优尚

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 = -3A High Continuous Collector Current
- I_{CM} = -6A Peak Pulse Current
- High Gain Device >200 @-1A
- $R_{CE(SAT)}$ = 83mΩ Typical
- Low Saturation Voltage

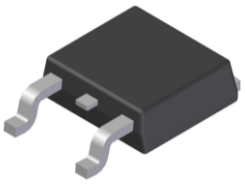
Mechanical Data

- 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 (e3)
- Weight: 0.34 grams (Approximate)

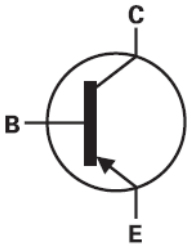
Application

- DC-DC Converters
- MOSFET Gate Drivers
- Charging Circuits
- Power Switches
- Siren Drivers

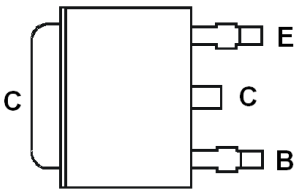
TO252 (DPAK)



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}	-50	V
Collector-Emitter Voltage	BV_{CEO}	-40	V
Emitter-Base Voltage	BV_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Base Current	I_B	-0.5	A
Peak Pulse Collector Current	I_{CM}	-6	A

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

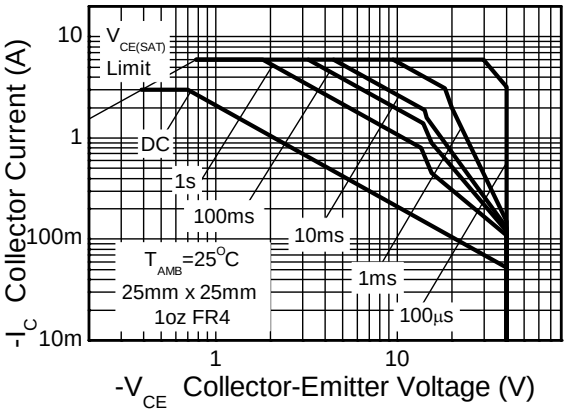
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.1	W
	(Note 6)		3.0	
	(Note 7)		3.9	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	59	°C/W
	(Note 6)		41	
	(Note 7)		32	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

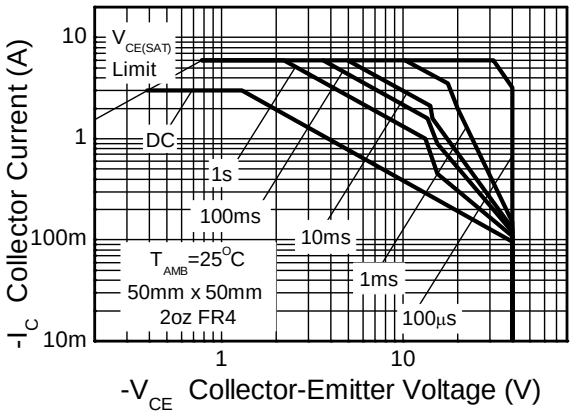
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3B
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed collector pad on 25mm x 25mm 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.
6. Same as note (5), except mounted on 50mm x 50mm 1oz copper.
7. Same as note (5), except mounted on 50mm x 50mm 2oz copper.
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

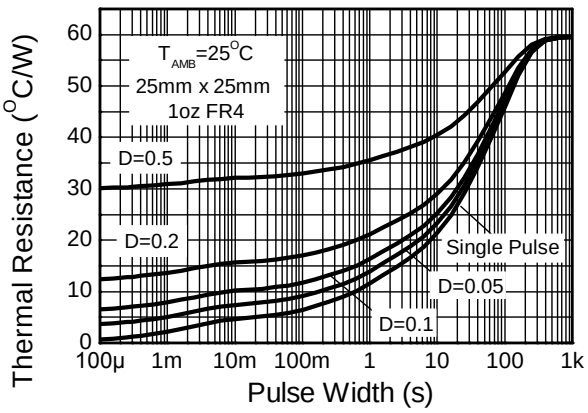
Thermal Characteristics and Derating Information



