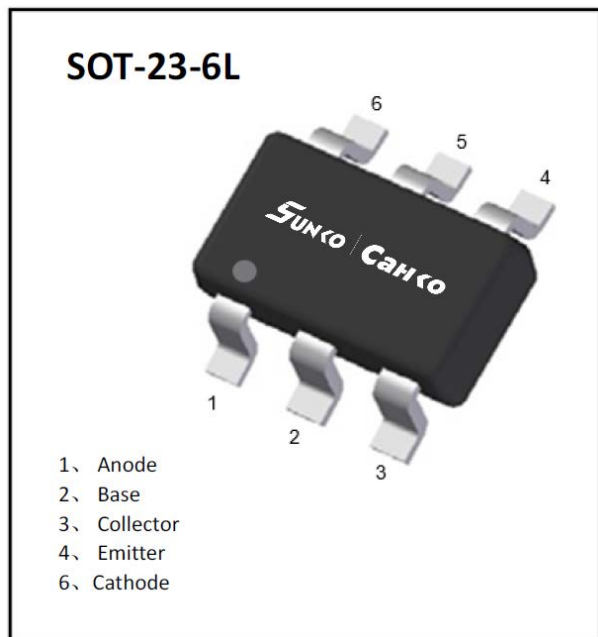


NPN Transistor with Zener Diode



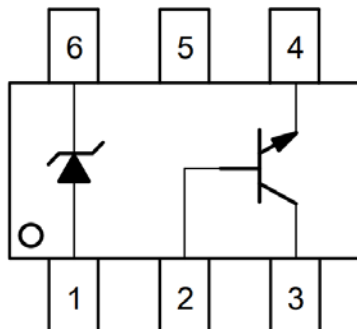
Features

- 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:** 4456A

■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
SMBT445V6A	F2	Approximate 15.6	3000	30000	120000	7" reel

■ Thermal Characteristics(T_a=25℃ Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Total Device Dissipation(Per device)	P _D	mW		500
Junction Temperature	T _J	℃		-55 to +150
Storage Temperature	T _{STG}	℃		-55 to +150

SMBT445V6A

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

Item	Symbol	Unit	Conditions	Value
Collector-Base Voltage	V_{CBO}	V	$I_C=10\mu A, I_E=0$	50
Collector-Emitter Voltage	V_{CEO}	V	$I_C=10mA, I_B=0$	45
Emitter-Base Voltage	V_{EBO}	V	$I_E=1\mu A, I_C=0$	5
Collector Current -Continuous	I_C	mA		500

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

Item	Symbol	Unit	Conditions	Min	TYP	Max
Collector-base breakdown voltage	V_{CBO}	V	$I_C=10\mu A, I_E=0$	50		
Collector-emitter breakdown voltage	V_{CEO}	V	$I_C=10mA, I_B=0$	45		
Emitter-base breakdown voltage	V_{EBO}	V	$I_E=1\mu A, I_C=0$	5		
Collector-base cut-off current	I_{CBO}	μA	$V_{CE}=45V, I_E=0$			0.1
Emitter-base cut-off current	I_{EBO}	μA	$V_{BE}=4V, I_C=0$			0.1
DC current gain	h_{FE1}		$V_{CE}=1V, I_C=100mA$	250		600
	h_{FE2}		$V_{CE}=1V, I_C=500mA$	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=500mA, I_B=50mA$			0.7
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=500mA, I_B=50mA$			1.2
Base-emitter saturation voltage	V_{BE}	V	$V_{CE}=1V, I_C=500mA$			1.2
Collector-base output capacitance	Cob	pF	$V_{CB}=10V, f=1MHz$		10	
Transition frequency	f_T	MHz	$V_{CE}=5V, I_C=10mA, f=100MHz$	100		

SMBT445V6A

■ 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)

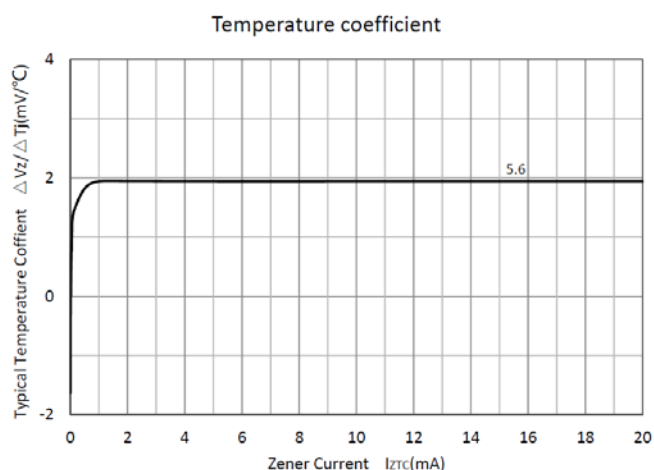
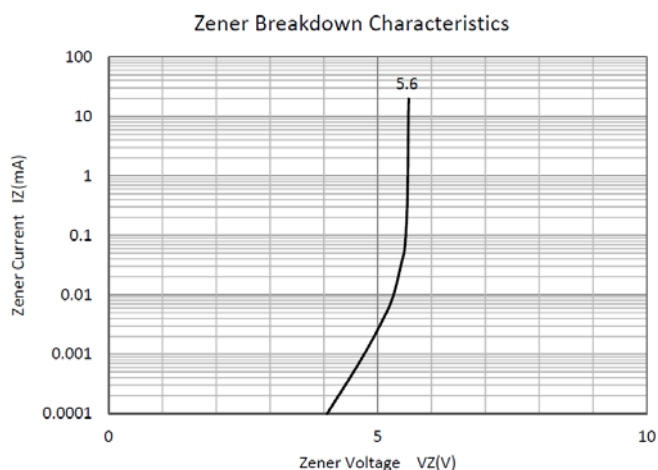
Type Number	V _Z at I _{ZT} (V)				I _R (μA)@V _R	
	min.	typ.	max.	I _{ZT} (μA)	max	V _R (V)
SMBT445V6A	5.32	5.6	5.88	50	10	4

