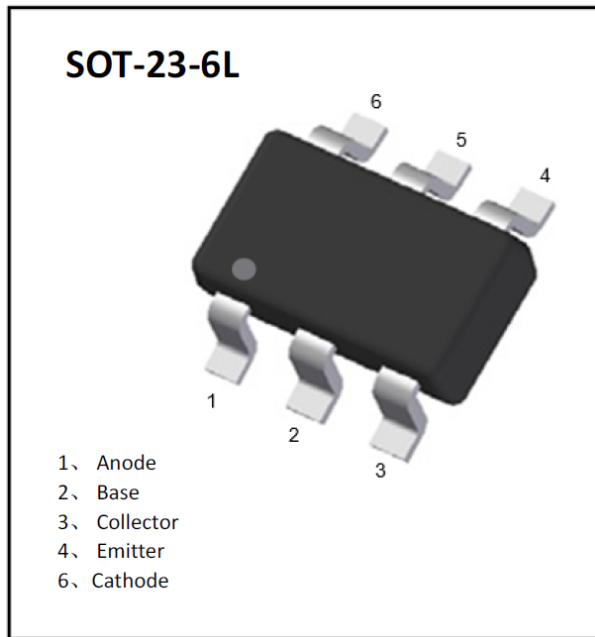


## NPN Transistor with Zener Diode



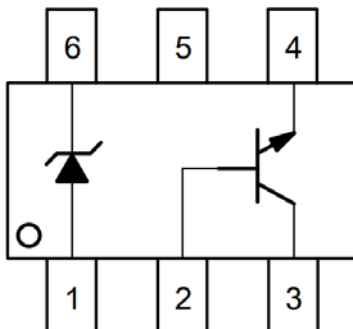
### Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- NPN+Zener

### Mechanical Data

- **Package:** SOT-23-6L
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 445V6

### ■Equivalent circuit



### ■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(mg)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SMBT445V6	F2	Approximate 15.6	3000	30000	120000	7" reel

### ■ Thermal Characteristics(T<sub>a</sub>=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Total Device Dissipation	P <sub>D</sub>	mW		300
Thermal Resistance From Junction To Ambient	R <sub>θJA</sub>	°C/W		417
Junction Temperature	T <sub>j</sub>	°C		-55 to +150
Storage Temperature	T <sub>STG</sub>	°C		-55 to +150



# SMBT445V6

## ■NPN Transistor Pin2、3、4 Maximum Ratings (Ta=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Collector-Base Voltage	$V_{CBO}$	V	$I_C=100\mu A, I_E=0$	60
Collector-Emitter Voltage	$V_{CEO}$	V	$I_C=1mA, I_B=0$	40
Emitter-Base Voltage	$V_{EBO}$	V	$I_E=100\mu A, I_C=0$	6
Collector Current -Continuous	$I_C$	mA		600

## ■NPN Transistor Pin2、3、4 Electrical Characteristics (Ta=25°C unless otherwise specified)

Item	Symbol	Unit	Conditions	Min	TYP	Max
Collector-base breakdown voltage	$V_{CBO}$	V	$I_C=100\mu A, I_E=0$	60		
Collector-emitter breakdown voltage	$V_{CEO}$	V	$I_C=1mA, I_B=0$	40		
Emitter-base breakdown voltage	$V_{EBO}$	V	$I_E=100\mu A, I_C=0$	6		
Base cut-off Current	$I_{BL}$	nA	$V_{CE}=35V, V_{EB(off)}=0.4V$			100
Collector cut-off current	$I_{CEX}$	nA	$V_{CE}=35V, V_{EB(off)}=0.4V$			100
DC current gain	$h_{FE}$		$V_{CE}=1V, I_C=0.1mA$	20		
	$h_{FE}$		$V_{CE}=1V, I_C=1mA$	40		
	$h_{FE}$		$V_{CE}=1V, I_C=10mA$	80		
	$h_{FE}$		$V_{CE}=1V, I_C=150mA$	100		300
	$h_{FE}$		$V_{CE}=1V, I_C=500mA$	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=150mA, I_B=15mA$			0.4
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=500mA, I_B=50mA$			0.75
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=150mA, I_B=15mA$			0.95
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=500mA, I_B=50mA$			1.2
Transition frequency	$f_T$	MHz	$V_{CE}=10V, I_C=20mA, f=100MHz$	250		
Delay time	$t_d$	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=15mA, V_{BE(off)}=2V$			15
Rise time	$t_r$	ns				20
Storage time	$t_s$	ns				225
Fall time	$t_f$	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			30



