

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE (DARLINGTON)

2SD2131

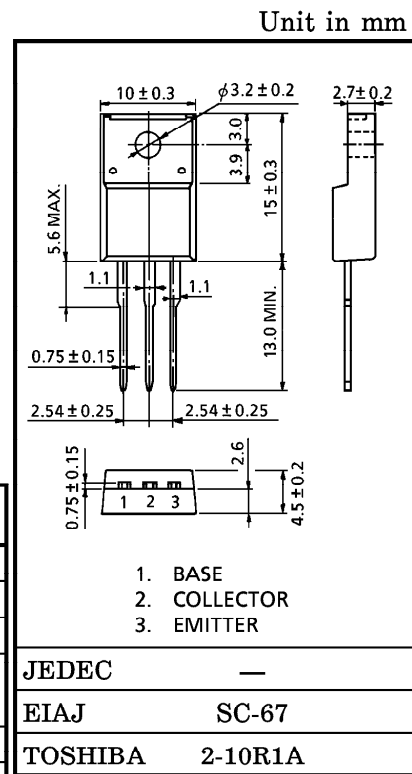
HIGH POWER SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE APPLICATIONS

- High DC Current Gain
: $h_{FE} = 2000$ (Min.) ($V_{CE} = 3V, I_C = 3A$)
- Low Saturation Voltage
: $V_{CE(sat)} = 1.5V$ (Max.) ($I_C = 3A$)
- Zener Diode Included Between Collector and Base.
- Unclamped Inductive Load Energy : $E = 150mJ$ (Min.)

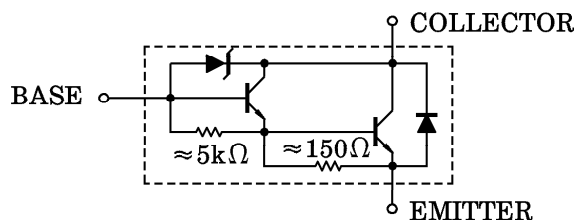
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	60 ± 10	V
Collector-Emitter Voltage		V_{CEO}	60 ± 10	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	5	A
	Pulse	I_{CP}	8	
Base Current		I_B	0.5	A
Collector Power Dissipation	$T_a = 25^\circ C$	P_C	2.0	W
	$T_c = 25^\circ C$		30	
Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$



Weight : 1.7g (Typ.)

