



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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Features

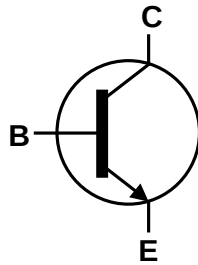
- $BV_{CEO} > 45V$
- $I_C = 100mA$ Collector Current
- Epitaxial Planar Die Construction
- Ultra-Small Surface-Mount Package
- Complementary PNP Type: NK-MMBT3906T

Mechanical Data

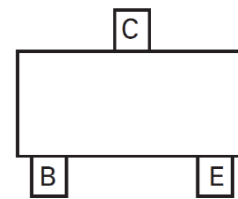
- Package: SOT523
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 
- Weight: 0.002 grams (Approximate)



Top View



Device Symbol



Pin-Out Top View

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	50	V
Collector-Emitter Voltage	V _{CE0}	45	V
Emitter-Base Voltage	V _{EB0}	6.0	V
Collector Current	I _C	100	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	833	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes: 5. For a device mounted with the collector lead on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

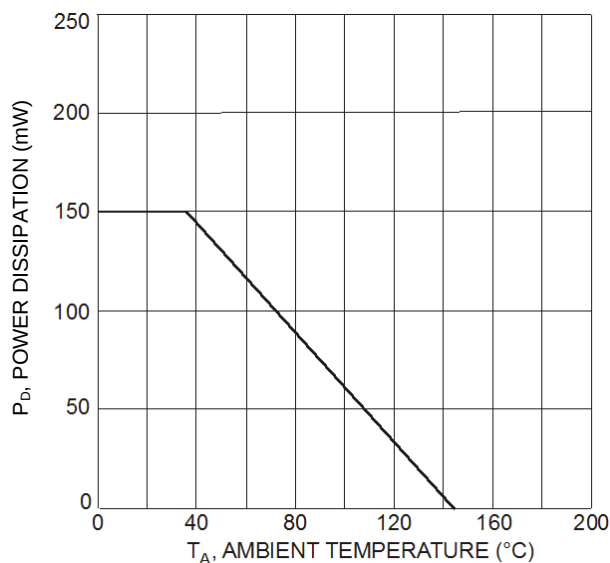


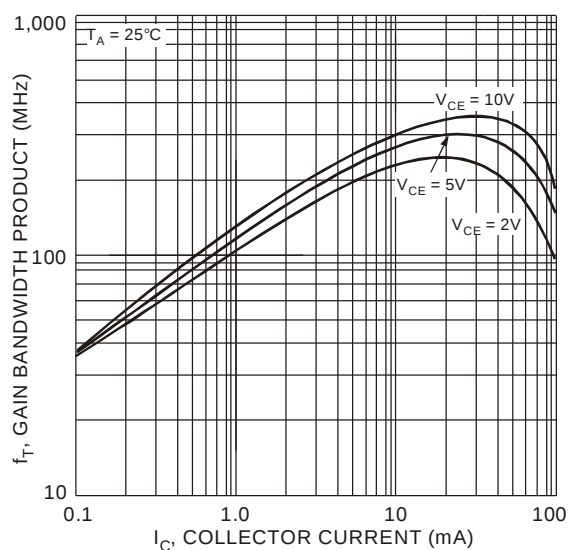
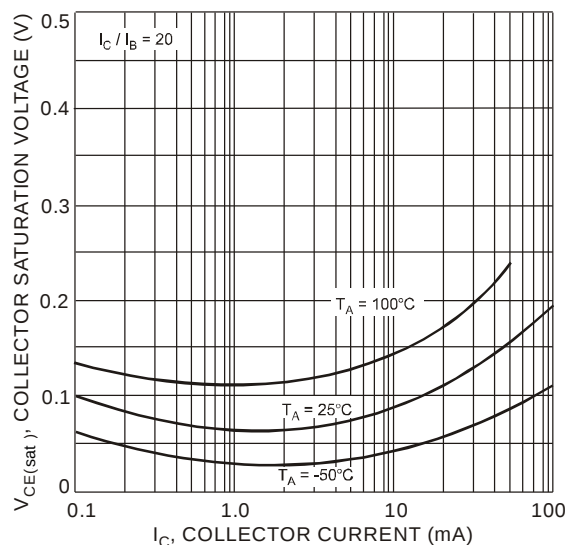
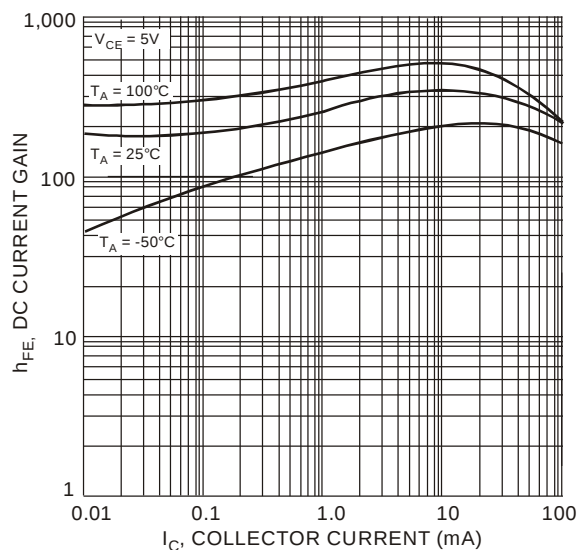
Fig. 1, Power Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)							
Collector-Base Breakdown Voltage		BV _{CB0}	50	—	—	V	I _C = 10μA, I _E = 0
Collector-Emitter Breakdown Voltage		BV _{CEO}	45	—	—	V	I _C = 1mA, I _B = 0
Emitter-Base Breakdown Voltage		BV _{EB0}	6	—	—	V	I _E = 10μA, I _C = 0
ON CHARACTERISTICS (Note 7)							
DC Current Gain	Current Gain A	h _{FE}	110	—	220	—	V _{CE} = 5V, I _C = 2mA
	B		200	290	450		
	C		420	520	800		
Collector-Emitter Saturation Voltage		V _{CE(sat)}	—	—	250 600	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5mA
Base-Emitter Saturation Voltage		V _{BE(sat)}	—	700 900	—	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5mA
Base-Emitter Voltage		V _{BE}	580 —	660 —	700 770	mV	V _{CE} = 5V, I _C = 2mA V _{CE} = 5V, I _C = 10mA
Collector-Emitter Cutoff Current		I _{CBO}	—	—	15 5	nA μA	V _{CB} = 30V V _{CB} = 30V, T _A = +150°C
SMALL SIGNAL CHARACTERISTICS							
Output Capacitance		C _{obo}	—	—	4.5	pF	V _{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product		f _T	100	—	—	MHz	V _{CE} = 5V, I _C = 10mA, f = 100MHz
Noise Figure	NK-BC847BT NK-BC847CT	NF	—	—	1 4	dB	V _{CE} = 5V, R _S = 2kΩ, f = 1MHz, BW = 200Hz

