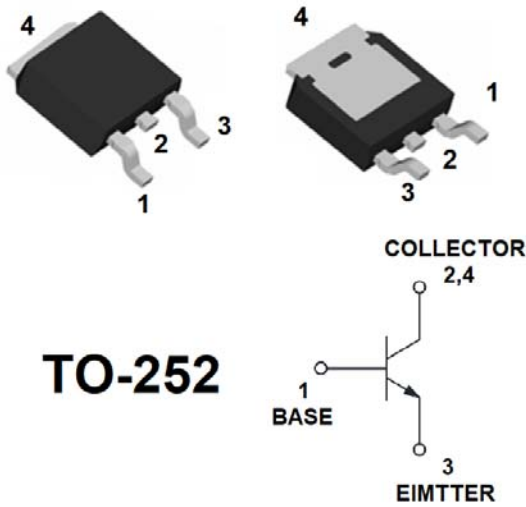


NPN Power Transistors



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 ⁽¹⁾	P_D	W	1.25
Total Device Dissipation ⁽²⁾	P_D	W	1.6
Thermal Resistance, Junction to Ambient Air ⁽¹⁾	R_{thJA}	°C/W	100
Thermal Resistance, Junction to Ambient Air ⁽²⁾	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

(1) Device mounted on FR-4 PCB, mounting pad for collector 1 cm²

(2) Device mounted on FR-4 PCB, mounting pad for collector 1 inch²



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}	μA	$V_{CE} = 60V, I_B = 0$			50
Collector-base cut-off current	I_{CES}	μA	$V_{CE} = 100V, V_{EB} = 0$			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

