TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

2SD2481

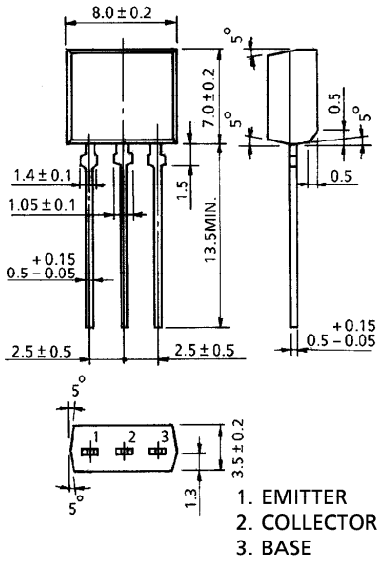
PULSE MOTOR DRIVE, HAMMER DRIVE APPLICATIONS

SWITCHING APPLICATIONS

POWER AMPLIFIER APPLICATIONS

- High DC Current Gain : h_{FE} = 4000 (Min.)
- Low Saturation Voltage : $V_{CE\,(sat)}$ = 1.5V (Max.)

Unit in mm



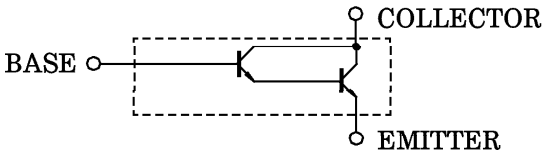
JEDEC	—
EIAJ	—
TOSHIBA	2-8M1A

Weight : 0.55g (Typ.)

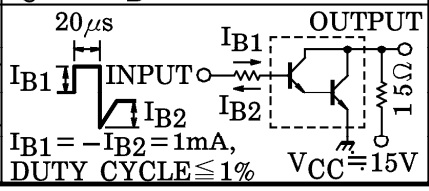
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	30	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	10	V
Collector Current	I_C	1.5	A
Base Current	I_B	0.15	A
Collector Power Dissipation	P_C	1.3	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

EQUIVALENT CIRCUIT



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 30V, I_E = 0	—	—	10	μA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 10V, I_C = 0	—	—	10	μA
Collector-Emitter Breakdown Voltage		$V_{(BR)\,CEO}$	I_C = 10mA, I_B = 0	30	—	—	V
DC Current Gain		h_{FE}	V_{CE} = 2V, I_C = 150mA	4000	—	—	
Saturation Voltage	Collector-Emitter	$V_{CE\,(sat)}$	I_C = 1A, I_B = 1mA	—	—	1.5	V
	Base-Emitter	$V_{BE\,(sat)}$	I_C = 1A, I_B = 1mA	—	—	2.2	
Switching Time	Turn-On Time	t_{on}		—	0.18	—	μs
	Storage Time	t_{stg}		—	0.6	—	
	Fall Time	t_f		—	0.3	—	

