

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCES)

# 2SA1681

POWER AMPLIFIER APPLICATIONS

POWER SWITCHING APPLICATIONS

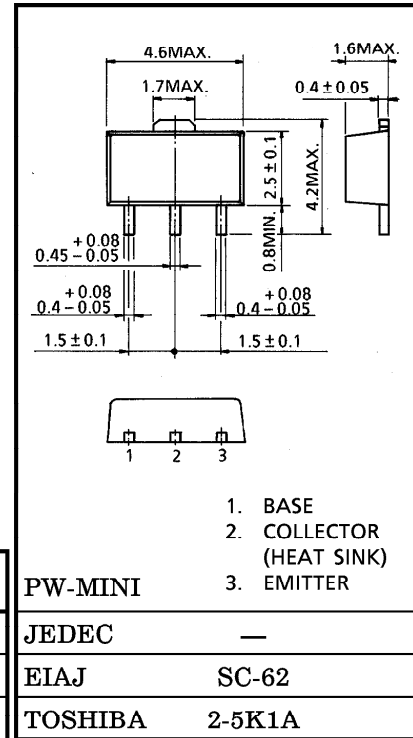
- Low Saturation Voltage :  $V_{CE(sat)} = -0.5V$  (Max.)  
( $I_C = -1A$ )
- High Speed Switching Time:  $t_{stg} = 300ns$  (Typ.)
- Small Flat Package
- $P_C = 1 \sim 2W$  (Mounted on Ceramic Substrate)
- Complementary to 2SC4409

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Collector Current	$I_C$	-2	A
Base Current	$I_B$	-0.2	A
Collector Power Dissipation	$P_C$	500	mW
Collector Power Dissipation	$P_C^*$	1000	mW
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ C$

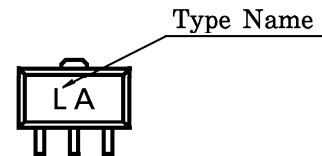
\* : Mounted on ceramic substrate ( $250mm^2 \times 0.8t$ )

Unit in mm



Weight : 0.05g

Marking



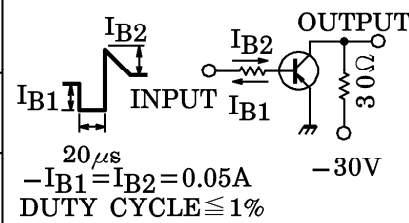
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		$I_{CBO}$	$V_{CB} = -60V, I_E = 0$	—	—	-0.1	$\mu A$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB} = -6V, I_C = 0$	—	—	-0.1	$\mu A$
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C = -10mA, I_B = 0$	-50	—	—	V
DC Current Gain		$h_{FE(1)}$	$V_{CE} = -2V, I_C = -100mA$	120	—	400	
		$h_{FE(2)}$	$V_{CE} = -2V, I_C = -1.5A$	40	—	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = -1A, I_B = -0.05A$	—	—	-0.5	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	$I_C = -1A, I_B = -0.05A$	—	—	-1.2	V
Transition Frequency		$f_T$	$V_{CE} = -2V, I_C = -100mA$	—	100	—	MHz
Collector Output Capacitance		$C_{ob}$	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	23	—	pF
Switching Time	Turn-on Time	$t_{on}$	 <p> <math>20\mu s</math>  <math>-I_{B1} = I_{B2} = 0.05A</math>                      DUTY CYCLE <math>\leq 1\%</math> </p>	—	0.1	—	$\mu s$
	Storage Time	$t_{stg}$		—	0.3	—	
	Fall Time	$t_f$		—	0.1	—	

