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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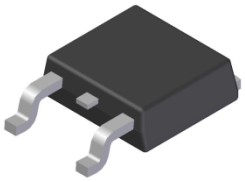
Features

- BV_{CEO} > 100V
- I_C = 3A Continuous Collector Current
- I_{CM} = 5A Peak Pulse Current
- Ideal for Power Switching or Amplification Applications

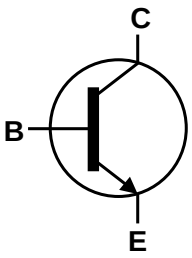
Mechanical Data

- Package: TO252
- Package 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 e3
- Weight: 0.34 grams (Approximate)

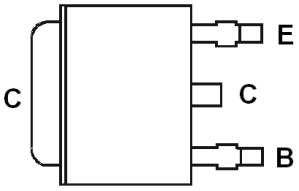
TO252 (DPAK)



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	V_{CBO}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3	A
Peak Pulse Collector Current	I_{CM}	5	A
Continuous Base Current	I_B	1	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.60	W
	(Note 6)		2.30	
	(Note 7)		1.45	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	48	°C/W
	(Note 6)		54	
	(Note 7)		86	
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	4000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

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

Thermal Characteristics

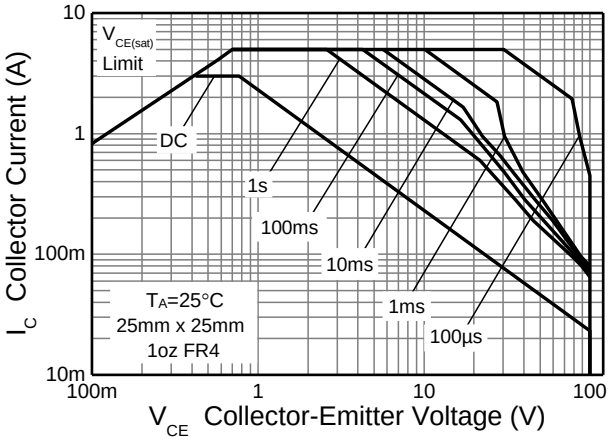


Figure 1. Safe Operating Area

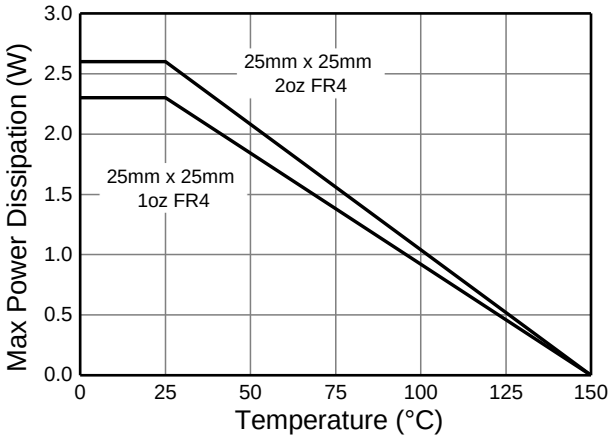


Figure 2. Derating Curve

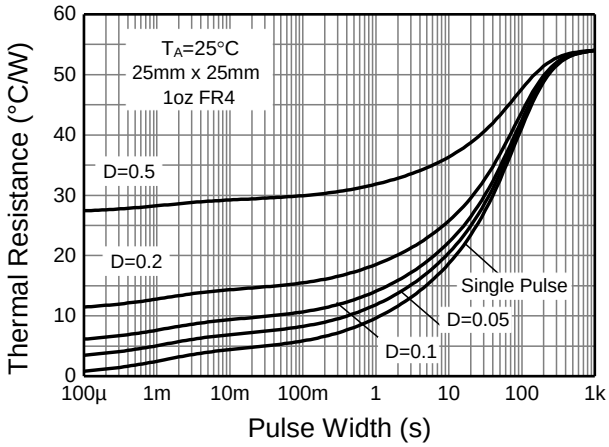


Figure 3. Transient Thermal Impedance