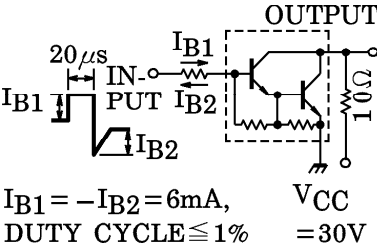
EQUIVALENT CIRCUIT



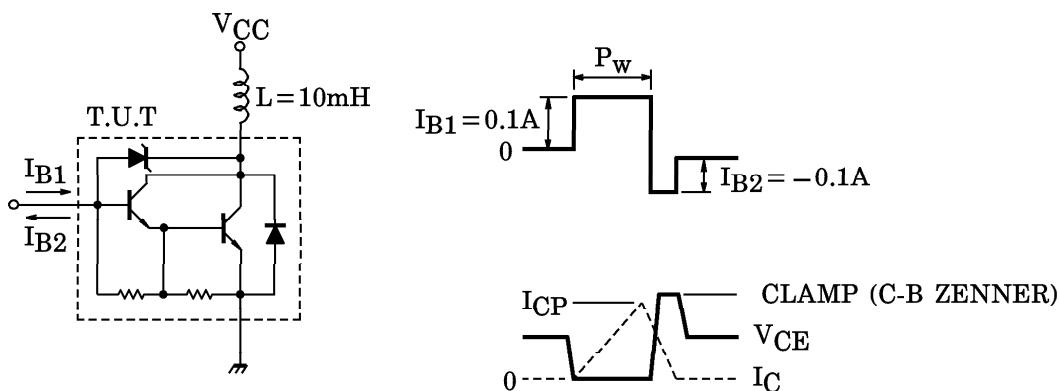
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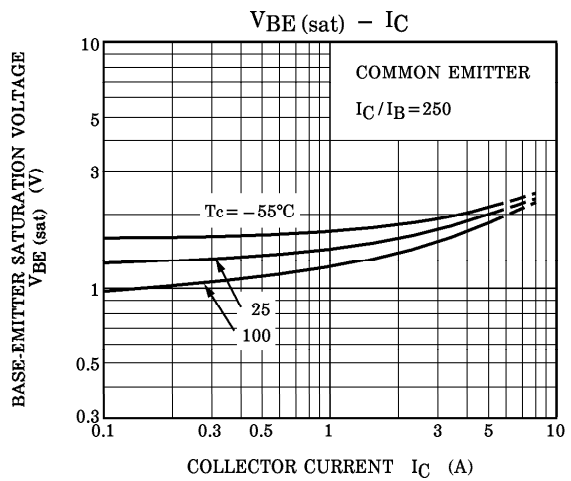
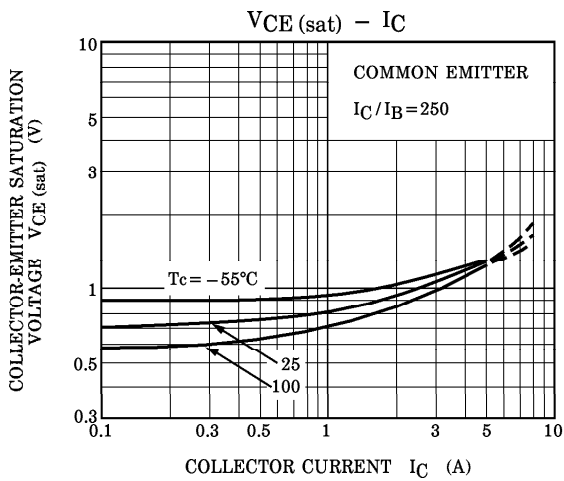
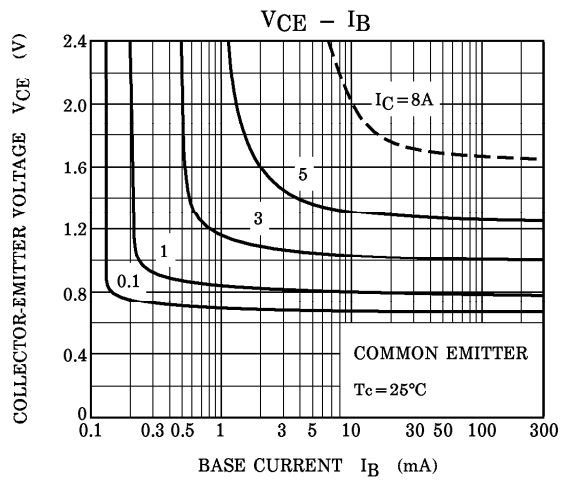
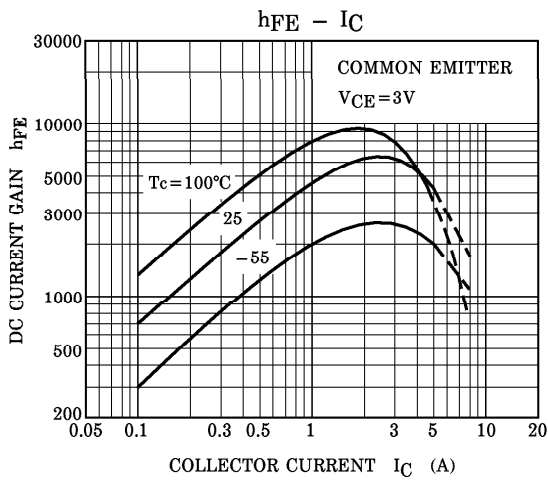
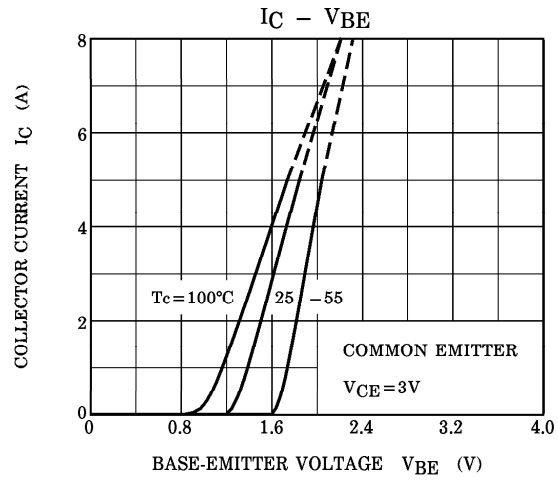
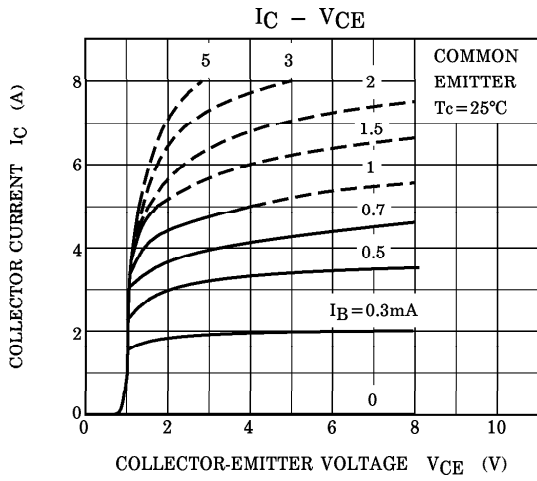
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		ICBO	V _{CB} = 45V, I _E = 0	—	—	10	μA
Collector Cut-off Current		ICEO	V _{CE} = 45V, I _B = 0	—	—	10	μA
Emitter Cut-off Current		IEBO	V _{EB} = 6V, I _C = 0	—	—	2.5	mA
Collector-Base Breakdown Voltage		V _{(BR) CBO}	I _C = 1mA, I _E = 0	50	60	70	V
Collector-Emitter Breakdown Voltage		V _{(BR) CEO}	I _C = 10mA, I _B = 0	50	60	70	V
DC Current Gain		h _{FE} (1)	V _{CE} = 3V, I _C = 3A	2000	—	15000	
		h _{FE} (2)	V _{CE} = 3V, I _C = 5A	1000	—	—	
Collector-Emitter Saturation Voltage		V _{CE (sat)} (1)	I _C = 3A, I _B = 6mA	—	1.1	1.5	V
		V _{CE (sat)} (2)	I _C = 5A, I _B = 20mA	—	1.3	2.5	
Base-Emitter Saturation Voltage		V _{BE (sat)}	I _C = 3A, I _B = 6mA	—	1.7	2.5	V
Unclamped Inductive Load Energy		E _S / B	(Note 1)	150	—	—	mJ
Switching Time	Turn-on Time	t _{on}		—	1.0	—	μs
	Storage Time	t _{stg}		—	4.0	—	
	Fall Time	t _f		I _{B1} = -I _{B2} = 6mA, DUTY CYCLE ≤ 1%	—	2.5	

