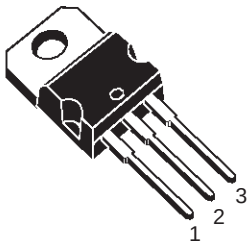
Toohong

BDX53B / BDX53C
BDX54B / BDX54C

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS



TO-220

APPLICATIONS

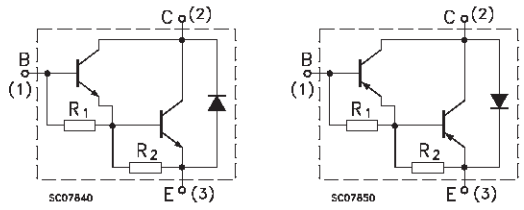
- AUDIO AMPLIFIERS
- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

The BDX53B and BDX53C are silicon Epitaxial-Base NPN power transistors in monolithic Darlington configuration mounted in Jedec TO-220 plastic package. They are intented for use in hammer drivers, audio amplifiers and other medium power linear and switching applications.

The complementary PNP types are BDX54B and BDX54C respectively.

INTERNAL SCHEMATIC DIAGRAM



R_1 Typ. = 10 KΩ R_2 Typ. = 150 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value		Unit
		NPN	BDX53B	BDX53C	
		PNP	BDX54B	BDX54C	
V_{CBO}	Collector-Base Voltage (I_E = 0)		80	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		80	100	V
V_{EBO}	Emitter-base Voltage (I_C = 0)		5		V
I_C	Collector Current		8		A
I_{CM}	Collector Peak Current (repetitive)		12		A
I_B	Base Current		0.2		A
P_{tot}	Total Dissipation at $T_c \leq 25\ ^oC$		60		W
T_{stg}	Storage Temperature		-65 to 150		^oC
T_j	Max. Operating Junction Temperature		150		^oC

For PNP types voltage and current values are negative.

THERMAL DATA

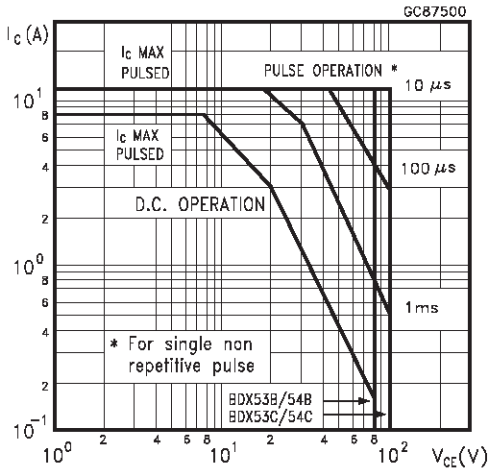
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	2.08	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	70	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

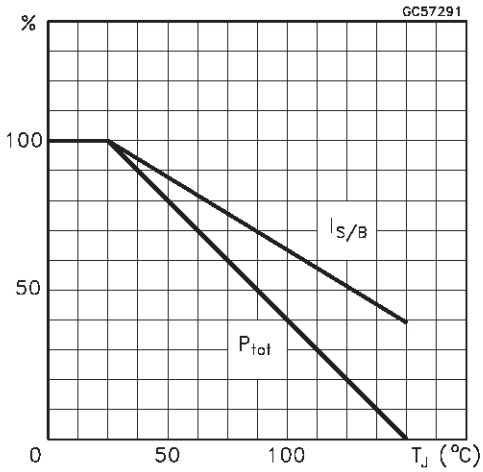
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BDX53B/54B** V_{CB} = 80 V for **BDX53C/54C** V_{CB} = 100V			0.2 0.2	mA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	for **BDX53B/54B** V_{CE} = 40 V for **BDX53C/54C** V_{CE} = 50V			0.5 0.5	mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			2	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA for **BDX53B/54B** for **BDX53C/54C**	80 100			V V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 3 A I_B =12 mA			2	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 3 A I_B =12 mA			2.5	V
h_{FE}*	DC Current Gain	I_C = 3 A V_{CE} = 3 V	750			
V_F*	Parallel-diode Forward Voltage	I_F = 3 A I_F = 8 A		1.8 2.5	2.5	V V

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
For PNP types voltage and current values are negative.

