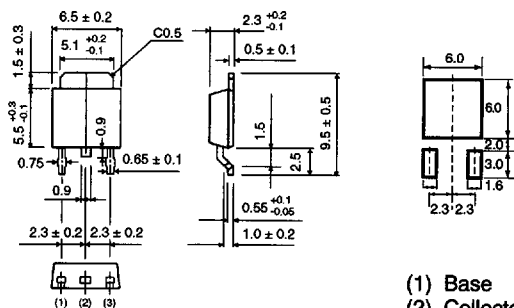
- available in CPT F5 (SC-63) package
- package marking: C5103★□, where ★ is h_{FE} code and □ is lot number
- high-speed switching, typically $t_f = 0.1 \mu s$ for $I_C = 3 A$
- low collector saturation voltage, typically $V_{CE(sat)} = 0.5 V$ for $I_C/I_B = 3 A/0.15 A$
- wide safe operating area (SOA)
- $P_{C(max)} = 1 W$ for $T_a = 25^\circ C$ and $P_{C(max)} = 10 W$ for $T_C = 25^\circ C$

Applications

- high speed switching applications

Dimensions (Units : mm)

2SC5103F5 (CPT F5)



Absolute maximum ratings ($T_a = 25^\circ C$)

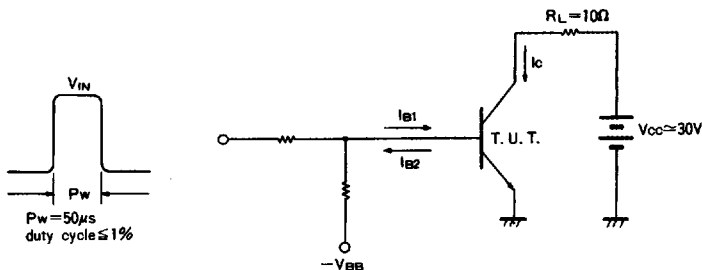
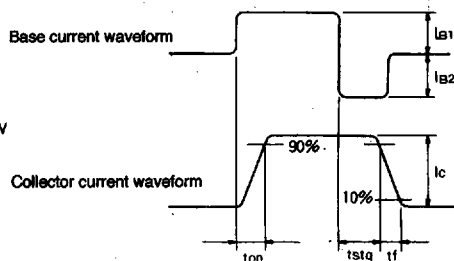
Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	V_{CBO}	100	V	
Collector-to-emitter voltage	V_{CEO}	60	V	
Emitter-to-base voltage	V_{EBO}	5	V	
Collector current	I_C	5	A	DC
		10		Pulse
Collector dissipation	P_C	1.0	W	$T_C = 25^\circ C$
		10		
Junction temperature	T_j	150	$^\circ C$	
Storage temperature	T_{stg}	$-55 \sim +150$	$^\circ C$	

Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	100			V	$I_C = 50\text{ }\mu\text{A}$
Collector-to-emitter voltage	$V_{CEO(SUS)}$	60			V	$I_C/I_B = 3\text{ A}/0.3\text{ A}$, $L = 1\text{ mH}$
Collector-to-emitter breakdown voltage	BV_{CEO}	60			V	$I_C = 1\text{ mA}$
Emitter-to-base breakdown voltage	BV_{EBO}	5			V	$I_E = 50\text{ }\mu\text{A}$
Collector cutoff current	I_{CBO}			10	μA	$V_{CB} = 100\text{ V}$
Emitter cutoff current	I_{EBO}			10	μA	$V_{EB} = 5\text{ V}$
DC current gain	h_{FE}	82	150	270		$V_{CE} = 2\text{ V}$, $I_C = 1\text{ A}$
		40				$V_{CE} = 2\text{ V}$, $I_C = 3\text{ A}$
Collector-to-emitter saturation voltage	$V_{CE(sat)}$			0.3	V	$I_C/I_B = 3\text{ A}/0.15\text{ A}$
				0.5		$I_C/I_B = 4\text{ A}/0.2\text{ A}$
Base-to-emitter saturation voltage	$V_{BE(sat)}$			1.2	V	$I_C/I_B = 3\text{ A}/0.15\text{ A}$
				1.5		$I_C/I_B = 4\text{ A}/0.2\text{ A}$
Transition frequency	f_T		120		MHz	$V_{CE} = 10\text{ V}$, $I_E = -0.5\text{ A}$, $f = 30\text{ MHz}$
Collector output capacitance	C_{ob}		80		pF	$V_{CB} = 10\text{ V}$, $I_E = 0\text{ A}$, $f = 1\text{ MHz}$
Turn on time	t_{on}			0.3	μs	$I_C = 3\text{ A}$, $R_L = 10\text{ }\Omega$, $I_{B1} = -I_{B2} = 0.15\text{ A}$, $V_{CC} \cong 30\text{ V}$
Storage time	t_{stg}			1.5	μs	
Fall time	t_f			0.3	μs	

