



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

- $BV_{CEO} > -20V$
- $BV_{ECO} > -5V$
- $I_C = -5A$ Continuous Collector Current
- $I_C = -10A$ Peak Pulse Collector Current
- Low Saturation Voltage $V_{CE(SAT)} < -40mV @ -1A$
- 1.5W Power Dissipation
- Complementary NPN Type: NK-ZXTN19020CFF

Mechanical Data

- Case: SOT23F
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification 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: 0.012 grams (Approximate)

Description

This low voltage PNP transistor has been designed for applications requiring high gain and very low saturation voltage. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.

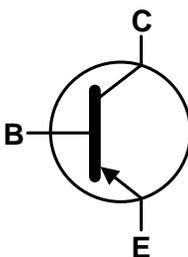
Applications

- Battery Charging
- Load Switch
- DC-DC Converters

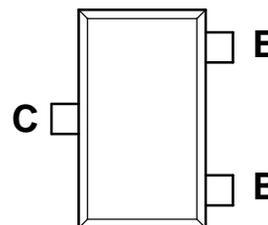
SOT23F



Top View



Device Symbol



Top View
Pin Configuration

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	-5	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5	A
Peak Pulse Current	I_{CM}	-10	A
Base Current	I_B	-1	A

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

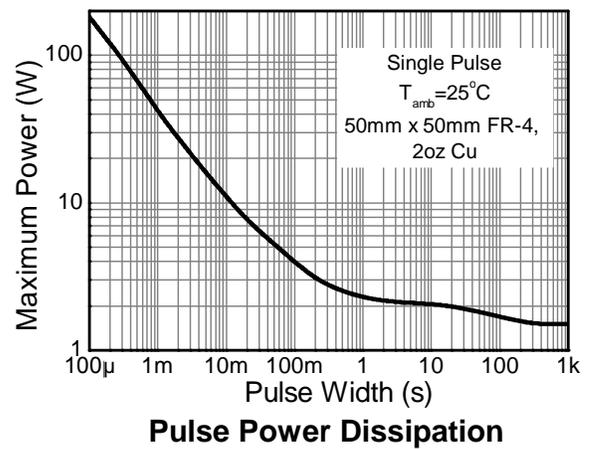
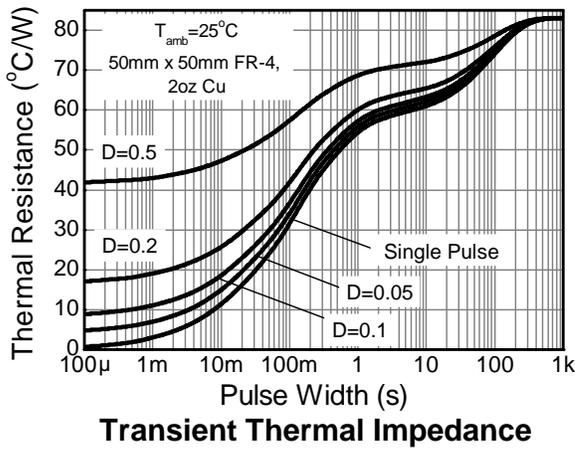
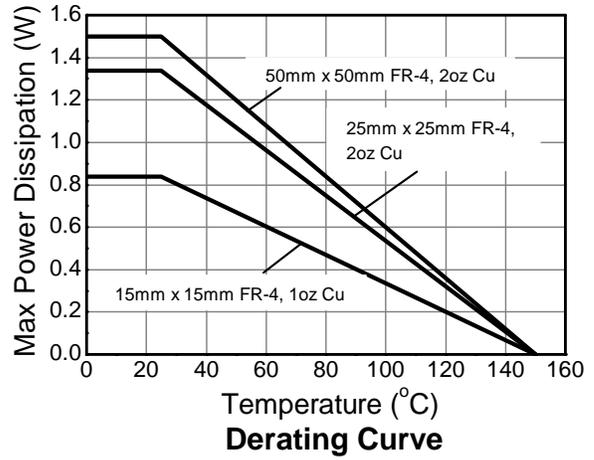
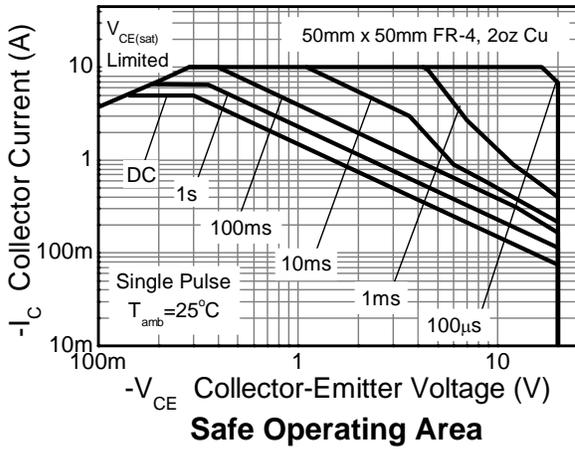
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	0.84	W mW/ $^\circ\text{C}$
		6.72	
		1.34	
		10.72	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.50	$^\circ\text{C/W}$
		12.0	
		2.0	
		16.0	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	149	$^\circ\text{C/W}$
		93.4	
		83.3	
		60	
Thermal Resistance, Junction to Solder Point	$R_{\theta JS}$	43.8	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 10)

