

## Description

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

## Features

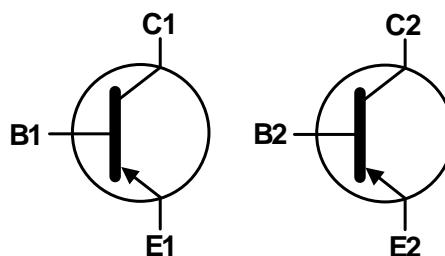
- $BV_{CEO} > -65V$
- $I_C = -100mA$  High Collector Current
- Complementary NPN Types Available (BC846AS)
- Ideally Suited for Automatic Insertion
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

## Mechanical Data

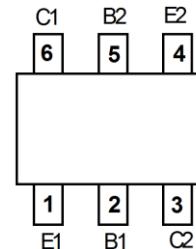
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol


 Top View  
 Pin-Out

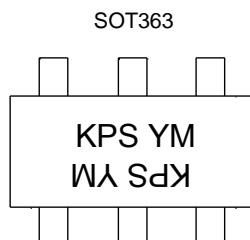
## Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
BC856ASQ-7-F	AEC-Q101	KPS	7	8	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](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/](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



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

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022				
Code	C	D	E	F	G	H	I	J				
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	$V_{CBO}$	-80	V
Collector – Emitter Voltage	$V_{CEO}$	-65	V
Emitter – Base Voltage	$V_{EBO}$	-5.0	V
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.)

