



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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Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

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)

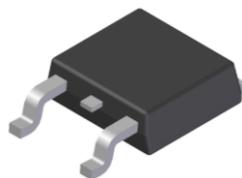
Application

- DC-DC Converters
- Power Switches
- Motor Control
- Automotive Circuits
- Inverter Circuits

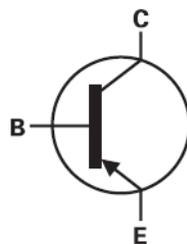
Mechanical Data

- 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 ⁽⁶³⁾
- Weight: 0.34 grams (Approximate)

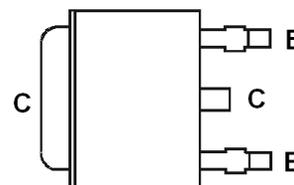
TO252 (DPAK)



Top View



Device Schematic



Pin Out Configuration
Top view

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

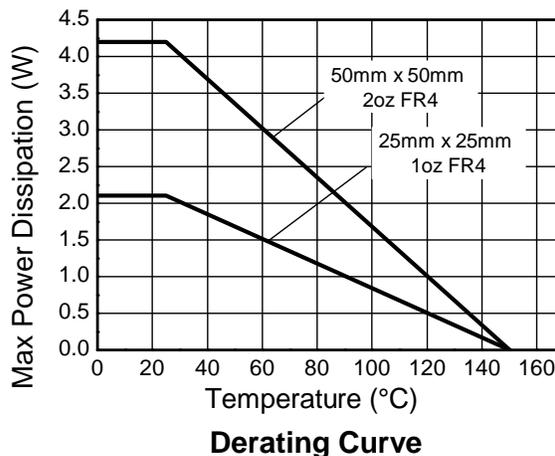
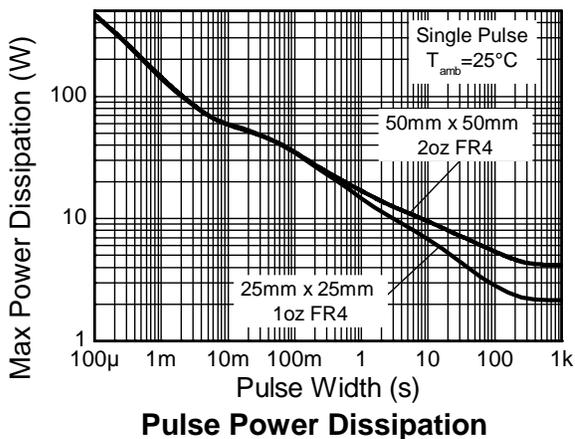
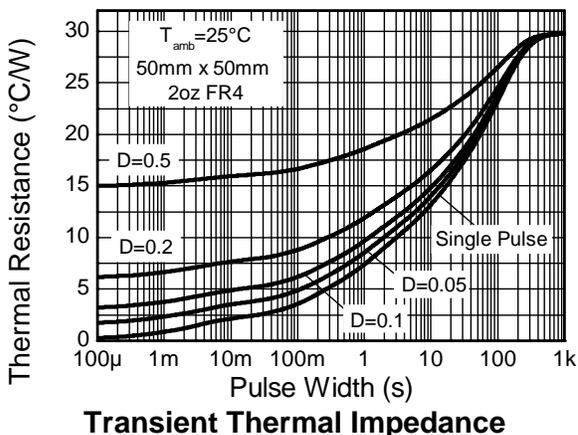
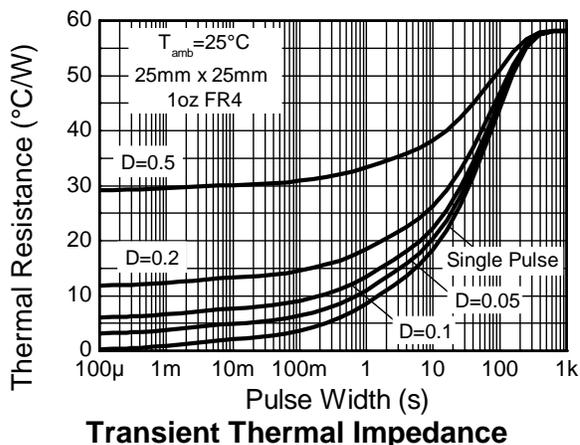
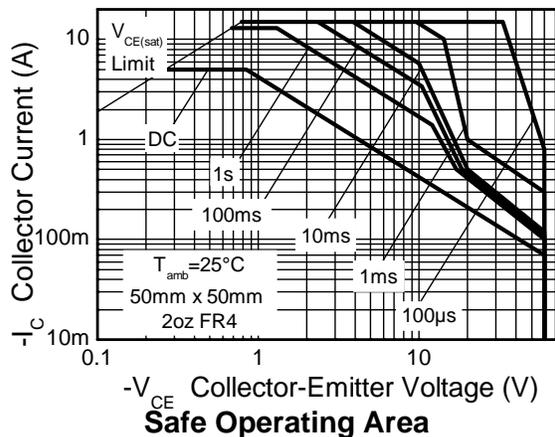
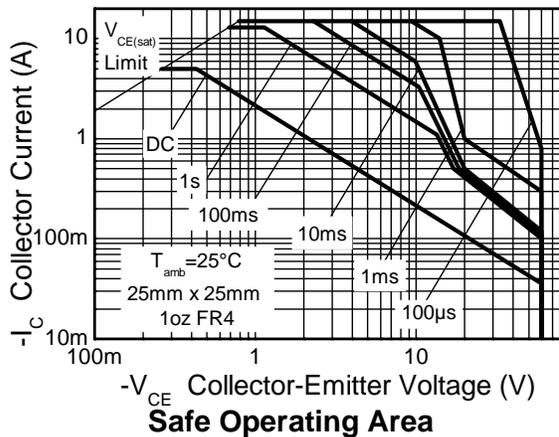
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 6)	2.1
		(Note 7)	3.2
		(Note 8)	4.2
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 6)	59
		(Note 7)	39
		(Note 8)	30
Thermal Resistance, Junction to Leads	R _{θJL}	1.77	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

