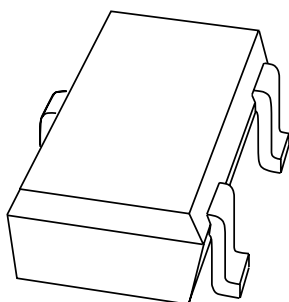


DATA SHEET



BC846W; BC847W; BC848W NPN general purpose transistors

Product specification
Supersedes data of 1999 Apr 23

2002 Feb 04

NPN general purpose transistors

BC846W; BC847W; BC848W

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 65 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a SOT323 plastic package.
PNP complements: BC856W, BC857W and BC858W.

MARKING

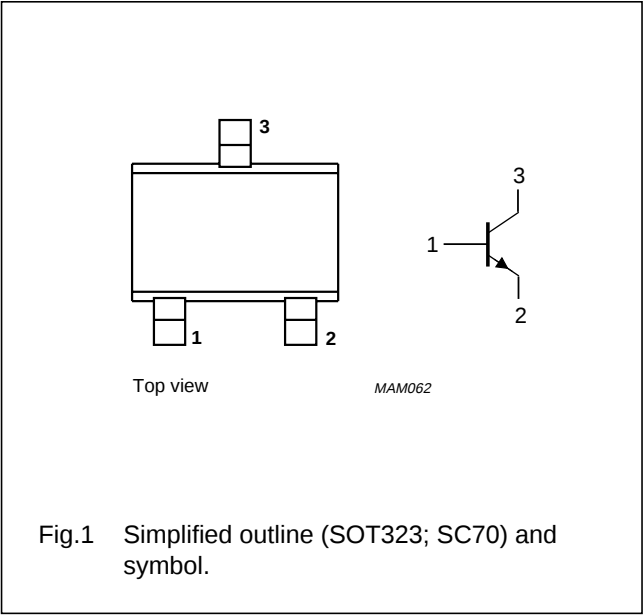
TYPE NUMBER	MARKING CODE ⁽¹⁾
BC846W	1D*
BC846AW	1A*
BC846BW	1B*
BC847W	1H*
BC847AW	1E*
BC847BW	1F*
BC847CW	1G*
BC848W	1M*

Note

1. * = -: made in Hong Kong.
* = t: made in Malaysia.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



NPN general purpose transistors

BC846W; BC847W; BC848W

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BC846W		–	80	V
	BC847W		–	50	V
	BC848W		–	30	V
V_{CEO}	collector-emitter voltage	open base			
	BC846W		–	65	V
	BC847W		–	45	V
	BC848W		–	30	V
V_{EBO}	emitter-base voltage	open collector			
	BC846W; BC847W		–	6	V
	BC848W		–	5	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Transistor mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	625	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

NPN general purpose transistors

BC846W; BC847W; BC848W

CHARACTERISTICS

$T_{amb} = 25\text{ °C}$; unless otherwise specified.

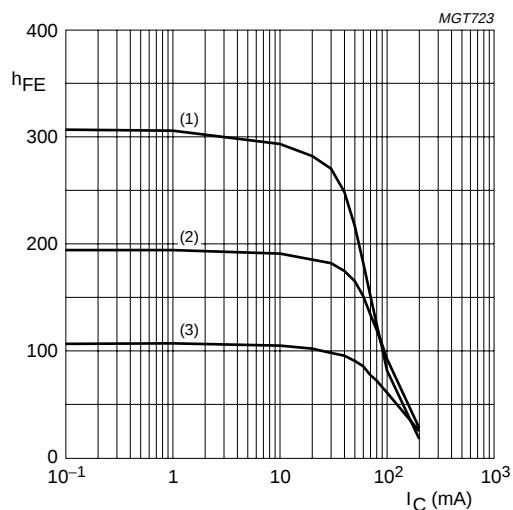
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0$	–	–	15	nA
		$V_{CB} = 30\text{ V}; I_E = 0$; $T_J = 150\text{ °C}$	–	–	5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
h_{FE}	DC current gain	$I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$				
	BC846AW; BC847AW		–	90	–	
	BC846BW; BC847BW; BC848BW		–	150	–	
	BC847CW		–	270	–	
	DC current gain	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$				
	BC846W		110	–	450	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	90	250	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$; note 1	–	200	600	mV
		$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	700	–	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$; note 1	–	900	–	mV
		$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	580	660	700	mV
V_{BE}	base-emitter voltage	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	–	–	770	mV
		$I_C = 2\text{ mA}; V_{CE} = 5\text{ V}$	–	–	770	mV
C_c	collector capacitance	$V_{CB} = 10\text{ V}; I_E = I_e = 0$; $f = 1\text{ MHz}$	–	–	3	pF
f_T	transition frequency	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}$; $f = 100\text{ MHz}$	100	–	–	MHz
F	noise figure	$I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}$; $R_S = 2\text{ k}\Omega; f = 1\text{ kHz}$; $B = 200\text{ Hz}$	–	–	10	dB

