NPN Transistors
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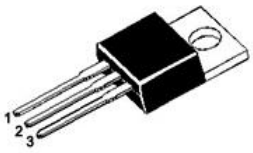
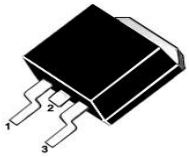


TO-220



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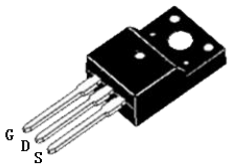
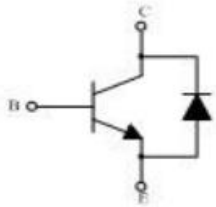


TO-220F



FEATURES

- High voltage
- High speed switching

APPLICATIONS

- High Speed Switching
- Suitable for Switching Regulator and Motor Control

MECHANICAL DATA

- **Case:** Molded plastic
- **Polarity:** As marked
- **Mounting Position:** Any
- **Molded Plastic:** UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275℃ maximum,10s per JESD 22-B106

Maximum Ratings at Ta=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	700	V
Collector Emitter Voltage	V_{CEO}	400	V
Emitter Base Voltage	V_{EBO}	9	V
Collector Current	I_C	5	A
Thermal Resistance from Junction to Ambient	R θJA	1.56	°C/W
Power Dissipation (Tc = 25 °C) Superimposed on Rated Load (JEDEC method)	P_{tot}	2	W
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at V_{CE} = 5 V, I_C = 2 A	h_{FE}	8	-	40	-
Collector Base Cutoff Current at V_{CB} = 700 V	I_{CBO}	-	-	100	μA
Collector Emitter Cutoff Current at V_{CE} = 400 V	I_{CEO}	-	-	100	μA
Emitter Base Cutoff Current at V_{EB} = 9 V	I_{EBO}	-	-	100	μA
Collector Emitter Saturation Voltage at I_C = 5 A, I_B =1A	$V_{CE(sat)}$	-	-	2	V
Base Emitter Saturation Voltage at I_C = 4A, V_{CE} = 1V	$V_{BE(sat)}$	-	-	1.6	V
Transition Frequency at VCE=10V ,IC=500mA, f=1MHZ	f_T	4	-	-	MHZ

