TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

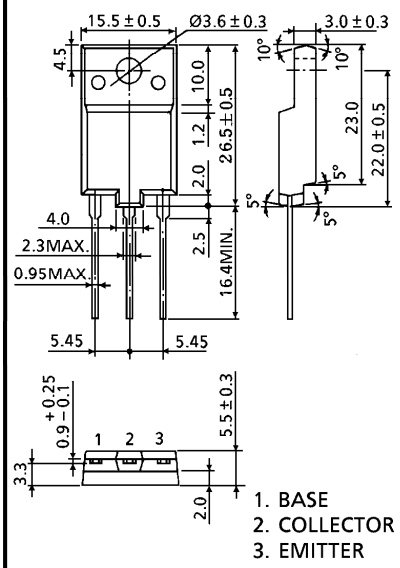
2SC5387

HORIZONTAL DEFLECTION OUTPUT FOR HIGH RESOLUTION DISPLAY, COLOR TV

HIGH SPEED SWITCHING APPLICATIONS

- High Voltage : V_{CBO} = 1500 V
- Low Saturation Voltage : $V_{CE\,(sat)}$ = 3 V (Max.)
- High Speed : t_f = 0.15 μs (Typ.)
- Collector Metal (Fin) is Fully Covered with Mold Resin.

Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-16E3A

Weight : 5.5 g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

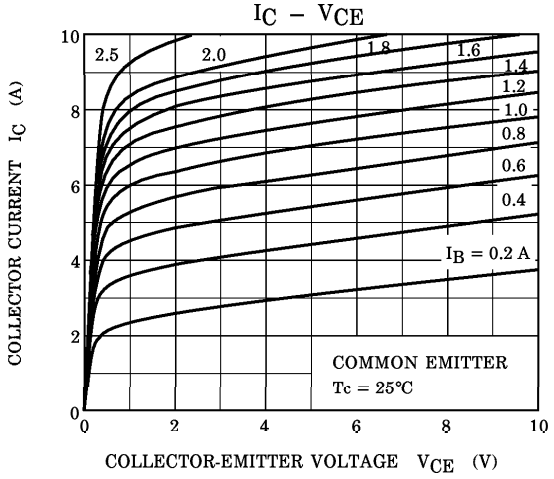
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	1500	V
Collector-Emitter Voltage		V_{CEO}	600	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current	DC	I_C	10	A
	Pulse	I_{CP}	20	
Base Current		I_B	5	A
Collector Power Dissipation (Tc = 25°C)		P_C	50	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

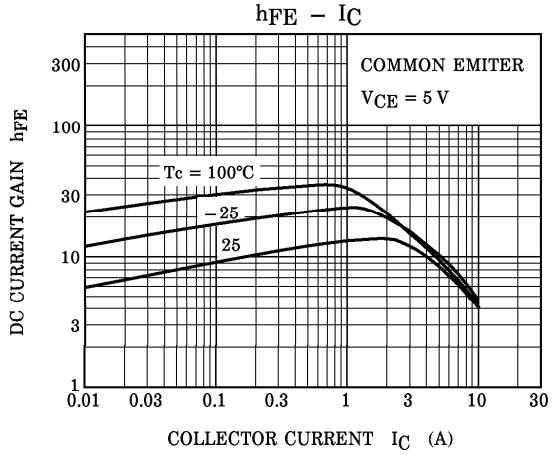
961001EAA1

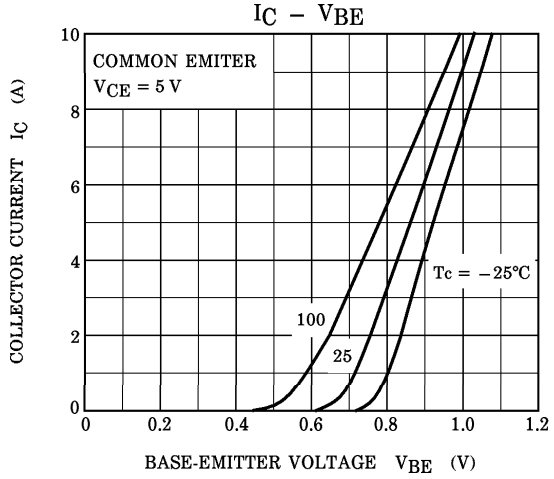
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing 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.
- 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.

