RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

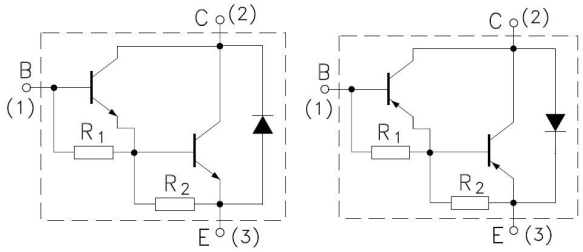
TIP120 THRU TIP127

DARLINGTON PLASTIC POWER TRANSISTORS

NPN	PNP
TIP120	TIP125
TIP121	TIP126
TIP122	TIP127

- High Power Switching
- Hammer Drive
- Pulse Motor Drive and Inductive Load Drive Applications

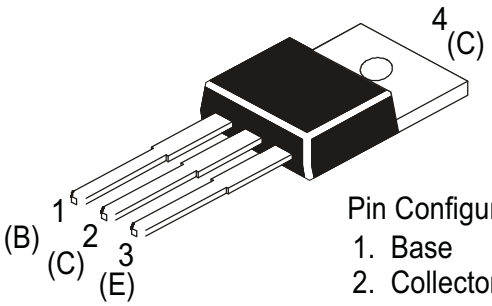
Internal Schematic Diagram



NPN:R1~8K Ohm R2~120 Ohm

PNP:R1~8K Ohm R2~120 Ohm

TO-220 Plastic Package



Pin Configuration
1. Base
2. Collector
3. Emitter
4. Collector

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION		TIP120/125	TIP121/126	TIP122/127	UNIT
Collector Emitter Voltage	V_{CEO}	60	80	100	V
Collector Base Voltage	V_{CBO}	60	80	100	V
Emitter Base Voltage	V_{EBO}	5			V
Collector Current Continuous	I_C	5			A
Collector Current Peak	I_{CM}	8			A
Base Current	I_B	120			mA
Power Dissipation upto T_c=25ºC Derate above 25ºC	P_D	65 0.52			W W/ºC
Power Dissipation upto T_a=25ºC Derate above 25ºC	P_D	2 16			W mW/ºC
Unclamped Inductive Load Energy	*E	50			mJ
Operating And Storage Junction Temperature	T_j, T_{stg}	- 65 to +150			ºC

*** I_C=1A, L=100mH, P.R.F.=10Hz, Vcc=20V, R_{BE}=100Ω**

THERMAL RESISTANCE

Junction to Case	$R_{th\ (j-c)}$	1.92	ºC/W
Junction to Ambient in free air	$R_{th\ (j-a)}$	62.5	ºC/W

2020-04/38
REV:A

ELECTRICAL CHARACTERISTICS (T_C=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	TIP120/125		TIP121/126		TIP122/127		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
Collector Emitter (sus) Voltage	*$V_{CEO(sus)}$	I_C=100mA, I_B=0	60		80		100		V
Collector Cut Off Current	I_{CEO}	V_{CE}=50V, I_B=0						0.5	mA
		V_{CE}=40V, I_B=0				0.5			mA
		V_{CE}=30V, I_B=0		0.5					mA
Collector Cut Off Current	I_{CBO}	V_{CB}=100V, I_E=0						0.2	mA
		V_{CB}=80V, I_E=0				0.2			mA
		V_{CB}=60V, I_E=0		0.2					mA
Emitter Cut Off Current	I_{EBO}	V_{EB}=5V, I_C=0		2.0		2.0		2.0	mA
DC Current Gain	*h_{FE}	I_C=0.5A,V_{CE}=3V	1000		1000		1000		
		I_C=3A, V_{CE}=3V	1000		1000		1000		
Collector Emitter Saturation Voltage	*$V_{CE\ (sat)}$	I_C=3A, I_B=12mA		2.0		2.0		2.0	V
		I_C=5A, I_B=20mA		4.0		4.0		4.0	V
Base Emitter On Voltage	*$V_{BE\ (on)}$	I_C=3A,V_{CE}=3V		2.5		2.5		2.5	V

***Pulse Test : Pulse width ≤300µs, Duty Cycle ≤2%**

ELECTRICAL CHARACTERISTICS (T_C=25ºC unless specified otherwise)

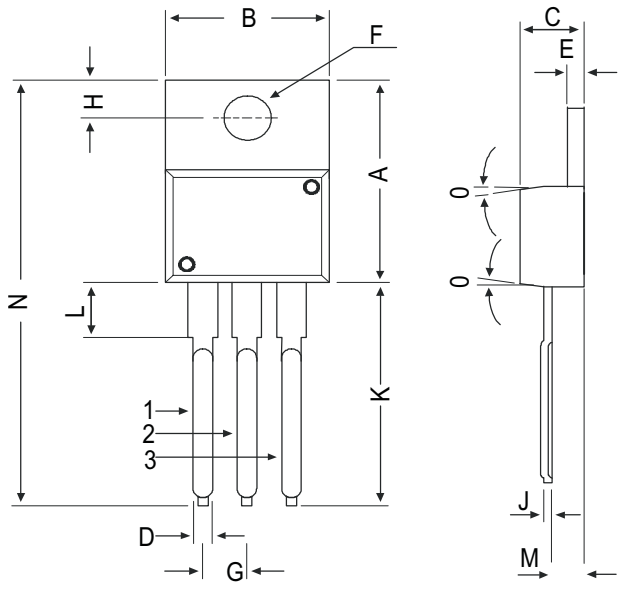
DYNAMIC CHARACTERISTIC

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Small Signal Current Gain	h_{fe}	I_C=3A,V_{CE}=4V, f=1MHz	4			
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=0.1MHz				
		TIP125,126,127			300	pF
		TIP120,121,122			200	pF

SWITCHING CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Turn on time	t_{on}	I_C=3A, R_L=10Ω		0.4		µs
		I_{B1}=I_{B2}=12mA				
Turn off time	t_{off}	$V_{EB\ (off)}$=5V		1.2		µs

TO-220 Plastic Package



DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	—	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	—	31.24
O	7 DEG	

All diminsions in mm.

PACKAGING OF DIODE AND BRIDGE RECTIFIERS

TUBE PACK

PACKAGE	PACKING CODE	EA PER BOX	INNER BOX SIZE (mm)	CARTON SIZE (mm)	EA PER CARTON	WEIGHT(Kg)
(I)TO-220/TO-220(A)	-C	2,000	550*140*92	572*308*120	4,000	11.80

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