

TENTATIVE

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE

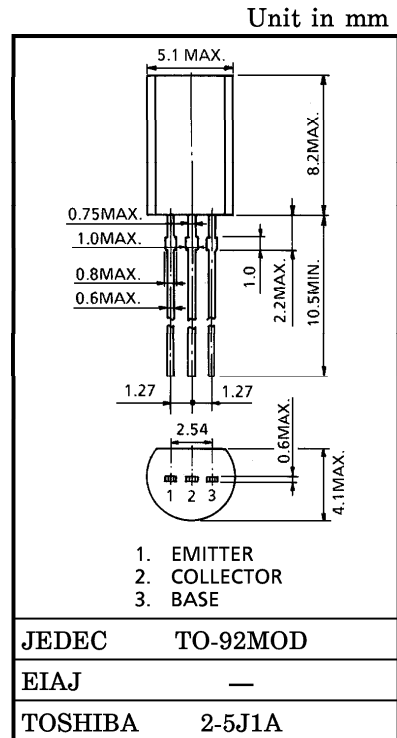
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HAMMER DRIVE, PULSE MOTOR DRIVE APPLICATIONS
FOR INDUCTIVE LOAD DRIVE

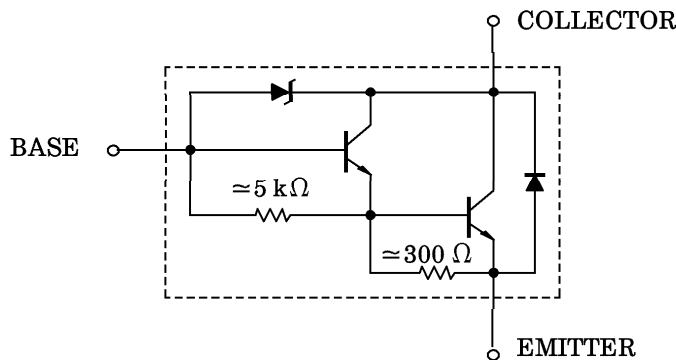
- High DC Current Gain
: $h_{FE} = 2000$ (Min.) ($V_{CE} = 2V, I_C = 1A$)
- Low Saturation Voltage
: $V_{CE(sat)} = 1.5V$ (Max.) ($I_C = 1A, I_B = 1mA$)
- Built-in Zener Diode between Collector and Base

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	80 ± 10	V
Collector-Emitter Voltage		V_{CEO}	80 ± 10	V
Emitter-Base Voltage		V_{EBO}	8	V
Collector Current	DC	I_C	± 2	A
	Pulse	I_{CP}	± 3	
Base Current		I_B	0.5	A
Collector Power Dissipation ($T_a = 25^\circ C$)		P_C	0.9	W
Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$



EQUIVALENT CIRCUIT



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● The information contained herein is subject to change without notice.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB} = 60\text{ V}, I_E = 0$	—	—	10	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = 8\text{ V}, I_C = 0$	0.8	—	4.0	mA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	$I_C = 100\ \mu\text{A}, I_E = 0$	70	80	90	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	70	80	90	V
DC Current Gain		h_{FE}	$V_{CE} = 2\text{ V}, I_C = 1\text{ A}$	2000	—	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	1.5	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 1\text{ mA}$	—	—	2.0	V
Emitter-Collector Forward Voltage		V_{ECF}	$I_E = 1\text{ A}, I_B = 0$	—	1.2	2.0	V
Transition Frequency		f_T	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	—	100	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	—	20	—	pF
Unclamped Inductive Load Energy		$E_{S/B}$	$L = 10\text{ mH}, I_C = 1.2\text{ A},$ $I_B = \pm 50\text{ mA}$	7.2	—	—	mJ
Switching Time	Turn-on Time	t_{on}	<p> I_{B1} I_{B2} $20\ \mu\text{s}$ I_{B1} I_{B2} $V_{CC} = 30\text{ V}$ $I_{B1} = -I_{B2} = 1\text{ mA},$ $\text{DUTY CYCLE} \leq 1\%$ </p>	—	0.2	—	μs
	Storage Time	t_{stg}		—	4.0	—	
	Fall Time	t_f		—	0.6	—	