

FEATURES

- Low saturation voltage
- High current output up to 1.5A
- Complementary to 2SA940
- High Stability and High Reliability

MECHANICAL DATA

- Case: TO-220, ITO-220, TO-263, TO-126, TO-251, TO-252 Package
- Terminals: Plated solderable per MIL-STD-750, method 2026
- Mounting Position: Any

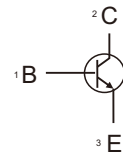
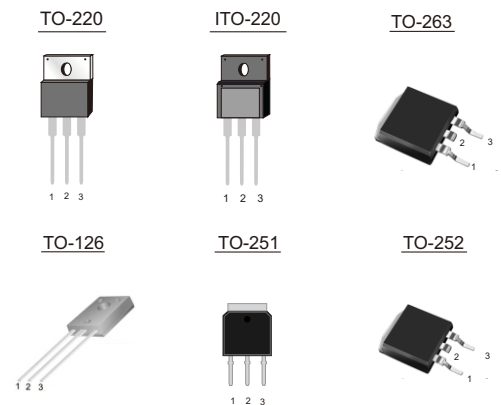


Table1 Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Unit	Value		
Collector-Emitter Voltage	V_{CEO}	V	150		
Collector-Base Voltage	V_{CBO}	V	150		
Emitter-Base Voltage	V_{EBO}	V	5.0		
Collector Current (DC)	I_C	A	1.5		
Collector Current (Pulse)	I_{CP}	A	3		
Base Current (DC)	I_B	A	0.5		
Power Dissipation $T_C=25^{\circ}\text{C}$	P_D	W	TO-220/TO-263/ TO-252/TO-251	ITO-220	ITO-126
			25	18	12.5
Operation Junction Temperature	T_J	$^{\circ}\text{C}$	-55 to +150		
Storage Temperature	T_{STG}	$^{\circ}\text{C}$	-55 to +150		

Table 2. Thermal Characteristics

Parameter	Symbol	TO-220/TO-263/ TO-252/TO-251	ITO-220	ITO-126	Unit
Thermal resistance Junction to Case	$R_{\theta JC}$	5.0	7.0	10.0	$^{\circ}\text{C}/\text{W}$

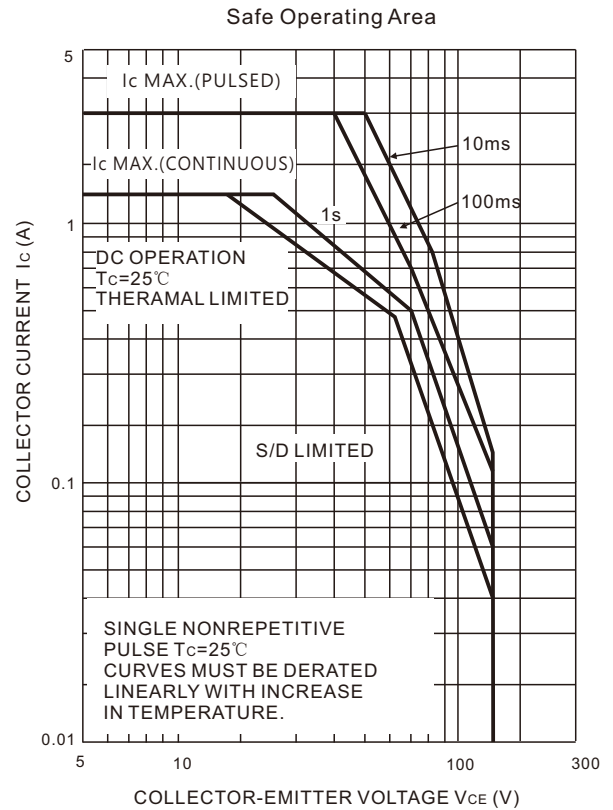
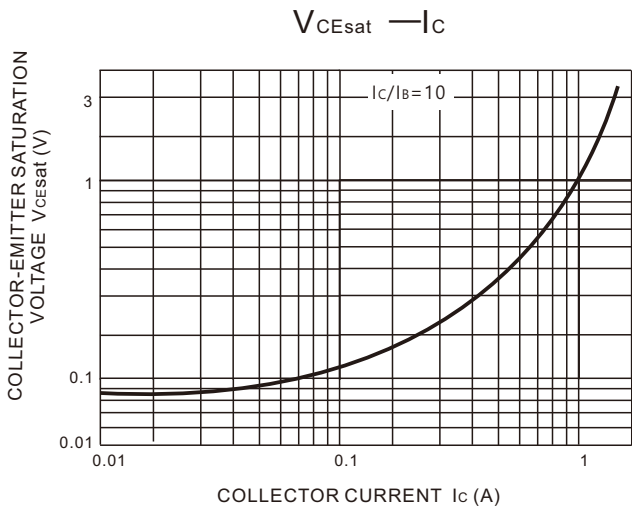
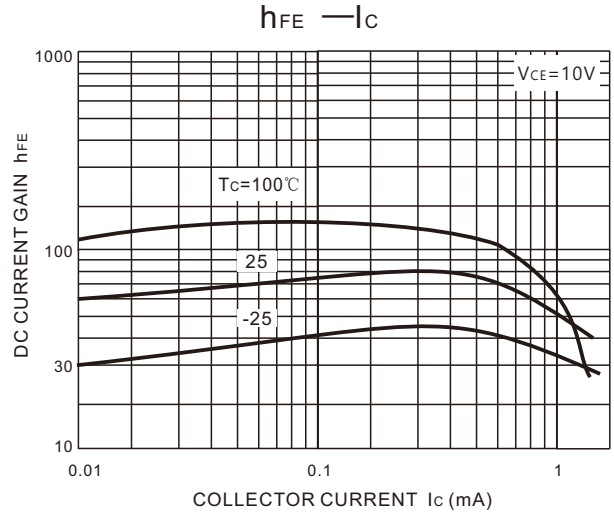
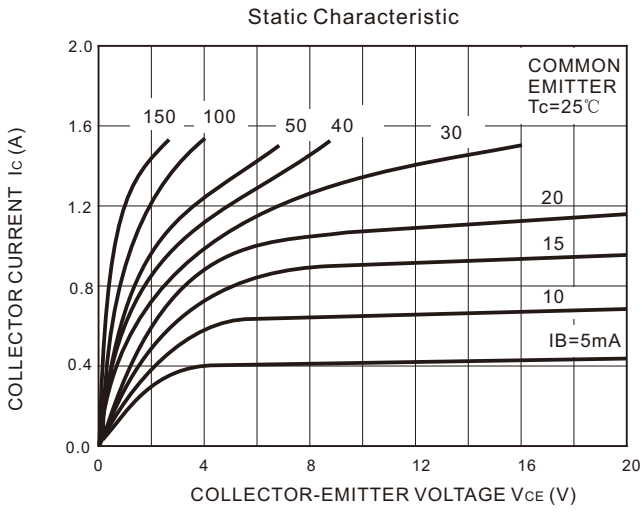
ELECTRICAL CHARACTERISTICS($T_C=25^{\circ}\text{C}$ Unless otherwise specified)

