TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE

2SD1947A

HIGH CURRENT SWITCHING APPLICATIONS

LAMP, SOLENOID DRIVE APPLICATIONS

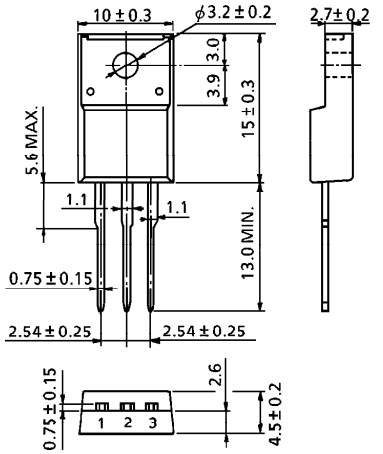
INDUSTRIAL APPLICATIONS

- High DC Current Gain : h_{FE} = 500~1500 (I_C = 1A)
- Low Collector Saturation Voltage
  : $V_{CE\,(sat)}$ = 0.3V (Max.) (I_C = 5A)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	100	V
Collector-Emitter Voltage		V_{CEO}	100	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	10	A
	Pulse	I_{CP}	15	
Base Current		I_B	2	A
Collector Power Dissipation	Ta = 25°C	P_C	2.0	W
	Tc = 25°C		40	
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

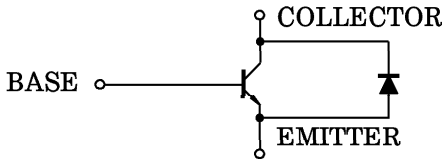
Unit in mm



1. BASE
2. COLLECTOR
3. EMITTER

JEDEC	—
EIAJ	—
TOSHIBA	2-10R1A

EQUIVALENT CIRCUIT



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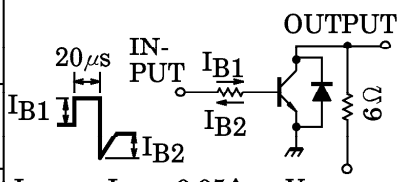
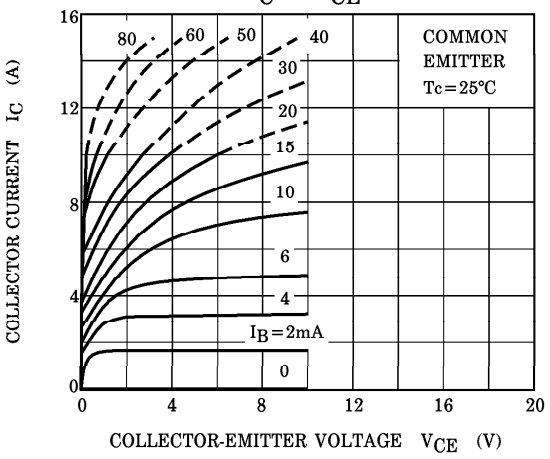
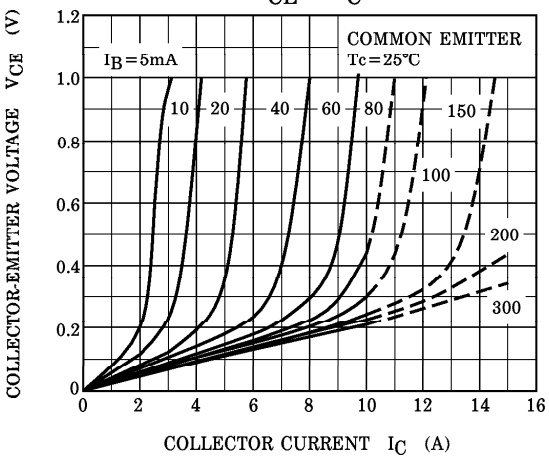
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 100V, I_E = 0	—	—	10	μA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 7V, I_C = 0	—	—	10	μA
Collector-Emitter Breakdown Voltage		$V_{(BR)\,CEO}$	I_C = 50mA, I_B = 0	100	—	—	V
DC Current Gain		$h_{FE\,(1)}$	V_{CE} = 1V, I_C = 1A	500	—	1500	
		$h_{FE\,(2)}$	V_{CE} = 1V, I_C = 5A	150	—	—	
Collector-Emitter Saturation Voltage		$V_{CE\,(sat)}$	I_C = 5A, I_B = 0.05A	—	—	0.3	V
Base-Emitter Saturation Voltage		$V_{BE\,(sat)}$	I_C = 5A, I_B = 0.05A	—	—	1.2	V
Collector-Emitter Forward Voltage		V_{ECF}	I_E = 5A, I_B = 0	—	—	2.0	V
Transition Frequency		f_T	V_{CE} = 5V, I_C = 1A	—	70	—	MHz
Collector Output Capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	160	—	pF
Switching Time	Turn-on Time	t_{on}		—	0.5	—	μs
	Storage Time	t_{stg}		—	6.0	—	
	Fall Time	t_f	$I_{B1} = -I_{B2} = 0.05A$, DUTY CYCLE ≦ 1%	—	1.0	—	