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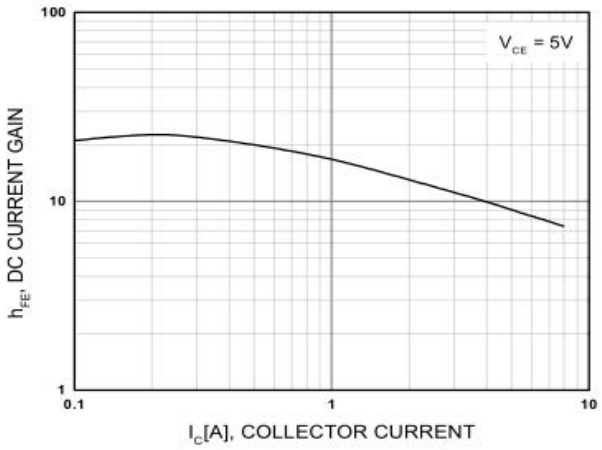
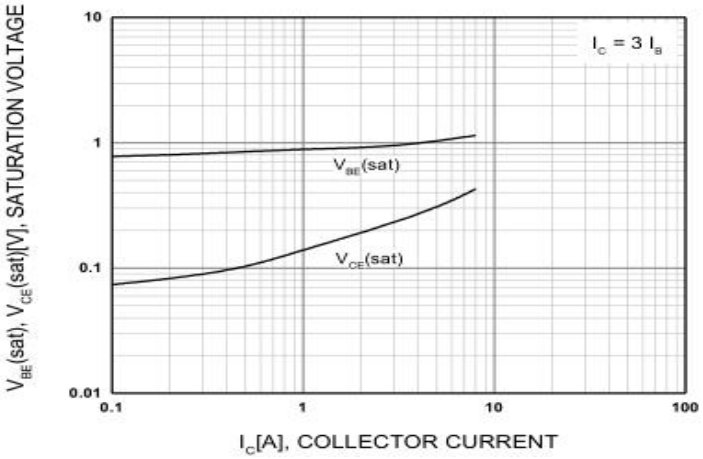
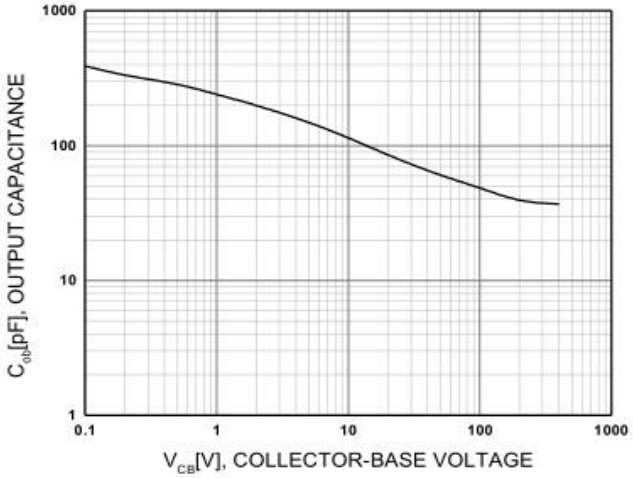
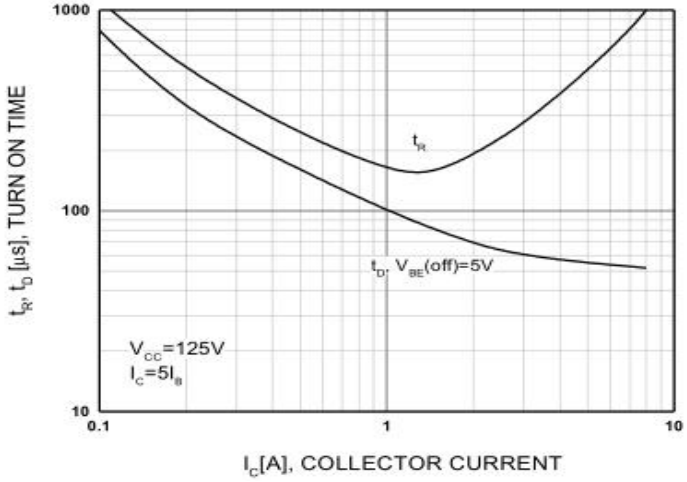
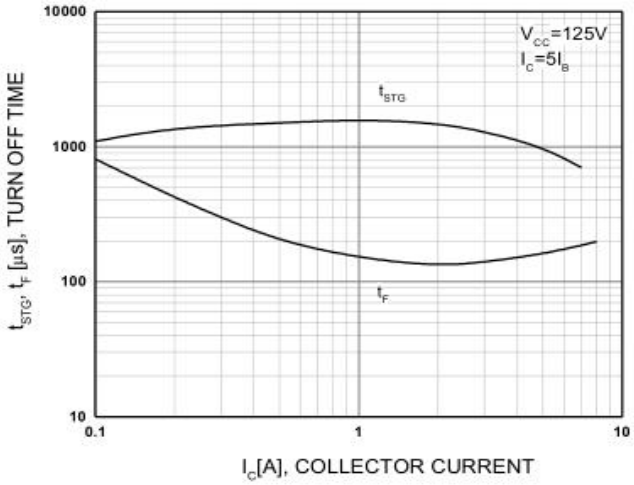
RATINGS AND CHARACTERISTIC CURVES

