

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}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	500	mA

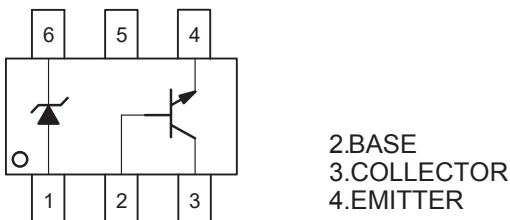
Zener Diode

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

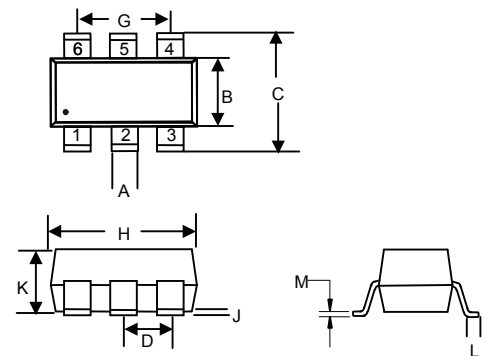
Internal Structure



Marking: 4456A

**NPN Transistor
with
Zener Diode**

SOT23-6L



DIM	INCHES		MM		NOTE
	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	$V_{(BR)CBO}$	50			V	$I_C=10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage(*)	$V_{(BR)CEO}$	45			V	$I_C=10mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=1\mu A, I_C=0$
Collector Cutoff Current	I_{CBO}			0.1	μA	$V_{CB}=45V, I_E=0$
Emitter-Base Cutoff Current	I_{EBO}			0.1	μA	$V_{EB}=4V, I_C=0$
DC Current Gain(*)	h_{FE1}	250		600		$V_{CE}=1V, I_C=100mA$
	h_{FE2}	40				$V_{CE}=1V, I_C=500mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.7	V	$I_C=500mA, I_B=50mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.2	V	$I_C=500mA, I_B=50mA$
Base-Emitter Voltage	V_{BE}			1.2	V	$V_{CE}=1V, I_C=500mA$
Collector capacitance	C_{ob}		10		pF	$V_{CB}=10V, f=1MHz,$
Transition Frequency	f_T	100			MHz	$V_{CE}=5V, I_C=10mA, f=100MHz$

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

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

MCC Part Number	Zener Voltage				Leakage Current $I_R @ V_R$	
		$V_Z @ I_{ZT}$		I_{ZT}	I_R	V_R
	Min.(V)	Nom(V)	Max.(V)	μA	μA	V
SMBT445V6	5.32	5.6	5.88	50	10	4.0