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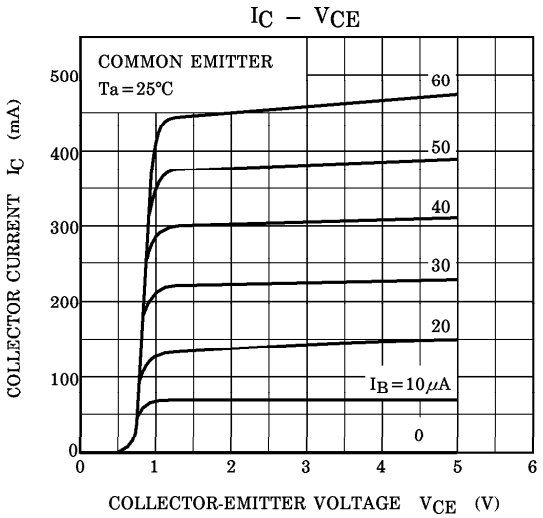
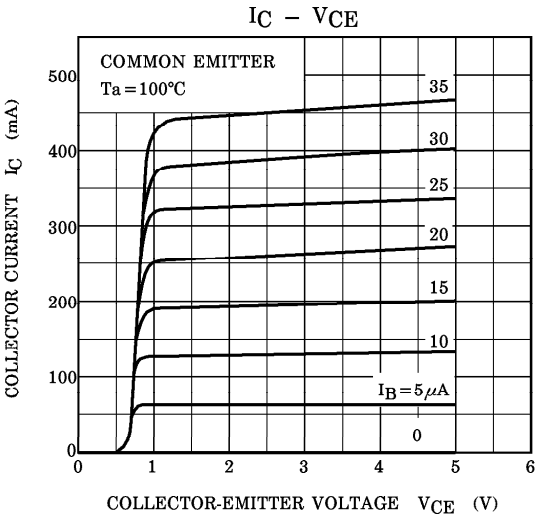
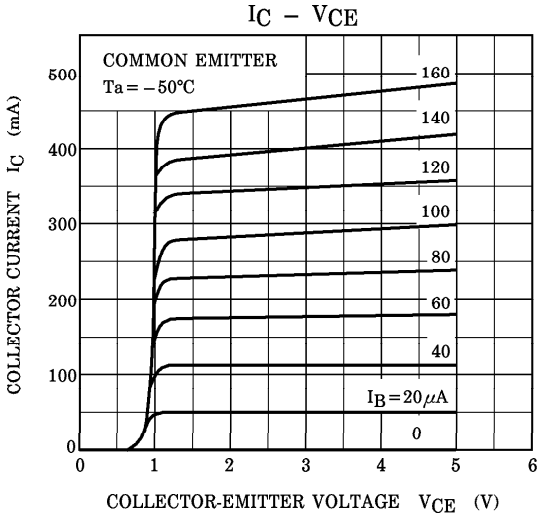
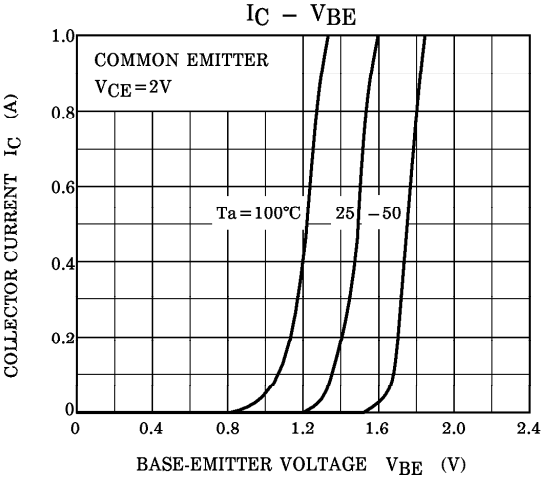
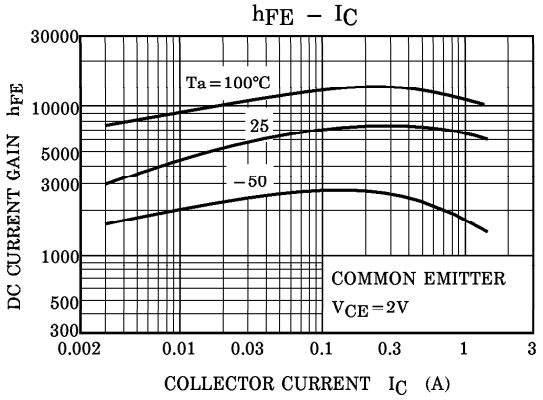
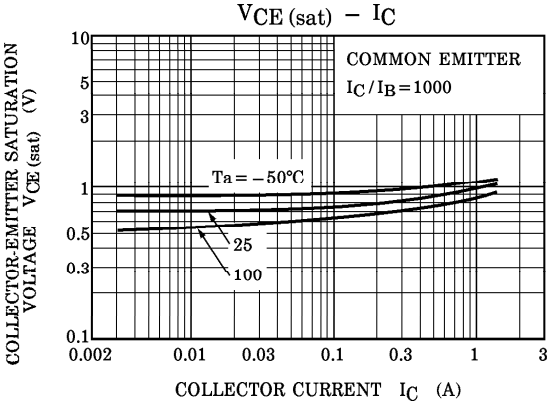

IC – VCE
COMMON EMITTER
Ta = 25°C
60
50
40
30
20
IB = 10μA
0
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)

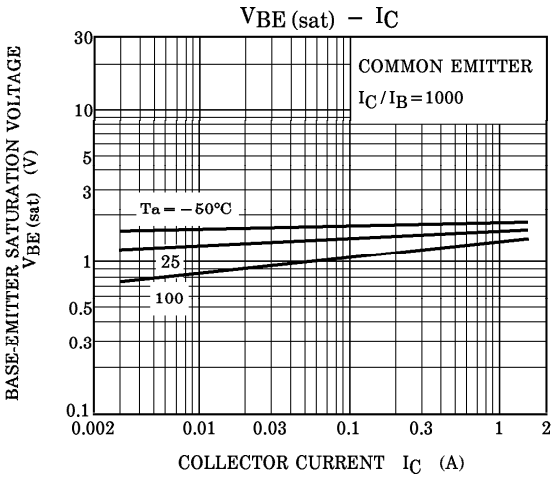

IC – VCE
COMMON EMITTER
Ta = 100°C
35
30
25
20
15
10
IB = 5μA
0
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)

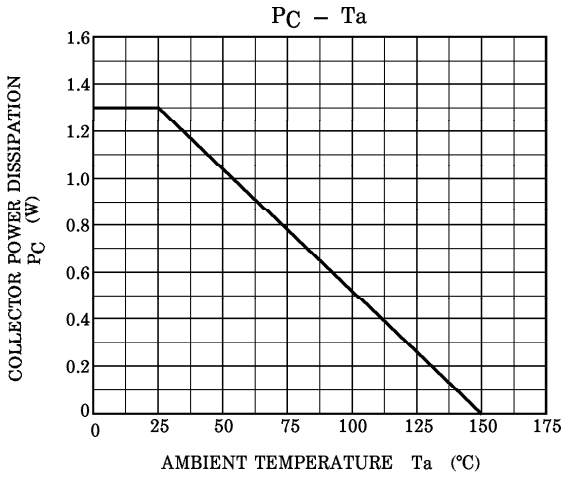

IC – VCE
COMMON EMITTER
Ta = −50°C
160
140
120
100
80
60
40
IB = 20μA
0
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)