Parameter	Symbol	Unit	Conditions	Min	Max
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	V	$I_C=10\text{mA}, I_B=0$	150	---
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	V	$I_C=100\mu\text{A}, I_E=0$	150	---
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	V	$I_E=100\mu\text{A}, I_C=0$	5.0	---
Collector cut-off Current	I_{CEO}	μA	$V_{CE}=150\text{V}, I_B=0$	---	100
Collector -emitter cut-off Current	I_{CES}	μA	$V_{CE}=150\text{V}$	---	100
Emitter cut-off Current	I_{EBO}	μA	$V_{EB}=5\text{V}, I_C=0$	---	100
DC Current Gain	$h_{FE(1)}$		$I_C=10\text{mA}, V_{CE}=5\text{V}$	30	300
	$h_{FE(2)}$		$I_C=500\text{mA}, V_{CE}=5\text{V}$	60	180
	$h_{FE(3)}$		$I_C=2\text{A}, V_{CE}=5\text{V}$	15	300
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V	$I_C=0.5\text{A}, I_B=50\text{mA}$	---	0.60
			$I_C=1\text{A}, I_B=100\text{mA}$	---	0.80
			$I_C=2\text{A}, I_B=200\text{mA}$	---	1.20
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V	$I_C=2\text{A}, I_B=200\text{mA}$	---	1.50
Transition frequency	f_T	MHZ	$I_C=500\text{mA}, V_{CE}=10\text{V}$ $f=1.0\text{MHZ}$	4	---

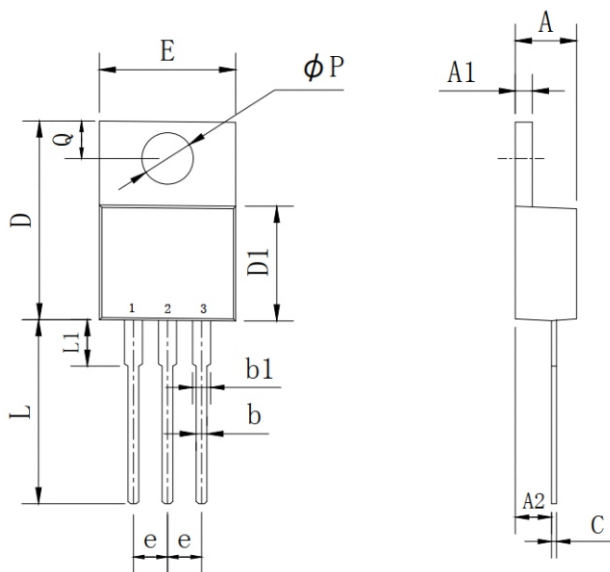
CLASSIFICATION OF $h_{FE(2)}$

h_{FE}	60-180					
Rank	1	2	3	4	5	6
Range	60-80	80-100	100-120	120-140	140-160	160-180

