TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

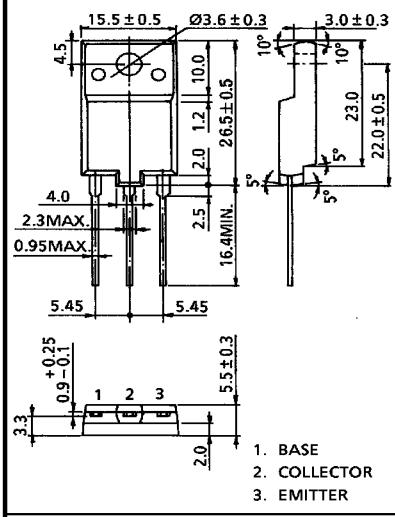
S 2 0 0 0 N

COLOR TV HORIZONTAL OUTPUT APPLICATIONS

COLOR TV SWITCHING REGULATOR APPLICATIONS

- High Voltage : V_{CES} = 1500 V
- High Speed : t_f = 0.7 μs (Max.)
- Low Saturation Voltage : $V_{CE\ (sat)}$ = 5 V (Max.)
- Collector Metal (Fin) is Fully Covered with Mold Resin. ((IS) Package)

Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-16E3A

Weight : 5.5 g (Typ.)

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	I_C	8	A
	Pulse	I_{CP}	15	
Base Current		I_B	4	A
Collector Power Dissipation (Tc = 25°C)		P_C	50	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C
Thermal Resistance		$R_{th\ (j\text{-}c)}$	2.5	°C / W

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 1500 V, V_{BE} = 0	—	—	1	mA
Emitter-Base Breakdown Voltage		V_{EBO}	I_E = 1 mA, I_C = 0	5	—	—	V
DC Current Gain		h_{FE} (1)	V_{CE} = 5 V, I_C = 1 A	10	—	30	
		h_{FE} (2)	V_{CE} = 5 V, I_C = 4.5 A	4.5	—	9	
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 4.5 A, I_B = 2 A	—	—	1	V
			I_C = 4.5 A, I_B = 1 A	—	—	5	
Base-Emitter Saturation Voltage		$V_{BE\ (sat)}$	I_C = 4.5 A, I_B = 1 A	—	0.9	1.2	V
Collector-Emitter Sustain Voltage		$V_{CEX\ (sus)}$	L = 40 mH, I_B = 500 mA, V_{BE} = −1.7 V	700	—	—	V
Transition Frequency		f_T	V_{CE} = 10 V, I_C = 0.1 A	—	2	—	MHz
Collector Output Capacitance		Cob	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	95	—	pF
Switching Time (Fig.1)	Storage Time	t_{stg}	I_{CP} = 4.5 A, I_{B1} (end) = 1 A	—	8	12	μs
	Fall Time	t_f	f_H = 15.75 kHz	—	0.4	0.7	

