TIP140

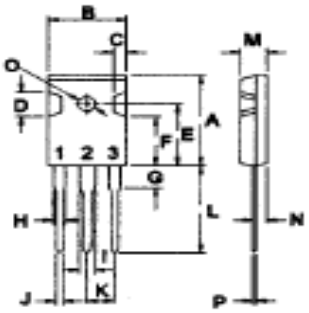
Darlington Transistors

multicomp

Features:

Designed for general-purpose amplifier and low speed switching applications.

- Collector-Emitter sustaining voltage-$V_{CEO\ (sus)}$ = 60V (Minimum) - TIP140
- Collector-Emitter saturation voltage-$V_{CE\ (sat)}$ = 2.5V (Maximum) at I_C = 5.0A.
- Monolithic construction with built-in-base-emitter shunt resistor.



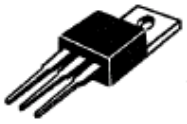
Pin 1. Base
2. Collector
3. Emitter

Dimension	Minimum	Maximum
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

Dimensions : Millimetres

NPN
TIP140

10 Ampere
Darlington
Complementary Silicon
Power Transistors
60 Volts
125 Watts



TO-247 (3P)

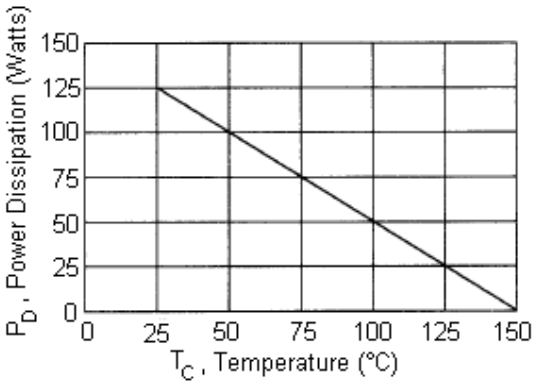
Maximum Ratings

Characteristic	Symbol	TIP140	Unit
Collector-Emitter Voltage	V_{CEO}	60	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5.0	
Collector Current-Continuous Peak	I_C I_{CM}	10 15	A
Base Current	I_B	0.5	A
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	125 1.0	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	Rθjc	1.0	°C/W

Figure 1 Power Derating

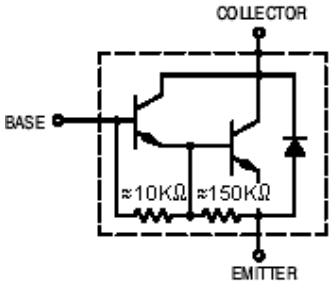


Electrical Characteristics (T_C = 25°C unless otherwise noted)

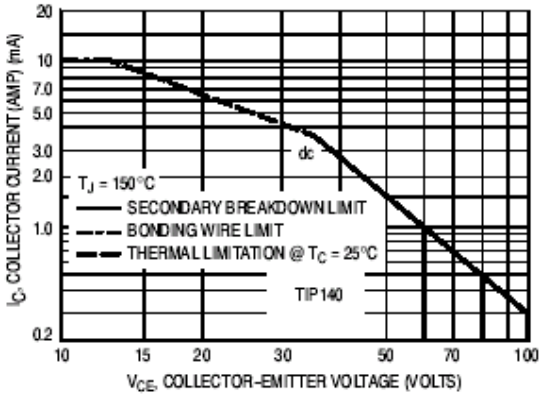
Characteristic		Symbol	Minimum	Maximum	Unit
OFF Characteristics					
Collector-Emitter Sustaining Voltage (1) (I_C = 30mA, I_B = 0)		$V_{CEO\ (sus)}$	60	-	V
Collector Cut off Current (V_{CE} = 30V, I_B = 0)		I_{CEO}	-	2.0	mA
Collector Cut off Current (V_{CB} = 60V, I_E = 0)		I_{CBO}	-	1.0	
Emitter Cut off Current (V_{EB} =5.0V, I_C = 0)		I_{EBO}	-	2.0	
ON Characteristics (1)					
DC Current Gain (I_C = 5.0A, V_{CE} = 4.0V) (I_C = 10A, V_{CE} = 40V)		hFE	1000 500	-	-
Collector-Emitter Saturation Voltage (I_C = 5.0A, I_B = 10mA) (I_C = 10A, I_B = 40mA)		$V_{CE\ (sat)}$	-	2.0 3.0	V
Base-Emitter Saturation Voltage (I_C = 10A, I_B = 40mA)		$V_{BE\ (sat)}$		3.5	
Base-Emitter On Voltage (I_C = 10A, V_{CE} = 4.0V)		$V_{BE\ (on)}$	-	3.0	
Switching Characteristics					
Delay Time	V_{CC} = 30V, I_C = 5.0A I_{B1} = -I_{B2} = 20mA t_P = 20ms, Duty Cycle £2.0%	t_d	0.15 (Typical)	-	µs
Rise Time		t_r	0.55 (Typical)	-	
Storage Time		t_s	2.50 (Typical)	-	
Fall Time		t_f	2.50 (Typical)	-	

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2.0%.

