优尚

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

企业微信二维码　　　企业QQ二维码

Features

- $BV_{CEO} > 100V$
- $I_C = 1A$ High Continuous Current
- Low Saturation Voltage $V_{CE(sat)} < 300mV$ @ 250mA
- Complementary PNP Type: NK-FCX593

Mechanical Data

- Package: SOT89
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish, Solderable per MIL-STD-202, Method 208 (e3)
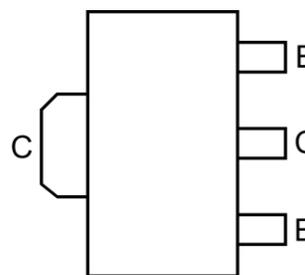- Weight: 0.052 grams (Approximate)

Application

- Load management functions
- Solenoids, relays and actuator drivers
- DC – DC modules

SOT89
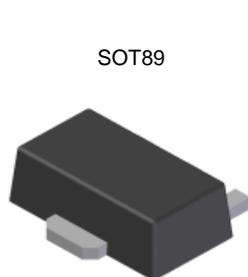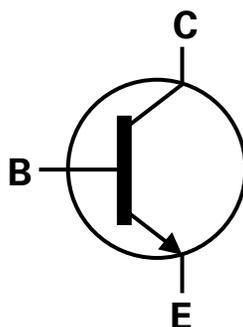
Top View

Device Symbol

Top View
Pin-Out

Maximum Ratings (@T$_A$ = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V$_{CBO}$	120	V
Collector-Emitter Voltage	V$_{CEO}$	100	V
Emitter-Base Voltage	V$_{EBO}$	7	V
Continuous Collector Current	I$_C$	1	A
Peak Pulse Current	I$_{CM}$	2	A
Continuous Base Current	I$_B$	200	mA

Thermal Characteristics (@T$_A$ = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector Power Dissipation (Note 5)	P$_D$	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R$_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Case (Note 6)	R$_{\theta JC}$	16	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R$_{\theta JL}$	10.01	°C/W
Operating and Storage Temperature Range	T$_J$, T$_{STG}$	-65 to +150	°C

Notes: 5. For the device mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. Thermal resistance from junction to the top of the case.
7. Thermal resistance from junction to solder-point (on the exposed collector pad).

Thermal Characteristics and Derating Information
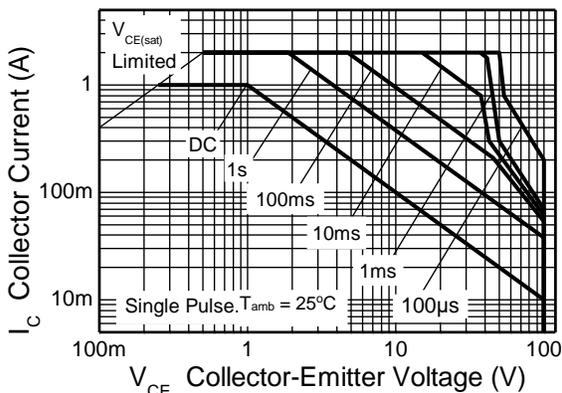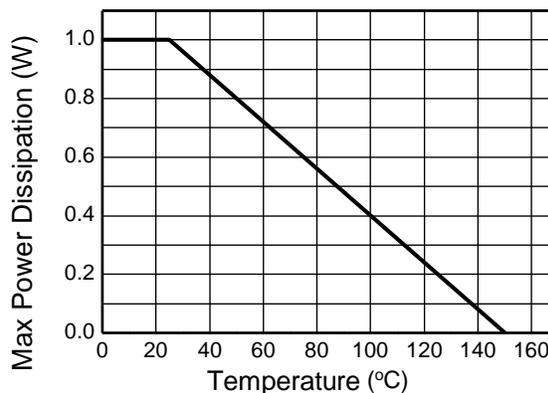
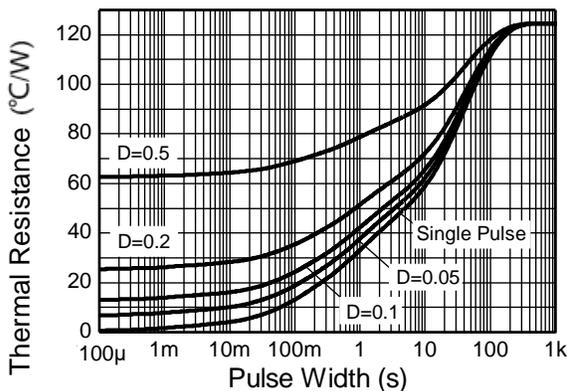

Figure 1. Safe Operating Area

Figure 2. Derating Curve

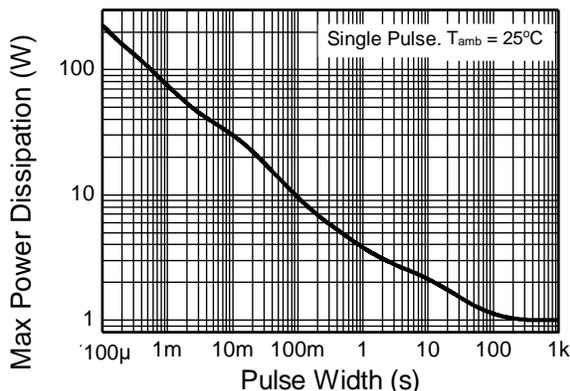Figure 3. Transient Thermal Impedance

Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	120	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	100	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB} = 100V
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V
Emitter Cutoff Current	I_{CES}	—	—	100	nA	V_{CES} = 100V
DC Current Transfer Static Ratio (Note 8)	h_{FE}	100 100 60 20	— — — —	— 300 — —	—	I_C = 1mA, V_{CE} = 10V I_C = 250mA, V_{CE} = 10V I_C = 500mA, V_{CE} = 10V I_C = 1A, V_{CE} = 10V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	— —	— —	0.3 0.6	V	I_C = 500mA, I_B = 50mA I_C = 1A, I_B = 100mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	—	—	1.15	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	—	—	1.0	V	I_C = 1A, V_{CE} = 10V
Transitional Frequency	f_T	150	—	—	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = 10V, f = 1MHz