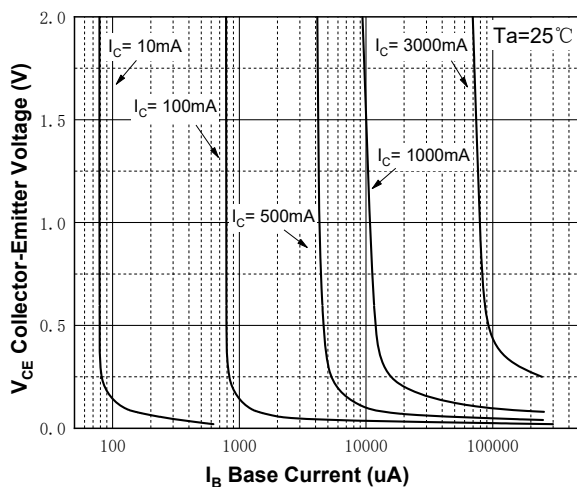


Fig.2 - DC Current Gain

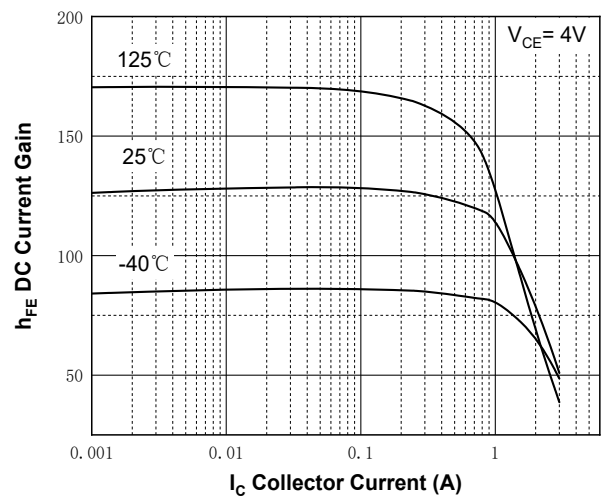


Fig.3 - DC Current Gain

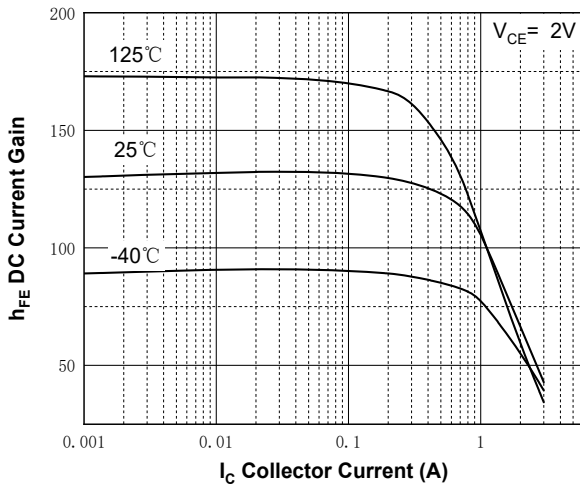


Fig.4 - Collector-Emitter Saturation Voltage vs. Collector Current

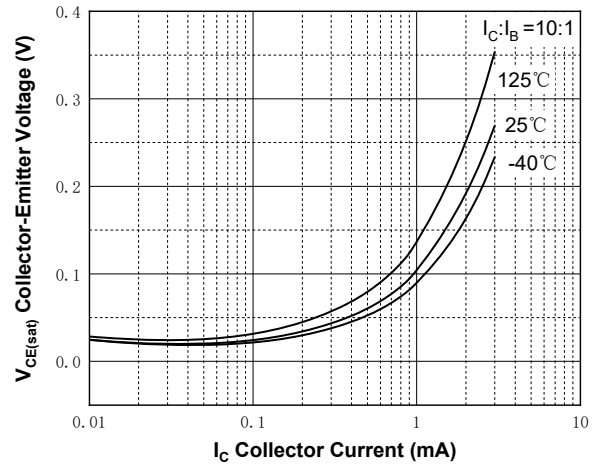


Fig.5 - Base-Emitter Saturation Voltage vs. Collector Current

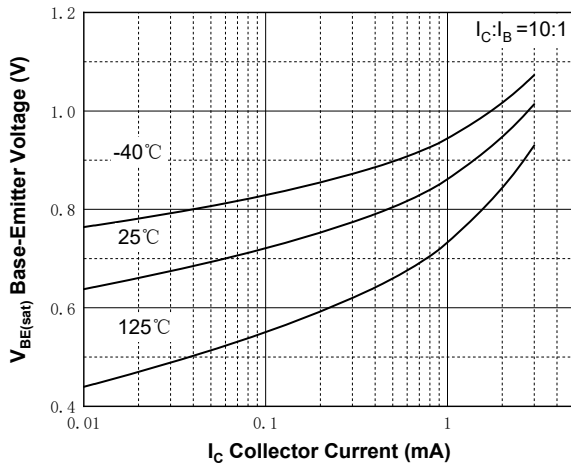


Fig.6 - Capacitance

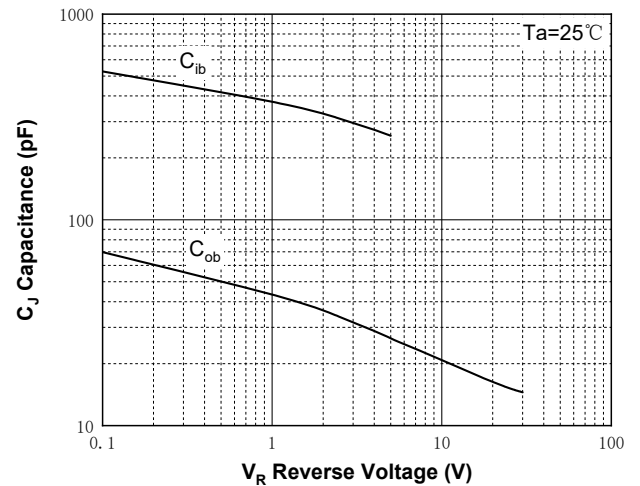


Fig.7 - Transient thermal impedance

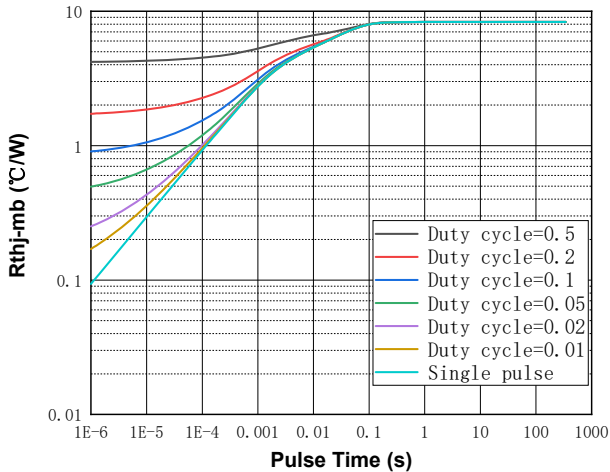
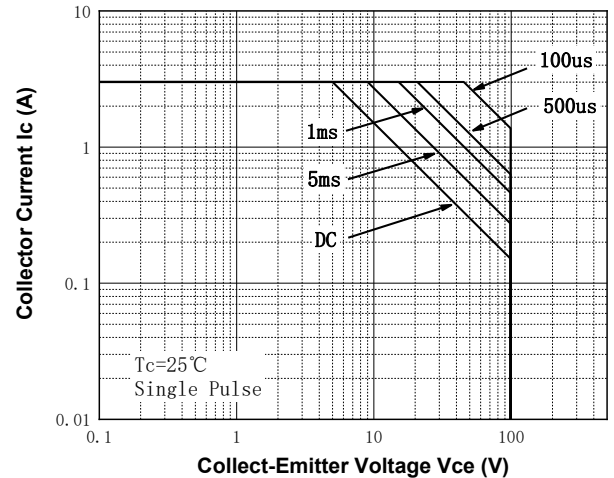
