JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

# TO-92 Plastic-Encapsulate Transistors
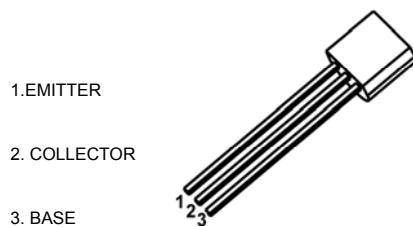
3DD13002B TRANSISTOR（NPN）

TO-92

FEATURE

Power Switching Applications

1.EMITTER

2. COLLECTOR

3. BASE

MAXIMUM RATINGS (Ta=25℃ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	600	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	0.8	A
P_C	Collector Power Dissipation	0.9	W
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55~150	℃

### ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)
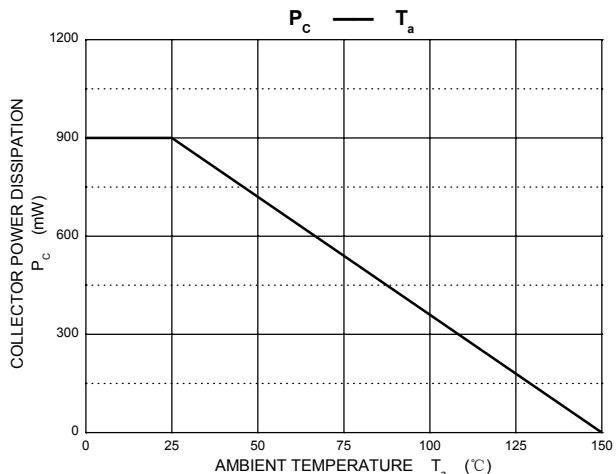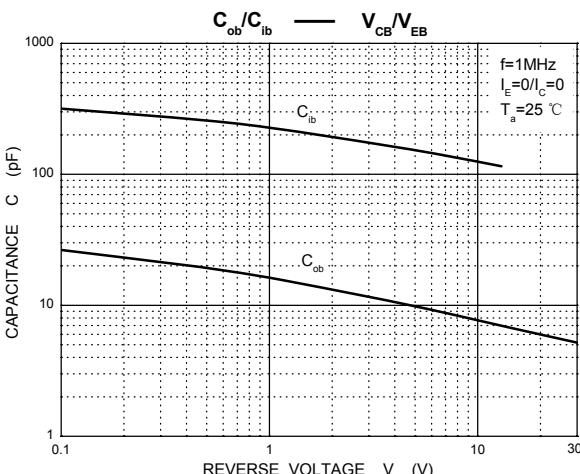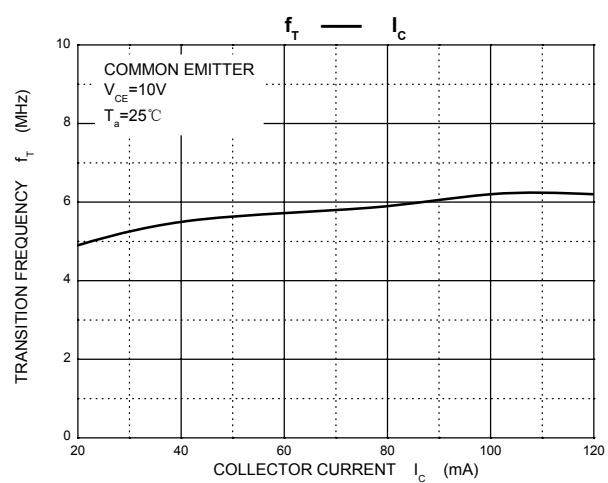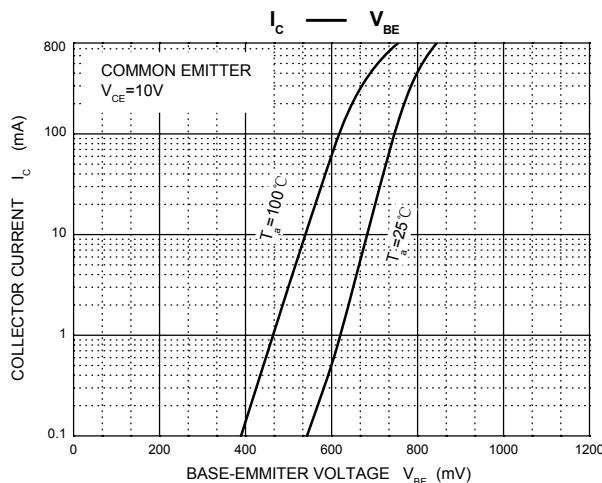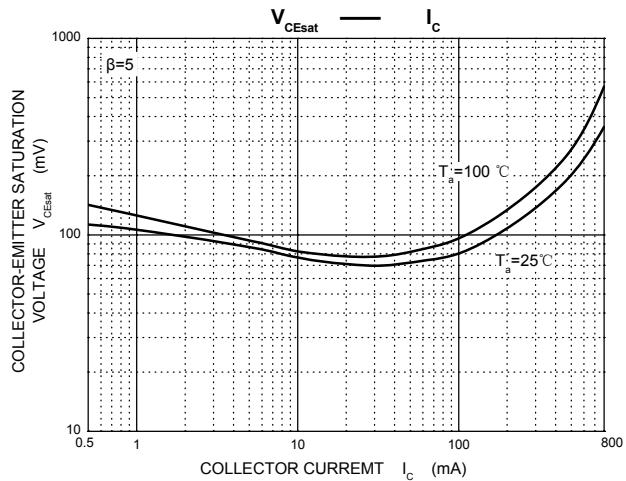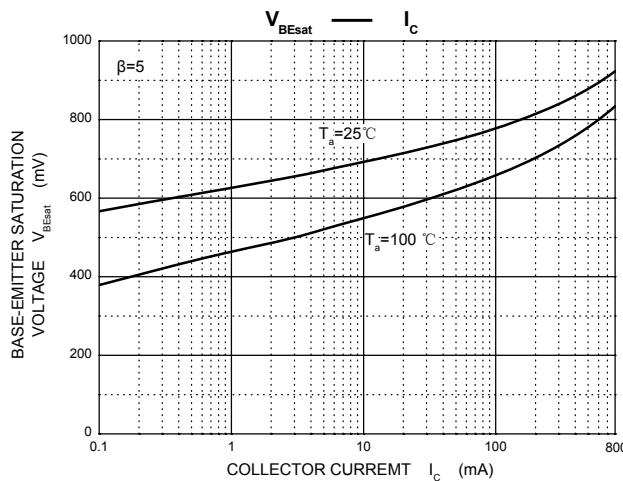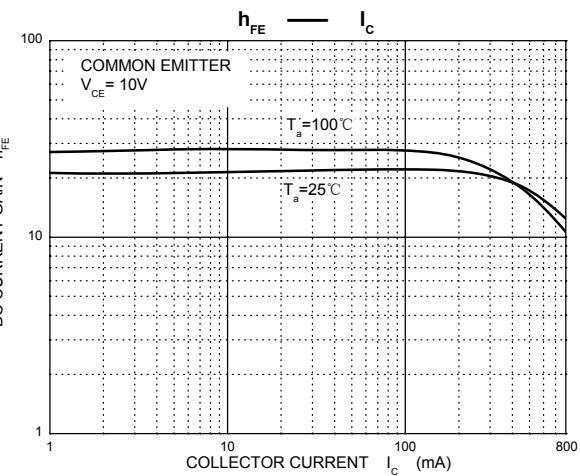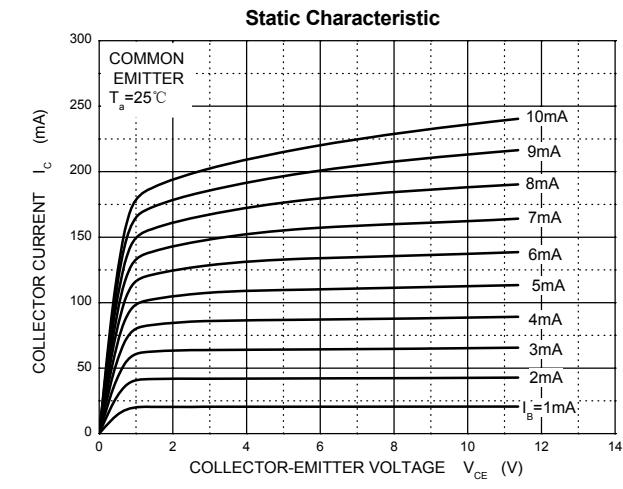
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=100μA,I_E=0	600			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=1mA,I_B=0	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E= 100μA,I_C=0	6			V
Collector cut-off current	I_{CBO}	V_{CB}= 600V,I_E=0			100	μA
	I_{CEO}	$V_{CÒ}$= 400V,I_B=0			100	μA
Emitter cut-off current	I_{EBO}	V_{EB}= 6 V, I_C=0			100	μA
Dc current gain	h_{FE1}	V_{CE}= 10 V, I_C=200mA	9		40	
	h_{FE2}	V_{CE}= 10 V, I_C=0.25mA	5			
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=200mA, I_B=40mA			0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=200mA, I_B=40mA			1.1	V
Transition frequency	f_T	V_{CE}=10V, I_C=100mA f =1MHz	5			MHz
Fall time	t_f	I_C=1A, I_{B1}=-I_{B2}=0.2A V_{CC}=100V			0.5	μs
Storage time	t_s				2.5	μs

