TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

2SC3328

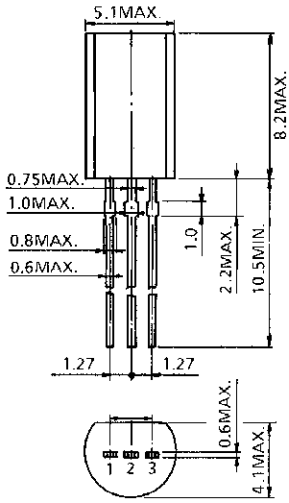
POWER AMPLIFIER APPLICATIONS.

POWER SWITCHING APPLICATIONS.

INDUSTRIAL APPLICATIONS

Unit in mm

- Low Saturation Voltage
  : $V_{CE(sat)} = 0.5V$ (Max.) ($I_C = 1A$)
- High Speed Switching Time : $t_{stg} = 1.0\mu s$ (Typ.)
- Complementary to 2SA1315



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	TO-92MOD
EIAJ	—
TOSHIBA	2-5J1A

Weight : 0.36g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	2	A
Base Current	I_B	1	A
Collector Power Dissipation	P_C	900	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

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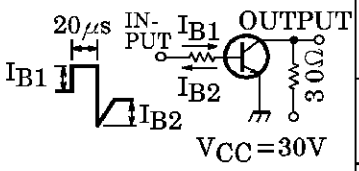
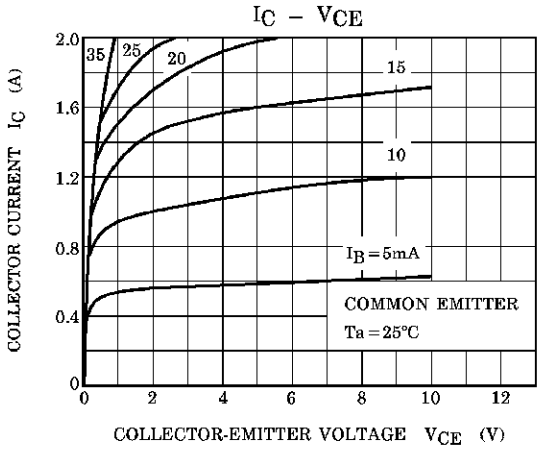
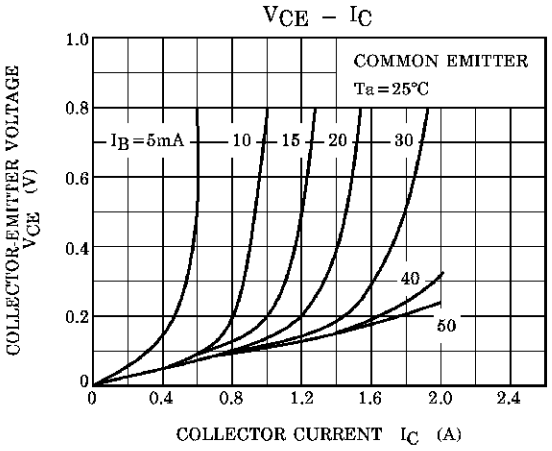
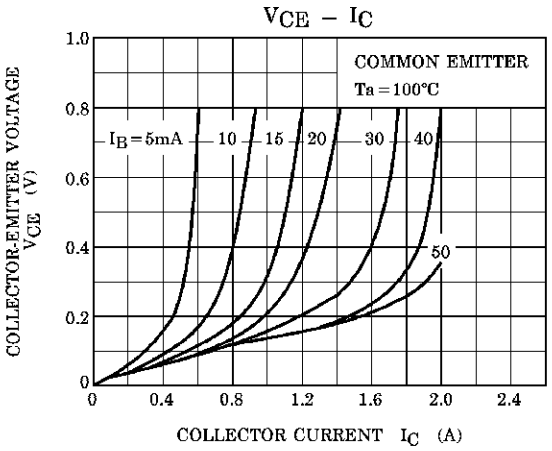
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

