

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (DARLINGTON)

2SD1509

MICRO MOTOR DRIVE, HAMMER DRIVE APPLICATIONS

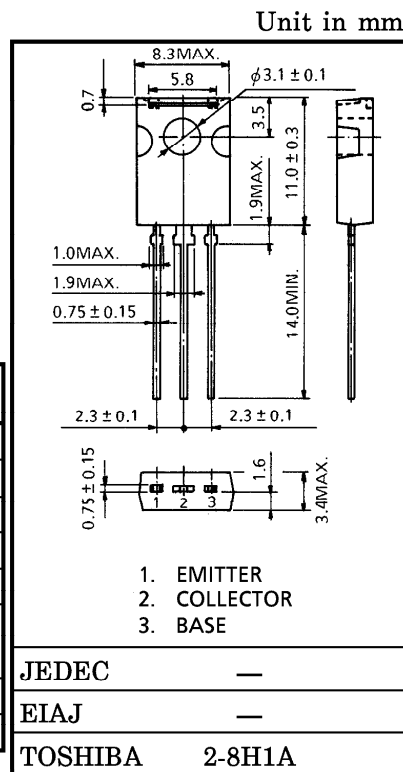
SWITCHING APPLICATIONS

POWER AMPLIFIER APPLICATIONS

- High DC Current Gain : $h_{FE} = 2000$ (Min.)
- Low Saturation Voltage
: $V_{CE(sat)} = 1.5V$ (Max.)

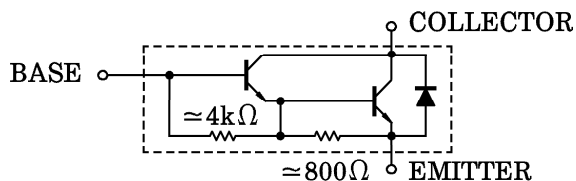
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	8	V
Collector Current	I_C	2	A
Base Current	I_B	0.5	A
Collector Power Dissipation	P_C	$T_a = 25^\circ C$	1.5
		$T_c = 25^\circ C$	10
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$



Weight : 0.82g (Typ.)

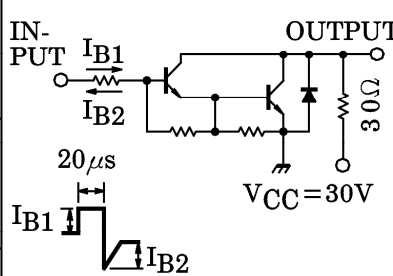
EQUIVALENT CIRCUIT



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB} = 80V, I_E = 0$	—	—	10	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = 8V, I_C = 0$	—	—	4	mA
Collector-Emitter Breakdown Voltage		$V_{(BR) CEO}$	$I_C = 10mA, I_B = 0$	80	—	—	V
DC Current Gain		h_{FE}	$V_{CE} = 2V, I_C = 1A$	2000	—	—	
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 1A, I_B = 1mA$	—	—	1.5	V
Base-Emitter Saturation Voltage		$V_{BE (sat)}$	$I_C = 1A, I_B = 1mA$	—	—	2.0	V
Transition Frequency		f_T	$V_{CE} = 2V, I_C = 0.5A$	—	100	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	20	—	pF
Switching Time	Turn-on Time	t_{on}	 <p>IN-PUT I_{B1} I_{B2} OUTPUT 30Ω $V_{CC} = 30V$ $20\mu s$</p>	—	0.4	—	μs
	Storage Time	t_{stg}		—	4.0	—	
	Fall Time	t_f		$I_{B1} = -I_{B2} = 1mA$ DUTY CYCLE $\leq 1\%$	—	0.6	