# SMBT445V6

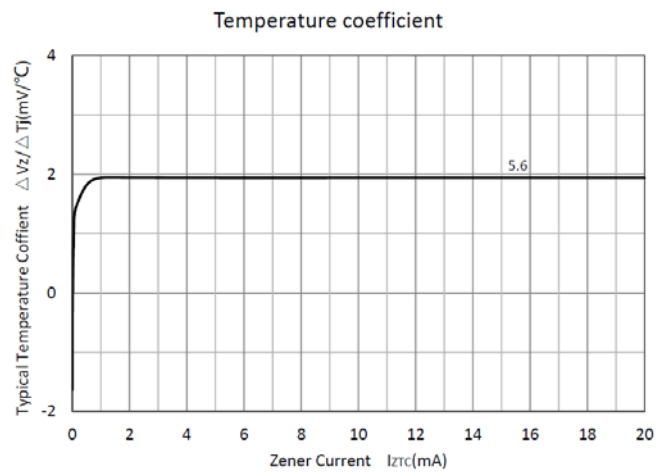
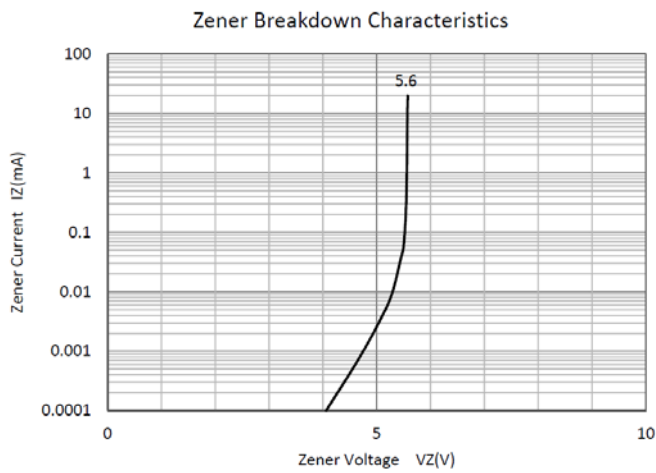
## ■ Zener Diode Pin1、6 Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum Forward Voltage @I <sub>F</sub> =10mA	V <sub>F</sub>	V	0.9

## ■ Zener Diode Pin1、6 Electrical Characteristics (Ta=25°C unless otherwise specified)

Type Number	V <sub>z</sub> at I <sub>zT</sub> (V)			Z <sub>zT</sub> (Ω)		Z <sub>zk</sub> (Ω)		I <sub>R</sub> (μA)@V <sub>R</sub>	
	min.	typ.	max.	I <sub>zT</sub> (mA)	max.	I <sub>zk</sub> (mA)	max.	max	V <sub>R</sub> (V)
SMBT445V6	5.49	5.6	5.71	5	40	1.0	400	0.1	2.0

