

200mW, NPN Small Signal Transistor

FEATURES

- AEC-Q101 qualified
- General-purpose transistors
- Ideal for automated placement
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- General switching and amplification

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
V_{CBO}	50-80	V
V_{CEO}	45-65	V
V_{EBO}	6	V
I_C	100	mA
h_{FE}	450-800	
Configuration	Single die	

MECHANICAL DATA

- Case: SOT-323
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Weight: 5.00mg (approximately)



PACKAGE: SOT-323	PIN CONFIGURATION	CIRCUIT DIAGRAM

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Power dissipation ⁽¹⁾	P_D	200	mW
Collector-base voltage	$BC846BWH$	80	V
	$BC847BWH, BC847CWH$	50	
Collector-emitter voltage	$BC846BWH$	65	V
	$BC847BWH, BC847CWH$	45	
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	100	mA
Junction temperature	T_J	-55 to +150	°C
Storage temperature	T_{STG}	-55 to +150	°C

Note:

1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-ambient thermal resistance ⁽¹⁾	$R_{\Theta JA}$	625	°C/W

Thermal Performance Note:

1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ C$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT	
Collector-base breakdown voltage	$I_C = 10\mu A, I_E = 0A$	$BC846BWH$	$V_{(BR)CBO}$	80	-	-	V
		$BC847BWH, BC847CWH$		50	-	-	
Collector-emitter breakdown voltage	$I_C = 10mA, I_B = 0A$	$BC846BWH$	$V_{(BR)CEO}$	65	-	-	V
		$BC847BWH, BC847CWH$		45	-	-	
Emitter-base breakdown voltage	$I_E = 1\mu A, I_C = 0A$	$V_{(BR)EBO}$	6	-	-	V	
Collector-base cut-off current	$V_{CB} = 30V, I_E = 0A$	I_{CBO}	-	-	15	nA	
Emitter-base cut-off current	$V_{EB} = 5V, I_C = 0A$	I_{EBO}	-	-	0.1	μA	
DC current gain	$V_{CE} = 5V, I_C = 2mA$	$BC846BWH, BC847BWH$	h_{FE}	200	-	450	-
		$BC847CWH$		420	-	800	
Collector-emitter saturation voltage	$I_C = 10mA, I_B = 0.5mA$	$V_{CE(sat)}$	-	-	0.25	V	
	$I_C = 100mA, I_B = 5mA$		-	-	0.60		
Base-emitter saturation voltage	$I_C = 10mA, I_B = 0.5mA$	$V_{BE(sat)}$	-	0.7	-	V	
	$I_C = 100mA, I_B = 5mA$		-	0.9	-		
Base-emitter voltage	$V_{CE} = 5V, I_C = 2mA$	V_{BE}	580	660	700	mV	
	$V_{CE} = 5V, I_C = 10mA$		-	-	770		
Transition frequency	$V_{CE} = 5V, I_C = 10mA, f = 100MHz$	f_T	100	-	-	MHz	
Output capacitance	$V_{CB} = 10V, I_E = 0A, f = 1MHz$	C_{obo}	-	-	4.5	pF	

ORDERING AND MARKING INFORMATION

ORDERING CODE	PACKAGE	PACKING	DEVICE MARKING
BC846BWH RFG	SOT-323	3,000 / 7" Tape & Reel	<u>1B</u>
BC847BWH RFG	SOT-323	3,000 / 7" Tape & Reel	<u>1F</u>
BC847CWH RFG	SOT-323	3,000 / 7" Tape & Reel	<u>1G</u>

