BDX 70 to 75
2N6098 to 6103

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).

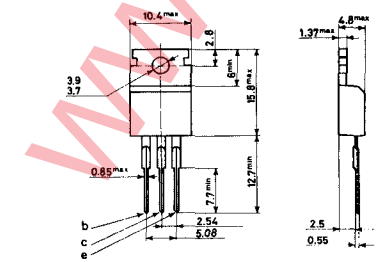
ABSOLUTE MAXIMUM RATINGS

		BDX 70 / BDX 71	BDX 72 / BDX 73	BDX 74 / 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 $T_{amb} \leq 25$ °C	1.8 W		
	at $T_{case} \leq 25$ °C	75 W		
T_{stg}	Storage temperature	-65 to 150 °C		
T_j	Junction temperature	150 °C		

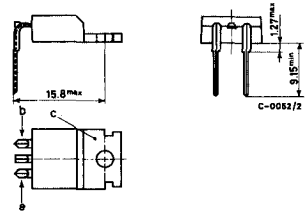
MECHANICAL DATA

Dimensions in mm

Collector connected to tab



TO-220 AB



TO-220 AA

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 °C unless otherwise specified)

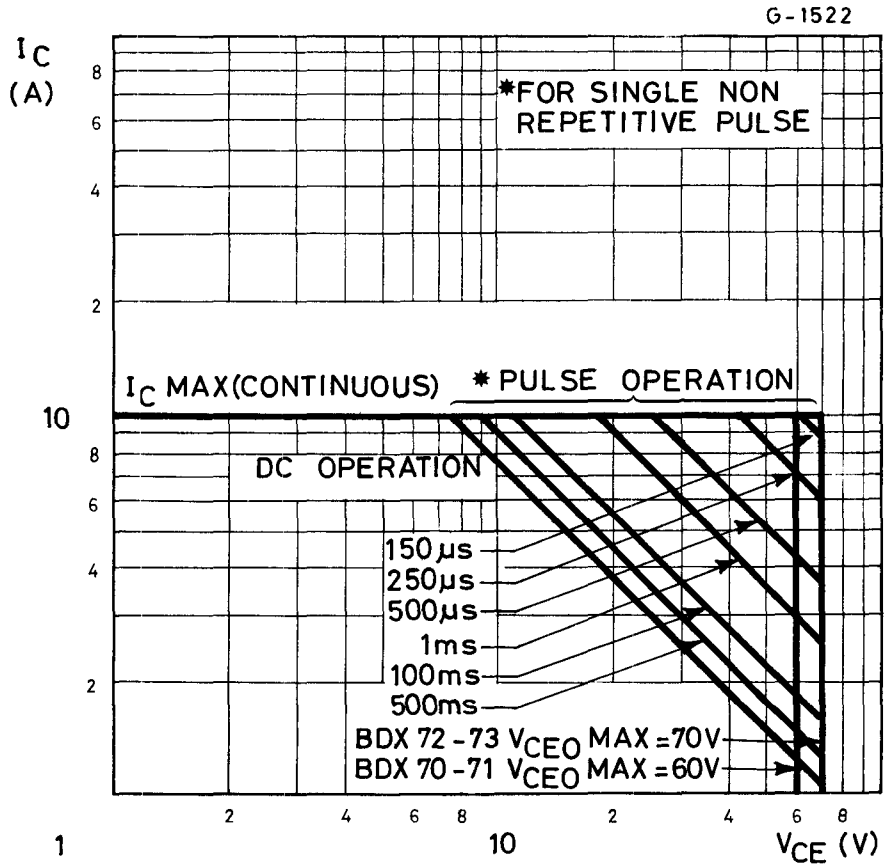
Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector cutoff current (V_{BE} = -1.5 V)	for **BDX 70-71**				
		V_{CE} = 65 V			2	mA
		V_{CE} = 65 V T_{case} = 150 °C			10	mA
		for **BDX 72-73**				
		V_{CE} = 75 V			2	mA
		V_{CE} = 75 V T_{case} = 150 °C			10	mA
		for **BDX 74-75**				
		V_{CE}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

