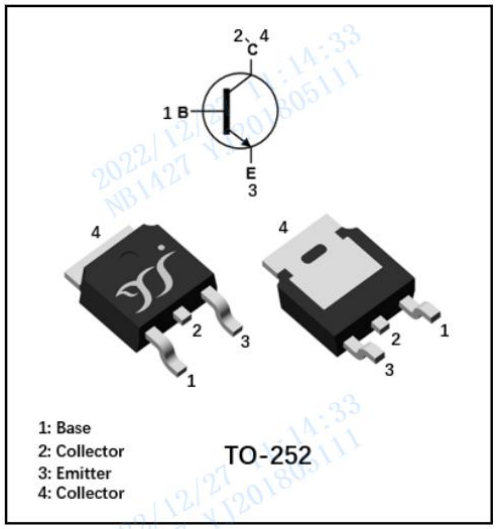
NPN Power Transistor



Features

- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1

Applications

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

Mehanical Data

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

■ Maximum Ratings (Ta=25℃ unless otherwise noted)

Item	Symbol	Unit	Value
Device marking code			MJD31C
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
Collector Base -Continuous	I_B	A	1
Total Device Dissipation (*)	P_D	W	1.25
Thermal Resistance, Junction to Ambient Air (*)	R_{thJA}	℃/W	100
Junction Temperature	T_j	℃	-55 to +150
Storage Temperature	T_{STG}	℃	-55 to +150

(*) Device mounted on FR-4 PCB 15 x 17 x 0.8 mm

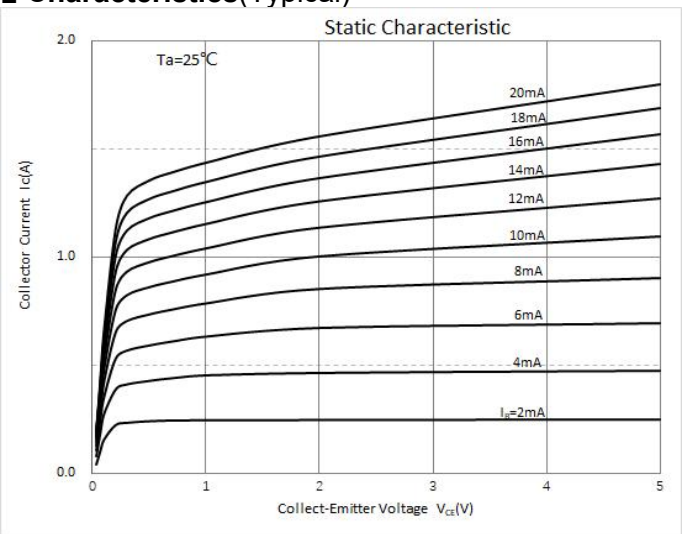
■ Electrical Characteristics (Ta=25℃ unless otherwise noted)

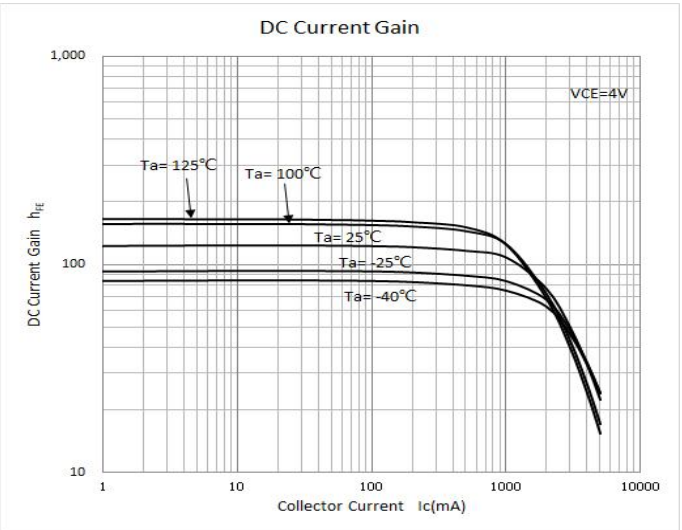
Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V_{CBO}	V	I_C= 1mA, I_E=0	100	-	-
Collector-emitter breakdown voltage	V_{CEO}	V	I_C= 30mA, I_B=0	100	-	-
Emitter-base breakdown voltage	V_{EBO}	V	I_E= 1mA, I_C=0	5	-	-
Collector- emitter cut-off current	I_{CEO}	uA	V_{CE}= 60V, I_B =0	-	-	50
Collector- emitter cut-off current	I_{CES}	uA	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

