DUAL NPN SMALL-SIGNAL SURFACE-MOUNT TRANSISTOR

Features

- BV_{CEO} > 45V
- 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)**
- **The BC847BSQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

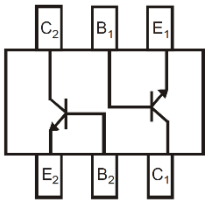
Mechanical Data

- Package: SOT363
- 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 Finish. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

SOT363



Top View



Device Schematic

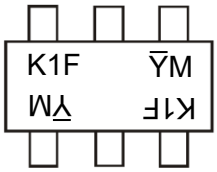
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
BC847BSQ-7-F	SOT363	K1F	7	8	3000	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

SOT363



K1F = Product Type Marking Code (See Ordering Information)
ŸM = Date Code Marking
Ÿ or Y = Year (ex: N = 2026)
M = Month (ex: 2 = February)

Date Code Key

Year	2020	-	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	H	-	N	P	R	S	T	U	V	W	X	Y

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

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Absolute Maximum Ratings (@ T_A = +25°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}	6	V
Collector Current	I_C	100	mA
Peak Pulse Collector Current	I_{CM}	200	mA
Peak Pulse 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
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Note: 5. 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.

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

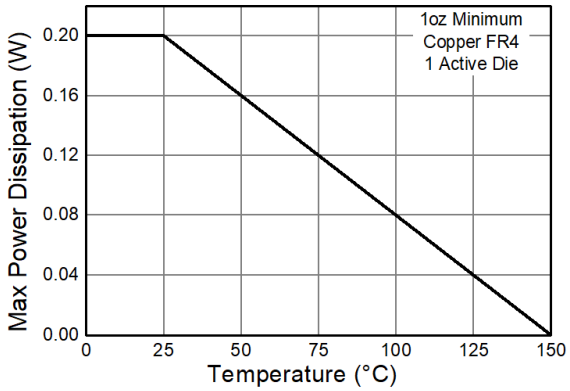


Fig 1. Derating Curve

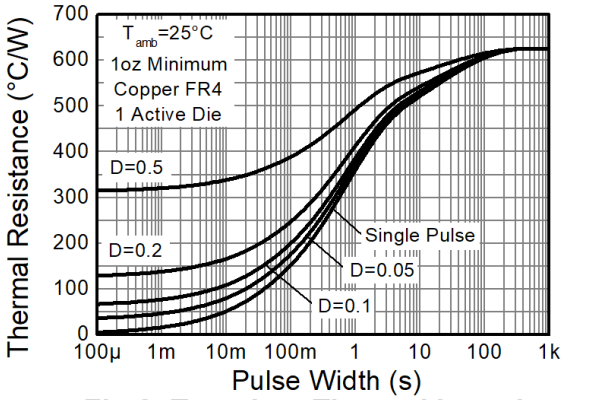


Fig 2. Transient Thermal Impedance

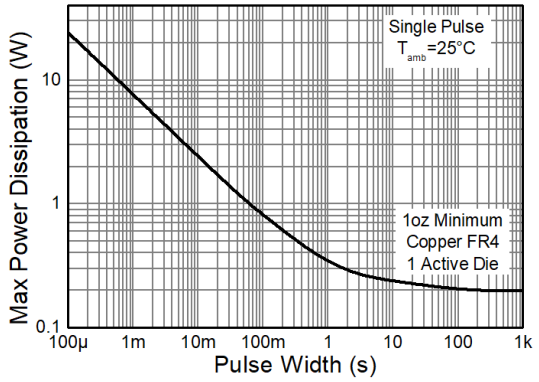


Fig 3. Pulse Power Dissipation

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

Characteristic (Note 6)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	I_C = 100μA, I_B = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	45	—	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	I_E = 100μA, I_C = 0
DC Current Gain	h_{FE}	200	—	450	—	V_{CE} = 5.0V, I_C = 2.0mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	100 400	mV	I_C = 10mA, I_B = 0.5mA I_C = 100mA, I_B = 5.0mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	755	—	mV	I_C = 10mA, I_B = 0.5mA
Base-Emitter Voltage	$V_{BE(on)}$	580	665	700	mV	V_{CE} = 5.0V, I_C = 2.0mA
Collector-Cutoff Current	I_{CBO}	— —	— —	20 5.0	nA μA	V_{CB} = 40V V_{CB} = 40V, T_A = +125°C
Emitter-Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5.0V, I_C = 0
Gain Bandwidth Product	f_T	100	—	—	MHz	V_{CE} = 5.0V, I_C = 10mA, f = 100MHz
Collector-Base Capacitance	C_{CBO}	—	2.0	3.0	pF	V_{CB} = 10V, f = 1.0MHz
Emitter-Base Capacitance	C_{EBO}	—	11	—	pF	V_{EB} = 0.5V, f = 1.0MHz

Note: 6. Short duration pulse test used to minimize self-heating effect.