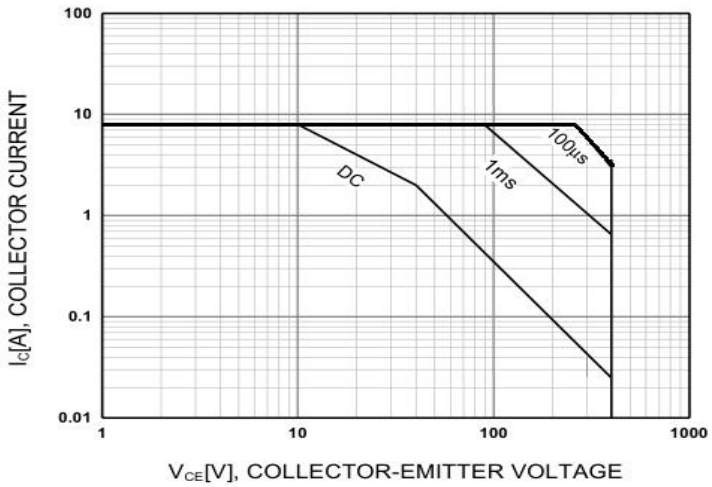












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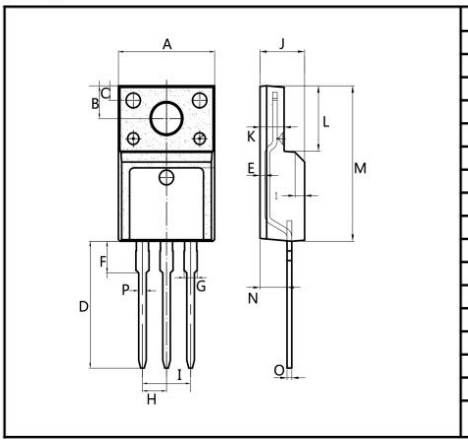
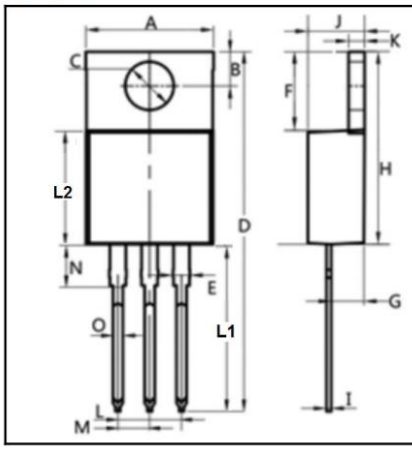
Package Outline Dimensions millimeters

TO-220F



Dim.	Min.	Max.
A	9.95	10.25
B	2.95	3.25
C	1.25	1.45
D	12.80	13.20
E	0.40	0.60
F	2.8	3.5
G	1.30	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.60	4.75
K	2.45	2. 65
L	6.5	6.8
M	15.4	16.0
N	2.75	3.05
O	0.45	0.55
P	0.70	0.90
All Dimensions in millimeter		

TO-220AB



Dim.	Min.	Max.
A	10.15	10.35
B	2.50	2.95
C	3.70	3.90
D	28.5	29.5
E	1.20	1.40
F	6.20	6.55
G	2.4	2.6
H	15.0	16.0
I	0.35	0.42
J	4.3	4.55
K	1.25	1.35
L	Typ5.08	
L1	13	14
L2	8.5	9.5
M	Typ2.54	
N	2.8	3.5
O	0.70	0.90
All Dimensions in millimeter		

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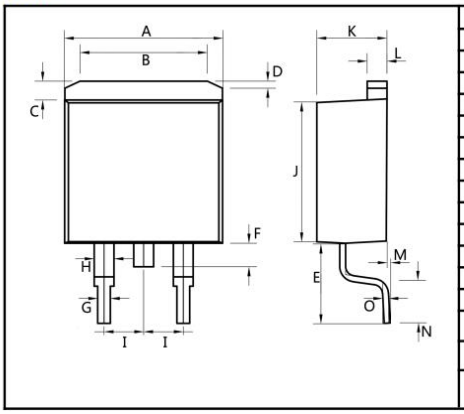

Dim.	Min.	Max.
A	10.15	10.35
B	6	8
C	1.2	1.5
D	0.55	1.0
E	5.0	6.0
F	1.4	1.6
G	0.75	0.85
H	1.2	1.5
I	Typ2.54	
J	8.5	9.5
K	4.3	4.55
L	1.25	1.35
M	0.02	0.23
N	2.2	2.8
O	0.30	0.40
All Dimensions in millimeter		