BC848CW-7-F Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	BC848CW-7-F-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	BC848CW-7-F
Description	TRANS NPN 30V 0.1A SOT323
Detailed Description	Bipolar (BJT) Transistor NPN 30 V 100 mA 300MHz 200 mW Surface Mount SOT-323

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
BC848CW-7-F	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	100 mA
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
30 V	600mV @ 5mA, 100mA
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
20nA (ICBO)	420 @ 2mA, 5V
Power - Max:	Frequency - Transition:
200 mW	300MHz
Operating Temperature:	Mounting Type:
-65°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
SC-70, SOT-323	SOT-323
Base Product Number:	
BC848	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0075	

Lead-free Green

BC846AW–BC848CW

NPN SMALL SIGNAL TRANSISTOR IN SOT323

Features

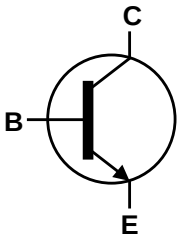
- Ideally Suited for Automatic Insertion
- Complementary PNP Types: BC856W–BC858W
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

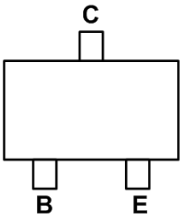
- Package: SOT323
- Package Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

SOT323

Top View



Device Symbol



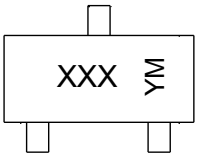
Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Packing	
				Qty.	Carrier
BC846AW-7-F	SOT323	K1Q	7	3,000	Reel
BC846BW-7-F	SOT323	K1R	7	3,000	Reel
BC846BW-13-F	SOT323	K1R	13	10,000	Reel
BC847AW-7-F	SOT323	K1Q	7	3,000	Reel
BC847BW-7-F	SOT323	K1R	7	3,000	Reel
BC847BW-13-F	SOT323	K1R	13	10,000	Reel
BC847CW-7-F	SOT323	K1M	7	3,000	Reel
BC847CW-13-F	SOT323	K1M	13	10,000	Reel
BC848AW-7-F	SOT323	K1Q	7	3,000	Reel
BC848BW-7-F	SOT323	K1R	7	3,000	Reel
BC848CW-7-F	SOT323	K1M	7	3,000	Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



XXX = Product Type Marking Code
(Please See *Ordering Information*)
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: L = 2024)
M or $\overline{M}$ = Month (ex: 2 = February)

Date Code Key

Year	2001	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	M	-	L	M	N	P	R	S	T	U	V	W

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	BC846AW/BW	V_{CBO}	80	V
	BC847AW/BW/CW		50	
	BC848AW/BW/CW		30	
Collector-Emitter Voltage	BC846AW/BW	V_{CEO}	65	V
	BC847AW/BW/CW		45	
	BC848AW/BW/CW		30	
Emitter-Base Voltage	BC846AW/BW BC847AW/BW/CW	V_{EBO}	6	V
	BC848AW/BW/CW		5	
Continuous Collector Current		I_C	100	mA
Peak Collector Current		I_{CM}	200	mA
Peak Base Current		I_{BM}	200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	200	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	625	°C/W
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	115	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Charged Device Model	ESD CDM	1,000	V	C3
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes: 5. For a device mounted on minimum recommended pad layout 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Refer to JEDEC specification JESD22-A114, JESD22-C101 and JESD22-A115.

