

TIP142, TIP147

Complementary power Darlington transistors

Datasheet — production data

Features

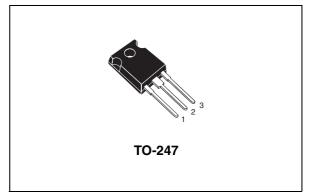
- Monolithic Darlington configuration
- Integrated antiparallel collector-emitter diode

Applications

■ Linear and switching industrial equipment

Description

The devices are manufactured in planar technology with "base island" layout and monolithic Darlington configuration. The resulting transistors show exceptional high gain performance coupled with very low saturation voltage.





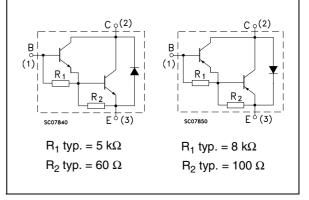


Table 1. Device summary

Part number	Marking	Polarity	Package	Packaging
TIP142	TIP142	NPN	TO-247	Tube
TIP147	TIP147	PNP	10-247	Tube

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This is information on a product in full production.

1 Absolute maximum ratings

Table 2.	Absolute	maximum	ratings
	Absolute	maximum	ruungo

Symbol	Parameter	Value	Unit
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
۱ _C	Collector current	10	А
I _{CM}	Collector peak current	20	A
Ι _Β	Base current	0.5	A
P _{TOT}	Total dissipation at $T_{case} = 25 \ ^{\circ}C$	125	W
T _{STG}	Storage temperature	-65 to 150	°C
Т _Ј	Max. operating junction temperature	150	°C

Note: For PNP type voltage and current are negative.

Table 3.Thermal data

Symbol	Parameter	Value	Unit
R _{thJC}	Thermal resistance junction-case max	1	°C/W



2 Electrical characteristics

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

Symbol	Parameter	Test conditions	Min.	Тур.	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	$I_{\rm C} = 10 \ {\rm A}$ $V_{\rm CE} = 4 \ {\rm V}$			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	$I_{C} = 10 \text{ A}$ $R_{L} = 3 \Omega$ $I_{B1} = -I_{B2} = 40 \text{ mA}$		0.9 4		μs μs

Table 4. Electrical characteristics

1. Pulse test: pulse duration \leq 300 µs, duty cycle \leq 2 %.

For PNP type voltage and current are negative.



3 Electrical characteristics (curve)

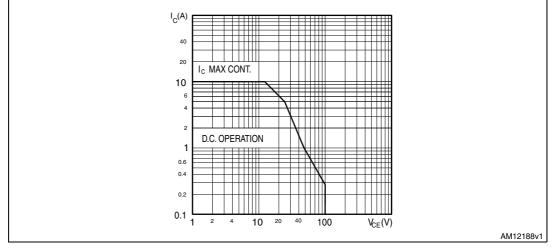
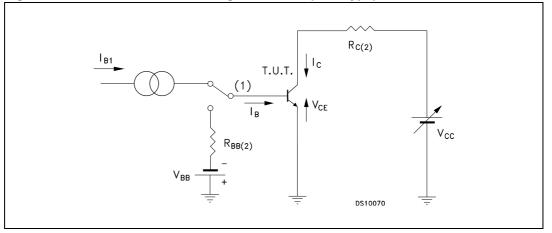


Figure 2. Safe operating area



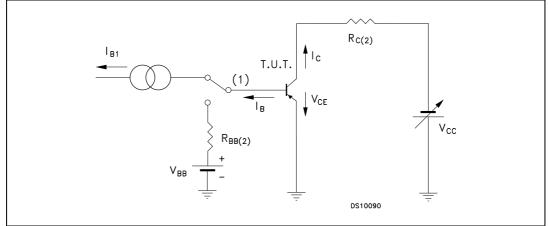
4 Test circuits

Figure 3.	Resistive load	switching t	est circuit ((NPN type))



- 1. Fast electronic switch
- 2. Non-inductive resistor





- 1. Fast electronic switch
- 2. Non-inductive resistor



5 Package mechanical data

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Dim.	mm.			
Dim. —	Min.	Тур.	Max.	
А	4.85		5.15	
A1	2.20		2.60	
b	1.0		1.40	
b1	2.0		2.40	
b2	3.0		3.40	
С	0.40		0.80	
D	19.85		20.15	
E	15.45		15.75	
е	5.30	5.45	5.60	
L	14.20		14.80	
L1	3.70		4.30	
L2		18.50		
ØP	3.55		3.65	
ØR	4.50		5.50	
S	5.30	5.50	5.70	

Table 5.TO-247 mechanical data



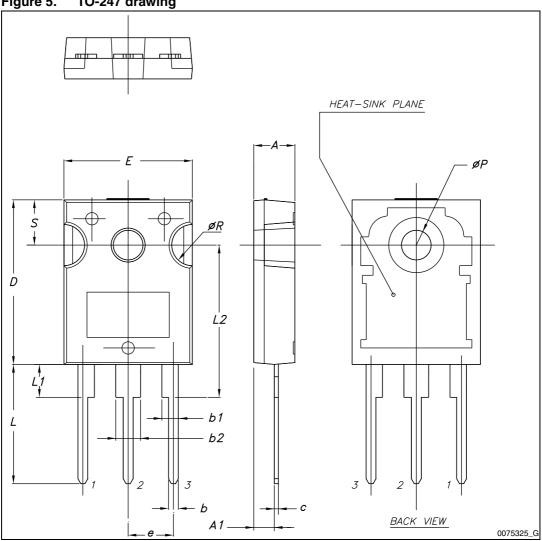


Figure 5. TO-247 drawing



6 Revision history

Table 6.Document revision history

Date	Revision	Changes
15-Oct-2007	6	Package change from SOT-93 to TO-247.
12-May-2010	7	Technology change from epitaxial base to planar base island.
19-Apr-2012	8	Added: <i>Figure 2: Safe operating area</i> Updated: mechanical data



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