

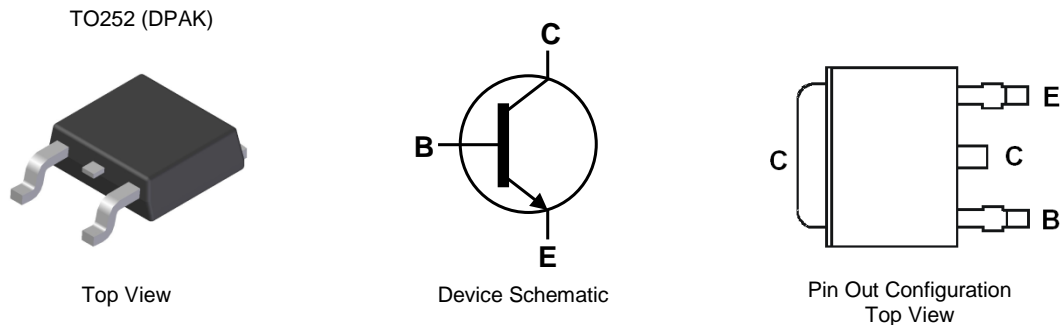
Features

- $BV_{CE0} > 100V$
- $I_C = 6A$ Continuous Collector Current
- $I_{CM} = 10A$ Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- Complementary PNP Type: MJD42CQ
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The MJD41CQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

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 ③
- Weight: 0.34 grams (Approximate)

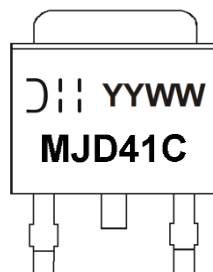


Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
MJD41CQ-13	TO252 (DPAK)	MJD41C	13	16	2500	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



MJD41C = Product Type Marking Code
 DII = Manufacturers' Code Marking
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 24 = 2024)
 WW = Week Code (01 to 53)

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	6	A
Peak Pulse Collector Current	I _{CM}	10	A
Continuous Base Current	I _B	2	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	2.7
		(Note 6)	2.4
		(Note 7)	1.5
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5)	46
		(Note 6)	52
		(Note 7)	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	4000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

- Notes:
- 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.
 - Same as note (5), except mounted on 25mm x 25mm 1oz copper.
 - Same as note (5), except mounted on minimum recommended pad (MRP) layout.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics

