

SILICON HOMETAXIAL* NPN

MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

The BDX 70/2N 6098, BDX 71/2N 6099, BDX 72/2N 6100, BDX 73/2N 6101, BDX 74/2N 6102 and BDX 75/2N 6103 are single diffused "hometaxial" silicon NPN transistors. Even type numbers are in Jedec TO-220 AA plastic case; odd type numbers are in Jedec TO-220 AB plastic case. All types are intended for a wide variety of medium-power switching and linear applications, such as series and shunt regulators, solenoid drivers, motor-speed controllers and driver and output stages of high-fidelity amplifiers.

The design ensures freedom from second breakdown at maximum ratings.

* Hometaxial types employ a structure in which the base region has homogeneous resistivity silicon material in the axial direction (emitter-to-collector).

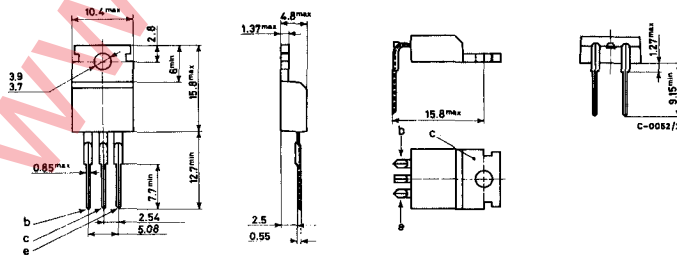
ABSOLUTE MAXIMUM RATINGS

		BDX 70	BDX 72	BDX 74
		BDX 71	BDX 73	BDX 75
V_{CBO}	Collector-base voltage ($I_E = 0$)	70 V	80 V	45 V
$V_{CER (sus)}$	Collector-emitter voltage ($R_{BE} \leq 100 \Omega$)	65 V	75 V	45 V
$V_{CEO (sus)}$	Collector-emitter voltage ($I_B = 0$)	60 V	70 V	40 V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	8 V	8 V	5 V
I_C	Collector current	10 A	10 A	16 A
I_B	Base current	4 A		
P_{tot}	Total power dissipation at $T_{amb} \leq 25^\circ C$	1.8 W		
	at $T_{case} \leq 25^\circ C$	75 W		
T_{stg}	Storage temperature	-65 to 150 °C		
T_j	Junction temperature	150 °C		

MECHANICAL DATA

Dimensions in mm

Collector connected to tab



TO-220 AB

TO-220 AA

BDX 70 to 75 2N6098 to 6103

THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max	1.67	°C/W
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	70	°C/W

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

Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEV} Collector cutoff current ($V_{BE} = -1.5\text{ V}$)	for BDX 70-71 $V_{CE} = 65\text{ V}$ $V_{CE} = 65\text{ V } T_{case} = 150\text{°C}$ for BDX 72-73 $V_{CE} = 75\text{ V}$ $V_{CE} = 75\text{ V } T_{case} = 150\text{°C}$ for BDX 74-75 $V_{CE} = 40\text{ V}$ $V_{CE} = 40\text{ V } T_{case} = 150\text{°C}$			2 10 2 10 2 10	mA mA mA mA mA mA
I_{CEO} Collector cutoff current ($I_B = 0$)	for BDX 70-71 $V_{CE} = 50\text{ V}$ for BDX 72-73 $V_{CE} = 60\text{ V}$ for BDX 74-75 $V_{CE} = 30\text{ V}$			2 2 2	mA mA mA
I_{EBO} Emitter cutoff current ($I_C = 0$)	for BDX 70-71-72-73 $V_{EB} = 8\text{ V}$ for BDX 74-75 $V_{EB} = 5\text{ V}$			1 1	mA mA
$V_{CER(sus)}$ *Collector-emitter voltage ($R_{BE} = 100\ \Omega$)	$I_C = 200\text{ mA}$ for BDX 70-71 for BDX 72-73 for BDX 74-75			65 75 45	V V V

ELECTRICAL CHARACTERISTICS (continued)

