

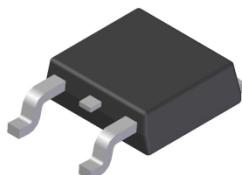
Features

- $BV_{CEO} > -80V$
- $I_C = -8A$ Continuous Collector Current
- $I_{CM} = -16A$ Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- Complementary NPN Type: [MJD44H11](#)
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- An automotive-compliant part is available under a separate datasheet ([MJD45H11Q](#))

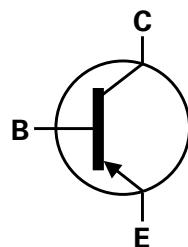
Mechanical Data

- 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)

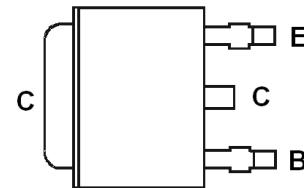
TO252 (DPAK)



Top View



Device Schematic


 Pin Out Configuration
 Top View

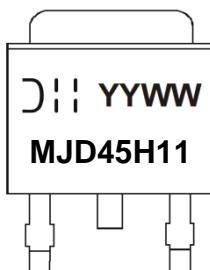
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
MJD45H11-13	TO252 (DPAK)	MJD45H11	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



MJD45H11 = Product Type Marking Code

DII = Manufacturer's Code Marking

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 25 = 2025)

WW = Week Code (01 to 53)

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-100	V
Collector-Emitter Voltage	V_{CEO}	-80	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-8	A
Peak Pulse Collector Current	I_{CM}	-16	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	2.7	W
		2.4	
		1.5	
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	46	°C/W
		52	
		83	
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 — Charged Device Model	ESD CDM	1,000	V	C3

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 JS-001-2017 and JS-002-2022.

