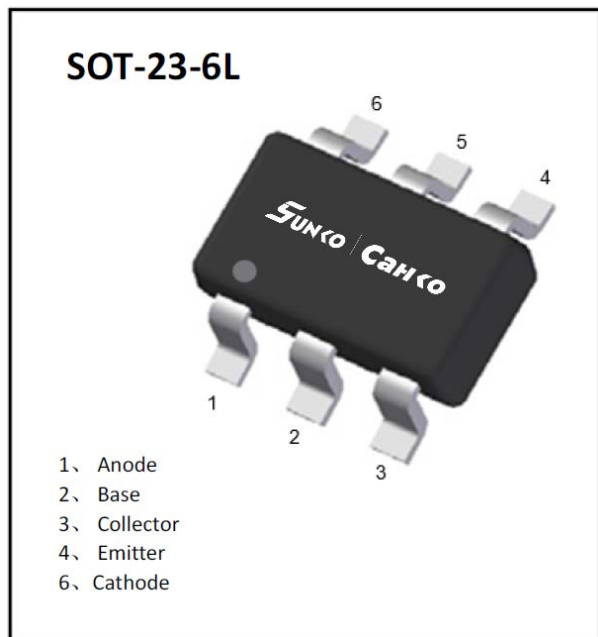


NPN Transistor with Zener Diode



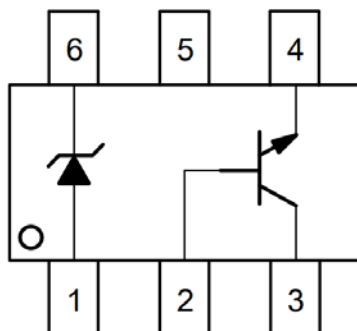
Features

- 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(Ta=25℃ Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Total Device Dissipation	P _D	mW		300
Thermal Resistance From Junction To Ambient	R _{θJA}	℃/W		417
Junction Temperature	T _j	℃		-55 to +150
Storage Temperature	T _{STG}	℃		-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	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			225
Fall time	t_f	ns				30

SMBT445V6

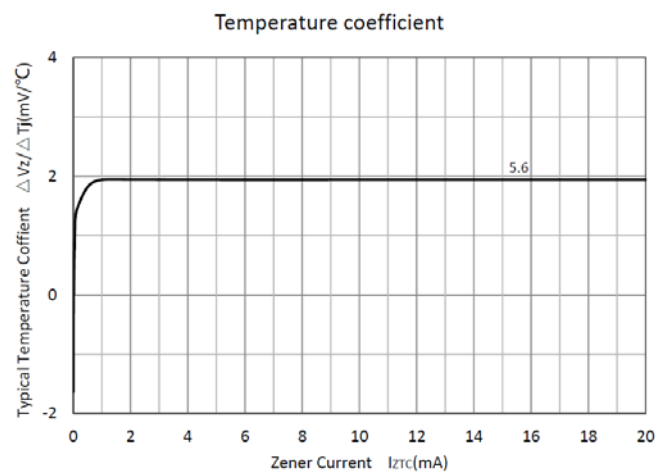
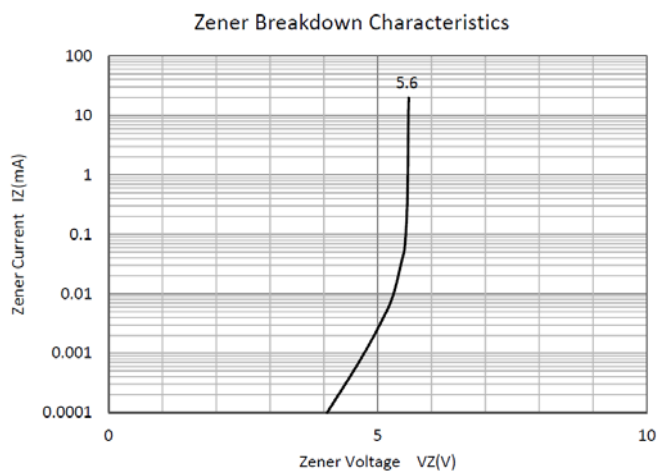
■ Zener Diode Pin1、6 Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum Forward Voltage @I _F =10mA	V _F	V	0.9

