



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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企业微信二维码



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Features

- $BV_{CEO} > -120V$
- $I_C = -1A$ Continuous Collector Current
- Saturation Voltage $V_{CE(SAT)} < -1.1V @ -1A$
- h_{FE} Characterized Up to -6A
- High h_{FE} (Min) = 3,000 @ -1A
- 1.5W Power Dissipation
- Complementary NPN Type: NK-ZXTN04120HFF

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 (3)
- Weight: 0.012 grams (Approximate)

Description

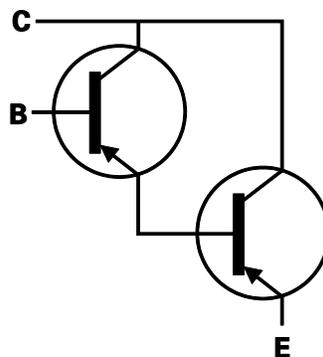
This high performance PNP Darlington transistor is designed for applications requiring high gain and very low saturation voltage. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of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

Applications

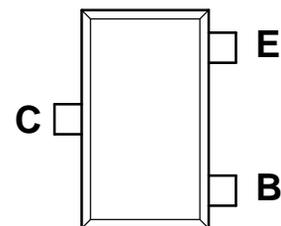
- Boost Converters
- MOSFET and IGBT Gate Drivers
- Lamp and Relay Driver
- Motor Drive
- Siren Driver



Top View



Device Symbol



Top View
Pin Configuration

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-140	V
Collector-Emitter Voltage	V _{CEO}	-120	V
Emitter-Base Voltage	V _{EBO}	-10	V
Continuous Collector Current	I _C	-1	A
Peak Pulse Current	I _{CM}	-4	A
Base Current	I _B	-0.5	A

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

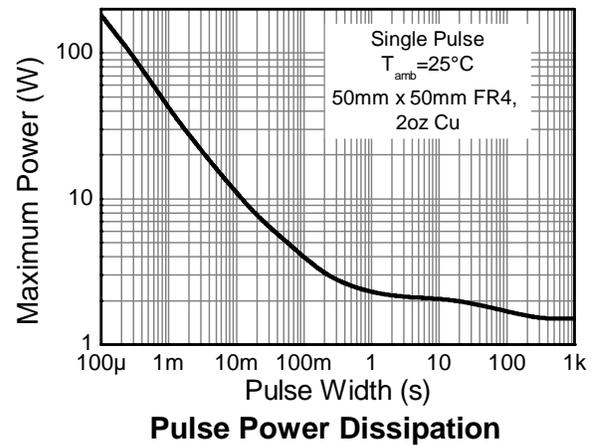
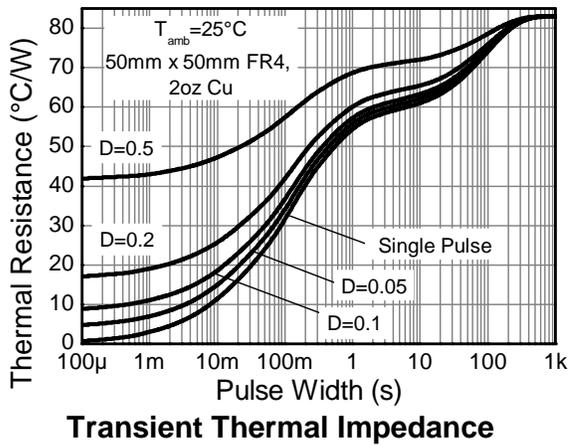
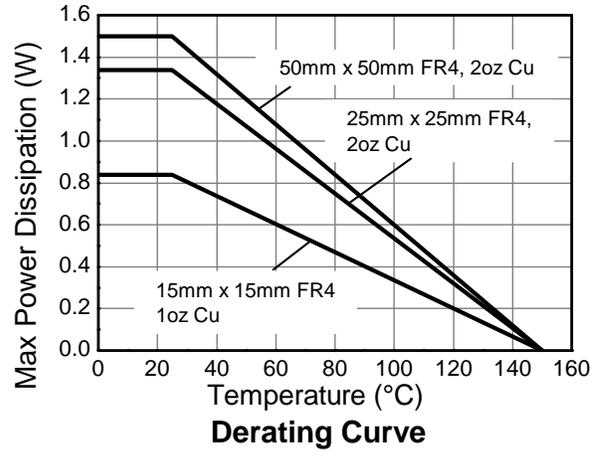
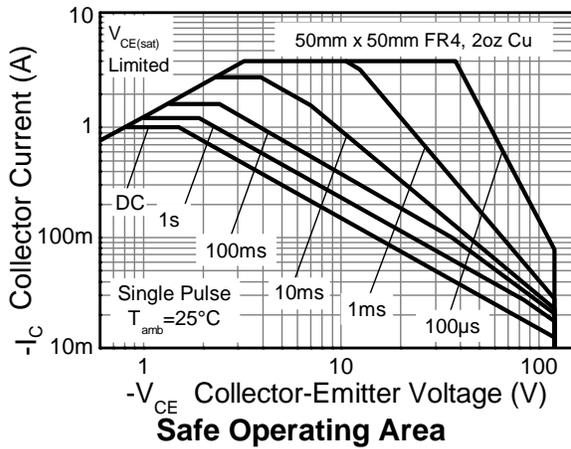
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	0.84	W mW/°C
		6.72	
		1.34	
		10.72	
		1.50	
Thermal Resistance, Junction to Ambient	R _{θJA}	12.0	°C/W
		2.0	
		16.0	
		149	
Thermal Resistance, Junction to Ambient	R _{θJA}	93	°C/W
		83	
		60	
		60	
Thermal Resistance, Junction to Leads	R _{θJL}	43.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge – Machine Model	ESD MM	200	V	B

