



JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

TO-220 Plastic-Encapsulate Transistors

3DD13005 TRANSISTOR (NPN)

FEATURES

- power switching applications

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current -Continuous	4	A
P_C	Collector Power Dissipation	2	W
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55-150	$^{\circ}\text{C}$

TO-220

1. BASE
2. COLLECTOR
3. EMITTER



ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

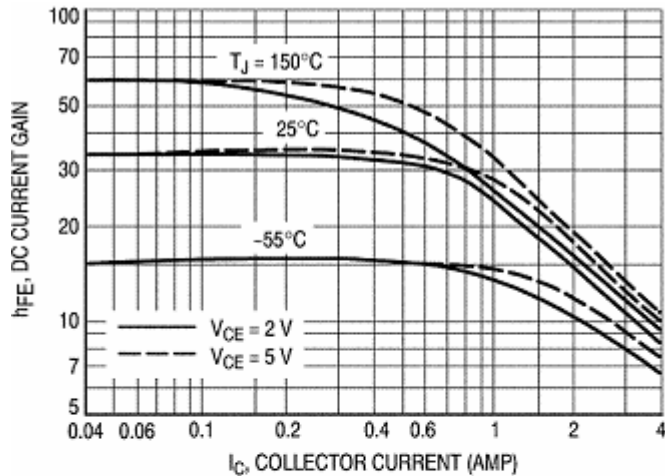
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=1\text{mA}$, $I_E=0$	700			V
Collector-emitter breakdown	$V_{(BR)CEO}$	$I_C=10\text{mA}$, $I_B=0$	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=1\text{mA}$, $I_C=0$	9			V
Collector cut-off current	I_{CBO}	$V_{CB}=700\text{V}$, $I_E=0$			1	mA
Collector cut-off current	I_{CEO}	$V_{CE}=400\text{V}$, $I_B=0$			0.1	mA
Emitter cut-off current	I_{EBO}	$V_{EB}=7\text{V}$, $I_C=0$			0.05	mA
DC current gain	h_{FE1}	$V_{CE}=5\text{V}$, $I_C=1\text{A}$	10		60	
	h_{FE2}	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$	5			
	h_{FE3}	$V_{CE}=5\text{V}$, $I_C=2\text{A}$	8		40	
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=1\text{A}$, $I_B=0.2\text{A}$			0.3	V
	$V_{CE(sat)2}$	$I_C=4\text{A}$, $I_B=1\text{A}$			0.8	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=2\text{A}$, $I_B=0.5\text{A}$			1.6	V
Transition Frequency	f_T	$V_{CE}=10\text{V}$, $I_C=500\text{mA}$, $f=1\text{MHz}$	5			MHz
Fall time	t_f	$I_{B1}=-I_{B2}=0.4\text{A}$, $I_C=2\text{A}$, $V_{CC}=120\text{V}$			0.6	μs
Storage time	t_s	$I_C=0.25\text{A}$	1.8		6.6	μs

CLASSIFICATION OF h_{FE1}

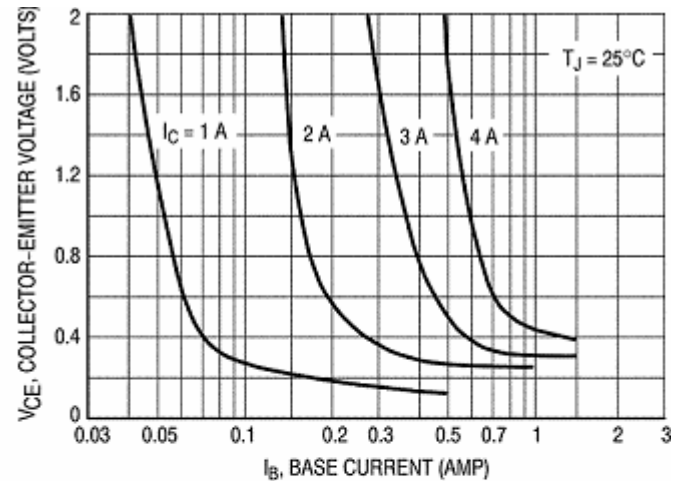
Rank										
Range	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60