Thermal Characteristic and Derating Information

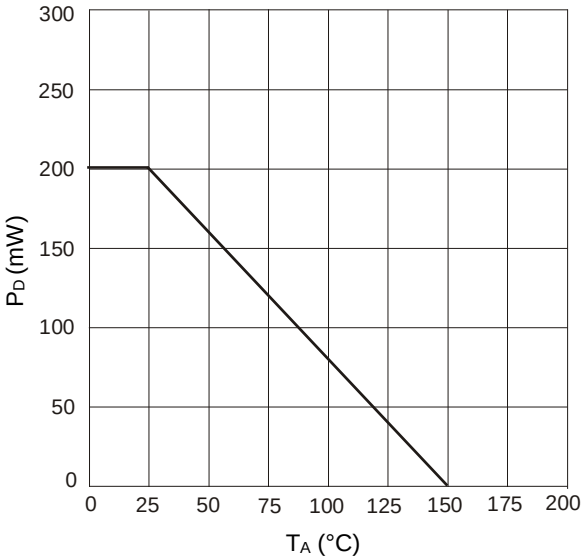


Figure 1. P_D v T_A

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BC846AW/BW	BV_{CBO}	80	—	—	V	I_C = 100µA
		BC847AW/BW/CW		50				
		BC848AW/BW/CW		30				
Collector-Emitter Breakdown Voltage (Note 7)		BC846AW/BW	BV_{CEO}	65	—	—	V	I_C = 10mA
		BC847AW/BW/CW		45				
		BC848AW/BW/CW		30				
Emitter-Base Breakdown Voltage		BC846AW/BW BC847AW/BW/CW	BV_{EBO}	6	—	—	V	I_E = 100µA
		BC848AW/BW/CW		5				
DC Current Gain (Note 7)	Current Gain Group	BC846AW/BC847AW/BC848AW	h_{FE}	110	180	220	—	V_{CE} = 5.0V, I_C = 2.0mA
		BC846BW/BC847BW/BC848BW		200	290	450		
		BC847CW/BC848CW		420	520	800		
Collector Cutoff Current			I_{CBO}	—	—	20	nA	V_{CB} = 30V
						5	µA	V_{CB} = 30V, T_A = +150°C
Collector-Emitter Saturation Voltage (Note 7)			$V_{CE(sat)}$	—	90	250	mV	I_C = 10mA, I_B = 0.5mA
					200	600		I_C = 100mA, I_B = 5.0mA
Base-Emitter Turn-on Voltage (Note 7)			$V_{BE(on)}$	580	660	700	mV	I_C = 2mA, V_{CE} = 5V
				—	—	770		I_C = 10mA, V_{CE} = 5V
Base-Emitter Saturation Voltage (Note 7)			$V_{BE(sat)}$	—	700	—	mV	I_C = 10mA, I_B = 0.5mA
					900			I_C = 100mA, I_B = 5mA
Output Capacitance			C_{obo}	—	3	4.5	pF	V_{CB} = 10V, f = 1.0MHz
Transition Frequency			f_T	100	300	—	MHz	V_{CE} = 5V, I_C = 10mA f = 100MHz
Noise Figure			NF	—	—	10	dB	V_{CE} = 5V, I_C = 200µA R_S = 2kΩ, f = 1kHz Δf = 200Hz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

