RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

BC846BDF

NPN Type Bipolar Transistor

Features

- Low profile package
- Ideal for automated placement
- Low saturation voltages
- High voltage capability
- High Stability and High Reliability
- RoHS Compliant

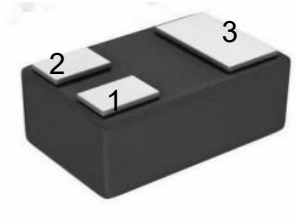
Mechanical Characteristics

- Package: DFN1006-3L
- Lead Finish:Matte Tin
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020

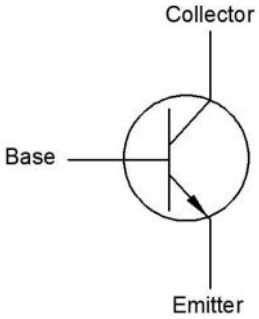
Applications

- amplifying signal
- Electronic switch
- Oscillating circuit
- Variable resistance
- Lighting applications

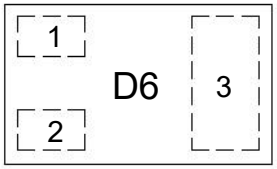
Appearance&Symbol



Package：DFN1006-3L
1：Base
2：Emitter
3：Collector



Marking Information



D6 = Marking Code

Absolute Maximum Ratings(T=25ºCunless otherwise noted)

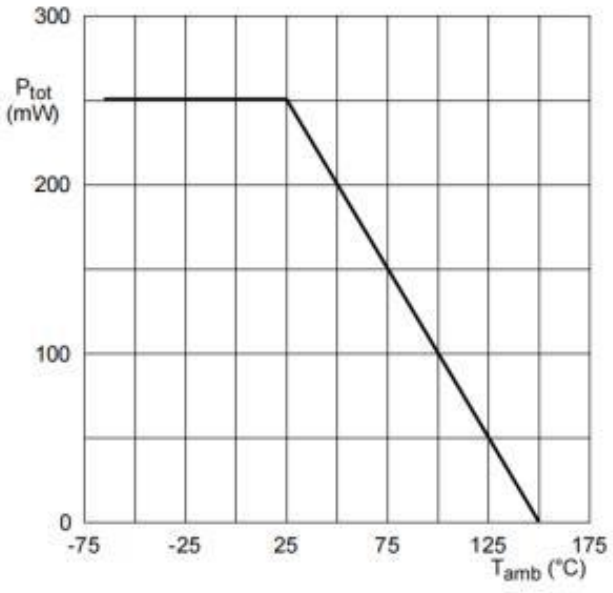
Parameters	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	65	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current Continuous	I_C	0.1	A
peak collector current (single pulse;tp ≤ 1 ms)	I_{CM}	0.2	A
peak base current(single pulse;tp ≤ 1 ms)	I_{BM}	0.2	A
total power dissipation (T_{amb} ≤ 25 °C)	P_{tot}	250	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	500	℃/W
ambient temperature	T_{amb}	-55 to +150	℃
Operating Junction temperature	T_J	-55 to +150	℃
Storage Temperature Range	T_{STG}	-55 to +150	℃

2025-10/114
REV:O

Electrical Characteristics(T=25ºCunless otherwise noted)

Parameters	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cut-Off Current	I_{CBO}	V_{CB} 30V,I_E 0A			15	nA
		V_{CB} 30V,I_E 0A,T_J 150 ℃			5	uA
Emitter Cut-Off Current	I_{EBO}	V_{EB} 5V,I_C 0A			100	nA
DC current gain	h_{FE}	V_{CE} 5V,I_C 2mA	200		450	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C 10mA, I_B 0.5mA		90	200	mV
		I_C 100mA, I_B 5mA,pulsed; $t_p \leq$ 300 μs; $\delta \leq 0.02$		200	400	
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C 10mA, I_B 0.5mA		760		mV
		I_C 100mA, I_B 5mA		900		
Base-emitter voltage	V_{BE}	I_C 2mA, V_{CE} 5V	580	660	700	mV
		I_C 10mA,V_{CE} 5V			770	
Transition frequency	f_T	V_{CE} 5V, I_C 10mA,f 100MHz	100			MHZ
collector capacitance	C_c	V_{CB} 10V,f 1.0MHz,I_E 0A,i_e 0A		2	3	pF
emitter capacitance	C_e	V_{EB} 0.5V,f 1.0MHz,I_C 0A,i_C 0A		11		pF
Noise Figure	NF	V_{CE} 5V,f 1KHz,I_C 0.2mA,R_S 2K Ω,B 200Hz		2	10	dB