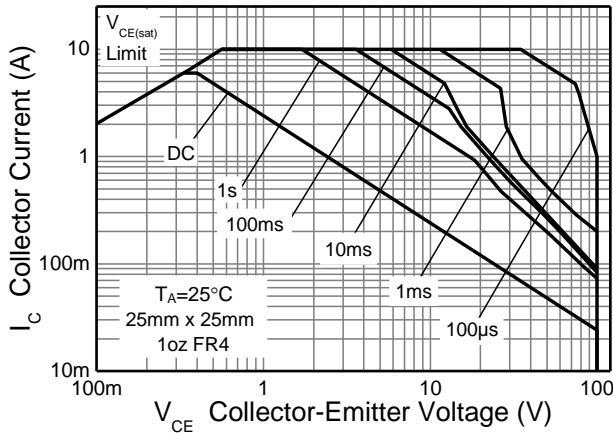


Figure 1. Safe Operating Area

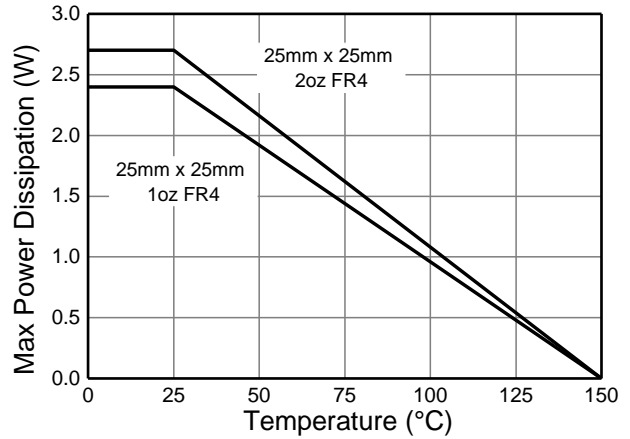


Figure 2. Derating Curve

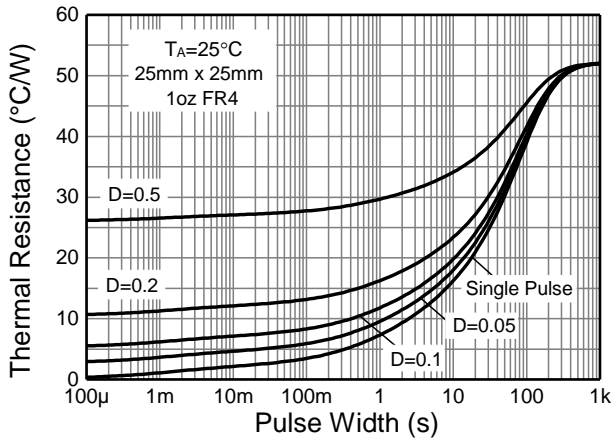


Figure 3. Transient Thermal Impedance

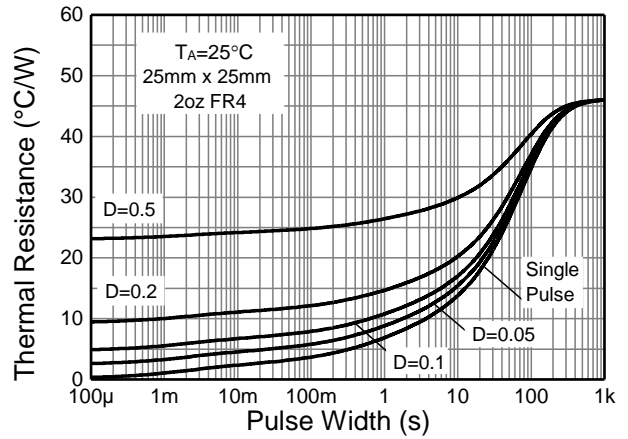


Figure 4. Transient Thermal Impedance

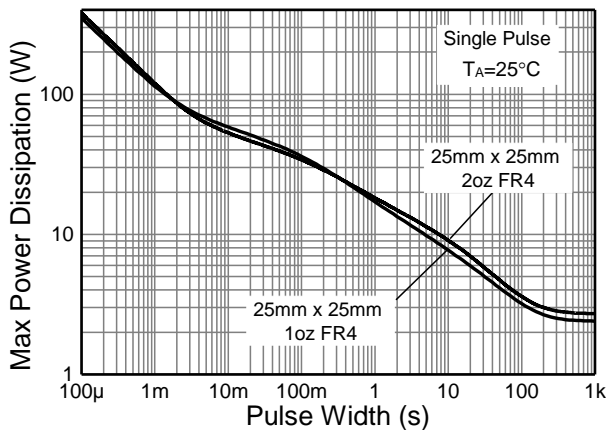


Figure 5. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	120	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	100	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	I_{CES}	—	—	1	μA	$V_{CE} = 100\text{V}$
Collector-Base Cut-Off Current	I_{CBO}	—	—	100	nA	$V_{CB} = 100\text{V}$
Emitter Cut-Off Current	I_{EBO}	—	—	1	μA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	—	1.5	V	$I_C = 6\text{A}, I_B = 600\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	—	1.4	V	$I_C = 6\text{A}, I_B = 600\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	—	2	V	$I_C = 6\text{A}, V_{CE} = 4\text{V}$
DC Current Gain (Note 9)	h_{FE}	30 15	— —	— —	—	$V_{CE} = 4\text{V}, I_C = 0.3\text{A}$ $V_{CE} = 4\text{V}, I_C = 3\text{A}$
Small-Signal Current Gain	h_{fe}	20	—	—	—	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}, f = 1\text{kHz}$
Current Gain-Bandwidth Product	f_T	3	—	—	MHz	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}, f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	40	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Input Capacitance	C_{ibo}	—	960	—	pF	$V_{EB} = 0.5\text{V}, f = 1\text{MHz}$
Delay Time	t_d	—	50	—	ns	$I_C = 1\text{A}, V_{CC} = 10\text{V},$ $I_{B1} = -I_{B2} = 100\text{mA}$
Rise Time	t_r	—	45	—	ns	
Storage Time	t_s	—	500	—	ns	
Fall Time	t_f	—	65	—	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.)

