

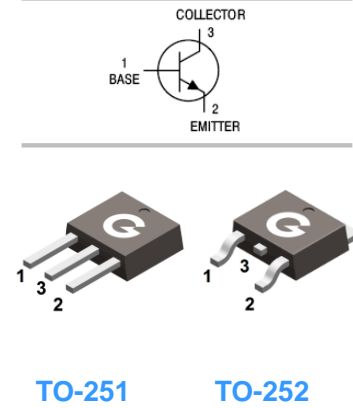
Features

- Lead formed for surface mount application
- Straight lead
- RoHS compliant with Halogen-free

HF

Mechanical Data

- Case: TO-251, TO-252
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
MJD31CI	TO-251	80 pcs / Tube	MJD31C
MJD31C	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	MJD31C

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Base Breakdown Voltage	V _{CB0}	100	V
Collector-Emitter Breakdown Voltage	V _{CEO}	100	V
Emitter-Base Breakdown Voltage	V _{EBO}	5	V
Collector Current (Continuous)	I _C	3	A
Collector Current (Peak)	I _{CM}	5	A
Base Current (continuous)	I _B	1	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T _A = 25°C) *1	P _D	3	W
Thermal Resistance Junction-to-Air *1	R _{θJA}	42	°C/W
Thermal Resistance Junction-to-Case *1	R _{θJC}	13	°C/W
Thermal Resistance Junction-to-Lead *1	R _{θJL}	5	°C/W
Junction Temperature Range	T _J	-65 ~ +150	°C
Storage Temperature Range	T _{STG}	-65 ~ +150	°C

Note 1: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	100	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 30\text{mA}, I_B = 0$	100	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\text{mA}, I_C = 0$	5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 100\text{V}, I_E = 0$	-	-	50	μA
Collector Cut-off Current	I_{CEO}	$V_{CE} = 60\text{V}, I_B = 0$	-	-	50	μA
Collector Cut-off Current	I_{CES}	$V_{CE} = 100\text{V}, V_{EB} = 0$	-	-	20	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	-	1	mA
DC Current Gain	h_{FE}	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	25	-	-	-
		$V_{CE} = 4\text{V}, I_C = 3\text{A}$	15	-	75	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 0.375\text{A}$	-	-	1.2	V
Base-emitter on voltage	$V_{BE(on)}$	$V_{CE} = 4\text{V}, I_C = 3\text{A}$	-	-	1.8	V
Transition Frequency	f_T	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}$	3	-	-	MHz