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:
- For a device mounted with the exposed collector pad on 15mm x 15mm 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.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 - Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
 - Same as Note 7, whilst measured at $t < 5$ seconds.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

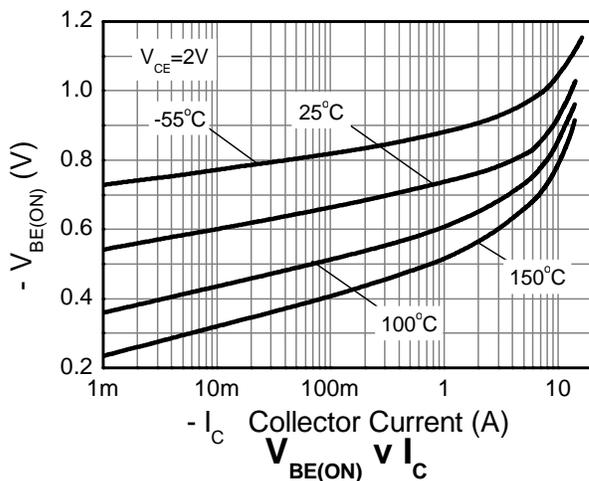
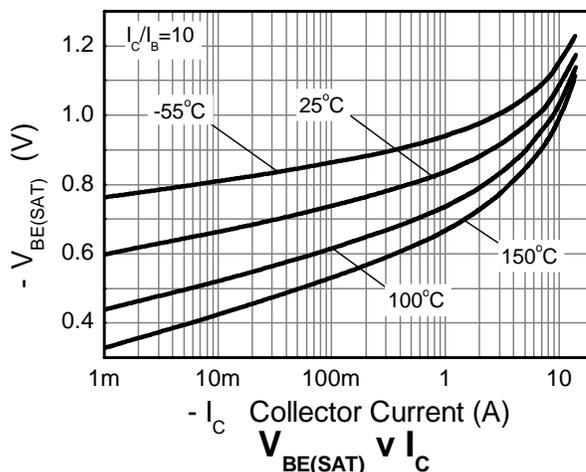
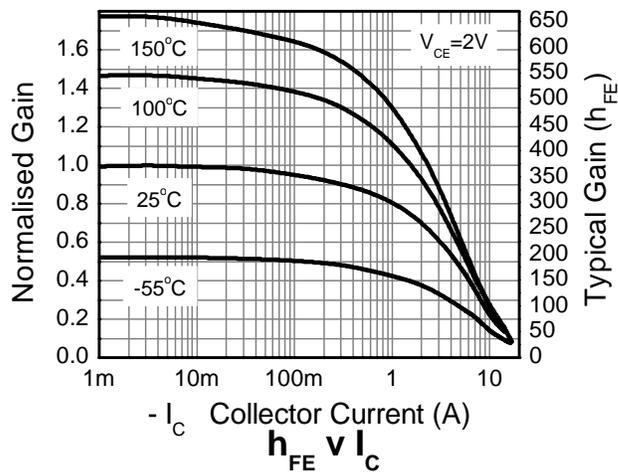
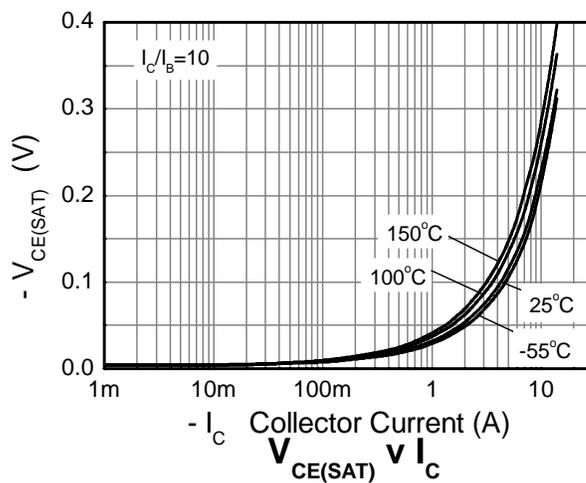
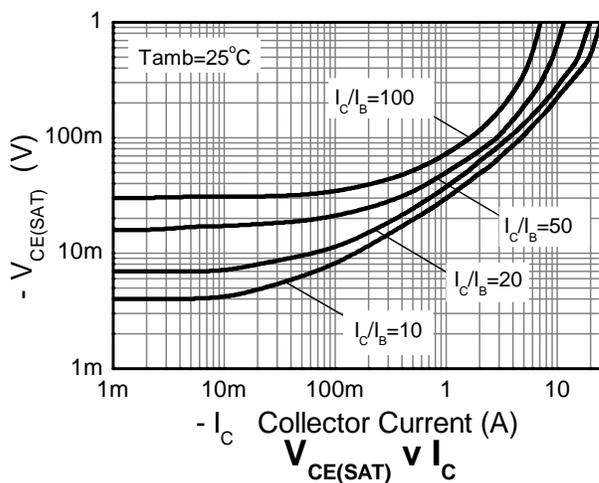