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

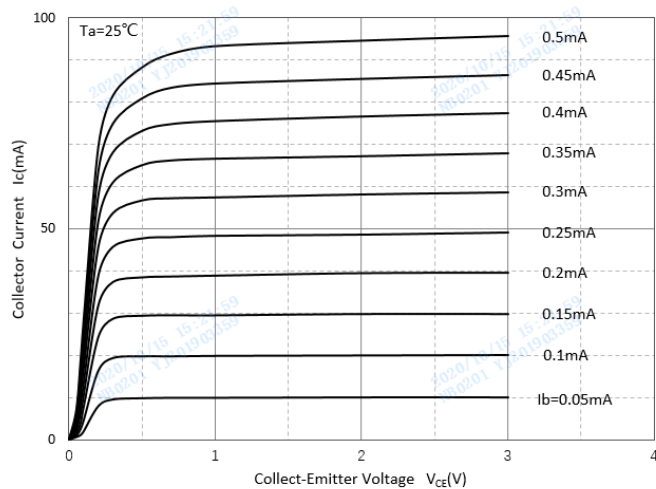
Type Number	V _z at I _{zT} (V)			Z _{zt} (Ω)		Z _{zk} (Ω)		I _R (μA)@V _R	
	min.	typ.	max.	I _{zT} (mA)	max.	I _{zk} (mA)	max.	max	V _R (V)
SMBT445V6	5.49	5.6	5.71	5	40	1.0	400	0.1	2.0

■ Zener Diode Pin1、6 Characteristics (Typical)

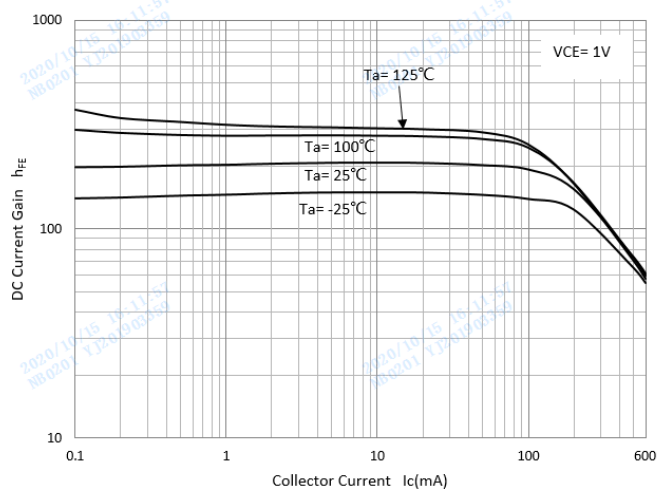


■ NPN Transistor Pin2、3、4 Characteristics (Typical)

