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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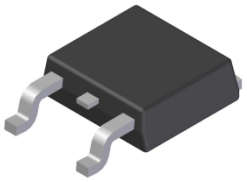
Features

- BV_{CEO} > -100V
- I_C = -3A High Continuous Collector Current
- I_{CM} = -5A Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- Complementary NPN Type: NK-MJD31CUQ

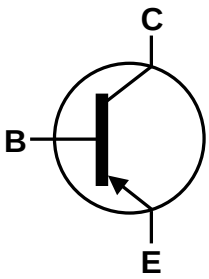
Mechanical Data

- 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)

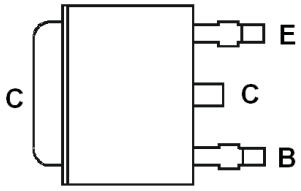
TO252 (DPAK)



Top View



Device Schematic



Pinout 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
Power Dissipation	P_D	16	W

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

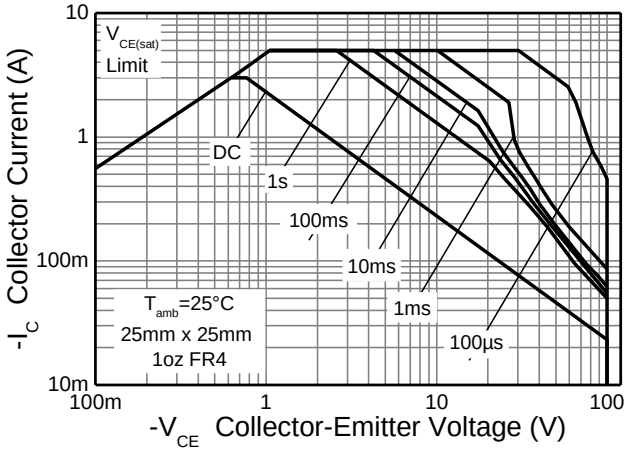
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2.60	W
	(Note 6)		2.30	
	(Note 7)		1.45	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	48	°C/W
	(Note 6)		54	
	(Note 7)		86	
Thermal Resistance, Junction to Leads	(Note 8)	$R_{\theta JL}$	7.8	
Thermal Resistance, Junction to Case	(Note 7)	$R_{\theta JC}$	7.3	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

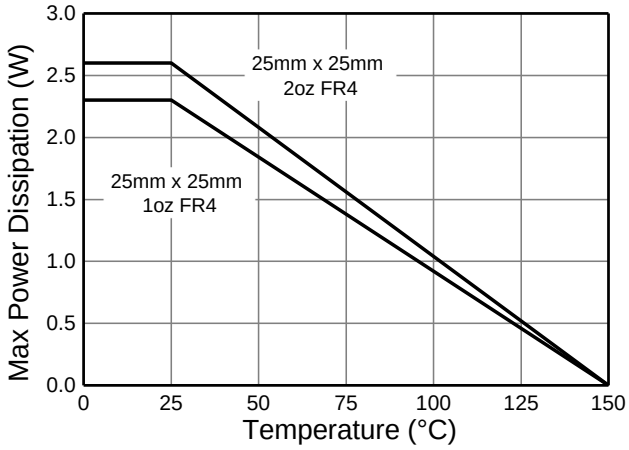
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed collector pad on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady state.
6. Same as note (5), except mounted on 25mm x 25mm 1oz copper.
7. Same as note (5), except mounted on minimum recommended pad (MRP) layout.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

