

## Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

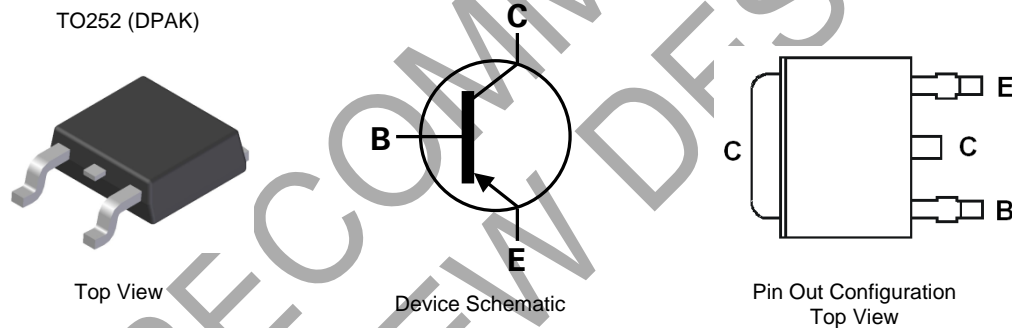
## Features

- $BV_{CEO} > -100V$
- $I_C = -3A$  high Continuous Collector Current
- $I_{CM} = -5A$  Peak Pulse Current
- Ideal for Power Switching or Amplification Applications
- Complementary NPN Type: MJD31CQ
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The MJD32CQ 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 (DPAK)
- 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)

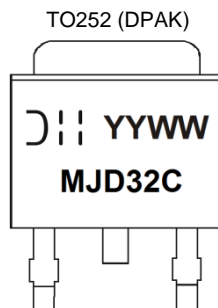


## Ordering Information (Note 4)

Part Number	Package	Marking	Reel size (inches)	Tape width (mm)	Packing	
					Qty.	Carrier
MJD32CQ-13	TO252 (DPAK)	MJD32C	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



MJD32C = Product Type Marking Code  
 DII = Manufacturers' code marking  
 YYWW = Date Code Marking  
 YY = Last Digit of Year (ex: 24 = 2024)  
 WW = Week Code (01 - 53)

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-100	V
Collector-Emitter Voltage	V <sub>CE0</sub>	-100	V
Emitter-Base Voltage	V <sub>EB0</sub>	-6	V
Continuous Collector Current	I <sub>C</sub>	-3	A
Peak Pulse Collector Current	I <sub>CM</sub>	-5	A
Continuous Base Current	I <sub>B</sub>	-1	A
Power Dissipation	P <sub>D</sub>	15	W

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	3.9
		(Note 6)	2.1
		(Note 7)	1.6
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 5)	32
		(Note 6)	59
		(Note 7)	80
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	8.4	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

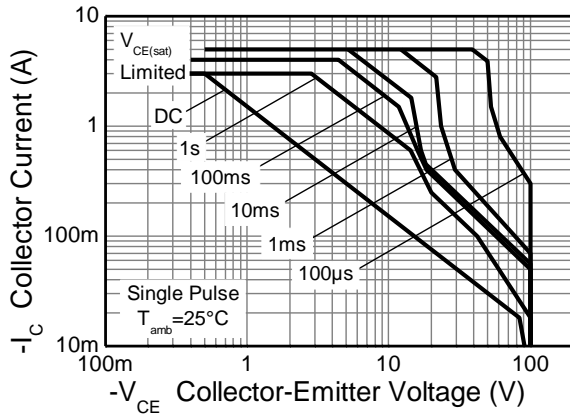
**ESD Ratings** (Note 9)

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

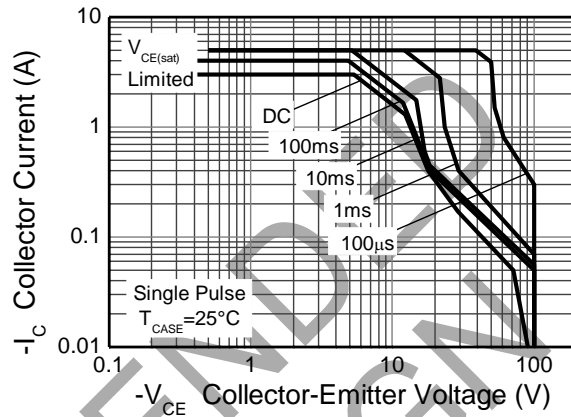
- Notes:
5. For a device mounted with the exposed collector pad on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  6. Same as note (6), except mounted on 25mm x 25mm 1oz copper.
  7. Same as note (6), 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.

