



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



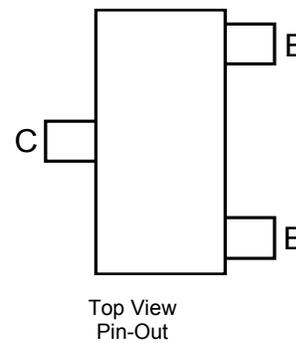
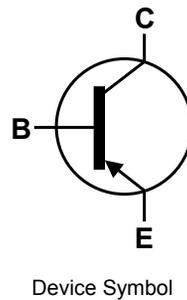
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## Features

- $BV_{CEO} > -30V$
- $I_C = -1A$  Continuous Collector Current
- $I_{CM} = -2A$  Peak Pulse Current
- Low saturation voltage  $V_{CE(sat)} < -350mV @ -1A$
- $R_{SAT} = 250m\Omega$  for a low equivalent on-resistance
- Complementary NPN type: NK-FMMT489

## Mechanical Data

- Case: SOT23
- 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: 0.008 grams (approximate)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-30	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current	$I_C$	-1	A
Peak Pulse Current	$I_{CM}$	-2	A
Base Current	$I_B$	-200	mA

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

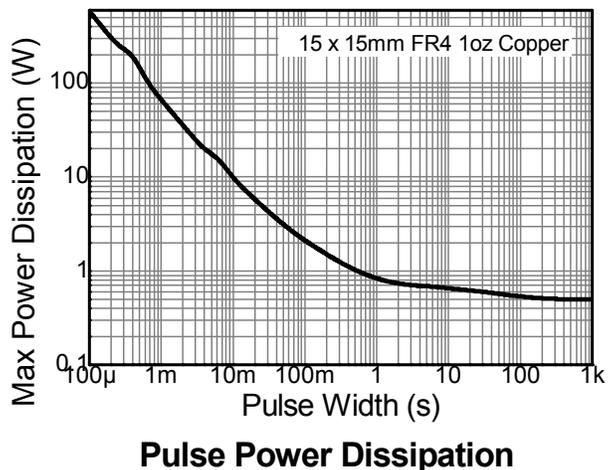
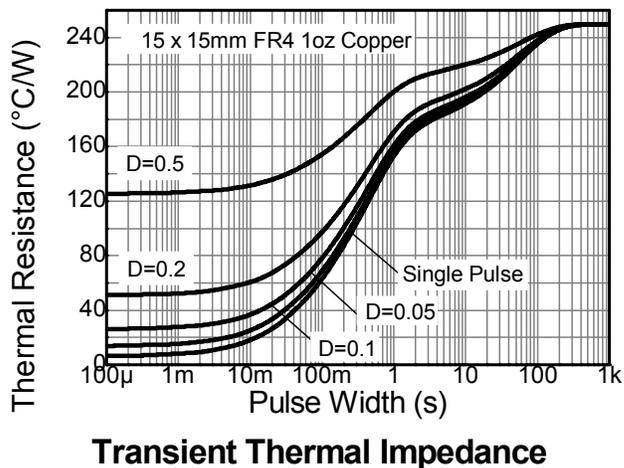
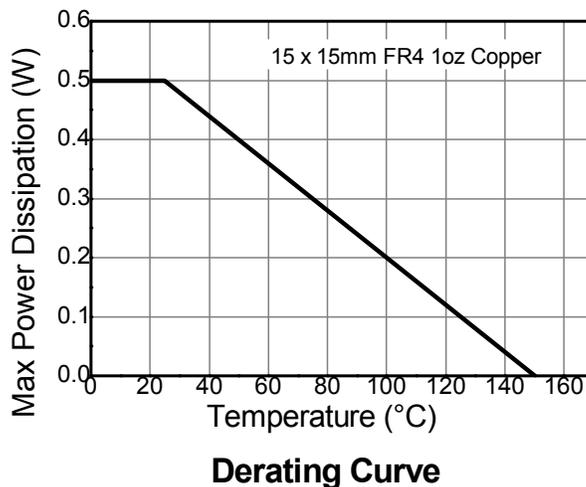
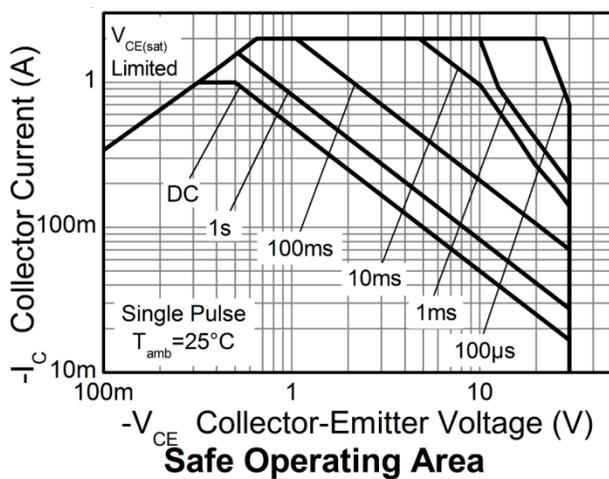
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	250	$^\circ\text{C/W}$
Thermal Resistance, Junction to Lead (Note 6)	$R_{\theta JL}$	197	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**ESD Ratings** (Note 7)

