New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

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

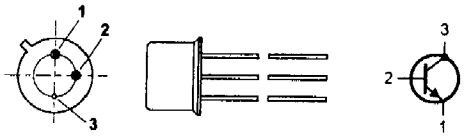

Fig.1 Simplified outline (TO-39) and symbol.

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	$T_{amb} \leq 25$ °C	–	–	800	mW
		$T_{case} \leq 100$ °C	–	–	2.86	W
h_{FE}	DC current gain	I_C = 150 mA; V_{CE} = 10 V	70	142	–	
f_T	transition frequency	I_C = 50 mA; V_{CE} = 10 V; f = 100 MHz	50	–	–	MHz
t_{off}	turn-off time	I_{Con} = 150 mA; I_{Bon} = 15 mA; I_{Boff} = −15 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	$T_{amb} \leq 25$ °C	–	800	mW
		$T_{case} \leq 25$ °C	–	5	W
		25° C ≤ $T_{case} \leq 100$ °C	–	2.86	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	175	°C
T_{amb}	operating ambient temperature		−65	+150	°C

THERMAL CHARACTERISTICS

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

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