

## Features

- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings @ 25°C Unless Otherwise Specified

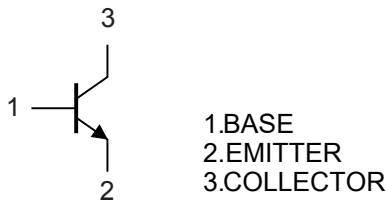
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 556°C/W Junction to Ambient<sup>(Note 1)</sup>
- Thermal Resistance: 357°C/W Junction to Ambient<sup>(Note 2)</sup>

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	300	V
Collector-Emitter Voltage	$V_{CEO}$	300	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Continuous Collector Current	$I_C$	500	mA
Power Dissipation <sup>(Note 1)</sup>	$P_D$	225	mW
Power Dissipation <sup>(Note 2)</sup>	$P_D$	350	mW

- Note 1. Device Mounted on FR-5 Board.  
2. Device with Alumina Substrate.

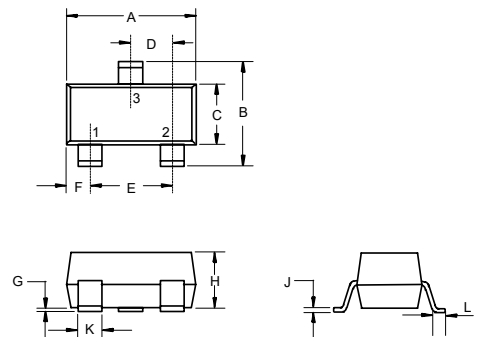
## Marking: 1D

## Internal Structure



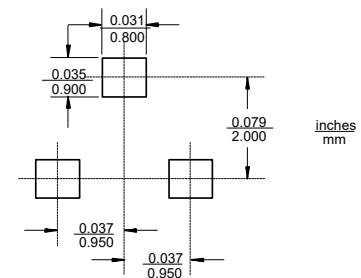
# NPN Silicon High Voltage Transistor

## SOT-23



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

## Suggested Solder Pad Layout



**Electrical Characteristics @  $T_A=25^\circ\text{C}$  Unless Otherwise Specified**

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	300			V	$I_C=100\mu\text{A}, I_E=0$
Collector-Emitter Breakdown Voltage*	$V_{(BR)CEO}$	300			V	$I_C=1\text{mA}, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E=100\mu\text{A}, I_C=0$
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB}=200\text{V}, I_E=0$
Emitter Cutoff Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB}=6\text{V}, I_C=0$
DC Current Gain*	$h_{FE(1)}$	25				$V_{CE}=10\text{V}, I_C=1\text{mA}$
	$h_{FE(2)}$	40				$V_{CE}=10\text{V}, I_C=10\text{mA}$
	$h_{FE(3)}$	40				$V_{CE}=10\text{V}, I_C=30\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.5	V	$I_C=20\text{mA}, I_B=2\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			0.9	V	$I_C=20\text{mA}, I_B=2\text{mA}$
Transition Frequency	$f_T$	50			MHz	$V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$
Collector output Capacitance	$C_{cb}$			3	pF	$V_{CB}=20\text{V}, I_E=0, f=1\text{MHz}$

