



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

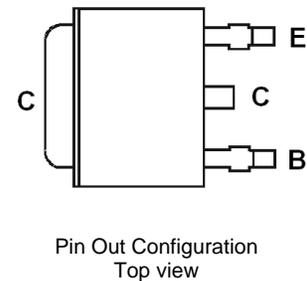
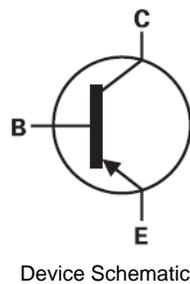
- $BV_{CEO} > -60V$
- $R_{SAT} = 53m\Omega$  Typical
- Continuous Collector Current  $I_C = -6A$
- Up to 15A Peak Current
- Low Equivalent On Resistance
- Low Saturation Voltage
- High Gain Holds Up (100 min @ 2A )

## Mechanical Data

- Case: TO252 (DPAK)
- 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; Solderable per MIL-STD-202, Method 208 
- Weight: 0.34 grams (approximate)

## Application

- DC – DC converters
- Power Switches
- Motor Control
- Automotive Circuits
- Inverter Circuits



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

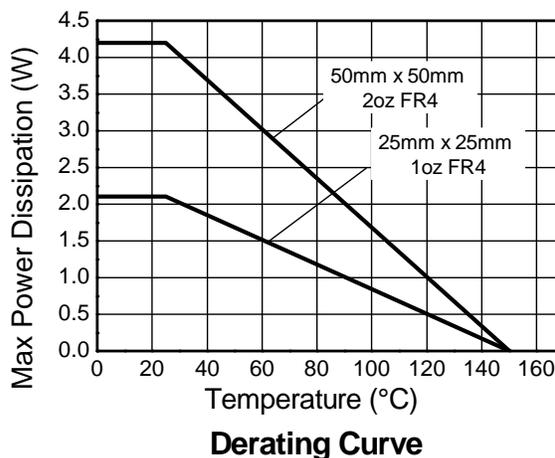
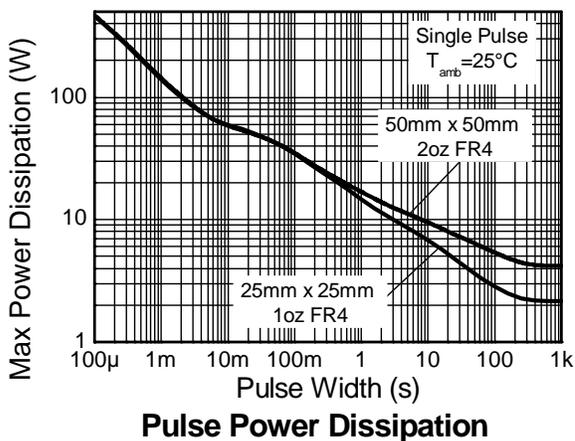
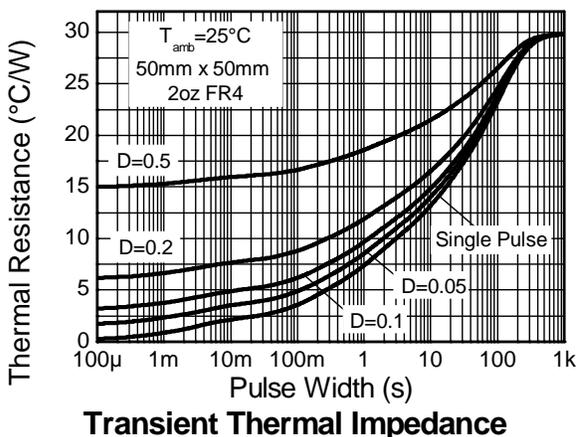
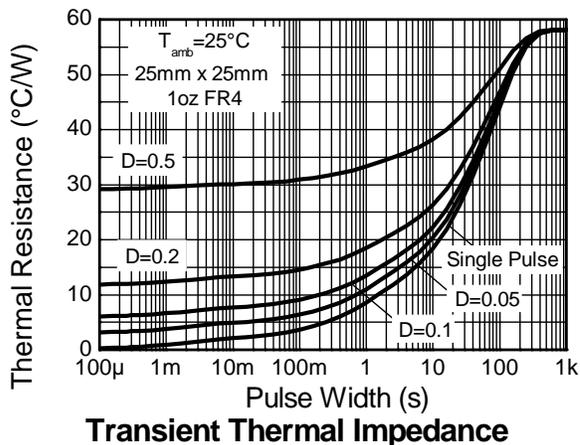
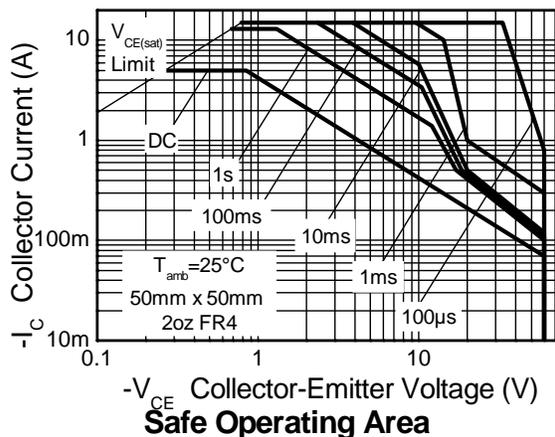
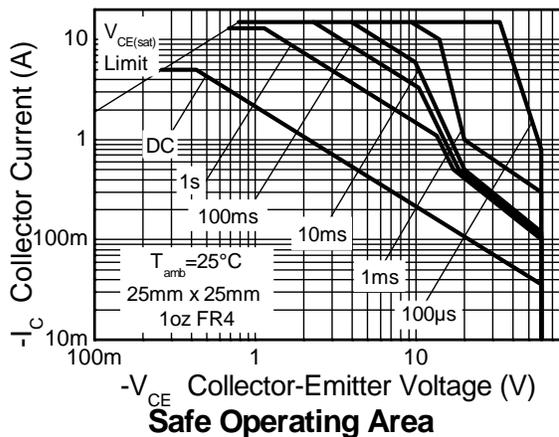
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$BV_{CBO}$	-100	V
Collector-Base Voltage	$BV_{CER}$	-100	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current	$I_C$	-6	A
Base Current	$I_B$	-0.5	A
Peak Pulse Collector Current	$I_{CM}$	-15	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	2.1	W
		3.2	
		4.2	
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	59	$^{\circ}\text{C/W}$
		39	
		30	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	1.77	$^{\circ}\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