Thermal Characteristics

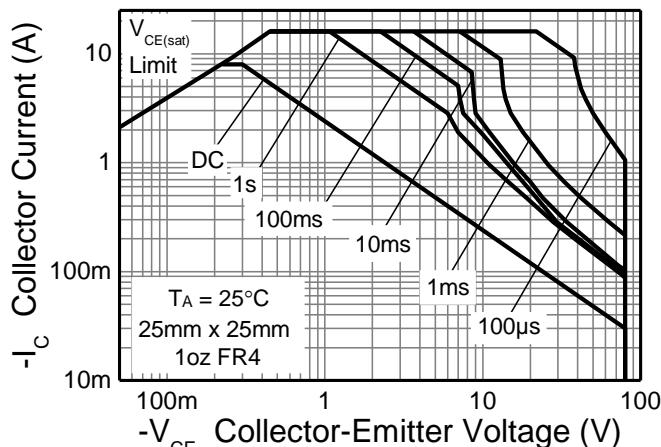


Figure 1. Safe Operating Area

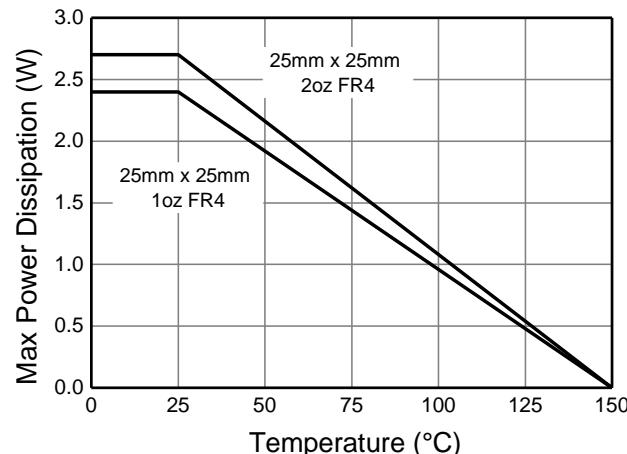


Figure 2. Derating Curve

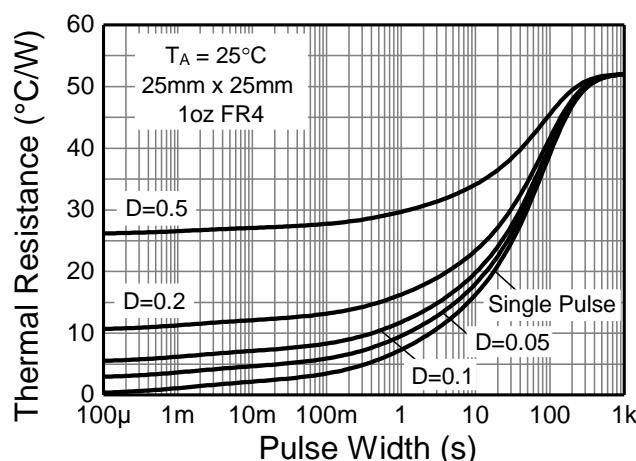


Figure 3. Transient Thermal Impedance

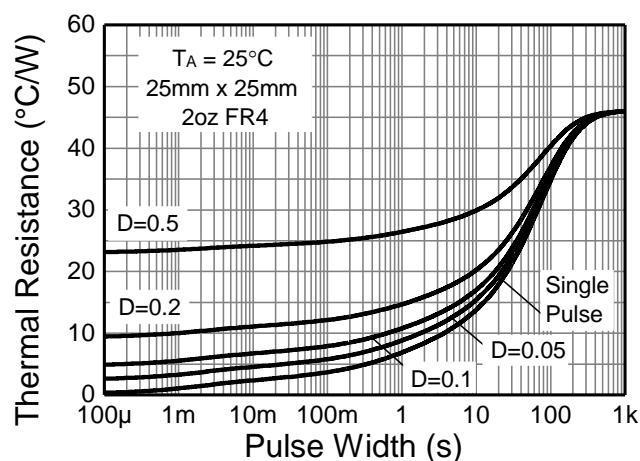


Figure 4. Transient Thermal Impedance

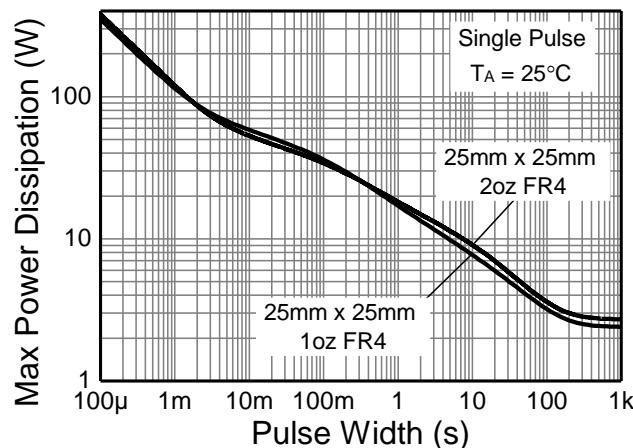


Figure 5. Pulse Power Dissipation

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-80	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CES}	—	—	-1	μA	$V_{\text{CE}} = -80\text{V}$
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	$V_{\text{CB}} = -80\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	-1	μA	$V_{\text{EB}} = -6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{\text{CE}(\text{sat})}$	—	—	-1	V	$I_C = -8\text{A}, I_B = -400\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{\text{BE}(\text{sat})}$	—	—	-1.5	V	$I_C = -8\text{A}, I_B = -800\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{\text{BE}(\text{on})}$	—	—	-2	V	$I_C = -6\text{A}, V_{\text{CE}} = -4\text{V}$
DC Current Gain (Note 9)	h_{FE}	60 40	—	—	—	$V_{\text{CE}} = -1\text{V}, I_C = -2\text{A}$ $V_{\text{CE}} = -1\text{V}, I_C = -4\text{A}$
Current Gain-Bandwidth Product	f_T	3	—	—	MHz	$V_{\text{CE}} = -10\text{V}, I_C = -0.5\text{A},$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	85	—	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Input Capacitance	C_{ibo}	—	835	—	pF	$V_{\text{EB}} = -0.5\text{V}, f = 1\text{MHz}$
Delay Time	t_d	—	5	—	ns	$I_C = -5\text{A}, V_{\text{CC}} = -12.5\text{V},$ $-I_{B1} = I_{B2} = 500\text{mA}$
Rise Time	t_r	—	105	—	ns	
Storage Time	t_s	—	155	—	ns	
Fall Time	t_f	—	15	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