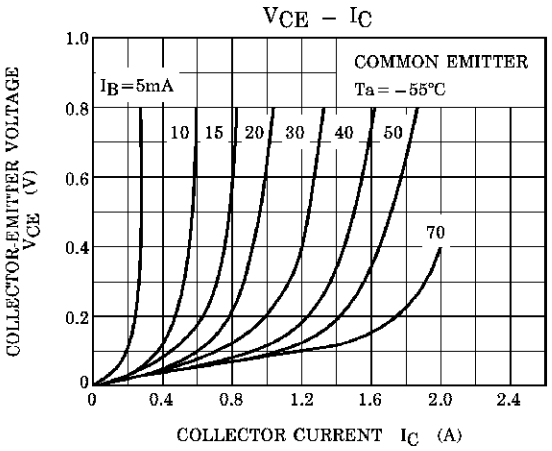
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB}=80V$, $I_E=0$	—	—	1.0	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB}=5V$, $I_C=0$	—	—	1.0	μA
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C=10mA$, $I_B=0$	80	—	—	V
DC Current Gain		$h_{FE(1)}$ (Note)	$V_{CE}=2V$, $I_C=0.5A$	70	—	240	
		$h_{FE(2)}$	$V_{CE}=2V$, $I_C=1.5A$	40	—	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=1A$, $I_B=0.05A$	—	0.15	0.5	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	$I_C=1A$, $I_B=0.05A$	—	0.9	1.2	V
Transition Frequency		f_T	$V_{CE}=2V$, $I_C=0.5A$	—	100	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB}=10V$, $I_E=0$, $f=1MHz$	—	30	—	pF
Switching Time	Turn-on Time	t_{on}		—	0.2	—	μs
	Storage Time	t_{stg}	$I_{B1}=-I_{B2}=0.05A$, DUTY CYCLE≦1%	—	1.0	—	
	Fall Time	t_f		—	0.2	—	

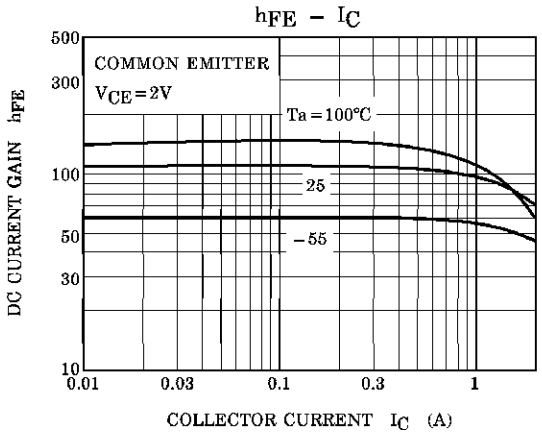
Note : $h_{FE(1)}$ Classification O : 70~140, Y : 120~240

