

Complementary power Darlington transistors

Features

- Good h_{FE} linearity
- High f_T frequency
- Monolithic Darlington configuration with integrated antiparallel collector-emitter diode

Application

■ Linear and switching industrial equipment

Description

The devices are manufactured in planar technology with "base island" layout and monolithic Darlington configuration.

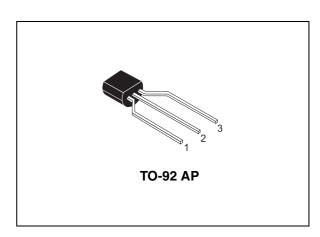


Figure 1. Internal schematic diagram

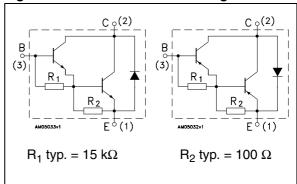


Table 1. Device summary

Order codes	Marking	Polarity	Package	Packaging
STX112-AP	X112	NPN	TO92-AP	Ammopack
STX117-AP	X117	PNP	TO92-AP	Ammopack

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	- 100 V	
V _{CEO}	Collector-emitter voltage (I _B = 0)		
V _{EBO}	Emitter-base voltage (I _C = 0)	5	V
Ic	Collector current	2	Α
I _{CM}	Collector peak current	4	Α
I _B	Base current	0.05	Α
P _{TOT}	Total dissipation at T _{amb} = 25 °C	1.2	W
T _{STG}	T _{STG} Storage temperature		°C
T _J	Max. operating junction temperature	150	°C

Note: For PNP types voltage and current values are negative.

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R _{thJA}	Thermal resistance junction-ambient max.	104	°C/W

2 Electrical characteristics

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

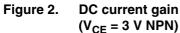
Table 4. Electrical characteristics

Symbol	Parameter	Test con	ditions	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	-		٧
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	I _C = 2 A	$I_B = 8 \text{ mA}$		-	2.5	V
V _{BE(on)}	Base-emitter on voltage	I _C = 2 A	V _{CE} = 4 V		-	2.8	٧
h _{FE} ⁽¹⁾	DC current gain	I _C = 1 A	V _{CE} = 4 V	1000	-		
		I _C = 2 A	$V_{CE} = 4 V$	500	-		

^{1.} Pulse test: pulse duration \leq 300 μ s, duty cycle \leq 2 %

Note: For PNP types voltage and current values are negative.

2.1 Typical characteristic (curves)



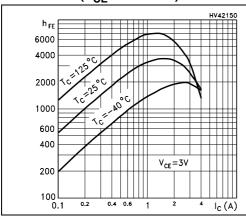
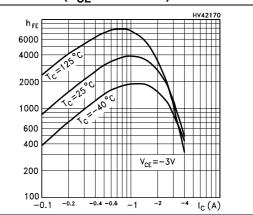


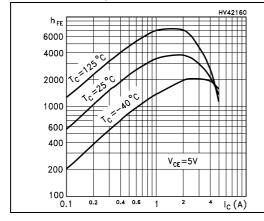
Figure 3. DC current gain (V_{CE} = - 3 V PNP)



Electrical characteristics STX112, STX117

Figure 4. DC current gain $(V_{CE} = 5 V NPN)$

Figure 5. DC current gain $(V_{CE} = -5 \text{ V PNP})$



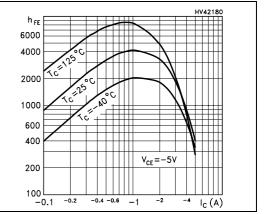
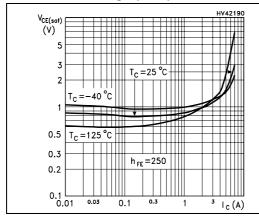


Figure 6. Collector-emitter saturation voltage (NPN)

Figure 7. Collector-emitter saturation voltage (PNP)