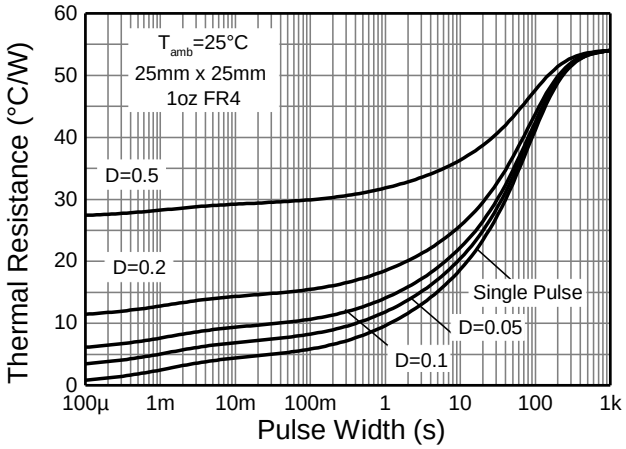
Thermal Characteristics



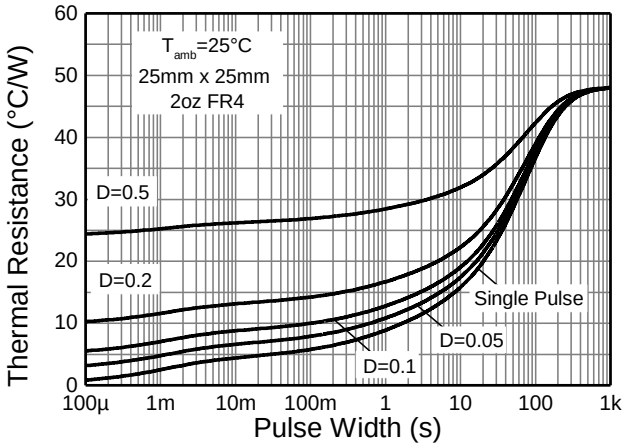
Safe Operating Area



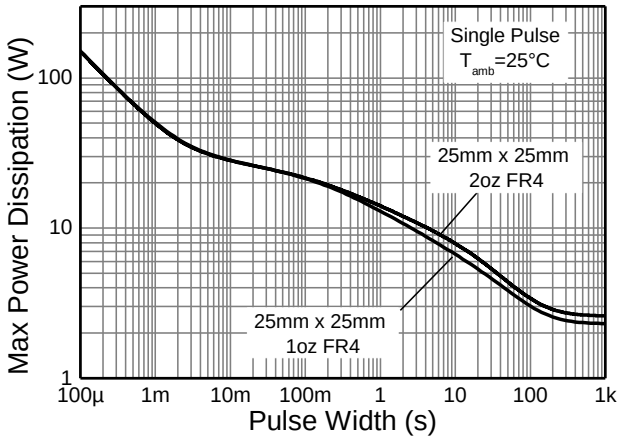
Derating Curve



Transient Thermal Impedance



Transient Thermal Impedance



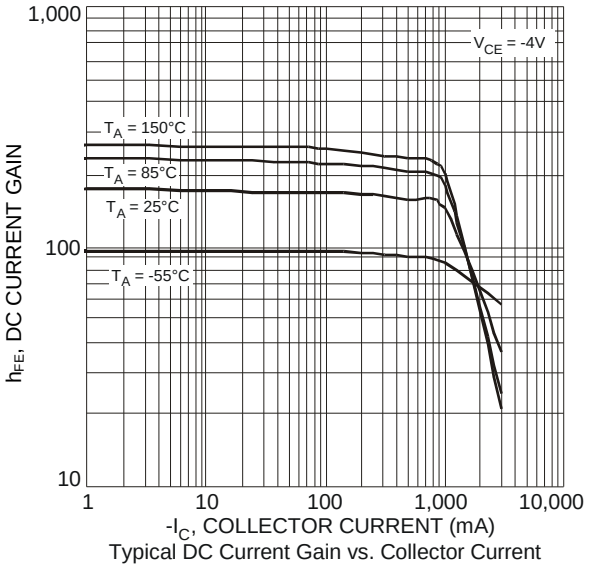
Pulse Power Dissipation

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

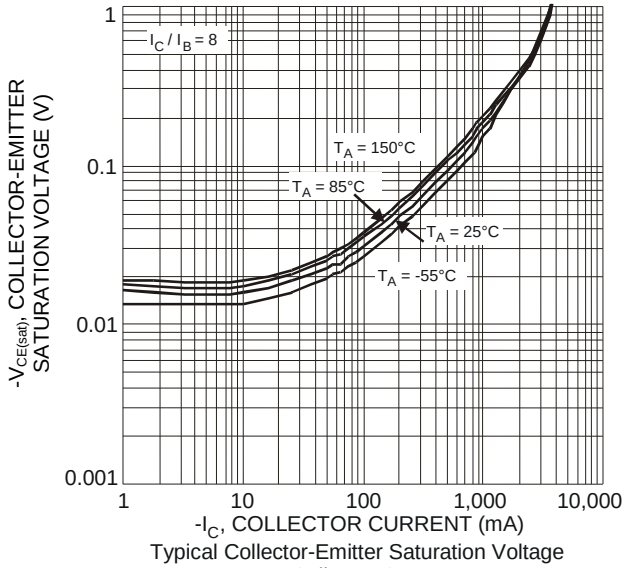
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-120	–	–	V	I_C = -20μA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-100	–	–	V	I_C = -30mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	–	–	V	I_E = -100μA
Collector-Base Cut-off Current	I_{CBO}	–	–	-1	μA	V_{CB} = -100V
Collector Cut-off Current	I_{CEO}	–	–	-1	μA	V_{CE} = -60V
Collector Cut-off Current	I_{CES}	–	–	-1	μA	V_{CE} = -100V