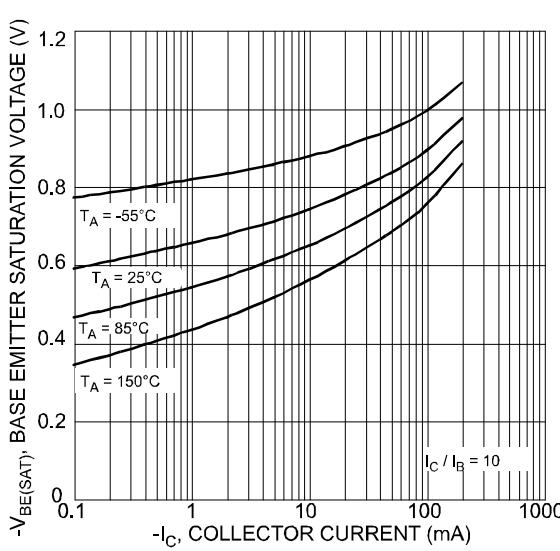
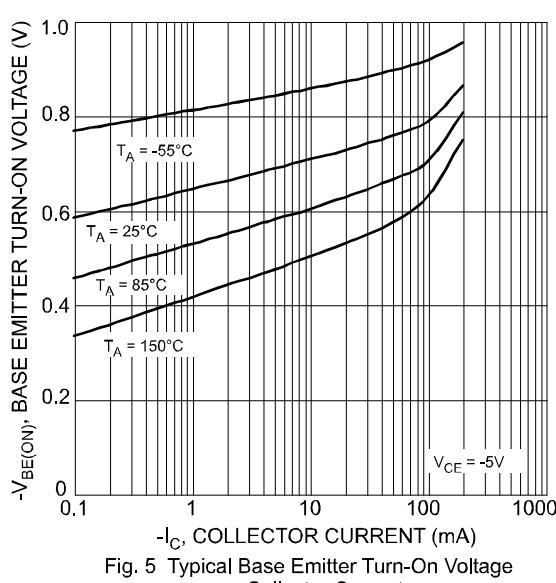
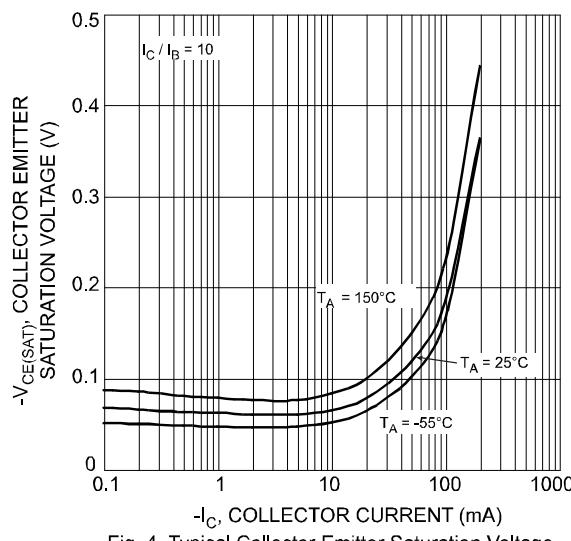
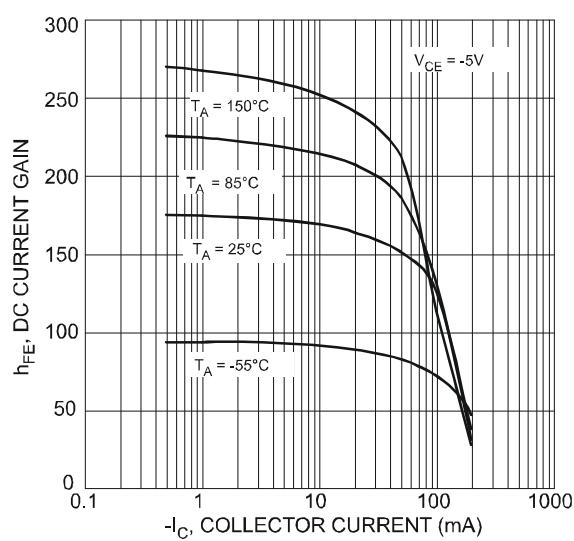
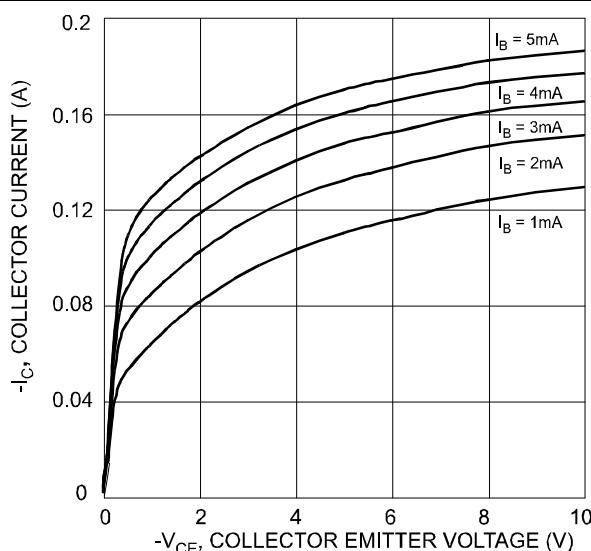
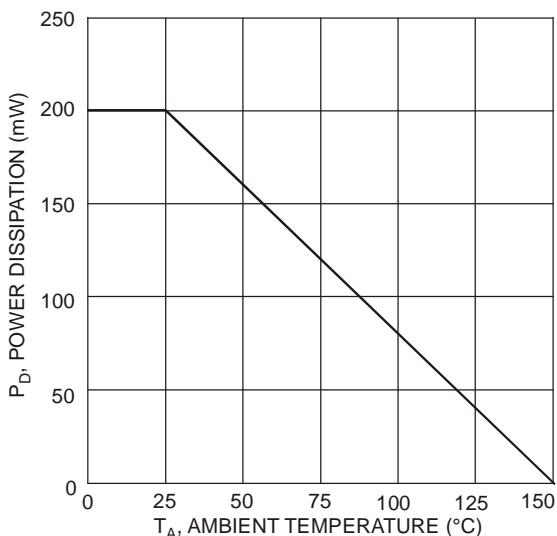
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	$P_D$	200	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{JJA}$	625	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

**Electrical Characteristics** (Note 7) (@ $T_A = +25^\circ\text{C}$  unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector – Base Breakdown Voltage	$BV_{CBO}$	-80	—	—	V	$I_C = 10\mu\text{A}$
Collector – Emitter Breakdown Voltage	$BV_{CEO}$	-65	—	—	V	$I_C = 10\text{mA}$
Emitter – Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = 1\mu\text{A}$
DC Current Gain	$h_{FE}$	125	180	250	—	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$
Collector – Emitter Saturation Voltage	$V_{CE(\text{SAT})}$	—	-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 Saturation Voltage	$V_{BE(\text{SAT})}$	—	-700 -850	—	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$ $I_C = -100\text{mA}, I_B = -5.0\text{mA}$
Base – Emitter Voltage	$V_{BE(\text{ON})}$	-600 —	-650 —	-750 -820	mV	$V_{CE} = -5.0\text{V}, I_C = -2.0\text{mA}$ $V_{CE} = -5.0\text{V}, I_C = -10\text{mA}$
Collector – Cutoff Current	$I_{CES}$ $I_{CBO}$ $I_{EBO}$	— — —	— — —	-15 -15 -4.0	nA nA $\mu\text{A}$	$V_{CE} = -80\text{V}$ $V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}, T_A = +150^\circ\text{C}$
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	$C_{CB}$	—	3	—	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$

Notes: 6. For the device mounted on minimum recommended pad layout FR4 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.)