Typical Characteristics

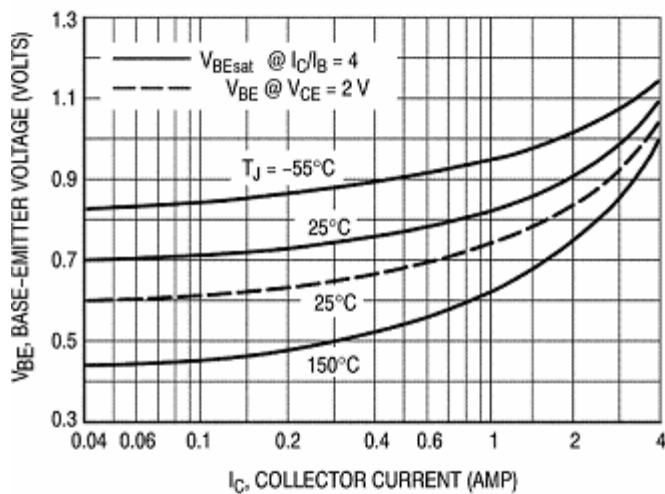
3DD13005



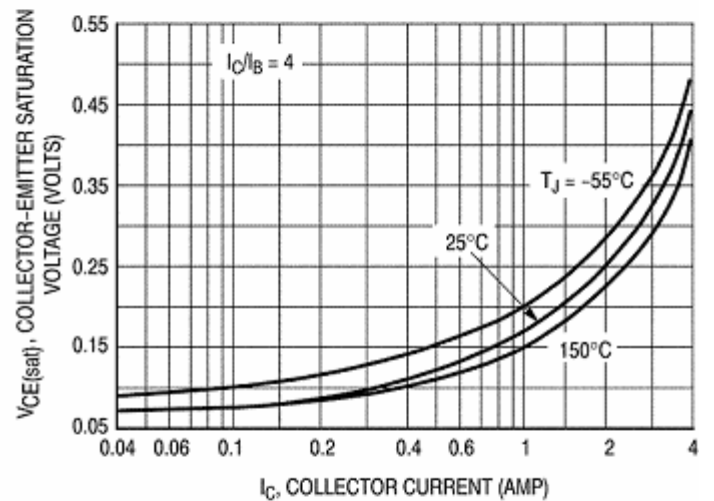
DC Current Gain



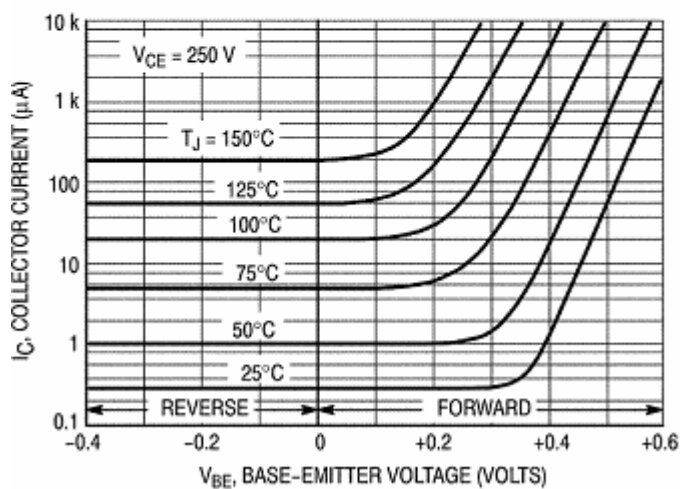
Collector Saturation Region



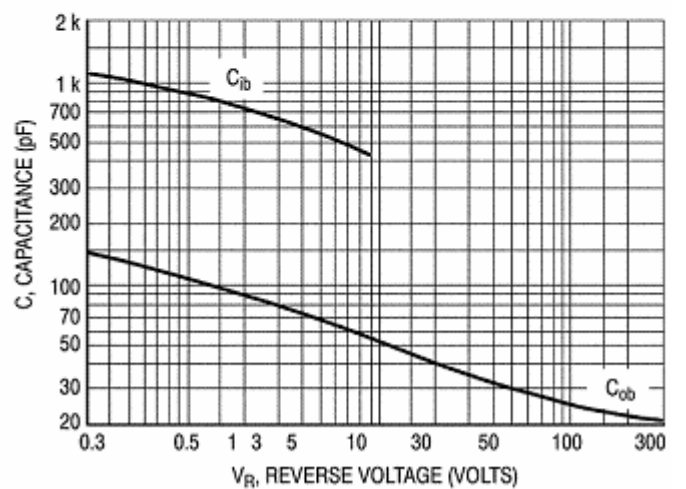
Base-Emitter Voltage



Collector-Emitter Saturation Voltage



Collector Cutoff Region



Capacitance