

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (DARLINGTON)

# 2SD1658

MICRO MOTOR DRIVE, HAMMER DRIVE APPLICATIONS

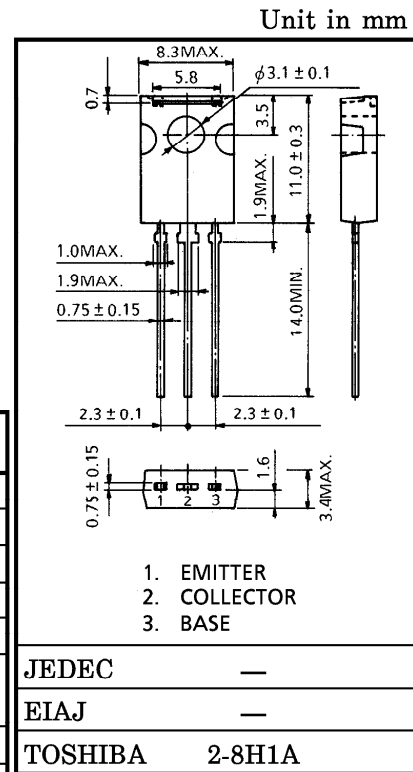
SWITCHING APPLICATIONS

POWER AMPLIFIER APPLICATIONS

- High DC Current Gain :  $h_{FE} = 2000$  (Min.)
- Low Saturation Voltage  
:  $V_{CE(sat)} = 1.5V$  (Max.)
- Zener Diode Included Between Collector and Base.

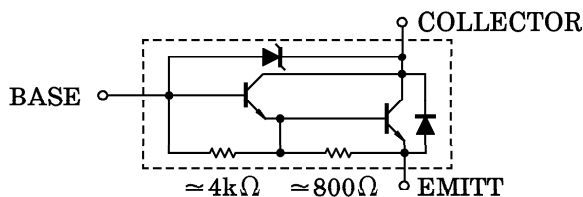
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CBO}$	$60 \pm 10$	V
Collector-Emitter Voltage		$V_{CEO}$	$60 \pm 10$	V
Emitter-Base Voltage		$V_{EBO}$	8	V
Collector Current		$I_C$	2	A
Base Current		$I_B$	0.5	A
Collector Power Dissipation	Ta = 25°C	$P_C$	1.5	W
	Tc = 25°C		10	
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°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		$I_{CBO}$	$V_{CB} = 45V, I_E = 0$	—	—	10	$\mu A$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB} = 8V, I_C = 0$	—	—	4	mA
Collector-Emitter Breakdown Voltage		$V_{(BR) CEO}$	$I_C = 10mA, I_B = 0$	50	60	70	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>INPUT  <math>I_{B1}</math>  <math>I_{B2}</math>                  OUTPUT  <math>30\Omega</math>  <math>V_{CC} = 30V</math>  <math>20\mu s</math>  <math>I_{B1}</math>  <math>I_{B2}</math></p>	—	0.4	—	$\mu s$
	Storage Time	$t_{stg}$		—	4.0	—	
	Fall Time	$t_f$		$I_{B1} = -I_{B2} = 1mA,$ DUTY CYCLE $\leq 1\%$	—	0.6	

