

NPN switching transistor

BFX85

FEATURES

- High current (max. 1 A)
- Low voltage (max. 60 V).

APPLICATIONS

- General purpose switching and amplification
- Industrial applications.

DESCRIPTION

NPN transistor in a TO-39 metal package.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector, connected to case

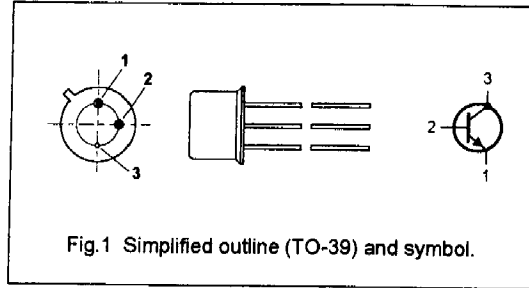


Fig. 1 Simplified outline (TO-39) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	—	100	V
V_{CEO}	collector-emitter voltage	open base	—	—	60	V
I_C	collector current (DC)		—	—	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ C$	—	—	800	mW
		$T_{case} \leq 100^\circ C$	—	—	2.86	W
h_{FE}	DC current gain	$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$	70	142	—	
f_T	transition frequency	$I_C = 50\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	50	—	—	MHz
t_{off}	turn-off time	$I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA}; I_{Boff} = -15\text{ mA}$	—	360	—	ns

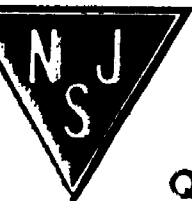
LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	100	V
V_{CEO}	collector-emitter voltage	open base	—	60	V
V_{EBO}	emitter-base voltage	open collector	—	6	V
I_C	collector current (DC)		—	1	A
I_{CM}	peak collector current		—	1	A
I_{BM}	peak base current		—	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ C$	—	800	mW
		$T_{case} \leq 25^\circ C$	—	5	W
		$25^\circ C \leq T_{case} \leq 100^\circ C$	—	2.86	W
T_{stg}	storage temperature		-65	+150	$^\circ C$
T_j	junction temperature		—	175	$^\circ C$
T_{amb}	operating ambient temperature		-65	+150	$^\circ C$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air	200	K/W
$R_{th\ j-c}$	thermal resistance from junction to case		35	K/W



NPN switching transistor

BFX85

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector cut-off current	I _E = 0; V _{CB} = 80 V	–	2	50	nA
		I _E = 0; V _{CB} = 80 V; T _j = 100 °C	–	0.1	2.5	μA
		I _E = 0; V _{CB} = 100 V	–	10	500	nA
		I _E = 0; V _{CB} = 100 V; T _j = 100 °C	–	0.5	30	μA
I _{EBO}	emitter cut-off current	I _C = 0; V _{EB} = 5 V	–	2	50	nA
		I _C = 0; V _{EB} = 5 V; T _j = 100 °C	–	0.1	2.5	μA
		I _C = 0; V _{EB} = 6 V	–	10	500	nA
h _{FE}	DC current gain	I _C = 10 mA; V _{CE} = 10 V	50	90	–	
		I _C = 150 mA; V _{CE} = 10 V	70	142	–	
		I _C = 500 mA; V _{CE} = 10 V	30	90	–	
		I _C = 1 A; V _{CE} = 10 V	15	50	–	
V _{CEsat}	collector-emitter saturation voltage	I _C = 10 mA; I _B = 1 mA	–	150	200	mV
		I _C = 150 mA; I _B = 15 mA	–	150	350	mV
		I _C = 500 mA; I _B = 50 mA	–	0.35	1	V
		I _C = 1 A; I _B = 100 mA	–	0.66	1.6	V
V _{BEsat}	base-emitter saturation voltage	I _C = 10 mA; I _B = 1 mA	–	0.69	1.2	V
		I _C = 150 mA; I _B = 15 mA	–	0.92	1.3	V
		I _C = 500 mA; I _B = 50 mA	–	1.15	1.5	V
		I _C = 1 A; I _B = 100 mA	–	1.4	2	V
C _c	collector capacitance	I _E = I _e = 0; V _{CB} = 10 V; f = 1 MHz	–	7	12	pF
f _T	transition frequency	I _C = 50 mA; V _{CE} = 10 V; f = 100 MHz	50	185	–	MHz
Switching Times (between 10% and 90% levels) see Fig.2						
t _{on}	turn-on time	I _{Con} = 150 mA; I _{Bon} = 15 mA; I _{Boff} = –15 mA	–	55	–	ns
t _d	delay time		–	15	–	ns
t _r	rise time		–	40	–	ns
t _{off}	turn-off time		–	360	–	ns
t _s	storage time		–	300	–	ns
t _f	fall time		–	60	–	ns