

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: 328°C/W Junction to Ambient

NPN Transistor

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	600	mA

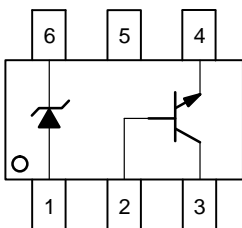
Zener Diode

Parameter	Symbol	Rating	Unit
Maximum Forward Voltage @ $I_F=10mA$	V_F	0.9	V

Total Device Dissipation

Parameter	Symbol	Rating	Unit
Total Device Dissipation	P_D	380	mW

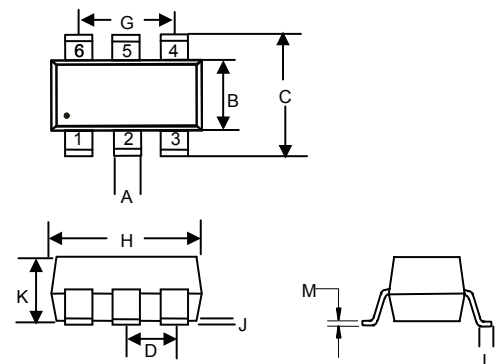
Internal Structure



2.BASE
3.COLLECTOR
4.EMITTER

**NPN Transistor
with
Zener Diode**

SOT23-6L



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.012	0.020	0.30	0.50	
B	0.051	0.070	1.30	1.80	
C	0.087	0.126	2.20	3.20	
D	0.037		0.95		TYP.
G	0.074		1.90		TYP.
H	0.106	0.122	2.70	3.10	
J	0.002	0.006	0.05	0.15	
K	0.030	0.051	0.75	1.30	
L	0.012	0.024	0.30	0.60	
M	0.003	0.008	0.08	0.22	

NPN Transistor---Electrical Characteristics @ T_A=25°C Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	V _{(BR)CBO}	60			V	I _C =100μA, I _E =0
Collector-Emitter Breakdown Voltage*	V _{(BR)CEO}	40			V	I _C =1mA, I _B =0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6			V	I _E =100μA, I _C =0
Base Cutoff Current	I _{BL}			0.1	μA	V _{CE} =35V, V _{BE} =0.4V
Collector Cutoff Current	I _{CEX}			0.1	μA	V _{CE} =35V, V _{BE} =0.4V
DC Current Gain*	h _{FE(1)}	20				V _{CE} =1V, I _C =0.1mA
	h _{FE(2)}	40				V _{CE} =1V, I _C =1mA
	h _{FE(3)}	80				V _{CE} =1V, I _C =10mA
	h _{FE(4)}	100		300		V _{CE} =1V, I _C =150mA
	h _{FE(5)}	40				V _{CE} =2V, I _C =500mA
Collector-Emitter Saturation Voltage	V _{CE(sat)}			0.4	V	I _C =150mA, I _B =15mA
				0.75	V	I _C =500mA, I _B =50mA
Base-Emitter Saturation Voltage	V _{BE(sat)}		0.75	0.95	V	I _C =150mA, I _B =15mA
				1.2	V	I _C =500mA, I _B =50mA
Transition Frequency	f _T	250			MHz	V _{CE} =10V, I _C =20mA, f=100MHz
Delay Time	t _d			15	ns	V _{CC} =30V, V _{BE} =0.2V, I _C =150mA, I _{B1} =15mA
Rise Time	t _r			20	ns	
Storage Time	t _s			225	ns	V _{CC} =30V, I _C =150mA, I _{B1} =I _{B2} =15mA
Fall Time	t _f			30	ns	
Collector-Base Capacitance	C _{cb}			6.5	pF	V _{CB} =5V, I _E =0, f=1MHz
Emitter-Base Capacitance	C _{eb}			30	pF	V _{EB} =0.5V, I _C =0, f=1MHz

*.Pulse test: Pulse Width≤300μs,Duty Cycle≤2.0%.

Zener Diode---Electrical Characteristics @ 25°C Unless Otherwise Specified

MCC Part Number	Zener Voltage			Maximum Zener Impedance				Reverse Current	
	V _Z @ I _{ZT}			Z _{ZT}	I _{ZT}	Z _{ZK}	I _{ZK}	I _R (Max)	V _R
	Min.(V)	Nom(V)	Max.(V)	Ω	mA	Ω	mA	μA	V
SMBT445V6	5.49	5.6	5.71	40	5	400	1	0.1	2.0