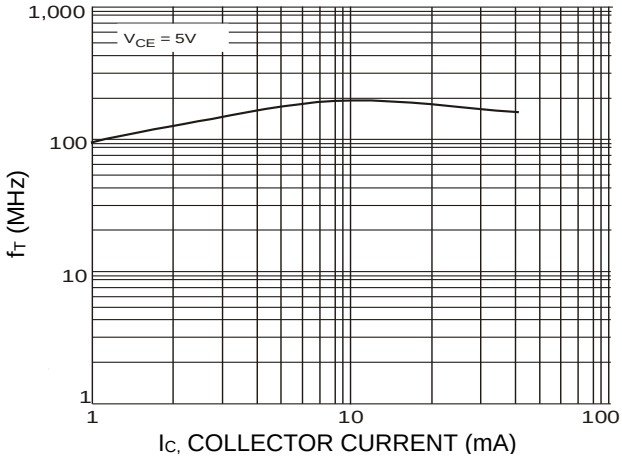


Figure 2. f_T v I_C

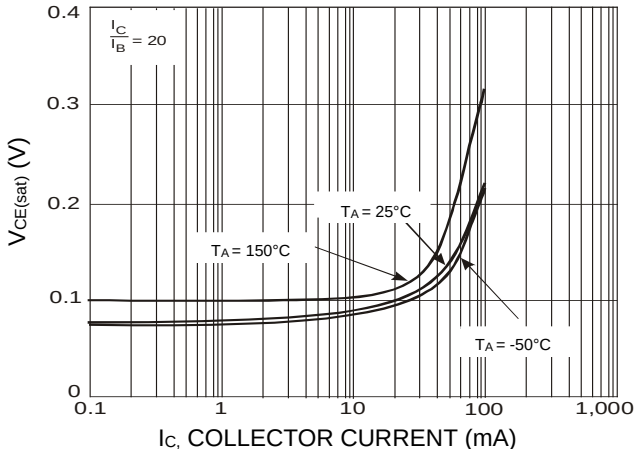


Figure 3. $V_{CE(sat)}$ v I_C

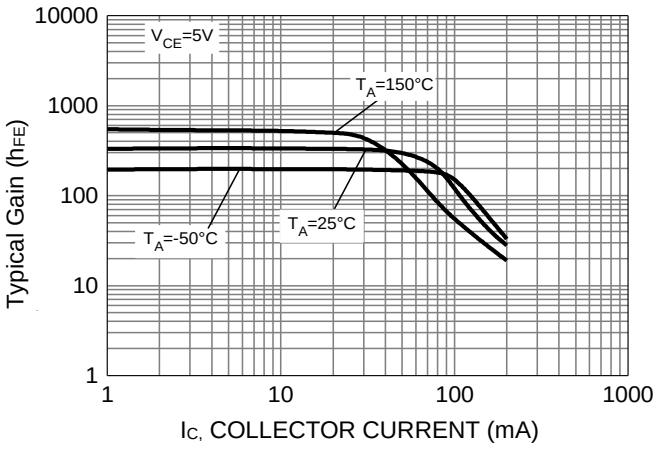


Figure 4. h_{FE} v I_C
(Band B Group Gain)

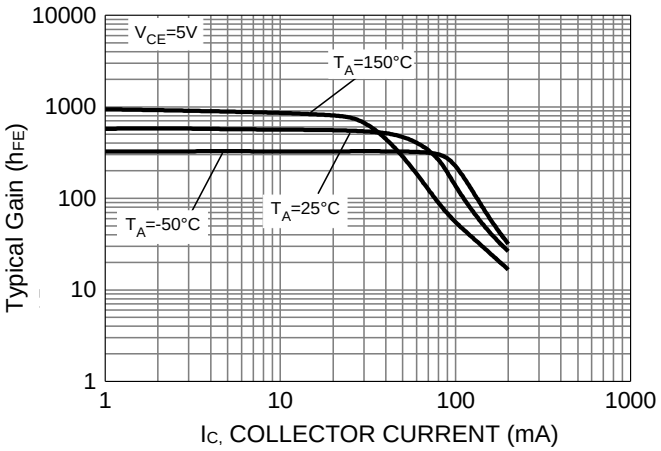


Figure 5. h_{FE} v I_C
(Band C Group Gain)