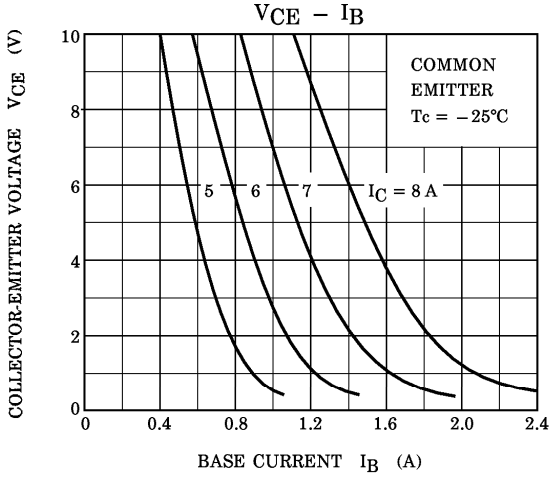
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

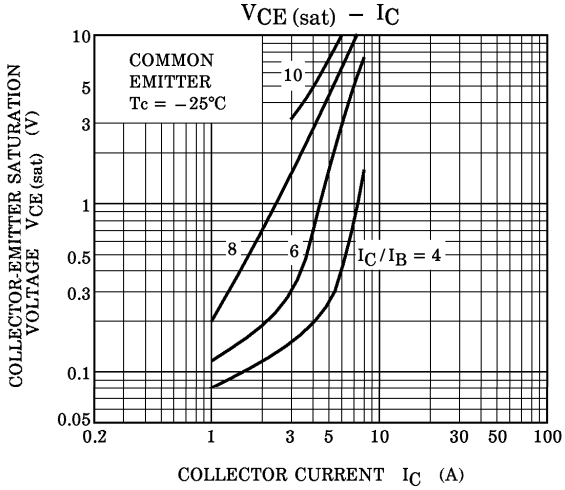
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 1500 V, I_E = 0	—	—	1	mA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	10	μA
Emitter-Base Breakdown Voltage		$V_{(BR)CEO}$	I_C = 10 mA, I_B = 0	600	—	—	V
DC Current Gain		$h_{FE(1)}$	V_{CE} = 5 V, I_C = 1 A	15	—	35	
		$h_{FE(2)}$	V_{CE} = 5 V, I_C = 8 A	4.3	—	7.8	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C = 8 A, I_B = 2 A	—	—	3	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	I_C = 8 A, I_B = 2 A	—	—	1.5	V
Transition Frequency		f_T	V_{CE} = 10 V, I_C = 0.1 A	—	1.7	—	MHz
Collector Output Capacitance		C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	130	—	pF
Switching Time	Storage Time	t_{stg}	I_{CP} = 6 A, I_{B1} (end) = 1.2 A	—	2.5	3.5	μs
	Fall Time	t_f	f_H = 64 kHz	—	0.15	0.3	

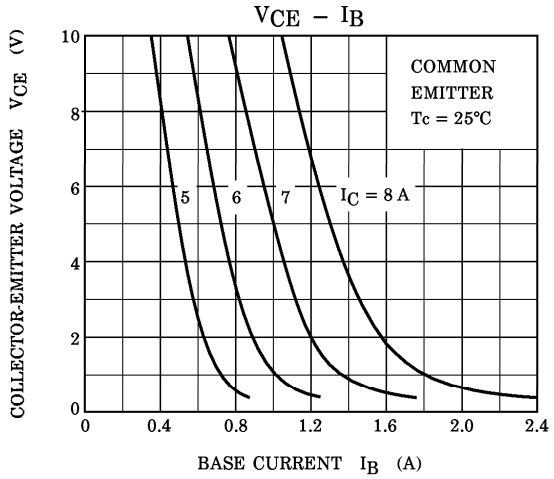

IC – VCE
COLLECTOR CURRENT IC (A)
COLLECTOR-EMITTER VOLTAGE VCE (V)
2.5
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
IB = 0.2 A
COMMON EMITTER
Tc = 25°C
0
2
4
6
8
10

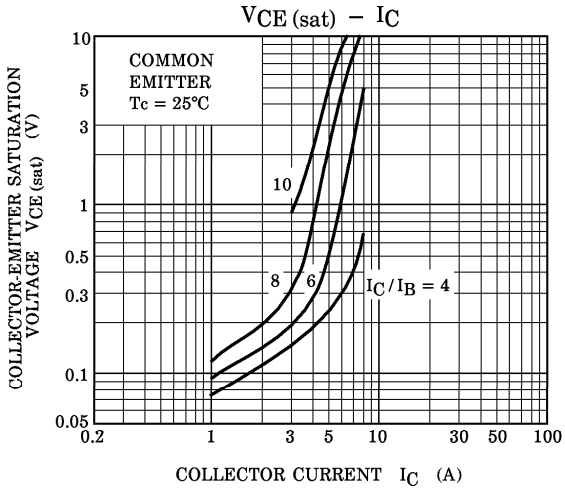

hFE – IC
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (A)
COMMON EMITER
VCE = 5 V
Tc = 100°C
−25
25
300
100
30
10
3
1
0.01
0.03
0.1
0.3
1
3
10
30