Internal Schematic Diagram



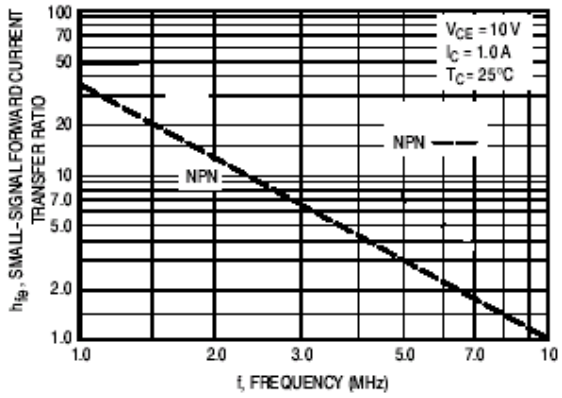
Active Region Safe Operating Area (SOA)



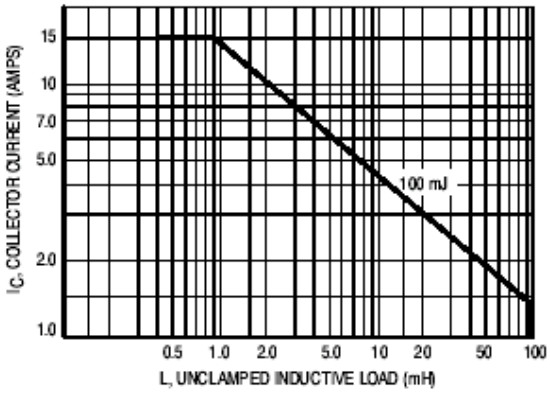
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is based on $T_{J\,(PK)}$ = 150°C; T_C is variable depending on conditions. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

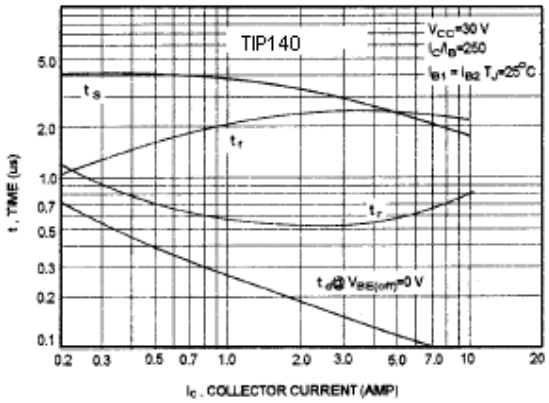
Small-Signal Common-Emitter Forward Current Transfer Ratio



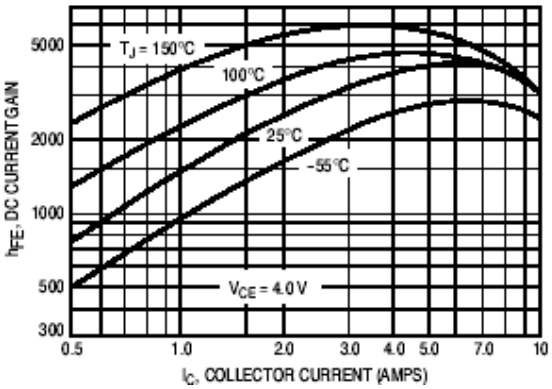
Unclamped Inductive Load



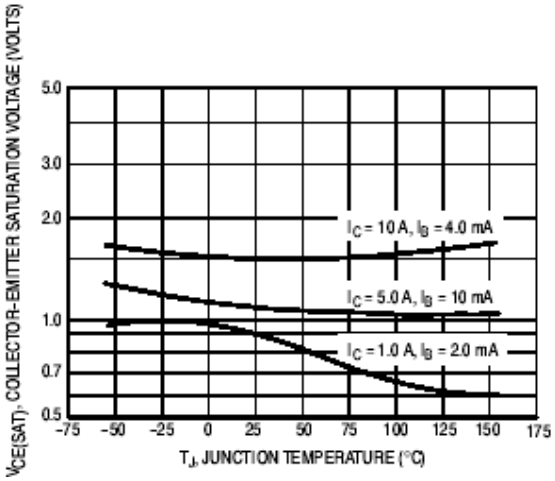
Switching Time



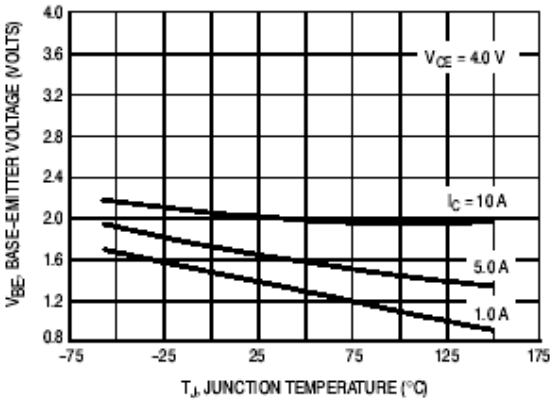
DC Current Gain



Collector-Emitter Saturation Voltage



Base-Emitter Voltage



Specifications

$I_{C\ (av)}$ maximum (A)	V_{CEO} maximum V	h_{FE} minimum at I_C = 5A	P_{tot} at 25°C (W)	Package	Type	Part Number
10	60	1000	125	TO-220	NPN	TIP140

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