SGS-THOMSON MICROELECTRONICS

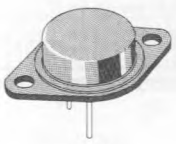
BDX87/87A/87B/87C
BDX88/88A/88B/88C

POWER DARLINGTONS

DESCRIPTION

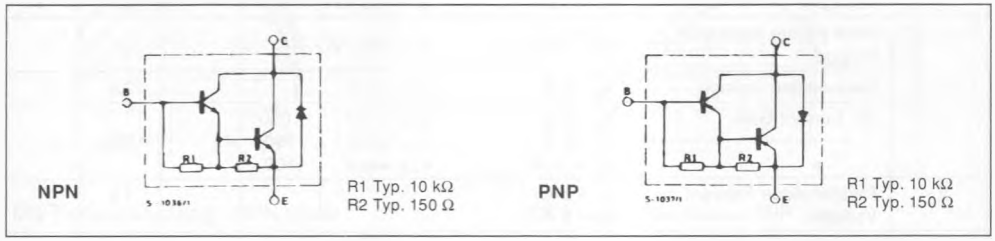
The BDX87, BDX87A, BDX87B and BDX87C are silicon epitaxial-base NPN power transistors in monolithic Darlington configuration and are mounted in Jedec TO-3 metal case. They are intended for use in power linear and switching applications.

The complementary PNP types are the BDX88, BDX88A, BDX88B and BDX88C respectively.



TO-3

INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BDX87 BDX88	BDX87A BDX88A	BDX87B BDX88B	BDX87C BDX88C	
V_{CBO}	Collector-base Voltage (I_E = 0)		45	60	80	100	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)		45	60	80	100	V
V_{EBO}	Emitter-base Voltage (I_C = 0)		5				V
I_C	Collector Current		12				A
I_{CM}	Collector Peak Current (repetitive)		18				A
I_B	Base Current		0.2				A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		120				W
T_{stg}	Storage Temperature		– 65 to 200				°C
T_j	Junction Temperature		200				°C

* For PNP types voltage and current values are negative.

THERMAL DATA

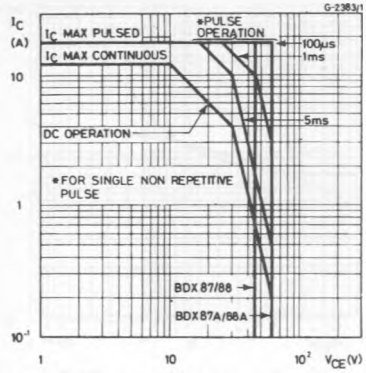
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	1.45	°C/W

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

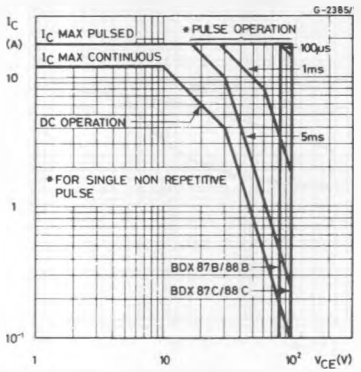
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BDX87/8** V_{CB} = 45 V			500	µA
		for **BDX87A/8A** V_{CB} = 60 V			500	µA
		for **BDX87B/8B** V_{CB} = 80 V			500	µA
		for **BDX87C/8C** V_{CB} = 100 V			500	µA
		T_{case} = 150 °C				
		for **BDX87/8** V_{CB} = 45 V			5	mA
		for **BDX87A/8A** V_{CB} = 60 V			5	mA
		for **BDX87B/8B** V_{CB} = 80 V			5	mA
		for **BDX87C/8C** V_{CB} = 100 V			5	mA
I_{CEO}	Collector Cutoff Current (I_B = 0)	for **BDX87/8** V_{CE} = 22 V			1	mA
		for **BDX87A/8A** V_{CE} = 30 V			1	mA
		for **BDX87B/8B** V_{CE} = 40 V			1	mA
		for **BDX87C/8C** V_{CE} = 50 V			1	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA for **BDX87/88**	45			V
		for **BDX87A/88A**	60			V
		for **BDX87B/88B**	80			V
		for **BDX87C/88C**	100			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 6 A I_B = 24 mA			2	V
		I_C = 12 A I_B = 120 mA			3	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 12 A I_B = 120 mA			4	V
V_{BE}*	Base-emitter Voltage	I_C = 6 A V_{CE} = 3 V			2.8	V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 3 V	1000			
		I_C = 6 A V_{CE} = 3 V	750		18000	
		I_C = 12 A V_{CE} = 3 V	100			
V_F	Parallel-diode Forward Voltage	I_F = 3 A			1.8	V
		I_F = 8 A		2.5		V
h_{fe}	Small Signal Current Gain	I_C = 5 A V_{CE} = 3 V f = 1 MHz		25		