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CBO}	-25	-45	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV _{CEO}	-20	-30	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.3	—	V	I _E = -100μA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECX}	-6	-8.3	—	V	I _E = -100μA, R _{BC} ≤ 1kΩ or 0.25V < V _{BC} < -0.25V
Emitter-Collector Breakdown Voltage (Base Open)	BV _{ECO}	-5	-8.5	—	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}	—	<-1	-50	nA μA	V _{CB} = -20V V _{CB} = -20V, T _A = +100°C
Emitter-Base Cutoff Current	I _{EBO}	—	<-1	-50	nA	V _{EB} = -5.6V
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h _{FE}	200 170 110	350 300 180	500 — —	—	I _C = -100mA, V _{CE} = -2V I _C = -1A, V _{CE} = -2V I _C = -5A, V _{CE} = -2V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	-30 -50 -75 -105	-40 -70 -120 -135	mV	I _C = -1A, I _B = -100mA I _C = -1A, I _B = -20mA I _C = -2A, I _B = -40mA I _C = -5A, I _B = -500mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	-925	-1050	mV	I _C = -5A, I _B = -500mA
Base-Emitter On Voltage	V _{BE(ON)}	—	-815	-950	mV	I _C = -5A, V _{CE} = -2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	—	200	—	MHz	I _C = -50mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{OBO}	—	52	70	pF	V _{CB} = -10V, f = 1MHz
Delay Time	t _D	—	66.8	—	ns	V _{CC} = -15V, I _C = -750mA, I _{B1} = -I _{B2} = -15mA
Rise Time	t _R	—	74.5	—	ns	
Storage Time	t _S	—	226	—	ns	
Fall Time	t _F	—	85.5	—	ns	

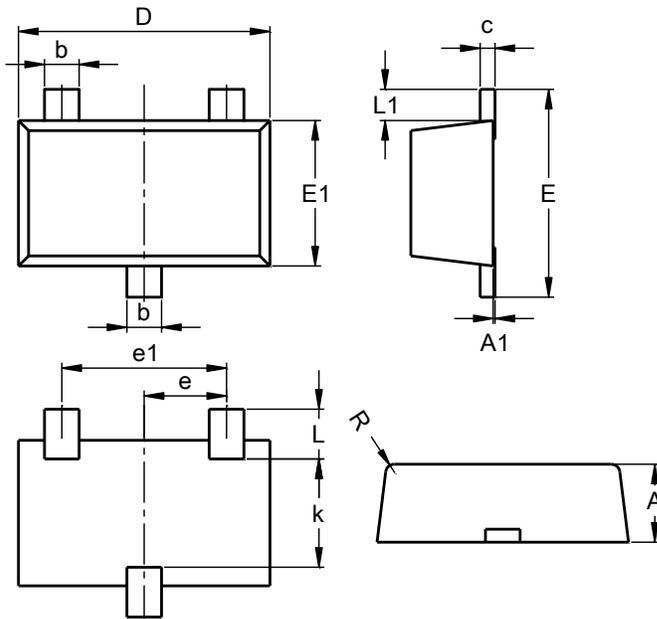
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

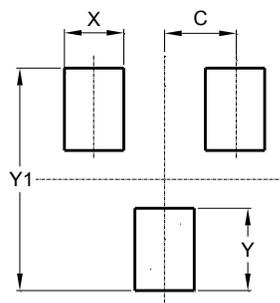
SOT23F



SOT23F			
Dim	Min	Max	Typ
A	0.80	1.00	0.90
A1	0.00	0.10	0.01
b	0.35	0.50	0.44
c	0.10	0.20	0.16
D	2.80	3.00	2.90
e	0.95 REF		
e1	1.90 REF		
E	2.30	2.50	2.40
E1	1.50	1.70	1.65
k	1.20	-	-
L	0.30	0.65	0.50
L1	0.30	0.50	0.40
R	0.05	0.15	-
All Dimensions in mm			

Suggested Pad Layout

SOT23F



Dimensions	Value (in mm)
C	0.95
X	0.80
Y	1.110
Y1	3.000