\*.Pulse test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

**Curve Characteristics**

Fig. 1 - Static Characteristics

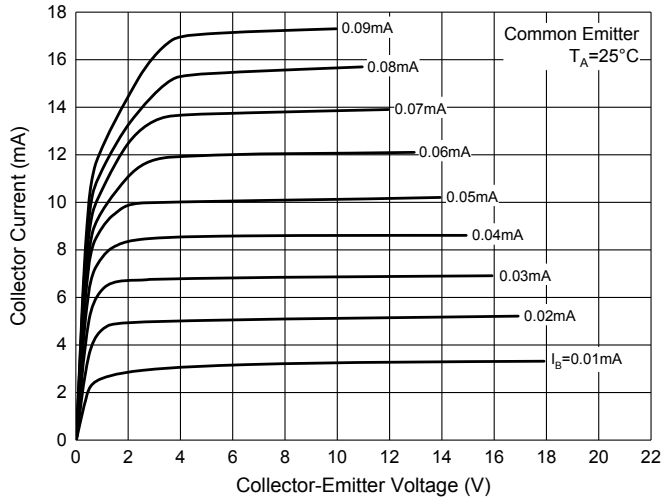


Fig. 2 - DC Current Gain Characteristics

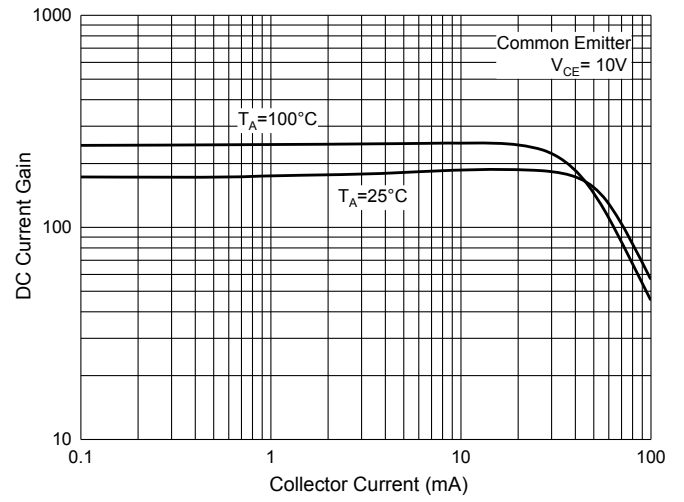


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

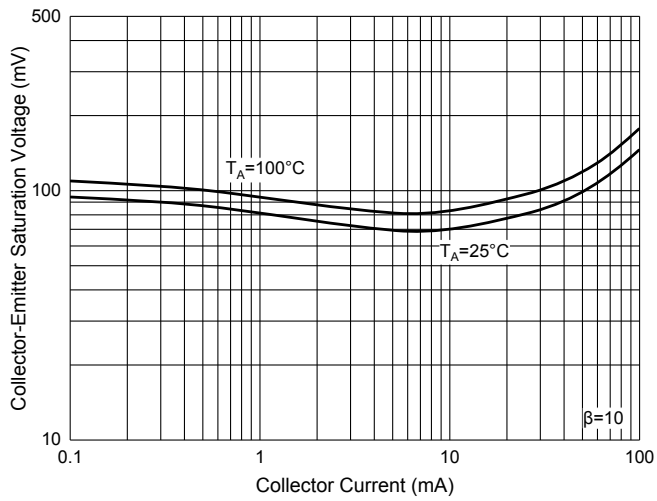


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

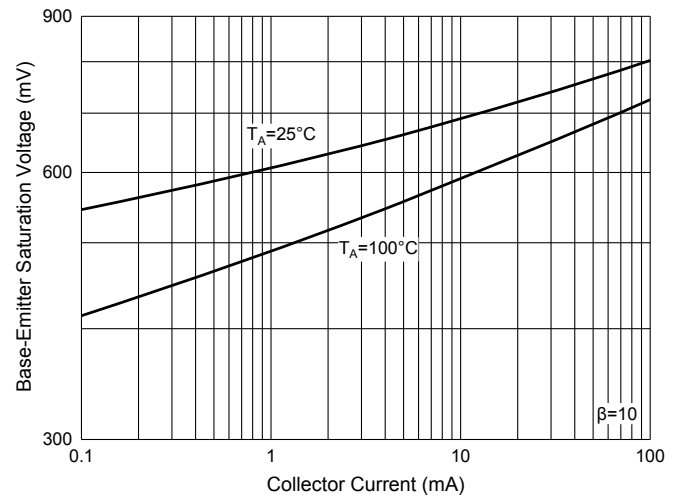


Fig. 5 - Base-Emitter Voltage Characteristics

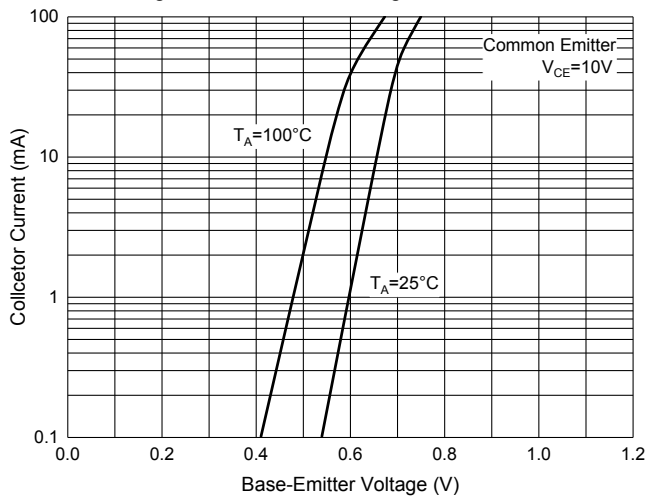
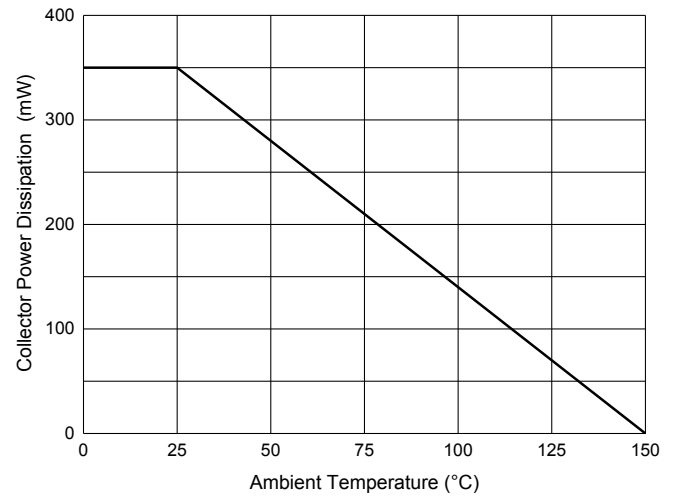


Fig. 6 - Collector Power Derating Curve



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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