- Notes:
5. For the device mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  6. For the device mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
  7. For the device mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions
  8. Thermal resistance from junction to solder-point (at the end of the collector lead)

**Typical Thermal Characteristics**

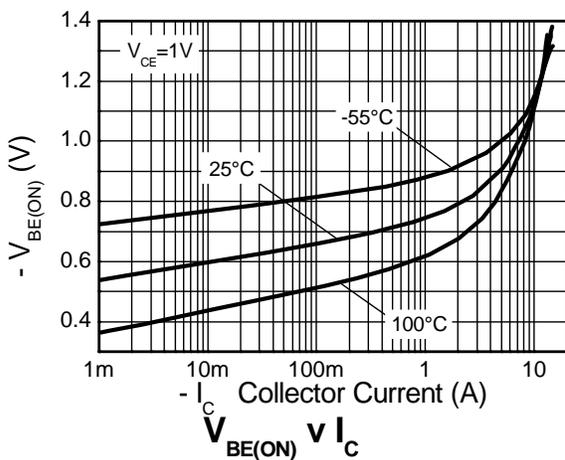
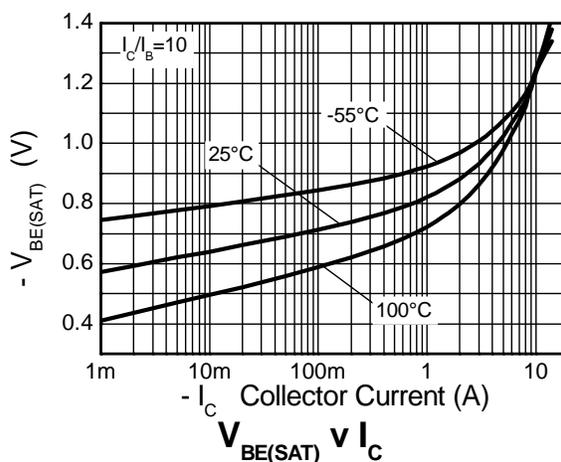
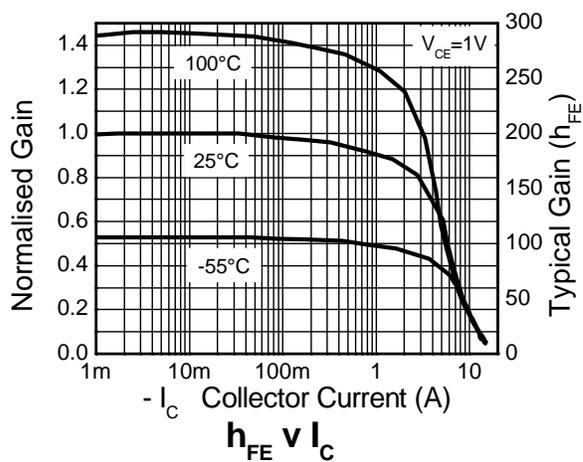
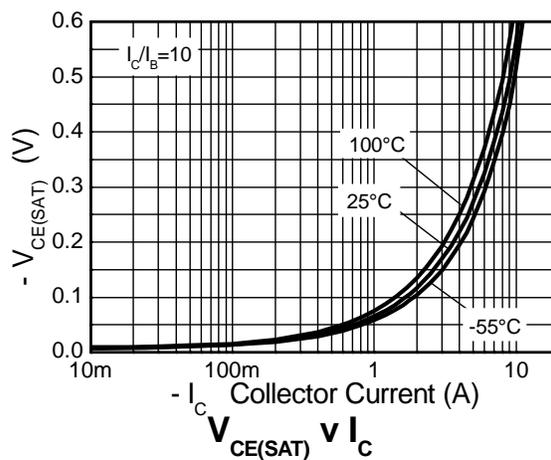
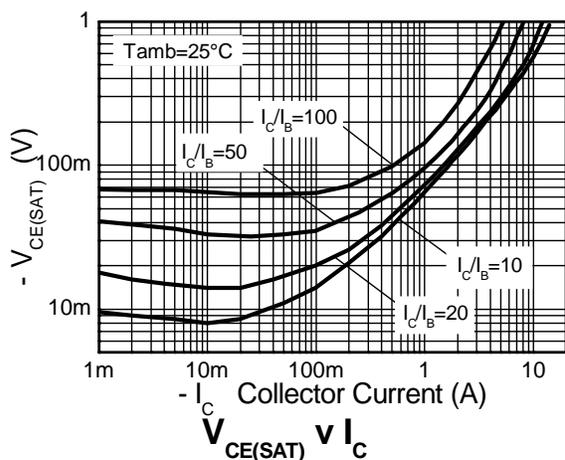


