TIP142
TIP147

Complementary power Darlington transistors

Features

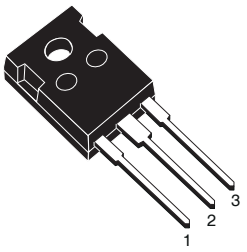
- Monolithic Darlington configuration
- Integrated antiparallel collector-emitter diode

Applications

- Linear and switching industrial equipment

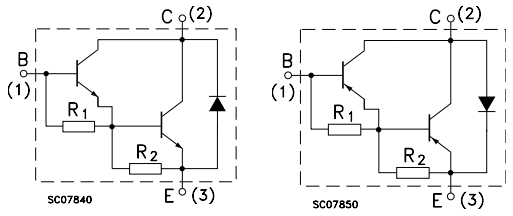
Description

The TIP142 is an Epitaxial-base NPN power transistor in monolithic Darlington configuration, mounted in TO-247 plastic package. It is intended for use in power linear and switching applications. The PNP complementary type is TIP147.



TO-247

Figure 1. Internal schematic diagrams



R_1 typ. =5 KΩ R_2 typ. =150 Ω

Table 1. Device summary

Part number	Marking	Package	Packaging
TIP142	TIP142	TO-247	Tube
TIP147	TIP147		

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter		Value	Unit
		NPN	TIP142	
		PNP	TIP147	
V_{CBO}	Collector-base voltage (I_E = 0)		100	V
V_{CEO}	Collector-emitter voltage (I_B = 0)		100	V
V_{EBO}	Emitter-base voltage (I_C = 0)		5	V
I_C	Collector current		10	A
I_{CM}	Collector peak current		20	A
I_B	Base current		0.5	A
P_{TOT}	Total dissipation at T_{case} = 25°C		125	W
T_{stg}	Storage temperature		-65 to 150	°C
T_J	Max. operating junction temperature		150	°C

For PNP type voltage and current are negative.

Table 3. Thermal data

Symbol	Parameter		Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	1	°C/W

2 Electrical characteristics

(T_{case} = 25°C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 100 V			1	mA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 50 V			2	mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			2	mA
$V_{CEO(sus)}$ (1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 30 mA	100			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 5 A I_B = 10 mA I_C = 10 A I_B = 40 mA			2 3	V V
$V_{BE(on)}$ (1)	Base-emitter on voltage	I_C = 10 A V_{CE} = 4 V			3	V
h_{FE} (1)	DC current gain	I_C = 5 A V_{CE} = 4 V I_C = 10 A V_{CE} = 4 V	1000 500			
t_{on} t_{off}	Resistive load Turn-on time Turn-off time	I_C = 10 A R_L = 3 Ω I_{B1} = -I_{B2} = 40 mA		0.9 4		µs µs

1. Pulsed duration = 300 µs, duty cycle ≤ 1.5%.

For PNP type voltage and current are negative.

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark.

TO-247 Mechanical data

Dim.	mm.		
	Min.	Typ	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e		5.45	
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
øP	3.55		3.65
øR	4.50		5.50
S		5.50