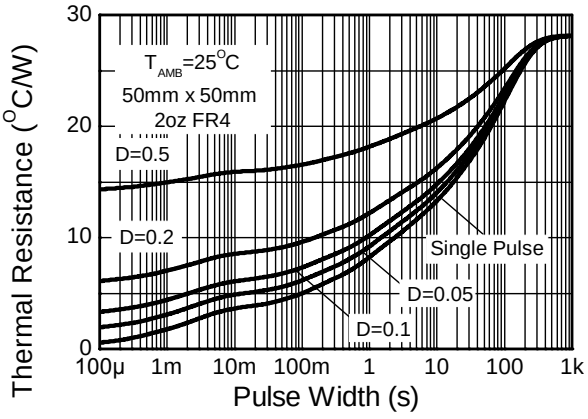
Safe Operating Area



Safe Operating Area



Transient Thermal Impedance



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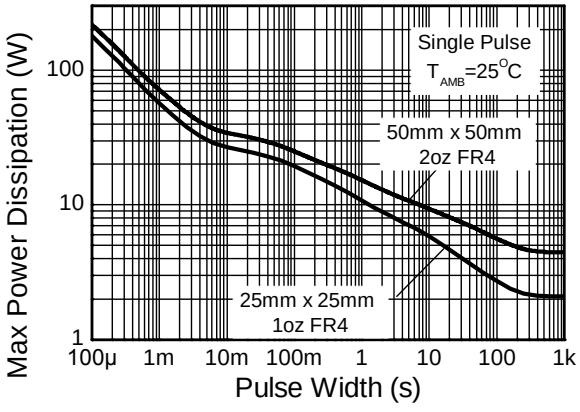
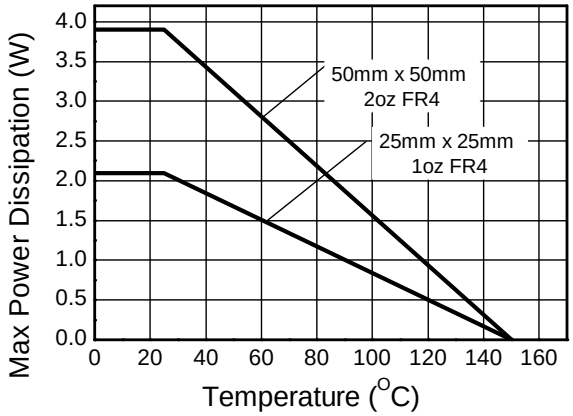


Pulse Power Dissipation



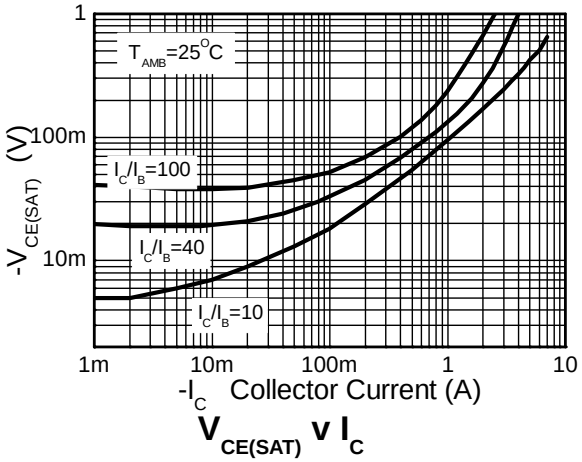
Derating Curve

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

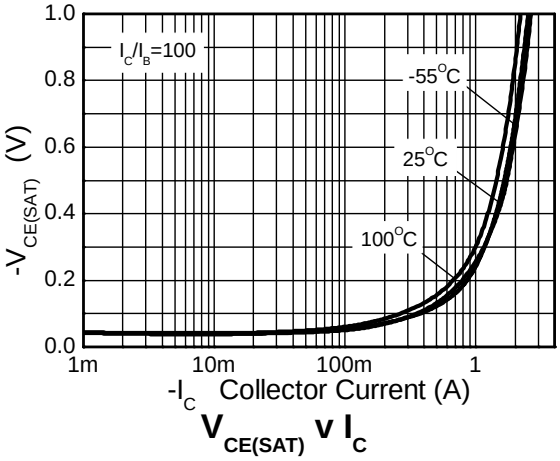
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-70	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-40	-60	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.3	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	—	<1	-20	nA	V_{CB} = -30V
Emitter Cutoff Current	I_{EBO}	—	<1	-20	nA	V_{EB} = -6V
Emitter Cutoff Current	I_{CES}	—	<1	-20	nA	V_{CB} = -30V
DC Current Transfer Static Ratio (Note 9)	h_{FE}	300 250 200 150 80	450 390 350 280 170	800 — — — —	—	I_C = -10mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V I_C = -1A, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	-110 -220 -260 -250	-170 -350 -450 -450	mV	I_C = -0.5A, I_B = -5mA I_C = -1A, I_B = -10mA I_C = -2A, I_B = -50mA I_C = -3A, I_B = -300mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	-1.05	-1.15	V	I_C = -3A, I_B = -300mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	-0.90	-1.0	V	I_C = -3A, V_{CE} = -2V
Transitional Frequency	f_T	100	—	—	MHz	I_C = -50mA, V_{CE} = -5V f = 50MHz
Output Capacitance	C_{OBO}	—	24	—	pF	V_{CB} = -10V, f = 1MHz,
Switching Times	t_{ON} t_{OFF}	—	35 600	—	ns	I_C = -500mA, V_{CC} = -10V, I_{B1} = -50mA I_{B2} = 50mA

