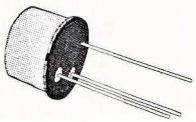
SGS-THOMSON
MICROELECTRONICS

BSY53
BSY54

GENERAL PURPOSE AMPLIFIERS

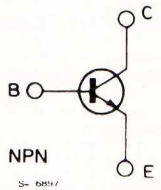
DESCRIPTION

The BSY53 and BSY54 are silicon planar epitaxial NPN transistors in Jedec TO-39 metal case, intended for use in general purpose amplifiers.



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	75	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	30	V
V_{EBO}	Emitter-base Voltage (I_E = 0)	7	V
I_C	Collector Current	750	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.8 3	mW mW
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

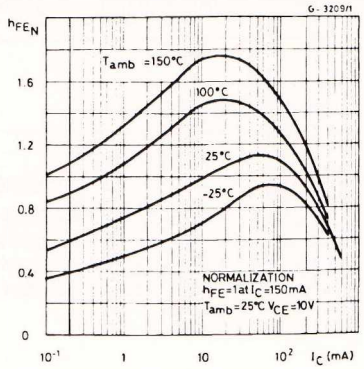
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	58	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	220	°C/W

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

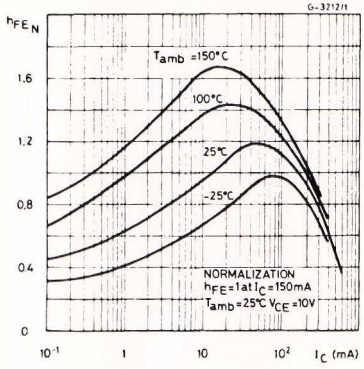
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 60 V				10	nA
		V_{CB} = 60 V	T_{amb} = 150 °C			10	µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V				10	nA
$V_{CE\ (sat)}$*	Collector-emitter Saturation Voltage	I_C = 150 mA	I_B = 15 mA		0.15	0.6	V
		I_C = 500 mA	I_B = 50 mA		0.5	1.2	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 **BSY53**					
		I_C = 0.1 mA	V_{CE} = 10 V	20	40		
		I_C = 1 mA	V_{CE} = 10 V		50		
		I_C = 10 mA	V_{CE} = 10 V	35	65		
		I_C = 150 mA	V_{CE} = 10 V	40		120	
		I_C = 500 mA	V_{CE} = 10 V	20	35		
		for **BSY54**					
		I_C = 0.01 mA	V_{CE} = 10 V	20	55		
		I_C = 0.1 mA	V_{CE} = 10 V	35	80		
		I_C = 1 mA	V_{CE} = 10 V		100		
		I_C = 10 mA	V_{CE} = 10 V	75	135		
		I_C = 150 mA	V_{CE} = 10 V	100		300	
		I_C = 500 mA	V_{CE} = 10 V	40	60		
f_T	Transition Frequency	I_C = 50 mA f = 50 MHz	V_{CE} = 10 V		100		MHz
C_{CBO}	Collector-base Capacitance	I_E = 0 f = 1 MHz	V_{CB} = 10 V		10		pF
C_{EBO}	Emitter-base Capacitance	I_C = 0 f = 1 MHz	V_{EB} = 0.5 V		23		pF
NF	Noise Figure	I_C = 0.3 mA R_g = 1.5 kΩ f = 30 Hz to 15 kHz	V_{CE} = 10 V		3	8	dB
h_{fe}	Small Signal Current Gain	I_C = 1 mA f = 1 kHz	V_{CE} = 10 V				
			for **BSY53**	30		150	
			for **BSY54**	50		250	
h_{ie}	Input Impedance	I_C = 1 mA f = 1 kHz	V_{CE} = 10 V				
			for **BSY53**	0.8		4.5	kΩ
			for **BSY54**	1.6		9	kΩ
h_{re}	Reverse Voltage Ratio	I_C = 1 mA f = 1 kHz	V_{CE} = 10 V			3×10^{-4}	
h_{oe}	Output Impedance	I_C = 1 mA f = 1 kHz	V_{CE} = 10 V				
			for **BSY53**	3.5		10	µS
			for **BSY54**	4.5		12.5	µS

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

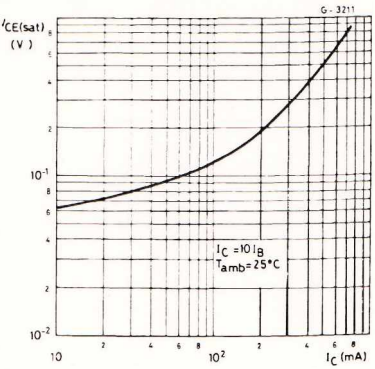
DC Normalized Current Gain (for BSY53 only).



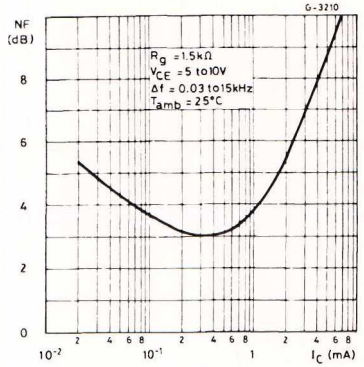
DC Normalized Current Gain (for BSY54 only).



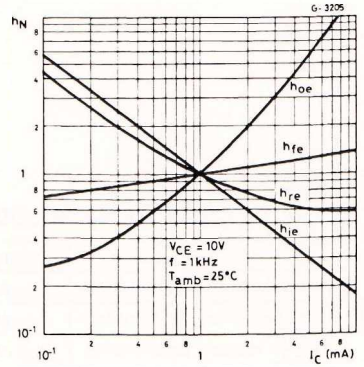
Collector-emitter Saturation Voltage.



NF vs. Collector Current



Normalized h Parameters.



Power Rating Chart.