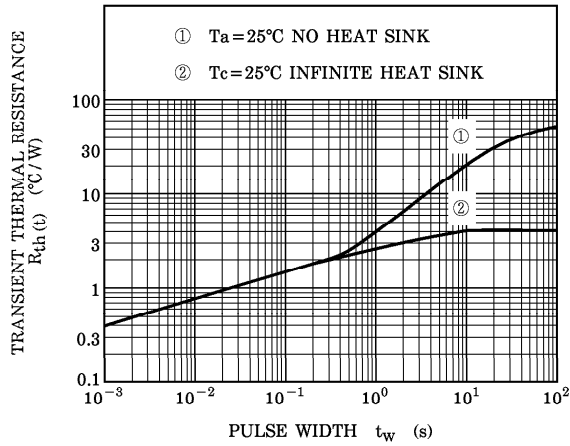
(Note 1) Measurement circuit of unclamped inductive load energy.



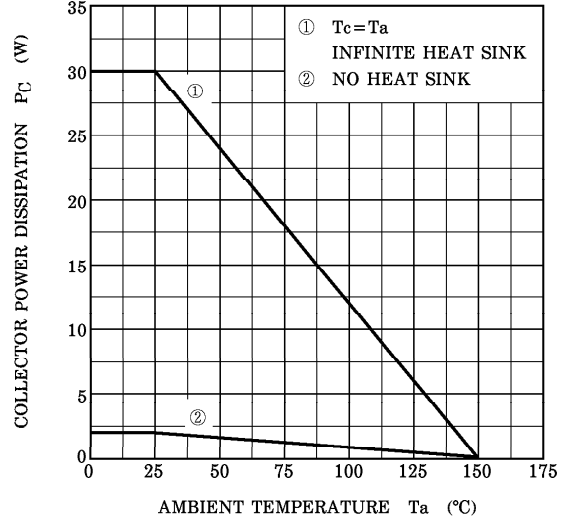
(Note 2) ① Pulse width adjusted for desired I_{CP} (I_{CP} = 5.47A MIN.)
 ② E = 1/2 L I_{CP}²



$R_{th}(t) - t_w$



$P_C - T_a$



SAFE OPERATING AREA