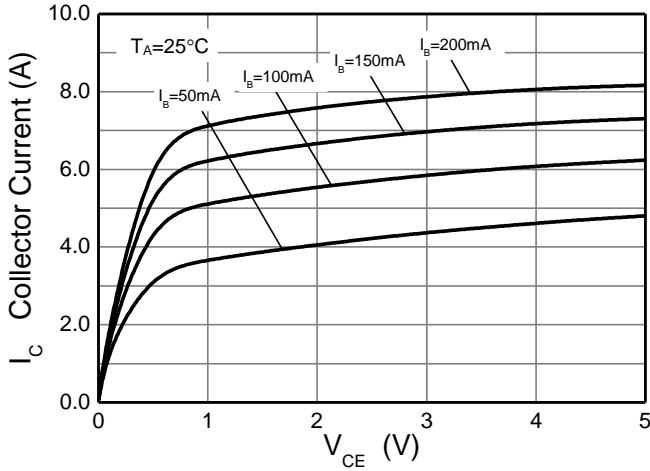


Figure 6. I_C v V_{CE}

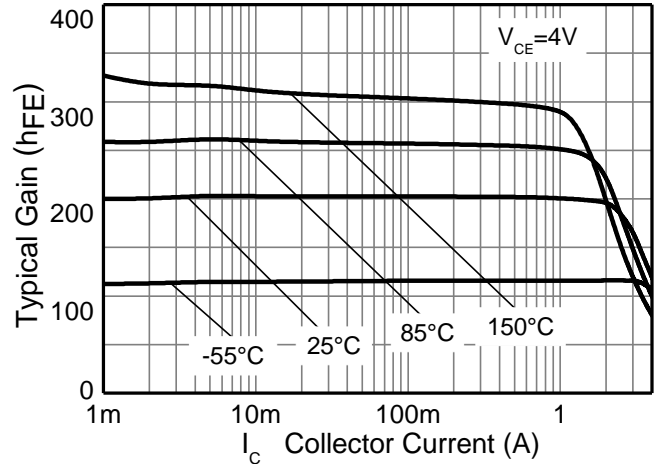


Figure 7. h_{FE} v I_C

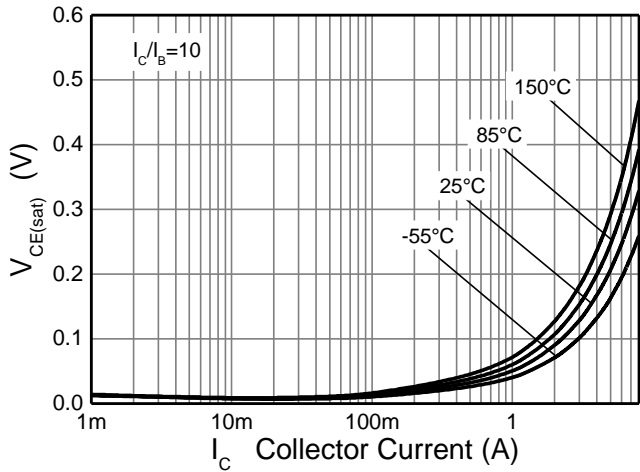


Figure 8. $V_{CE(sat)}$ v I_C

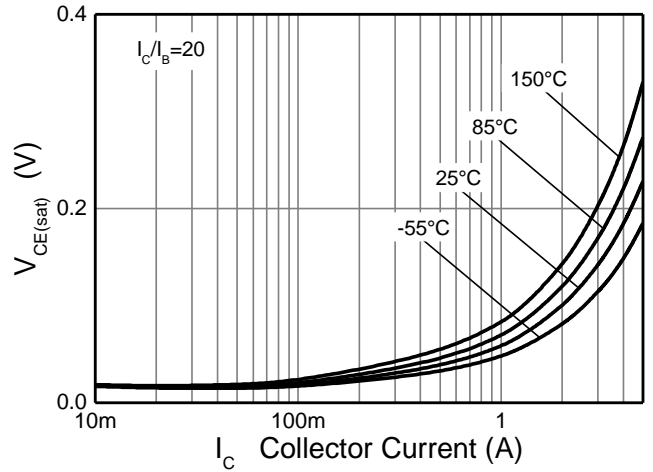


Figure 9. $V_{CE(sat)}$ v I_C

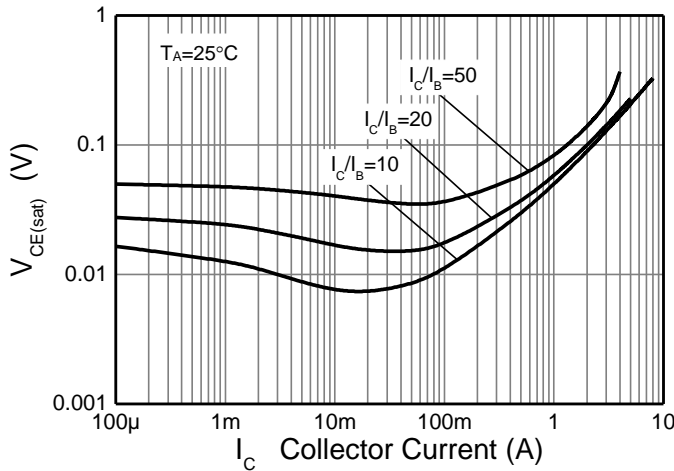


Figure 10. $V_{CE(sat)}$ v I_C

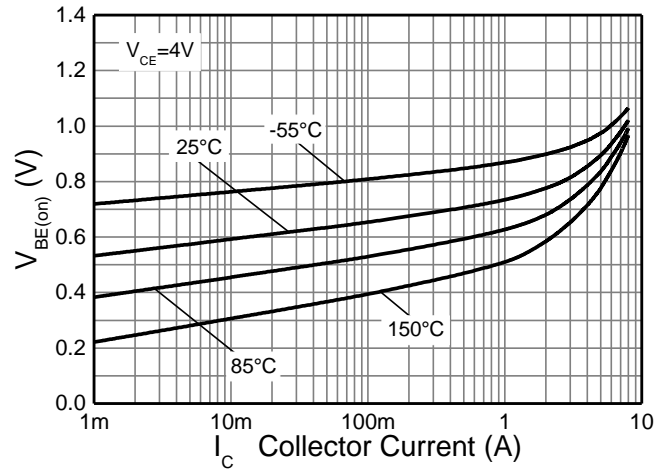


Figure 11. $V_{BE(on)}$ v I_C

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