NPN Transistor---Curve Characteristics

Fig. 1 - Static Characteristics

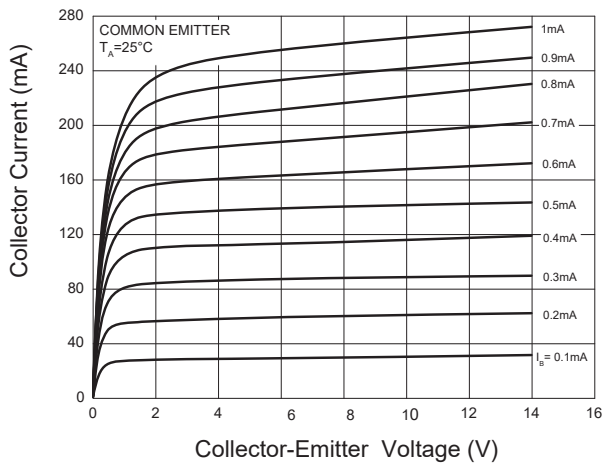


Fig. 2 - DC Current Gain Characteristics

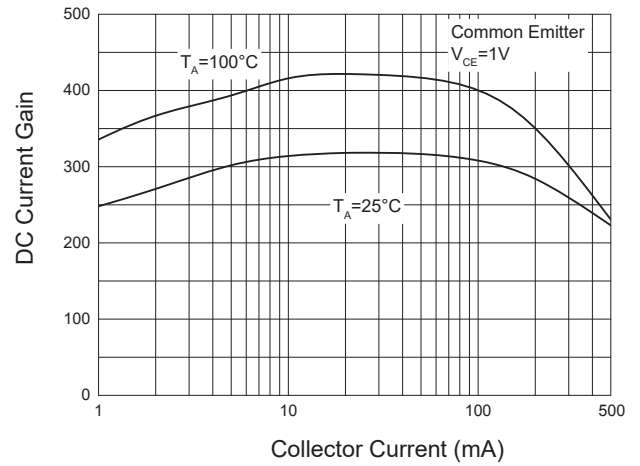


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

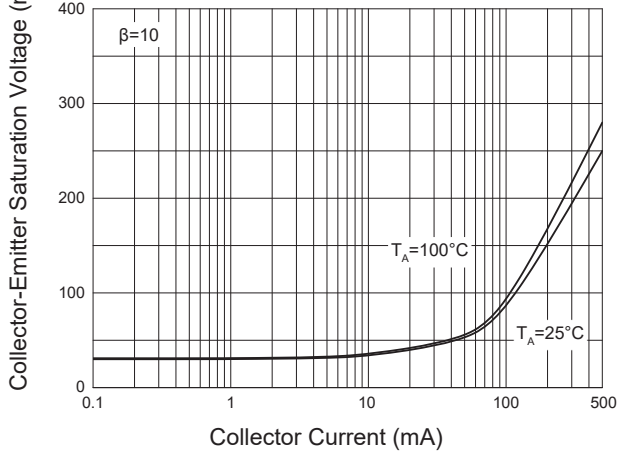
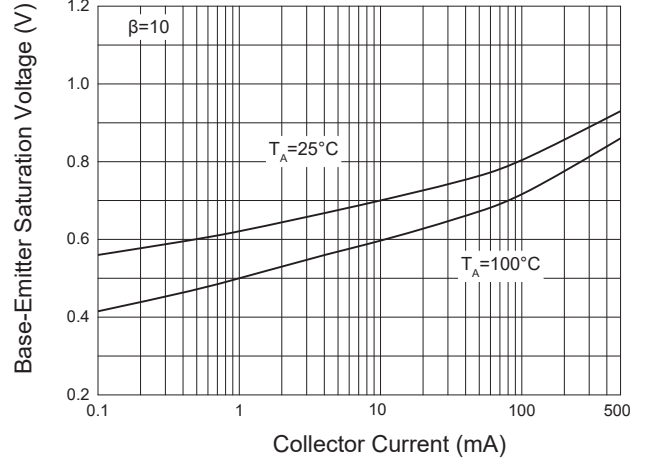
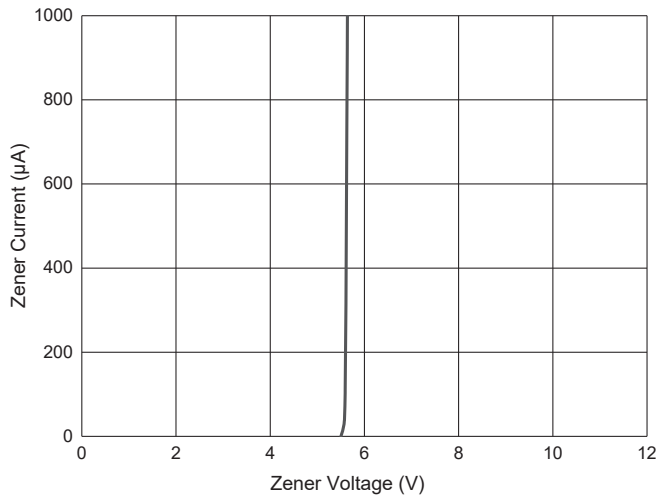


Fig. 4 - Base-Emitter Saturation Voltage Characteristics



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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