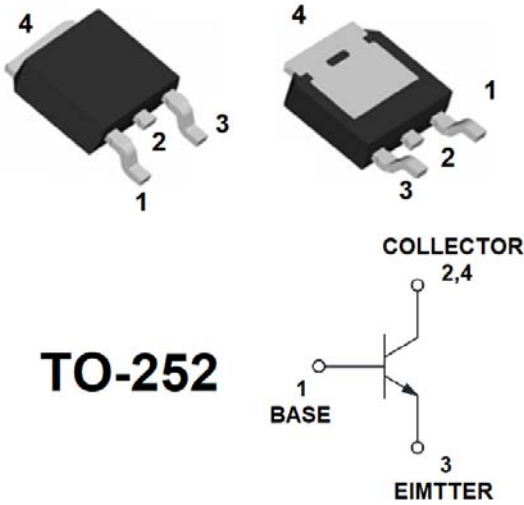


## NPN Power Transistors



**TO-252**

### Features

- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1
- Part no. with suffix "Q" means AEC-Q101 qualified

### Applications

- Designed for general purpose amplifier and low speed switching applications.

### Mechanical Data

- Case: TO-252
- Terminals: Tin plated leads, solderable per J-STD-002 and JESD22-B102

### ■ Maximum Ratings (Ta=25°C unless otherwise noted)

Item	Symbol	Unit	Value
Collector-Base Voltage	$V_{CBO}$	V	100
Collector-Emitter Voltage	$V_{CEO}$	V	100
Emitter-Base Voltage	$V_{EBO}$	V	5
Collector Current -Continuous	$I_C$	A	3
Total Device Dissipation (*)	$P_D$	W	1.6
Thermal Resistance, Junction to Ambient Air (*)	$R_{thJA}$	°C/W	79
Thermal Resistance, Junction to Mounting Base	$R_{thJ-mb}$	°C/W	8.3
Junction Temperature	$T_j$	°C	-55 to +150
Storage Temperature	$T_{STG}$	°C	-55 to +150

(\*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch, mounting pad for collector 1 cm<sup>2</sup>



# MJD31CQ

## ■ Electrical Characteristics (Ta=25°C unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{CBO}$	V	$I_C = 1mA, I_E = 0$	100		
Collector-emitter breakdown voltage	$V_{CEO}$	V	$I_C = 30mA, I_B = 0$	100		
Emitter-base breakdown voltage	$V_{EBO}$	V	$I_E = 1mA, I_C = 0$	5		
Collector-base cut-off current	$I_{CEO}$	$\mu A$	$V_{CE} = 60V, I_B = 0$			50
Collector-base cut-off current	$I_{CES}$	$\mu A$	$V_{CE} = 100V, V_{EB} = 0$			20
Emitter-base cut-off current	$I_{EBO}$	mA	$V_{EB} = 5V, I_C = 0$			1
DC current gain	$h_{FE}$		$V_{CE} = 4V, I_C = 1A$	25		
			$V_{CE} = 4V, I_C = 3A$	10		75
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 3A, I_B = 0.375A$			1.2
Base-emitter voltage	$V_{BE}$	V	$I_C = 3A, V_{CE} = 4V$			1.8

## ■ Other Characteristics (Ta=25°C unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Transition frequency	$f_T$	MHZ	$V_{CE} = 10V, I_C = 0.5A, f = 1KHZ$	3		

## ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MJD31CQ	F1	MJD31C	2500	2500	25000	13"Reel

## ■ Characteristics(Typical)

Fig.1 - Collector Saturation Region

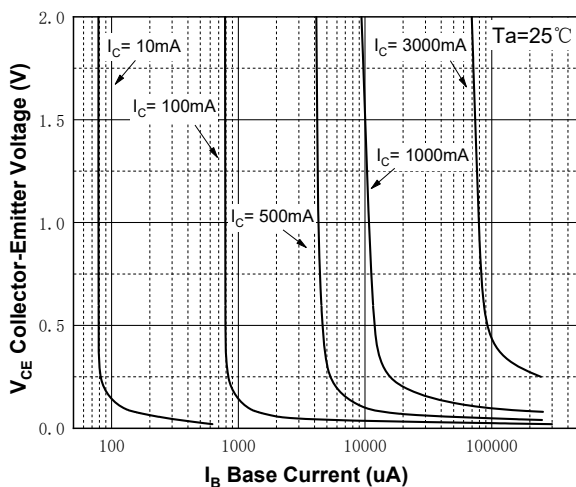


Fig.2 - DC Current Gain

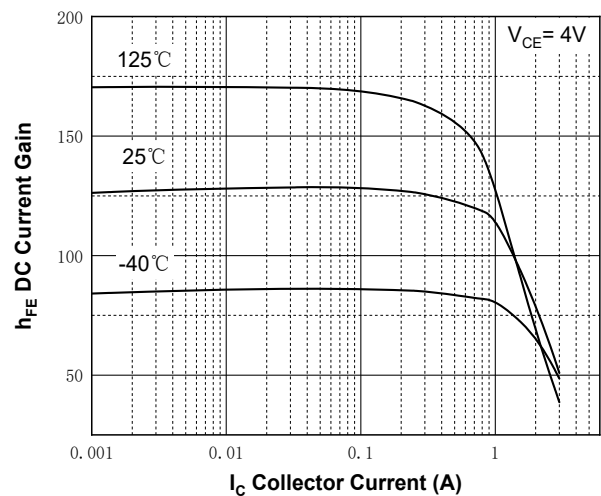




Fig.3 - DC Current Gain

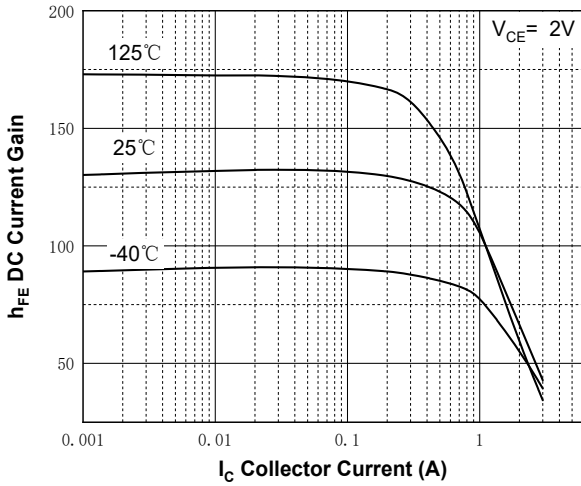


Fig.4 - Collector-Emitter Saturation Voltage vs. Collector Current

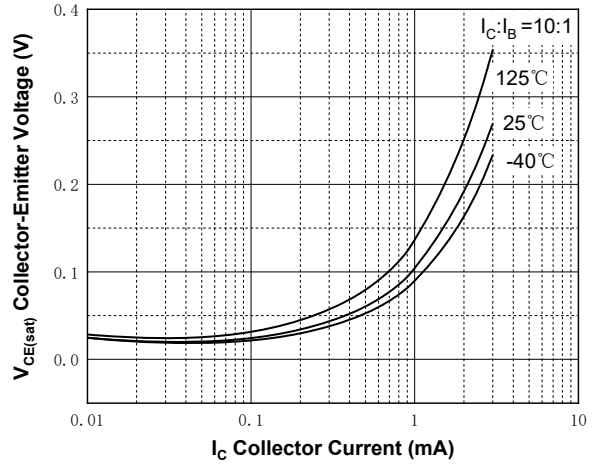


Fig.5 - Base-Emitter Saturation Voltage vs. Collector Current

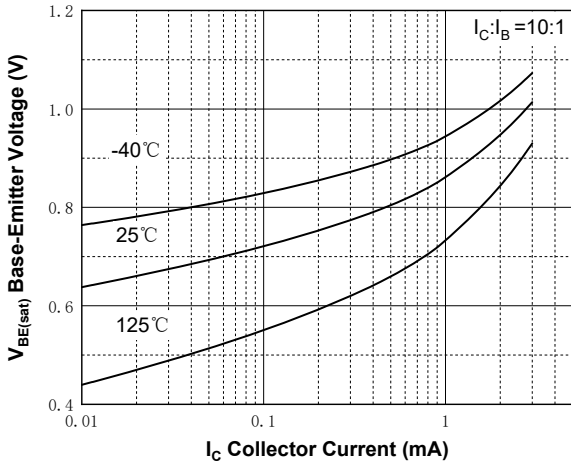


Fig.6 - Capacitance

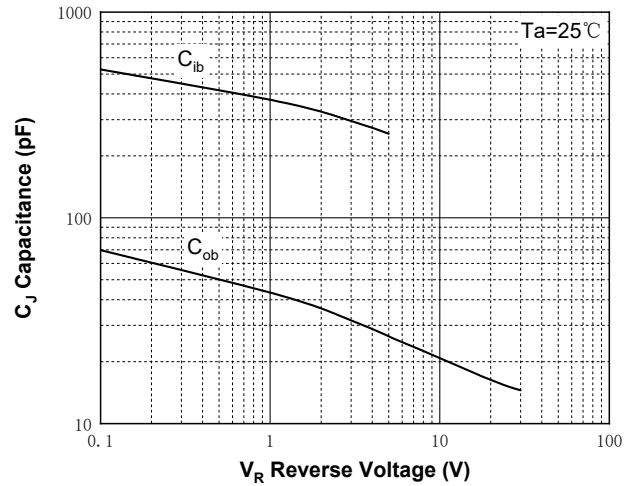


Fig.7 - Transient thermal impedance

