

Description

AC857CWQ Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

Features

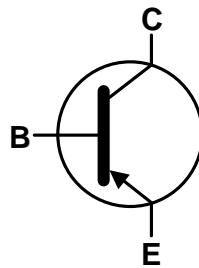
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (AC847CWQ)
- For switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

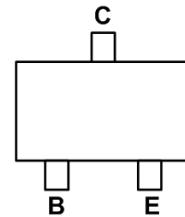
- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208^③
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol


 Top View
 Pin-Out

Ordering Information (Notes 4 & 5)

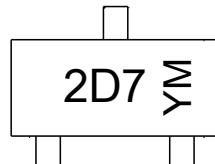
Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
AC857CWQ-7	Automotive	2D7	7	3,000

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT323



2D7 = Product Type Marking Code (See Ordering Information)

YM = Date Code Marking

 Y or \bar{Y} = Year (ex: A = 2013)

 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024				
Code	E	F	G	H	I	J	K	L				
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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Continuous Collector Current	I_C	-100	mA
Peak Collector Current	I_{CM}	-200	mA
Peak Emitter Current	I_{EM}	-200	mA

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

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

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-	-	V	$I_C = -100\text{nA}$
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-45	-	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	-	-	V	$I_E = -100\text{nA}$
DC Current Gain (Note 7)	h_{FE}	420	520	800	-	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
Collector Cutoff Current	I_{CBO}	-	-	-15	nA	$V_{CB} = -30\text{V}$
				-4	μA	$V_{CB} = -30\text{V}, T_A = +150^\circ\text{C}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(\text{sat})}$	-	-75 -250	-300 -650	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(\text{on})}$	-600 -	-650 -820	-750 -850	mV	$I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -10\text{mA}, V_{CE} = -5\text{V}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(\text{sat})}$	-	-700 -850	-	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5\text{mA}$
Output Capacitance	C_{obo}	-	3	4.5	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Transition Frequency	f_T	100	200	-	MHz	$V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$
Noise Figure	NF	-	-	10	dB	$V_{CE} = -5\text{V}, I_C = -200\text{μA}$ $R_S = 2\text{kΩ}, f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$

Notes: 6. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

7. Measured under pulsed conditions. Pulse width $\leq 300\text{μs}$. Duty cycle $\leq 2\%$

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

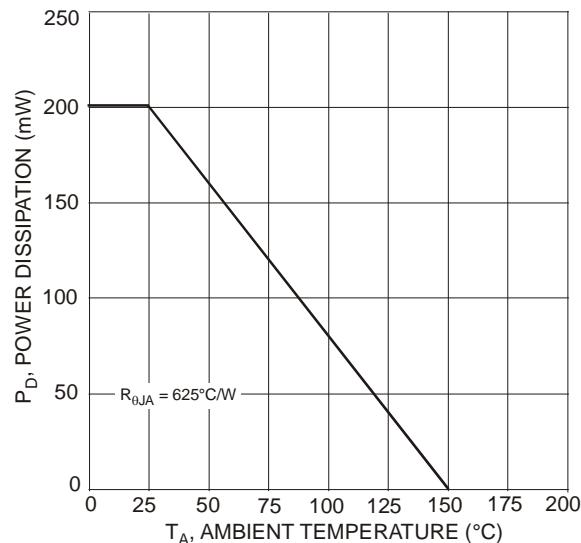


Fig. 1 Power Dissipation vs.
Ambient Temperature (Note 5)

