

## Description

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

## Features

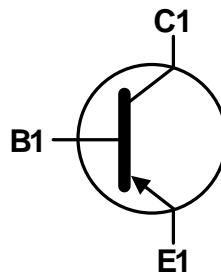
- Ultra-Small Surface Mount Package
- Ideally Suited for Automated Insertion
- For Switching and AF Amplifier Application
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

## Mechanical Data

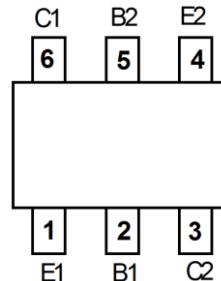
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Finish. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol


 Top View  
 Pin-Out

## Ordering Information (Notes 4 & 5)

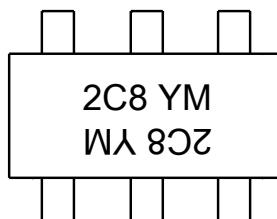
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
AC857BSQ-7	Automotive	2C8	7	8	3,000

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See [http://www.diodes.com/quality/lead\\_free.html](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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
- For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information

SOT363



2C8 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: D = 2016)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023				
Code	D	E	F	G	H	I	J	K				
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
Collector Current	$I_C$	-100	mA
Peak Collector Current	$I_{CM}$	-200	mA
Peak Base Current	$I_{BM}$	-200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\text{thJA}}$	625	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

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

Characteristic (Note 7)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	—	—	V	$I_C = -100\mu\text{A}, I_B = 0$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	-45	—	—	V	$I_C = -10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -100\mu\text{A}, I_C = 0$
DC Current Gain	$h_{FE}$	220	—	475	—	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(\text{SAT})}$	—	—	-100 -400	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 Saturation Voltage	$V_{BE(\text{SAT})}$	—	-700	—	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$
Base-Emitter Voltage	$V_{BE(\text{ON})}$	-580	-665	-750	mV	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
Collector-Cutoff Current	$I_{CBO}$	—	—	-15 -4.0	nA μA	$V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}, T_A = +150^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5.0\text{V}, I_C = 0$
Gain Bandwidth Product	$f_T$	100	—	—	MHz	$V_{CE} = -5.0\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$
Collector-Base Capacitance	$C_{CBO}$	—	2	3	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$
Emitter-Base Capacitance	$C_{EBO}$	—	11	—	pF	$V_{EB} = -0.5\text{V}, f = 1.0\text{MHz}$

Notes: 6. For the device mounted on minimum recommended pad layout FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.  
7. Short duration pulse test used to minimize self-heating effect.

