

Silicon NPN Transistor

BDX71

Medium Power Linear and Switching

65V / 10A

DATASHEET

OEM –SGS Ates

Source: SGS Ates Databook 1977

HOMETAXIAL* NPN

BDX 71/2N 6099
BDX 73/2N 6101
BDX 75/2N 6103

MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

The BDX 71/2N 6099, BDX 73/2N 6101, and BDX 75/2N 6103 are single diffused "hometaxial" silicon NPN transistors in Jedec TO-220 plastic package. 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.

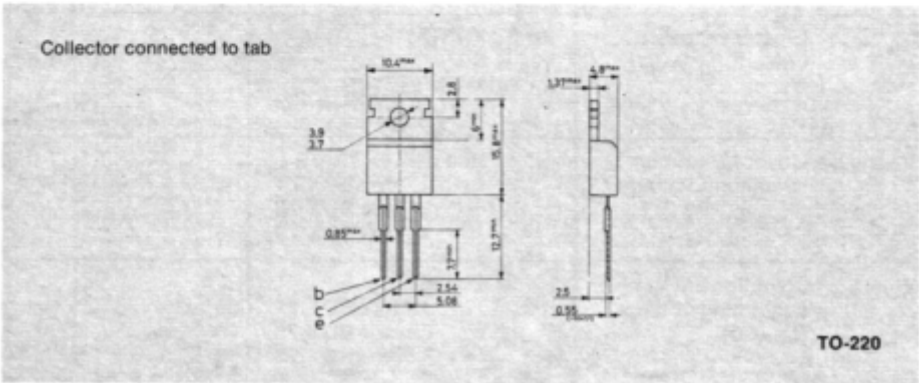
*Hometaxial types employ a structure in which the base region has homogeneous resistivity silicon material in the axial direction (emitter-to-collector).

ABSOLUTE MAXIMUM RATINGS

		BDX 71 2N 6099	BDX 73 2N 6101	BDX 75 2N 6103
V_{CBO}	Collector-base voltage ($I_E = 0$)	70V	80V	45V
V_{CER}	Collector-emitter voltage ($R_{BE} \leq 100 \Omega$)	65V	75V	45V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	60V	70V	40V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	8V	8V	5V
I_C	Collector current	10A	10A	16A
I_B	Base current		4A	
P_{tot}	Total power dissipation at $T_{amb} \leq 25^\circ C$ $T_{case} \leq 25^\circ C$		1.8W 75W	
T_{stg}	Storage temperature		-65 to 150 °C	
T_J	Junction temperature		150 °C	

MECHANICAL DATA

Dimensions in mm



BDX 71/2N 6099
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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 ($T_{case} = 25^{\circ}C$ unless otherwise specified)

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

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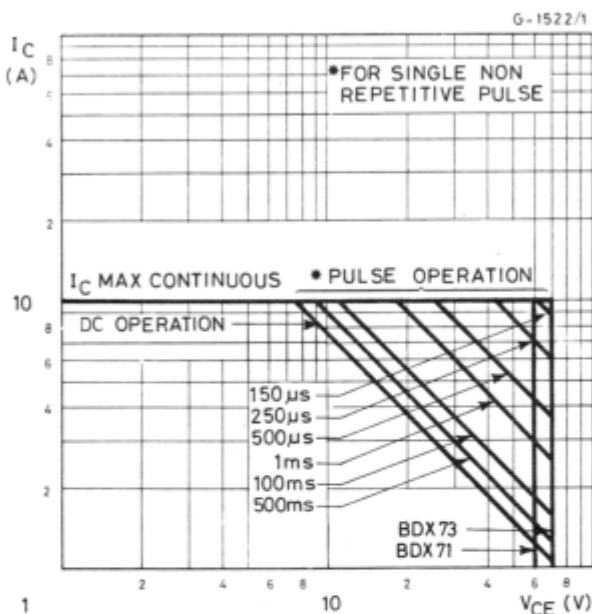
ELECTRICAL CHARACTERISTICS (continued)

