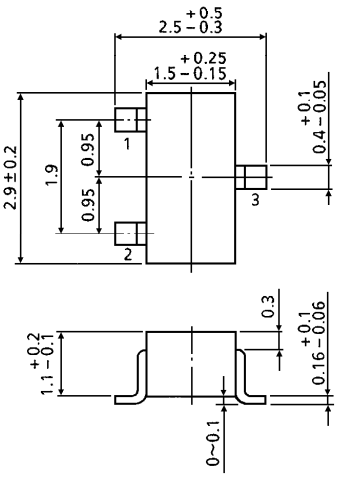
TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE (PCT PROCESS)

2SC3138

HIGH VOLTAGE SWITCHING APPLICATIONS

Unit in mm

- High Voltage : V_{CBO} = 200V (Min.)
  V_{CEO} = 200V (Min.)
- Small Flat Package
- Complementary to 2SA1255



1. BASE
2. EMITTER
3. COLLECTOR

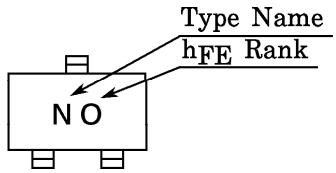
JEDEC	TO-236MOD
EIAJ	SC-59
TOSHIBA	2-3F1A

Weight : 0.012g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	200	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	50	mA
Base Current	I_B	20	mA
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	−55~125	°C

MARKING



961001EAA1

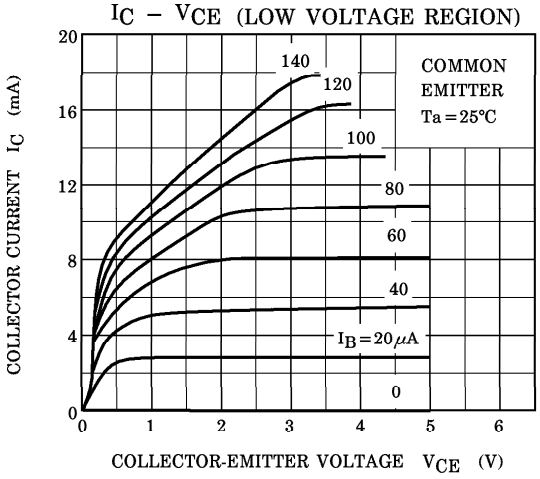
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

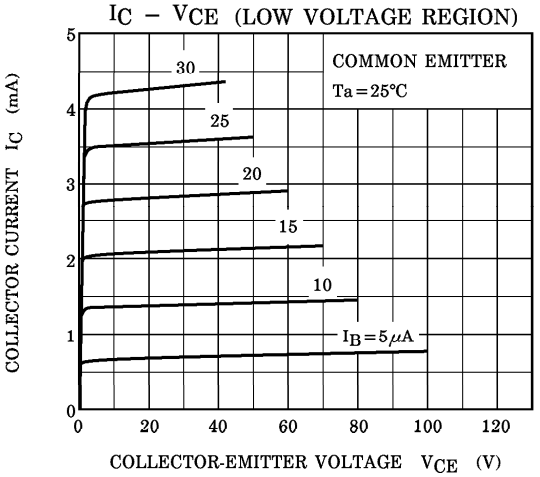
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB} = 200V, I_E = 0	—	—	0.1	μA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 5V, I_C = 0	—	—	0.1	μA
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	I_C = 0.1mA, I_E = 0	200	—	—	V
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C = 1mA, I_B = 0	200	—	—	V
DC Current Gain		h_{FE} (Note)	V_{CE} = 3V, I_C = 10mA	70	—	240	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	—	0.1	0.5	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA	—	0.75	1.5	V
Transition Frequency		f_T	V_{CE} = 10V, I_C = 2mA	50	100	—	MHz
Collector Output Capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	2	4	pF
Switching Time	Turn on Time	t_{on}	V_{CC} = 50V, I_C = 6mA, $I_{B1} = -I_{B2}$ = 0.6mA, Pulse Width = 5μs, Duty Cycle ≦ 2%	—	0.3	—	μs
	Storage Time	t_{stg}		—	2	—	
	Fall Time	t_f		—	0.4	—	

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

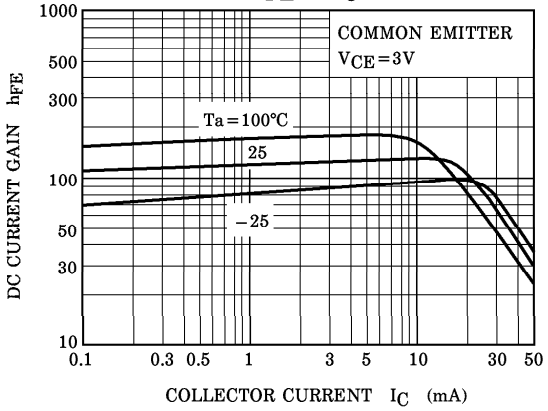
I_C – V_{CE} (LOW VOLTAGE REGION)