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 Power Dissipation Curve

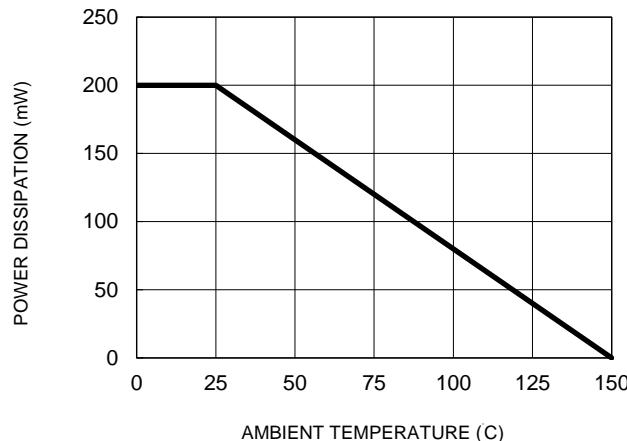


Fig.2 Typical Capacitance Characteristics

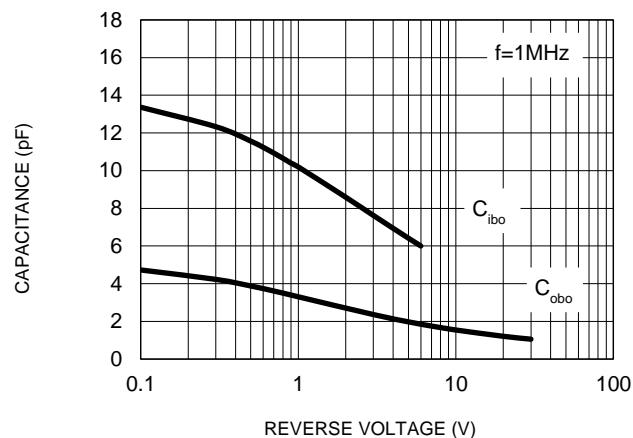


Fig.3 DC Current Gain vs. Collector Current

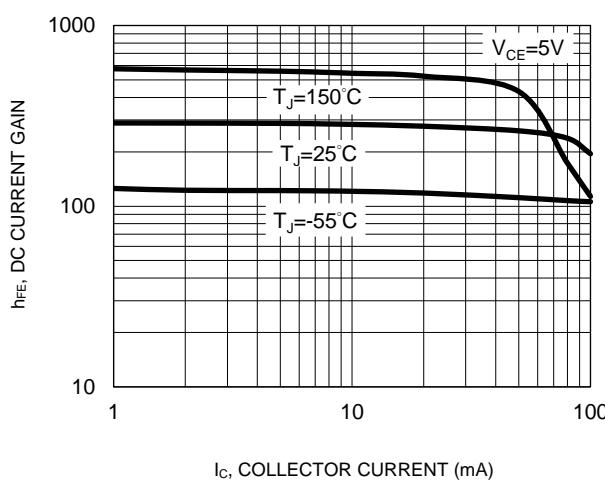


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current

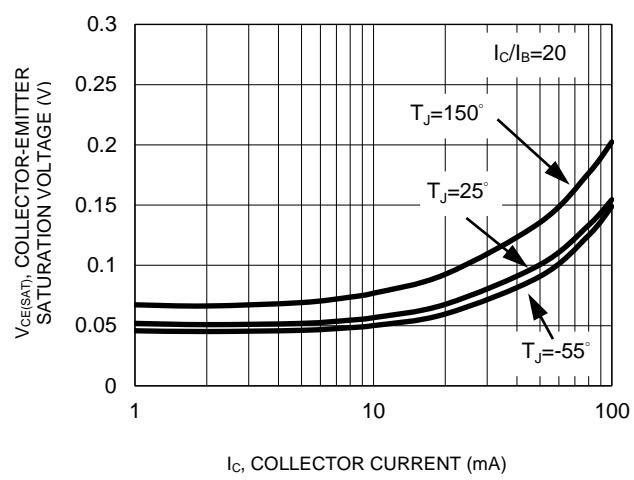


Fig.5 Base-Emitter Saturation Voltage vs. Collector Current

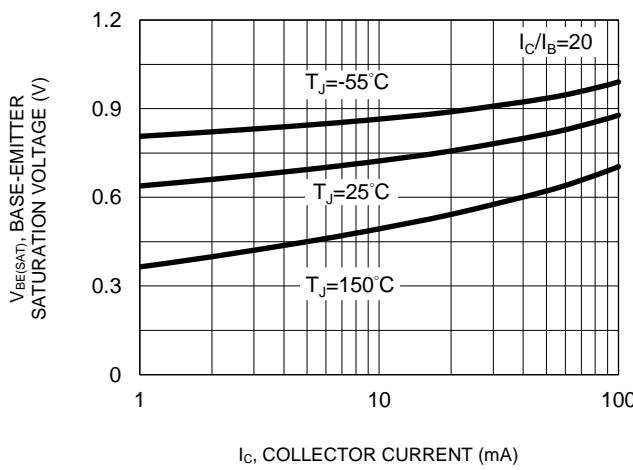
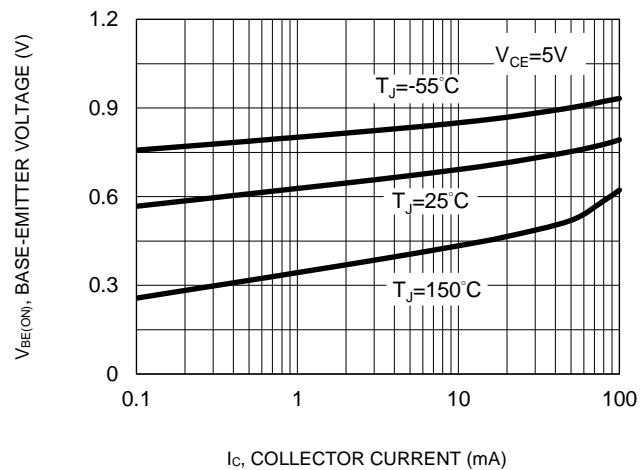
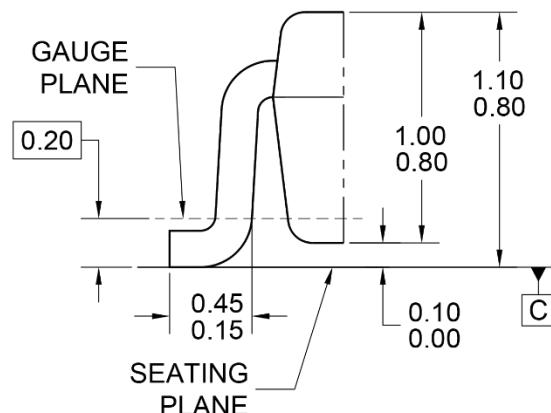
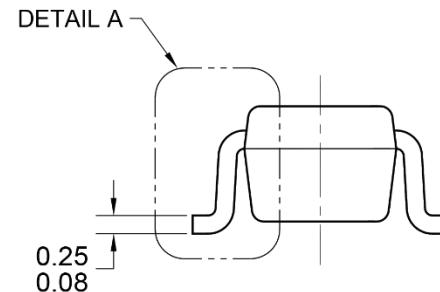