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

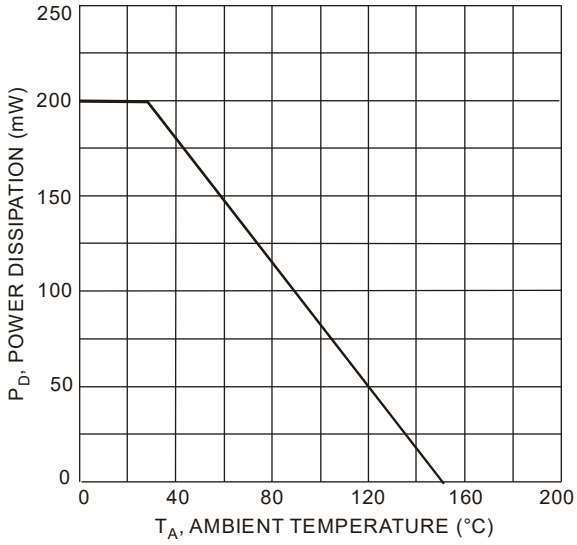


Fig 4. P_D vs. T_A

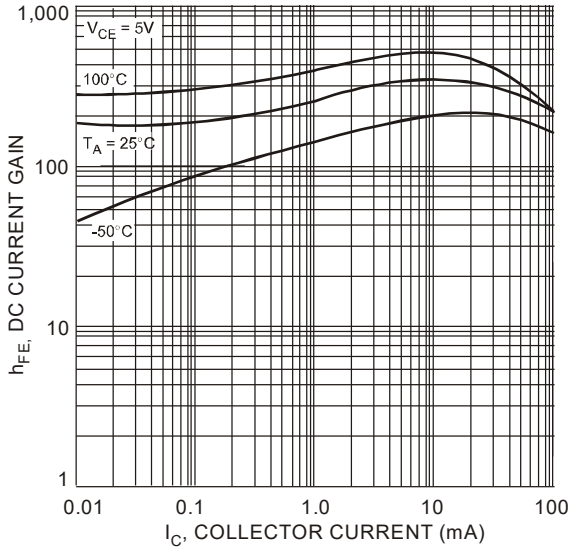


Fig 5. h_{FE} vs. I_C

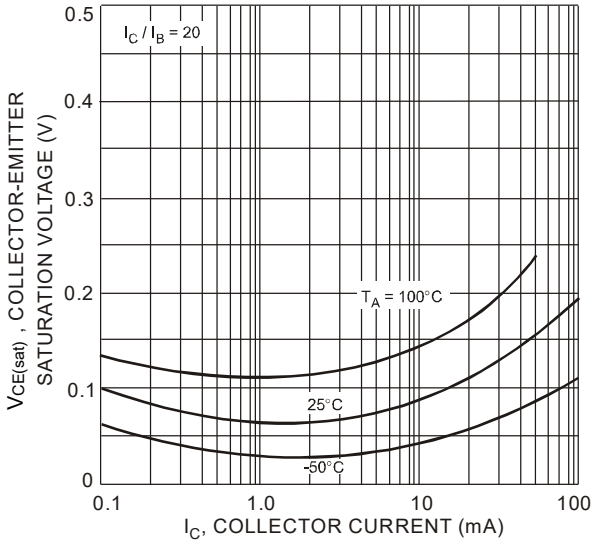


Fig 6. $V_{CE(sat)}$ vs. I_C

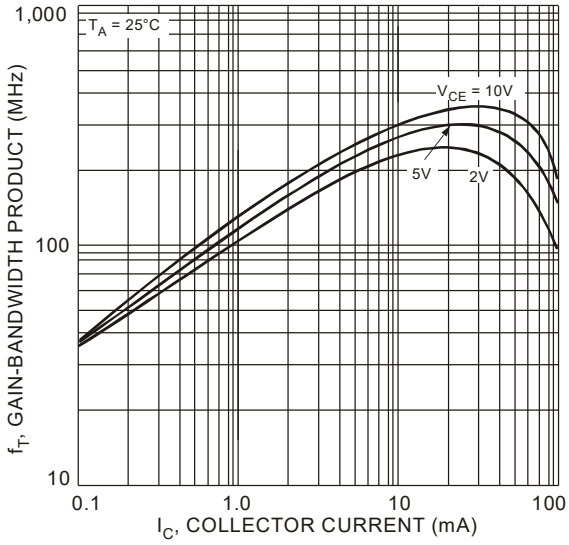


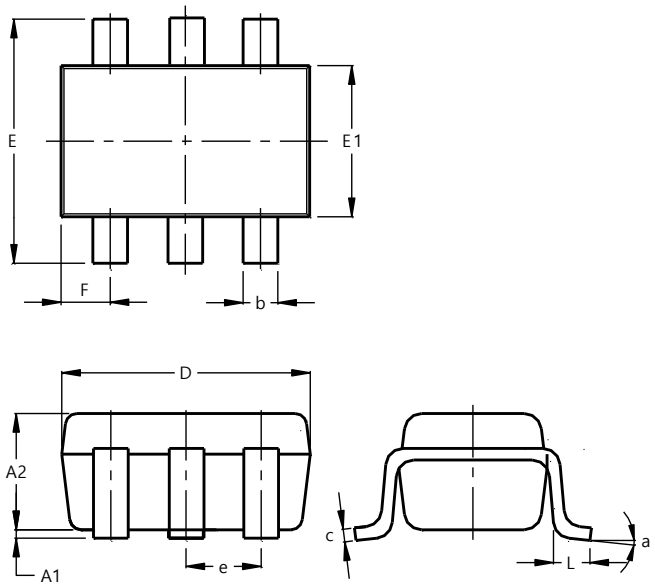
Fig 7. f_T vs. I_C

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Package Outline Dimensions

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

SOT363

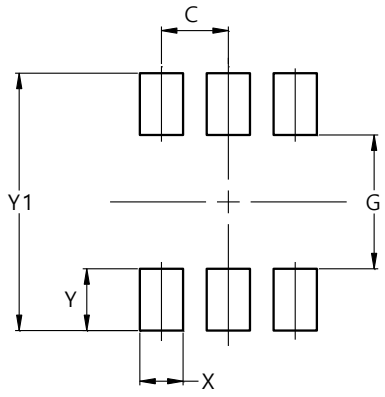


SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT363



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

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