

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

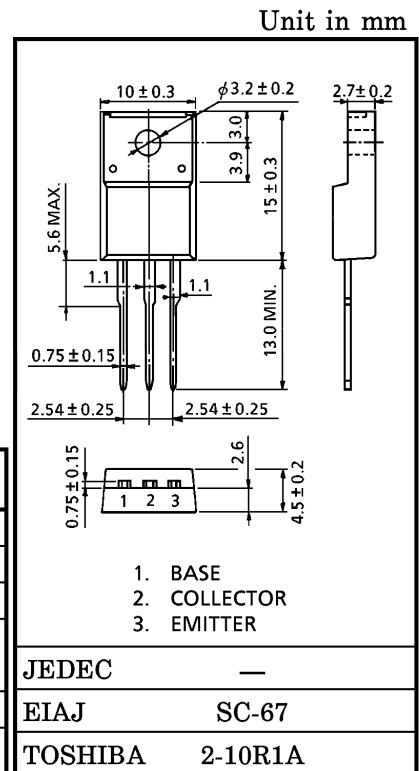
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SWITCHING REGULATOR APPLICATIONS
 HIGH VOLTAGE SWITCHING APPLICATIONS
 DC-DC CONVERTER APPLICATIONS

- High Speed Switching : $t_f = 0.3 \mu s$ (Max.) ($I_C = 1.2 A$)
- High Collector Breakdown Voltage : $V_{CEO} = 400 V$
- High DC Current Gain : $h_{FE} = 20$ (Min.) ($I_C = 0.3 A$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	600	V
Collector-Emitter Voltage		V_{CEO}	400	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	3	A
	Pulse	I_{CP}	5	
Base Current		I_B	1	A
Collector Power Dissipation	$T_a = 25^\circ C$	P_C	2.0	W
	$T_c = 25^\circ C$		25	
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}	$V_{CB} = 480\text{ V}, I_E = 0$	—	—	100	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	10	μA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	$I_C = 1\text{ mA}, I_B = 0$	600	—	—	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	400	—	—	V
DC Current Gain		$h_{FE(1)}$	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	13	—	—	
		$h_{FE(2)}$	$V_{CE} = 5\text{ V}, I_C = 0.3\text{ A}$	20	—	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = 1.2\text{ A}, I_B = 0.15\text{ A}$	—	—	1.0	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	$I_C = 1.2\text{ A}, I_B = 0.15\text{ A}$	—	—	1.3	V
Switching Time	Turn-on Time	t_r	<p> $V_{CC} \cong 360\text{ V}$ $I_{B1} \downarrow$ (20 μs) $I_{B2} \downarrow$ I_{B1} (during pulse) I_{B21} (during fall time) $I_{B1} = 0.15\text{ A}, I_{B2} = -0.3\text{ A}$ DUTY CYCLE $\leq 1\%$ </p>	—	—	0.5	μs
	Storage Time	t_{stg}		—	—	2.0	
	Fall Time	t_f		—	—	0.3	