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 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 leads).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

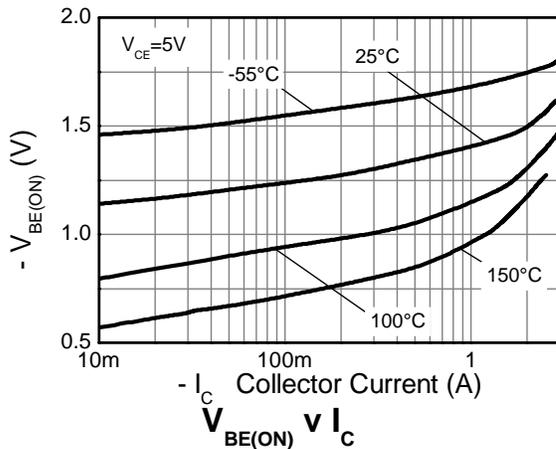
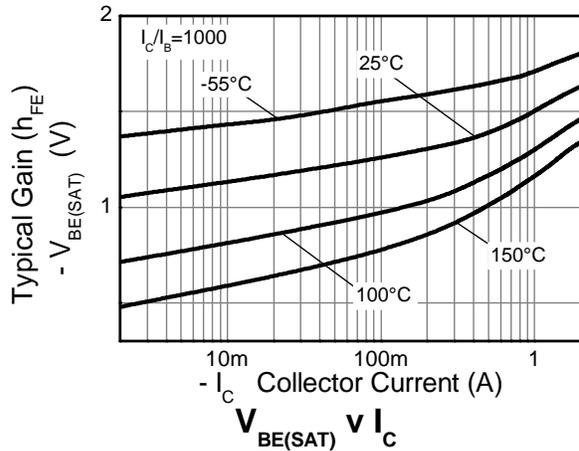
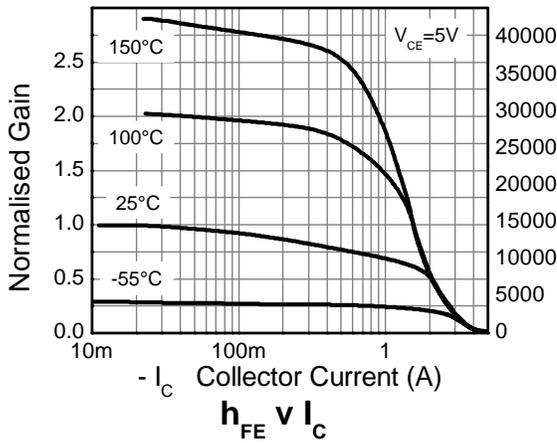
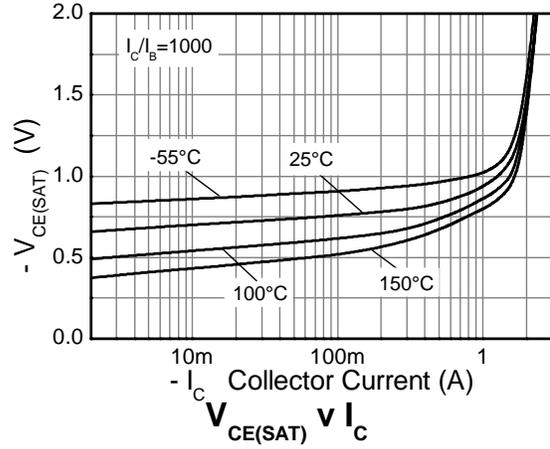
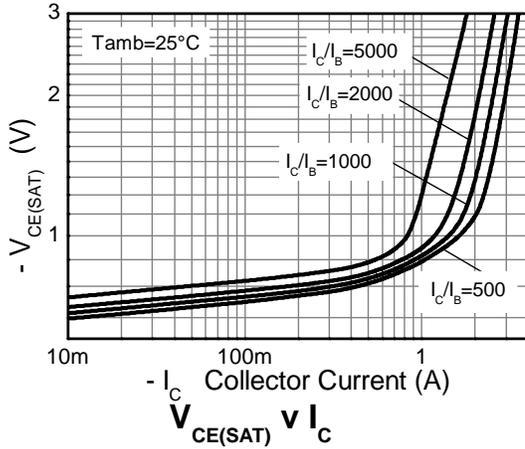