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

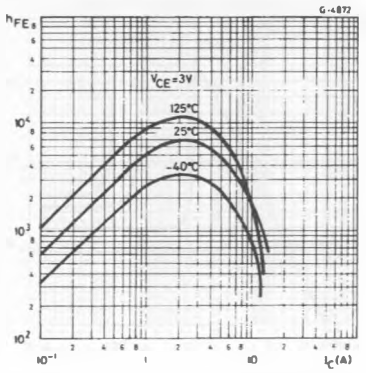
Safe Operating Areas (for **BDX87, BDX87A, BDX88, BDX88A**).



Safe Operating Areas (for **BDX87A, BDX87C, BDX88B, BDX88C**).



DC Current Gain (NPN types).



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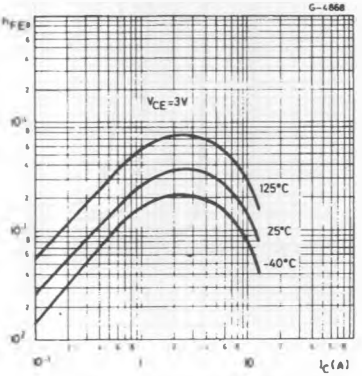
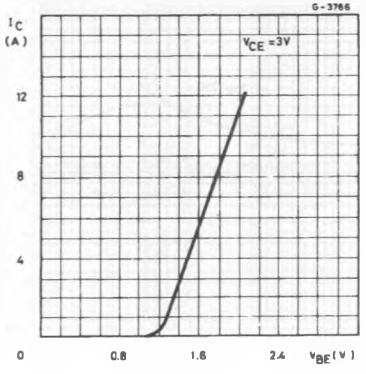
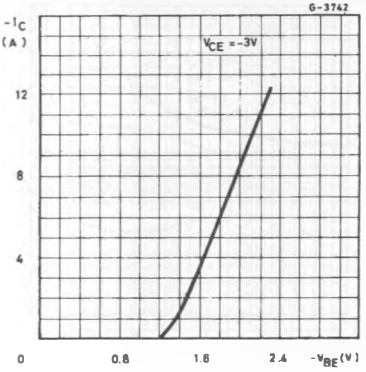


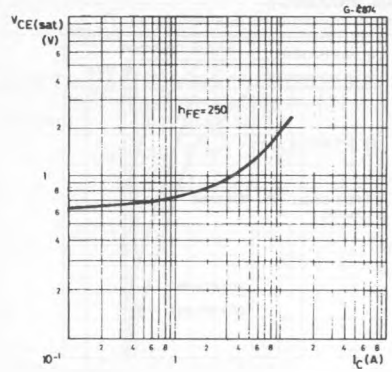
DC Transconductance (NPN types).



DC Transconductance (PNP types).



Collector-emitter Saturation Voltage (NPN types).



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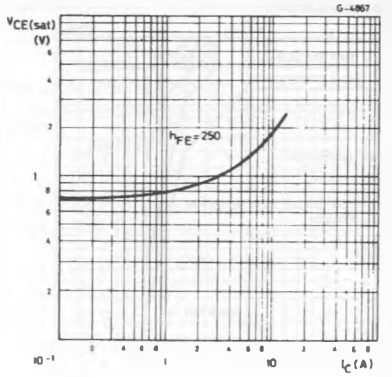