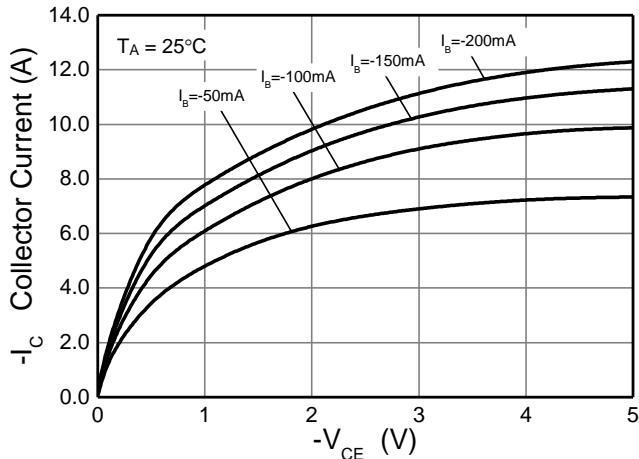


Figure 6. I_C v V_{CE}

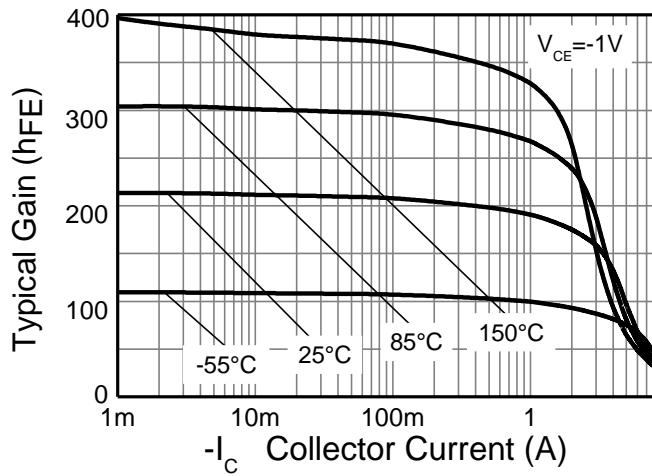


Figure 7. h_{FE} v I_C

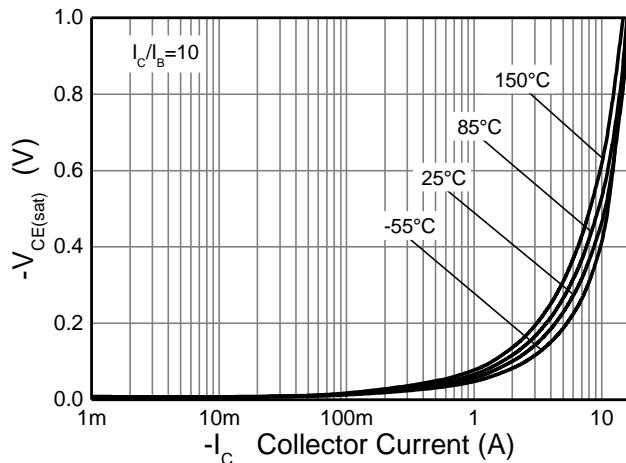


Figure 8. $V_{CE(sat)}$ v I_C

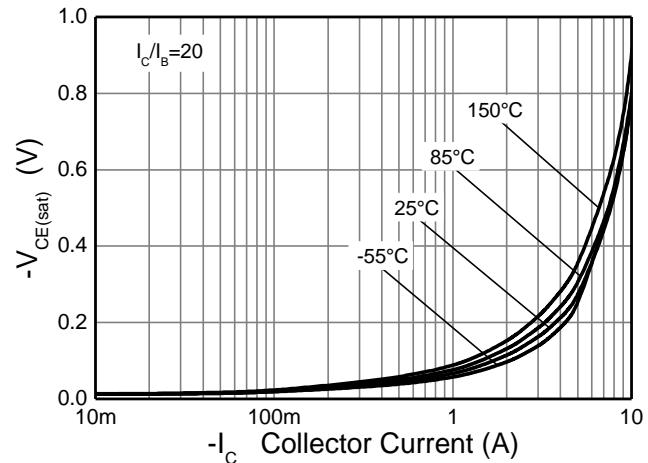


Figure 9. $V_{CE(sat)}$ v I_C

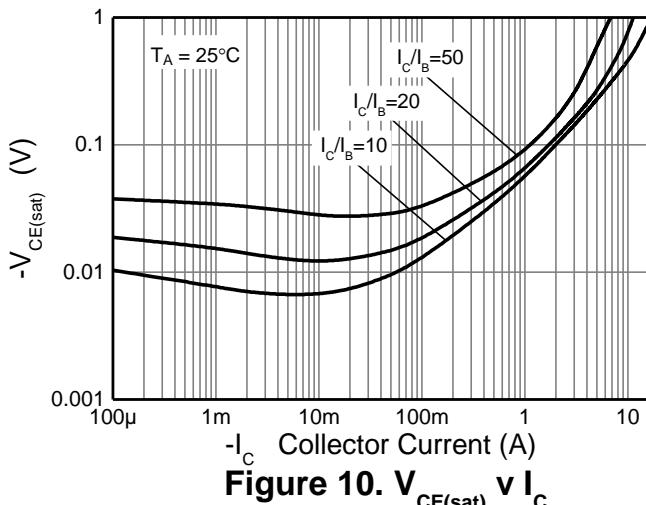


Figure 10. $V_{CE(sat)}$ v I_C

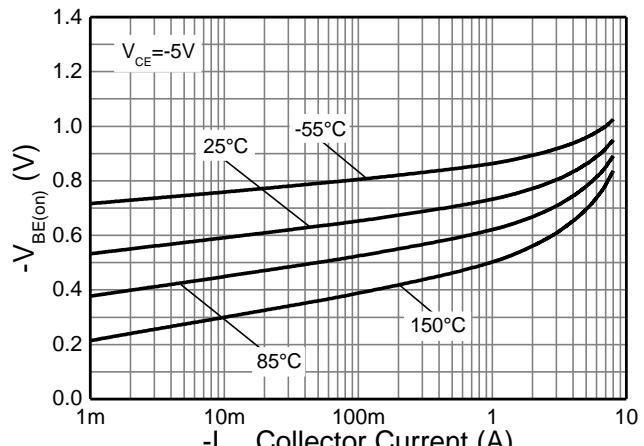


Figure 11. $V_{BE(on)}$ v I_C

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (continued)

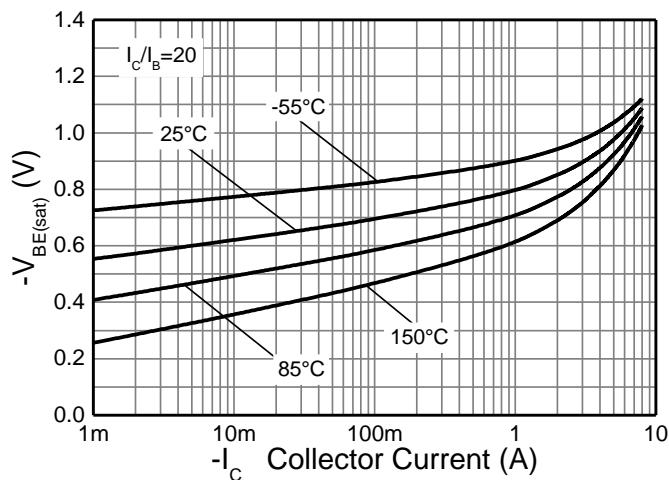
