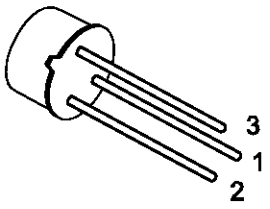
SGS-THOMSON MICROELECTRONICS

BFY50/51

MEDIUM POWER AMPLIFIER

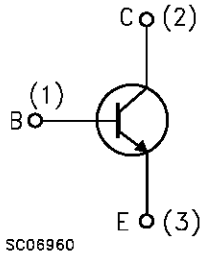
DESCRIPTION

The BFY50 and BFY52 are silicon planar epitaxial NPN transistors in Jedec TO-39 metal case. They are intended for general purpose linear and switching applications.



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BFY50	BFY51	
V_{CBO}	Collector-Base Voltage (I_E = 0)	80	60	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	35	30	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	6		V
I_C	Collector Current	1		A
I_{CM}	Collector Peak Current (t_p < 5 ms)	1.5		A
P_{tot}	Total Dissipation at $T_{amb} \leq 25\ ^oC$ at $T_{case} \leq 25\ ^oC$	0.8 5		W W
T_{stg}	Storage Temperature	-65 to 200		^oC
T_j	Max. Operating Junction Temperature	200		^oC

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	35	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	218	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BFY50**				
		V_{CB} = 60 V			50	nA
		V_{CB} = 60 V T_{case} = 100 °C			2.5	µA
		for **BFY51**				
		V_{CB} = 40 V			50	nA
		V_{CB} = 40 V T_{case} = 100 °C			2.5	µA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			50	nA
		V_{EB} = 5 V T_{case} = 100 °C			2.5	µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (IE = 0)	I_C = 100 µA				
		for **BFY50**	80			V
		for **BFY51**	60			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = 30 mA				
		for **BFY50**	35			V
		for **BFY51**	30			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_C = 100 µA	6			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA				
		for **BFY50**		0.14	0.2	V
		for **BFY51**		0.14	0.35	V
		I_C = 1 A I_B = 0.1 A				
		for **BFY50**		0.7	1	V
		for **BFY51**		0.7	1.6	V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA		0.95	1.3	V
		I_C = 1 A I_B = 0.1 A		1.5	2	V
h_{FE}*	DC Current Gain	for **BFY50**				
		I_C = 10 mA V_{CE} = 10 V	20	40		
		I_C = 150 mA V_{CE} = 10 V	30	55		
		I_C = 1A V_{CE} = 10 V	15	30		
		for **BFY51**				
		I_C = 10 mA V_{CE} = 10 V	30	55		
		I_C = 150 mA V_{CE} = 10 V	40	70		
		I_C = 1A V_{CE} = 10 V	15	40		
h_{fe}*	Small Signal Current Gain	V_{CE} = 6 V f = 1KHz				
		I_C = 1 mA				
		for **BFY50**		25		
		for **BFY51**		30		
		I_C = 10 mA				
		for **BFY50**		45		
		for **BFY51**		60		
f_T	Transition Frequency	I_C = 50 mA V_{CE} = 10 V				
		for **BFY50**	60	100		MHz
		for **BFY51**	50	110		MHz
C_{CBO}	Collector Base Capacitance	I_E = 0 V_{CB} = 10 V f = 1MHz		10		pF

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

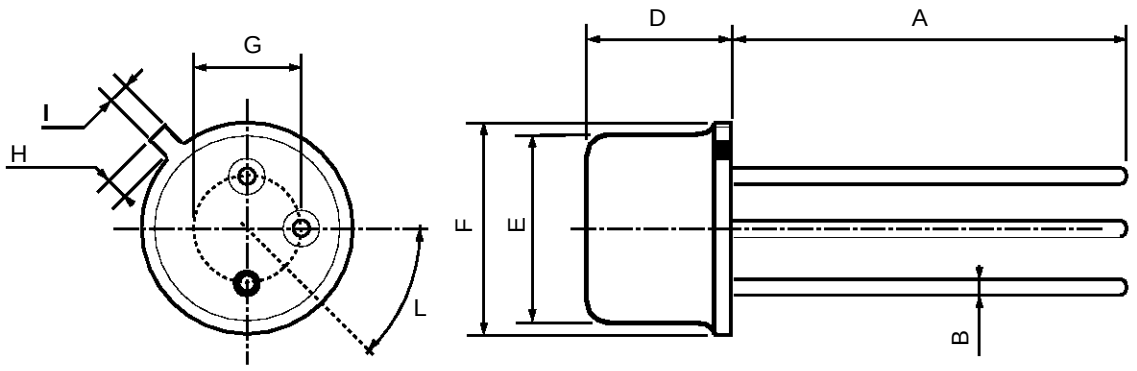
ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{ie}	Input Impedance	I_C = 10 mA V_{CE} = 5 V f = 1KHz for **BFY50** for **BFY51**		 180 220		 Ω Ω
h_{re}	Reverse Voltage Ratio	I_C = 10 mA V_{CE} = 5 V f = 1KHz for **BFY50** for **BFY51**		 55 70		 10^{-6} 10^{-6}
h_{oe}	Output Admittance	I_C = 10 mA V_{CE} = 5 V f = 1KHz for **BFY50** for **BFY51**		 30 35		 µS µS
t_d	Delay Time	I_C = 150 mA V_{CC} = 10 V I_{B1} = 15 mA V_{BE} = -2 V		15		ns
t_r	Rise Time	I_C = 150 mA V_{CC} = 10 V I_{B1} = 15 mA V_{BE} = -2 V		40		ns
t_s	Storage Time	I_C = 150 mA V_{CC} = 10 V I_{B1} = -I_{B2} = 15 mA		300		ns
t_f	Fall Time	I_C = 150 mA V_{CC} = 10 V I_{B1} = -I_{B2} = 15 mA		60		ns

∗ Pulsed: Pulse duration = 300 µs, duty cycle ≤ 1 %

TO-39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45^{o} (typ.)					



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