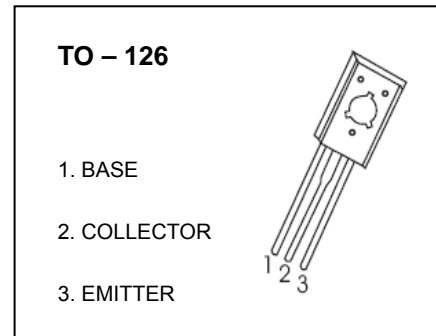


## TO-126 Plastic-Encapsulate Transistor

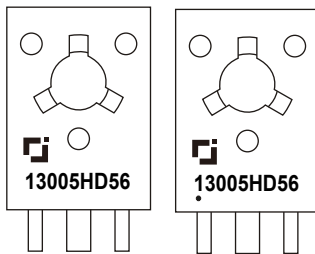
### 3DD13005HD56 TRANSISTOR (NPN)

#### FEATURES

- Power Switching Applications
- Good high temperature
- Low saturation voltage
- High speed switching

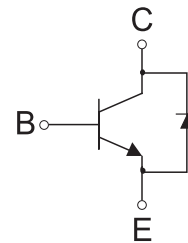


#### MARKING



Logo  
13005HD56=Device code  
Solid dot= Green molding compound device, if none, the normal device

#### Equivalent Circuit



#### ORDERING INFORMATION

Part Number	Package	Packing Method	Pack Quantity
3DD13005HD56	TO-126	Bulk	200pcs/Bag
3DD13005HD56-TU	TO-126	Tube	60pcs/Tube

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

Symbol	Parameter	Value	Unit
$V_{CB0}$	Collector-Base Voltage	700	V
$V_{CEO}$	Collector-Emitter Voltage	450	V
$V_{EBO}$	Emitter-Base Voltage	9	V
$I_C$	Collector Current	3.5	A
$P_C$	Collector Power Dissipation	1.5	W
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	83.3	$^{\circ}\text{C/W}$
$T_j$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  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 voltage	$V_{(BR)CEO}^*$	$I_C=10\text{mA}, I_B=0$	450			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=1\text{mA}, I_C=0$	9			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=700\text{V}, I_E=0$			100	$\mu\text{A}$
Collector cut-off current	$I_{CEO}$	$V_{CE}=450\text{V}, I_B=0$			100	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			100	$\mu\text{A}$
DC current gain	$h_{FE(1)}^*$	$V_{CE}=5\text{V}, I_C=1\text{A}$	10		40	
	$h_{FE(2)}^*$	$V_{CE}=5\text{V}, I_C=5\text{mA}$	10			
	$h_{FE(3)}^*$	$V_{CE}=5\text{V}, I_C=2\text{A}$	5			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=1\text{A}, I_B=200\text{mA}$			0.3	V
	$V_{CE(sat)2}$	$I_C=2\text{A}, I_B=500\text{mA}$			0.6	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C=2\text{A}, I_B=500\text{mA}$			1.2	V
	$V_{BE(sat)2}$	$I_C=500\text{mA}, I_B=100\text{mA}$			1	V
Emitter-collector forward voltage	$V_{FEC}$	$I_C=2\text{A}$			2	V
Transition frequency	$f_T$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	5			MHZ
Storage time	$t_s$	$I_C=250\text{mA}$ (UI9600)			5	$\mu\text{s}$