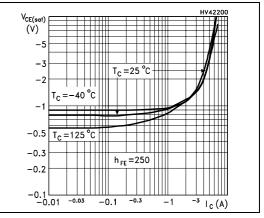
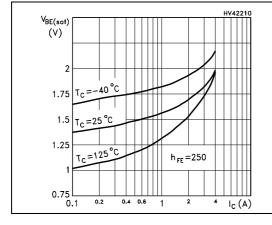


Figure 8. Base-emitter saturation voltage (NPN)

Figure 9. Base-emitter saturation voltage (PNP)



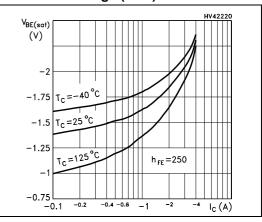
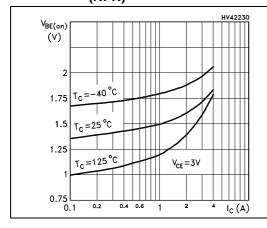


Figure 10. Base-emitter on voltage (NPN)

Figure 11. Base-emitter on voltage (PNP)



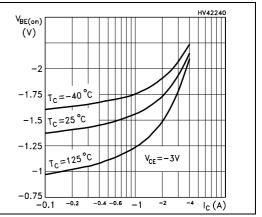
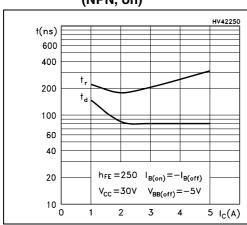


Figure 12. Resistive load switching time Figure 13. Resistive load switching time (NPN, on) (PNP, on)



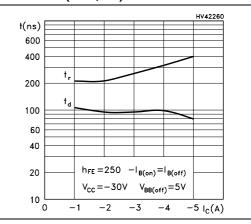
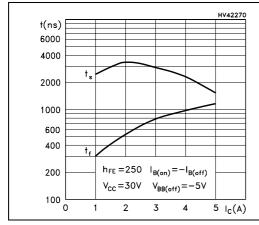
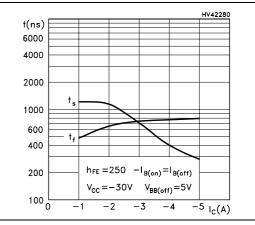


Figure 14. Resistive load switching time Figure 15. Resistive load switching time (NPN, off) (PNP, off)



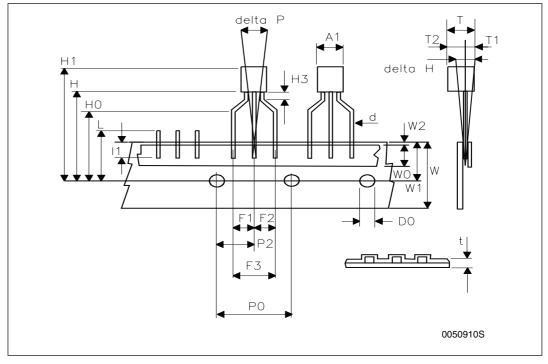


3 Package mechanical data

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TO-92 ammopack shipment (suffix"-AP") mechanical data

Dim.		mm.	
Dim.	Min.	Тур.	Max.
A1			4.80
Т			3.80
T1			1.60
T2			2.30
d			0.48
P0	12.50	12.70	12.90
P2	5.65	6.35	7.05
F1,F2	2.44	2.54	2.94
F3	4.98	5.08	5.48
delta H	-2.00		2.00
W	17.50	18.00	19.00
W0	5.70	6.00	6.30
W1	8.50	9.00	9.25
W2			0.50
Н	18.50		20.50
H3	0.5	1	1.5
H0	15.50	16.00	16.50
H1			25.00
D0	3.80	4.00	4.20
t			0.90
L			11.00
I1	3.00		
delta P	-1.00		1.00



Revision history STX112, STX117

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
21-Jan-2008	3	
07-Apr-2010	4	Updated package mechanical data.

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