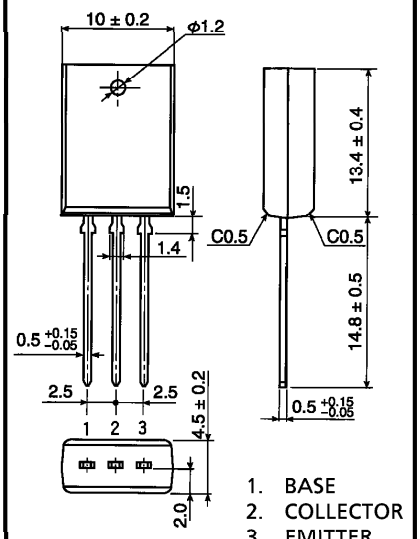
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

2SC5176

HIGH CURRENT SWITCHING APPLICATIONS
DC-DC CONVERTER APPLICATIONS

- Low Collector Saturation Voltage
  : $V_{CE\ (sat)}$ = 0.4V (Max.) (at I_C = 3A)
- High Speed Switching Time : t_{stg} = 1.0 μs (Typ.)

Unit in mm



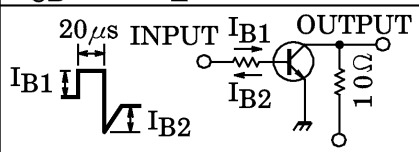
JEDEC	—
JEITA	—
TOSHIBA	2-10T1A

Weight : 1.5g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

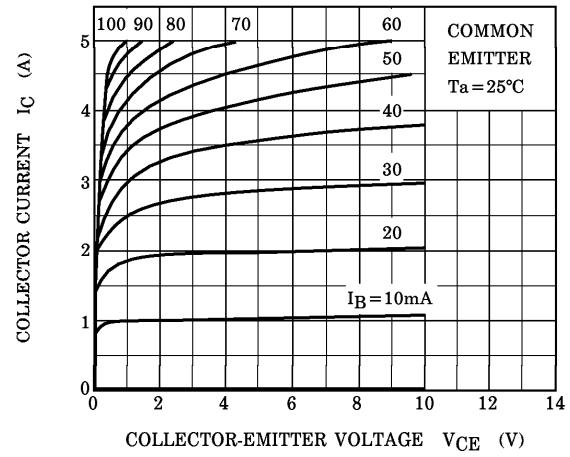
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	100	V
Collector-Emitter Voltage		V_{CEO}	80	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	5	A
	Pulse	I_{CP}	8	
Base Current		I_B	1	A
Collector Power Dissipation		P_C	1.8	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

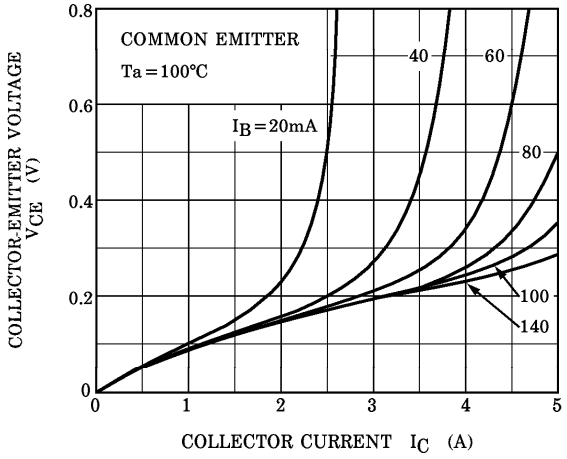
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 100V, I_E = 0	—	—	1	μA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 7V, I_C = 0	—	—	1	μA
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	80	—	—	V
DC Current Gain		$h_{FE(1)}$ (Note)	V_{CE} = 1V, I_C = 1A	70	—	240	
		$h_{FE(2)}$	V_{CE} = 1V, I_C = 3A	40	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE(sat)}$	I_C = 3A, I_B = 0.15A	—	0.2	0.4	V
	Base-Emitter	$V_{BE(sat)}$	I_C = 3A, I_B = 0.15A	—	0.9	1.2	
Transition Frequency		f_T	V_{CE} = 4V, I_C = 1A	—	120	—	MHz
Collector Output Capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	80	—	pF
Switching Time	Turn-on Time	t_{on}	 $I_{B1} = -I_{B2} = 0.15A$ DUTY CYCLE ≦ 1%	—	0.2	—	μs
	Storage Time	t_{stg}		—	1.0	—	
	Fall Time	t_f		—	0.1	—	