Note

1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

NPN general purpose transistors

BC846W; BC847W; BC848W



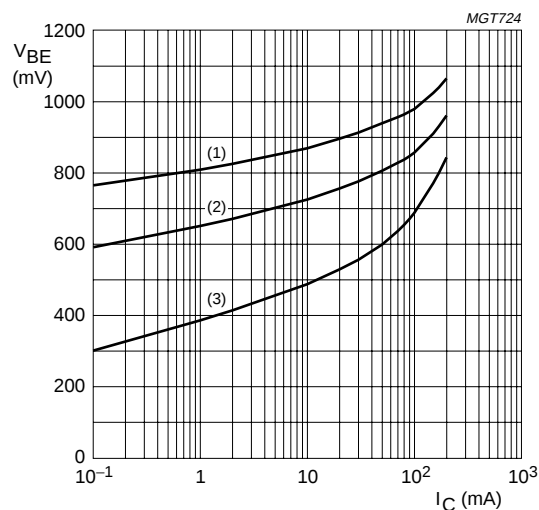
BC847AW; $V_{CE} = 5\text{ V}$.

(1) $T_{amb} = 150^\circ\text{C}$.

(2) $T_{amb} = 25^\circ\text{C}$.

(3) $T_{amb} = -55^\circ\text{C}$.

Fig.2 DC current gain as a function of collector current; typical values.



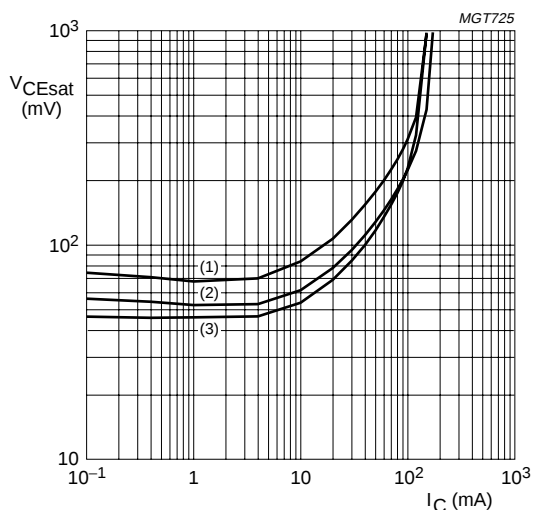
BC847AW; $V_{CE} = 5\text{ V}$.

(1) $T_{amb} = -55^\circ\text{C}$.

(2) $T_{amb} = 25^\circ\text{C}$.

(3) $T_{amb} = 150^\circ\text{C}$.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



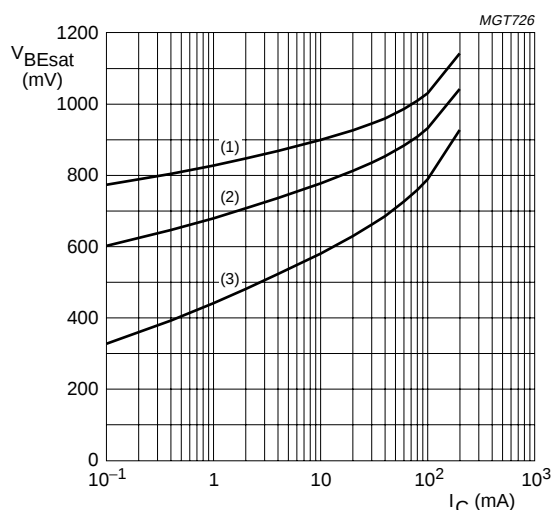
BC847AW; $I_C/I_B = 20$.