■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient (Note1)	R _{θJ-A}	°C/W	250
Thermal resistance, junction-to-case (Note1)	R _{θJ-C}	°C/W	200

Note1: Device mounted on PCB(25.4*25.4*1.5mm), single-sided copper,with standard footprint.

■ Zener Diode Pin1、6 Characteristics (Typical)



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

Fig 1: Static Characteristics

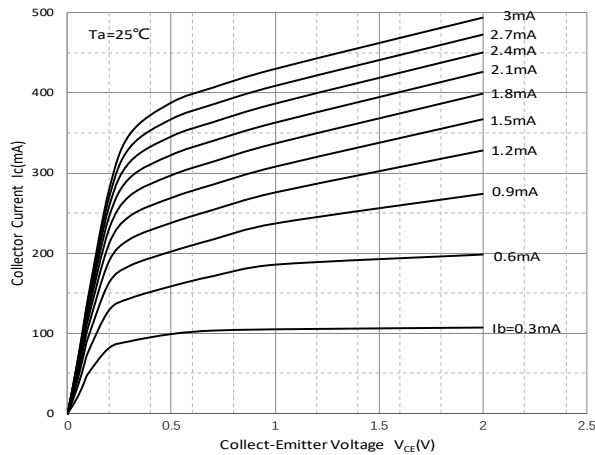


Fig 2: DC Current Gain

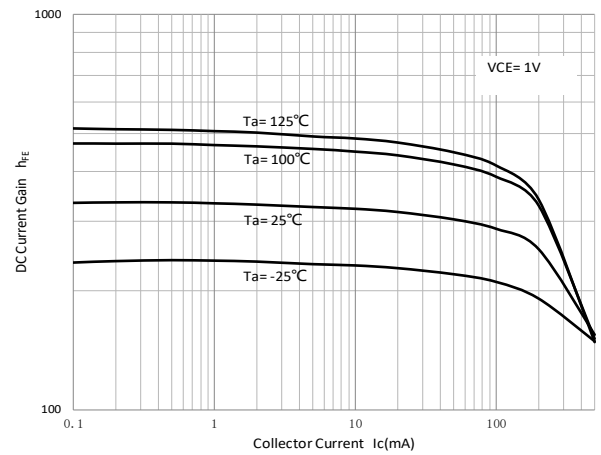


Fig 3: Collector-Emittor Saturation Voltage

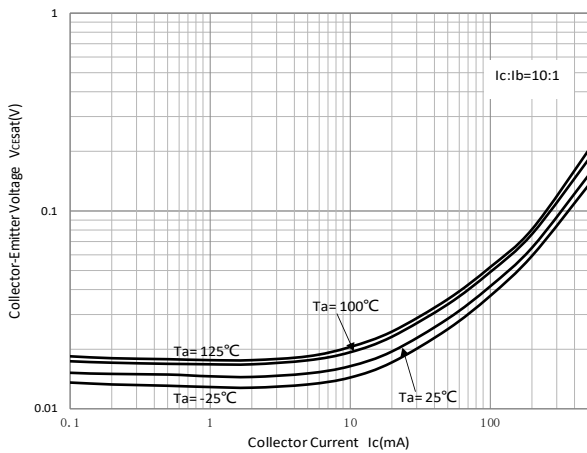