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

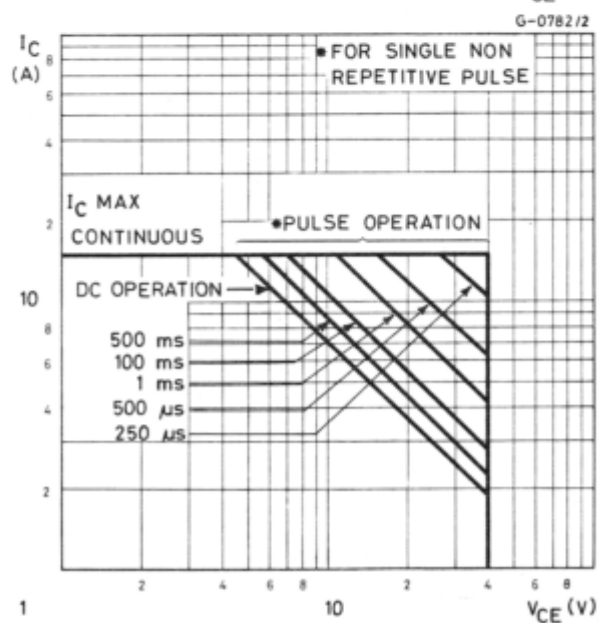
* Pulsed: pulse duration = 300 μs , duty cycle = 1.5 %

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Safe operating areas
(for **BDX71** and **BDX73** only)

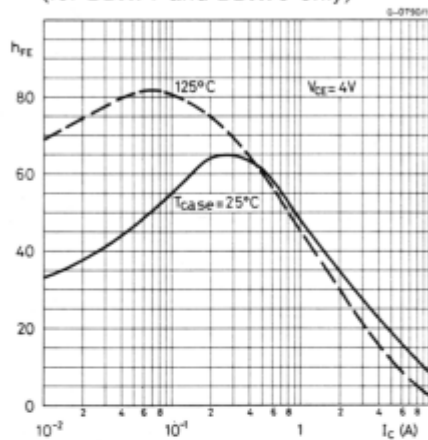


Safe operating areas
(for **BDX75** only)

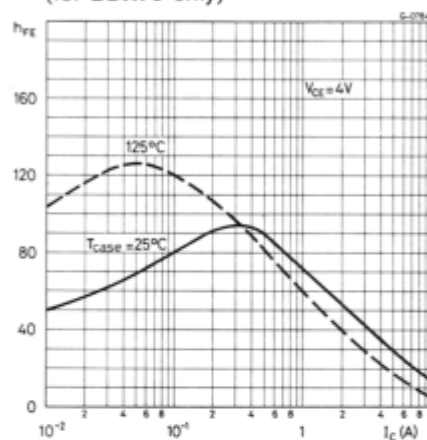


BDX 71/2N 6099
BDX 73/2N 6101
BDX 75/2N 6103

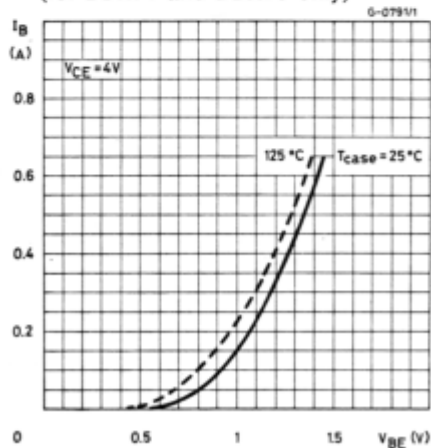
DC current gain
(for **BDX71** and **BDX73** only)



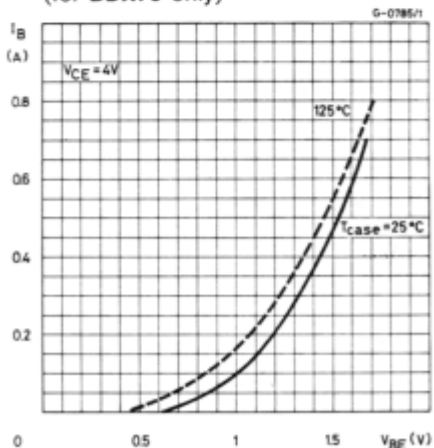
DC current gain
(for **BDX75** only)



Input characteristics
(for **BDX71** and **BDX73** only)

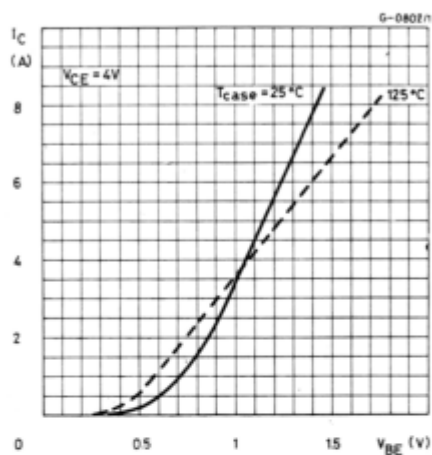


Input characteristics
(for **BDX75** only)