(Note) : $h_{FE(1)}$ Classification O : 70~140, Y : 120~240

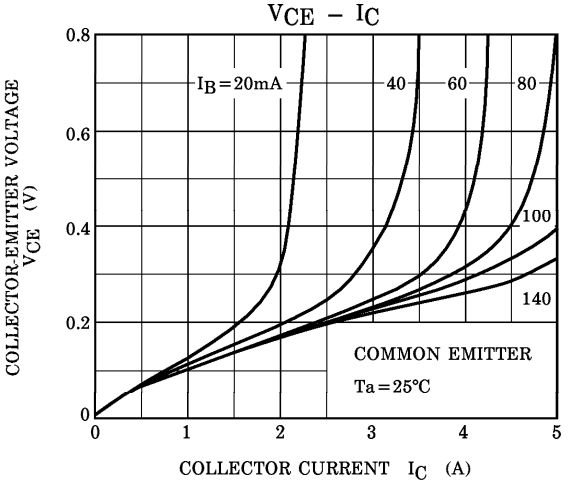
$I_C - V_{CE}$



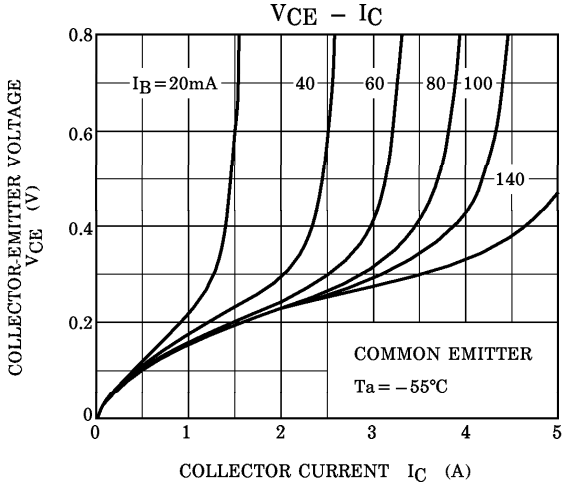
$V_{CE} - I_C$



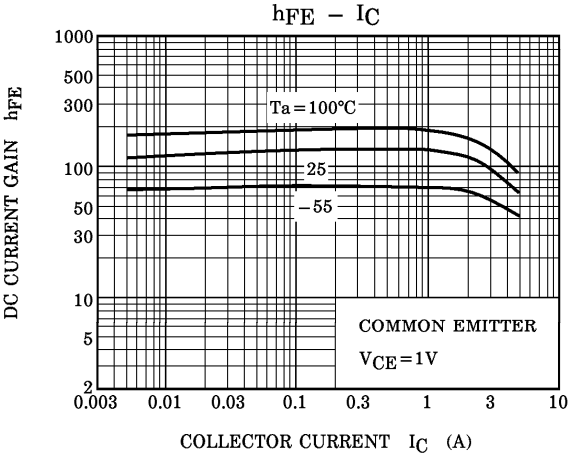
$V_{CE} - I_C$



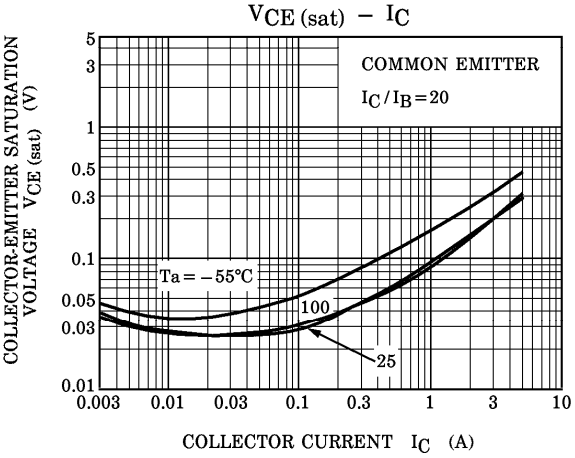
$V_{CE} - I_C$



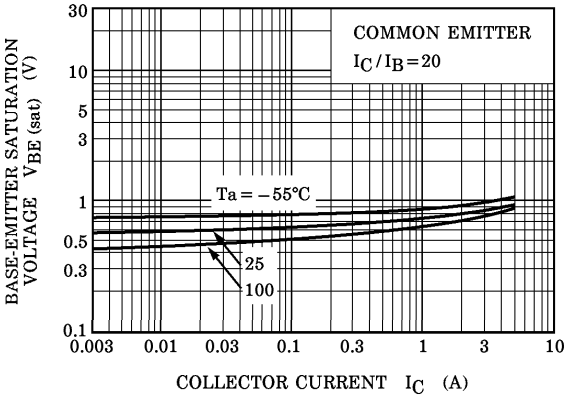
