TIP122/TIP127

Complementary power Darlington transistors

General 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

Product Summary

VCBO	IC
100V	5A

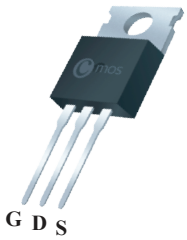
Applications

- General purpose linear and switching

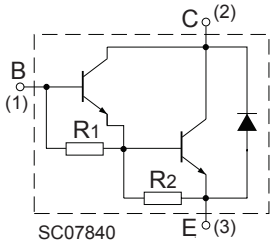
Features

- Low collector-emitter saturation voltage
- Complementary NPN - PNP transistors

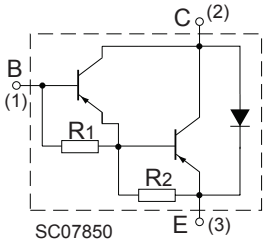
TO-220 Pin Configuration



TO-220



NPN:R_1=7KΩ
R_2=70Ω



PNP:R_1=16KΩ
R_2=60Ω

Device summary

Order codes	Marking	Polarity	Package	Packaging
TIP122	TIP122	NPN	TO-220	Tube
TIP127	TIP127	PNP		

Absolute maximum rating (1)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-base voltage (I_E = 0)	100	V
V_{CEO}	Collector-base voltage (I_B = 0)	100	V
V_{EBO}	Emitter-base voltage (I_C = 0)	5	V
I_C	Collector current	5	A
I_{CM}	Collector peak current	8	A
I_B	Base current	0.12	A
P_{TOT}	Total dissipation at Tcase ≤ 25°C	65	W
T_{stg}	Storage Temperature	-65 to 150	℃
T_J	Operating Junction Temperature Range	150	℃

Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient max.	62.5	℃/W
$R_{thj\text{-}case}$	Thermal resistance junction-case max.	1.92	℃/W

Electrical Characteristics

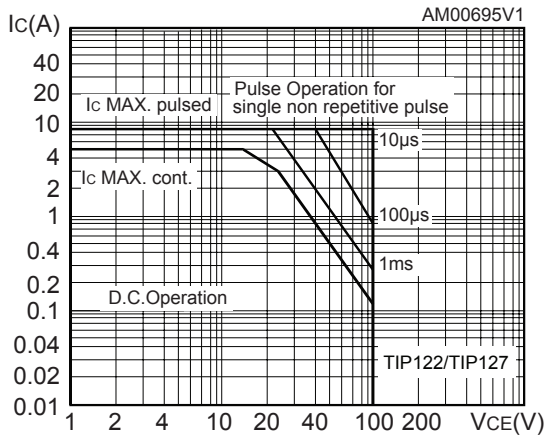
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{CB0}	Collector cut-off current (I_B = 0)	V_{CE} =100V	---	---	0.2	mA
I_{CEO}	Collector cut-off current($I_{B=0}$)	V_{CE}=50V	---	---	0.5	mA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB}=5V	---	---	2	mA
$V_{CEO(sus)}$ (2)	Collector-emitter sustaining voltage (I_B = 0)	I_C=30mA	100	---	---	V
$V_{CE(sat)}$ (2)	Collector-emitter saturation voltage	I_C=3A I_B =12mA I_C=5A I_B =20mA	--- ---	--- ---	2 4	V V
$V_{BE(on)}$ (2)	Base-emitter on voltage	I_C=3A V_{CE}=3V	---	---	2.5	V
h_{FE} (2)	DC current gain	I_C=0.5A V_{CE}=3V I_C=3A V_{CE}=3V	1000 1000	--- ---	--- ---	

Note

1. For PNP types voltage and current values are negative.
2. Pulsed duration = 300 μs, duty cycle ≤2%

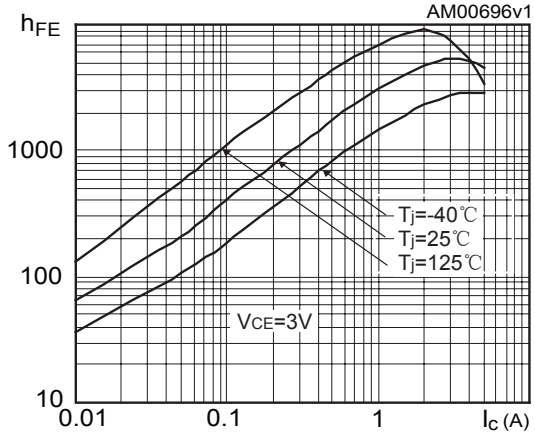
Electrical characteristic (curves)

