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Green

MJD2873

50V NPN MEDIUM POWER TRANSISTOR IN TO252

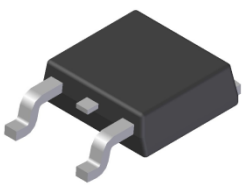
Features

- BV_{CEO} > 50V
- I_C = 2A Continuous Collector Current
- I_{CM} = 3A Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet (MJD2873Q)**

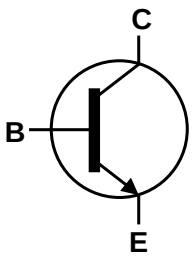
Mechanical Data

- 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)

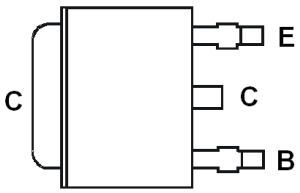
TO252 (DPAK)



Top View



Device Schematic



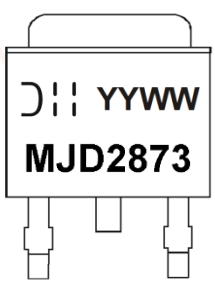
Pin Out Configuration
Top View

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
MJD2873-13	TO252 (DPAK)	MJD2873	13	16	2,500	Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



MJD2873 = Product Type Marking Code
= Manufacturers' Code Marking
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 24 = 2024)
WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	70	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	2	A
Peak Pulse Collector Current	I_{CM}	3	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	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 25mm x 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 x 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.

