ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

TIP150, TIP151, TIP152
Silicon NPN Power Darlington Transistor
TO–220 Type Package

Description:

The TIP150, TIP151, and TIP152 are silicon NPN power Darlington transistors in a TO–220 type package designed for use in automotive ignition, switching, and motor control applications.

Features:

- Collector–Emitter Sustaining Voltage:
  $V_{CEO(sus)}$ = 300V min (TIP150)
  $V_{CEO(sus)}$ = 350V min (TIP151)
  $V_{CEO(sus)}$ = 400V min (TIP152)
- Collector–Emitter Saturation Voltage: $V_{CE(sat)}$ = 2V max at I_C = 5A
- Reverse–Base SOA: 300V to 400V at 7A

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}
- TIP150 . . . . . 300V
- TIP151 . . . . . 350V
- TIP152 . . . . . 400V

Collector–Base Voltage, V_{CBO}
- TIP150 . . . . . 300V
- TIP151 . . . . . 350V
- TIP152 . . . . . 400V

Emitter–Base Voltage, V_{EBO} 8V

Collectoer Current, I_C
- Continuous 7A
- Peak 10A

Base Current, I_B 1.5A

Total Power Dissipation (T_C = +25°C), P_D 80W
- Derate above 25°C . . . . . 0.64W/°C

Operating Junction Temperature Range, T_J . . . . . –65° to +150°C

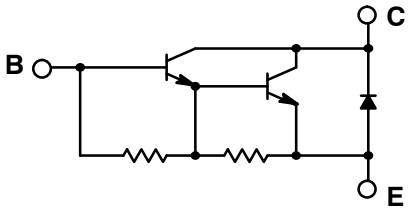
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C

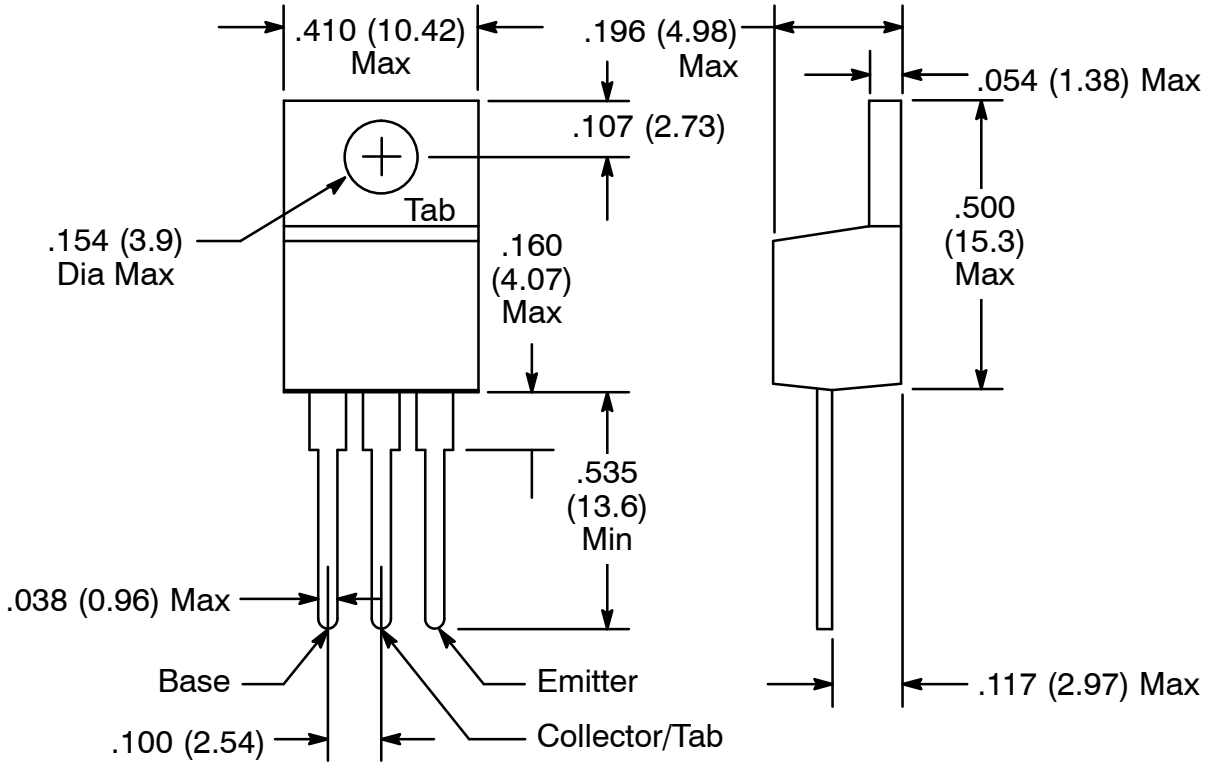
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.56°C/W

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage TIP150	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0, Note 1	300	–	–	V
TIP151			350	–	–	V
TIP152			400	–	–	V
Collector–Base Breakdown Voltage TIP150	$V_{(BR)CBO}$	I_C = 1mA, I_B = 0, Note 1	300	–	–	V
TIP151			350	–	–	V
TIP152			400	–	–	V
Collector Cutoff Current TIP150	I_{CEO}	V_{CE} = 300V, I_B = 0	–	–	250	μA
TIP151		V_{CE} = 350V, I_B = 0	–	–	250	μA
TIP152		V_{CE} = 400V, I_B = 0	–	–	250	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 8V, I_C = 0	–	–	15	mA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 2.5A	150	–	–	
		V_{CE} = 5V, I_C = 5.0A	50	–	–	
		V_{CE} = 5V, I_C = 7.0A	15	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 1A, I_B = 10mA	–	–	1.5	V
		I_C = 2A, I_B = 100mA	–	–	1.5	V
		I_C = 5A, I_B = 250mA	–	–	2.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 2A, I_B = 100mA	–	–	2.2	V
		I_C = 5A, I_B = 250mA	–	–	2.3	V
Diode Forward Voltage	V_F	I_F = 7A	–	–	3.5	V
Dynamic Characteristics						
Small–Signal Current Gain	h_{fe}	V_{CE} = 5V, I_C = 500mA, f = 1kHz	200	–	–	
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	–	–	150	pF
Switching Characteristics						
Delay Time	t_d	V_{CC} = 250V, I_C = 5A, I_{B1} = $-I_{B2}$ = 250mA, t_p = 20μs, Duty Cycle ≤ 2%	–	30	–	ns
Rise Time	t_r		–	180	–	ns
Storage Time	t_s		–	3.5	–	ns
Fall Time	t_f		–	1.6	–	ns

Note 1. Pulse test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.


B
C
E


.410 (10.42)
Max
.196 (4.98)
Max
.054 (1.38) Max
.107 (2.73)
Tab
.154 (3.9)
Dia Max
.160
(4.07)
Max
.500
(15.3)
Max
.535
(13.6)
Min
.038 (0.96) Max
Base
Emitter
.117 (2.97) Max
.100 (2.54)
Collector/Tab