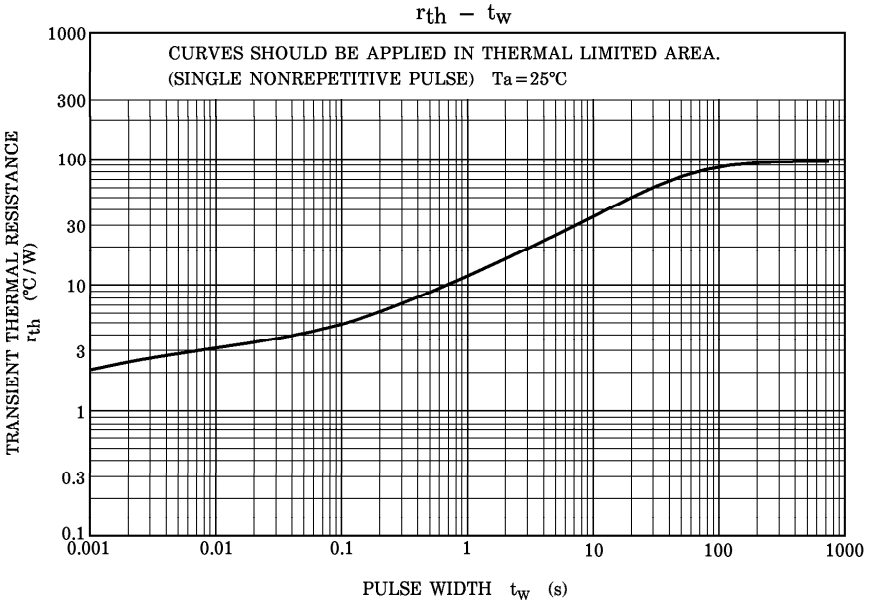

IC – VBE
COMMON EMITTER
VCE = 2V
Ta = 100°C
25
−50
COLLECTOR CURRENT IC (A)
BASE-EMITTER VOLTAGE VBE (V)

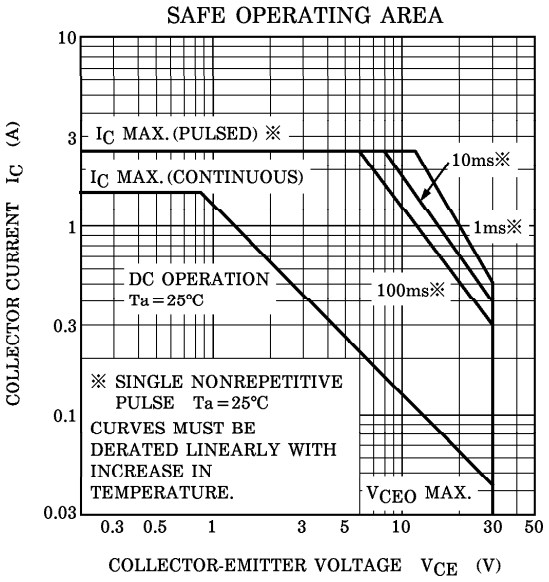

hFE – IC
Ta = 100°C
25
−50
COMMON EMITTER
VCE = 2V
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (A)


VCE (sat) – IC
COMMON EMITTER
IC / IB = 1000
Ta = −50°C
25
100
COLLECTOR-EMITTER SATURATION VOLTAGE VCE (sat) (V)
COLLECTOR CURRENT IC (A)


VBE (sat) – IC
COMMON EMITTER
IC / IB = 1000
Ta = −50°C
25
100
BASE-EMITTER SATURATION VOLTAGE VBE (sat) (V)
COLLECTOR CURRENT IC (A)
30
10
5
3
1
0.5
0.3
0.1
0.002
0.01
0.03
0.1
0.3
1
2


PC – Ta
COLLECTOR POWER DISSIPATION PC (W)
AMBIENT TEMPERATURE Ta (°C)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
0
25
50
75
100
125
150
175


rth – tw
CURVES SHOULD BE APPLIED IN THERMAL LIMITED AREA.
(SINGLE NONREPETITIVE PULSE) Ta = 25°C
TRANSIENT THERMAL RESISTANCE rth (°C/W)
PULSE WIDTH tw (s)
1000
300
100
30
10
3
1
0.3
0.1
0.001
0.01
0.1
1
10
100
1000


SAFE OPERATING AREA
10
3
1
0.3
0.1
0.03
COLLECTOR CURRENT IC (A)
IC MAX. (PULSED) ※
IC MAX. (CONTINUOUS)
10ms※
1ms※
100ms※
DC OPERATION
Ta = 25°C
※ SINGLE NONREPETITIVE PULSE Ta = 25°C
CURVES MUST BE DERATED LINEARLY WITH INCREASE IN TEMPERATURE.
VCEO MAX.
0.3 0.5 1 3 5 10 30 50
COLLECTOR-EMITTER VOLTAGE VCE (V)