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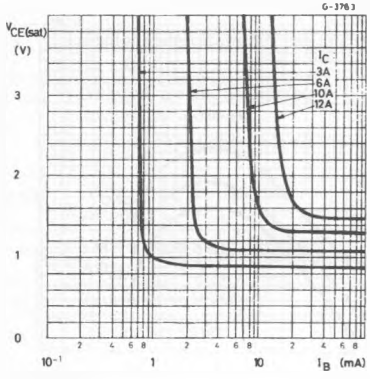
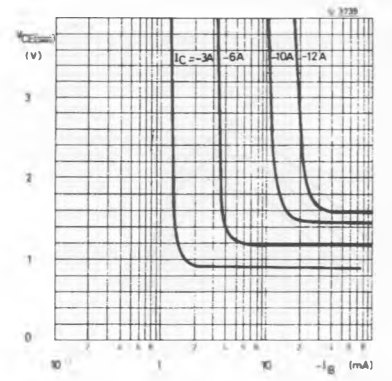
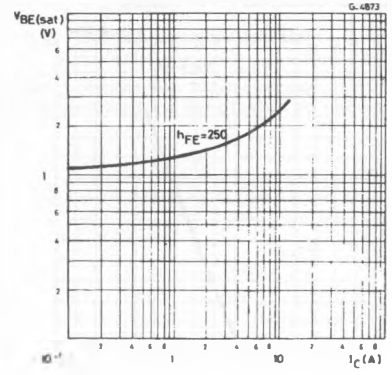


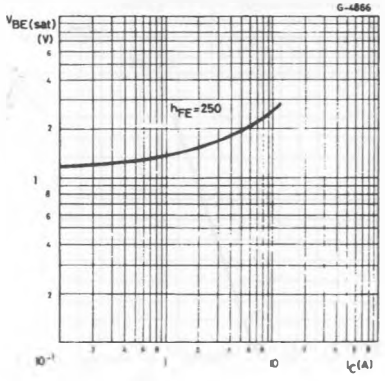
Collector-emitter Saturation Voltage (PNP types).



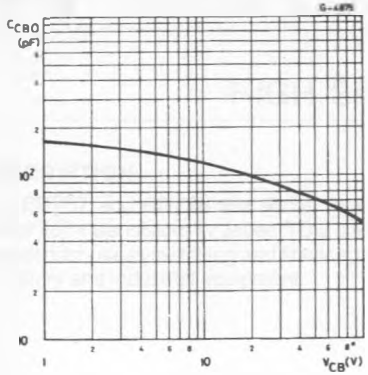
Base-emitter Saturation Voltage (NPN types).



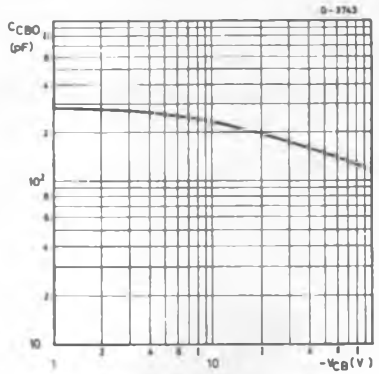
Base-emitter Saturation Voltage (PNP types).



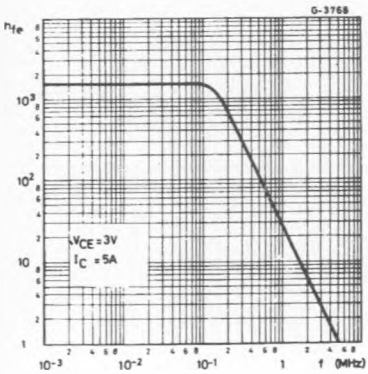
Collector-base Capacitance (NPN types).



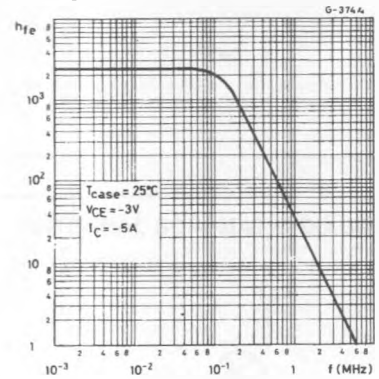
Collector-base Capacitance (PNP types).



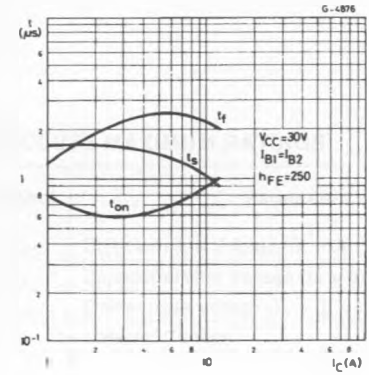
Small Signal Current Gain (NPN types).



Small Signal Current Gain (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).