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

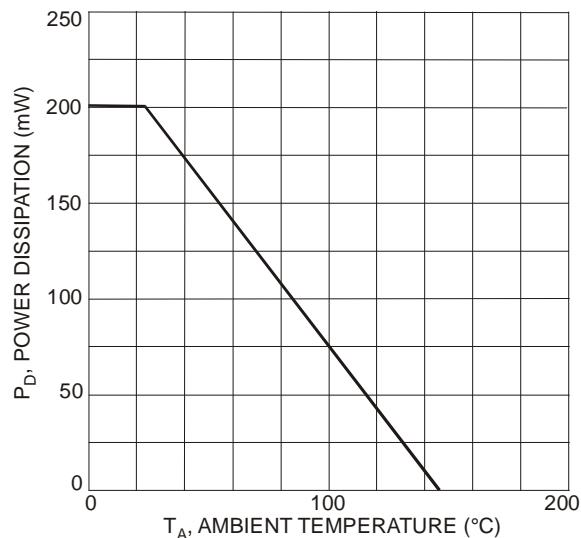


Fig. 1 Power Dissipation vs. Ambient Temperature

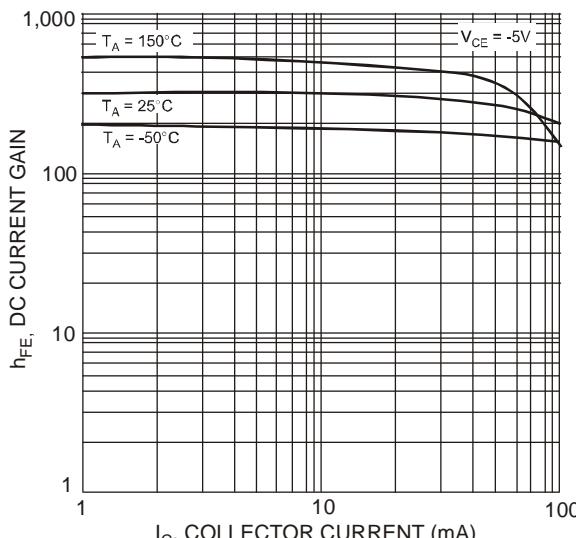


Fig. 2 Typical DC Current Gain vs. Collector Current

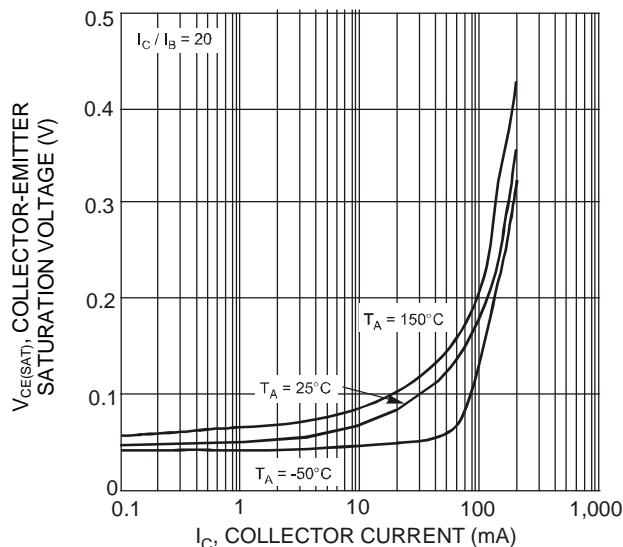


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

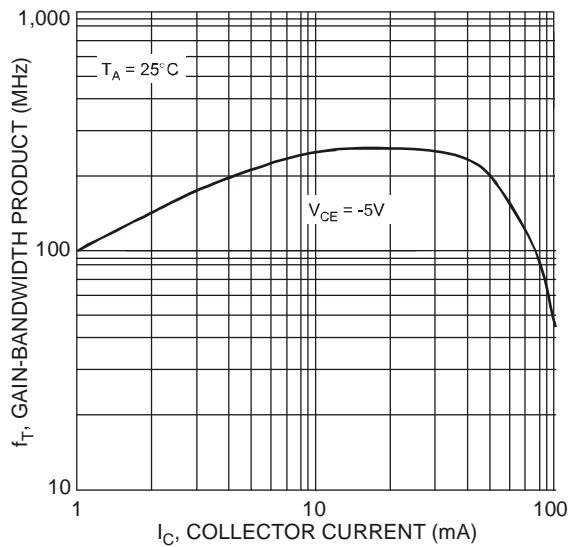
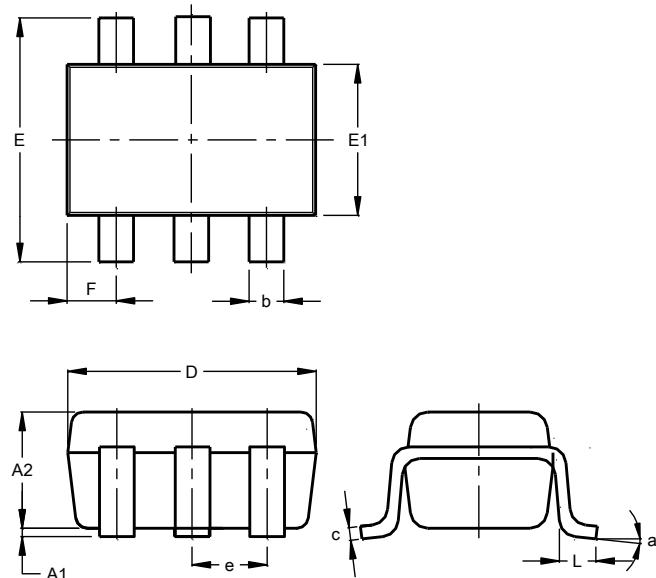


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

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

SOT363



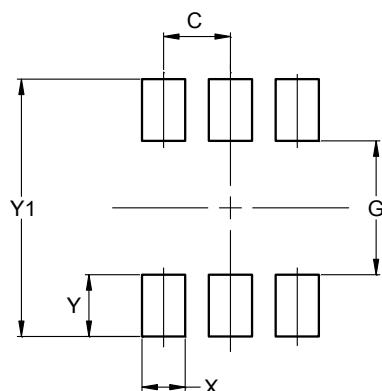
SOT363			
Dim	Min	Max	Typ
<b>A1</b>	0.00	0.10	0.05
<b>A2</b>	0.90	1.00	1.00
<b>b</b>	0.10	0.30	0.25
<b>c</b>	0.10	0.22	0.11
<b>D</b>	1.80	2.20	2.15
<b>E</b>	2.00	2.20	2.10
<b>E1</b>	1.15	1.35	1.30
<b>e</b>	0.650 BSC		
<b>F</b>	0.40	0.45	0.425
<b>L</b>	0.25	0.40	0.30
<b>a</b>	0°	8°	--

All Dimensions in mm

## Suggested Pad Layout

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

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Dimensions	Value (in mm)
<b>C</b>	0.650
<b>G</b>	1.300
<b>X</b>	0.420
<b>Y</b>	0.600
<b>Y1</b>	2.500

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