2SC5103F5

Transistor, NPN

Features

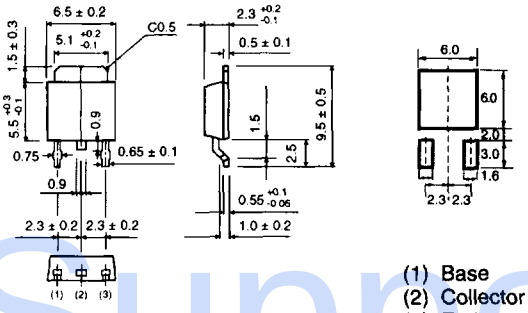
- available in CPT F5 (SC-63) package
- package marking: C5103★❑, where ★ is h_{FE} code and ❑ is lot number
- high-speed switching, typically $t_f = 0.1\ \mu s$ for $I_C = 3$ A
- low collector saturation voltage, typically $V_{CE(sat)} = 0.5$ V for $I_C/I_B = 3$ A/0.15 A
- wide safe operating area (SOA)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

Applications

- high speed switching applications

Dimensions (Units : mm)

2SC5103F5 (CPT F5)



(1) Base
(2) Collector
(3) Emitter

Absolute maximum ratings ($T_a = 25°C$)

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	
		10		$T_C = 25$ °C
Junction temperature	T_j	150	°C	
Storage temperature	T_{stg}	−55 ~ +150	°C	

Electrical characteristics (unless otherwise noted, T_a = 25°C)

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

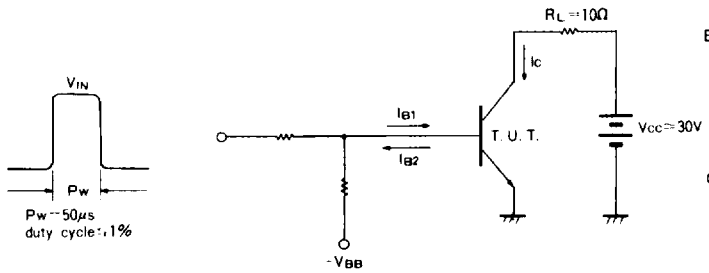
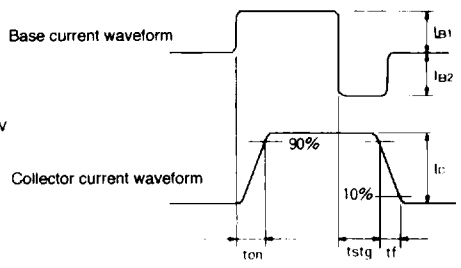


