TOSHIBA S2000N

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

S 2 0 0 0 N

COLOR TV HORIZONTAL OUTPUT APPLICATIONS
COLOR TV SWITCHING REGULATOR APPLICATIONS

• High Voltage : $V_{CES} = 1500 \text{ V}$ • High Speed : $t_f = 0.7 \,\mu\text{s}$ (Max.)

• Low Saturation Voltage: VCE (sat) = 5 V (Max.)

• Collector Metal (Fin) is Fully Covered with Mold Resin. ((IS) Package)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT	
Collector-Base Voltage		V _{CES}	1500	V	
Emitter-Base Voltage		v_{EBO}	5	V	
Collector Current	DC	IC	8	A	
	Pulse	ICP	15		
Base Current		I_{B}	4	A	
Collector Power Dissipation (Tc = 25°C)		PC	50	w	
Junction Temperature		T_j	150	°C	
Storage Temperature Range		$T_{ m stg}$	-55~150	°C	
Thermal Resistance		R _{th (j-c)}	2.5	°C/W	

15.5±0.5 03.6±0.3 3.0±0.3 0.0±0.1 0.0±0.1 0.0±0.1 0.0±0.2 0.0±0.1 0

Unit in mm

Weight: 5.5 g (Typ.)

2-16E3A

EIAJ TOSHIBA

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

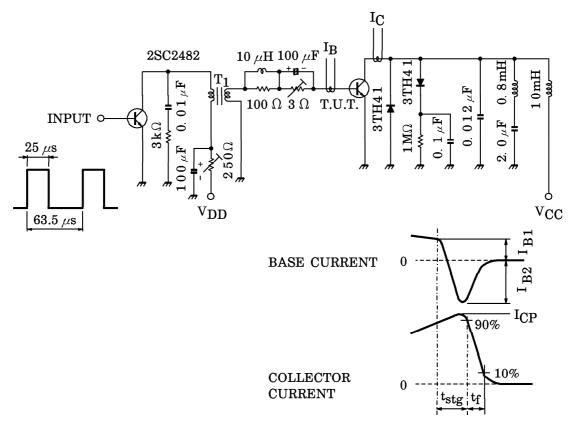
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	ICBO	$V_{CB} = 1500 \text{ V}, V_{BE} = 0$	_	_	1	mA
Emitter-Base Breakdown Voltage	V _{EBO}	$I_{\mathrm{E}}=1\mathrm{mA},~I_{\mathrm{C}}=0$	5	_	_	V
DC Current Gain	h _{FE} (1)	$V_{CE} = 5 V$, $I_{C} = 1 A$	10	_	30	-
DC Current Gain	h _{FE} (2)	$V_{CE} = 5 V, I_{C} = 4.5 A$	4.5	_	9	
Collector-Emitter Saturation	Var	$I_C = 4.5 \text{ A}, I_B = 2 \text{ A}$	_		1	V
Voltage	V _{CE} (sat)	$I_C = 4.5 \text{ A}, I_B = 1 \text{ A}$	_	_	5	
Base-Emitter Saturation	V _{BE (sat)}	$I_{C} = 4.5 \text{ A}, I_{B} = 1 \text{ A}$	_	0.9	1.2	V
Voltage	BE (sat)					
Collector-Emitter Sustain	VOEW	$\mathrm{L} = 40\mathrm{mH},~\mathrm{I_B} = 500\mathrm{mA}$	700	_	_	V
Voltage	VCEX (sus)	$V_{BE} = -1.7 \text{ V}$				
Transition Frequency	${ m f_T}$	$V_{CE} = 10 \text{ V}, I_{C} = 0.1 \text{ A}$	_	2	_	MHz
Collector Output Capacitance	Cob	$V_{CB} = 10 \text{ V}, \text{ I}_{E} = 0, \text{ f} = 1 \text{ MHz}$	_	95	_	pF
Switching Time Storage Time	$\mathbf{t_{stg}}$	$I_{CP} = 4.5 \text{ A}, I_{B1} \text{ (end)} = 1 \text{ A}$	_	8	12	
(Fig.1) Fall Time	tf	$ m f_{ m H} = 15.75~kHz$	_	0.4	0.7	μ s

961001EAA2

TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

TOSHIBA S2000N

Fig.1 SWITCHING TIME TEST CIRCUIT

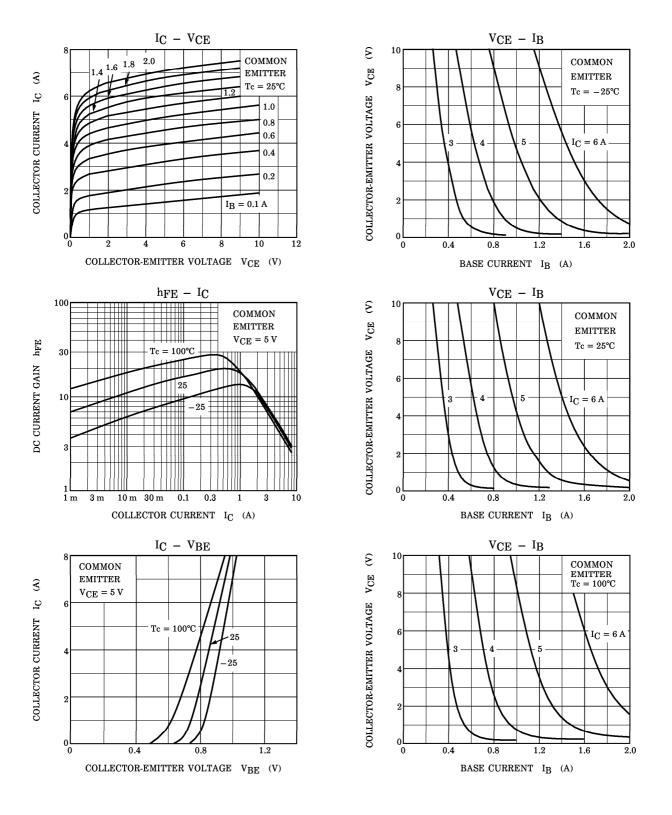


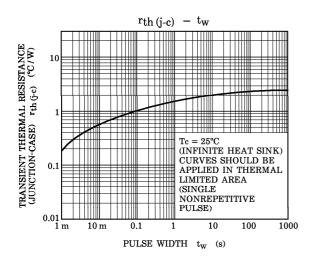
Base Current Gradient

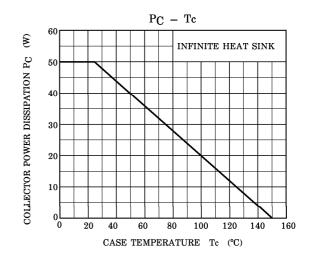
$$\label{eq:dIB} \mathrm{dI_B}/\,\mathrm{dt} = \; \frac{\mathrm{I_{B1}} + \mathrm{I_{B2}}}{\mathrm{t_{stg}}} \left(\mathrm{A}/\,\mu\mathrm{s}\right)$$

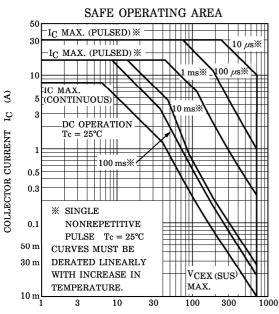
961001EAA2

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
 The information contained herein is subject to change without notice.









COLLECTOR-EMITTER VOLTAGE VCE (V)