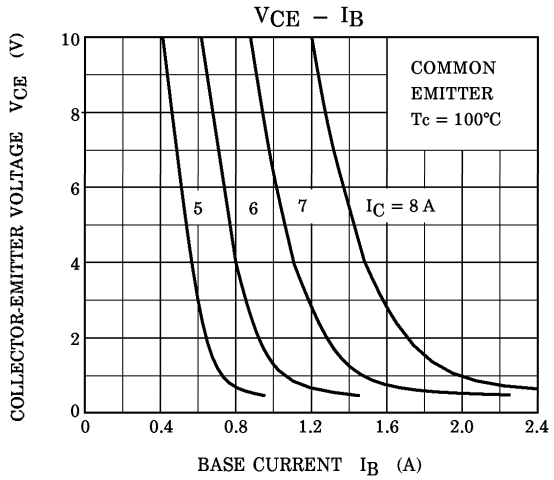

IC – VBE
COLLECTOR CURRENT IC (A)
BASE-EMITTER VOLTAGE VBE (V)
COMMON EMITER
VCE = 5 V
Tc = −25°C
100
25
0
2
4
6
8
10
0.2
0.4
0.6
0.8
1.0
1.2

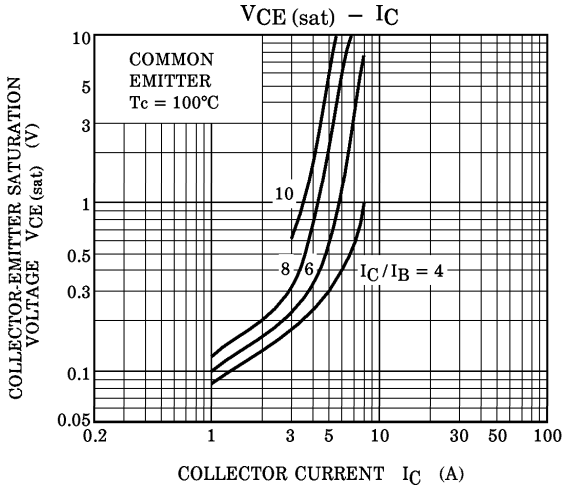

VCE – IB
COMMON
EMITTER
Tc = –25°C
5
6
7
IC = 8 A
COLLECTOR-EMITTER VOLTAGE VCE (V)
BASE CURRENT IB (A)

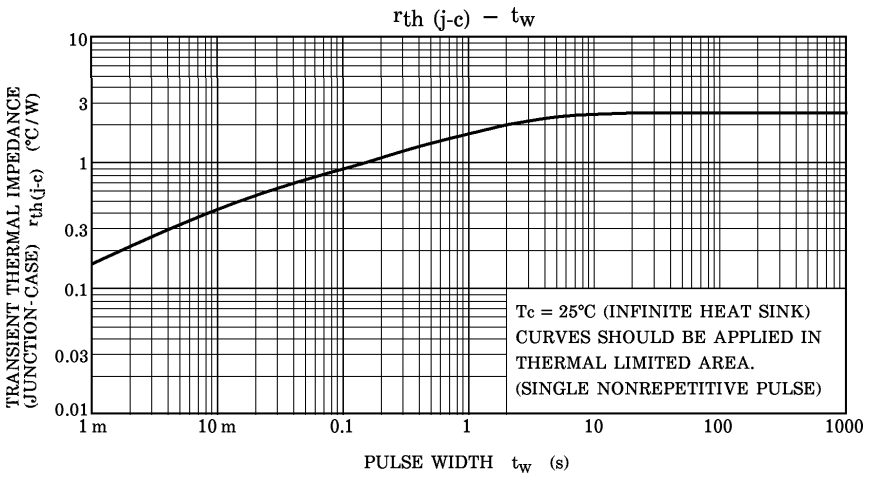

VCE (sat) – IC
COMMON
EMITTER
Tc = –25°C
10
8
6
IC / IB = 4
COLLECTOR-EMITTER SATURATION VOLTAGE VCE (sat) (V)
COLLECTOR CURRENT IC (A)