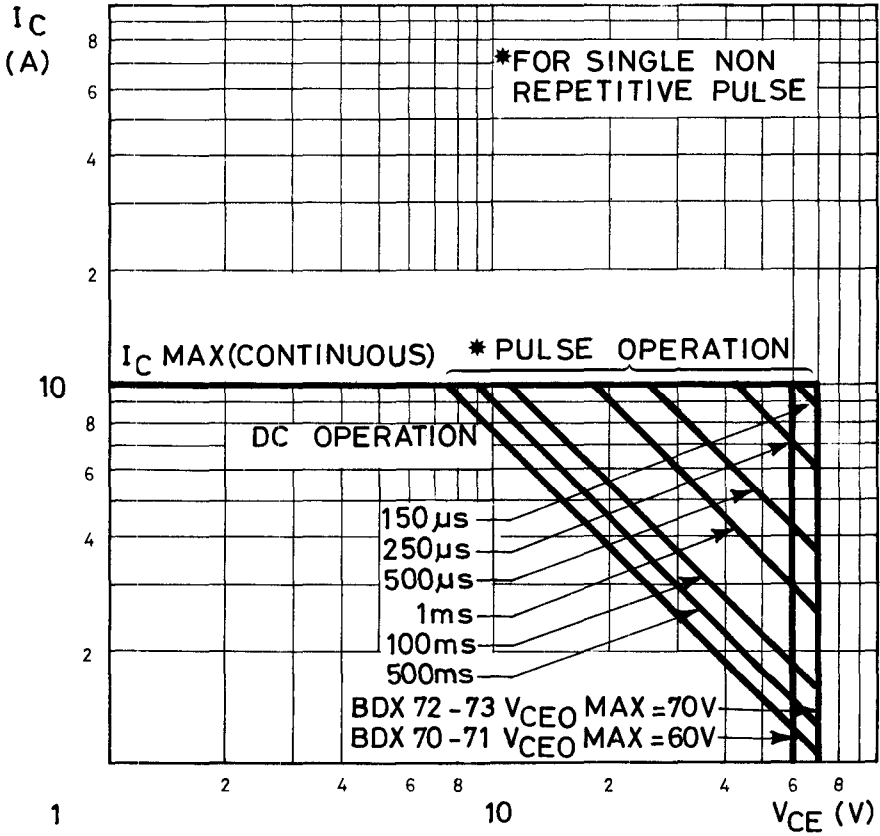
Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CEQ(sus)}$ * Collector-emitter voltage ($I_B = 0$)	$I_C = 200 \text{ mA}$ for BDX 70-71 for BDX 72-73 for BDX 74-75	60 70 40			V V V
$V_{CE(sat)}$ * Collector-emitter saturation voltage	for BDX 70-71-72-73 $I_C = 10 \text{ A}$ $I_B = 2 \text{ A}$ for BDX 74-75 $I_C = 16 \text{ A}$ $I_B = 3.2 \text{ A}$			2.5 2.5	V V
V_{BE} * Base-emitter voltage	for BDX 70-71 $I_C = 4 \text{ A}$ $V_{CE} = 4 \text{ V}$ for BDX 72-73 $I_C = 5 \text{ A}$ $V_{CE} = 4 \text{ V}$ for BDX 74-75 $I_C = 8 \text{ A}$ $V_{CE} = 4 \text{ V}$			1.7 1.7 1.7	V V V
h_{FE} * DC current gain	for BDX 70-71 $I_C = 4 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 10 \text{ A}$ $V_{CE} = 4 \text{ V}$ for BDX 72-73 $I_C = 5 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 10 \text{ A}$ $V_{CE} = 4 \text{ V}$ for BDX 74-75 $I_C = 8 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 16 \text{ A}$ $V_{CE} = 4 \text{ V}$	20 5 20 5 15 5		80 — 80 — 60 —	— — — — — —
h_{fe} Small signal current gain	$I_C = 500 \text{ mA}$ $V_{CE} = 4 \text{ V}$ $f = 1 \text{ kHz}$ $f = 100 \text{ kHz}$	15 8			— —

* Pulsed: pulse duration = 300 μs , duty factor = 1.5%

BDX 70 to 75
2N6098 to 6103

Safe operating areas (for **BDX 70-71-72-73** only)