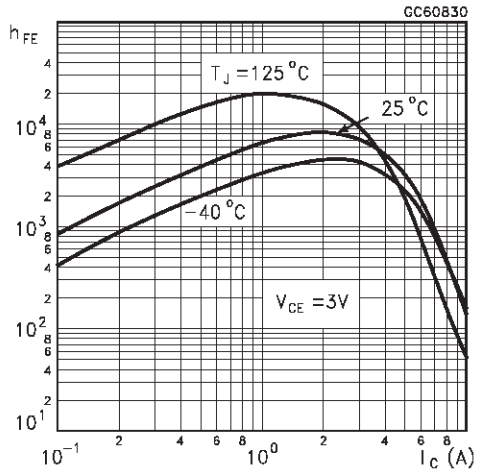
Safe Operating Area



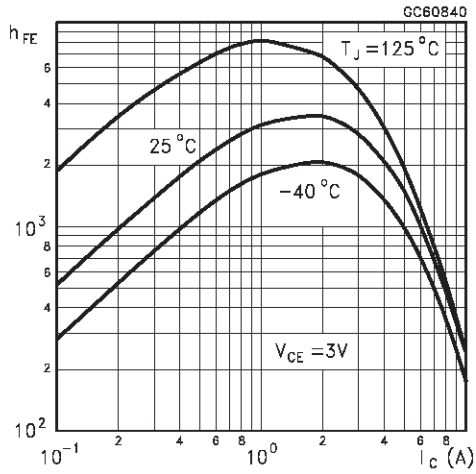
Derating Curve



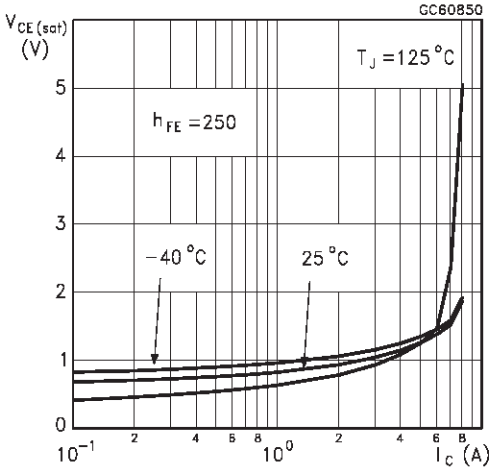
DC Current Gain (NPN type)



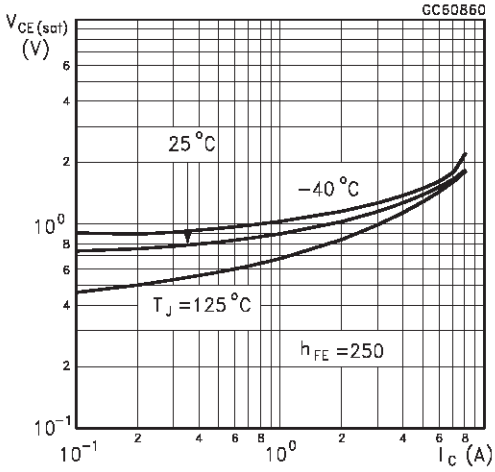
DC Current Gain (PNP type)



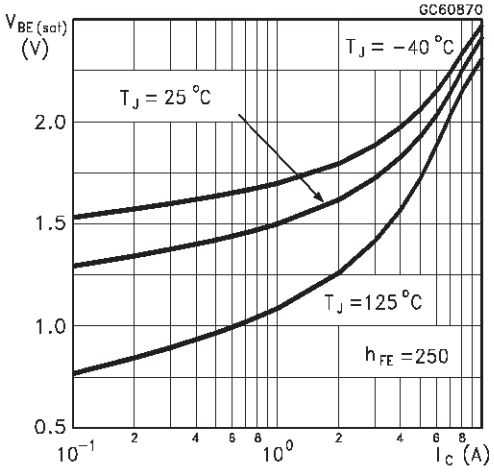
Collector Emitter Saturation Voltage (NPN type)



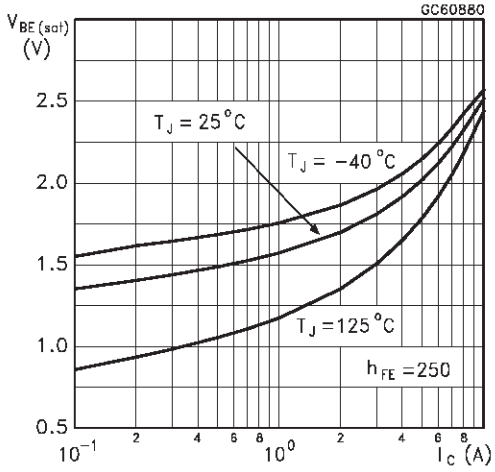
Collector Emitter Saturation Voltage (PNP type)