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

Typical Thermal Characteristics

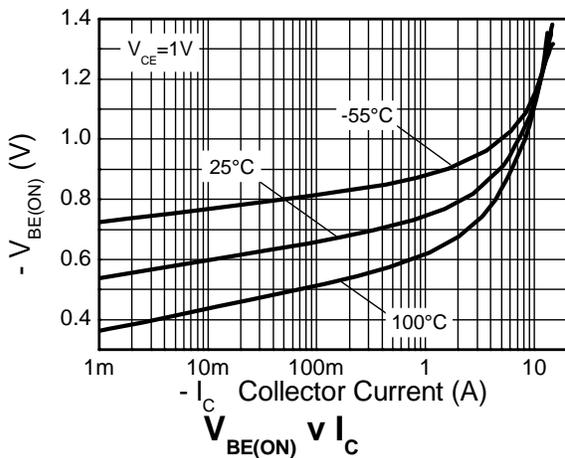
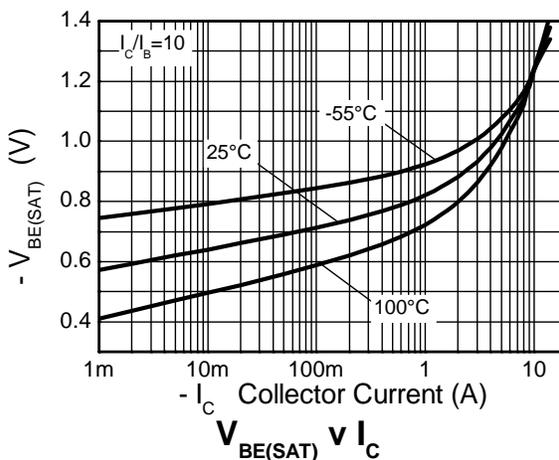
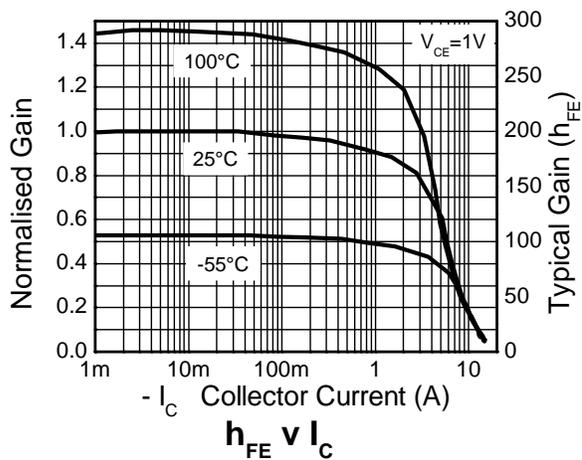
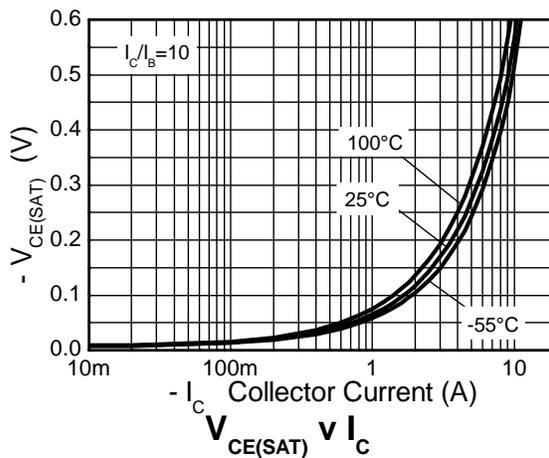
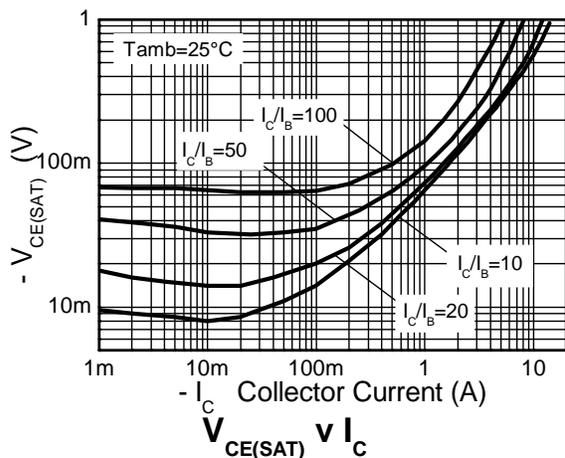