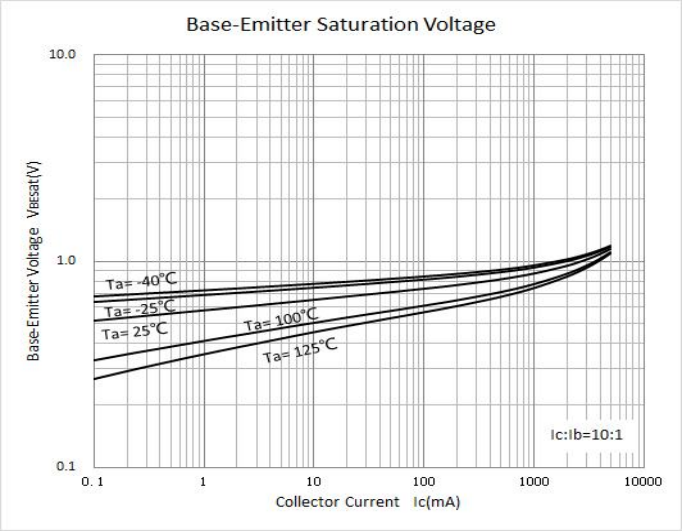
■ Other Characteristics (Ta=25℃ unless otherwise noted)

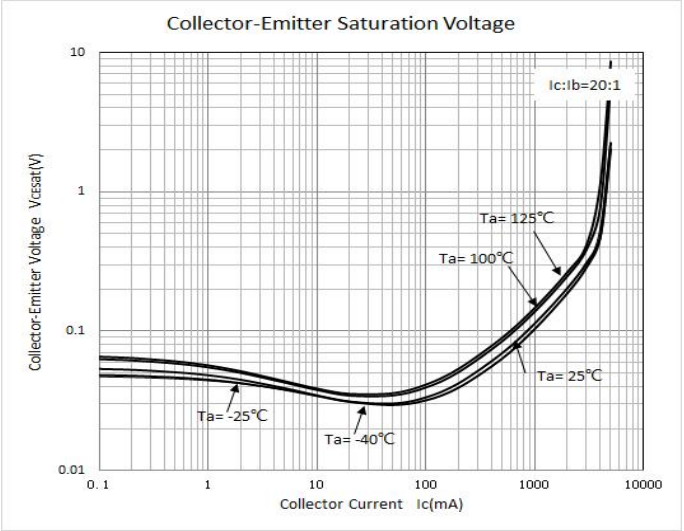
Item	Symbol	Unit	Conditions	Min	Typ	Max
Transition frequency	f_T	MHz	V_{CE}= 10V, I_C= 0.5A, f=1KHz	3	-	-

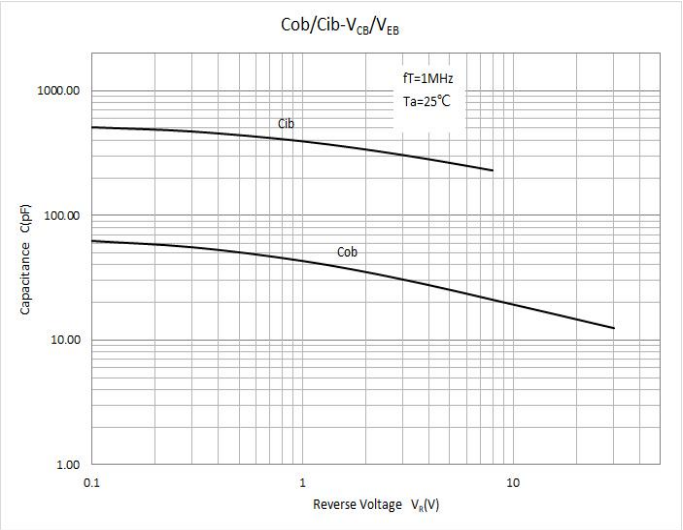
■ Characteristics(Typical)