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

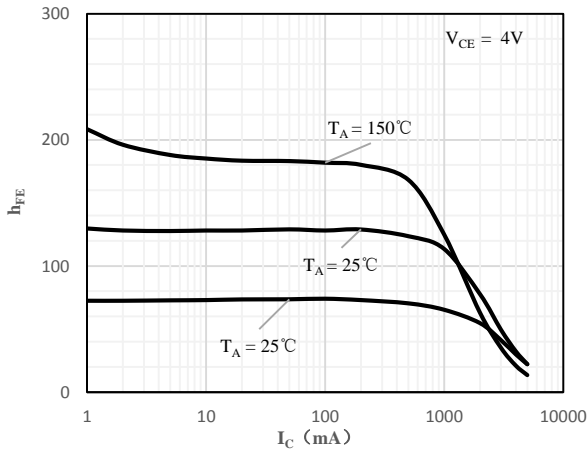


Fig 1 h_{FE} vs. I_C

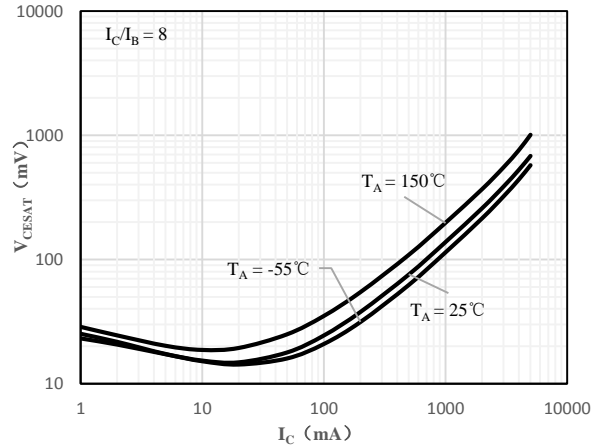


Fig 2 $V_{CE(sat)}$ vs. I_C

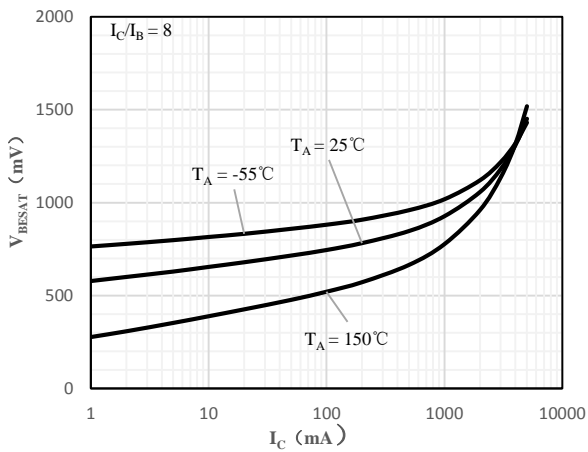


Fig 3 $V_{BE(sat)}$ vs. I_C

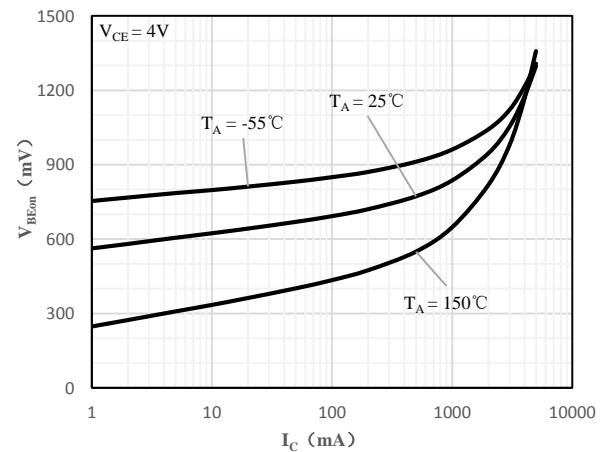


Fig 4 $V_{BE(ON)}$ vs. I_C

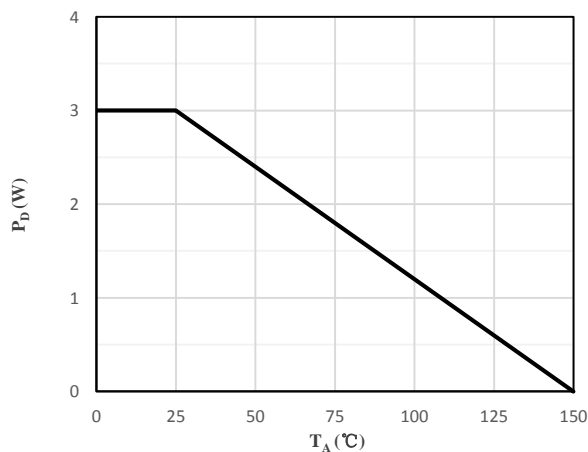


Fig 5 P_D vs. T_A

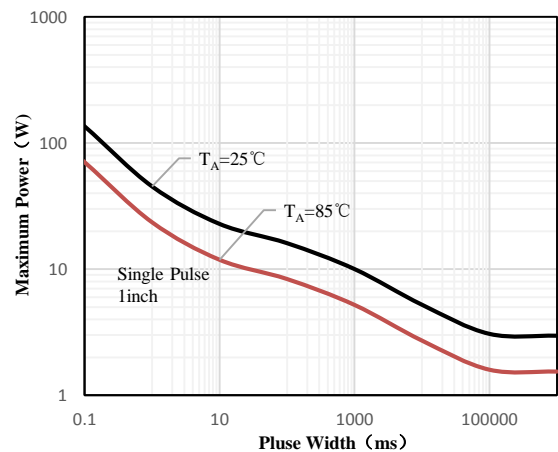


Fig 6 Pulse Power Dissipation

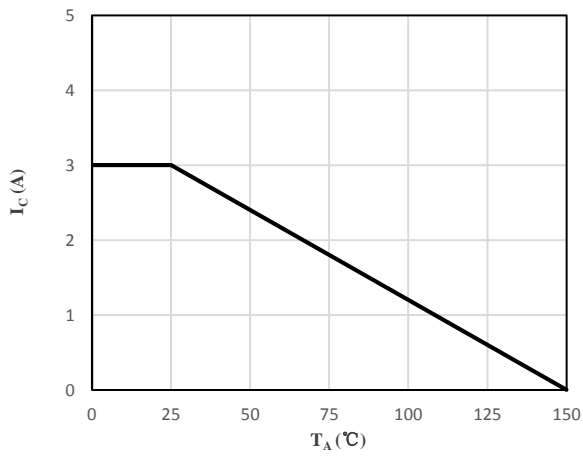


Fig 7 I_c vs. T_A

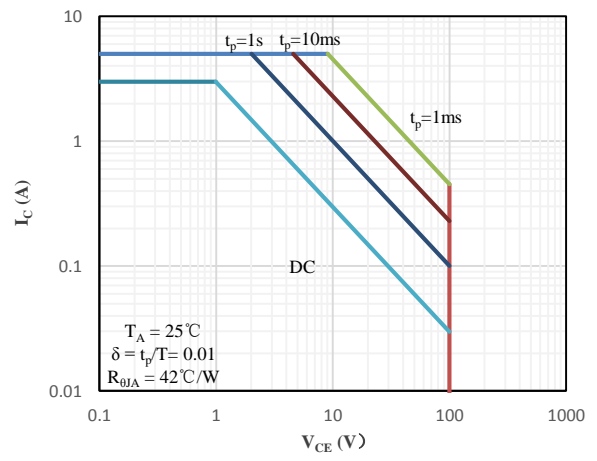
