



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

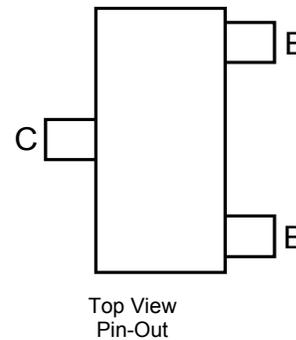
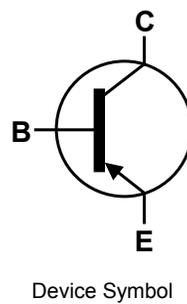
- $BV_{CEO} > -40V$
- $I_C = -1A$ High Continuous Current
- $I_{CM} = -2A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -500mV @ -1A$
- $R_{SAT} = 350m\Omega$ for a Low Equivalent On-resistance
- Complementary NPN type: NK-FMMT491A

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 ③
- Weight: 0.008 grams (approximate)

Application

- Power MOSFET gate driving
- Low loss power switching



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-40	V
Collector-Emitter Voltage	V _{CEO}	-40	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
Peak Base Current	I _{BM}	-1	A

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

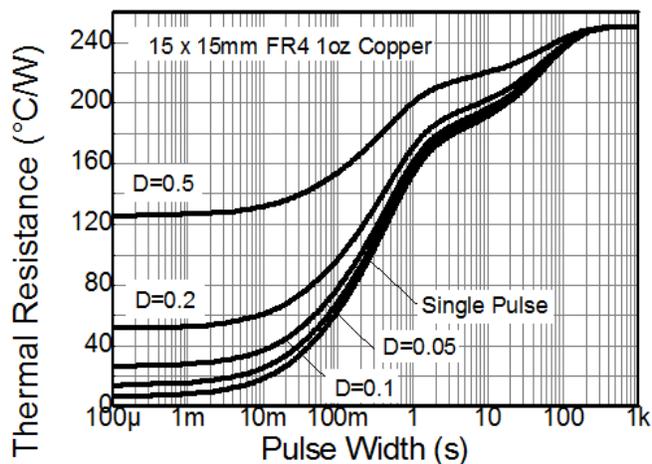
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	500	mW
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	250	°C/W
Thermal Resistance, Junction to Lead (Note 7)	R _{θJL}	197	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

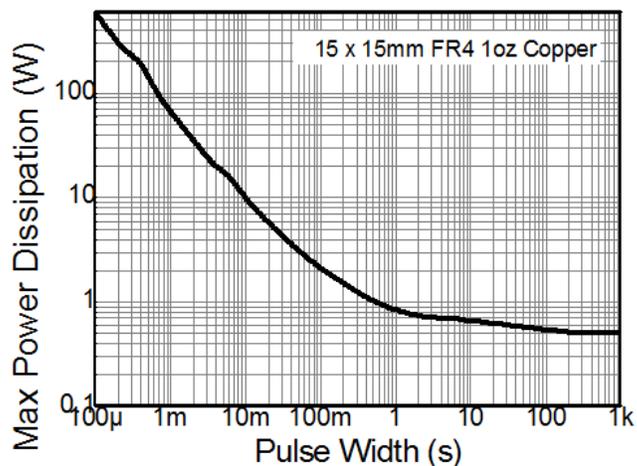
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted with the collector lead 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.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

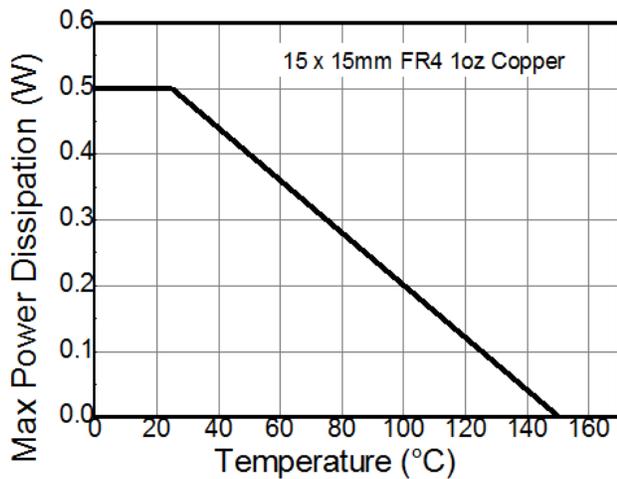
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation



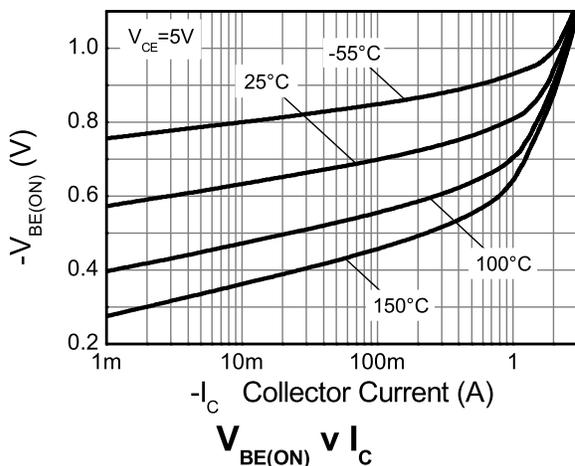
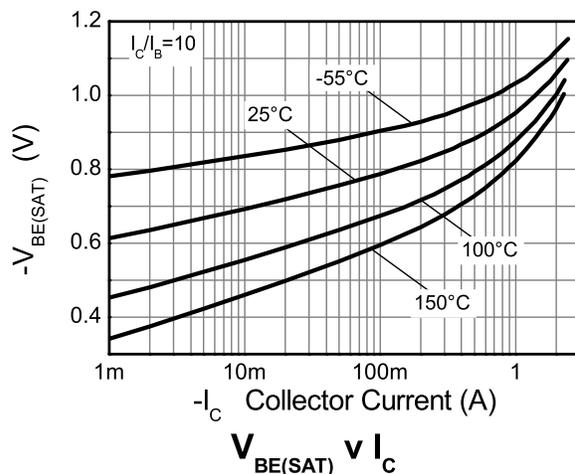
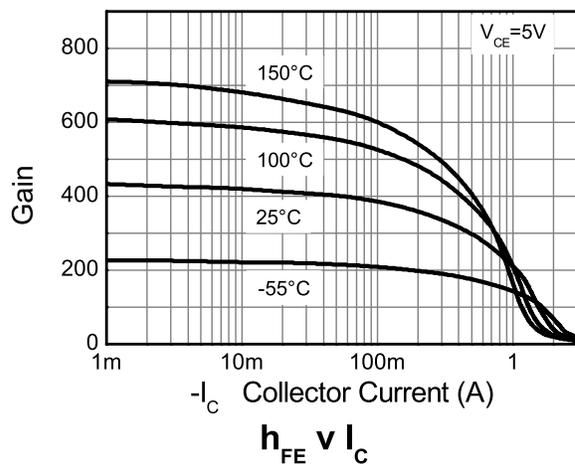
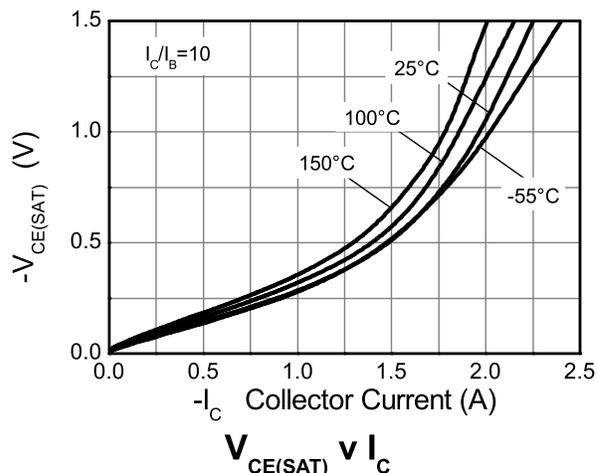
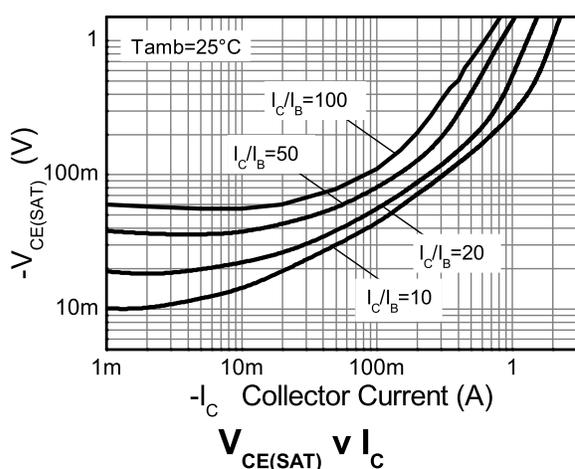
Derating Curve