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Thermal Characteristics

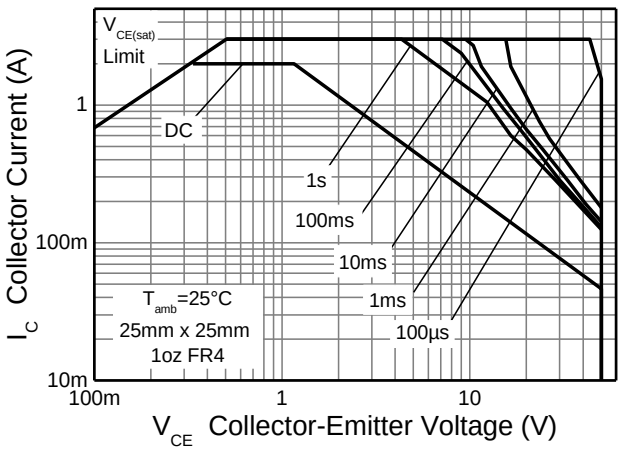


Figure 1. Safe Operating Area

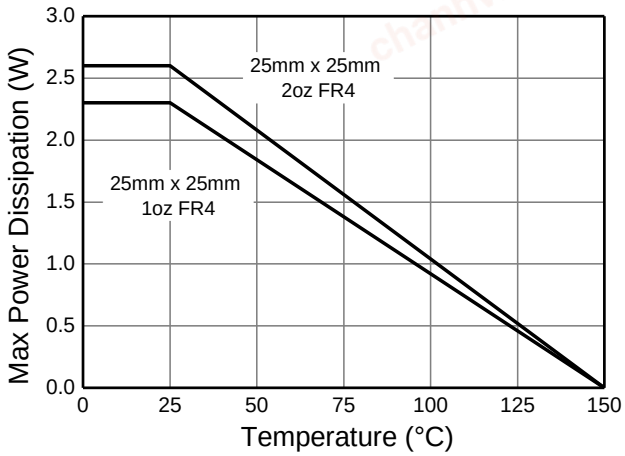


Figure 2. Derating Curve

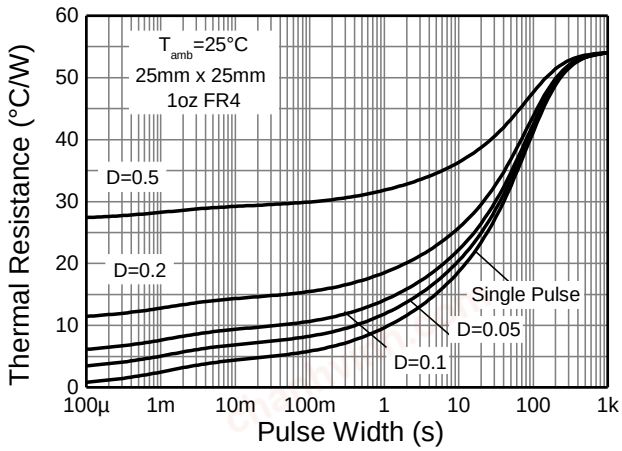


Figure 3. Transient Thermal Impedance

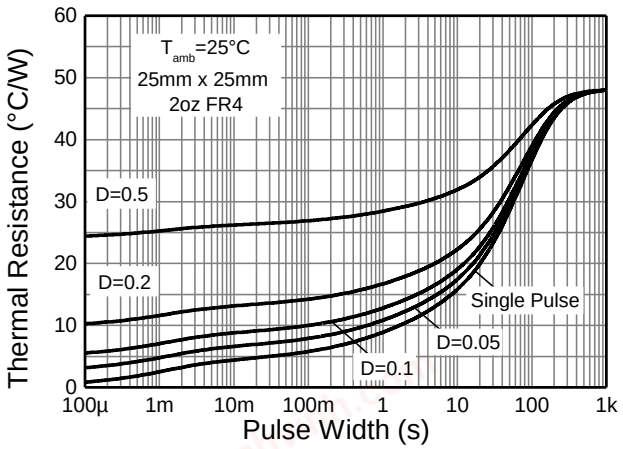


Figure 4. Transient Thermal Impedance

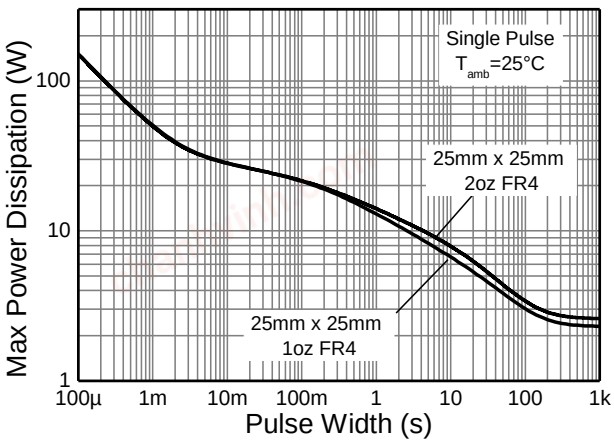


Figure 5. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	70	—	—	V	I_C = 100uA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	50	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100uA
Collector Cut-off Current	I_{CES}	—	—	100	nA	V_{CE} = 50V
Collector-Base Cut-off Current	I_{CBO}	—	—	100	nA	V_{CB} = 70V
Emitter Cut-off Current	I_{EBO}	—	—	100	nA	V_{EB} = 6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	—	0.3	V	I_C = 1A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	—	1.2	V	I_C = 1A, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	—	1.2 0.95	V	I_C = 1A, V_{CE} = 2V I_C = 0.75A, V_{CE} = 1.6V
DC Current Gain (Note 9)	h_{FE}	120 40 80	— — —	— — —	—	V_{CE} = 2V, I_C = 0.5A V_{CE} = 2V, I_C = 2A V_{CE} = 1.6V, I_C = 0.75A
Current Gain-Bandwidth Product	f_T	65	—	—	MHz	I_C = 0.1A, V_{CE} = 10V, f = 100MHz
Output Capacitance	C_{obo}	—	20	—	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{ibo}	—	295	—	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	—	380	—	ns	
Fall Time	t_f	—	60	—	ns	

