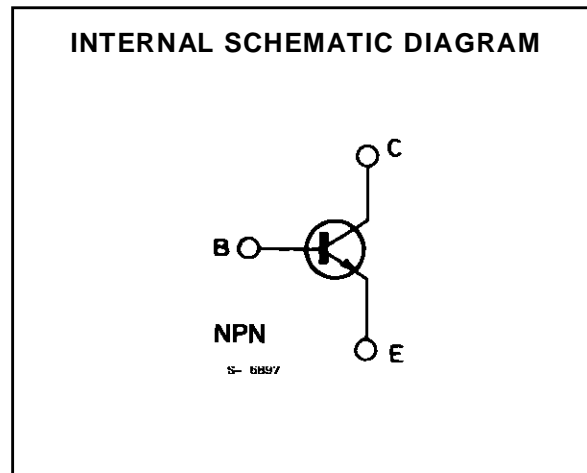
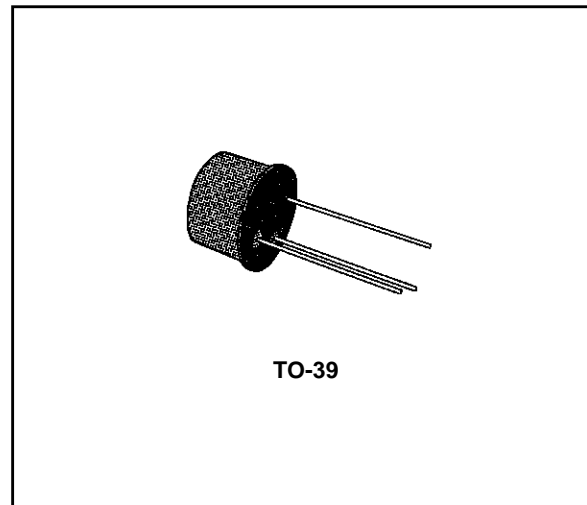


MEDIUM-POWER AMPLIFIERS

DESCRIPTION

The BFY50, BFY51 and BFY52 are silicon planar epitaxial NPN transistors in Jedec TO-39 metal case. They are intended for general purpose linear and switching applications.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	BFY50	BFY51	BFY52
V_{CBO}	Collector-base Voltage ($I_E = 0$)	80 V	60 V	40 V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	35 V	30 V	20 V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	6 V		
I_C	Collector Current	1 A		
I_{CM}	Collector Peak Current	1.5 A		
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ at $T_{case} \leq 25\text{ }^\circ\text{C}$	0.8 W 5 W		
T_{stg}, T_j	Storage and Junction Temperature	- 65 to 200 $^\circ\text{C}$		

BFY50-BFY51-BFY52

THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	35	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	218	°C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25\ ^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BFY50 $V_{CB} = 60\ \text{V}$ $V_{CB} = 60\ \text{V}$ for BFY51 $V_{CB} = 40\ \text{V}$ $V_{CB} = 40\ \text{V}$ for BFY52 $V_{CB} = 30\ \text{V}$ $V_{CB} = 30\ \text{V}$ $T_{case} = 100\ ^\circ\text{C}$			50 2.5 50 2.5 50 2.5	nA μA nA μA nA μA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\ \text{V}$ $V_{EB} = 5\ \text{V}$ $T_{case} = 100\ ^\circ\text{C}$			50 2.5	nA μA
$V_{(BR)CBO}^*$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = 100\ \mu\text{A}$	80 60 40			V V V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = 30\ \text{mA}$	35 30 20			V V V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 100\ \mu\text{A}$	6			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 150\ \text{mA}$ for BFY51 and BFY52 $I_C = 1\ \text{A}$ for BFY51 and BFY52	$I_B = 15\ \text{mA}$ for BFY50 $I_B = 0.1\ \text{A}$ for BFY50	0.14 0.14 0.7 0.7	0.2 0.35 1 1.6	V V V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 150\ \text{mA}$ $I_C = 1\ \text{A}$	$I_B = 15\ \text{mA}$ $I_B = 0.1\ \text{A}$	0.95 1.5	1.3 2	V V
h_{FE}^*	DC Current Gain	for BFY50 $I_C = 10\ \text{mA}$ $I_C = 150\ \text{mA}$ $I_C = 1\ \text{A}$ for BFY51 $I_C = 10\ \text{mA}$ $I_C = 150\ \text{mA}$ $I_C = 1\ \text{A}$ for BFY52 $I_C = 10\ \text{mA}$ $I_C = 150\ \text{mA}$ $I_C = 1\ \text{A}$	$V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$ $V_{CE} = 10\ \text{V}$	20 30 15 30 40 15 30 60 15	40 55 30 55 70 40 80 130 60	
h_{fe}	Small Signal Current Gain	$V_{CE} = 6\ \text{V}$ $I_C = 1\ \text{mA}$ $I_C = 10\ \text{mA}$	$f = 1\ \text{kHz}$ for BFY50 for BFY51 for BFY52 for BFY50 for BFY51 for BFY52	 25 30 40 45 60 120		

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

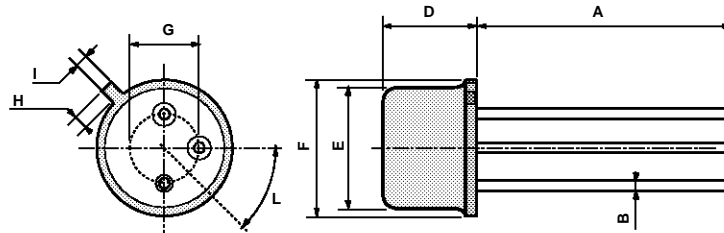
ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_T	Transition Frequency	$I_C = 50 \text{ mA}$ $V_{CE} = 10 \text{ V}$ for BFY50 for BFY51 for BFY52	60 50 50	100 110 120		MHz MHz MHz
C_{CBO}	Collector-base Capacitance	$I_E = 0$ $V_{CB} = 10 \text{ V}$ $f = 1 \text{ MHz}$		10		pF
h_{ie}	Input Impedance	$I_C = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $f = 1 \text{ kHz}$ for BFY50 for BFY51 for BFY52		180 220 400		Ω Ω Ω
h_{re}	Reverse Voltage Ratio	$I_C = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $f = 1 \text{ kHz}$ for BFY50 for BFY51 for BFY52		55×10^{-6} 70×10^{-6} 130×10^{-6}		
h_{oe}	Output Admittance	$I_C = 10 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $f = 1 \text{ kHz}$ for BFY50 for BFY51 for BFY52		30 35 70		μS μS μS
t_d	Delay Time	$I_C = 150 \text{ mA}$ $V_{CC} = 10 \text{ V}$ $I_{B1} = 15 \text{ mA}$ $V_{BE} = -2 \text{ V}$		15		ns
t_r	Rise Time	$I_C = 150 \text{ mA}$ $V_{CC} = 10 \text{ V}$ $I_{B1} = 15 \text{ mA}$ $V_{BE} = -2 \text{ V}$		40		ns
t_s	Storage Time	$I_C = 150 \text{ mA}$ $V_{CC} = 10 \text{ V}$ $I_{B1} = - I_{B2} = 15 \text{ mA}$		300		ns
t_f	Fall Time	$I_C = 150 \text{ mA}$ $V_{CC} = 10 \text{ V}$ $I_{B1} = - I_{B2} = 15 \text{ mA}$		60		ns

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

TO39 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° (typ.)					



P008B

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A