NOT FOR RECOMMENDED DESIGN

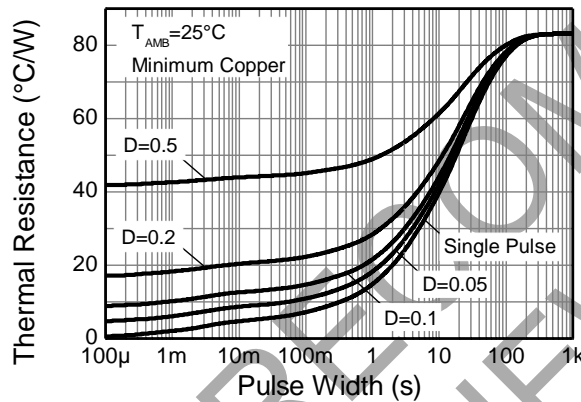
**Thermal Characteristics**



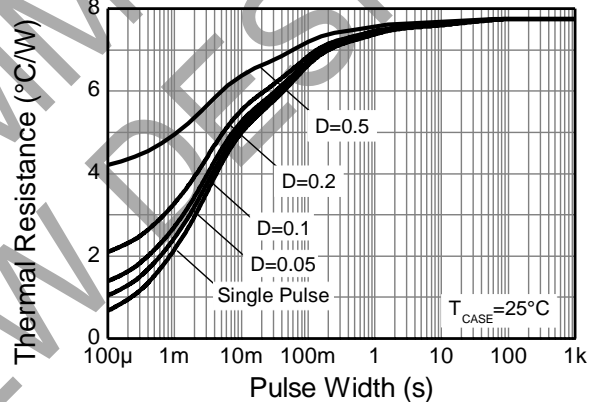
**Safe Operating Area**



**Safe Operating Area**



**Transient Thermal Impedance**



**Transient Thermal Impedance**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-100	—	—	V	I <sub>C</sub> = -30mA, I <sub>B</sub> = 0
Collector Cut-off Current	I <sub>CEO</sub>	—	—	-1	μA	V <sub>CB</sub> = -60V, I <sub>B</sub> = 0
Collector Cut-off Current	I <sub>CES</sub>	—	—	-1	μA	V <sub>CE</sub> = -100V, V <sub>EB</sub> = 0
Emitter Cut-off Current	I <sub>EBO</sub>	—	—	-1	μA	V <sub>EB</sub> = -5V, I <sub>C</sub> = 0
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	—	—	-1.2	V	I <sub>C</sub> = -3.0A, I <sub>B</sub> = -375mA
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(on)</sub>	—	—	-1.8	V	I <sub>C</sub> = -3A, V <sub>CE</sub> = -4V
DC Current Gain (Note 10)	h <sub>FE</sub>	25 10	—	— 50	—	V <sub>CE</sub> = -4V, I <sub>C</sub> = -1A V <sub>CE</sub> = -4V, I <sub>C</sub> = -3A
Current Signal Current Gain	H <sub>fe</sub>	20	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -0.5A, f = 1KHz
Current Gain-Bandwidth Product	f <sub>T</sub>	3.0	—	—	MHz	I <sub>C</sub> = -500mA, V <sub>CE</sub> = -10V, f = 1MHz

