



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

- $BV_{CEO} > -40V$
- $I_C = -3A$ High Continuous Current
- $I_{CM} = -5A$ Peak Pulse Current
- Very Low $V_{CE(sat)} < -220mV$ at $-1A$
- $R_{CE(sat)} = 66m\Omega$ at $-3A$
- $P_D = 2W$
- Complimentary Part – NK-FCX1051A

Mechanical Data

- Case: SOT89
- Case 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 ②
- Weight: 0.052 grams (Approximate)

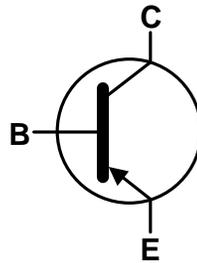
Applications

- Motor Driving (Including DC Fans)
- Solenoid, Relay and Actuator Drivers
- DC-DC Modules
- Backlight Inverters
- Power Switches
- MOSFET Gate Drivers

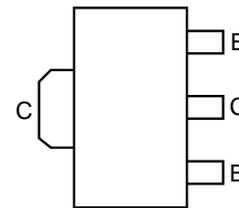
SOT89



Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-45	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Base Voltage	V _{EBO}	-5	V
Continuous Collector Current	I _C	-3	A
Peak Pulse Current	I _{CM}	-5	A
Base Current	I _B	-500	mA

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

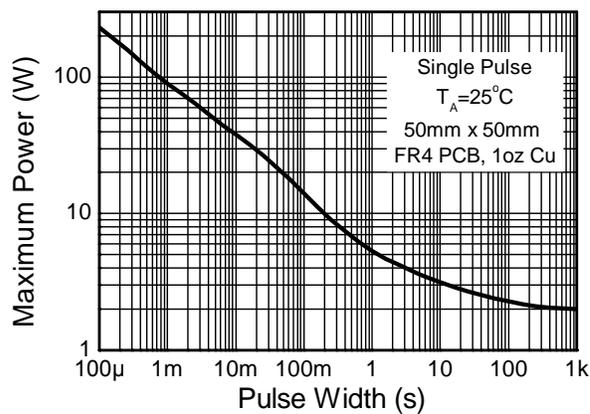
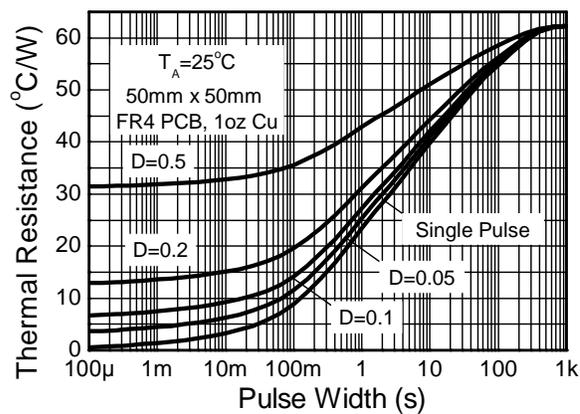
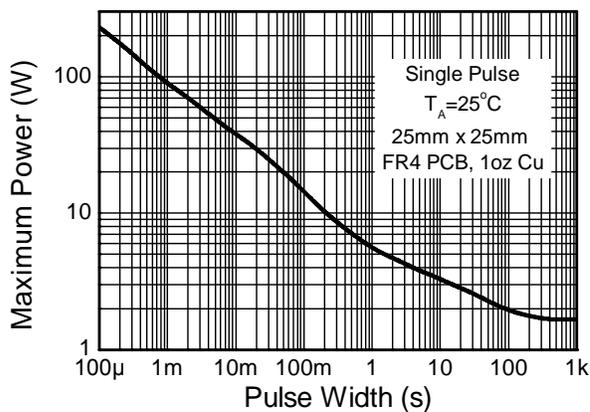
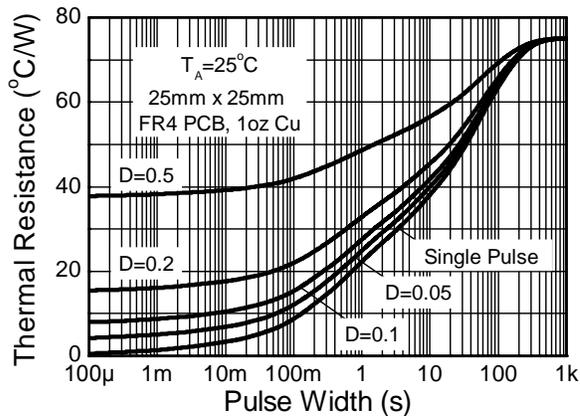
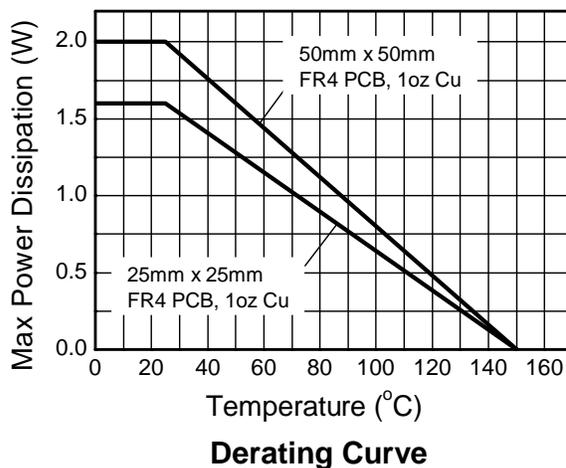
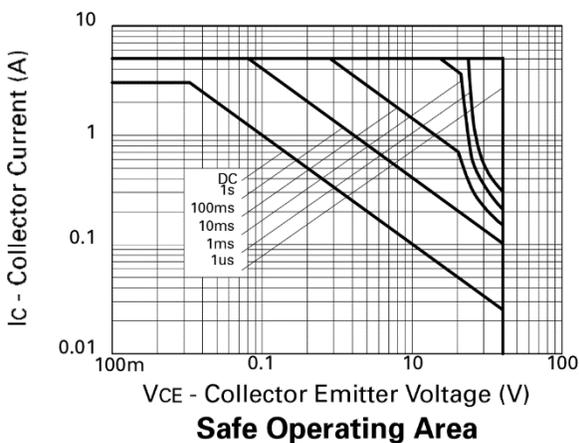
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	1
		(Note 6)	1.6
		(Note 7)	2.0
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5)	125
		(Note 6)	78
		(Note 7)	62.5
Thermal Resistance, Junction to Lead	R _{θJL}	3.6	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