CLASSIFICATION OF h$_{FE1}$

Range	9-15	15-20	20-25	25-30	30-35	35-40

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Typical Characteristics 3DD13002B

Static Characteristic

COMMON EMITTER
$T_a = 25℃$

COLLECTOR CURRENT I_C (mA)

10mA
9mA
8mA
7mA
6mA
5mA
4mA
3mA
2mA
$I_B = 1mA$

COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

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h_{FE} —— I_C

COMMON EMITTER
$V_{CE} = 10V$

DC CURRENT GAIN h_{FE}

$T_a = 100℃$
$T_a = 25℃$

COLLECTOR CURRENT I_C (mA)

V_{BEsat} —— I_C

$\beta = 5$

BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (mV)

$T_a = 25℃$
$T_a = 100℃$

COLLECTOR CURREMT I_C (mA)

V_{CEsat} —— I_C

$\beta = 5$

COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)

$T_a = 100℃$
$T_a = 25℃$

COLLECTOR CURREMT I_C (mA)

I_C —— V_{BE}

COMMON EMITTER
$V_{CE} = 10V$

COLLECTOR CURRENT I_C (mA)

$T_a = 100℃$
$T_a = 25℃$

BASE-EMMITER VOLTAGE V_{BE} (mV)

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f_T —— I_C

COMMON EMITTER
$V_{CE} = 10V$
$T_a = 25℃$

TRANSITION FREQUENCY f_T (MHz)

COLLECTOR CURRENT I_C (mA)

C_{ob}/C_{ib} —— V_{CB}/V_{EB}

$f = 1MHz$
$I_E = 0/I_C = 0$
$T_a = 25℃$

CAPACITANCE C (pF)

C_{ib}
C_{ob}

REVERSE VOLTAGE V (V)

P_C —— T_a

COLLECTOR POWER DISSIPATION P_C (mW)

AMBIENT TEMPERATURE T_a (℃)

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