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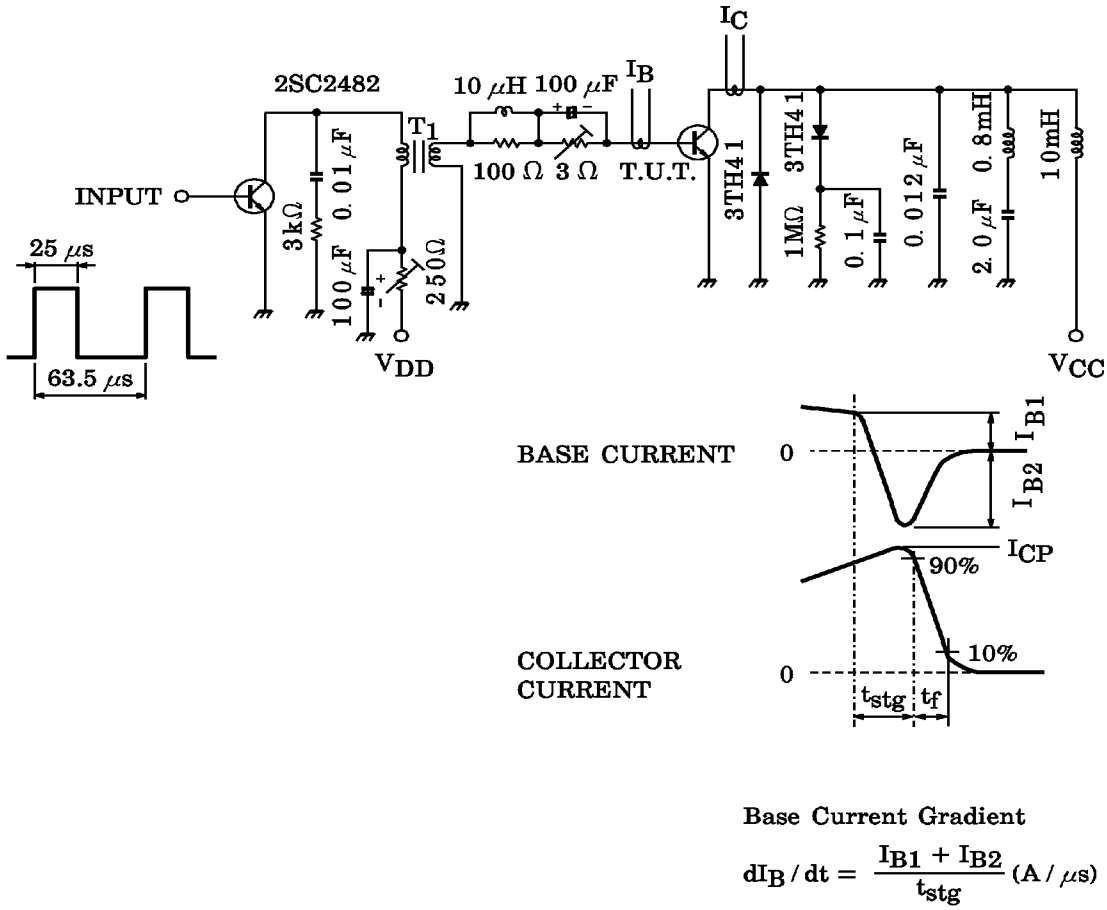
Fig.1 SWITCHING TIME TEST CIRCUIT



Base Current Gradient

$$dI_B / dt = \frac{I_{B1} + I_{B2}}{t_{stg}} \ (A / \mu s)$$

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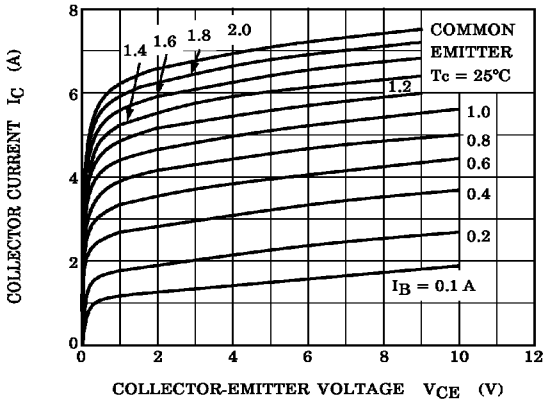
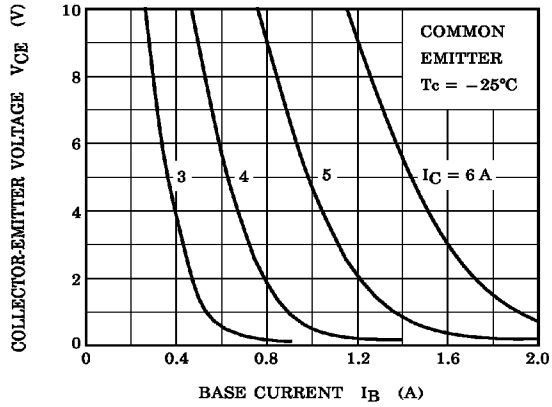
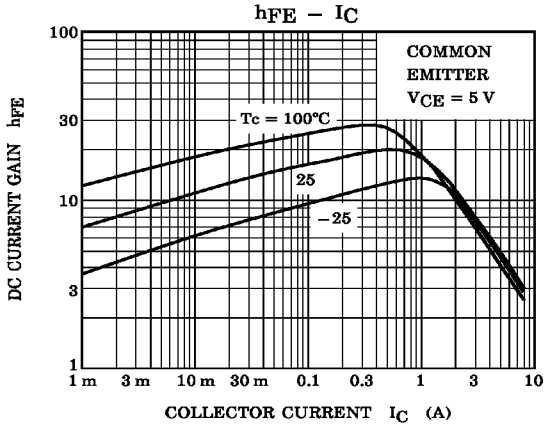
I_C – V_{CE}