Safe operating area

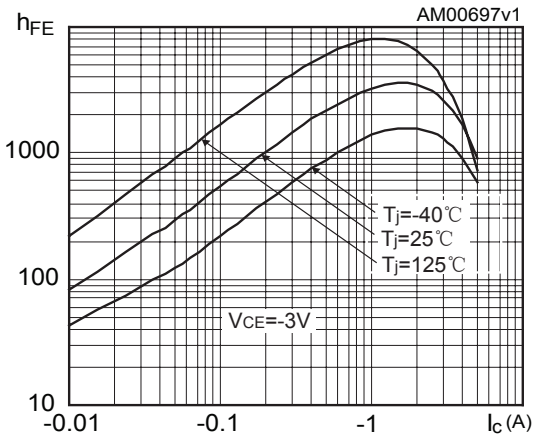


Derating curve

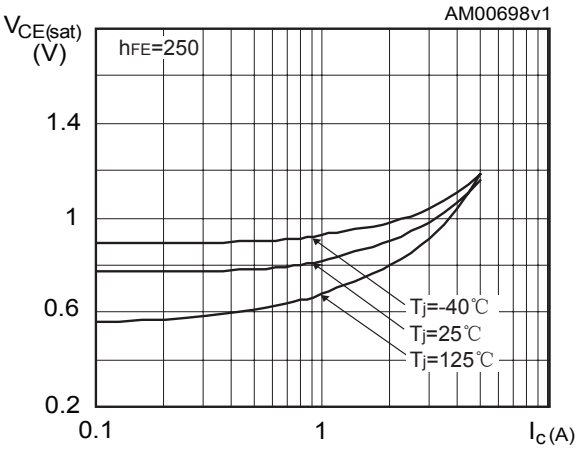
DC current gain for NPN type



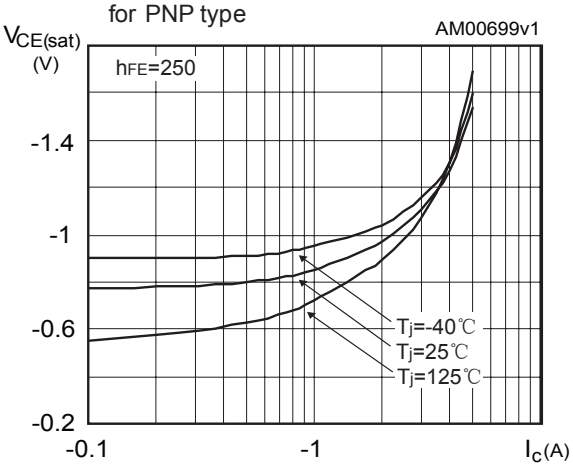
DC current gain for PNP type



Collector-emitter saturation voltage for NPN type

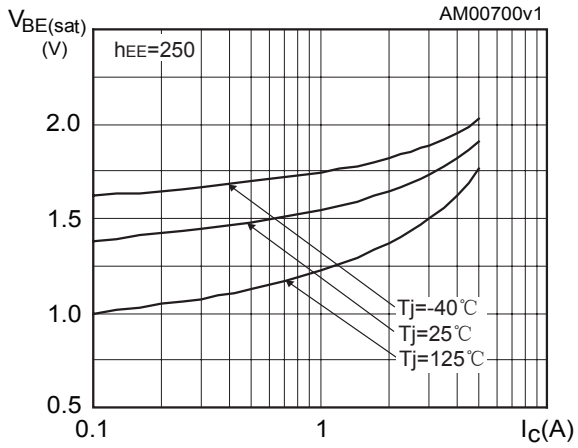


Collector-emitter saturation voltage for PNP type

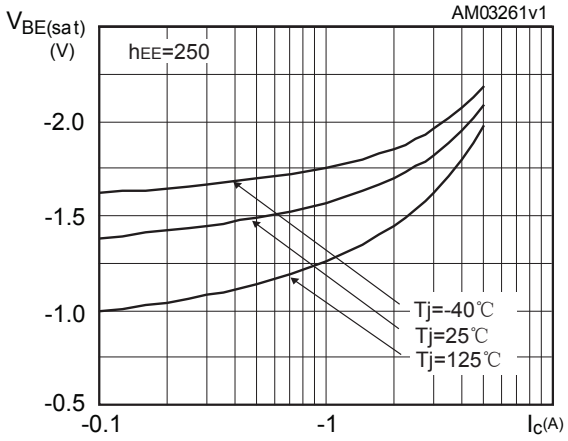


Electrical characteristic

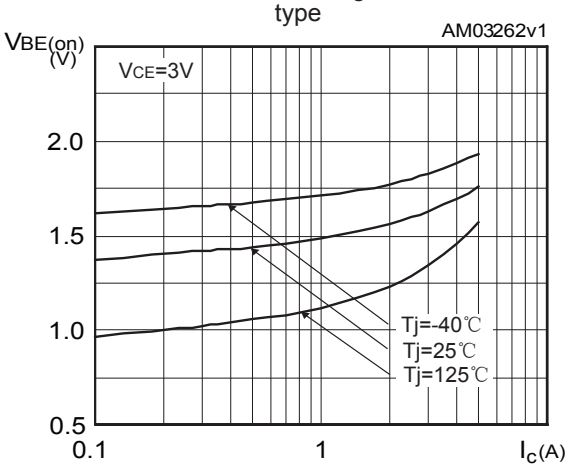
Base-emitter saturation voltage for NPN type



