Silicon NPN Transistor

2N4347

high power, high voltage

140V / 10A

DATASHEET

OEM –SGS Ates

Source: SGS Ates Databook 1977

BDX 11 / 2N 3442
BDX 12 / 2N 4347

HOMETAXIAL* NPN

HIGH POWER, HIGH VOLTAGE APPLICATIONS

The BDX11/2N 3442 and BDX12/2N 4347 are high voltage, «hometaxial*» NPN transistors in Jedec TO-3 metal case. They are intended for use as power switches, regulators, dc-dc converters, inverters and audio amplifiers.

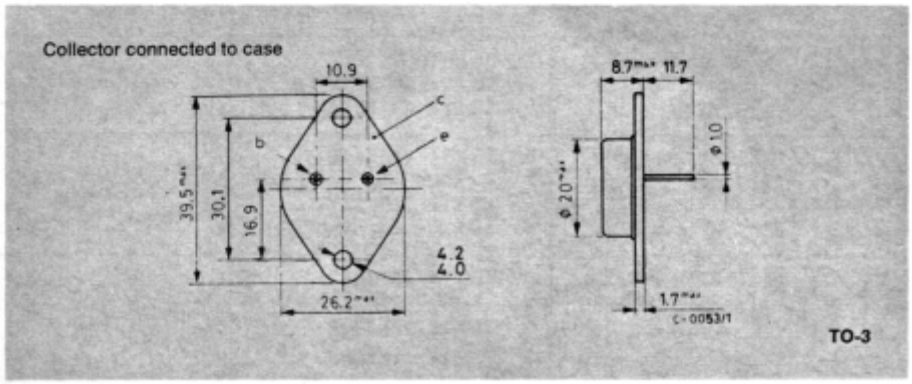
*Hometaxial types employ a structure in which the base region has homogeneous resistivity silicon material in the axial direction (emitter-to-collector).

ABSOLUTE MAXIMUM RATINGS

		BDX 12 2N 4347	BDX 11 2N 3442
V_{CBO}	Collector-base voltage ($I_E = 0$)	140V	160V
V_{CEV}	Collector-emitter voltage ($V_{BE} = -1.5$ V)	140V	160V
V_{CER}	Collector-emitter voltage ($R_{BE} \leq 100\ \Omega$)	130V	150V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	120V	140V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	7V	
I_C	Collector current	10A	
I_{CM}	Collector peak current (repetitive)	15A	
I_B	Base current	7A	
P_{tot}	Total power dissipation $T_{case} \leq 25°C$ for **BDX11/2N3442**	117W	
	for **BDX12/2N4347**	100W	
T_{stg}	Storage temperature	-65 to 200 °C	
T_j	Junction temperature	200 °C	

MECHANICAL DATA

Dimensions in mm



BDX 11 / 2N 3442
BDX 12 / 2N 4347

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	**BDX11/2N 3442**	max	1.5	°C/W
		BDX12/2N 4347	max	1.75	°C/W

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

Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current (I_E = 0) (for **BDX11/2N 3442**)	V_{CB} = 140 V			1	mA
I_{CEV}	Collector cutoff current (V_{BE} = -1.5 V)	for **BDX11/2N 3442**				
		V_{CE} = 140 V			1	mA
		V_{CE} = 140 V T_{case} = 150°C			10	mA
		for **BDX12/2N 4347**				
		V_{CE} = 120 V			2	mA
		V_{CE} = 120 V T_{case} = 150°C			10	mA
I_{EBO}	Emitter cutoff current (I_C = 0)	V_{EB} = 7 V			5	mA
$V_{CEV\ (sus)}$*	Collector-emitter sustaining voltage (V_{BE} = -1.5V)	I_C = 100mA				
		for **BDX11/2N 3442**	160			V
		for **BDX12/2N 4347**	140			V
$V_{CER\ (sus)}$*	Collector-emitter sustaining voltage (R_{BE} = 100 Ω)	I_C = 100mA				
		for **BDX11/2N 3442**	150			V
		for **BDX12/2N 4347**	130			V
$V_{CEO\ (sus)}$*	Collector-emitter sustaining voltage (I_B = 0)	I_C = 200mA				
		for **BDX11/2N 3442**	140			V
		for **BDX12/2N 4347**	120			V
$V_{CE\ (sat)}$*	Collector-emitter saturation voltage	for **BDX11/2N 3442**				
		I_C = 3 A I_B = 0.3 A			1	V
		for **BDX12/2N 4347**				
		I_C = 2 A I_B = 0.2 A			1	V
V_{BE}*	Base-emitter voltage	for **BDX11/2N 3442**				
		I_C = 3 A V_{CE} = 4 V			1.7	V
		for **BDX12/2N 4347**				
		I_C = 2 A V_{CE} = 4 V			2	V