 h_{FE} rankings

Item	P	Q
h_{FE}	82 ~ 180	120 ~ 270

Test circuits
Figure 1 Switching time test circuit

Figure 2 Switching time waveforms


Electrical characteristic curve

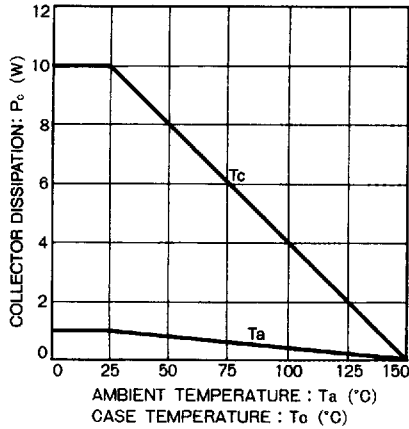


Figure 3

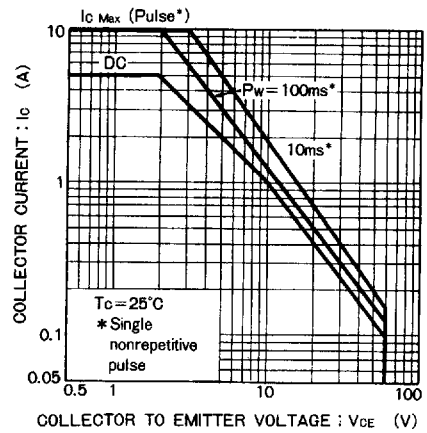


Figure 4

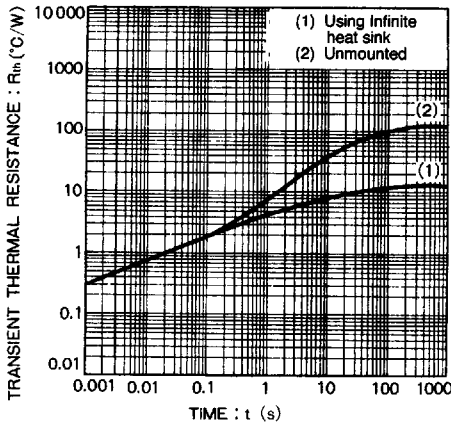


Figure 5

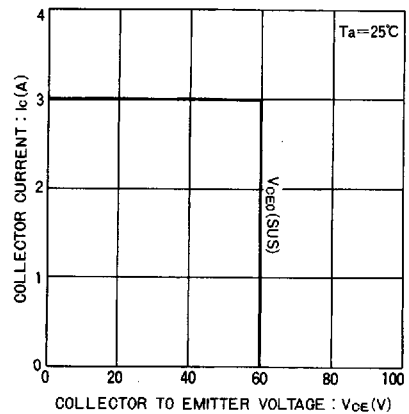


Figure 6

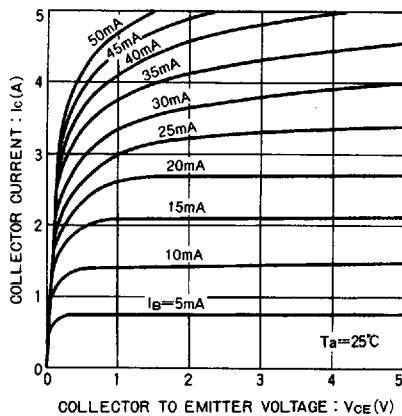


Figure 7