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 15mm x 15mm 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  6. Thermal resistance from junction to solder-point (at the end of the collector lead).
  7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

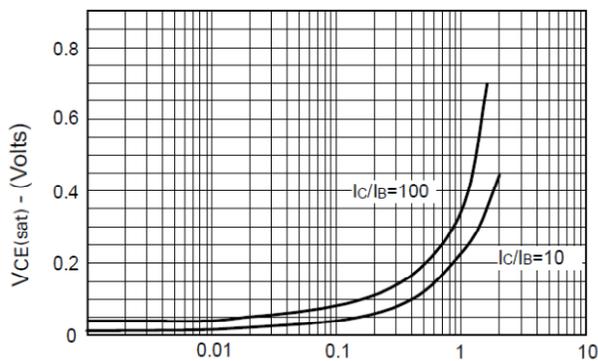


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	$BV_{CEO}$	-30	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	—	—	-100	nA	$V_{CB} = -30\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$	—	—	-100	nA	$V_{CES} = -30\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5.6\text{V}$
<b>ON CHARACTERISTICS (Note 8)</b>						
DC Current Gain	$h_{FE}$	100 100 80 40	— — — —	— 300 — —	—	$I_C = -1\text{mA}, V_{CE} = -2\text{V}$ $I_C = -500\text{mA}, V_{CE} = -2\text{V}$ $I_C = -1\text{A}, V_{CE} = -2\text{V}$ $I_C = -2\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— — —	— — —	-0.25 -0.35 -0.65	V	$I_C = -0.5\text{A}, I_B = -50\text{mA}$ $I_C = -1\text{A}, I_B = -100\text{mA}$ $I_C = -2\text{A}, I_B = -200\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.2	V	$I_C = -1\text{A}, I_B = -100\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	—	-1.1	V	$I_C = -1\text{A}, V_{CE} = -2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	$C_{obo}$	—	—	15	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	$f_T$	100	—	—	MHz	$V_{CE} = -5\text{V}, I_C = -100\text{mA}, f = 100\text{MHz}$

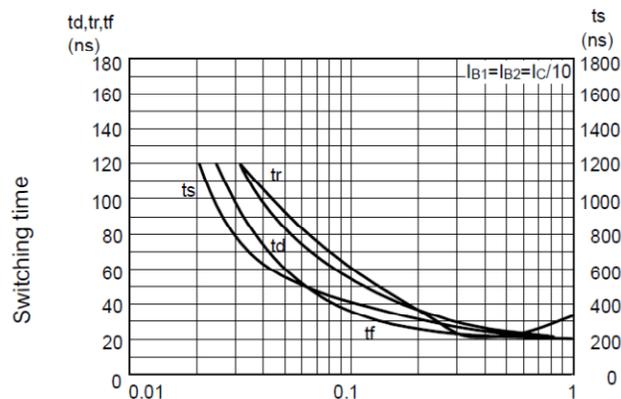
 Notes: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