ELECTRICAL CHARACTERISTICS (continued)

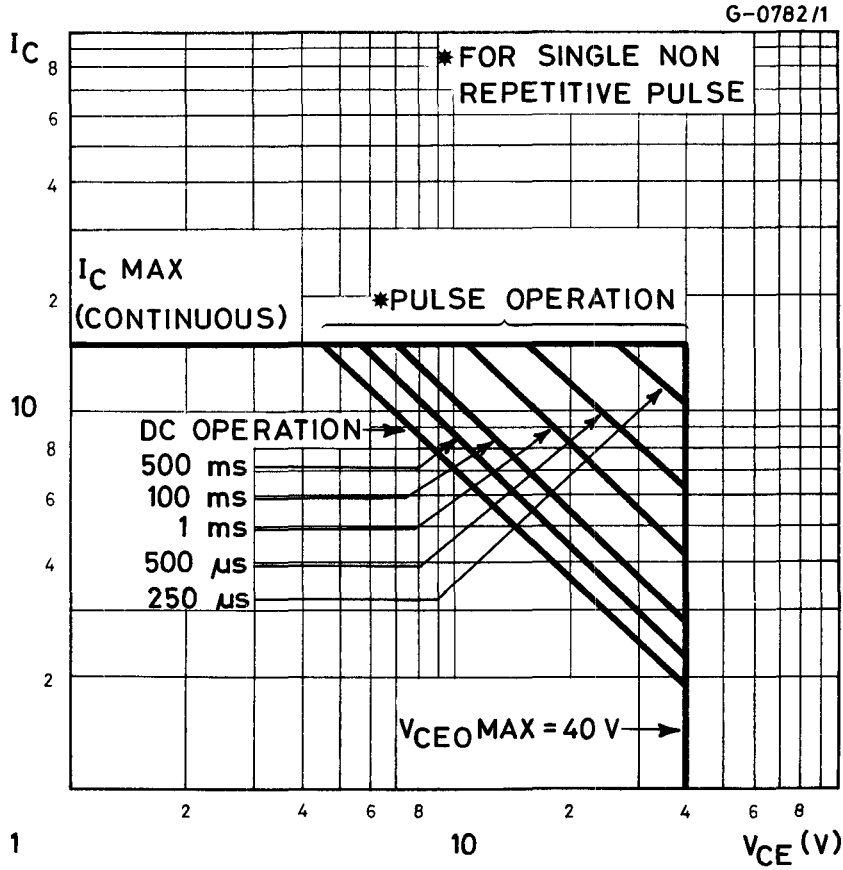
Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CEO(sus)}$* Collector-emitter voltage ($I_B = 0$)	I_C = 200 mA				
	for **BDX 70-71**	60			V
	for **BDX 72-73**	70			V
	for **BDX 74-75**	40			V
$V_{CE(sat)}$* Collector-emitter saturation voltage	*for* **BDX 70-71-72-73**				
	I_C = 10 A I_B = 2 A			2.5	V
	for **BDX 74-75**				
	I_C = 16 A I_B = 3.2 A			2.5	V
V_{BE}* Base-emitter voltage	for **BDX 70-71**				
	I_C = 4 A V_{CE} = 4 V			1.7	V
	for **BDX 72-73**				
	I_C = 5 A V_{CE} = 4 V			1.7	V
	for **BDX 74-75**				
	I_C = 8 A V_{CE} = 4 V			1.7	V
h_{FE}* DC current gain	for **BDX 70-71**				
	I_C = 4 A V_{CE} = 4 V	20		80	—
	I_C = 10 A V_{CE} = 4 V	5			—
	for **BDX 72-73**				
	I_C = 5 A V_{CE} = 4 V	20		80	—
	I_C = 10 A V_{CE} = 4 V	5			—
	for **BDX 74-75**				
	I_C = 8 A V_{CE} = 4 V	15		60	—
	I_C = 16 A V_{CE} = 4 V	5			—
→ h_{fe} Small signal current gain	I_C = 500 mA V_{CE} = 4 V				
	f = 1 kHz	15			—
	f = 100 kHz	8		28	—