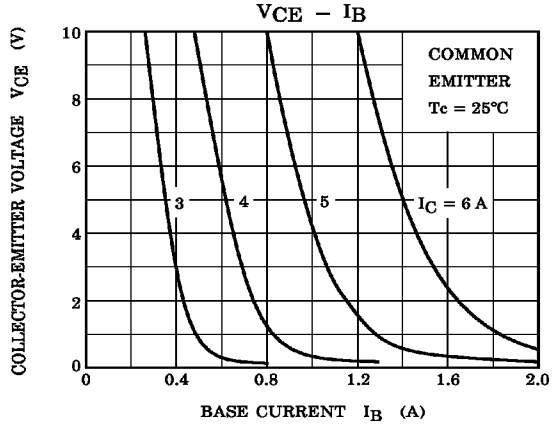
V_{CE} – I_B



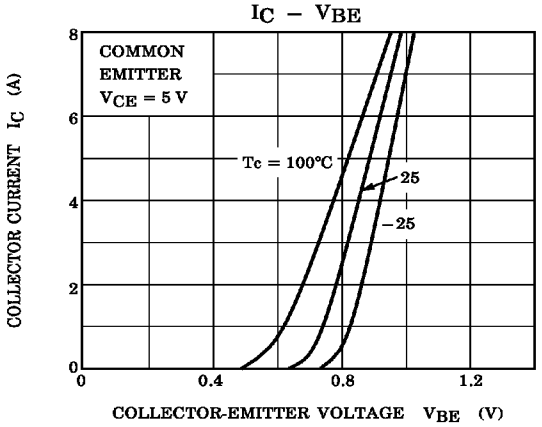
h_{FE} – I_C



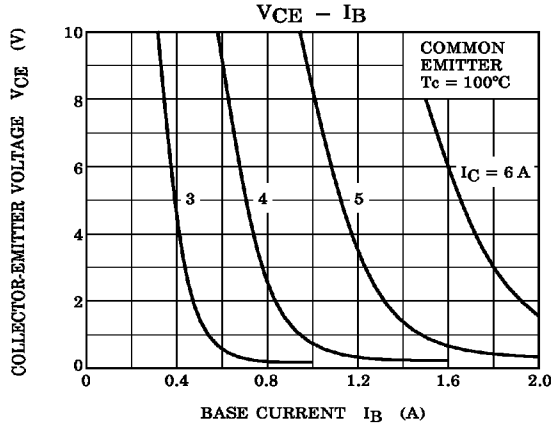
V_{CE} – I_B



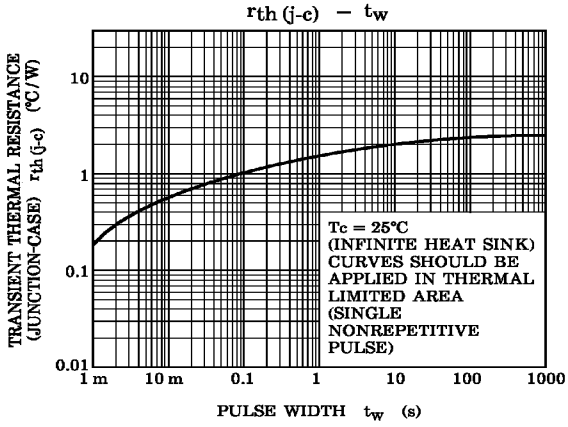
I_C – V_{BE}



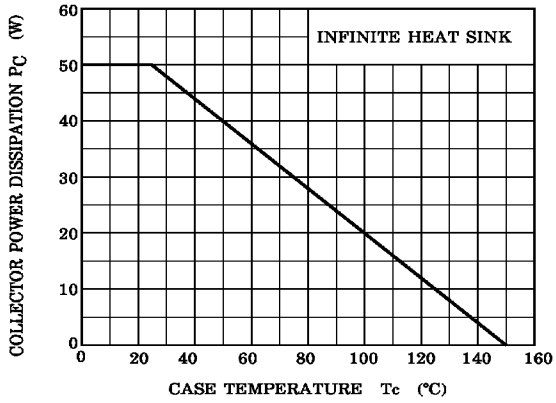
V_{CE} – I_B



$r_{th\,(j\text{-}c)}$ – t_w



P_C – Tc



SAFE OPERATING AREA