Emitter Cut-off Current	I_{EBO}	–	–	-1	μA	V_{EB} = -5V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	–	–	-300	mV	I_C = -1A, I_B = -100mA
		–	–	-500	mV	I_C = -2A, I_B = -200mA
		–	–	-700	mV	I_C = -3A, I_B = -375mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	–	–	-1.2	V	I_C = -2A, I_B = -200mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	–	–	-950	mV	I_C = -1A, V_{CE} = -2V
		–	–	-1.4	V	I_C = -3A, V_{CE} = -4V
DC Current Gain (Note 10)	h_{FE}	25 10	–	– 50	–	V_{CE} = -4V, I_C = -1A V_{CE} = -4V, I_C = -3A
Current Signal Current Gain	h_{FE}	20	–	–	–	V_{CE} = -10V, I_C = -0.5A, f = 1kHz
Current Gain-Bandwidth Product	f_T	3.0	–	–	MHz	I_C = -0.5A, V_{CE} = -10V, f = 1MHz

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

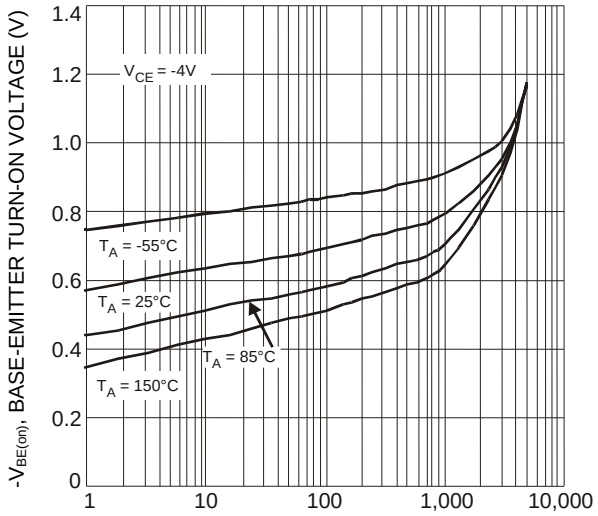
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



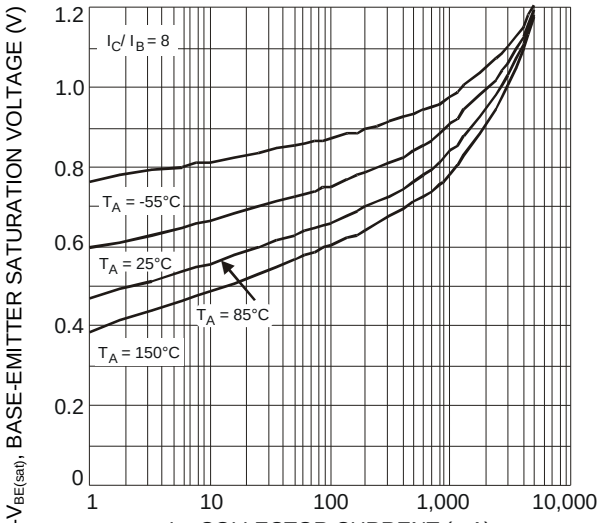
Typical DC Current Gain vs. Collector Current