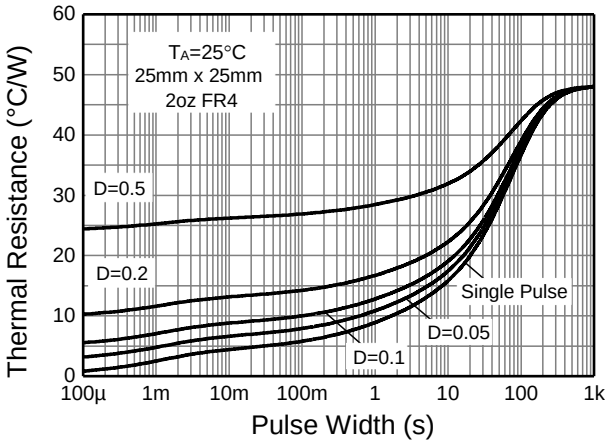


Figure 4. Transient Thermal Impedance

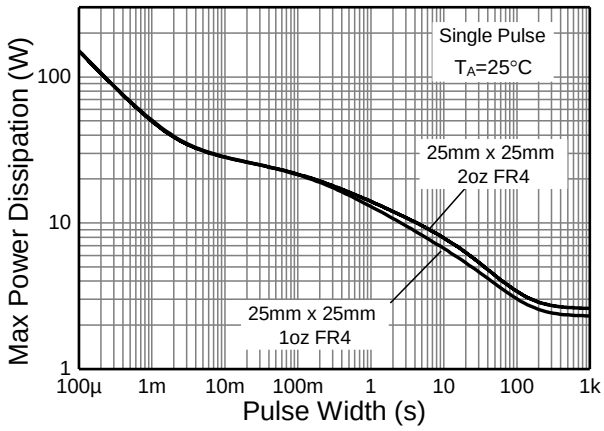


Figure 5. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	120	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	100	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100μA
Collector Cut-Off Current	I_{CES}	—	—	1	μA	V_{CE} = 100V
Collector-Base Cut-Off Current	I_{CBO}	—	—	100	nA	V_{CB} = 100V
Emitter Cut-Off Current	I_{EBO}	—	—	1	μA	V_{EB} = 6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	—	1.2	V	I_C = 3A, I_B = 375mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	—	1.35	V	I_C = 3A, I_B = 375mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	—	1.8	V	I_C = 3A, V_{CE} = 4V
DC Current Gain (Note 9)	h_{FE}	120 100 25 10	— — — —	— — — —	—	V_{CE} = 60V, I_C = 20mA V_{CE} = 4V, I_C = 0.5A V_{CE} = 4V, I_C = 1A V_{CE} = 4V, I_C = 3A
Small-Signal Current Gain	h_{fe}	20	—	—	—	V_{CE} = 10V, I_C = 0.5A, f = 1kHz
Current Gain-Bandwidth Product	f_T	3	—	—	MHz	V_{CE} = 10V, I_C = 0.5A, f = 100MHz
Output Capacitance	C_{obo}	—	15	—	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{ibo}	—	310	—	pF	V_{EB} = 0.5V, f = 1MHz
Delay Time	t_d	—	30	—	ns	I_C = 0.5A, V_{CC} = 10V, I_{B1} = -I_{B2} = 50mA
Rise Time	t_r	—	20	—	ns	
Storage Time	t_s	—	430	—	ns	
Fall Time	t_f	—	80	—	ns	

