

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

# 2SD1411A

HIGH CURRENT SWITCHING APPLICATIONS

POWER AMPLIFIER APPLICATIONS

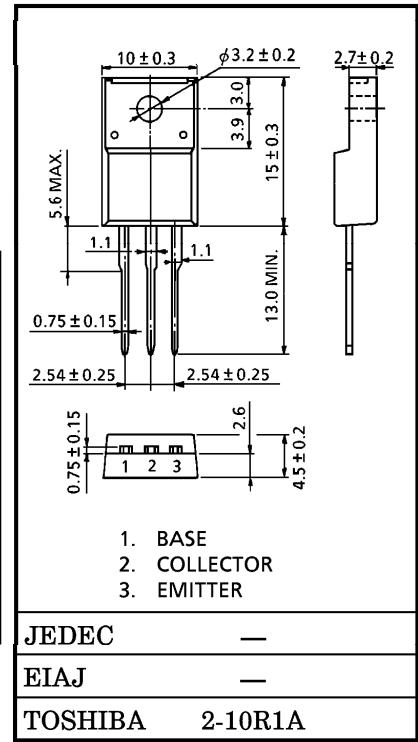
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Saturation Voltage :  $V_{CE(sat)} = 0.5V$  (Max.) at  $I_C = 4A$
- Complementary to 2SB1018A

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CB0}$	100	V
Collector-Emitter Voltage	$V_{CEO}$	80	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	7	A
Base Current	$I_B$	1	A
Collector Power	$P_C$	2.0	W
Dissipation		30	
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ C$



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 100V, I_E = 0$	—	—	5	$\mu A$	
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 5V, I_C = 0$	—	—	5	$\mu A$	
Collector-Emitter Breakdown Voltage	$V_{(BR) CEO}$	$I_C = 50mA, I_B = 0$	80	—	—	V	
DC Current Gain	$h_{FE} (1)$ (Note)	$V_{CE} = 1V, I_C = 1A$	70	—	240		
	$h_{FE} (2)$	$V_{CE} = 1V, I_C = 4A$	30	—	—		
Collector-Emitter Saturation Voltage	$V_{CE} (sat)$	$I_C = 4A, I_B = 0.4A$	—	0.25	0.5	V	
Base-Emitter Saturation Voltage	$V_{BE} (sat)$	$I_C = 4A, I_B = 0.4A$	—	0.9	1.4	V	
Transition Frequency	$f_T$	$V_{CE} = 4V, I_C = 1A$	—	10	—	MHz	
Collector Output Capacitance	$C_{ob}$	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	200	—	pF	
Switching Time	Turn-on Time	$t_{on}$		—	0.4	—	$\mu s$
	Storage Time	$t_{stg}$		—	2.5	—	
	Fall Time	$t_f$		$I_{B1} = -I_{B2} = 0.3A,$ $DUTY\ CYCLE \leq 1\%$	—	0.5	

(Note)  $h_{FE} (1)$  Classification    O : 70~140,    Y : 120~240

