BFY50
BFY51
BFY52

CASE 79, STYLE 1
TO-39 (TO-205AD)

GENERAL PURPOSE TRANSISTOR

NPN SILICON

4

MAXIMUM RATINGS

Rating	Symbol	BFY 50	BFY 51	BFY 52	Unit
Collector-Emitter Voltage	V_{CEO}	35	30	20	Vdc
Collector-Base Voltage	V_{CBO}	80	60	40	Vdc
Emitter-Base Voltage	V_{EBO}	6			Vdc
Collector Current – Continuous	I_C	1			Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	0.8 4.6			Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5 28.6			Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	16.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	89.5	°C/W

Refer to 2N3019 for graphs.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 10 mA)	BFY50 BFY51 BFY52	$V_{(BR)CEO}$	35 30 20		V
Collector-Base Breakdown Voltage (I_C = 10 μA)	BFY50 BFY51 BFY52	$V_{(BR)CBO}$	80 60 40		V
Emitter-Base Breakdown Voltage (I_E = 10 μA)		$V_{(BR)EBO}$	6		V
Collector Cutoff Current (V_{CB} = 60 V) (V_{CB} = 40 V) (V_{CB} = 30 V)	BFY50 BFY51 BFY52	I_{CBO}		50	nA
Collector Cutoff Current (V_{CB} = 60 V, T_j = 100°C) (V_{CB} = 40 V, T_j = 100°C) (V_{CB} = 30 V, T_j = 100°C)	BFY50 BFY51 BFY52	I_{CBO}		2.5	μA
Emitter Cutoff Current (V_{EB} = 5 V) (V_{EB} = 5 V, T_j = 100°C)		I_{EBO}		50 2.8	nA μA
ON CHARACTERISTICS					
DC Current Gain (I_C = 10 mA, V_{CE} = 6 V)	BFY50 BFY51-52	h_{FE}	20 30		
(I_C = 150 mA, V_{CE} = 6 V)	BFY50 BFY51 BFY52		30 40 60		
(I_C = 1 A, V_{CE} = 6 V)			15		
Collector-Emitter Saturation Voltage (I_C = 150 mA, I_B = 15 mA(1))	BFY50 BFY51-52	$V_{CE(sat)}$		0.2 0.35	V
(I_C = 1 A, I_B = 100 mA(1))	BFY50 BFY51-52			1 1.6	
Emitter-Base Saturation Voltage (I_C = 1 A, I_B = 100 mA(1))		$V_{BE(sat)}$		2	V

(1) Pulsed: Pulse Duration = 300 μs, Duty Cycle = 1%.

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
SMALL SIGNAL CHARACTERISTICS					
Small Signal Current Gain (I_C = 1 mA, V_{CE} = 6 V, f = 1 kHz)	BFY50 BFY51-52	h_{fe}	 10 30		
Output Capacitance (V_{CB} = 12 V, f = 500 kHz)		C_{ob}		12	pF
Current Gain Bandwidth Product (I_C = 50 mA, V_{CE} = 6 V, f = 20 MHz)	BFY50 BFY51-52	f_T	 60 50		MHz

4