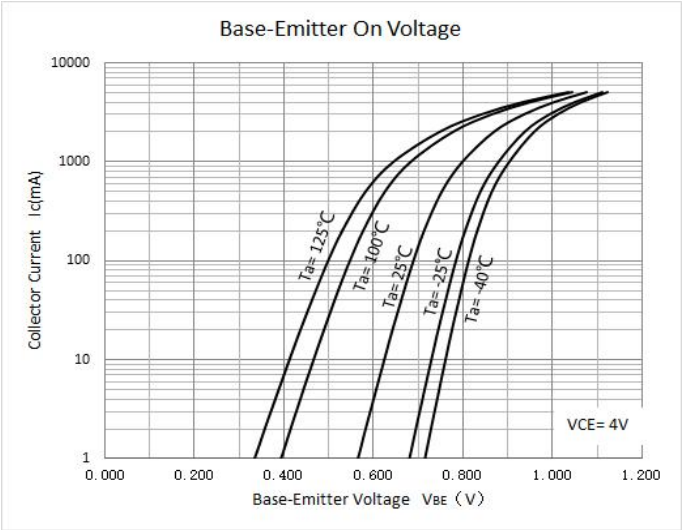


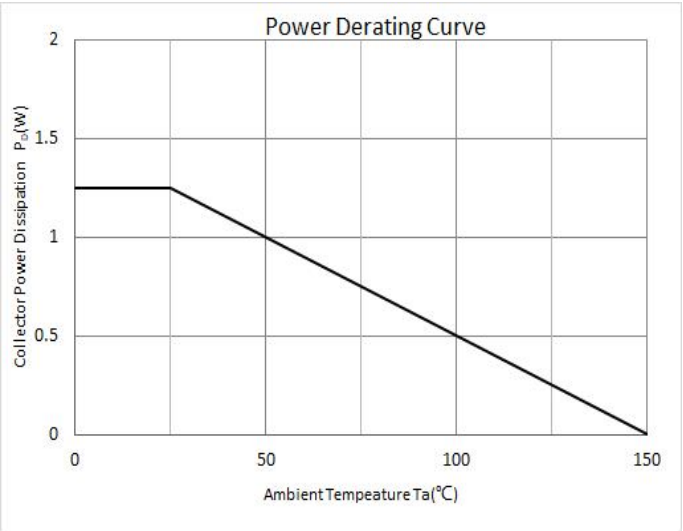


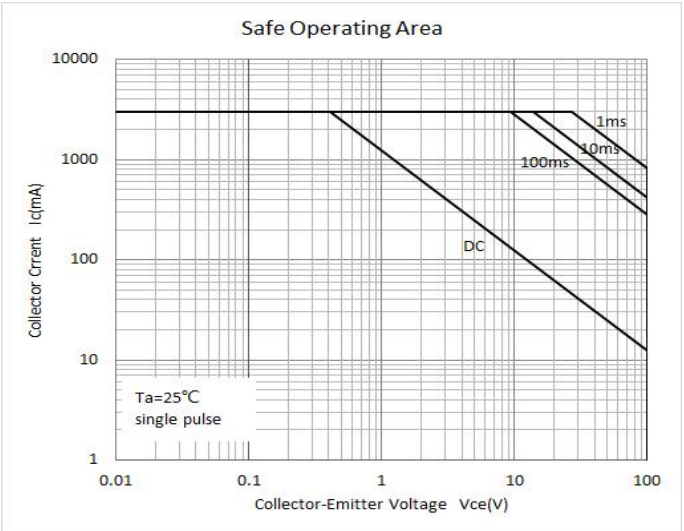

Base-Emitter Saturation Voltage
Base-Emitter Voltage VBEsat(V)
Collector Current Ic(mA)
Ta= -40℃
Ta= -25℃
Ta= 25℃
Ta= 100℃
Ta= 125℃
Ic:Ib=10:1