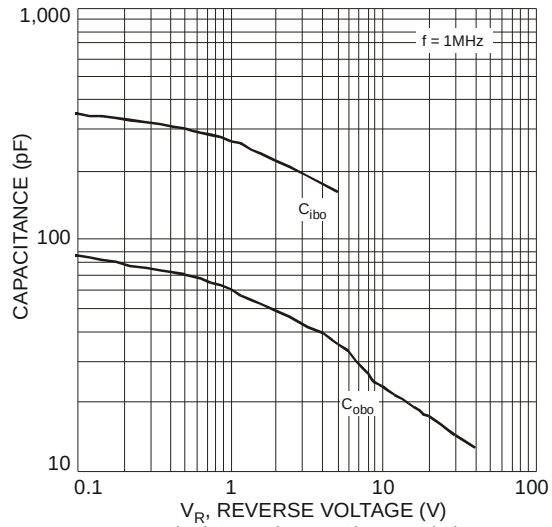
Typical Collector-Emitter Saturation Voltage vs. Collector Current



Typical Base-Emitter Turn-On Voltage vs. Collector Current



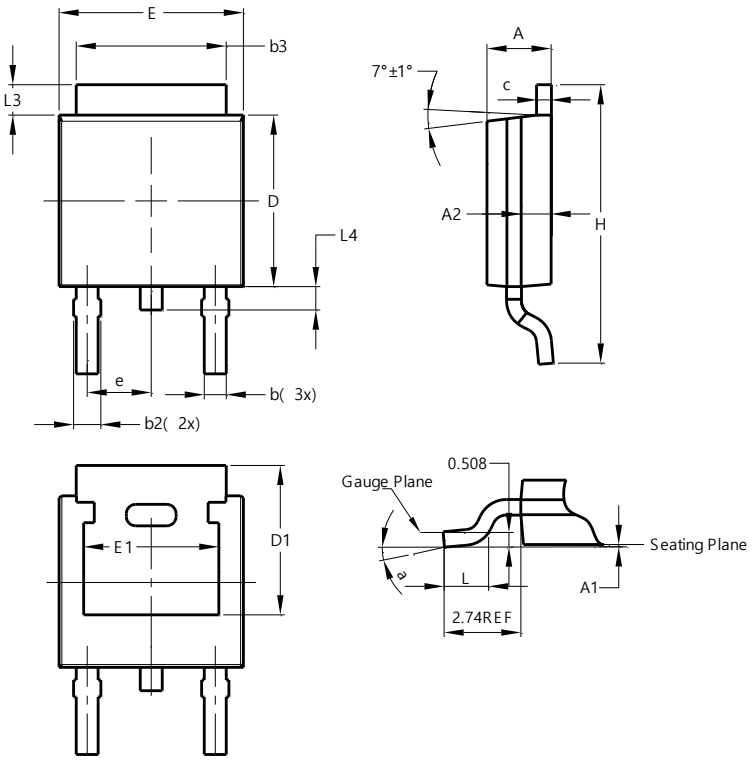
Typical Base-Emitter Saturation Voltage vs. Collector Current



Typical Capacitance Characteristics

Package Outline Dimensions

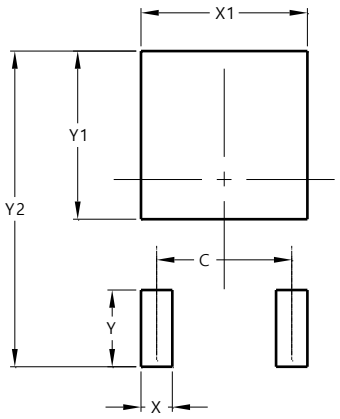
TO252 (DPAK)



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	5.50	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