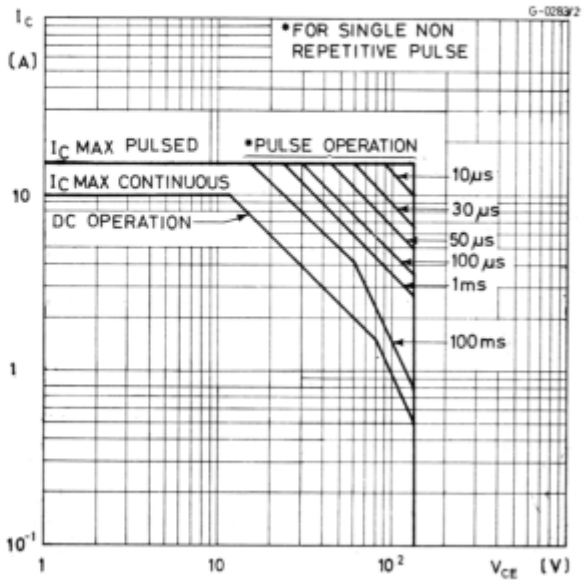
BDX 11 / 2N 3442
BDX 12 / 2N 4347

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
h_{FE}*	DC current gain	for **BDX11/2N 3442**				
	Gr. 4	I_C = 0.5 A V_{CE} = 4 V	20		50	—
	Gr. 5	I_C = 0.5 A V_{CE} = 4 V	35		75	—
	Gr. 6	I_C = 0.5 A V_{CE} = 4 V	60		145	—
	Gr. 7	I_C = 0.5 A V_{CE} = 4 V	120		250	—
		I_C = 3 A V_{CE} = 4 V	20		70	—
		for **BDX12/2N 4347**				
		I_C = 2 A V_{CE} = 4 V	20		70	—
h_{FE1}/h_{FE2}*	Matched pair (for **BDX11/2N 3442**)	I_C = 0.5 A V_{CE} = 4 V			1.6	—
$I_{s/b}$**	Second breakdown collector current	V_{CE} = 78 V **BDX11/2N 3442**	1.5			A
		V_{CE} = 67 V **BDX12/2N 4347**	1.5			A

* Pulsed: pulse duration = 300 μs, duty cycle = 1.5 %
** Pulsed: 1s, non repetitive pulse

Safe operating areas
(for **BDX11/2N 3442** only)



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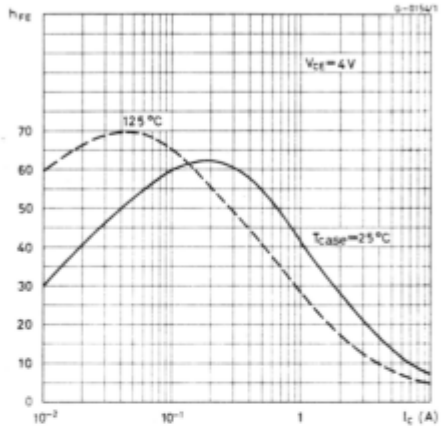
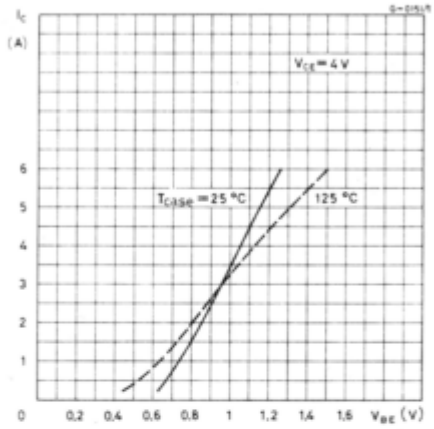
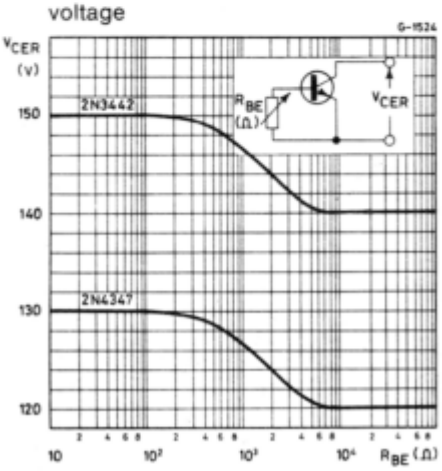
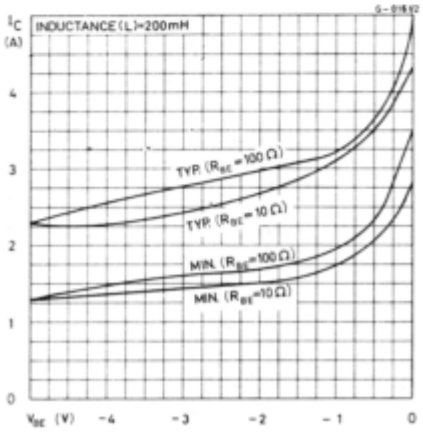
DC current gain



DC transconductance



Collector-emitter breakdown voltage



Reverse-bias second breakdown characteristics