## ■ Zener Diode Pin1、6 Characteristics (Typical)

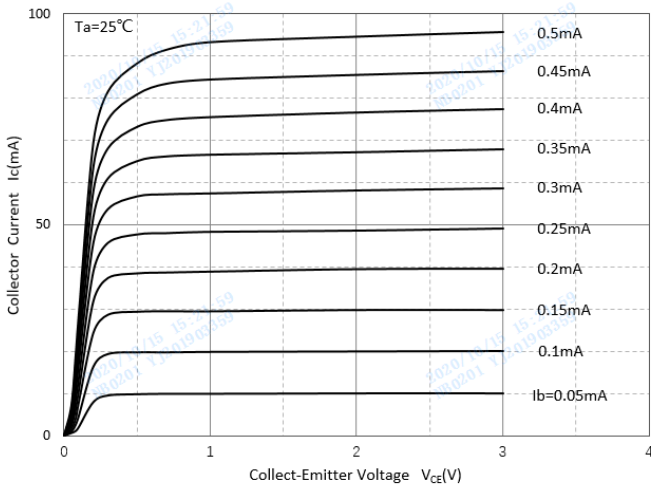




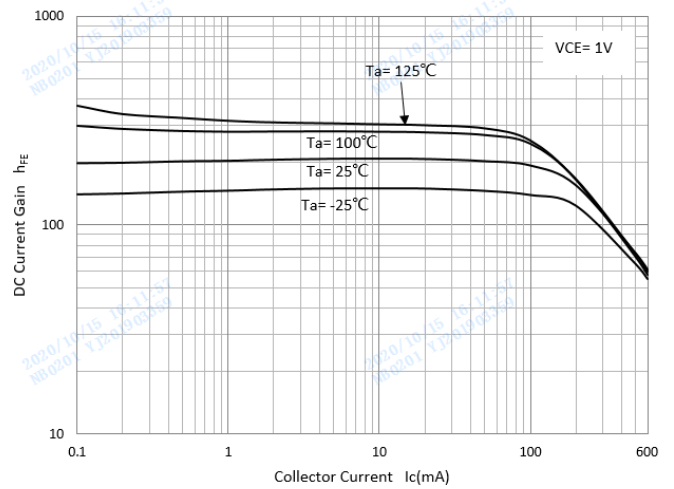
# SMBT445V6

## ■ NPN Transistor Pin2、3、4 Characteristics (Typical)

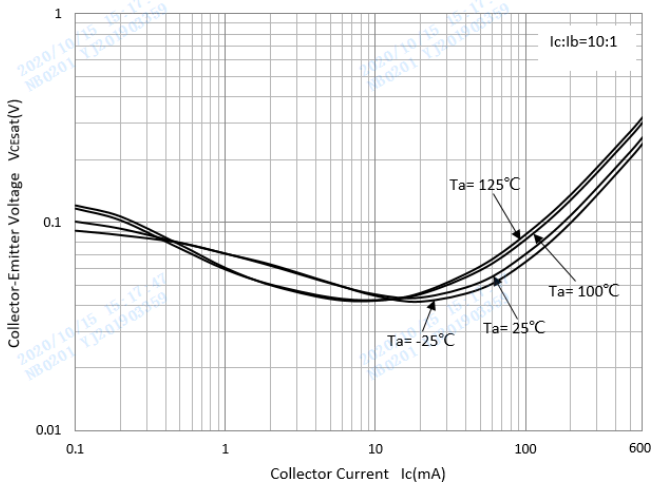
Static Characteristic



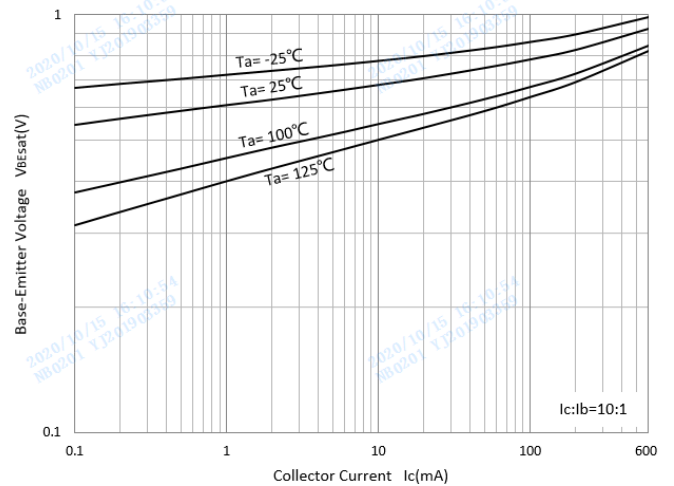
DC Current Gain



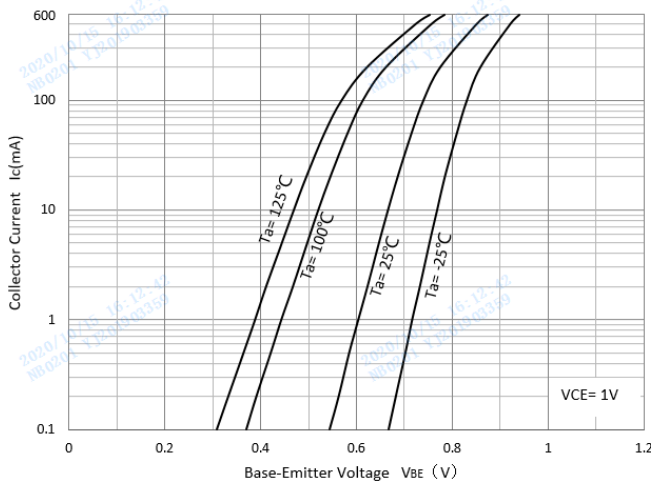
Collector-Emitter Saturation Voltage



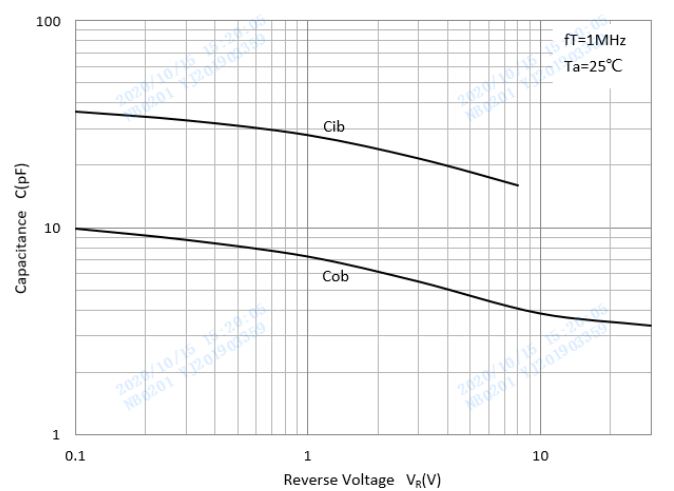
Base-Emitter Saturation Voltage



Base-Emitter On Voltage



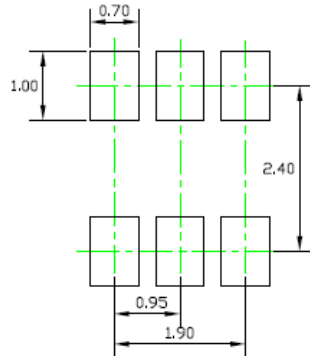
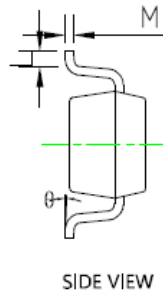
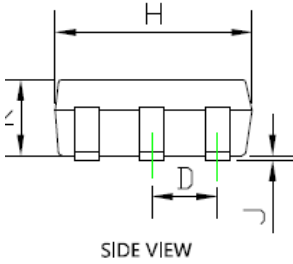
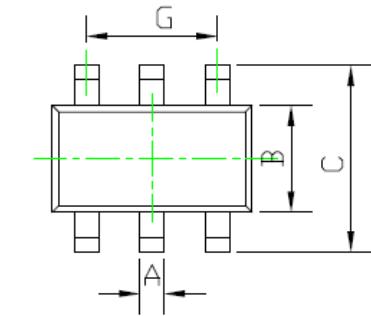
$C_{ob}/C_{ib}-V_{CB}/V_{EB}$





# SMBT445V6

## ■SOT-23-6L Package information



Note:  
 1,Controlling dimension in millimeters,  
 2,General tolerance:±0,05mm,  
 3.The pad layout is for reference purposes only.

SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.012	0.020	0.300	0.500
B	0.059	0.067	1.500	1.700
C	0.104	0.116	2.650	2.950
D	0.037BSC		0.950BSC	
G	0.075BSC		1.900BSC	
H	0.111	0.119	2.820	3.020
J	0.000	0.004	0.000	0.100
K	0.041	0.045	1.050	1.150
L	0.012	0.024	0.300	0.600
M	0.004	0.008	0.100	0.200
θ	0°	8°	0°	8°



## SMBT445V6

---

### Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com) , or consult your nearest Yangjie's sales office for further assistance.