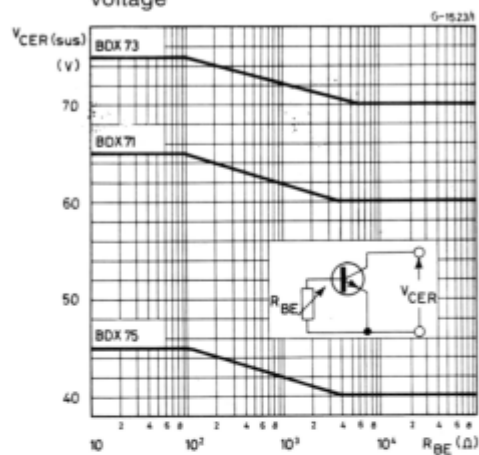
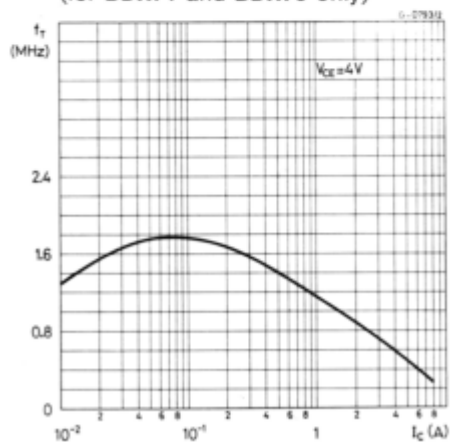
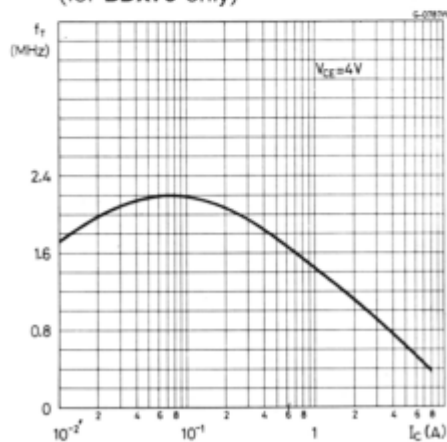


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DC transconductance

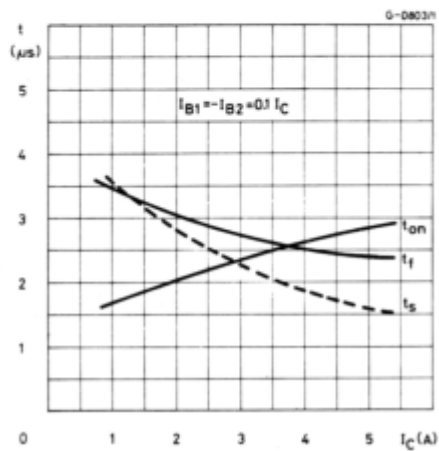


Collector-emitter breakdown voltage

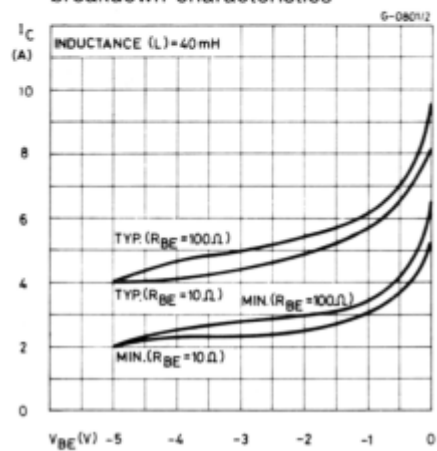
Transition frequency
(for BDX71 and BDX73 only)Transition frequency
(for BDX75 only)

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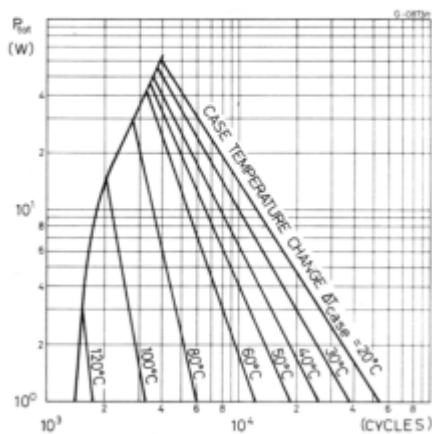
Saturated switching characteristics



Reverse-bias second breakdown characteristics



Thermal-cycle rating chart



Power rating chart

