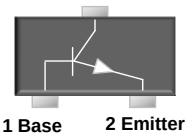
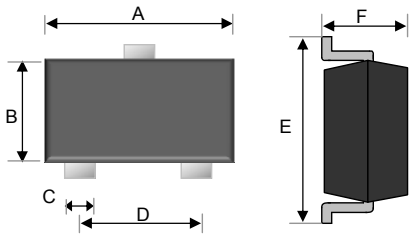
TAIWAN SEMICONDUCTOR

BC846A/B, BC847A/B/C, BC848A/B/C
250mW, NPN Small Signal Transistor

Small Signal Transistor



SOT-23



Dimensions	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	2.80	3.00	0.110	0.118
B	1.20	1.40	0.047	0.055
C	0.30	0.50	0.012	0.020
D	1.80	2.00	0.071	0.079
E	2.25	2.55	0.089	0.100
F	0.90	1.20	0.035	0.043

Features

- ✧Epitaxial planar die construction
- ✧Surface device type mounting
- ✧Moisture sensitivity level 1
- ✧Matte Tin(Sn) lead finish with Nickel(Ni) underplate
- ✧Pb free version and RoHS compliant
- ✧Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code

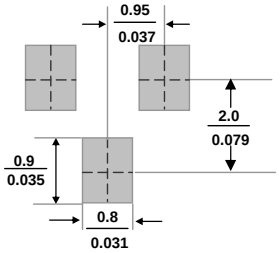
Mechanical Data

- ✧Case : SOT- 23 small outline plastic package
- ✧Terminal: Matte tin plated, lead free., solderable per MIL-STD-202, Method 208 guaranteed
- ✧High temperature soldering guaranteed: 260ºC/10s
- ✧Weight : 0.008gram (approximately)

Ordering Information

Package	Part No.	Packing	Marking
SOT-23	BC846A RF	3K / 7" Reel	1A
SOT-23	BC846B RF	3K / 7" Reel	1B
SOT-23	BC847A RF	3K / 7" Reel	1E
SOT-23	BC847B RF	3K / 7" Reel	1F
SOT-23	BC847C RF	3K / 7" Reel	1G
SOT-23	BC848A RF	3K / 7" Reel	1J
SOT-23	BC848B RF	3K / 7" Reel	1K
SOT-23	BC848C RF	3K / 7" Reel	1L
SOT-23	BC846A RFG	3K / 7" Reel	1A
SOT-23	BC846B RFG	3K / 7" Reel	1B
SOT-23	BC847A RFG	3K / 7" Reel	1E
SOT-23	BC847B RFG	3K / 7" Reel	1F
SOT-23	BC847C RFG	3K / 7" Reel	1G
SOT-23	BC848A RFG	3K / 7" Reel	1J
SOT-23	BC848B RFG	3K / 7" Reel	1K
SOT-23	BC848C RFG	3K / 7" Reel	1L

Suggested PAD Layout



Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Maximum Ratings

Type Number		Symbol	Value	Units
Power Dissipation		P_D	250	mW
Collector-Base Voltage	BC846 BC847 BC848	V_{CBO}	80 50 30	V
Collector-Emitter Voltage	BC846 BC847 BC848	V_{CEO}	65 45 30	V
Emitter-Base Voltage	BC846 BC847 BC848	V_{EBO}	6 6 5	V
Collector Current		I_C	0.1	A
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to + 150	°C

Notes:1. Valid provided that electrodes are kept at ambient temperature

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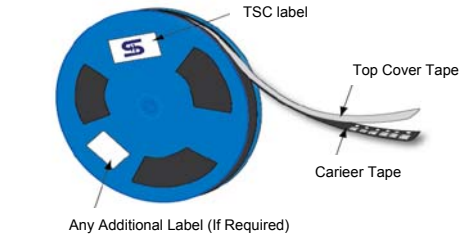
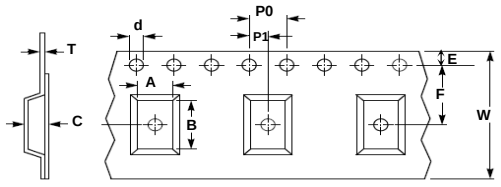
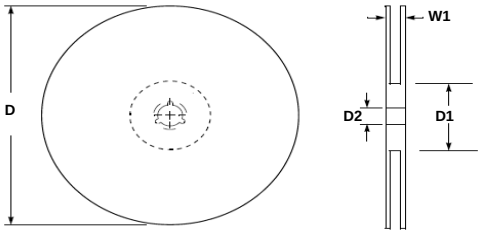
Electrical Characteristics