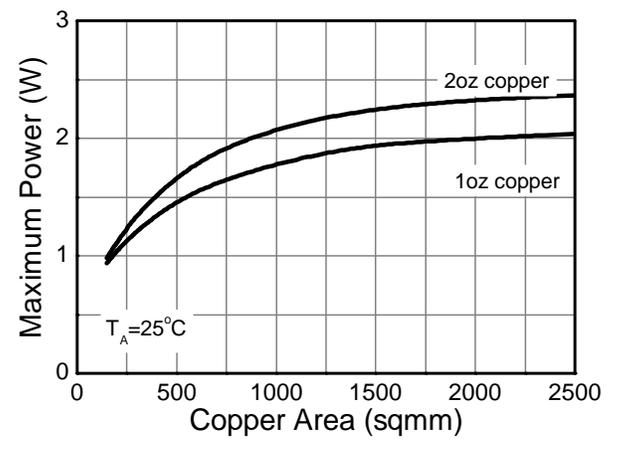
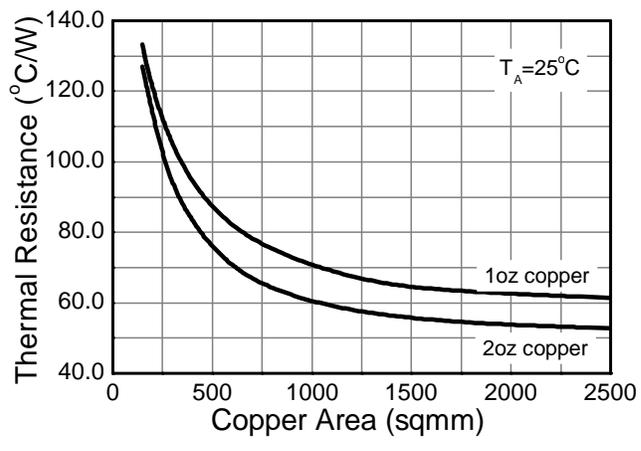
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the 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.
 6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 7. Same as Note 5, except the device is mounted on 50mm x 50mm 1oz copper.
 8. Thermal resistance from junction to solder-point (on the exposed collector pad).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Thermal Characteristics and Derating Information (Cont.)