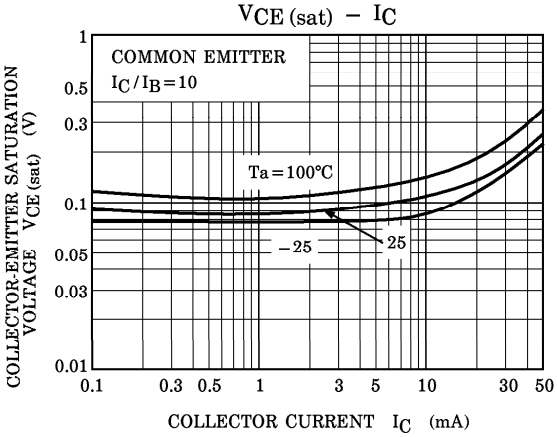
I_C – V_{CE} (LOW VOLTAGE REGION)



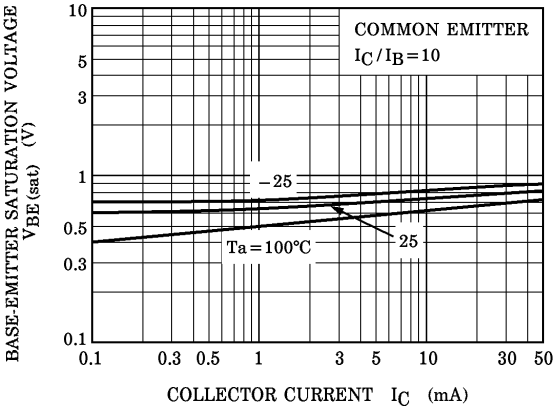
h_{FE} – I_C



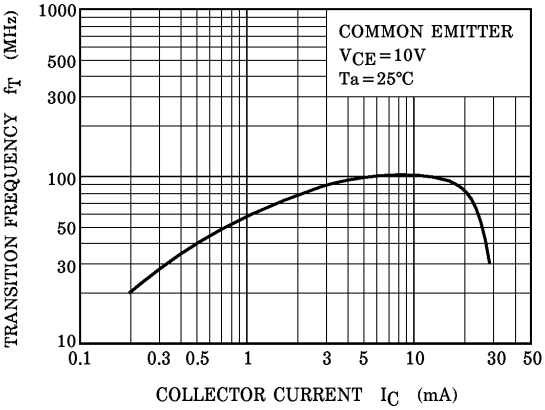
$V_{CE\,(sat)}$ – I_C

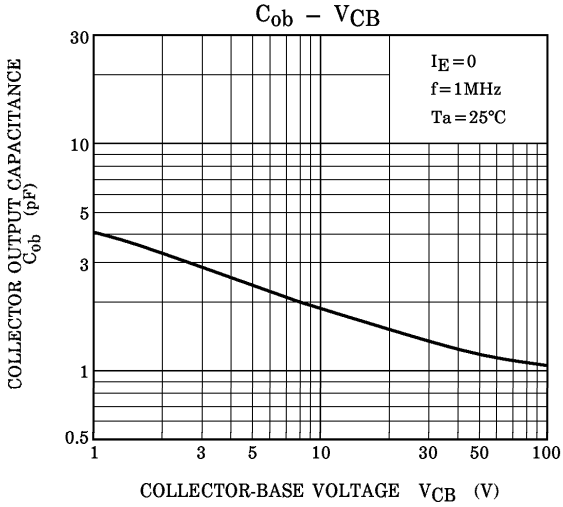


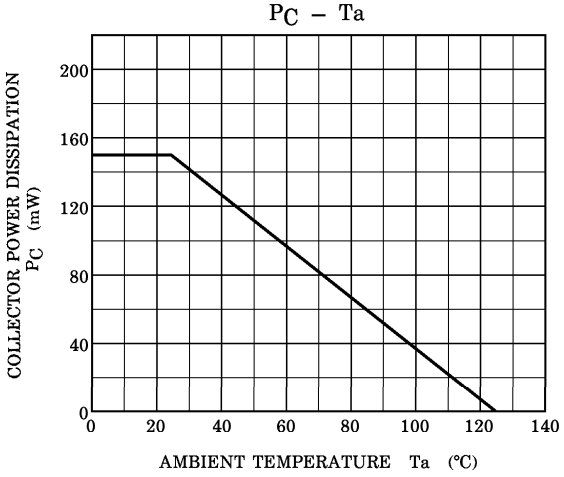
$V_{BE\,(sat)}$ – I_C



f_T – I_C




C_{ob} – V_{CB}
I_E = 0
f = 1MHz
Ta = 25°C
COLLECTOR OUTPUT CAPACITANCE C_{ob} (pF)
30
10
5
3
1
0.5
1
3
5
10
30
50
100
COLLECTOR-BASE VOLTAGE V_{CB} (V)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
20
40
60
80
100
120
140
AMBIENT TEMPERATURE Ta (°C)