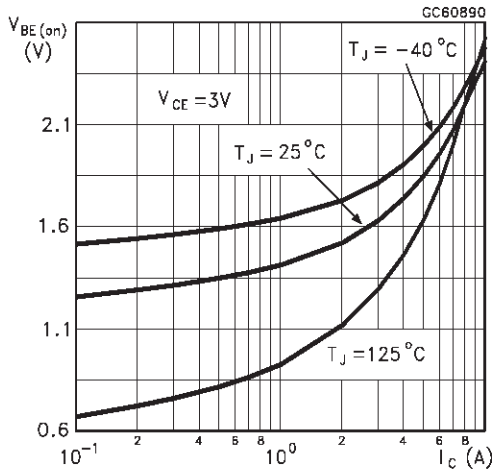
Base Emitter Saturation Voltage (NPN type)



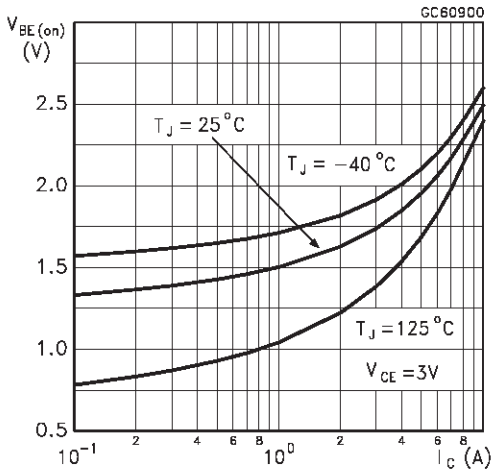
Base Emitter Saturation Voltage (PNP type)



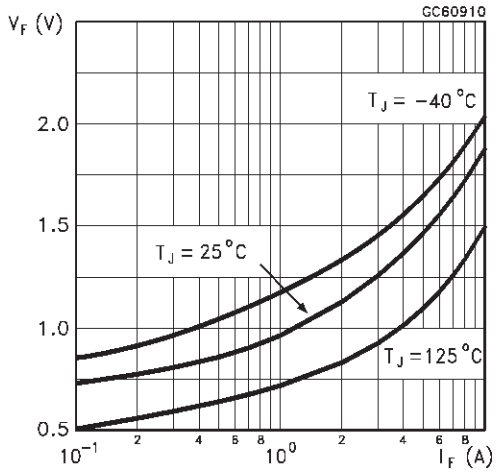
Base Emitter On Voltage (NPN type)



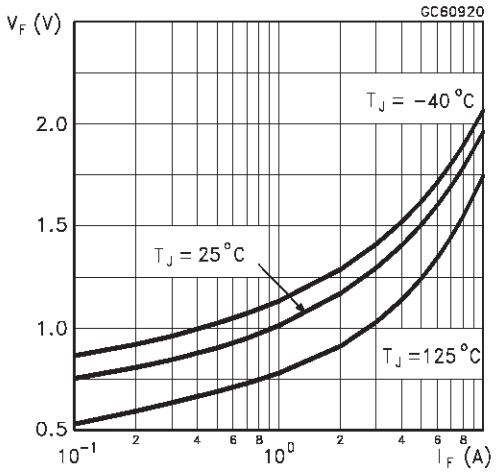
Base Emitter On Voltage (PNP type)



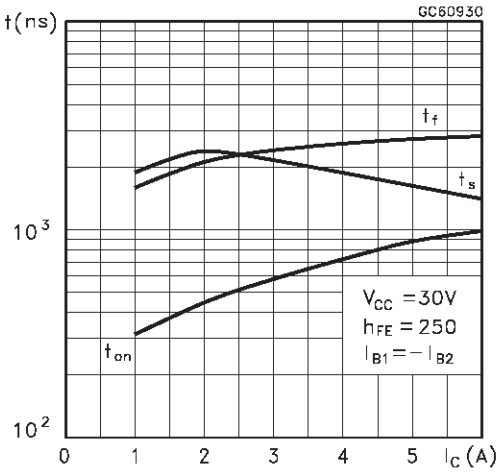
Freewheel Diode Forward Voltage (NPN type)



Freewheel Diode Forward Voltage (PNP type)



Switching Time Resistive Load (NPN type)



Switching Time resistive Load (PNP type)