Note:　　8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

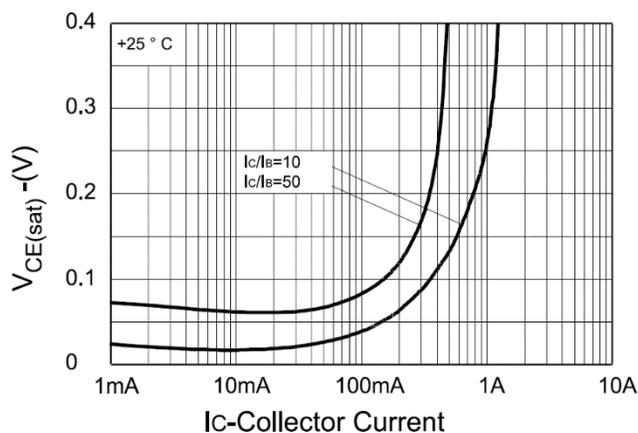## Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)
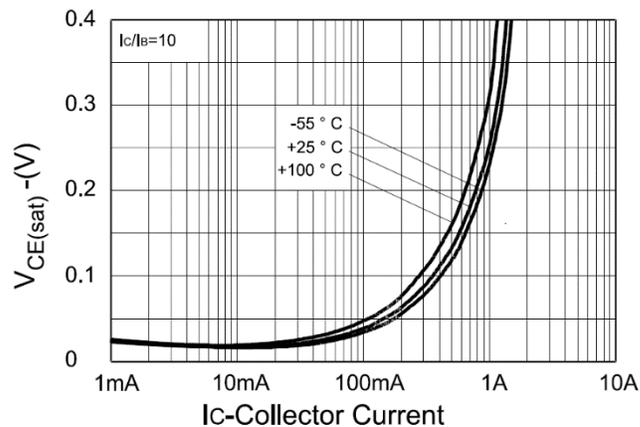

Figure 5. $V_{CE(sat)}$ v I_C

Figure 6. $V_{CE(sat)}$ v I_C

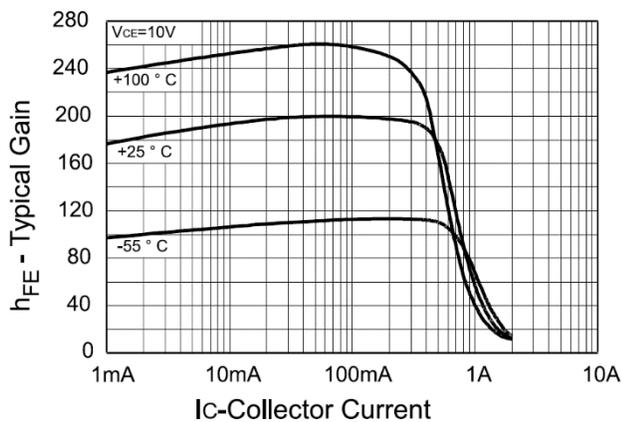
Figure 7. h_{FE}) v I_C
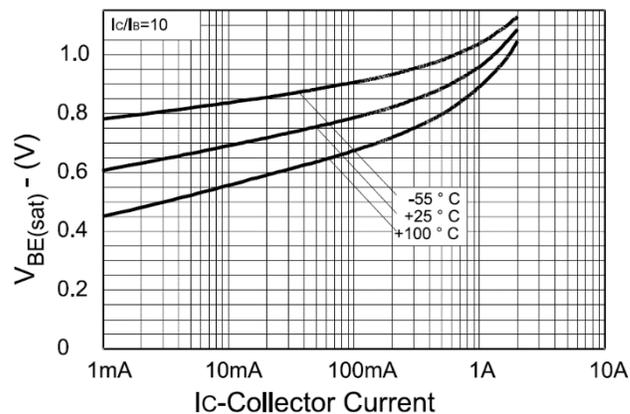
Figure 8. $V_{BE(sat)}$ v I_C
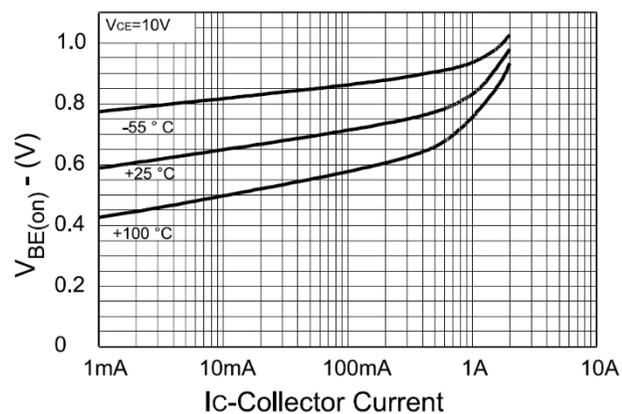
Figure 9. $V_{BE(on)}$ v I_C

Package Outline Dimensions

SOT89

TOP VIEW

BOTTOM VIEW

SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

SOT89

Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530