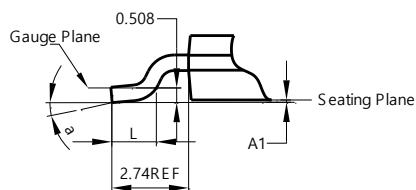
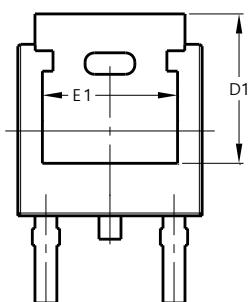
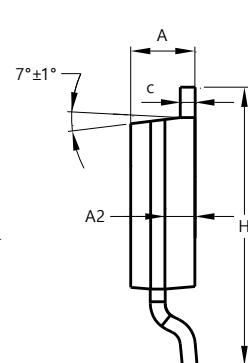
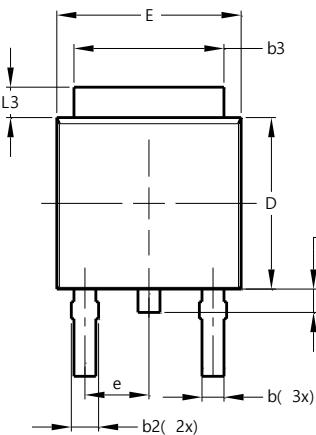


Figure 12. $V_{BE(sat)}$ v I_c

Package Outline Dimensions

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

TO252 (DPAK)



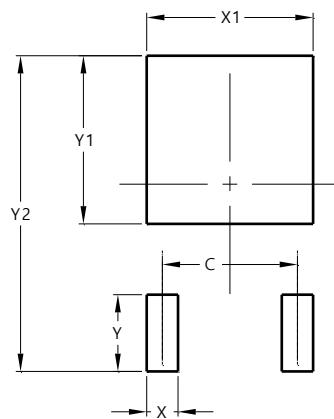
TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
E	6.45	6.70	6.58
E1	4.32	--	--
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83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