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

NOT RECOMMENDED FOR NEW DESIGN

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

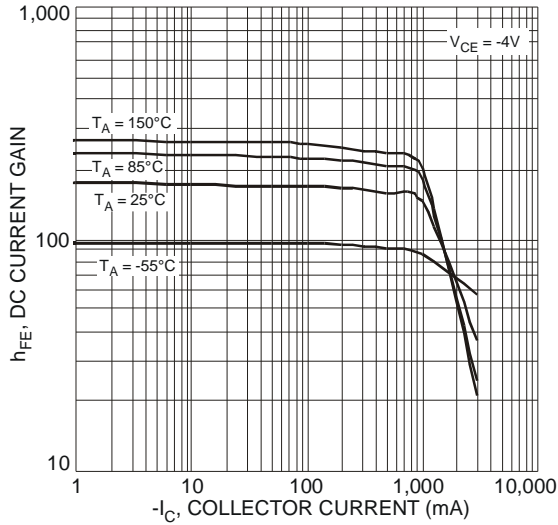


Figure 1 Typical DC Current Gain vs. Collector Current

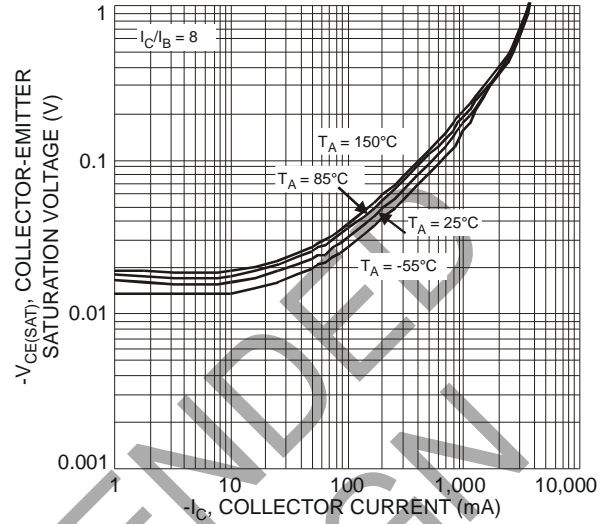


Figure 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

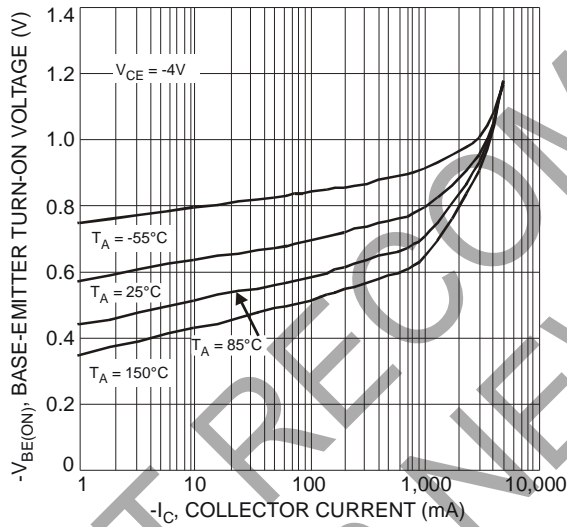


Figure 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

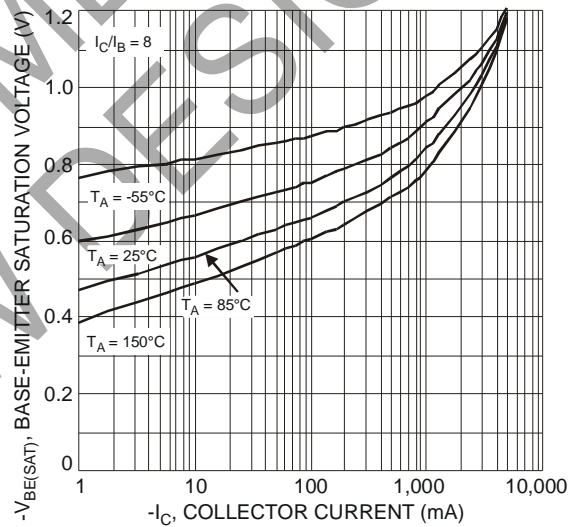


Figure 4 Typical Base-Emitter Saturation Voltage vs. Collector Current

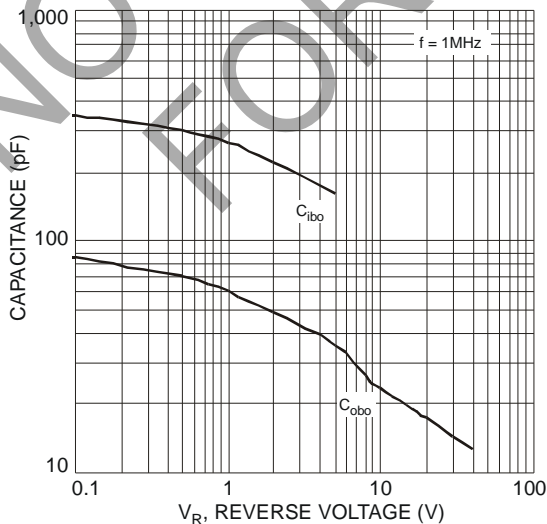
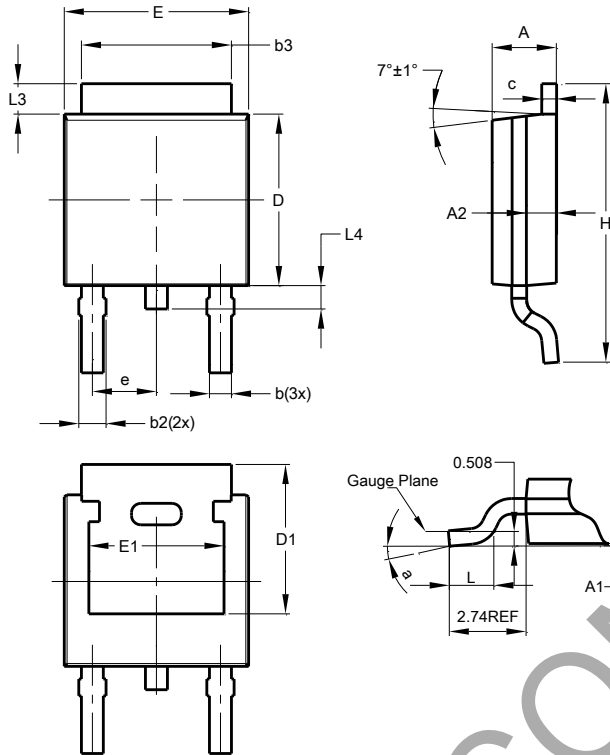


Figure 5 Typical Capacitance Characteristics

**Package Outline Dimensions**

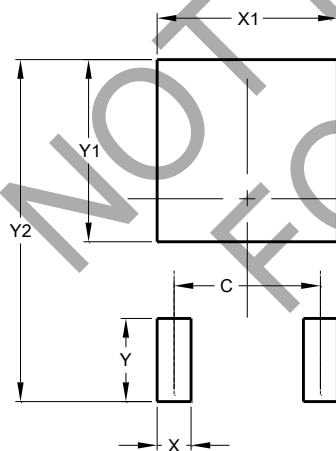
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
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.



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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