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

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

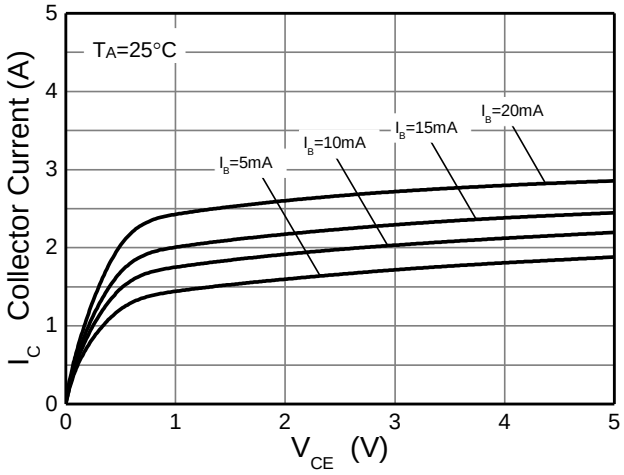


Figure 6. I_C v V_{CE}

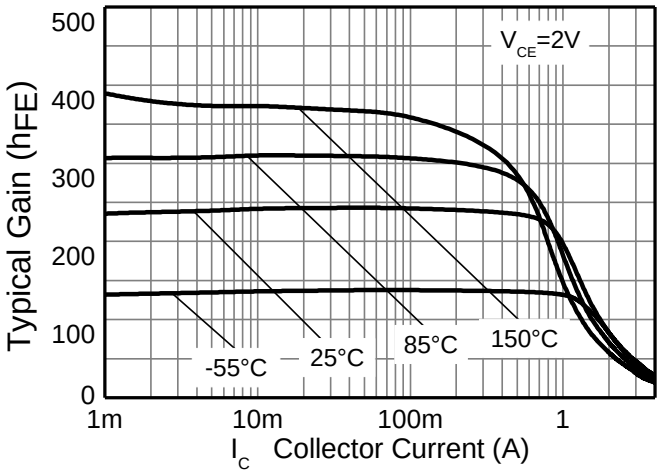


Figure 7. h_{FE} v I_C

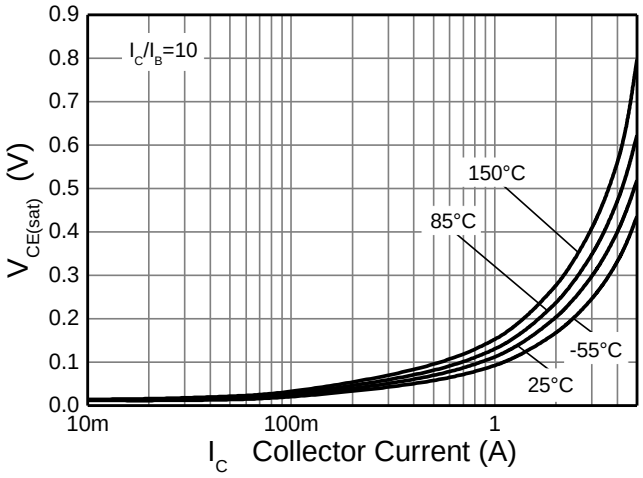


Figure 8. $V_{CE(sat)}$ v I_C

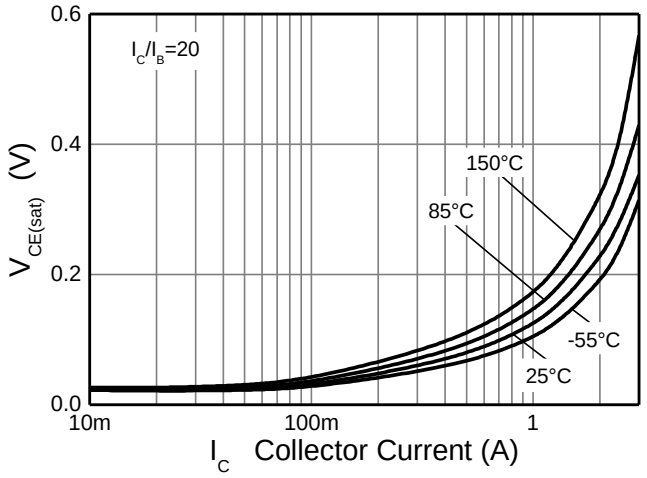


Figure 9. $V_{CE(sat)}$ v I_C

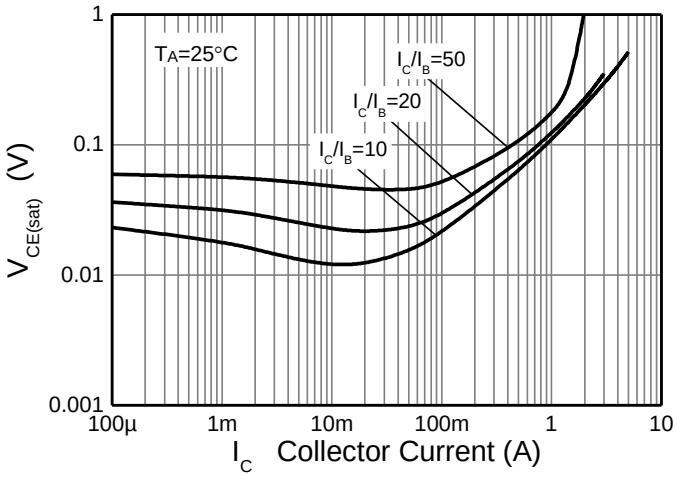


Figure 10. $V_{CE(sat)}$ v I_C

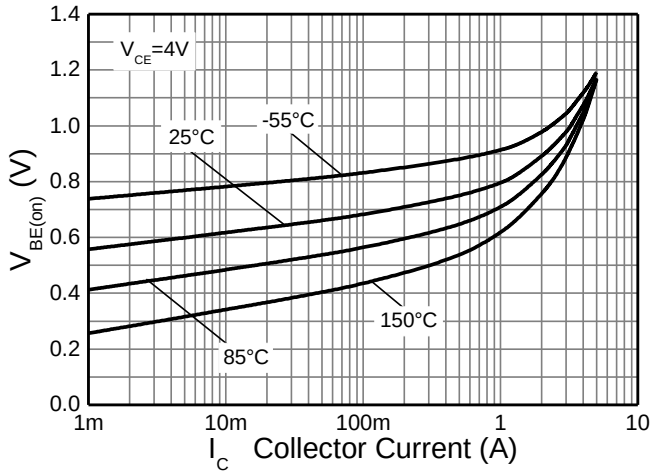