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

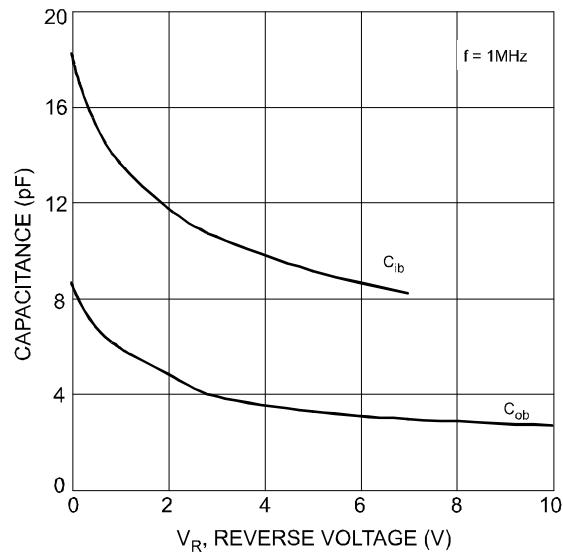


Fig. 7 Typical Capacitance Characteristics

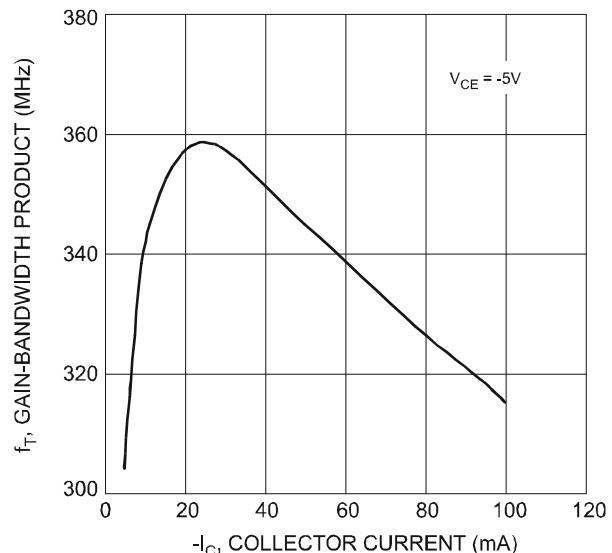
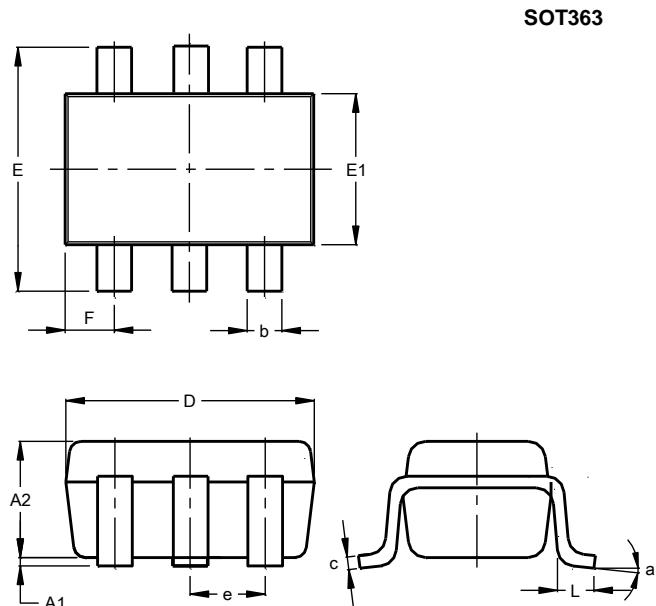


Fig. 8 Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

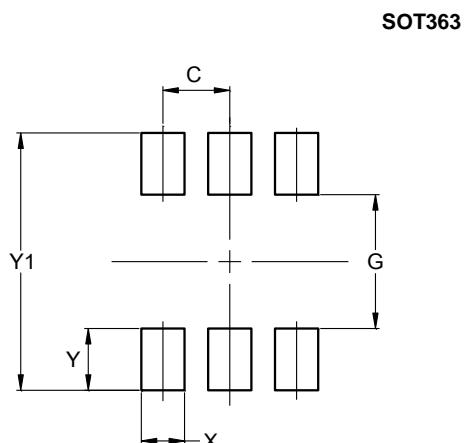
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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.



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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