$h_{FE} - I_C$



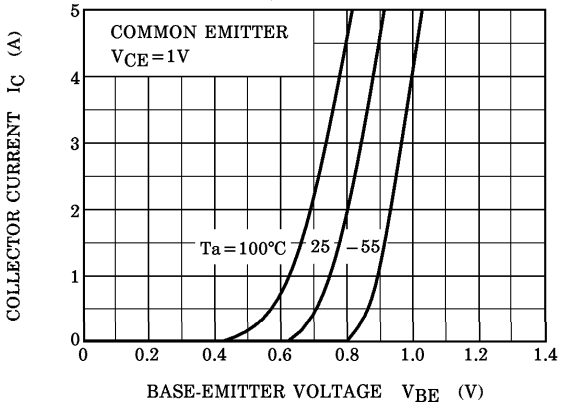
$V_{CE\,(sat)} - I_C$



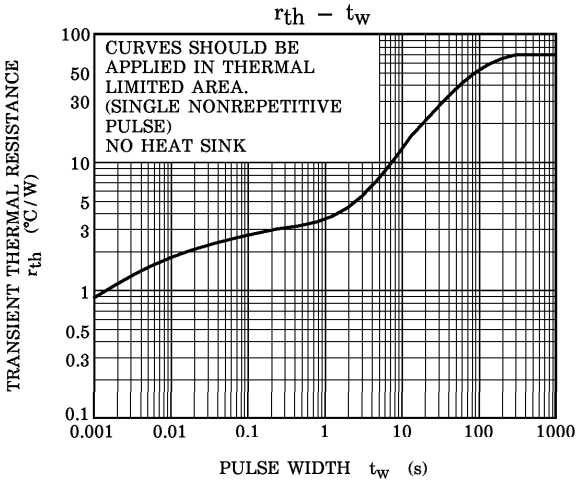
$V_{BE\,(sat)}$ – I_C



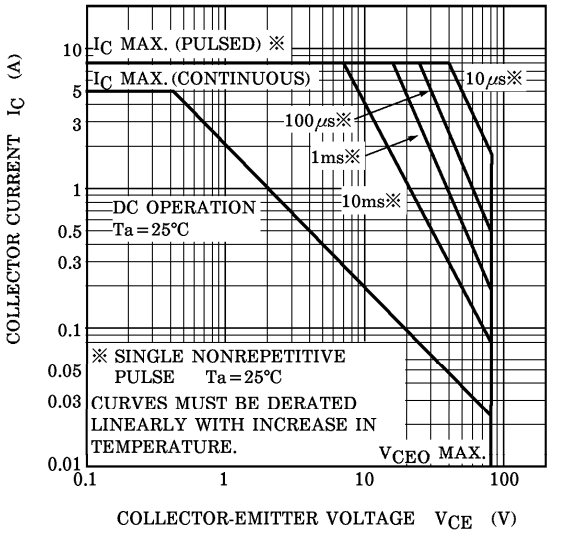
I_C – V_{BE}



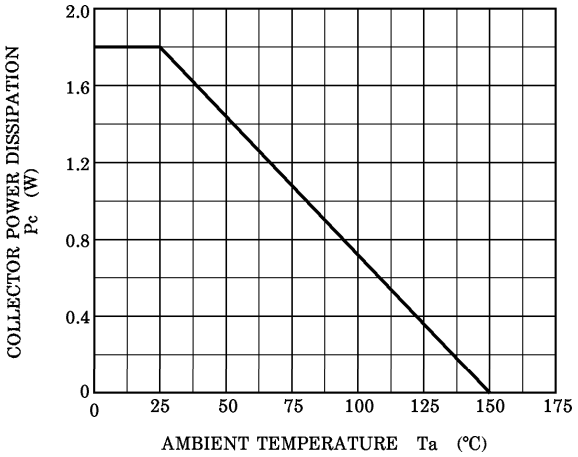
r_{th} – t_w



SAFE OPERATING AREA



P_C – Ta



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