Figure 11. $V_{BE(on)}$ v I_C

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

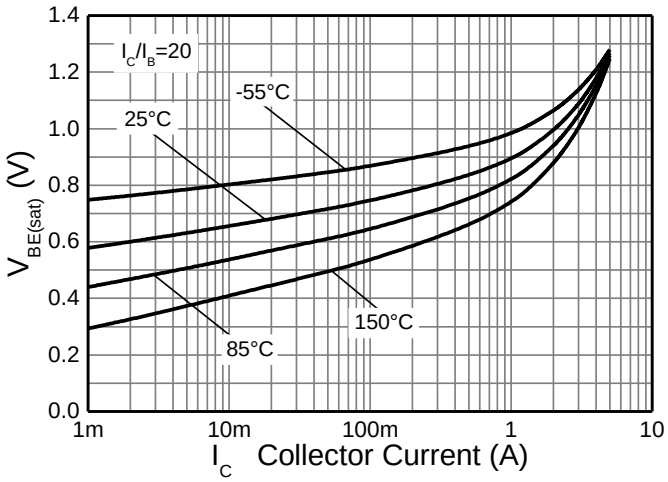


Figure 12. $V_{BE(sat)}$ v I_C

Package Outline Dimensions

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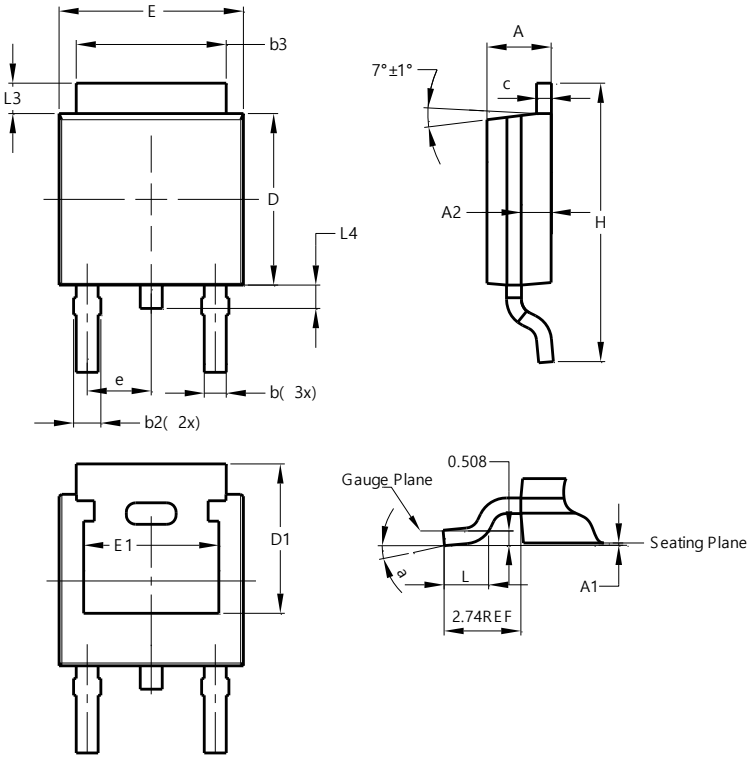
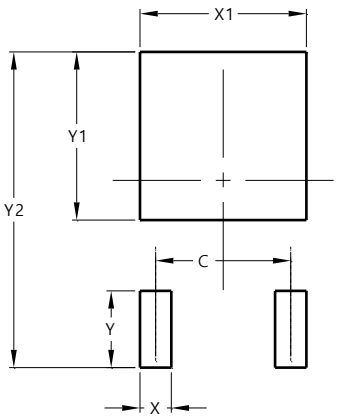
TO252 (DPAK)



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	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
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