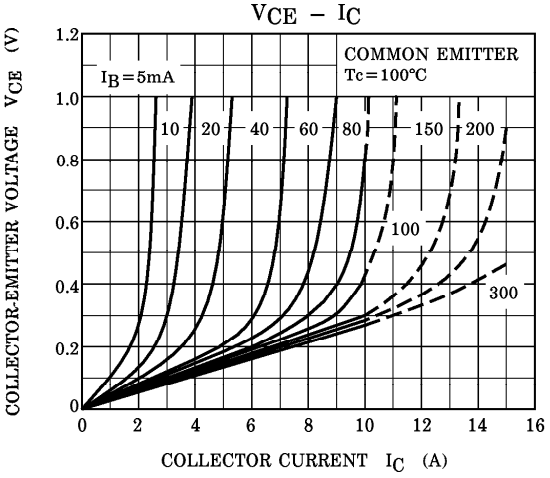
I_C – V_{CE}



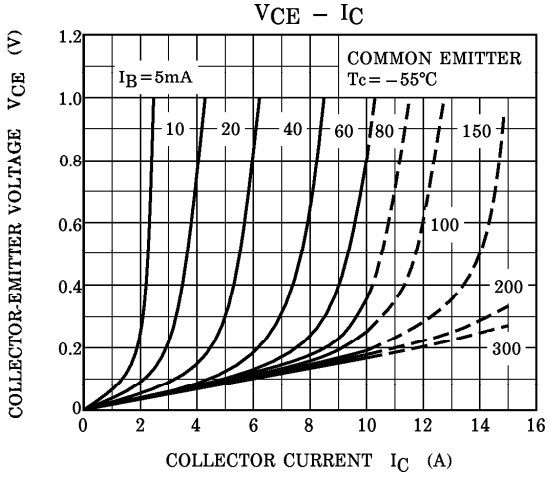
V_{CE} – I_C



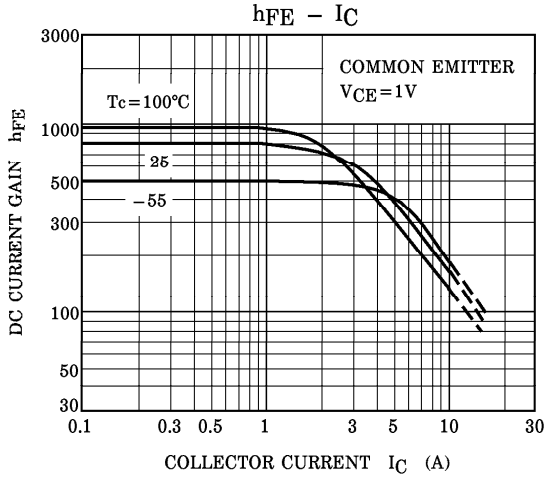
V_{CE} – I_C



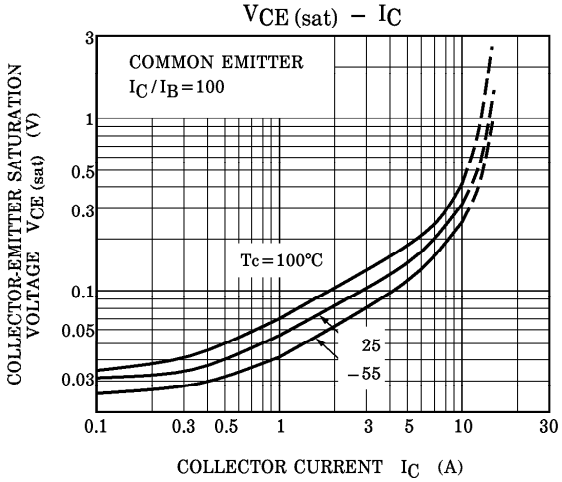
V_{CE} – I_C