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

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

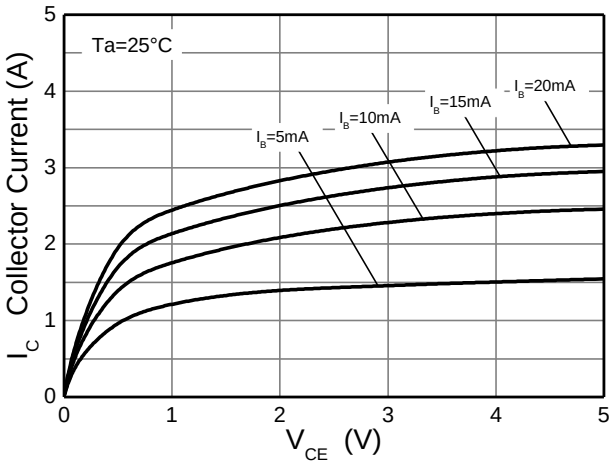


Figure 6. I_C v V_{CE}

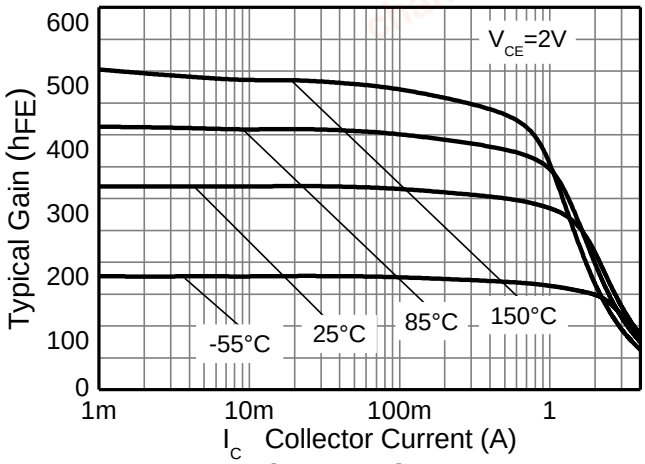


Figure 7. h_{FE} v I_C

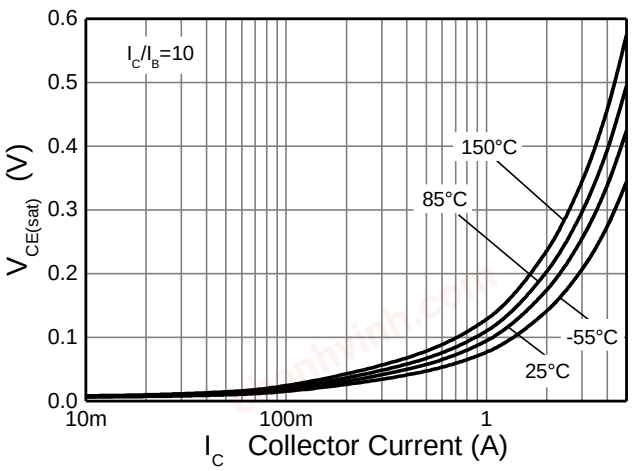


Figure 8. $V_{CE(sat)}$ v I_C

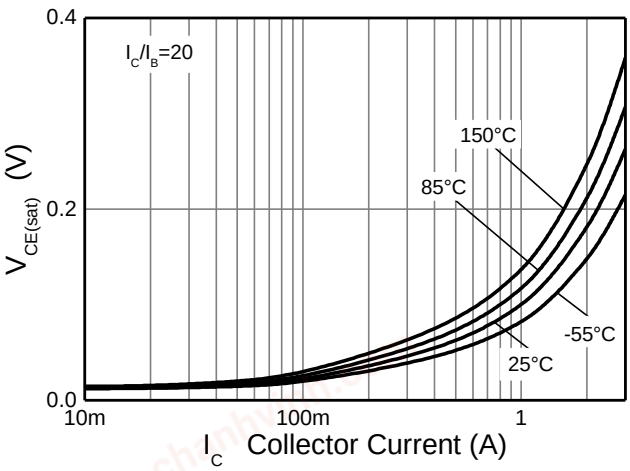


Figure 9. $V_{CE(sat)}$ v I_C

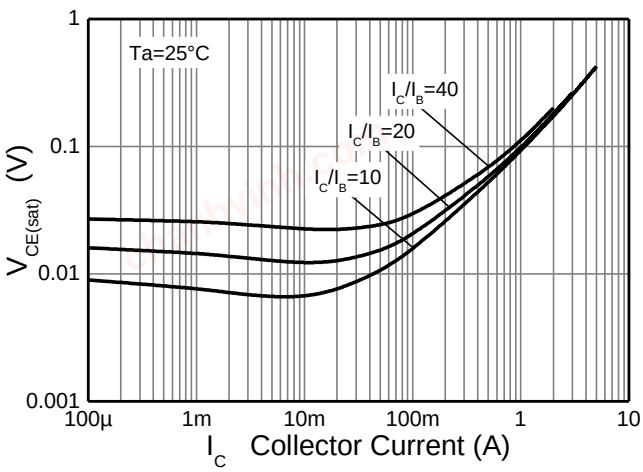


Figure 10. $V_{CE(sat)}$ v I_C

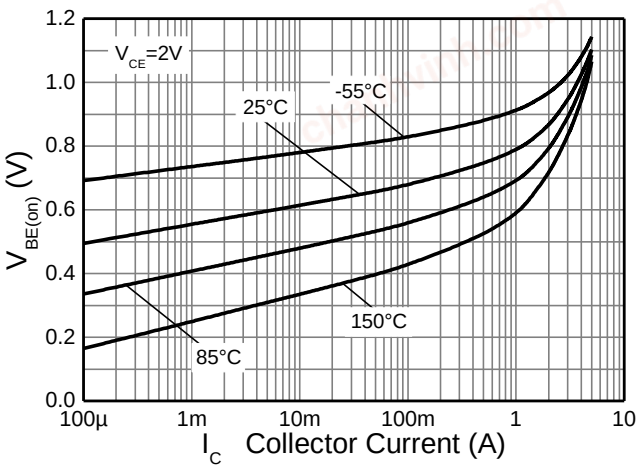


Figure 11. $V_{BE(on)}$ v I_C

