

SILICON HOMETAXIAL* NPN

HIGH POWER HIGH VOLTAGE APPLICATIONS

The 2N 3442/BDX 11 and 2N 4347/BDX 12 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).

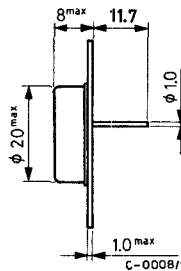
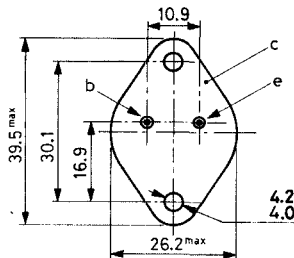
ABSOLUTE MAXIMUM RATINGS

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

MECHANICAL DATA

Dimensions in mm

Collector connected to case



(sim. to TO-3)

2N 3442/BDX 11

2N 4347/BDX 12

THERMAL DATA

$R_{th\ j-c}$	Thermal resistance junction-case	for 2N 3442	max	1.5 °C/W
		for 2N 4347	max	1.75 °C/W

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

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

ELECTRICAL CHARACTERISTICS (continued)

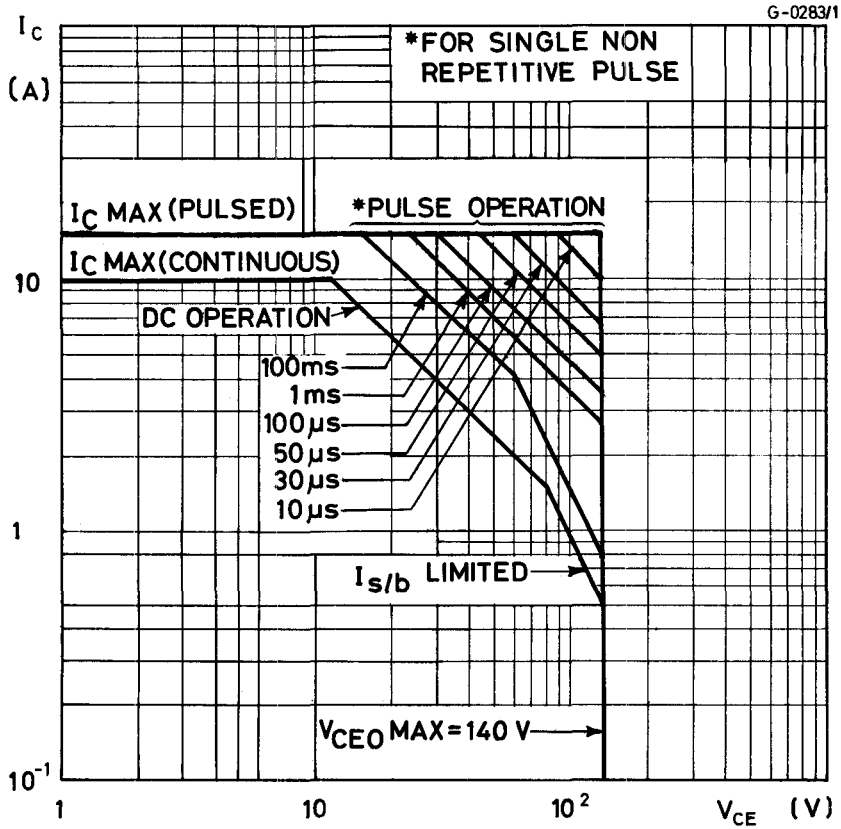
Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{BE}^* Base-emitter voltage	for 2N 3442 $I_C = 3\text{ A}$ $V_{CE} = 4\text{ V}$			1.7	V
	for 2N 4347 $I_C = 2\text{ A}$ $V_{CE} = 4\text{ V}$			2	V
h_{FE}^* DC current gain	for 2N 3442				
	Gr. 4 $I_C = 0.5\text{ A}$ $V_{CE} = 4\text{ V}$	20		50	—
	Gr. 5 $I_C = 0.5\text{ A}$ $V_{CE} = 4\text{ V}$	35		75	—
	Gr. 6 $I_C = 0.5\text{ A}$ $V_{CE} = 4\text{ V}$	60		145	—
	Gr. 7 $I_C = 0.5\text{ A}$ $V_{CE} = 4\text{ V}$	120		250	—
	$I_C = 3\text{ A}$ $V_{CE} = 4\text{ V}$	20		70	—
	for 2N 4347				
	$I_C = 2\text{ A}$ $V_{CE} = 4\text{ V}$	20		70	—
h_{FE1}/h_{FE2} Matched pair (for 2N 3442 only)	$I_C = 0.5\text{ A}$ $V_{CE} = 4\text{ V}$			1.6	—
$I_{s/b}^{**}$ Second breakdown collector current	$V_{CE} = 78\text{ V}$ for 2N 3442	1.5			A
	$V_{CE} = 67\text{ V}$ for 2N 4347	1.5			A

* Pulsed: pulse duration = 30 μs , duty factor = 1.5 %

** Pulsed: 1s, non repetitive pulse

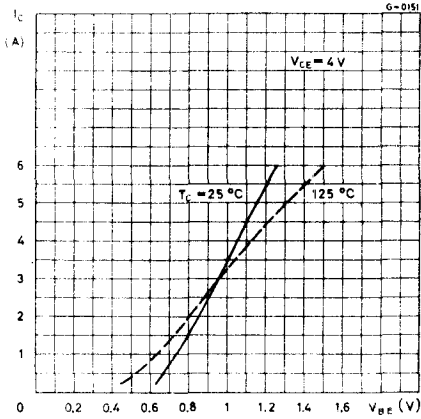
2N 3442/BDX 11
2N 4347/BDX 12

Safe operating areas (for 2N 3442 only)

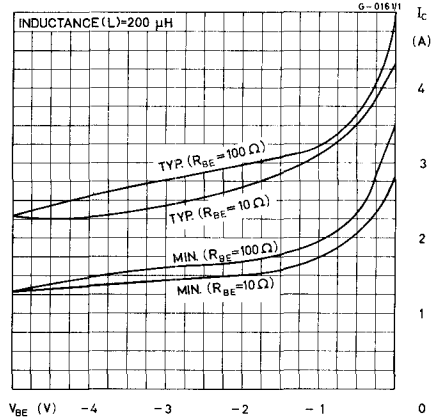


2N 3442/BDX 11 2N 4347/BDX 12

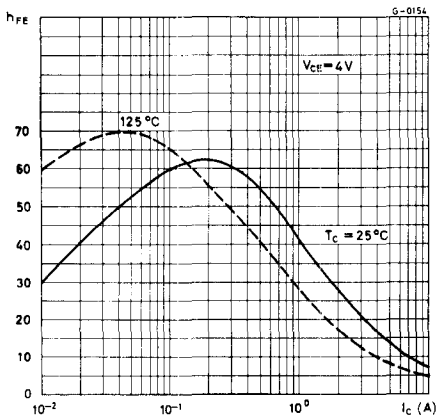
Typical DC transconductance



Reverse-bias second breakdown characteristics



Typical DC current gain



Collector-emitter breakdown voltage