NPN Transistor---Curve Characteristics

Fig. 1 - Static Characteristics

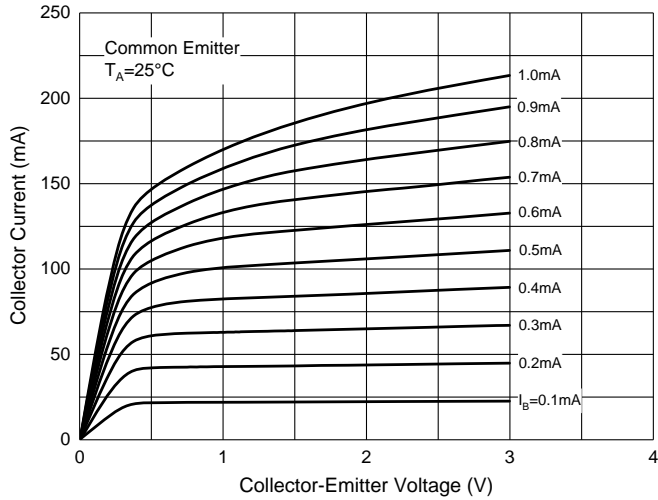


Fig. 2 - DC Current Gain Characteristics

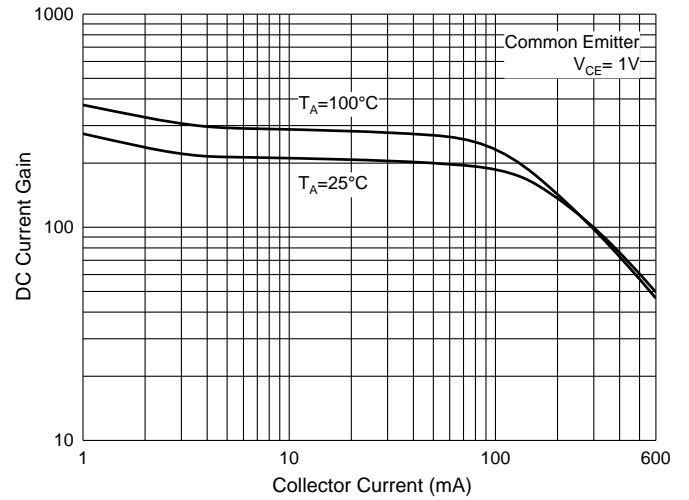


Fig. 3 - Base-Emitter Saturation Voltage Characteristics

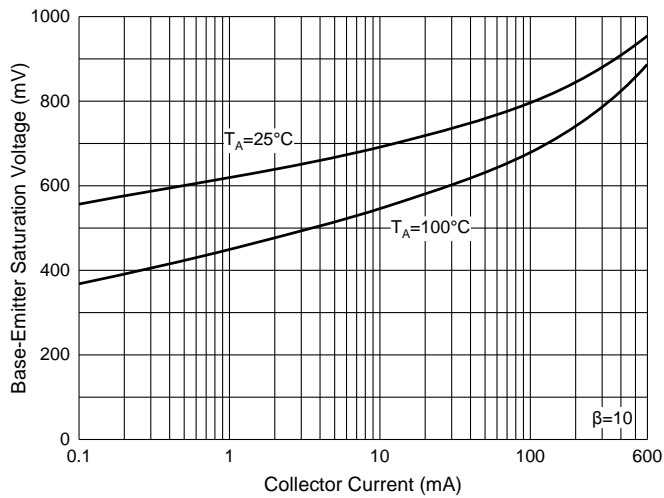
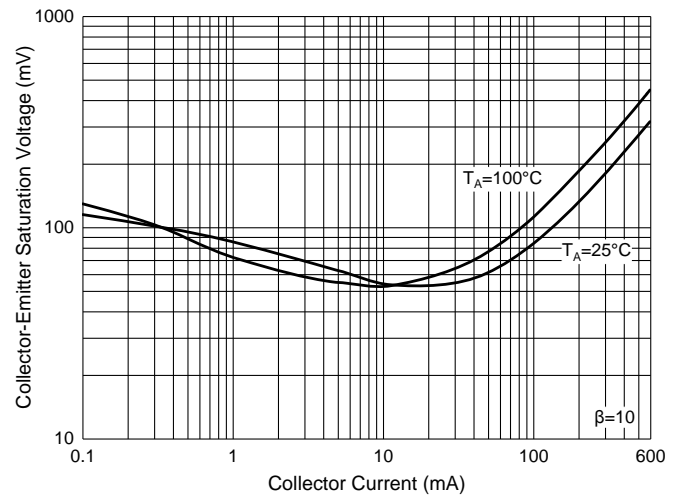
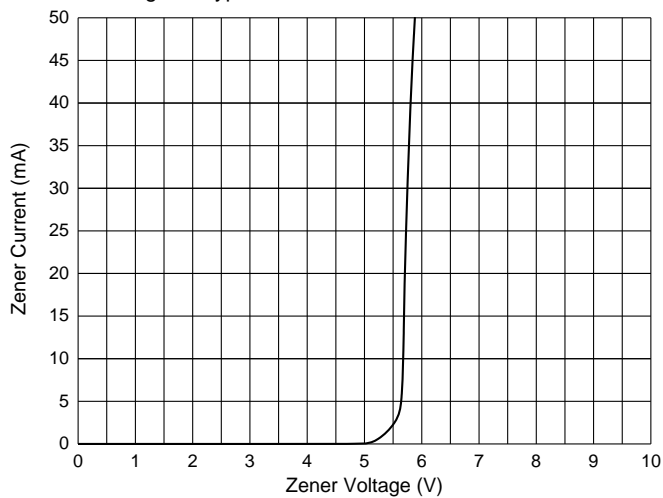


Fig. 4 - Collector-Emitter Saturation Voltage Characteristics



Zener Diode---Curve Characteristics

Fig. 5 - Typical Zener Breakdown Characteristics



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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