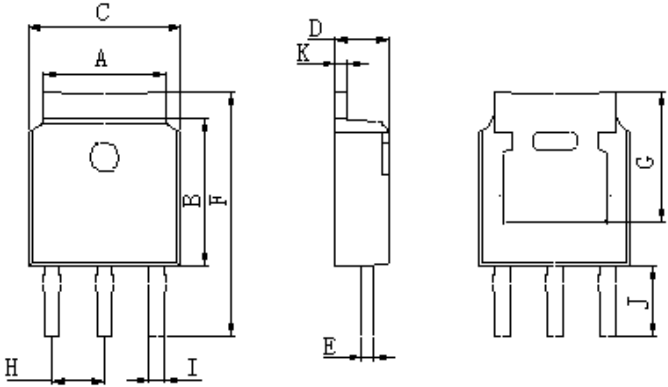
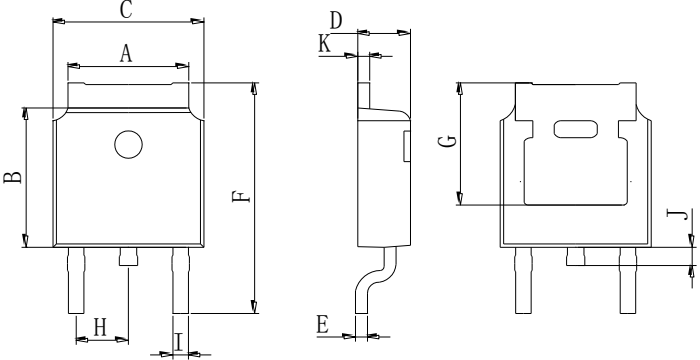


Fig 8 Safe Operating Area

Package Outline Dimensions (Unit: mm)

TO-251			
Dimension	Min.	Max.	
A	5.05	5.65	
B	5.80	6.40	
C	6.25	6.85	
D	2.20	2.40	
E	0.40	0.60	
F	11.00	11.60	
G	5.05	5.65	
H	2.10	2.50	
I	0.70	0.90	
J	4.00	4.40	
K	0.40	0.60	

TO-252			
Dimension	Min.	Max.	
A	5.05	5.65	
B	5.80	6.40	
C	6.25	6.85	
D	2.20	2.40	
E	0.40	0.60	
F	9.71	10.31	
G	5.05	5.65	
H	2.10	2.50	
I	0.70	0.90	
J	0.50	0.70	
K	0.40	0.60	

Mounting Pad Layout (Unit: mm)

TO-252
