

BFX38,39,40,41

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

HIGH CURRENT TRANSISTOR

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	BFX38 BFX39	BFX40 BFX41	Unit
Collector-Emitter Voltage	V _{CEO}	55	75	V _{dc}
Collector-Base Voltage	V _{CBO}	55	75	V _{dc}
Emitter-Base Voltage	V _{EBO}	5		V _{dc}
Collector Current - Continuous	I _C	1		A _{dc}
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	1.25 7.15		Watt mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	7 40		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 _{θJC}	20	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	140	°C/W

Refer to 2N4405 for graphs.

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 10 mA) (1)	BFX38-39 BFX40-41	V _{(BR)CEO}	55 75	V
Collector-Base Breakdown Voltage (I _C = 10 μA)	BFX38-39 BFX40-41	V _{(BR)CBO}	55 75	V
Emitter-Base Breakdown Voltage (I _E = 10 μA)		V _{(BR)EBO}	5	V
Collector Cutoff Current (V _{CB} = 40 V) (V _{CB} = 50 V) (V _{CB} = 40 V, T _A = 125°C) (V _{CB} = 50 V, T _A = 125°C)	BFX38-39 BFX40-41 BFX38-39 BFX40-41	I _{CBO}	50 50 50 50	nA μA

ON CHARACTERISTICS

Collector-Emitter Saturation Voltage (I _C = 150 mA, I _B = 15 mA) (1) (I _C = 500 mA, I _B = 50 mA) (1)		V _{CE(sat)}		0.15 0.5	V
DC Current Gain (I _C = 100 μA, V _{CE} = 5 V) (1)	BFX38-40 BFX39-41	h _{FE}	60 30		
(I _C = 100 mA, V _{CE} = 5 V) (1)	BFX38-40 BFX39-41		85 40		
(I _C = 500 mA, V _{CE} = 5 V) (1)	BFX38-40 BFX39-41		60 25		
(I _C = 1 A, V _{CE} = 5 V) (1)	BFX38 BFX39 BFX40 BFX41		30 15 25 10		
Emitter-Base Saturation Voltage (I _C = 150 mA, I _B = 15 mA) (1) (I _C = 500 mA, I _B = 15 mA) (1)		V _{BE(sat)}		0.9 1.1	V
DC Current Gain (I _C = 100 mA, V _{CE} = 5 V, T _A = 125°C) (1)	BFX38-40 BFX39-41	h _{FE}	30 15		

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

BFX38,39,40,41**ELECTRICAL CHARACTERISTICS** (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
SMALL SIGNAL CHARACTERISTICS				
Current Gain — Bandwidth Product ($I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$)	f_T	100		MHz
Output Capacitance ($V_{CB} = 10\text{ V}$)	C_{ob}		20	pF
Input Capacitance ($V_{EB} = 0.5\text{ V}$)	C_{ib}		120	pF
Turn On Time ($I_C = 500\text{ mA}$, $I_{B1} = 50\text{ mA}$)	t_{on}		100	ns
Turn Off Time ($I_C = 500\text{ mA}$, $I_{B1} = I_{B2} = 50\text{ mA}$)	t_{off}		350	ns
Fall Time ($I_C = 500\text{ mA}$, $I_{B1} = I_{B2} = 50\text{ mA}$)	t_f		50	ns