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

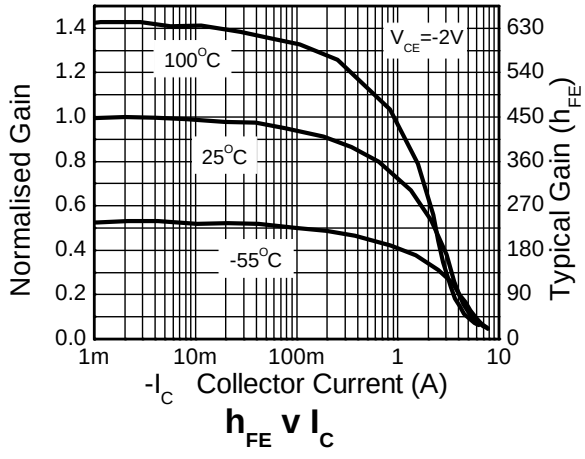
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



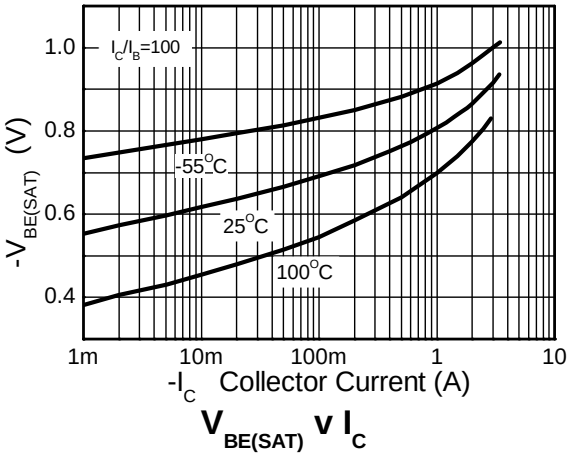
$V_{CE(SAT)}$ v I_C



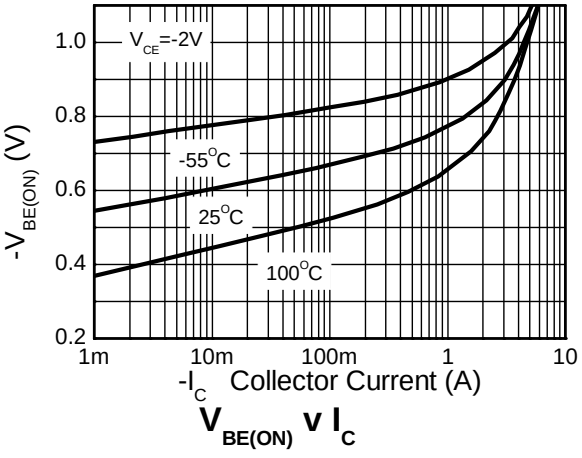
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



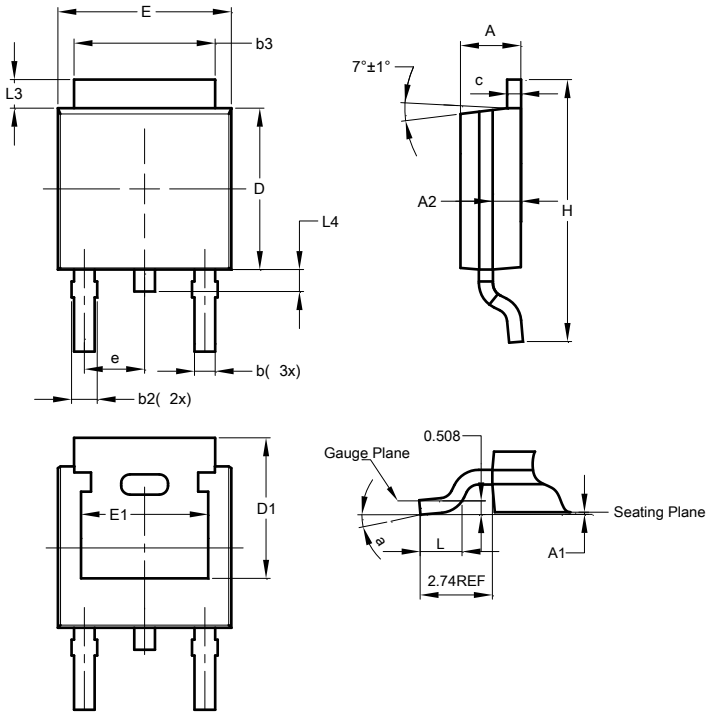
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

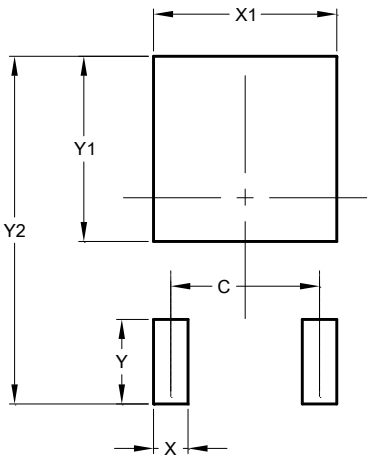
TO252 (DPAK)



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