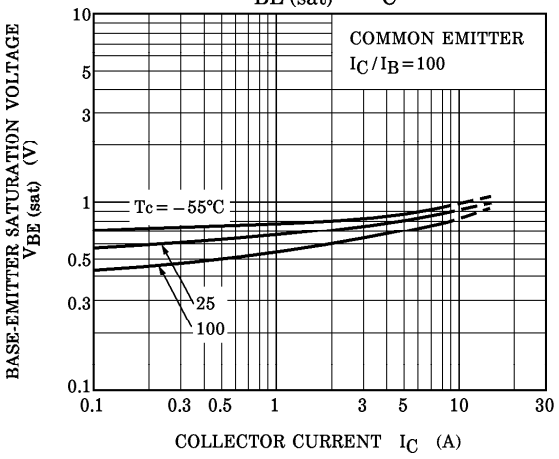
h_{FE} – I_C



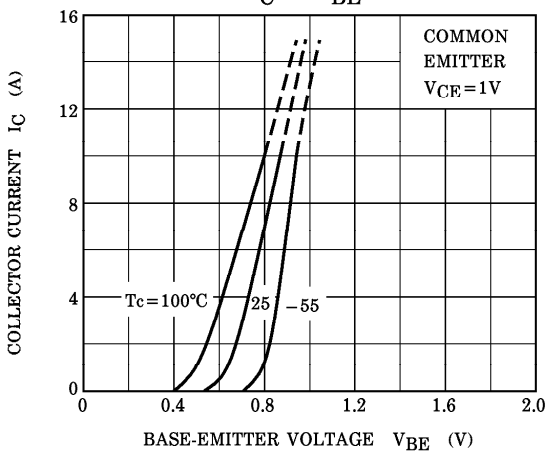
$V_{CE\,(sat)}$ – I_C



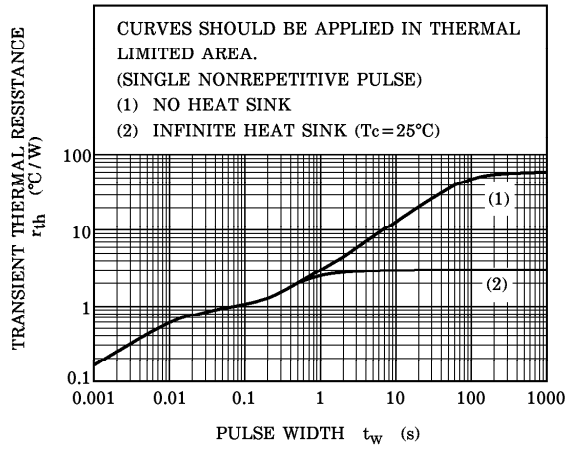
$V_{BE\,(sat)}$ – I_C



I_C – V_{BE}



r_{th} – t_w



SAFE OPERATING AREA