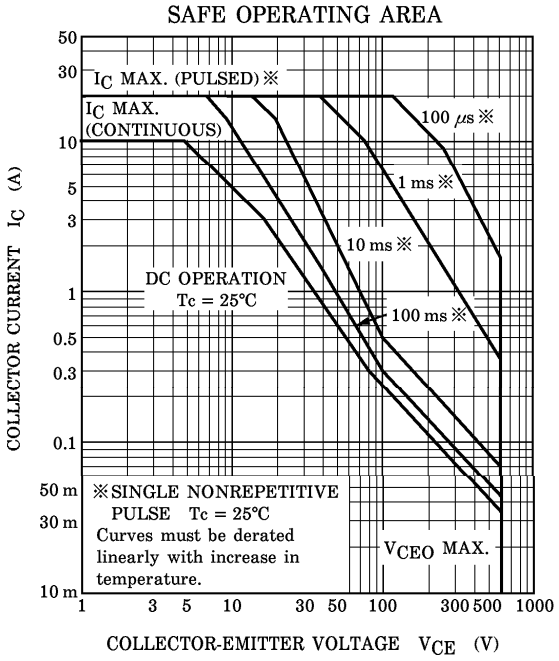

VCE – IB
COMMON
EMITTER
Tc = 25°C
5
6
7
IC = 8 A
COLLECTOR-EMITTER VOLTAGE VCE (V)
BASE CURRENT IB (A)

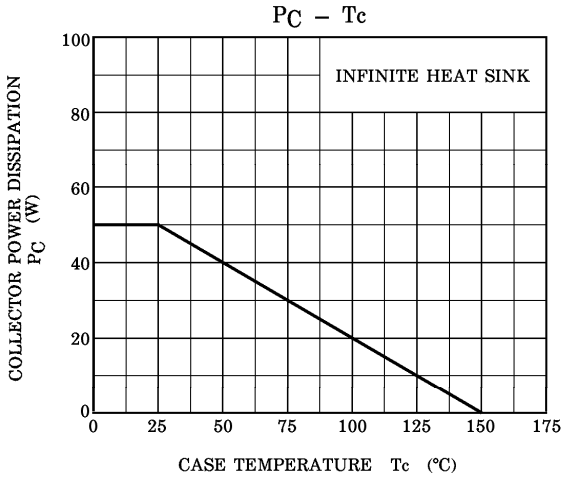

VCE (sat) – IC
COMMON
EMITTER
Tc = 25°C
10
8
6
IC / IB = 4
COLLECTOR-EMITTER SATURATION VOLTAGE VCE (sat) (V)
COLLECTOR CURRENT IC (A)


VCE – IB
COMMON
EMITTER
Tc = 100°C
5
6
7
IC = 8 A
COLLECTOR-EMITTER VOLTAGE VCE (V)
BASE CURRENT IB (A)


VCE (sat) – IC
COMMON
EMITTER
Tc = 100°C
10
8
6
IC / IB = 4
COLLECTOR-EMITTER SATURATION VOLTAGE VCE (sat) (V)
COLLECTOR CURRENT IC (A)


rth (j-c) – tw
TRANSIENT THERMAL IMPEDANCE (JUNCTION-CASE) rth(j-c) (°C/W)
10
3
1
0.3
0.1
0.03
0.01
1 m
10 m
0.1
1
10
100
1000
PULSE WIDTH tw (s)
Tc = 25°C (INFINITE HEAT SINK)
CURVES SHOULD BE APPLIED IN
THERMAL LIMITED AREA.
(SINGLE NONREPETITIVE PULSE)


SAFE OPERATING AREA
COLLECTOR CURRENT IC (A)
50
30
10
5
3
1
0.5
0.3
0.1
50 m
30 m
10 m
IC MAX. (PULSED)※
IC MAX.
(CONTINUOUS)
100 μs※
1 ms※
10 ms※
100 ms※
DC OPERATION
Tc = 25°C
※SINGLE NONREPETITIVE
PULSE Tc = 25°C
Curves must be derated
linearly with increase in
temperature.
VCEO MAX.
1
3
5
10
30
50
100
300
500
1000
COLLECTOR-EMITTER VOLTAGE VCE (V)


PC – Tc
COLLECTOR POWER DISSIPATION PC (W)
100
80
60
40
20
0
INFINITE HEAT SINK
0
25
50
75
100
125
150
175
CASE TEMPERATURE Tc (°C)