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

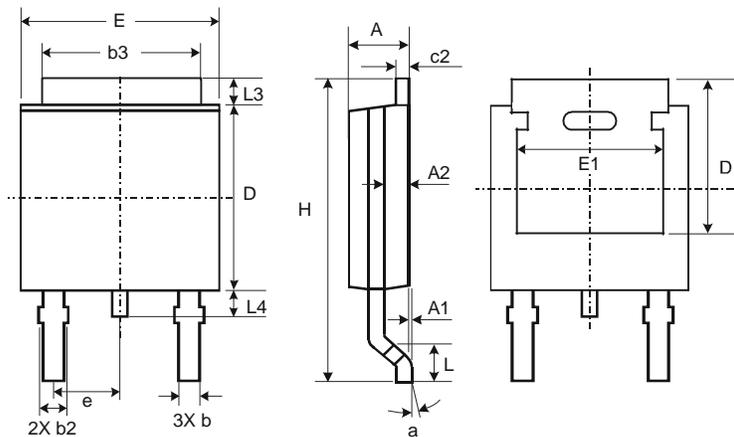
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-100	-125	-	V	I <sub>C</sub> = -100μA
Collector-Base Breakdown Voltage	BV <sub>CER</sub>	-100	-125	-	V	I <sub>C</sub> = -100μA, R <sub>BE</sub> ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-60	-80	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.1	-	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	<1	-20	nA	V <sub>CB</sub> = -80V
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	-10	nA	V <sub>EB</sub> = -6V
Emitter Cutoff Current	I <sub>CER</sub>	-	<1	-20	nA	V <sub>CE</sub> = -80V, R <sub>BE</sub> ≤ 1kΩ
DC current transfer Static ratio (Note 9)	h <sub>FE</sub>	100	230	-	-	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -1V
		100	200	300		I <sub>C</sub> = -2A, V <sub>CE</sub> = -1V
		50	110	-		I <sub>C</sub> = -6A, V <sub>CE</sub> = -1V
		15	40	-		I <sub>C</sub> = -10A, V <sub>CE</sub> = -1V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	-	-13	-25	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA
		-	-60	-90		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		-	-115	-165		I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
		-	-315	-400		I <sub>C</sub> = -6A, I <sub>B</sub> = -600mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	-	-1.05	-1.2	V	I <sub>C</sub> = -6A, I <sub>B</sub> = -600mA
Base-Emitter Turn-on Voltage (Note 9)	V <sub>BE(on)</sub>	-	-0.92	-1.05	V	I <sub>C</sub> = -6A, V <sub>CE</sub> = -1V
Transitional Frequency	f <sub>T</sub>	-	120	-	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V f = 50MHz
Output capacitance	C <sub>OBO</sub>	-	74	-	pF	V <sub>CB</sub> = -10V, f = 1MHz,
Switching times	t <sub>ON</sub>	-	82	-	nS	I <sub>C</sub> = -2A, V <sub>CC</sub> = -10V, I <sub>B1</sub> = I <sub>B2</sub> = -200mA
	t <sub>OFF</sub>	-	350	-		

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

### Typical Electrical Characteristics

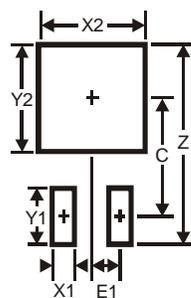


## Package Outline Dimensions



TO252			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	–	–
e	–	–	2.286
E	6.45	6.70	6.58
E1	4.32	–	–
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	–
<b>All Dimensions in mm</b>			

## Suggested Pad Layout



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3