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

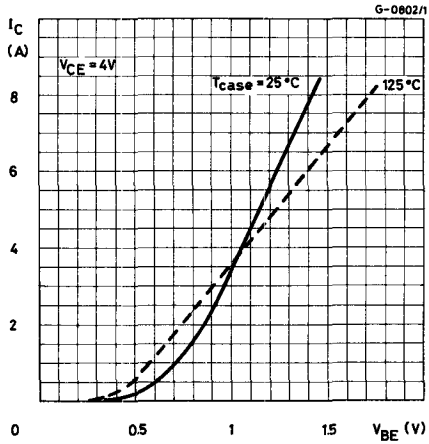
Safe operating areas (for **BDX 70-71-72-73** only)



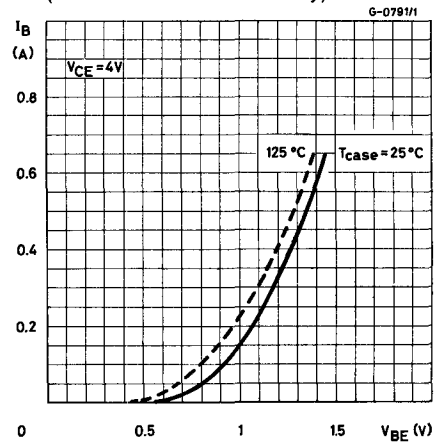
Safe operating areas (for **BDX 74-75** only)



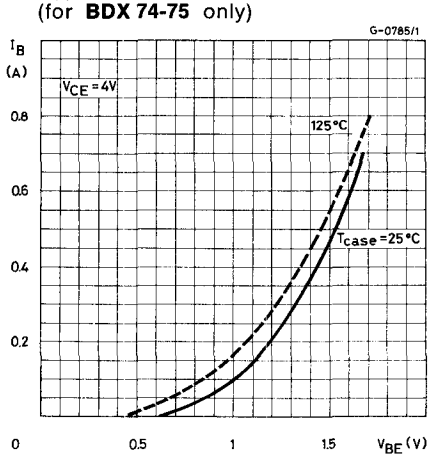
Typical DC transconductance



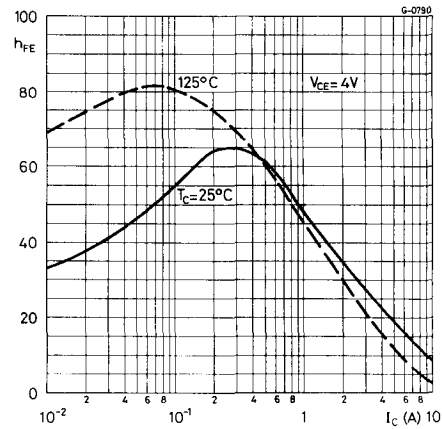
Typical input characteristics (for **BDX 70-71-72-73** only)



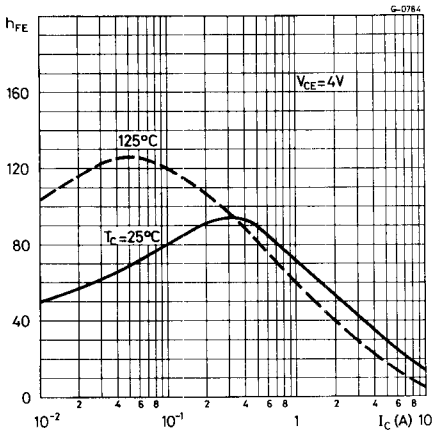
Typical input characteristics (for **BDX 74-75** only)