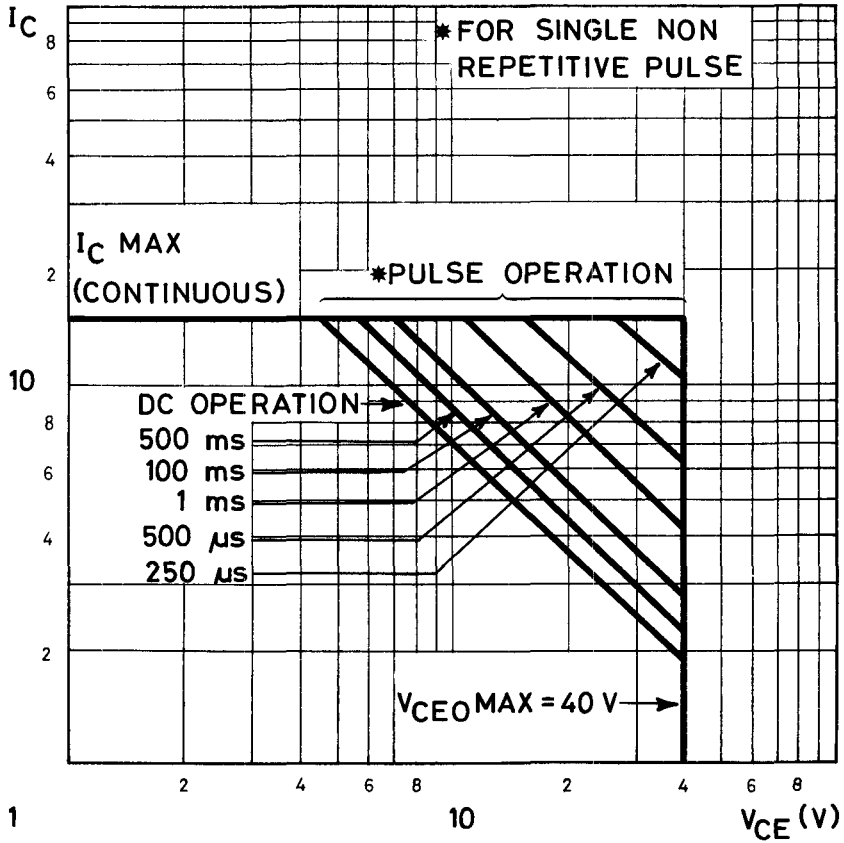
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BDX 70 to 75
2N6098 to 6103

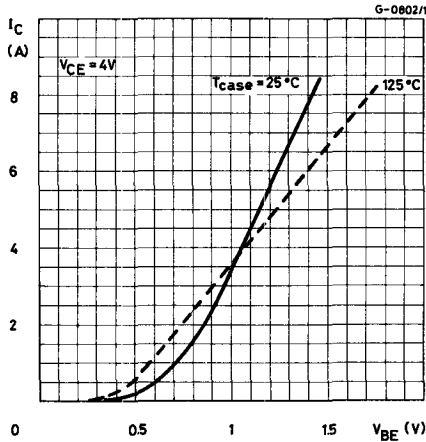
Safe operating areas (for **BDX 74-75** only)

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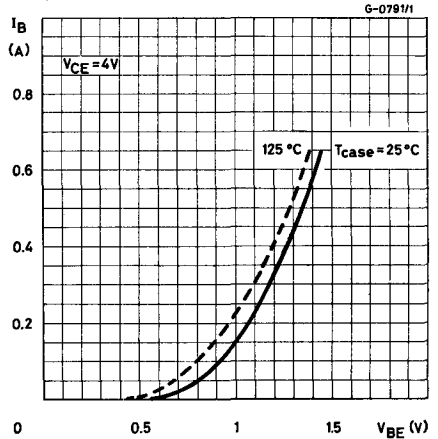


BDX 70 to 75 2N6098 to 6103

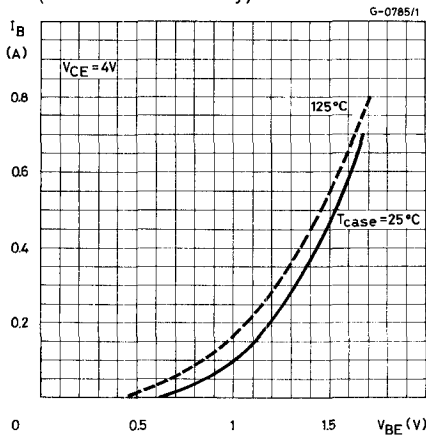
Typical DC transconductance



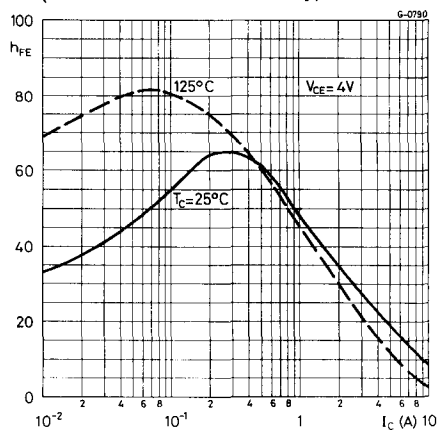
Typical input characteristics
(for **BDX 70-71-72-73** only)



Typical input characteristics
(for **BDX 74-75** only)

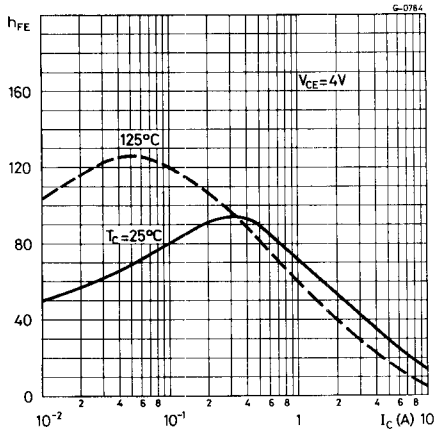


Typical DC current gain
(for **BDX 70-71-72-73** only)