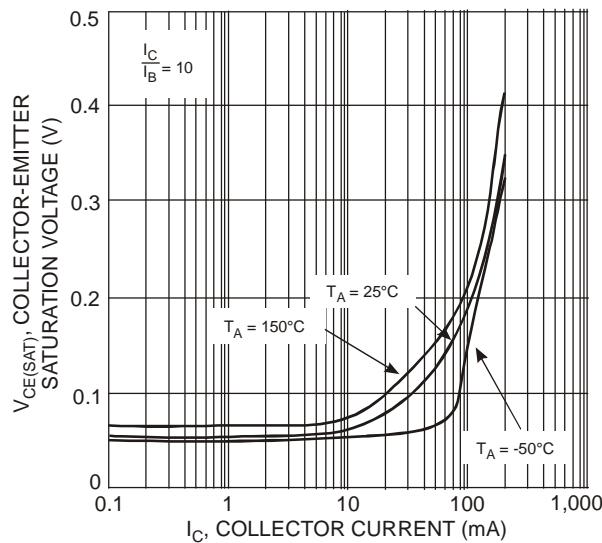


Fig. 2 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

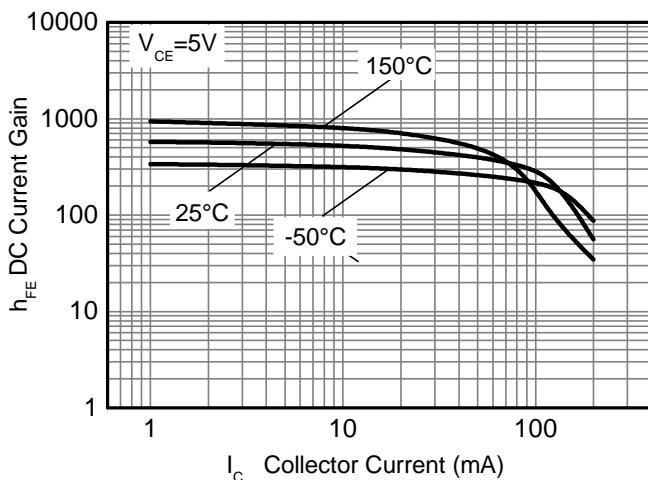


Fig. 3 Typical DC Current Gain (Group C)
vs Collector Current (mA)

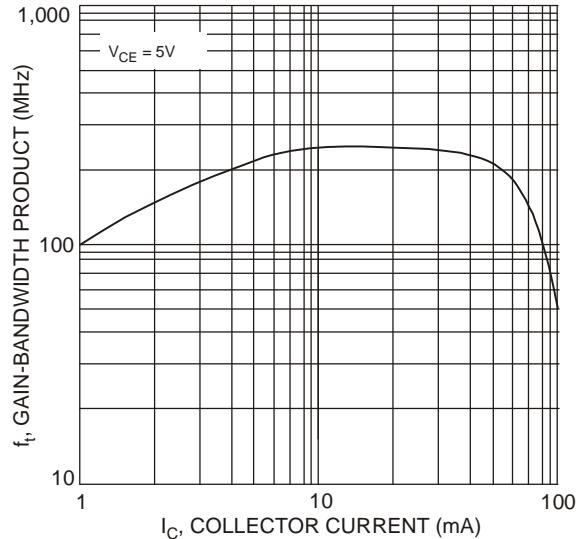
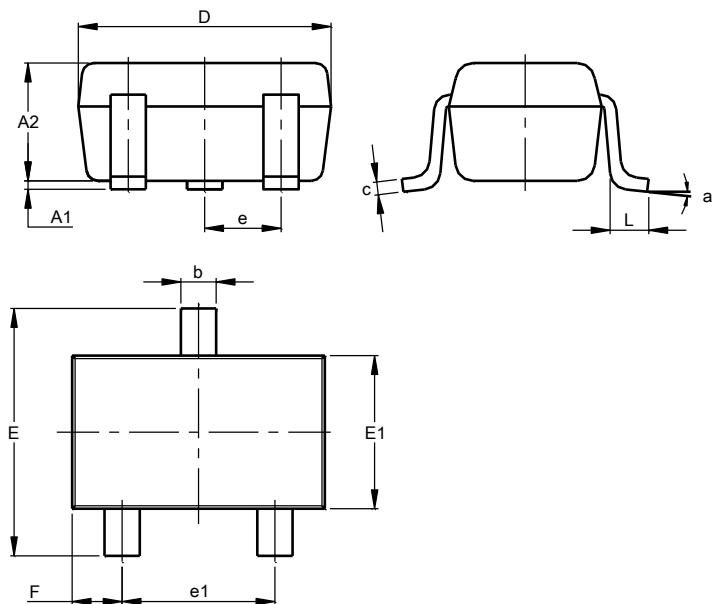


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

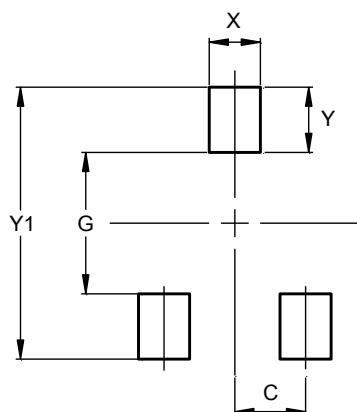
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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.



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

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