Characteristics(Typical)

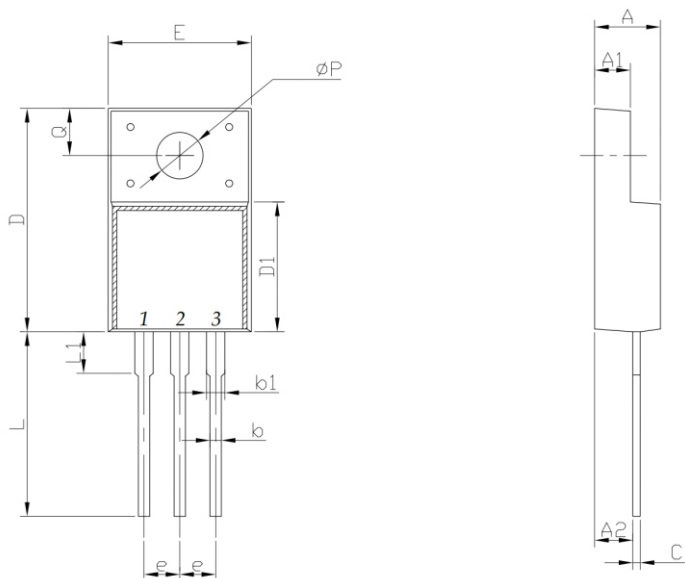


TO-220 PACKAGE OUTLINE DIMENSIONS



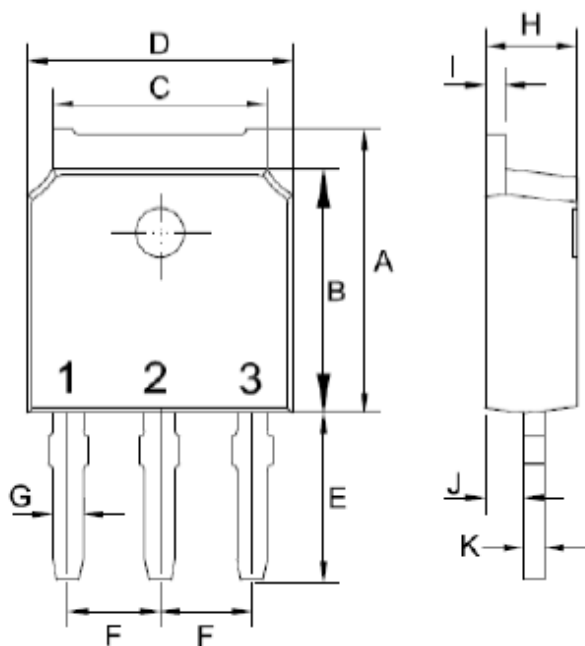
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	2.03	2.92	0.080	0.115
b	0.51	1.11	0.020	0.044
b1	0.97	1.6	0.038	0.063
C	0.3	0.7	0.012	0.028
D	14.6	15.9	0.575	0.626
D1	8.04	9.3	0.317	0.366
E	9.57	10.57	0.377	0.416
e	2.34	2.74	0.092	0.108
L	12.58	14.3	0.495	0.563
L1	2.8	4.2	0.110	0.165
P	3.4	4.14	0.134	0.163
Q	2.45	3	0.096	0.118