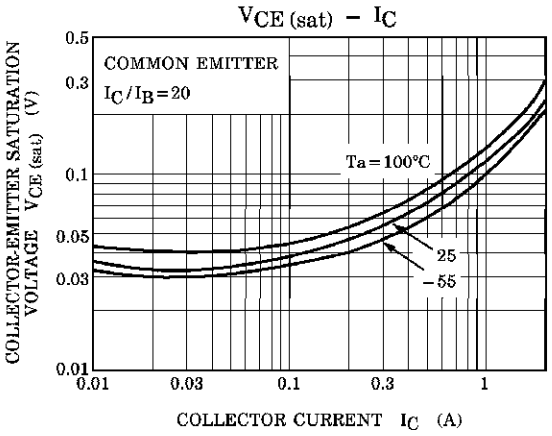

IC – VCE
COLLECTOR CURRENT IC (A)
COLLECTOR-EMITTER VOLTAGE VCE (V)
35
25
20
15
10
IB = 5mA
COMMON EMITTER
Ta = 25°C

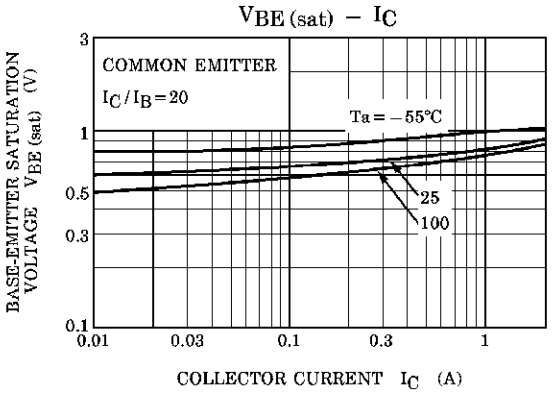

VCE – IC
COLLECTOR-EMITTER VOLTAGE VCE (V)
COLLECTOR CURRENT IC (A)
COMMON EMITTER
Ta = 25°C
IB = 5mA
10
15
20
30
40
50

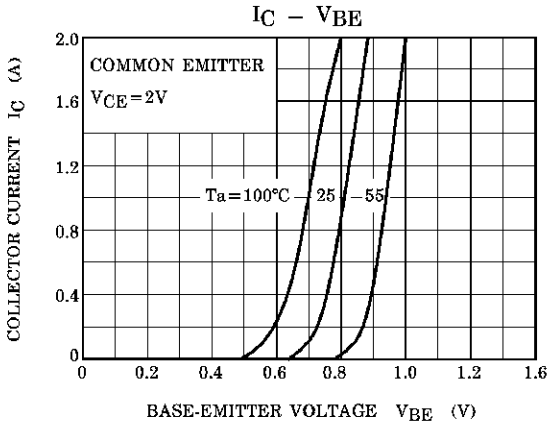

VCE – IC
COLLECTOR-EMITTER VOLTAGE VCE (V)
COLLECTOR CURRENT IC (A)
COMMON EMITTER
Ta = 100°C
IB = 5mA
10
15
20
30
40
50

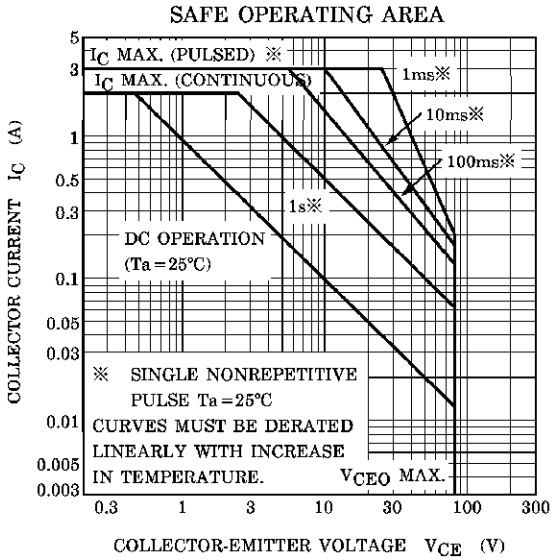

VCE – IC
COLLECTOR-EMITTER VOLTAGE VCE (V)
COLLECTOR CURRENT IC (A)
COMMON EMITTER
Ta = –55°C
IB = 5mA
10
15
20
30
40
50
70

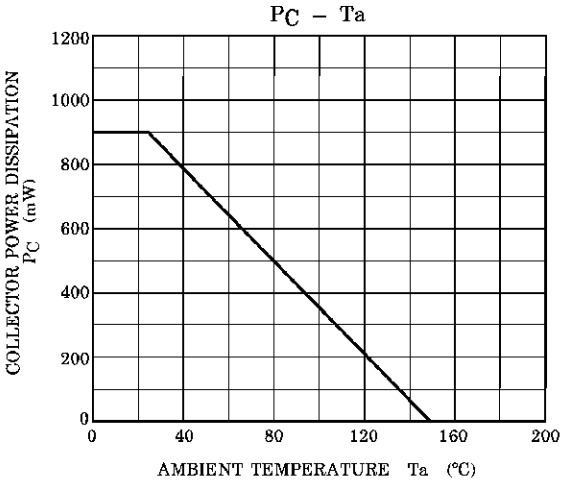

hFE – IC
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (A)
COMMON EMITTER
VCE = 2V
Ta = 100°C
25
–55


VCE (sat) – IC
COLLECTOR-EMITTER SATURATION VOLTAGE VCE (sat) (V)
COLLECTOR CURRENT IC (A)
COMMON EMITTER
IC / IB = 20
Ta = 100°C
25
–55


VBE (sat) – IC
COMMON EMITTER
IC / IB = 20
Ta = –55°C
25
100
BASE-EMITTER SATURATION VOLTAGE VBE (sat) (V)
COLLECTOR CURRENT IC (A)
3
1
0.5
0.3
0.1
0.01
0.03
0.1
0.3
1


IC – VBE
COMMON EMITTER
VCE = 2V
Ta = 100°C
25
–55
COLLECTOR CURRENT IC (A)
BASE-EMITTER VOLTAGE VBE (V)
2.0
1.6
1.2
0.8
0.4
0
0
0.2
0.4
0.6
0.8
1.0
1.2
1.6


SAFE OPERATING AREA
IC MAX. (PULSED) ※
IC MAX. (CONTINUOUS)
1ms※
10ms※
100ms※
1s※
DC OPERATION
(Ta = 25°C)
※ SINGLE NONREPETITIVE
PULSE Ta = 25°C
CURVES MUST BE DERATED
LINEARLY WITH INCREASE
IN TEMPERATURE.
VCEO MAX.
COLLECTOR CURRENT IC (A)
COLLECTOR-EMITTER VOLTAGE VCE (V)
5
3
1
0.5
0.3
0.1
0.05
0.03
0.01
0.005
0.003
0.3
1
3
10
30
100
300


PC – Ta
COLLECTOR POWER DISSIPATION PC (mW)
AMBIENT TEMPERATURE Ta (°C)
1200
1000
800
600
400
200
0
0
40
80
120
160
200