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

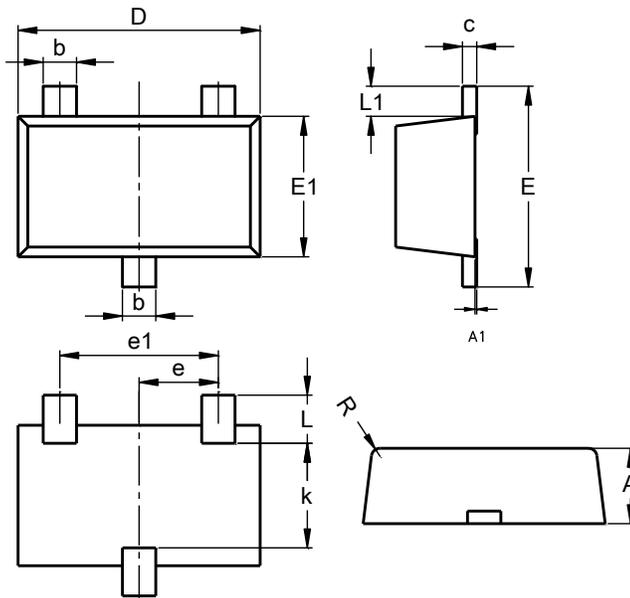
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CBO}	-140	-170	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV _{CEO}	-120	-140	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-10	-16	—	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}	—	<-1	-100	nA	V _{CB} = -120V
Emitter-Base Cutoff Current	I _{CES}	—	<-0.1	-10	μA	V _{CB} = -120V, T _A = +100°C
Emitter-Base Cutoff Current	I _{EBO}	—	<-1	-100	nA	V _{EB} = -5.6V
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h _{FE}	3,000 3,000 3,000 2,000	14,000 11,000 11,000 8,000	— — 30,000 —	—	I _C = -50mA, V _{CE} = -5V I _C = -500mA, V _{CE} = -5V I _C = -1A, V _{CE} = -5V I _C = -2A, V _{CE} = -5V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	-0.77 -0.9 -1.3	-0.9 -1.1 -2.0	V	I _C = -250mA, I _B = -0.25mA I _C = -1A, I _B = -1mA I _C = -2A, I _B = -2mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	-1.5	-1.7	V	I _C = -1A, I _B = -1mA
Base-Emitter On Voltage	V _{BE(ON)}	—	-1.4	-1.7	V	I _C = -1A, V _{CE} = -5V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	—	150	—	MHz	I _C = -100mA, V _{CE} = -10V, f = 20MHz
Input Capacitance	C _{I BO}	—	67	90	pF	V _{EB} = -0.5V, f = 1MHz
Output Capacitance	C _{O BO}	—	22	40	pF	V _{CB} = -1V, f = 1MHz
Delay Time	t _D	—	556	—	ns	V _{CC} = -10V, I _C = -0.5A, I _{B1} = I _{B2} = -0.5mA
Rise Time	t _R	—	212	—	ns	
Storage Time	t _S	—	681	—	ns	
Fall Time	t _F	—	304	—	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.)

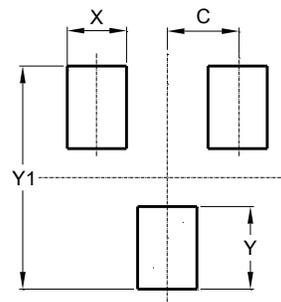


Package Outline Dimensions

SOT23F


SOT23F			
Dim	Min	Max	Typ
A	0.80	1.00	0.90
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	0.190 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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.