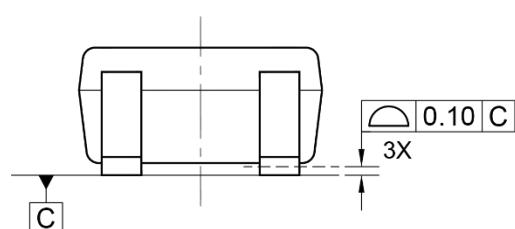
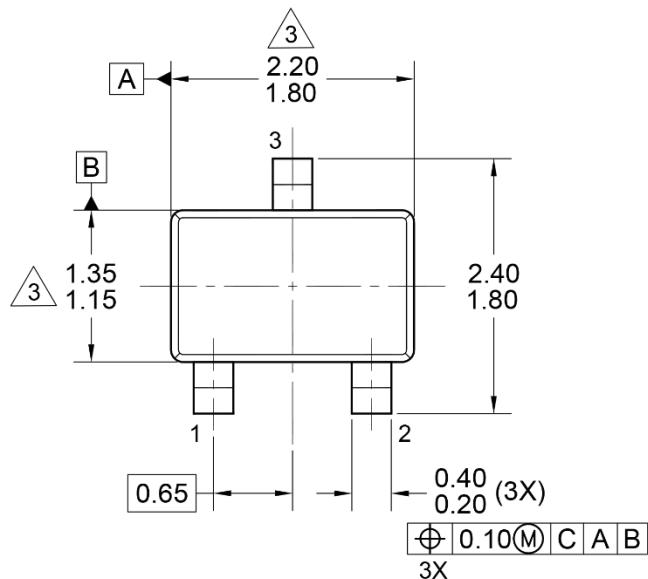


Fig.6 Base-Emitter Voltage vs. Collector Current



PACKAGE OUTLINE DIMENSIONS

SOT-323



P/NFYW

#1

MARKING DIAGRAM

P/N = Device marking Y = Year code
F = Factory code W = Bi-Week code (A~Z)

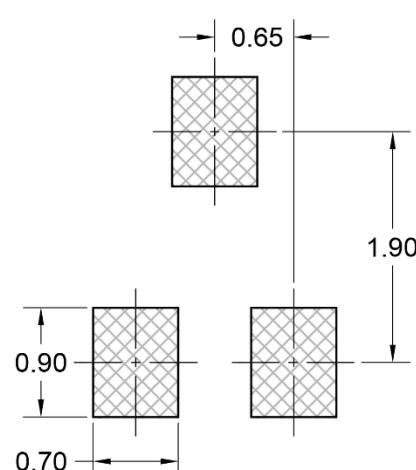
NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEITA ED-7500A, EIAJ SC-70.

4 DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

5. DWG NO. REF: HQ2SD07-SOT323-098 REV A

4 DIMENSIONS D AND E DO NOT
INCLUDE MOLD FLASH, PROTRUSIONS OR
GATE BURRS.



SUGGESTED PAD LAYOUT

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