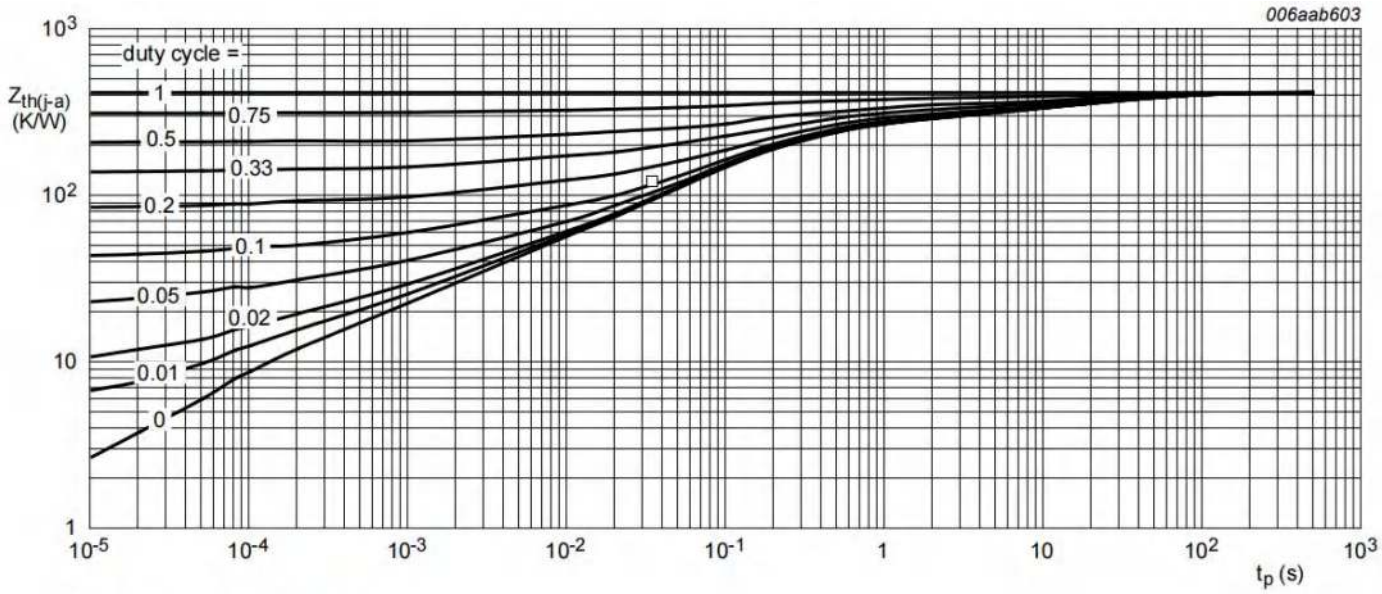
RATING AND CHARACTERISTICS CURVES (BC846BDF)



FR4 PCB, standard footprint

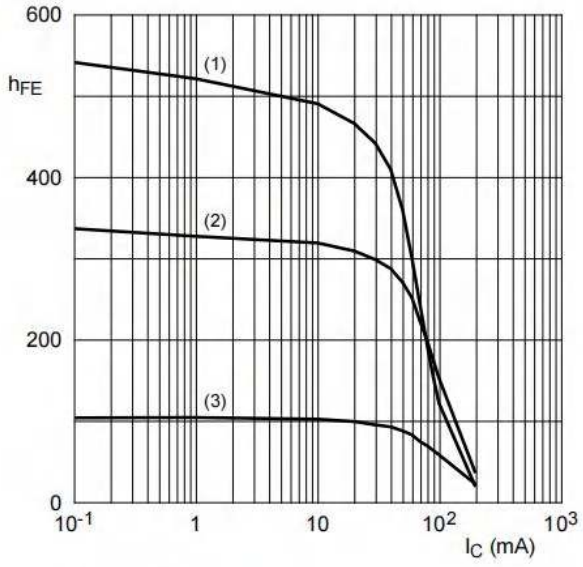
Power derating curve for DFN1006 -3L

RATING AND CHARACTERISTICS CURVES (BC846BDF)



