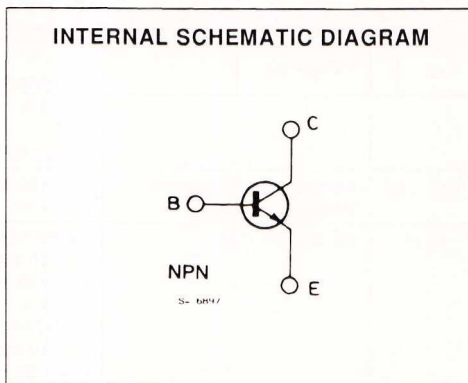
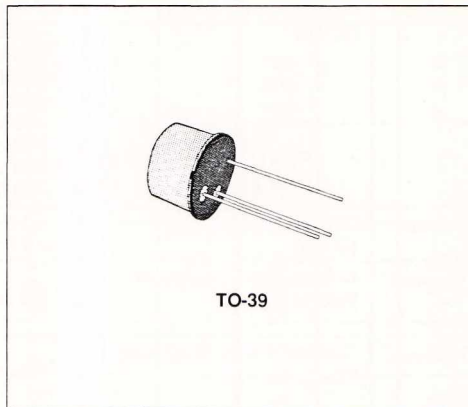


MEDIUM-POWER AMPLIFIERS

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 $T_{amb} \leq 25^\circ C$ at $T_{case} \leq 25^\circ C$	0.8 W 5 W		
T_{stg}, T_j	Storage and Junction Temperature	- 65 to 200 °C		

THERMAL DATA

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

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BFY50 $V_{CB} = 60\ V$ $V_{CB} = 60\ V$ for BFY51 $V_{CB} = 40\ V$ $V_{CB} = 40\ V$ for BFY52 $V_{CB} = 30\ V$ $V_{CB} = 30\ V$	$T_{case} = 100\ ^{\circ}C$		50 2.5	nA μA	
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\ V$ $V_{EB} = 5\ V$	$T_{case} = 100\ ^{\circ}C$		50 2.5	nA μA	
$V_{(BR)CBO}^*$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = 100\ \mu A$	for BFY50 for BFY51 for BFY52	80 60 40		V V V	
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = 30\ mA$	for BFY50 for BFY51 for BFY52	35 30 20		V V V	
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 100\ \mu A$		6		V	
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 150\ mA$ for BFY51 and BFY52 $I_C = 1\ A$	$I_B = 15\ mA$ for BFY50 $I_B = 0.1\ A$ for BFY50 for BFY51 and BFY52		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	$I_C = 150\ mA$ $I_C = 1\ A$	$I_B = 15\ mA$ $I_B = 0.1\ A$		0.95 1.5	1.3 2	V V
h_{FE}^*	DC Current Gain	for BFY50 $I_C = 10\ mA$ $I_C = 150\ mA$ $I_C = 1\ A$ for BFY51 $I_C = 10\ mA$ $I_C = 150\ mA$ $I_C = 1\ A$ for BFY52 $I_C = 10\ mA$ $I_C = 150\ mA$ $I_C = 1\ A$	$V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$ $V_{CE} = 10\ V$	20 30 15 30 40 15 30 60 15	40 55 30 55 70 40 80 130 60		
h_{fe}	Small Signal Current Gain	$V_{CE} = 6\ V$ $I_C = 1\ mA$	$f = 1\ kHz$ for BFY50 for BFY51 for BFY52 $I_C = 10\ mA$ 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	$I_E = 0$ $f = 1 \text{ MHz}$	$V_{CB} = 10 \text{ V}$		10		pF
h_{ie}	Input Impedance	$I_C = 10 \text{ mA}$ $f = 1 \text{ kHz}$	$V_{CE} = 5 \text{ V}$ for BFY50 for BFY51 for BFY52		180 220 400		Ω Ω Ω
h_{re}	Reverse Voltage Ratio	$I_C = 10 \text{ mA}$ $f = 1 \text{ kHz}$	$V_{CE} = 5 \text{ V}$ for BFY50 for BFY51 for BFY52		55×10^{-6} 70×10^{-6} 130×10^{-6}		
h_{oe}	Output Admittance	$I_C = 10 \text{ mA}$ $f = 1 \text{ kHz}$	$V_{CE} = 5 \text{ V}$ for BFY50 for BFY51 for BFY52		30 35 70		μS μS μS
t_d	Delay Time	$I_C = 150 \text{ mA}$ $I_{B1} = 15 \text{ mA}$	$V_{CC} = 10 \text{ V}$ $V_{BE} = -2 \text{ V}$		15		ns
t_r	Rise Time	$I_C = 150 \text{ mA}$ $I_{B1} = 15 \text{ mA}$	$V_{CC} = 10 \text{ V}$ $V_{BE} = -2 \text{ V}$		40		ns
t_s	Storage Time	$I_C = 150 \text{ mA}$ $I_{B1} = -I_{B2} = 15 \text{ mA}$	$V_{CC} = 10 \text{ V}$		300		ns
t_f	Fall Time	$I_C = 150 \text{ mA}$ $I_{B1} = -I_{B2} = 15 \text{ mA}$	$V_{CC} = 10 \text{ V}$		60		ns

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