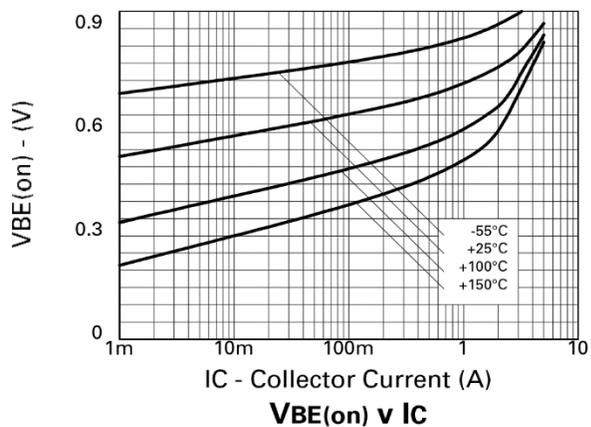
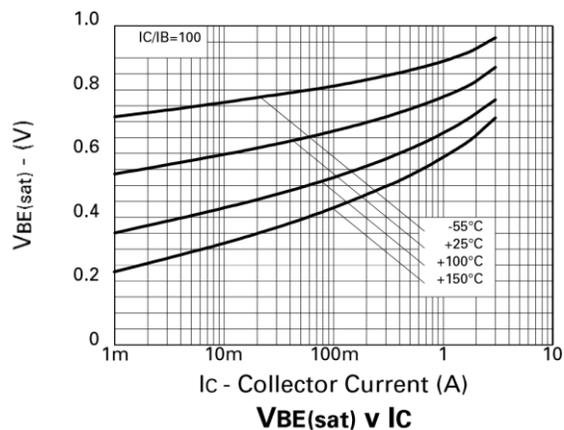
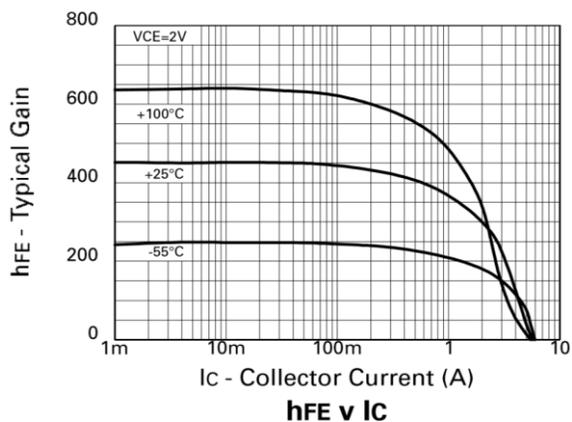
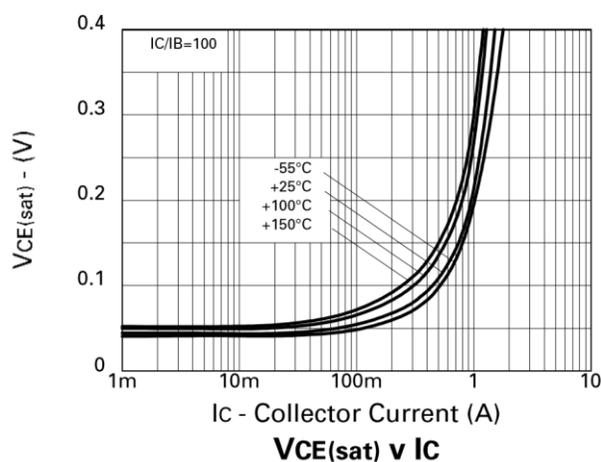
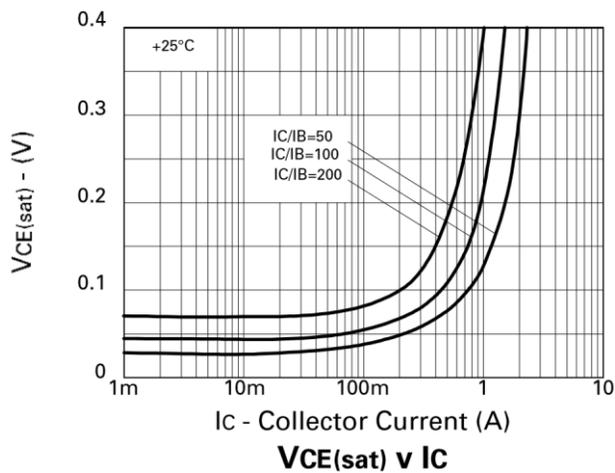