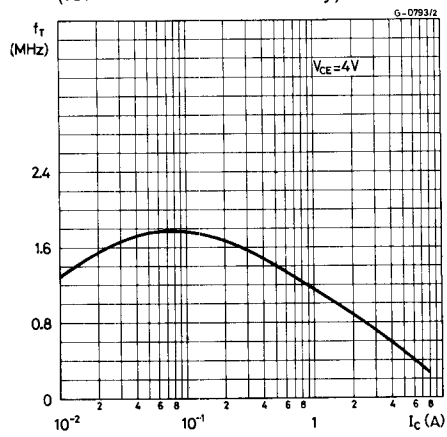
Typical DC current gain (for **BDX 70-71-72-73** only)



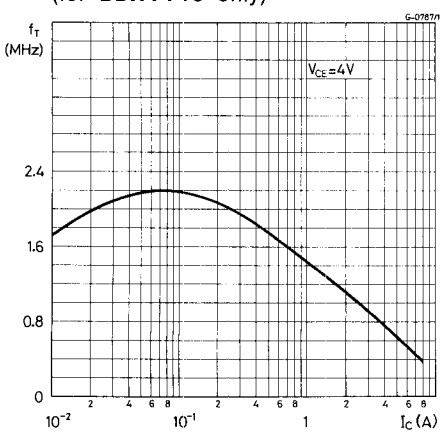
Typical DC current gain
(for **BDX 74-75** only)



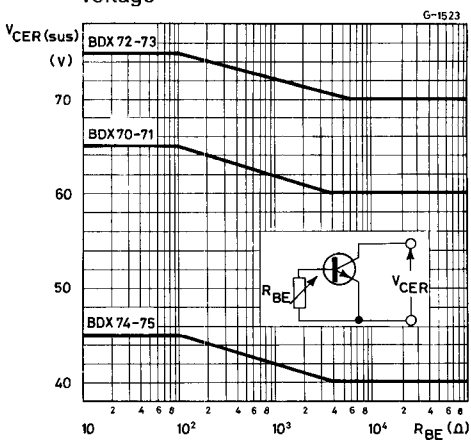
Typical transition frequency
(for **BDX 70-71-72-73** only)



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

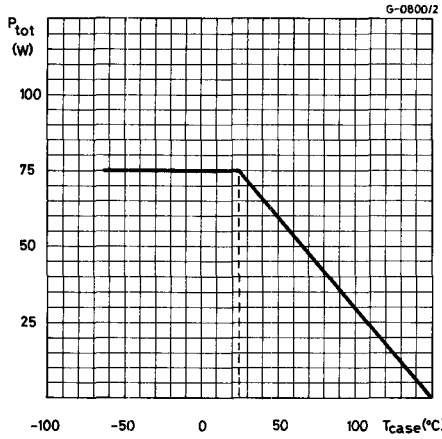


Collector-emitter breakdown
voltage

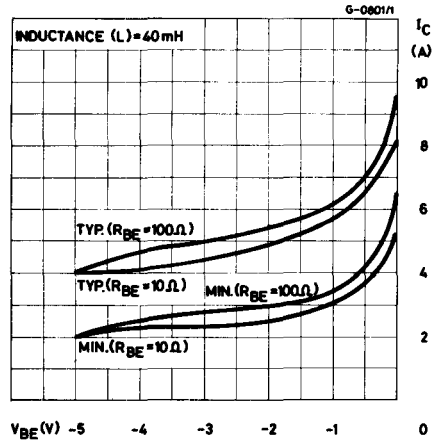


BDX 70 to 75
2N6098 to 6103

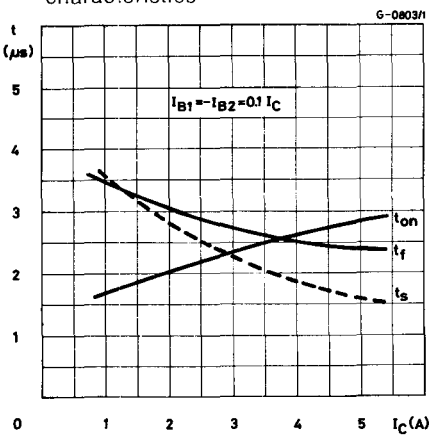
Power rating chart



Reverse-bias second breakdown characteristics



Typical saturated switching characteristics



Thermal-cycle rating chart