Fig 4: Base-Emittor Saturation Voltage

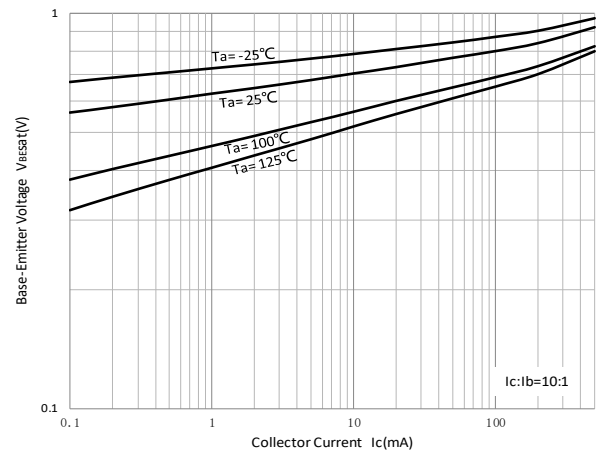


Fig 5: Base-Emittor On Voltage

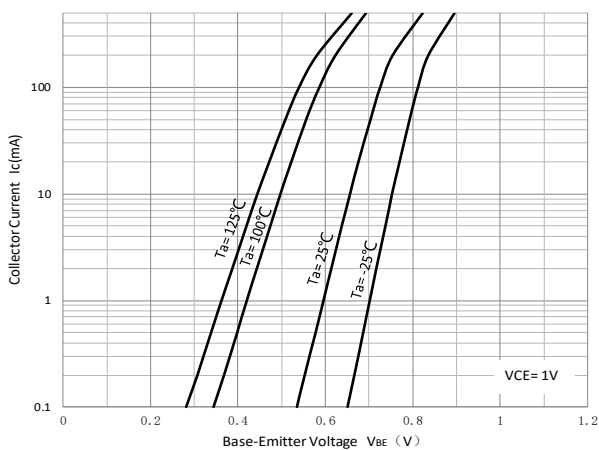


Fig 6: Cob/Cib-Vcb/Veb

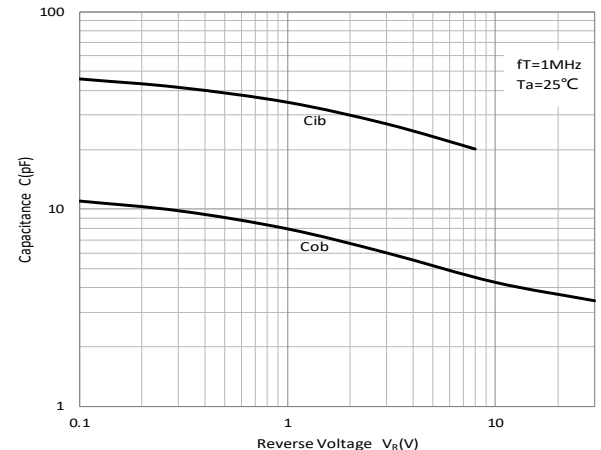
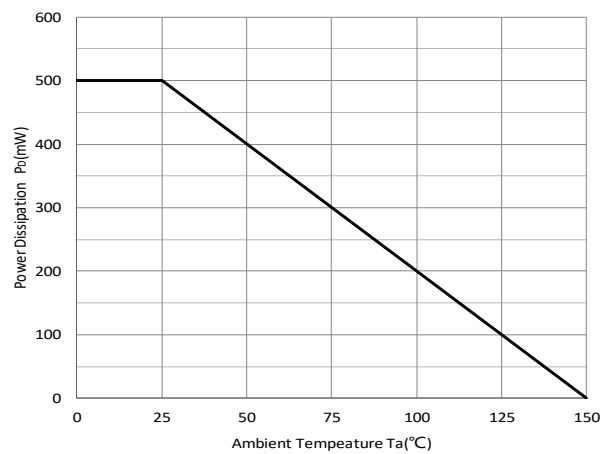
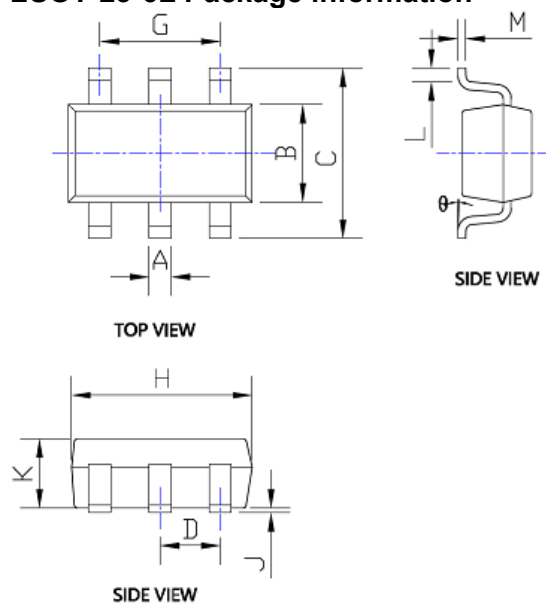


Fig 7: P_D - T_a Curve

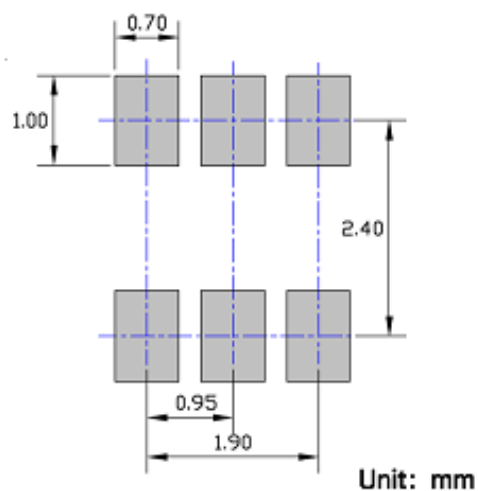


■ SOT-23-6L Package information



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°

■ Suggested Pad Layout



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