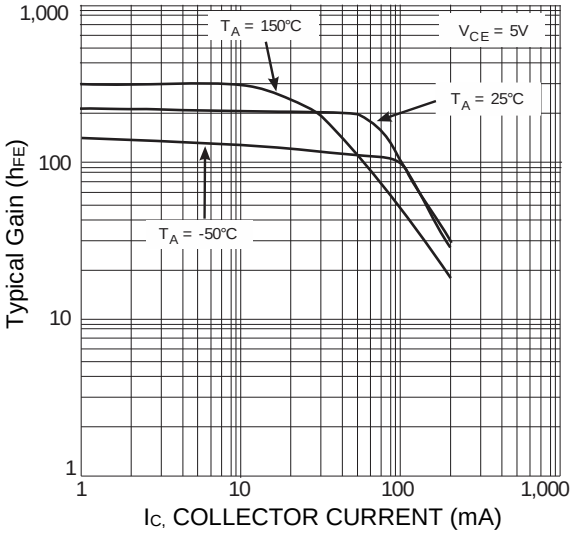
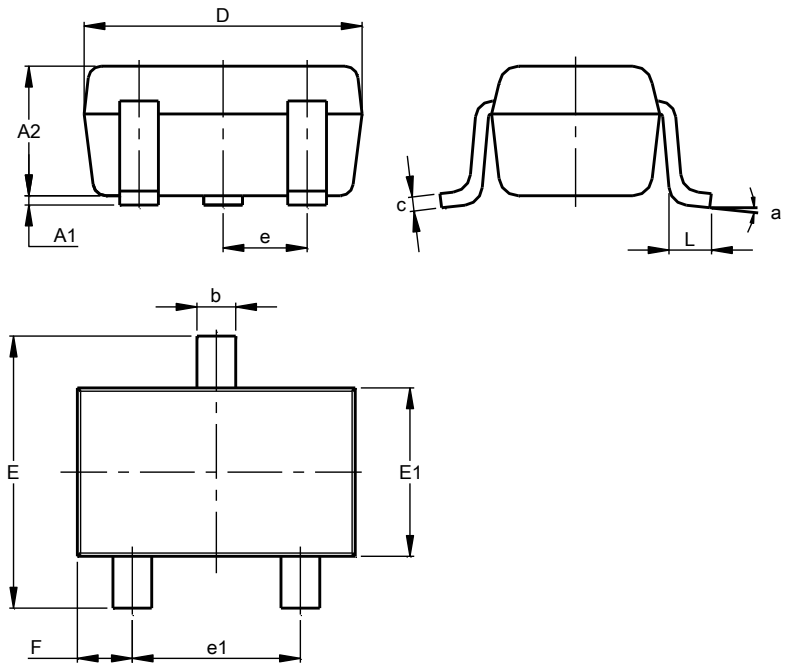


Figure 6. h_{FE} v I_C
(Band A Group Gain)

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT323

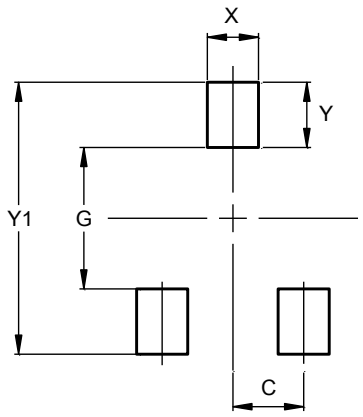


SOT323			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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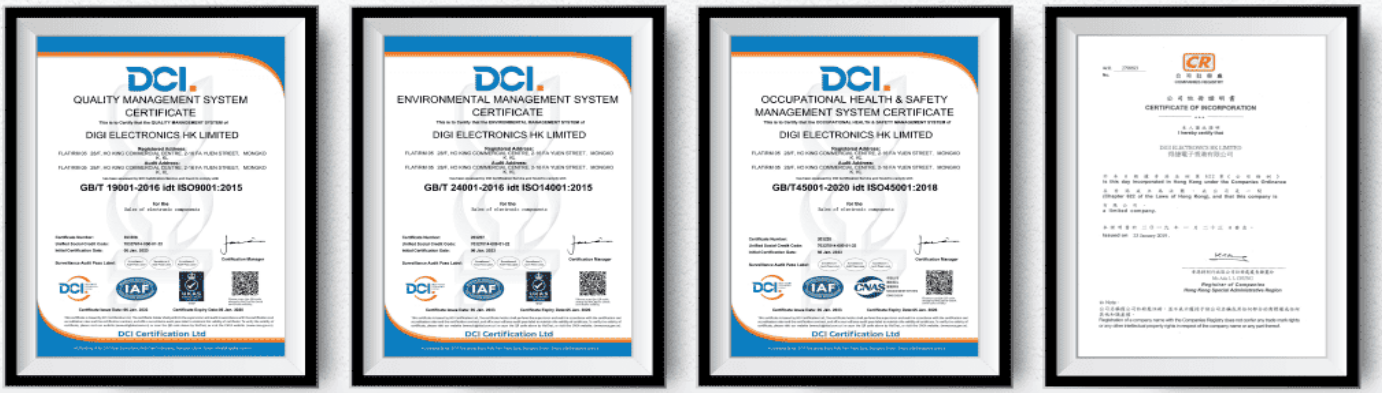

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