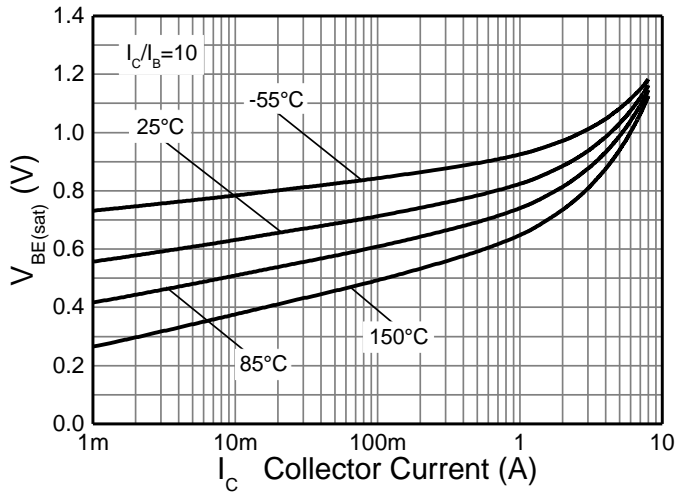
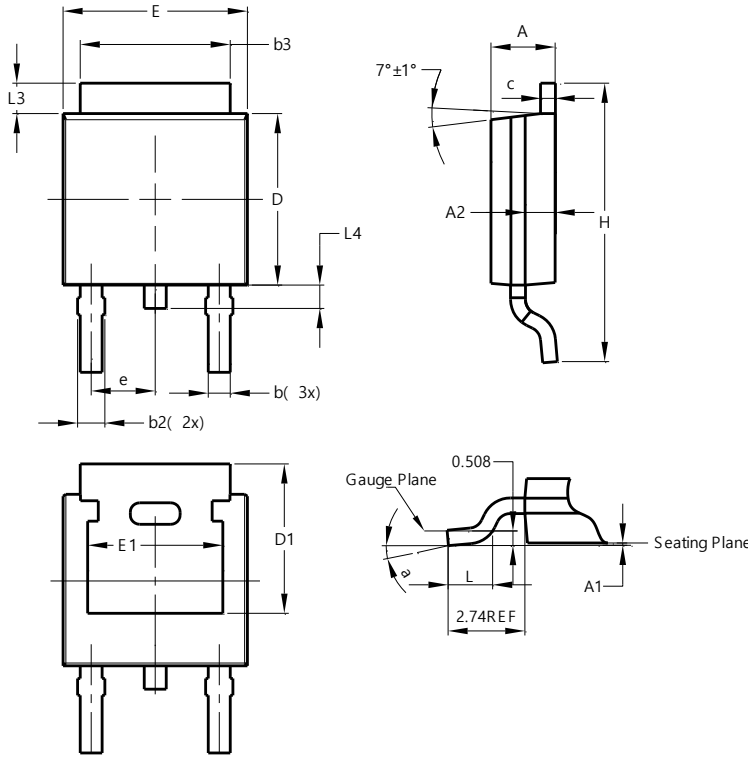


Figure 12. $V_{BE(sat)}$ v I_C

Package Outline Dimensions

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

TO252 (DPAK)

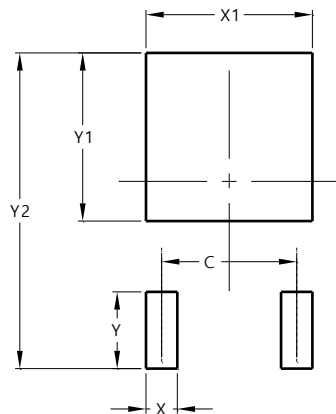


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
E	6.45	6.70	6.58
E1	4.32	--	--
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83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