Figure 2 Switching time waveforms



Electrical characteristic curve

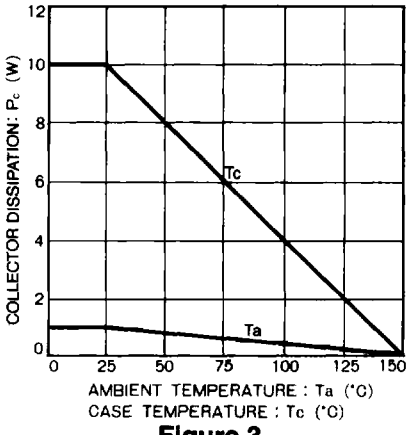


Figure 3

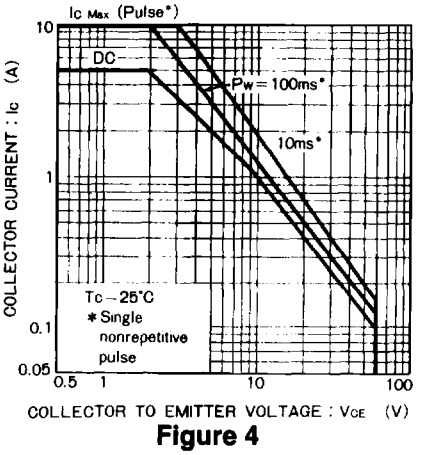


Figure 4

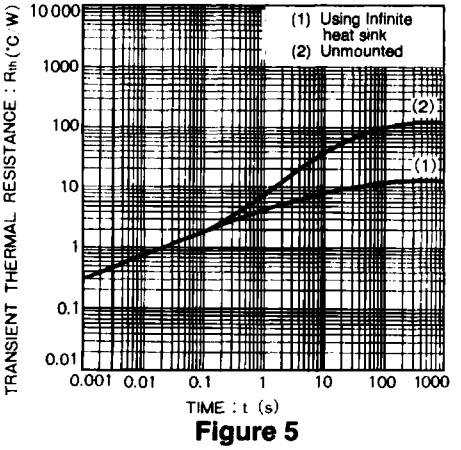


Figure 5

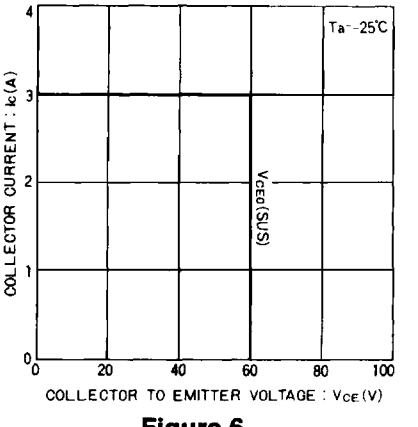


Figure 6

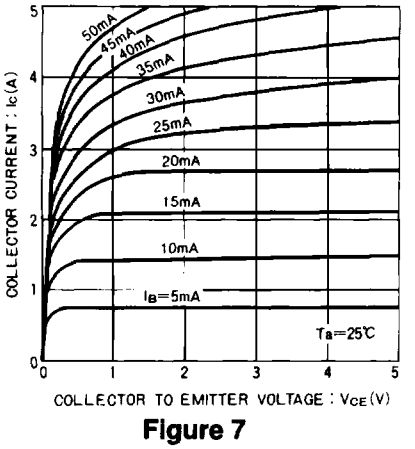


Figure 7

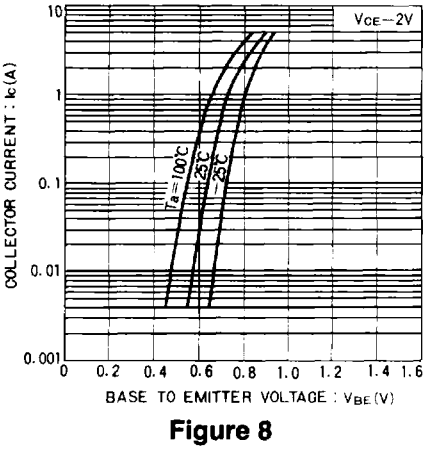


Figure 8

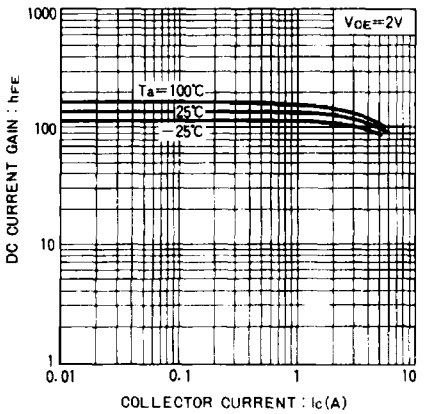


Figure 9

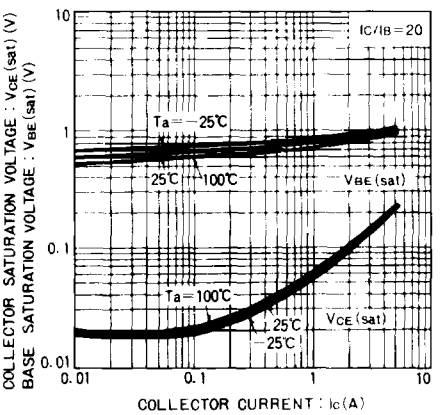


Figure 10

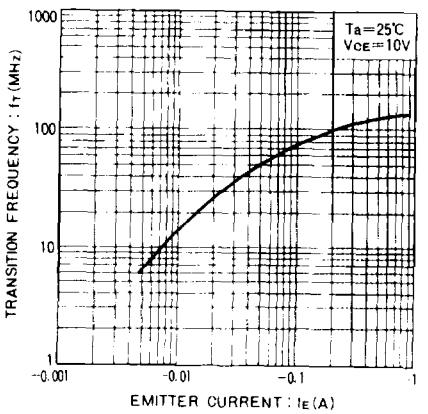


Figure 11

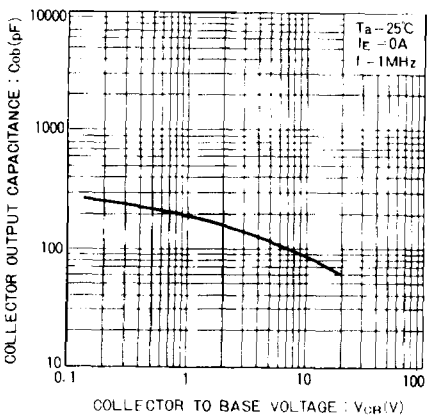


Figure 12

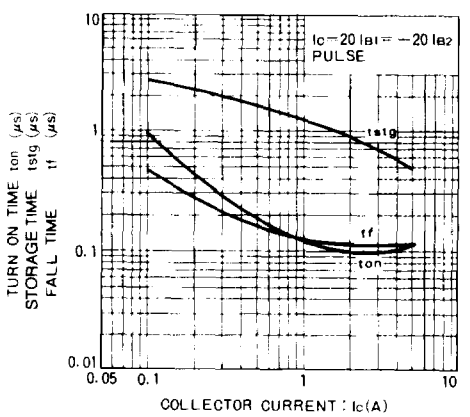


Figure 13

Ordering information

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