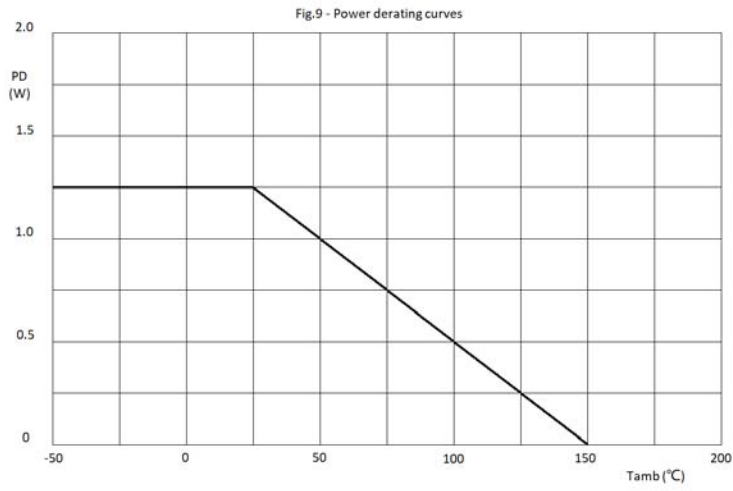


Fig.8 - Safe Operating Area



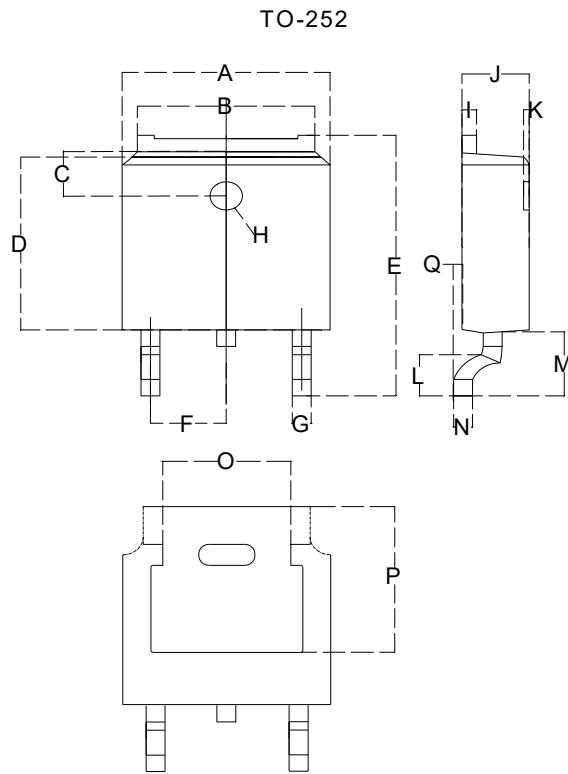


(1) Device mounted on FR-4 PCB, mounting pad for collector 1 cm²



MJD31CQ

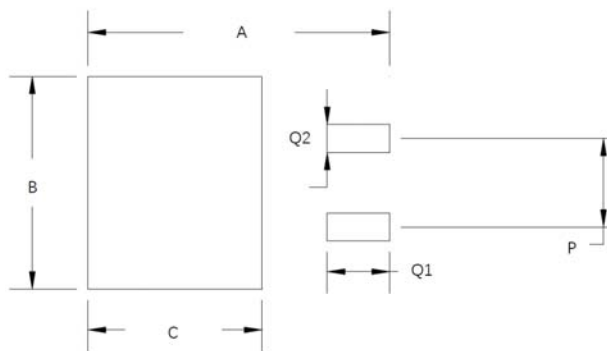
■ TO-252 Package information



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



Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with automotive electronics, are not designed for use in medical, life-saving, lifesustaining, or military, Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com) , or consult your nearest Yangjie's sales office for further assistance.