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-100	-125	—	V	I _C = -100μA
Collector-Base Breakdown Voltage	BV _{CER}	-100	-125	—	V	I _C = -100μA, R _{BE} ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	-60	-80	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.1	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	<1	-20	nA	V _{CB} = -80V
Emitter Cutoff Current	I _{EBO}	—	<1	-10	nA	V _{EB} = -6V
Emitter Cutoff Current	I _{CER}	—	<1	-20	nA	V _{CE} = -80V, R _{BE} ≤ 1kΩ
DC Current Transfer Static Ratio (Note 11)	h _{FE}	100	230	—	—	I _C = -10mA, V _{CE} = -1V
		100	200	300		I _C = -2A, V _{CE} = -1V
		50	110	—		I _C = -6A, V _{CE} = -1V
		15	40	—		I _C = -10A, V _{CE} = -1V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(SAT)}	—	-13	-25	mV	I _C = -0.1A, I _B = -10mA
		—	-60	-90		I _C = -1A, I _B = -100mA
		—	-115	-165		I _C = -2A, I _B = -200mA
		—	-315	-400		I _C = -6A, I _B = -600mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(SAT)}	—	-1.05	-1.2	V	I _C = -6A, I _B = -600mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(ON)}	—	-0.92	-1.05	V	I _C = -6A, V _{CE} = -1V
Transitional Frequency	f _T	—	120	—	MHz	I _C = -100mA, V _{CE} = -10V f = 50MHz
Output Capacitance	C _{OBO}	—	74	—	pF	V _{CB} = -10V, f = 1MHz,
Switching Times	t _{ON}	—	82	—	ns	I _C = -2A, V _{CC} = -10V, I _{B1} = I _{B2} = -200mA
	t _{OFF}	—	350	—		

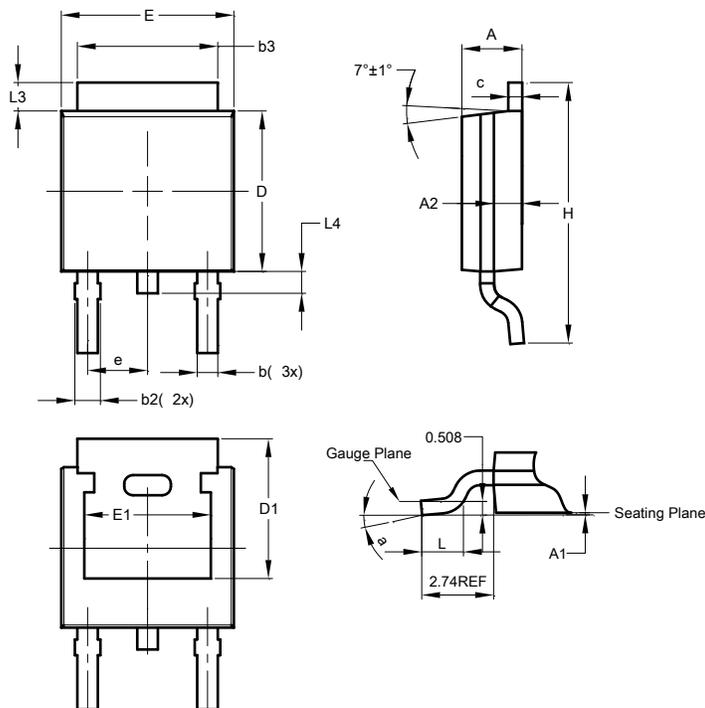
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics



Package Outline Dimensions

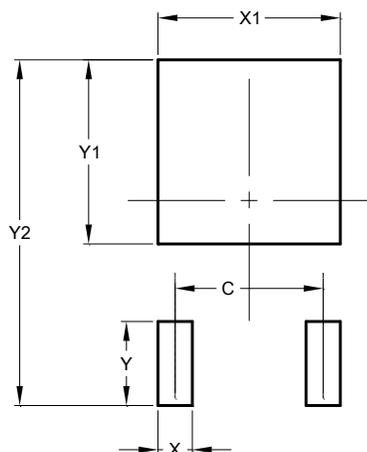
TO252 (DPAK)



TO252 (DPAK)			
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
c	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°	-
All Dimensions in mm			

Suggested Pad Layout

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700