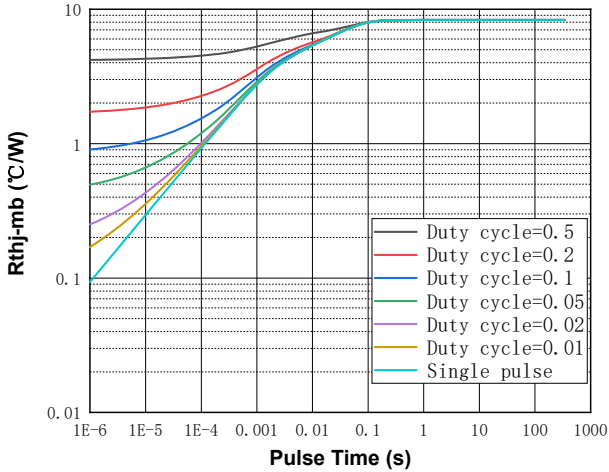
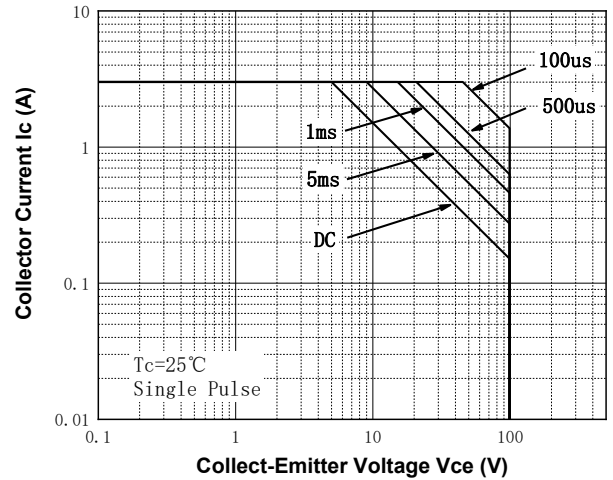


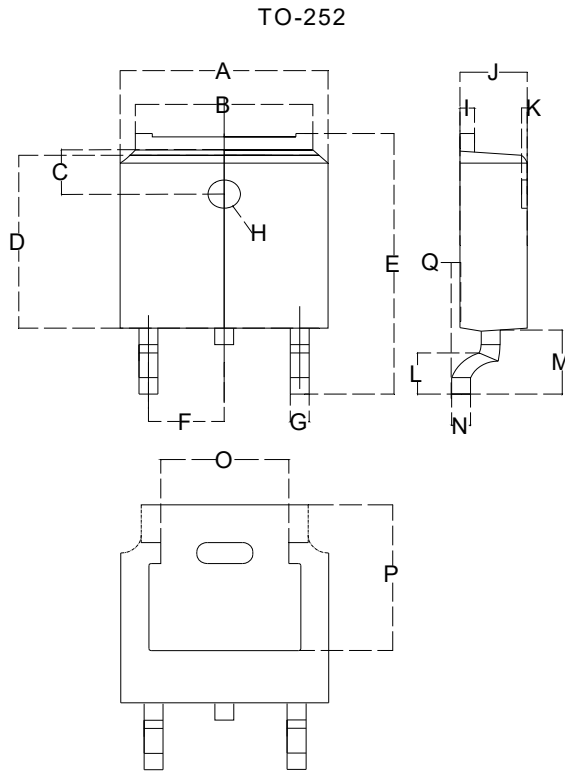
Fig.8 - Safe Operating Area





# MJD31CQ

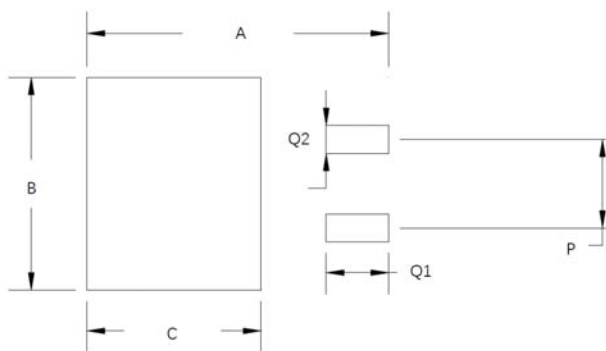
## ■ TO-252 Package information



Dimensions in millimeters

TO-252		
Dim	Min	Max
A	6.500	6.700
B	5.100	5.460
C	1.400	1.800
D	6.000	6.200
E	10.000	10.400
F	2.166	2.366
G	0.660	0.860
H	Φ 1.050	Φ 1.350
I	0.460	0.580
J	2.200	2.400
K	0	0.300
L	0.890	2.290
M	2.730	3.080
N	0.430	0.580
O	4.20	4.95
P	5.15	5.45
Q	0	0.2

## ■ Suggested Pad Layout



Dim	Millimeters
A	11.4
B	6.74
C	6.23
P	4.56
Q1	2.28
Q2	1.52



## MJD31CQ

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