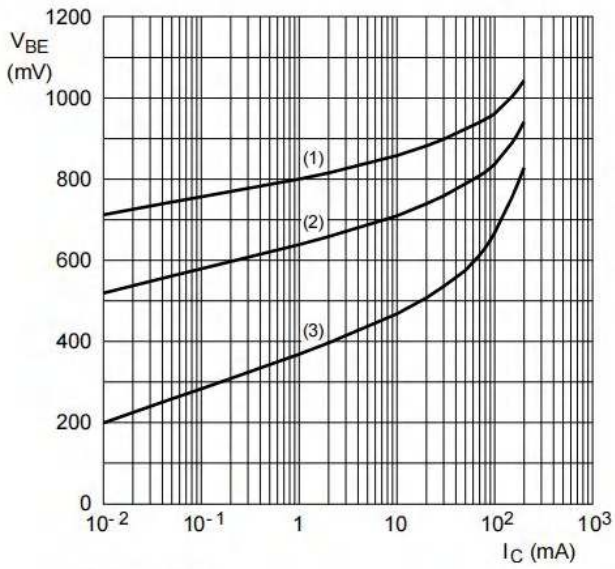
FR4 PCB, standard footprint

Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



V_{CE} = 5 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

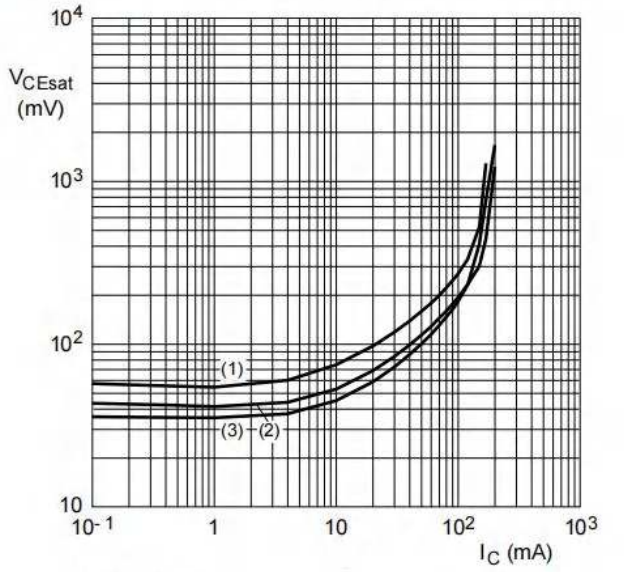
DC current gain as a function of collector current; typical values



V_{CE} = 5 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

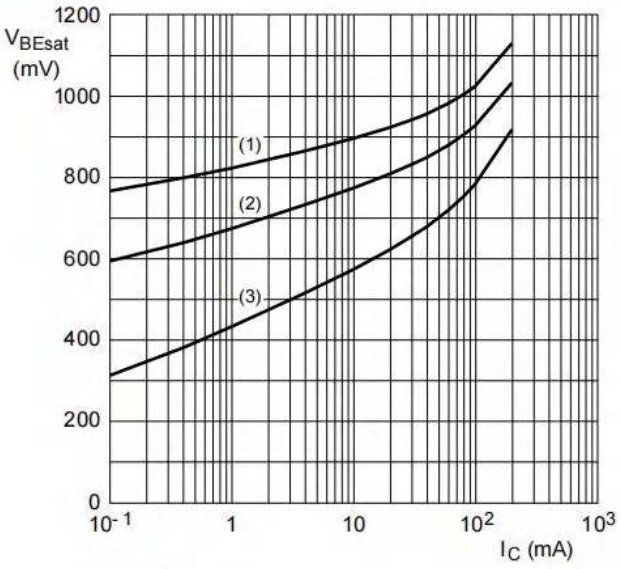
Base-emitter voltage as a function of collector current; typical values

RATING AND CHARACTERISTICS CURVES (BC846BDF)