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

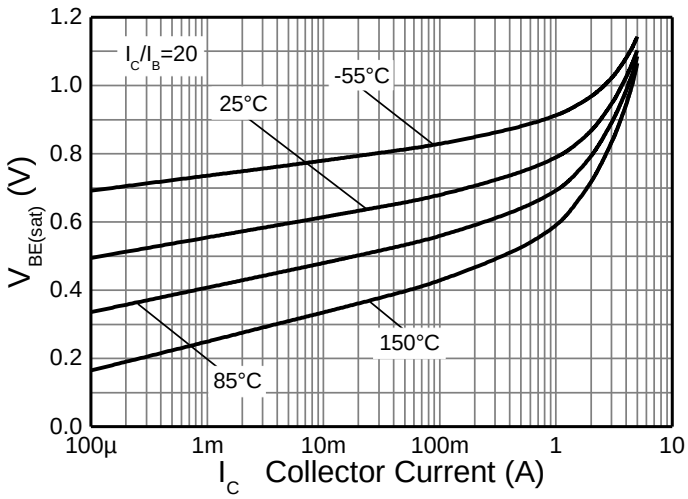


Figure 12. $V_{BE(sat)}$ v I_C

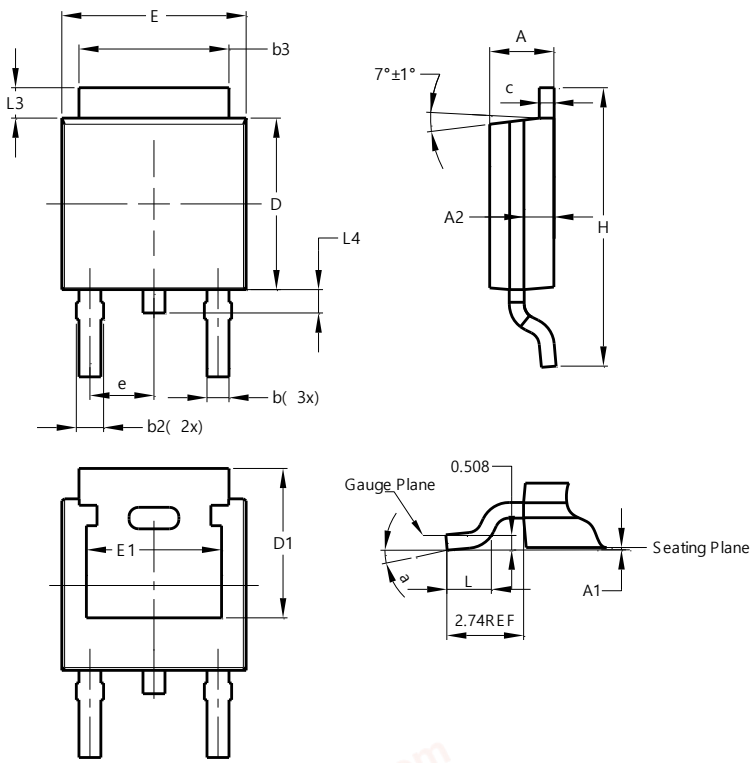
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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO252 (DPAK)

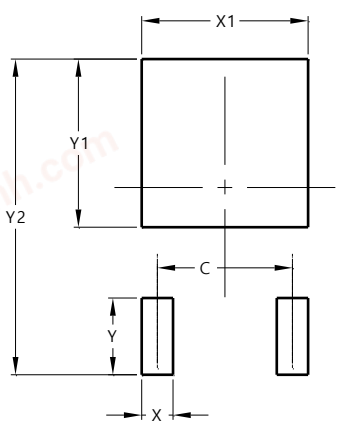


TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
E	6.45	6.70	6.58
E1	4.32	--	--
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO252 (DPAK)



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

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