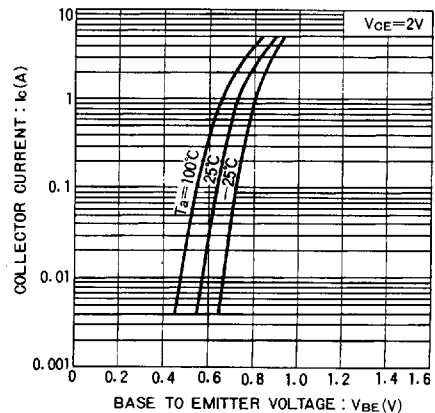


Figure 8

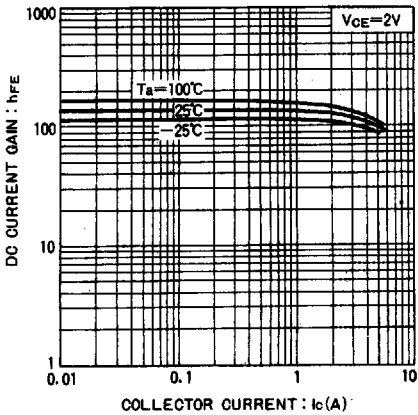


Figure 9

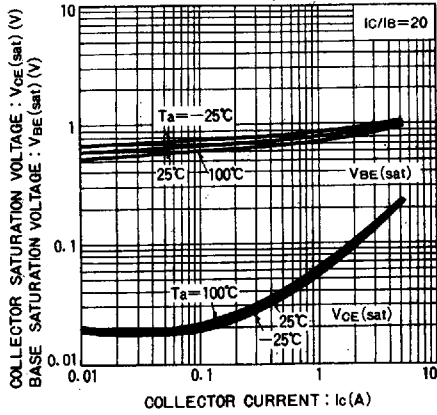


Figure 10

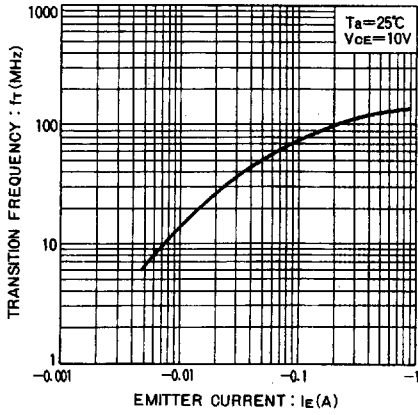


Figure 11

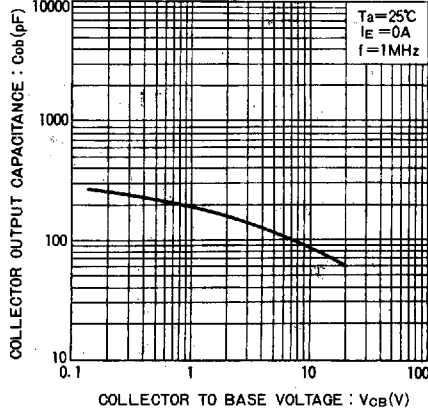


Figure 12

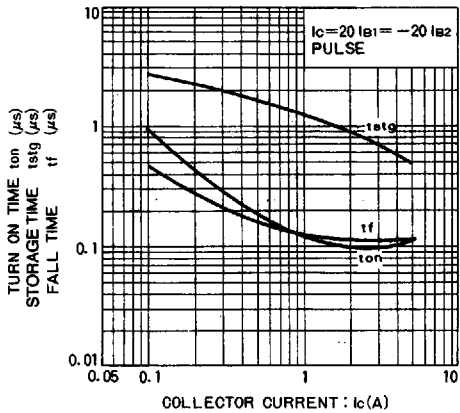


Figure 13

Ordering information

Package	Tape
Code	TL
Basic order quantity	2500
2SC5103F5	★
★ = Standard, ☆ = Semi-standard, * = Special order	