I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

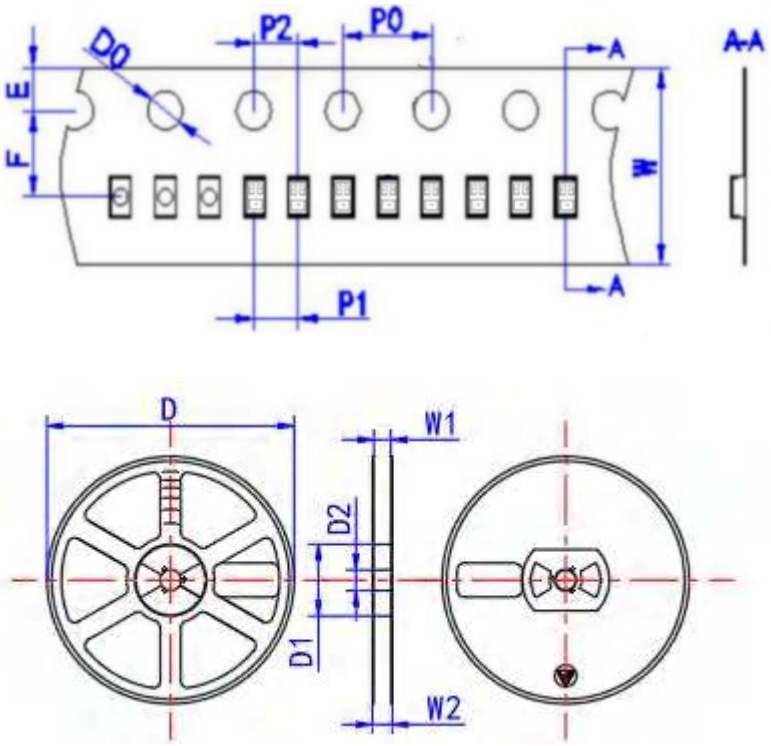
Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Base-emitter saturation voltage as a function of collector current; typical values