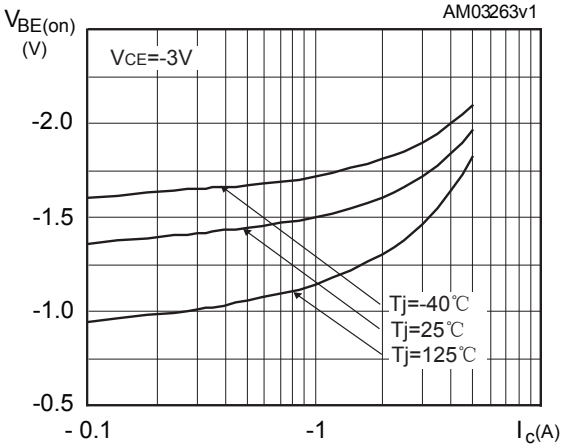
Base-emitter saturation voltage for PNP type



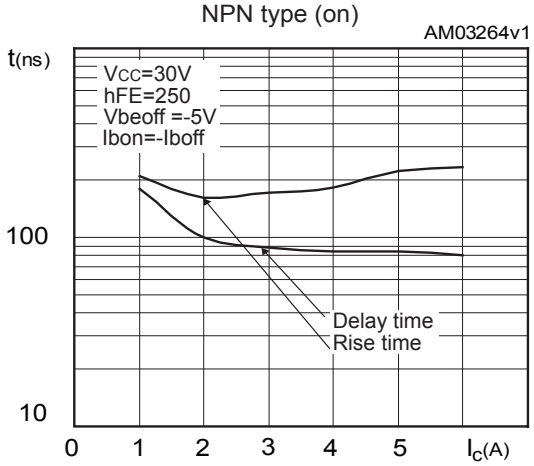
Base-emitter on voltage for NPN type



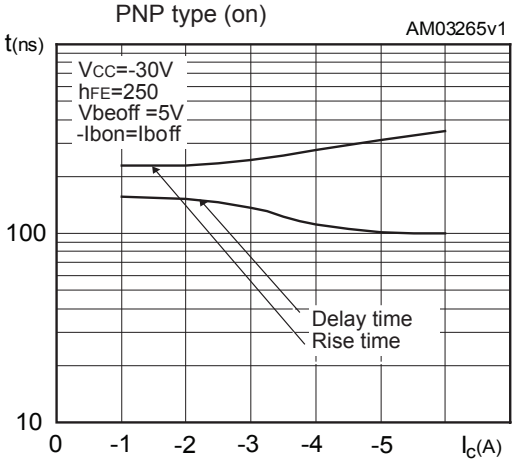
Base-emitter on voltage for PNP type



switching time on resistive load for NPN type (on)

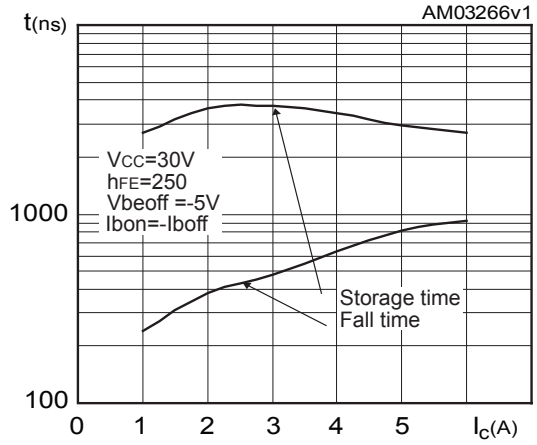


Resistive load switching times for PNP type (on)

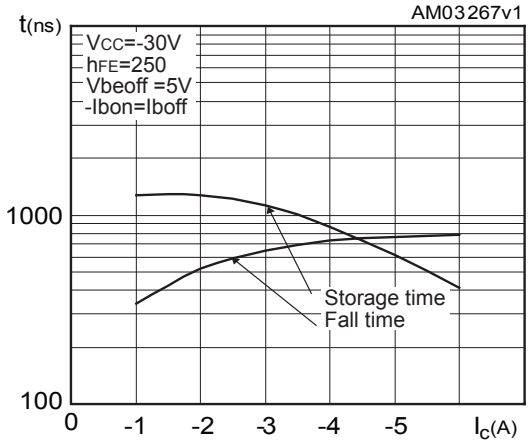


Electrical characteristic

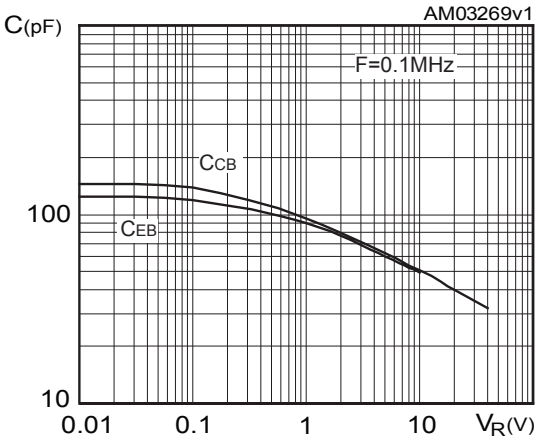
switching time on resistive load for NPN type (off)



switching time on resistive load for PNP type (off)



Capacitances for NPN type



Capacitances for PNP type