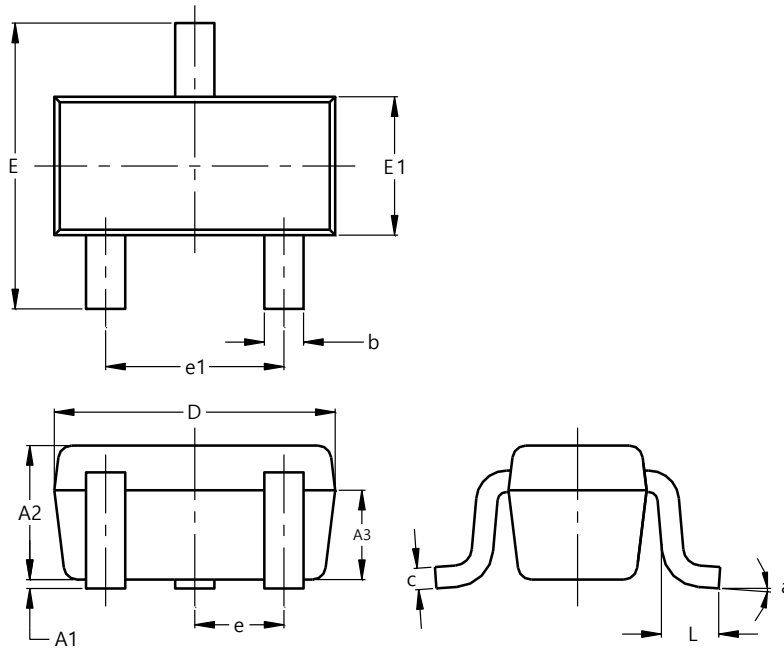
Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

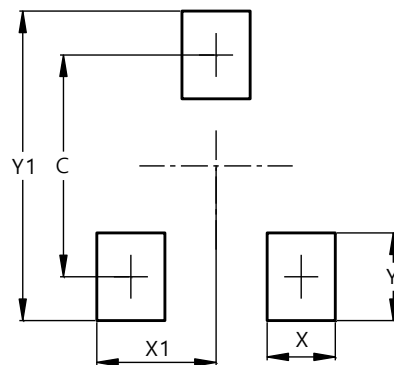
SOT523



SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80