Type Number				Symbol	Min	Max	Units
Collector-Base Breakdown Voltage	BC846 BC847 BC848	I_C= 10μA	I_E= 0	$V_{(BR)CBO}$	80 50 30	-	V
Collector-Emitter Breakdown Voltage	BC846 BC847 BC848	I_C= 10mA	I_B= 0	$V_{(BR)CEO}$	65 45 30	-	V
Emitter-Base Breakdown Voltage	BC846 BC847 BC848	I_E= 1μA	I_C= 0	$V_{(BR)EBO}$	6 6 5	-	V
Collector Cut-off Current		V_{CB}= 30V	I_E= 0	I_{CBO}	-	15	nA
Emitter Cut-off Current		V_{EB}= 5V	I_C=0	I_{EBO}	-	0.1	μA
DC current gain	BC846A, BC847A, BC848A BC846B, BC847B, BC848B BC847C, BC848C	V_{CE}= 5V	I_C= 2mA	h_{FE}	110 200 420	220 450 800	
Collector-Emitter saturation voltage		I_C= 100mA	I_B= 5mA	$V_{CE(sat)}$	-	0.5	V
Base-Emitter saturation voltage		I_C= 100mA	I_B= 5mA	$V_{BE(sat)}$	-	1.1	V
Transition frequency	V_{CE}= 5V	I_C= 10mA	f= 100MHz	f_T	100	-	MHz

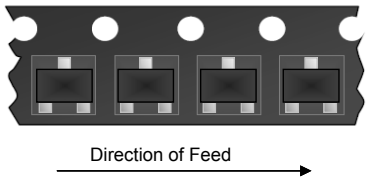
Tape & Reel specification







Item	Symbol	Dimension(mm)
Carrier width	A	3.15 ±0.10
Carrier length	B	2.77 ±0.10
Carrier depth	C	1.22 ±0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178 ± 1
Reel inner diameter	D1	55 Min
Feed hole width	D2	13.0 ± 0.20
Sprocke hole position	E	1.75 ±0.10
Punch hole position	F	3.50 ±0.05
Sprocke hole pitch	P0	4.00 ±0.10
Embossment center	P1	2.00 ±0.05
Overall tape thickness	T	0.229 ±0.013
Tape width	W	8.10 ±0.20
Reel width	W1	12.30 ±0.20



Small Signal Transistor

Rating and Characteristic Curves

Figure1. Static Characteristic

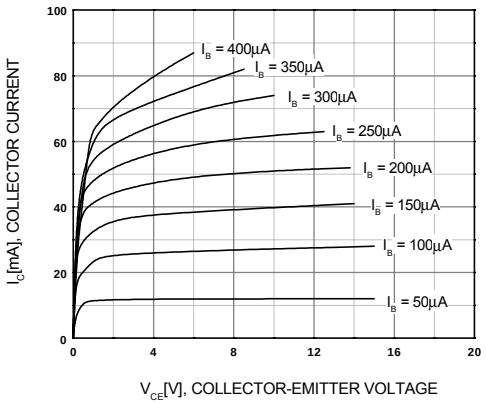
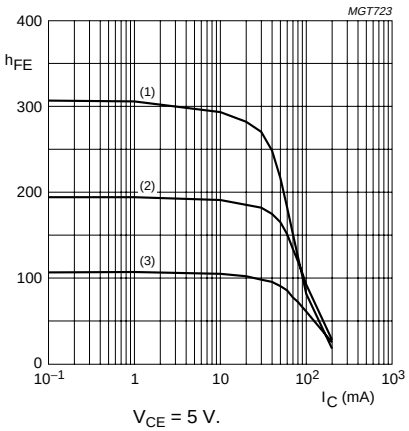
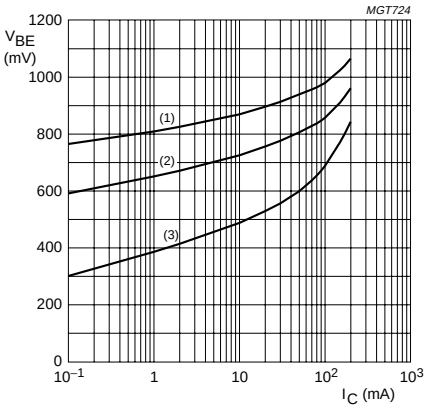


Figure 2. DC Current Gain



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

Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage



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

Figure 4. Base-Emitter On Voltage

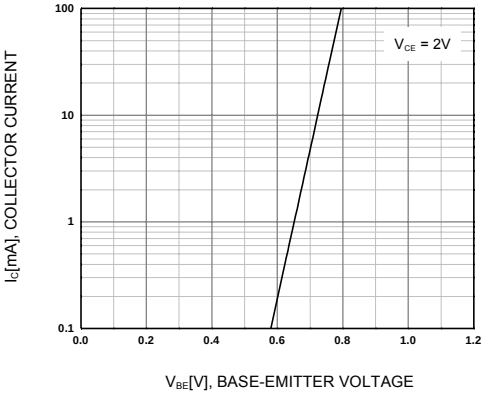


Figure 5. Collector Output Capacitance

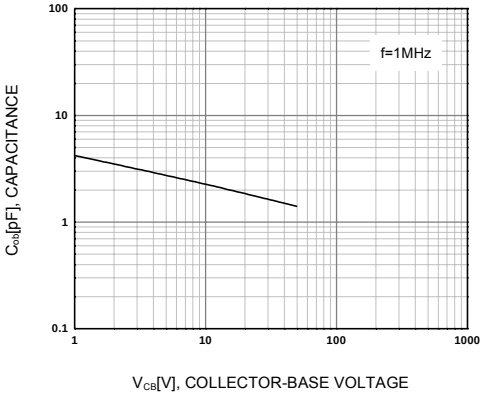


Figure 6. Current Gain Bandwidth Product