(1) $T_{amb} = 150^\circ\text{C}$.

(2) $T_{amb} = 25^\circ\text{C}$.

(3) $T_{amb} = -55^\circ\text{C}$.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



BC847AW; $I_C/I_B = 10$.

(1) $T_{amb} = -55^\circ\text{C}$.

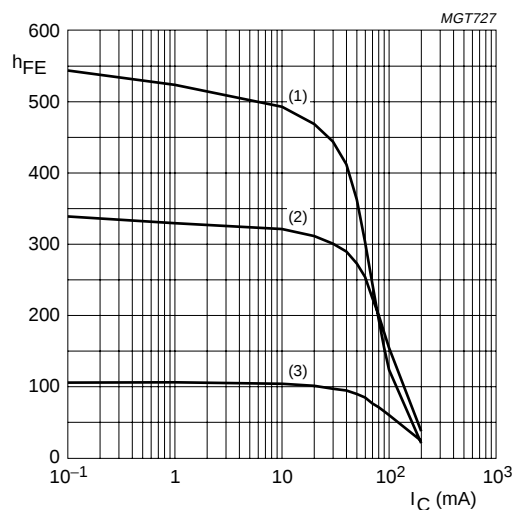
(2) $T_{amb} = 25^\circ\text{C}$.

(3) $T_{amb} = 150^\circ\text{C}$.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.

NPN general purpose transistors

BC846W; BC847W; BC848W



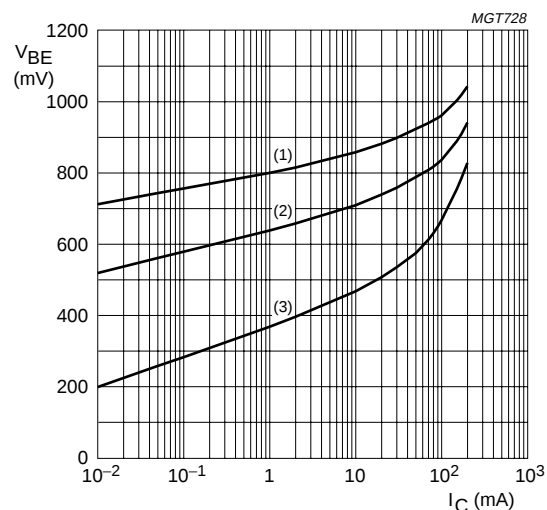
BC847BW; $V_{CE} = 5$ V.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.6 DC current gain as a function of collector current; typical values.



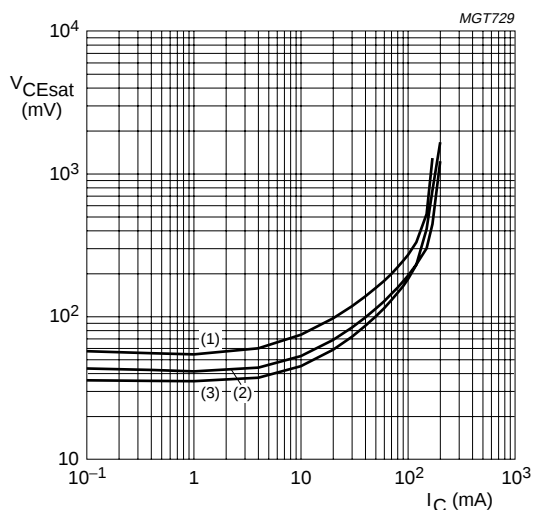
BC847BW; $V_{CE} = 5$ V.

(1) $T_{amb} = -55$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = 150$ °C.

Fig.7 Base-emitter voltage as a function of collector current; typical values.



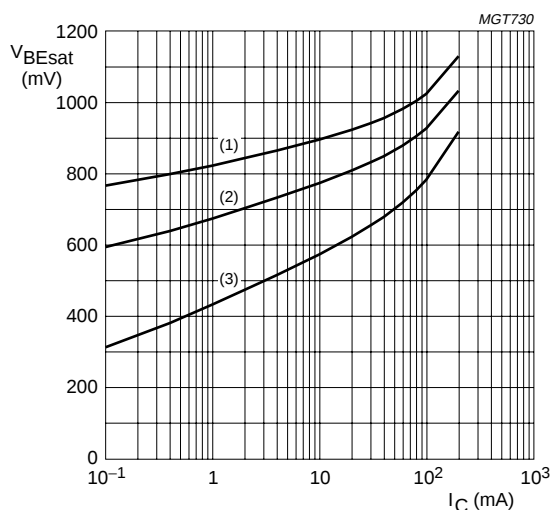
BC847BW; $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.8 Collector-emitter saturation voltage as a function of collector current; typical values.



