SILICON PLANAR NPN

BSY 51
BSY 52

PRELIMINARY DATA

GENERAL PURPOSE AMPLIFIERS

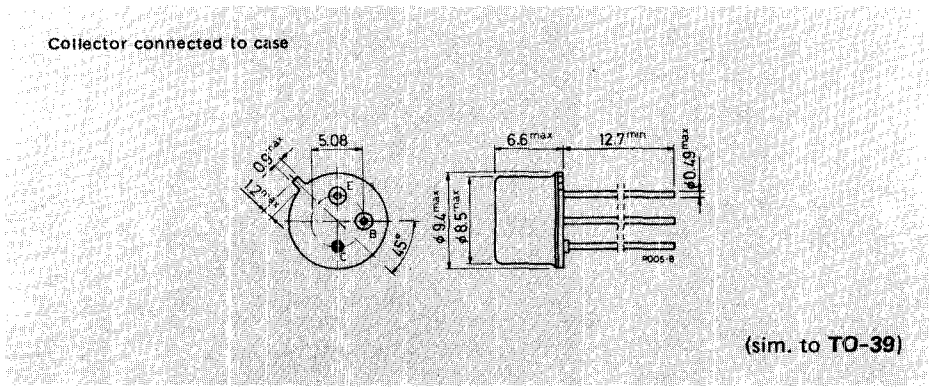
The BSY 51 and BSY 52 are silicon planar epitaxial NPN transistors in Jedec TO-39 metal case, intended for use in high performance amplifier, oscillator and switching circuits.

ABSOLUTE MAXIMUM RATINGS

V_{CBO}	Collector-base voltage ($I_E = 0$)	60	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	25	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	500	mA
P_{tot}	Total power dissipation at $T_{amb} = 25°C$	0.8	W
	$T_{case} = 25°C$	3	W
T_{stg}, T_j	Storage and junction temperature	-65 to 200	°C

MECHANICAL DATA

Dimensions in mm



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THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	58	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	220	°C/W

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

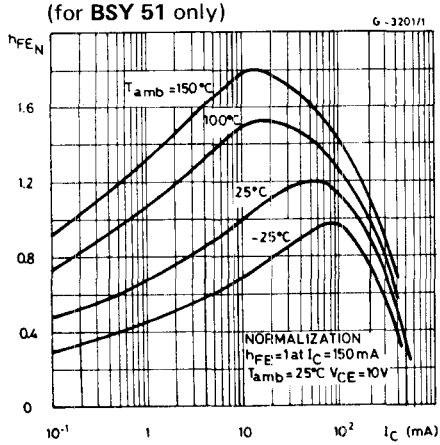
Parameter		Test conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current (I_E = 0)	V_{CB} = 30V				100	nA
		V_{CB} = 30V	T_{amb} = 150°C			100	μA
I_{EBO}	Emitter cutoff current (I_C = 0)	V_{EB} = 3V				50	nA
$V_{CE(sat)}$ *	Collector-emitter saturation-voltage	I_C = 150 mA	I_B = 15 mA		0.15	0.8	V
$V_{BE(sat)}$ *	Base-emitter saturation voltage	I_C = 150 mA	I_B = 15 mA		0.95	1.2	V
h_{FE} *	DC current gain	for **BSY 51**					
		I_C = 1 mA	V_{CE} = 10V		50		–
		I_C = 10 mA	V_{CE} = 10V	30	75		–
		I_C = 150 mA	V_{CE} = 10V	40		120	–
		I_C = 500 mA	V_{CE} = 10V		15		–
		for **BSY 52**					
		I_C = 1 mA	V_{CE} = 10V		100		–
		I_C = 10 mA	V_{CE} = 10V	70	135		–
		I_C = 150 mA	V_{CE} = 10V	100		300	–
		I_C = 500 mA	V_{CE} = 10V		25		–
f_T	Transition frequency	I_C = 50 mA	V_{CE} = 10V				
		f = 50 MHz			100		MHz
C_{CBO}	Collector-base capacitance	I_E = 0	V_{CB} = 10V				
		f = 1 MHz			10		pF
C_{EBO}	Emitter-base capacitance	I_C = 0	V_{EB} = 0.5V				
		f = 1 MHz			23		pF
NF	Noise figure	I_C = 0.3 mA	V_{CE} = 10V				
		R_g = 1.5 kΩ	f = 30Hz to 15kHz		6		dB