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



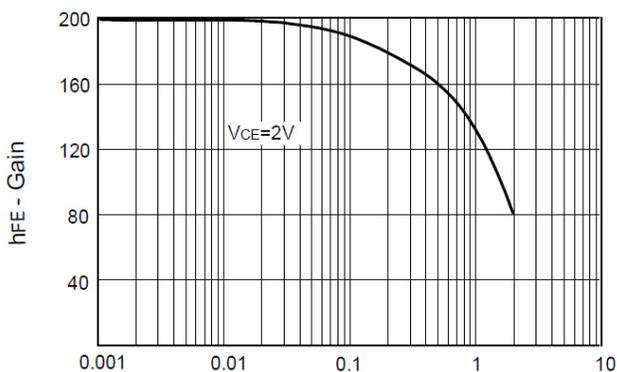
IC - Collector Current (Amps)

**VCE(sat) v IC**



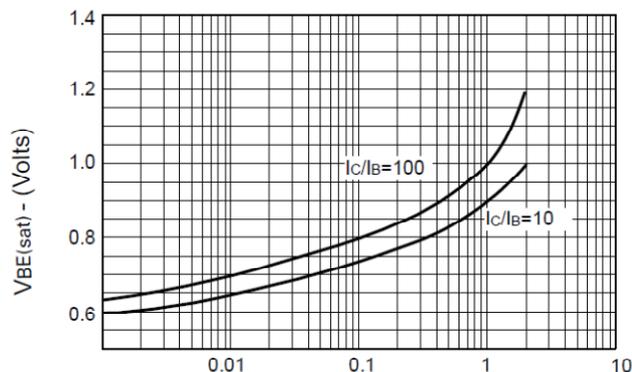
IC - Collector Current (Amps)

**Switching Speeds**



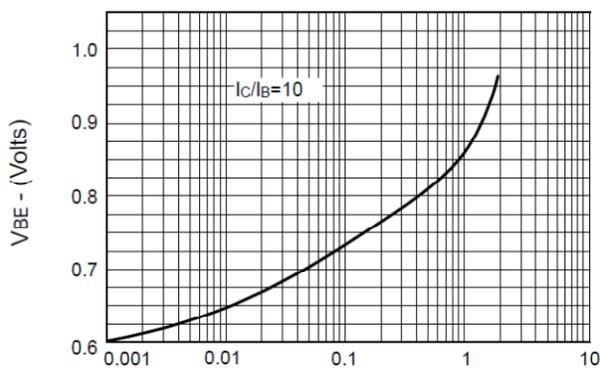
IC - Collector Current (Amps)

**hFE v IC**



IC - Collector Current (Amps)

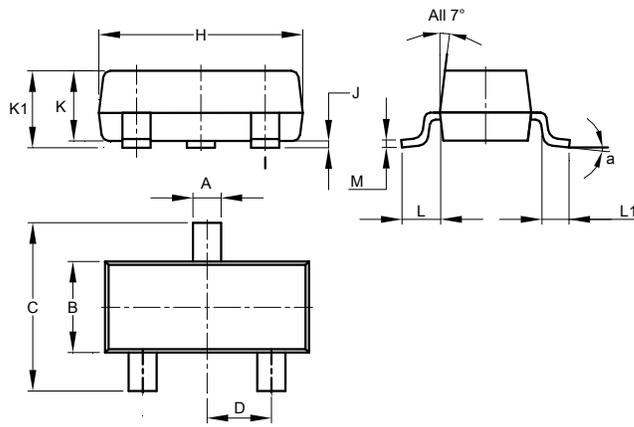
**VBE(sat) v IC**



IC - Collector Current (Amps)

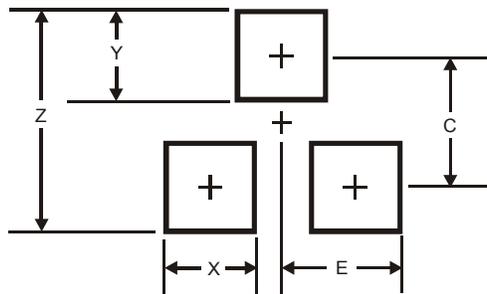
**VBE(on) v IC**

### Package Outline Dimensions



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

### Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35