BC847BW; $I_C/I_B = 10$.

(1) $T_{amb} = -55$ °C.

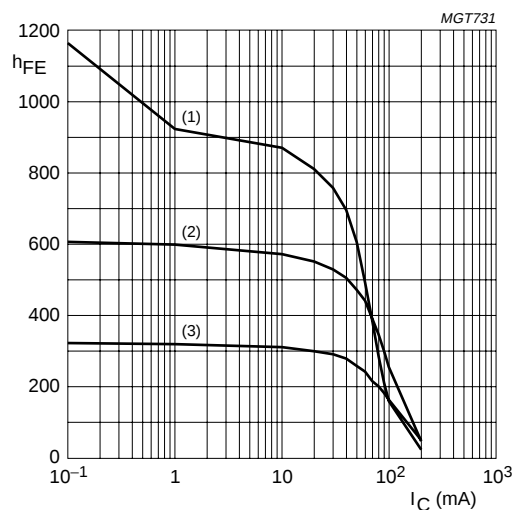
(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = 150$ °C.

Fig.9 Base-emitter saturation voltage as a function of collector current; typical values.

NPN general purpose transistors

BC846W; BC847W; BC848W



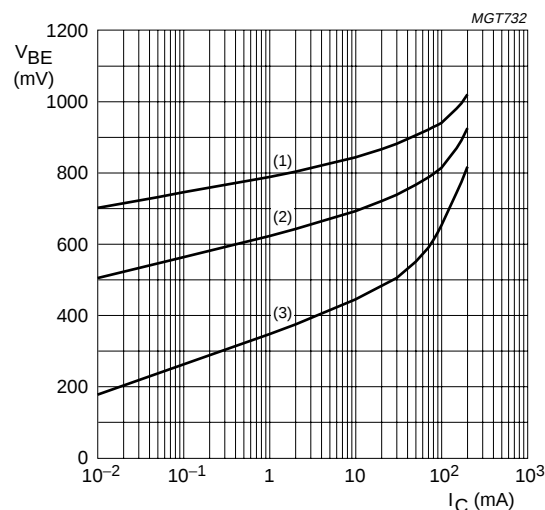
BC847CW; $V_{CE} = 5$ V.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.10 DC current gain as a function of collector current; typical values.



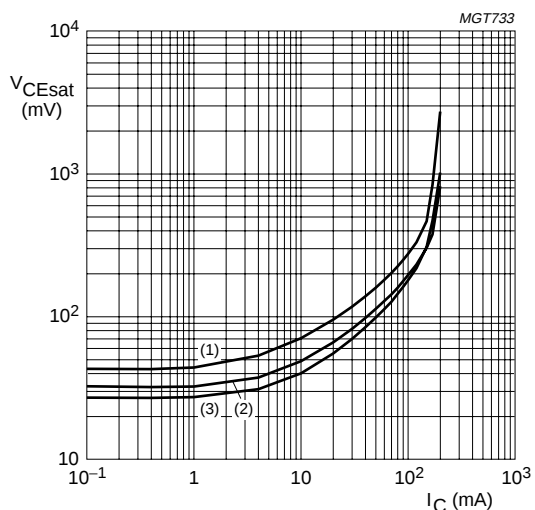
BC847CW; $V_{CE} = 5$ V.

(1) $T_{amb} = -55$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = 150$ °C.

Fig.11 Base-emitter voltage as a function of collector current; typical values.