ELECTRICAL CHARACTERISTICS (continued)

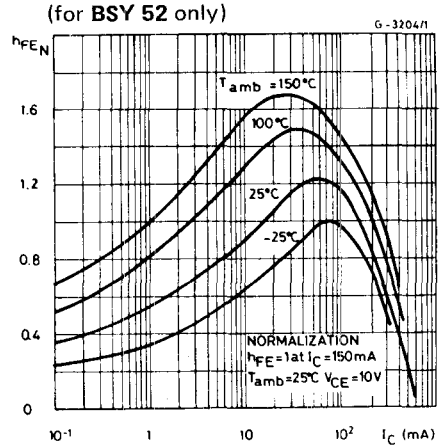
Parameter		Test conditions		Min.	Typ.	Max.	Unit
h_{fe}	Small signal current gain	I_C = 1 mA f = 1 kHz	V_{CE} = 10V				
			for **BSY 51**	30		100	–
			for **BSY 52**	50		200	–
h_{ie}	Input impedance	I_C = 1 mA f = 1 kHz	V_{CE} = 10V				
			for **BSY 51**	0.8		4.5	kΩ
			for **BSY 52**	1		8	kΩ
h_{re}	Reverse voltage ratio	I_C = 1 mA f = 1 kHz	V_{CE} = 10V			$3 \cdot 10^{-4}$	–
h_{oe}	Output admittance	I_C = 1 mA f = 1 kHz	V_{CE} = 10V				
			for **BSY 51**	3.5		13	μS
			for **BSY 52**	4.5		15	μS

* Pulsed: pulse duration = 300 μs, duty cycle = 1%

DC normalized current gain
(for **BSY 51** only)



DC normalized current gain
(for **BSY 52** only)



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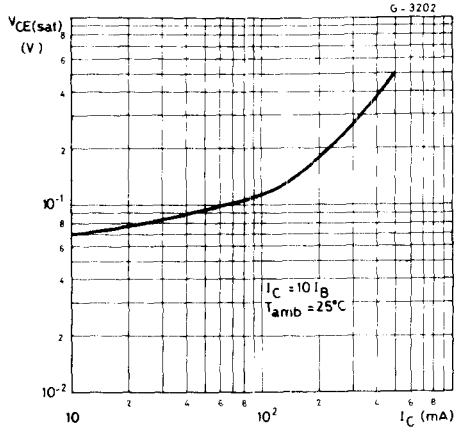
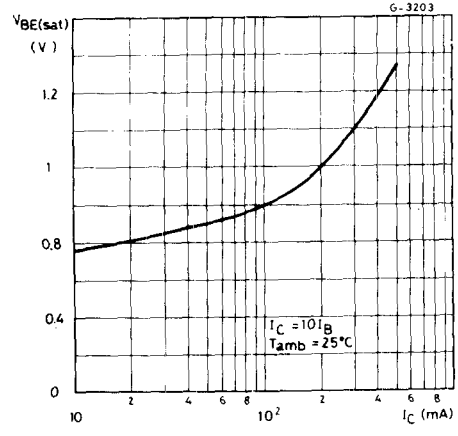
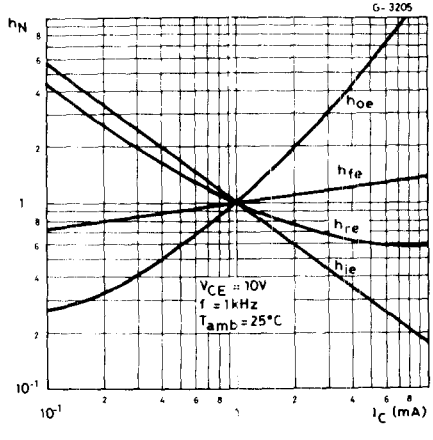
Collector-emitter saturation voltage



Base-emitter saturation voltage



Normalized h parameters



Power rating chart