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-45	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage	BV _{CES}	-40	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	-40	—	—	V	I _C = -10mA
Collector-Emitter Breakdown Voltage	BV _{CEV}	-40	—	—	V	I _C = -100μA, V _{EB} = 1V
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	—	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	-0.3	-100	nA	V _{CB} = -36V
Collector Cutoff Current	I _{CES}	—	-0.3	-100	nA	V _{CES} = -32V
Emitter Cutoff Current	I _{EBO}	—	-0.3	-100	nA	V _{EB} = -4V
DC Current Transfer Static Ratio (Note 10)	h _{FE}	270 250 180 100 -	450 400 300 190 45	- 800 - - -	—	I _C = -10mA, V _{CE} = -2V I _C = -0.5A, V _{CE} = -2V I _C = -2A, V _{CE} = -2V I _C = -3A, V _{CE} = -2V I _C = -5A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(sat)}	—	-60 -120 -140 -200	-90 -180 -220 -300	mV	I _C = -0.1A, I _B = -1mA I _C = -0.5A, I _B = -5mA I _C = -1A, I _B = -20mA I _C = -3A, I _B = -250mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	—	-985	-1050	mV	I _C = -3A, I _B = -250mA
Base-Emitter Turn-on Voltage (Note 10)	V _{BE(on)}	—	-850	-950	mV	I _C = -3A, V _{CE} = -2V
Transitional Frequency	f _T	—	145	—	MHz	I _C = -50mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{obo}	—	40	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{on}	—	170	—	ns	V _{CC} = -30V, I _C = -2A, I _{B1} = I _{B2} = ±20mA
	t _{off}	—	460	—	ns	

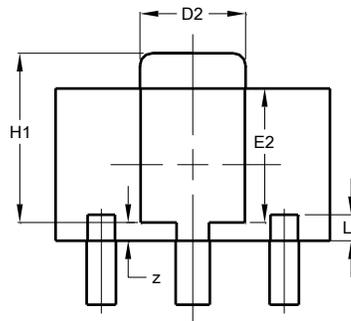
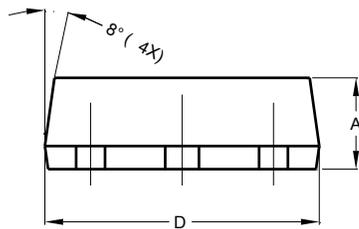
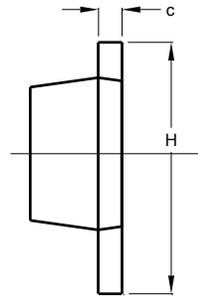
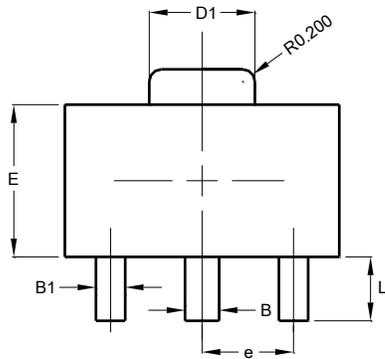
Note: 10. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

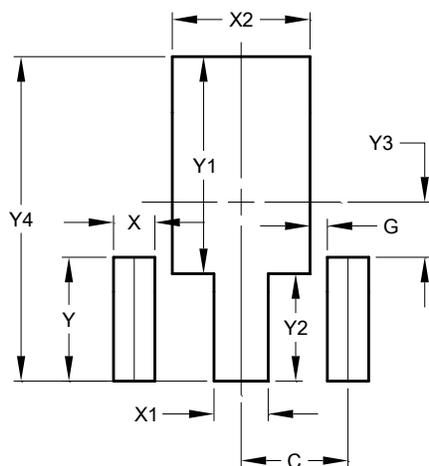
SOT89



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