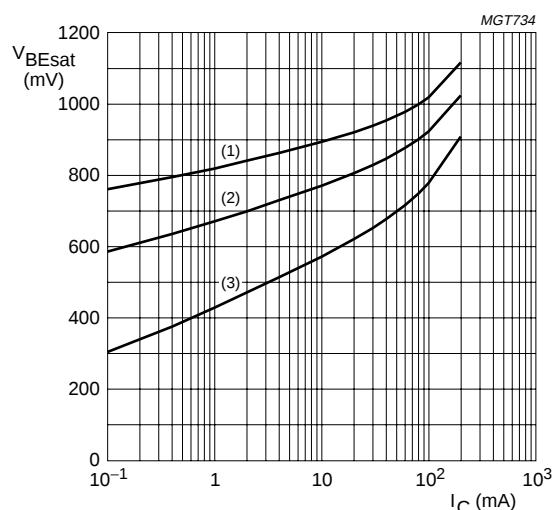
BC847CW; $I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.12 Collector-emitter saturation voltage as a function of collector current; typical values.



BC847CW; $I_C/I_B = 10$.

(1) $T_{amb} = -55$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = 150$ °C.

Fig.13 Base-emitter saturation voltage as a function of collector current; typical values.

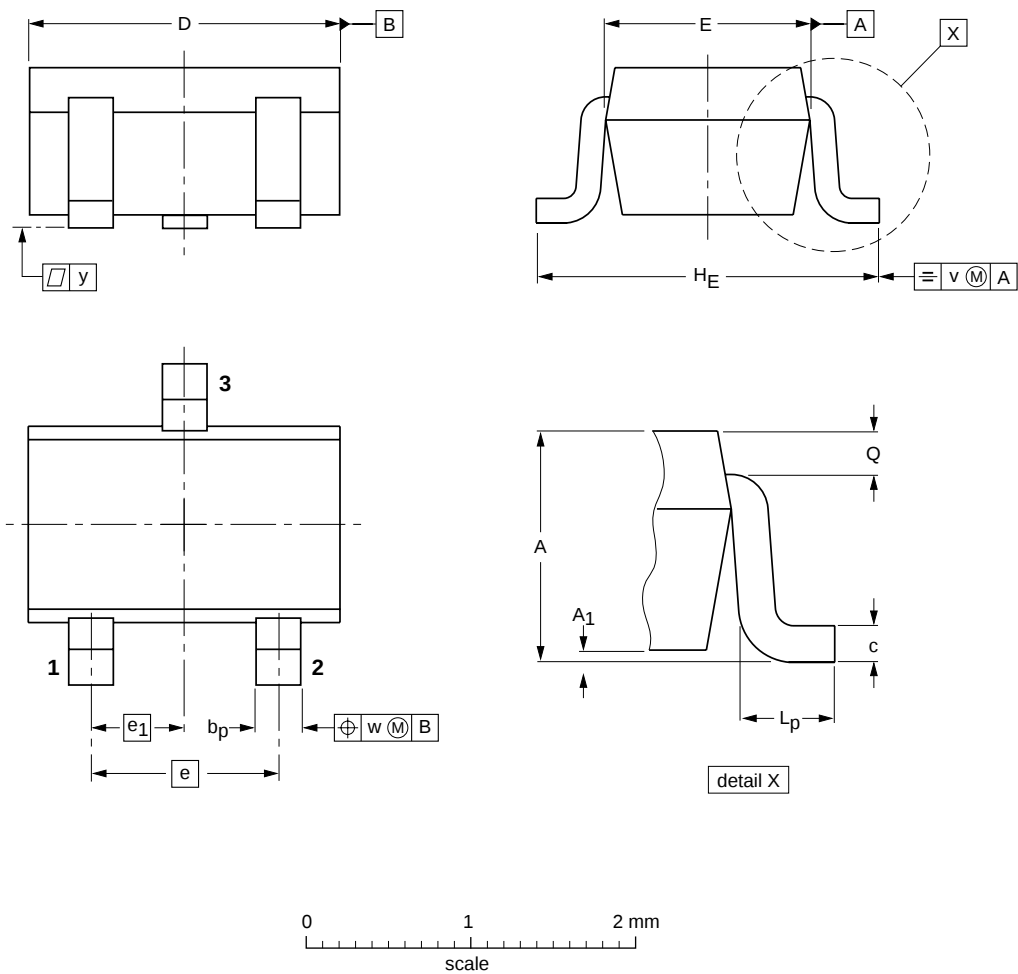
NPN general purpose transistors

BC846W; BC847W; BC848W

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

NPN general purpose transistors

BC846W; BC847W; BC848W

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NPN general purpose transistors

BC846W; BC847W; BC848W

NOTES

NPN general purpose transistors

BC846W; BC847W; BC848W

NOTES

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