ITO-220 PACKAGE OUTLINE DIMENSIONS



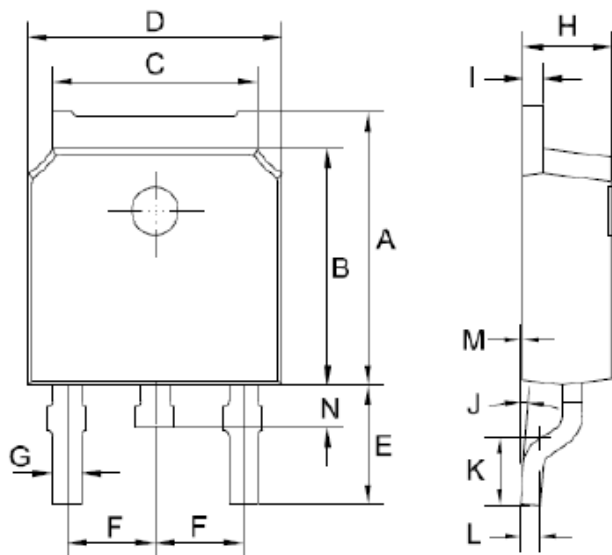
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.24	4.9	0.167	0.193
A1	2.3	2.92	0.091	0.115
A2	2.61	2.81	0.103	0.111
b	0.3	1	0.012	0.039
b1	0.9	1.55	0.035	0.061
C	0.3	0.7	0.012	0.028
D	14.5	16.36	0.571	0.644
D1	8.8	9.41	0.346	0.370
E	9.5	10.5	0.374	0.413
e	2.3	2.75	0.091	0.108
L	12.6	14	0.496	0.551
L1	2.45	4.3	0.096	0.169
P	2.9	3.8	0.114	0.150
Q	2.5	3.55	0.098	0.140

TO-251 PACKAGE OUTLINE DIMENSIONS



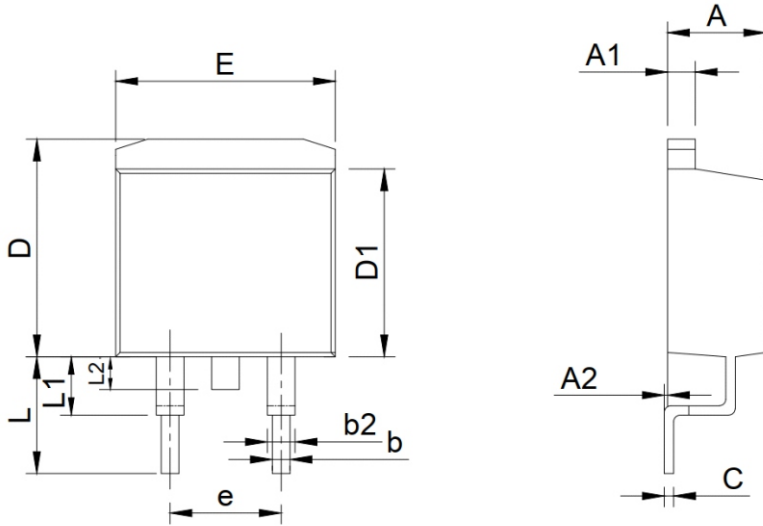
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	3.5	4.35	0.138	0.171
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0.71	1.31	0.028	0.052
K	0.41	0.61	0.016	0.024

TO-252 PACKAGE OUTLINE DIMENSIONS



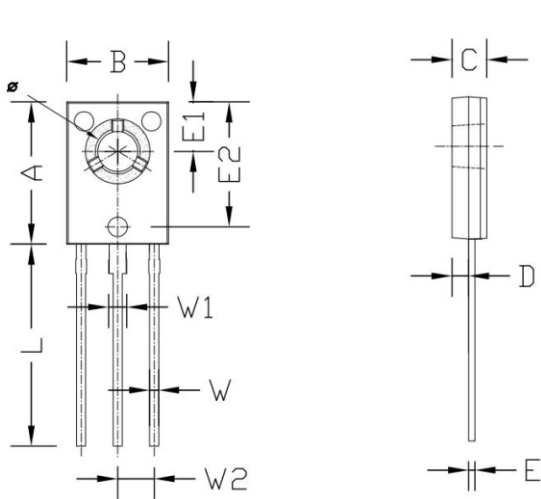
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	2.6	3.3	0.102	0.130
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0.71	1.31	0.028	0.052
K	1.45	1.85	0.057	0.073
L	0.41	0.61	0.016	0.024
M	0	0.12	0.000	0.005
P	0.6	1	0.024	0.039

TO-263 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	0	0.25	0.000	0.010
b	0.61	1.01	0.024	0.040
b1	1.2	1.34	0.047	0.053
C	0.3	0.6	0.012	0.024
D	9.48	10.84	0.373	0.427
D1	8.49	9.3	0.334	0.366
E	9.7	10.31	0.382	0.406
e	4.88	5.28	0.192	0.208
L	4.46	5.85	0.176	0.230
L1	1.33	2.33	0.052	0.092
L2	0	2.2	0.000	0.087

TO-126 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	10.50	11.10	0.413	0.437
B	7.65	7.95	0.301	0.313
C	2.50	2.80	0.098	0.110
D	1.45	1.75	0.057	0.069
E	0.40	0.60	0.016	0.024
E1	3.65	3.85	0.144	0.152
E2	9.40	9.60	0.370	0.378
L	15.4	15.9	0.606	0.626
W	0.60	0.80	0.024	0.031
W1	1.20	1.30	0.047	0.051
W2	2.32 TYP		0.091 TYP	
Φ	3.05	3.35	0.120	0.132

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