\*Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

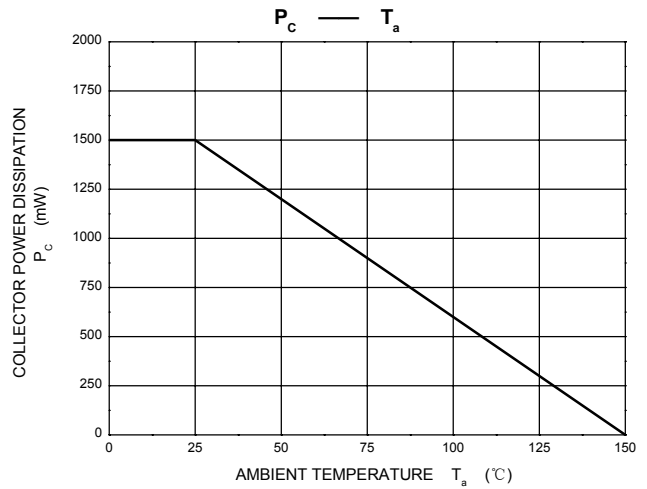
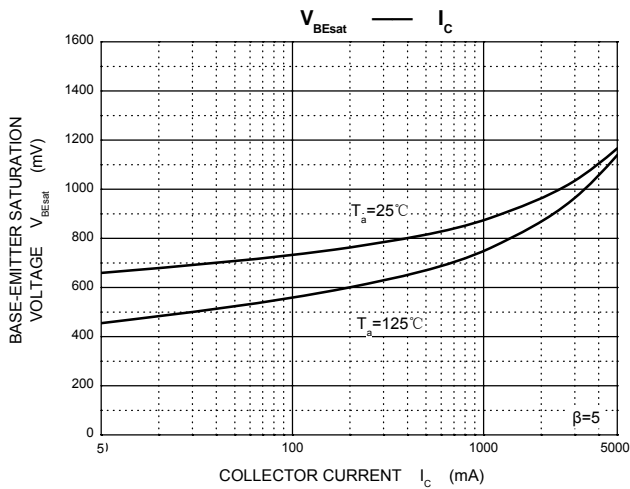
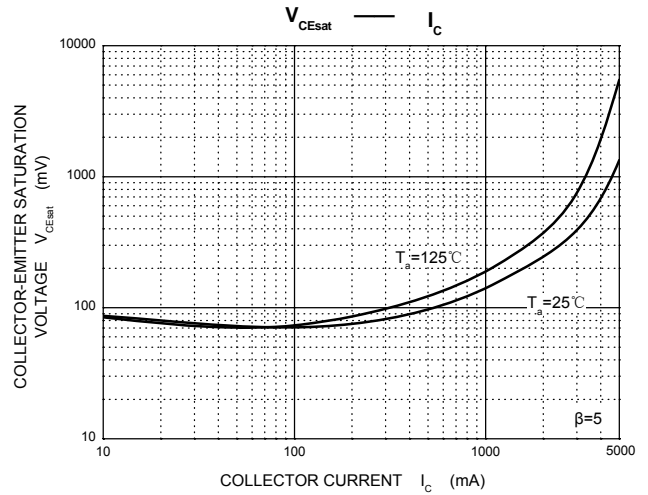
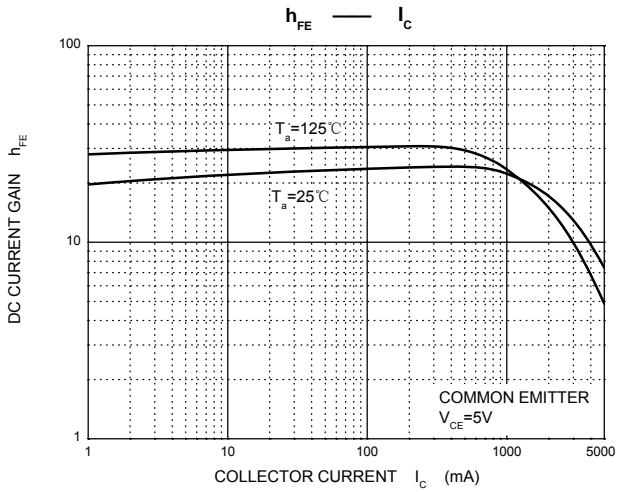
### CLASSIFICATION of $h_{FE(1)}$

RANGE	10-15	15-20	20-25	25-30	30-35	35-40

### CLASSIFICATION of $t_s$

RANK	A1	A2	B1	B2	C1	C2
RANGE	2.0-2.5 ( $\mu\text{s}$ )	2.5-3.0 ( $\mu\text{s}$ )	3.0-3.5 ( $\mu\text{s}$ )	3.5-4.0 ( $\mu\text{s}$ )	3.5-4.0 ( $\mu\text{s}$ )	4.5-5.0 ( $\mu\text{s}$ )

# Typical Characteristics



# TO-126 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.500	2.900	0.098	0.114
A1	1.100	1.500	0.043	0.059
b	0.660	0.860	0.026	0.034
b1	1.170	1.370	0.046	0.054
c	0.450	0.600	0.018	0.024
D	7.400	7.800	0.291	0.307
E	10.600	11.000	0.417	0.433
e	2.290 TYP		0.090 TYP	
e1	4.480	4.680	0.176	0.184
h	0.000	0.300	0.000	0.012
L	15.300	15.700	0.602	0.618
L1	2.100	2.300	0.083	0.091
P	3.900	4.100	0.154	0.161
Φ	3.000	3.200	0.118	0.126

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