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

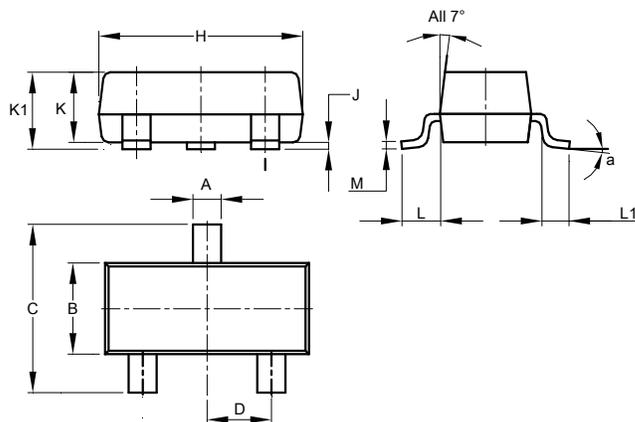
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	BV _{CBO}	-40	—	—	V	I _C = -100μA	
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-40	—	—	V	I _C = -10mA	
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	—	—	V	I _E = -100μA	
Collector Cutoff Current	I _{CBO}	—	—	-100	nA	V _{CB} = -30V	
Collector-Emitter Cutoff Current	I _{CES}	—	—	-100	nA	V _{CES} = -30V	
Emitter Cutoff Current	I _{EBO}	—	—	-100	nA	V _{EB} = -5.6V	
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	—	-200 -350 -500	mV	I _C = -100mA, I _B = -1mA I _C = -500mA, I _B = -20mA I _C = -1A, I _B = -100mA	
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	—	-1.1	V	I _C = -1A, I _B = -100mA	
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	—	-1.0	V	I _C = -1A, V _{CE} = -5V	
Static Forward Current Transfer Ratio (Note 9)	h _{FE}	300 300 250 160 30	—	— 800 — — —	—	I _C = -1mA, V _{CE} = -5V I _C = -100mA, V _{CE} = -5V I _C = -500mA, V _{CE} = -5V I _C = -1A, V _{CE} = -5V I _C = -2A, V _{CE} = -5V	
Transition Frequency	f _T	150	□00	—	MHz	V _{CE} = -10V, I _C = -50mA, f = 100MHz	
Output Capacitance	C _{obo}	—	—	10	pF	V _{CB} = -10V, f = 1MHz	
Switching Time	Delay Time	t _(d)	—	34.9	—	ns	V _{CC} = -10V, I _C = -500mA, I _{B1} = -I _{B2} = -25mA
	Rise Time	t _(r)	—	19.2	—		
	Storage Time	t _(s)	—	249	—		
	Fall Time	t _(f)	—	62	—		

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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

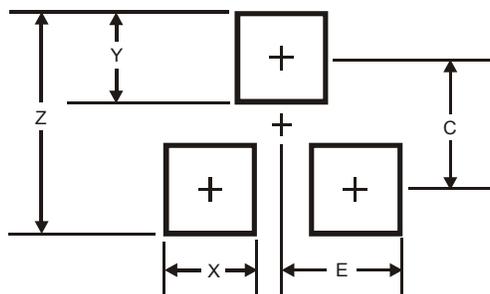


Package Outline Dimensions



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