Collector-Emitter Saturation Voltage
Collector-Emitter Voltage Vcesat(V)
Collector Current Ic(mA)
Ic:Ib=20:1
Ta= 125℃
Ta= 100℃
Ta= 25℃
Ta= -25℃
Ta= -40℃


Cob/Cib-VCB/VEB
Capacitance C(pF)
Reverse Voltage VR(V)
fT=1MHz
Ta=25℃
Cib
Cob


Base-Emitter On Voltage
Collector Current Ic(mA)
Base-Emitter Voltage VBE（V）
Ta= 125℃
Ta= 100℃
Ta= 25℃
Ta= -25℃
Ta= -40℃
VCE= 4V

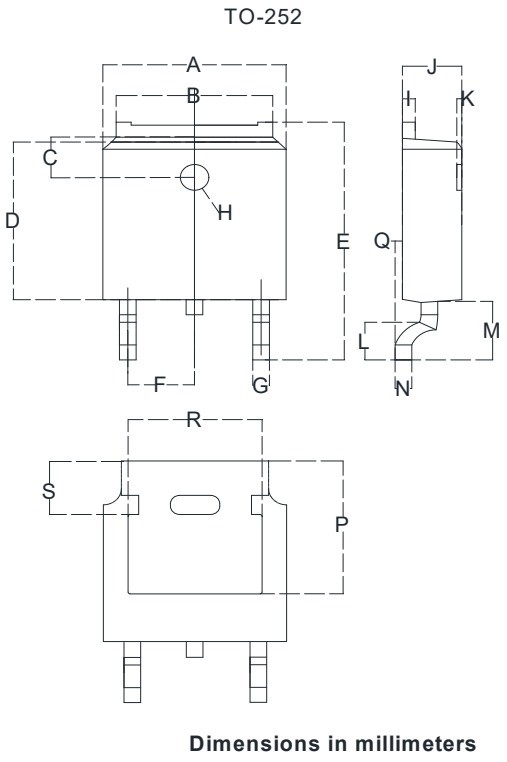

Power Derating Curve
Collector Power Dissipation PD(W)
Ambient Tempeature Ta(℃)


Safe Operating Area
Collector Crrent Ic(mA)
Collector-Emitter Voltage Vce(V)
1ms
10ms
100ms
DC
Ta=25℃
single pulse

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MJD31C	F1	2500	2500	25000	13”Reel

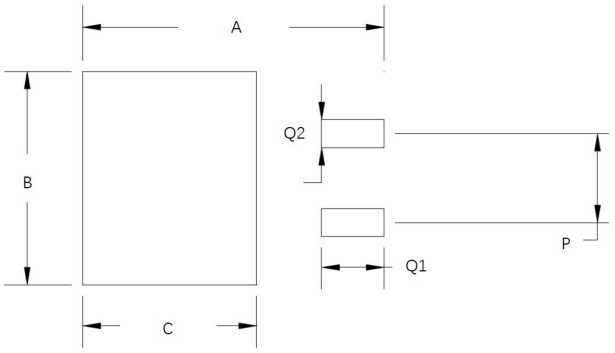
■ TO-252 Package information



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	Φ1.050	Φ1.350
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
P	5.15	5.45
Q	0	0.2
R	4.50	5.10
S	1.60	2.40

■ Suggested Pad Layout



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

Notice

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise. Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in STARSEA's terms and conditions of sale for such products, STARSEA assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of STARSEA products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.