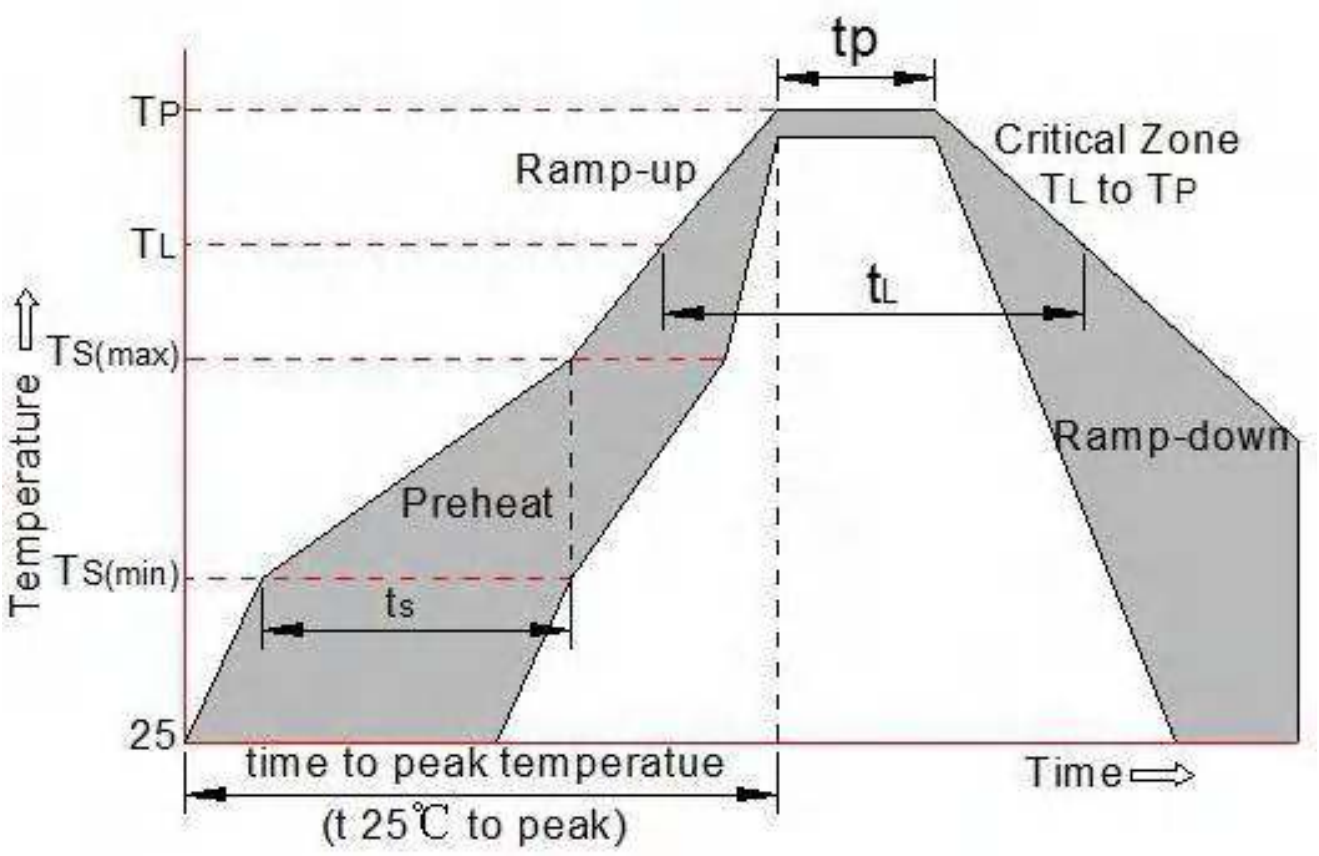
Tape & reel specification



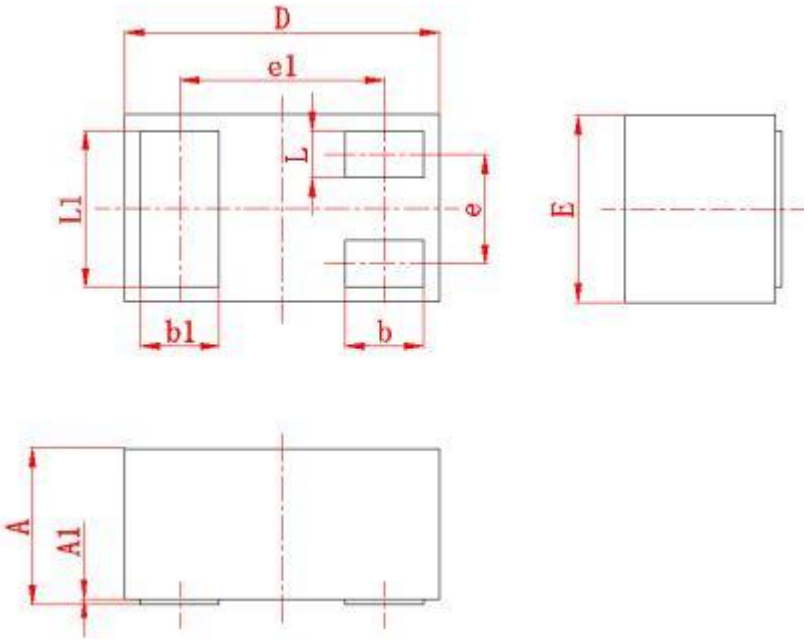
Symbol	Dimension in Millimeters
Tape	
D0	1.50+0.10/-0.00
E	1.75±0.10
F	3.50±0.10
P0	4.00±0.10
P1	2.00±0.10
P2	2.00±0.10
W	8.00+0.3/-0.1
Reel	
D	178.0±2.00
D1	54.40±1.00
D2	13.00±1.00
W1	9.50±1.00
W2	12.30±1.00

Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

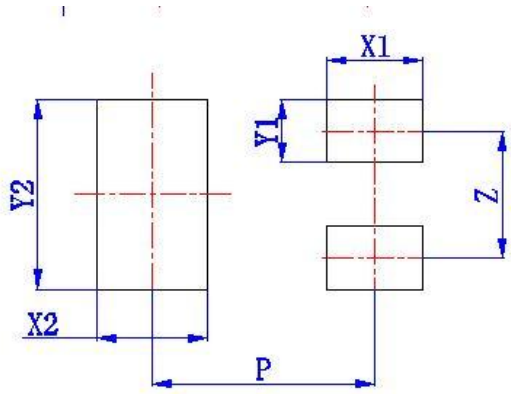


Package mechanical data



Symbol	Millimeters	
	Min	Max
A	0.4	0.5
A1	0	0.05
D	0.9	1.1
E	0.55	0.65
e	(0.35)	
e1	(0.65)	
b	0.2	0.3
b1	0.2	0.3
L	0.1	0.2
L1	0.45	0.55

Suggested Land Pattern



Symbol	Dimension in Millimeters
	Typ
X1	(0.3)
X2	(0.35)
Y1	(0.2)
Y2	(0.6)
Z	(0.4)
P	(0.7)

ORDERING INFORMATION

PACKAGE	PACKING CODE	REEL SIZE (inch)	PER REEL (EA)	REEL DIA (mm)	CARTON SIZE (mm)	PER CARTON (EA)	GROSS WEIGHT (Kg)
DFN1006	-T	7	10,000	178	390*205*310	400,000	6.16

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