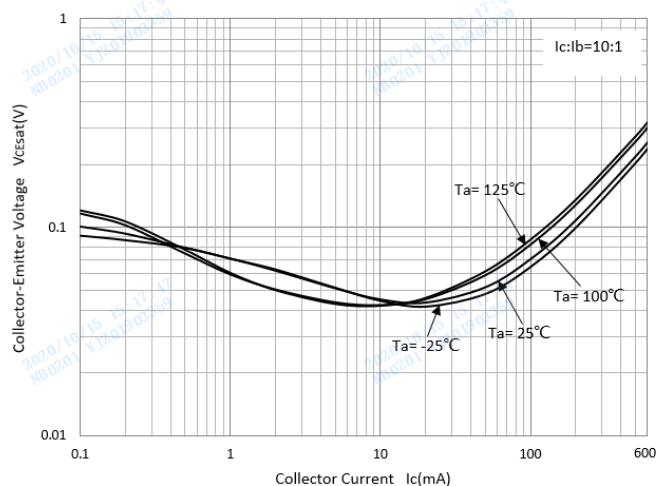
Static Characteristic



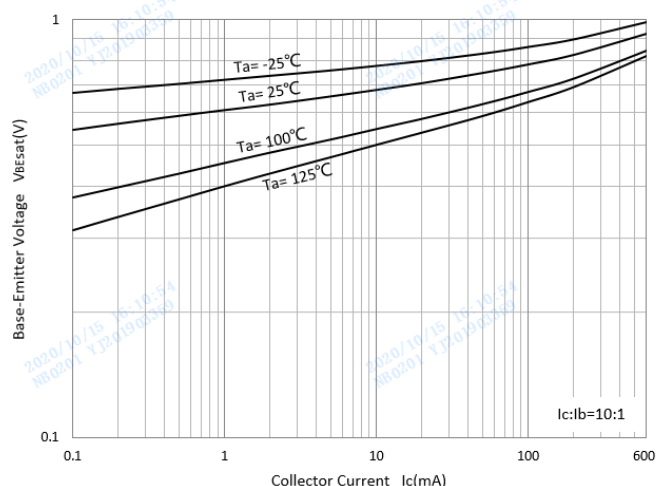
DC Current Gain



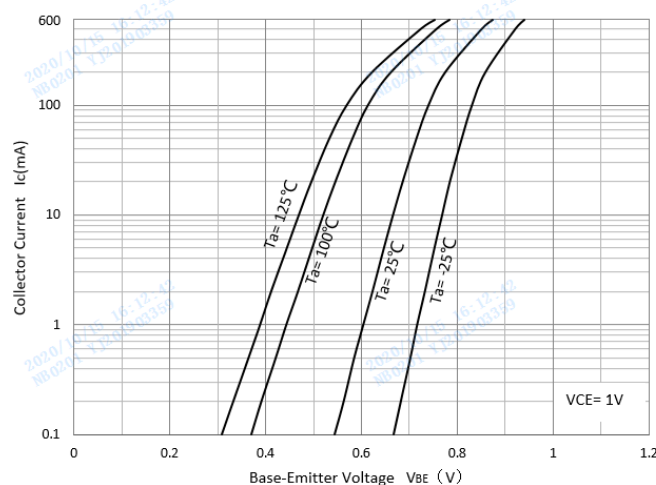
Collector-Emittor Saturation Voltage



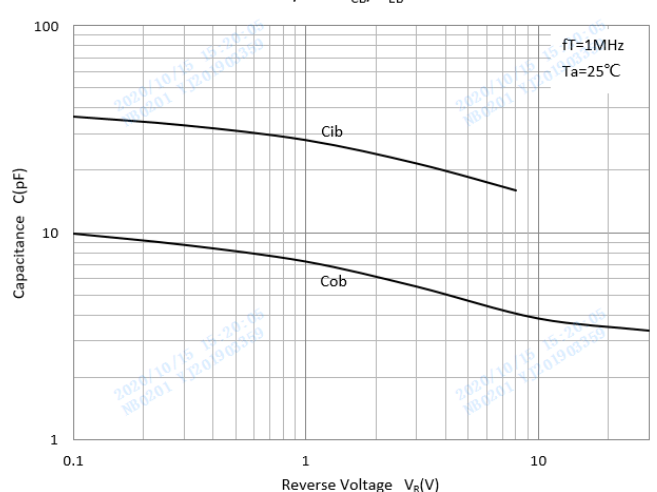
Base-Emittor Saturation Voltage



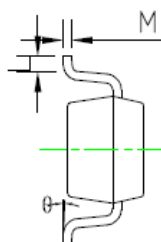
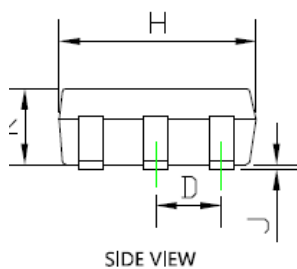
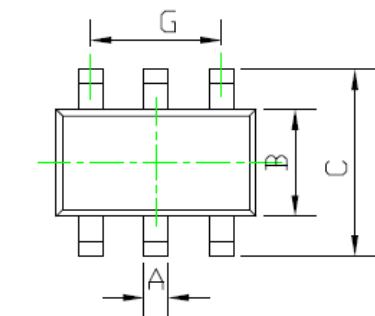
Base-Emittor On Voltage



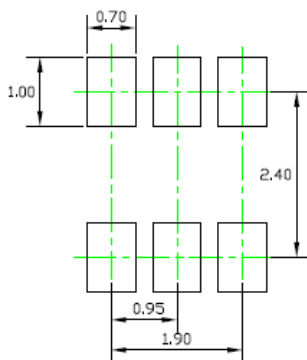
Cob/Cib-V_{CB}/V_{EB}



■SOT-23-6L Package information



SIDE VIEW



Suggested Solder Pad Layout

Note:
1. Controlling dimension in millimeters,
2. General tolerance: $\pm 0.05\text{mm}$,
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°

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