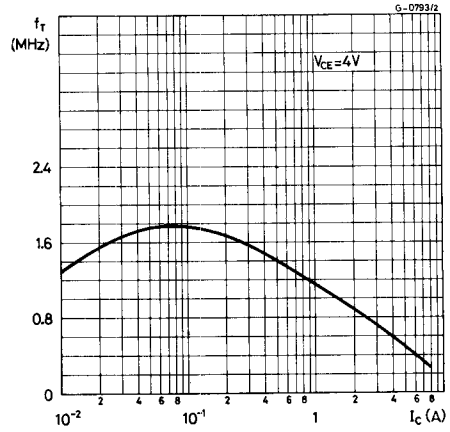


BDX 70 to 75 2N6098 to 6103

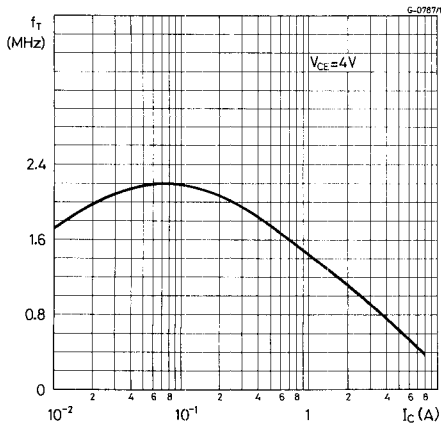
Typical DC current gain
(for **BDX 74-75** only)



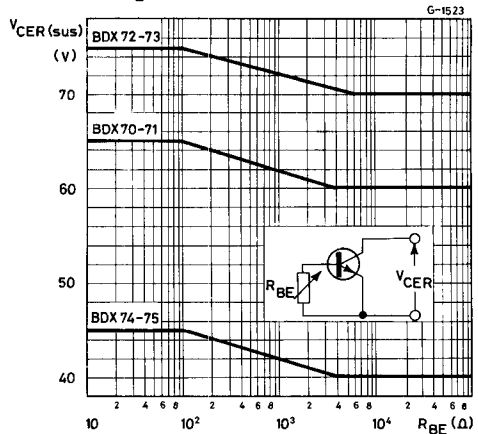
Typical transition frequency
(for **BDX 70-71-72-73** only)



Typical transition frequency
(for **BDX 74-75** only)

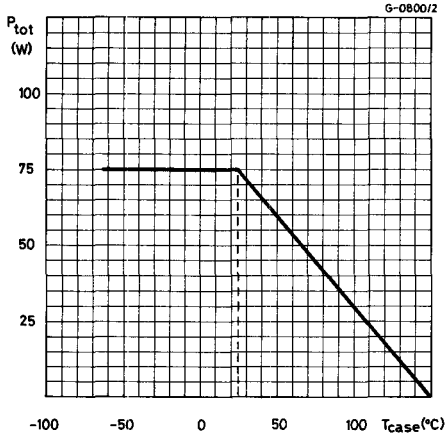


Collector-emitter breakdown voltage

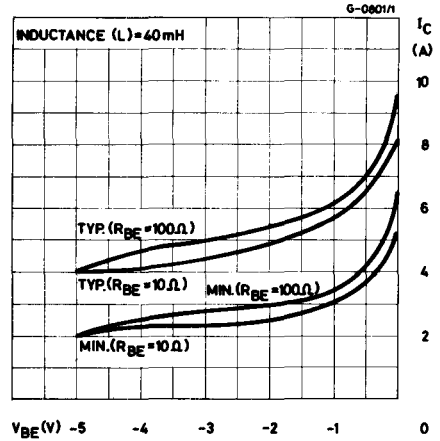


BDX 70 to 75 2N6098 to 6103

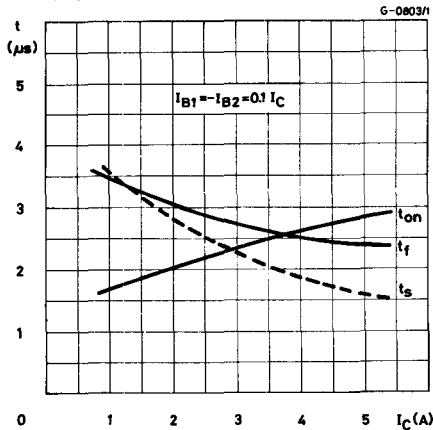
Power rating chart



Reverse-bias second breakdown characteristics



Typical saturated switching characteristics



Thermal-cycle rating chart

