50V NPN SMALL SIGNAL TRANSISTOR IN SOT523

Features

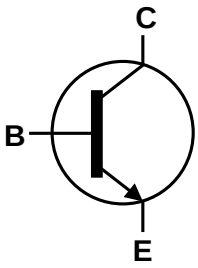
- BV_{CEO} > 50V
- I_C = 150mA High Collector Current
- Ultra-Small Surface Mount Package
- Complementary PNP Type Available (2DA1774Q/R/S)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

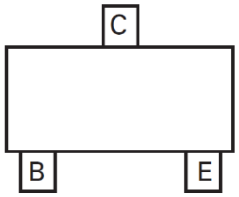
- Case: SOT523
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.002 grams (Approximate)

SOT523

Top View



Device Symbol



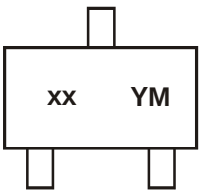
Pin-Out Top View

Ordering Information (Note 4)

Product	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
2DC4617Q-7-F	Active	AEC-Q101	8D	7	8	3000
2DC4617R-7-F	Active	AEC-Q101	8E	7	8	3000
2DC4617S-7-F	Active	AEC-Q101	8F	7	8	3000

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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, see http://www.diodes.com/products/packages.html.

Marking Information



xx = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: F = 2018)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	F	G	H	I	J	K	L	M	N	0	P	Q	R	S

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

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current—Continuous (Note 5)	I_C	150	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) T_A = 25°C	P_D	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\Theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

Notes: 5. For a device mounted with the collector lead, on a minimum recommended pad layout of 1oz copper on a single-sided 1.6mm FR4 PCB. Device is measured under still air conditions whilst operating in a steady-state.
6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

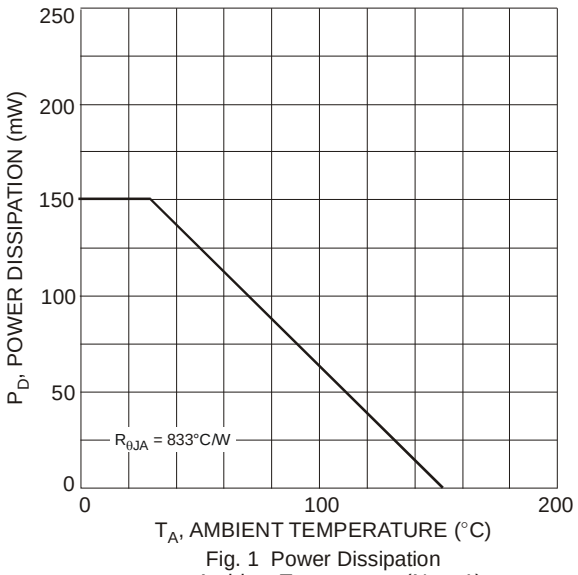


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 1)

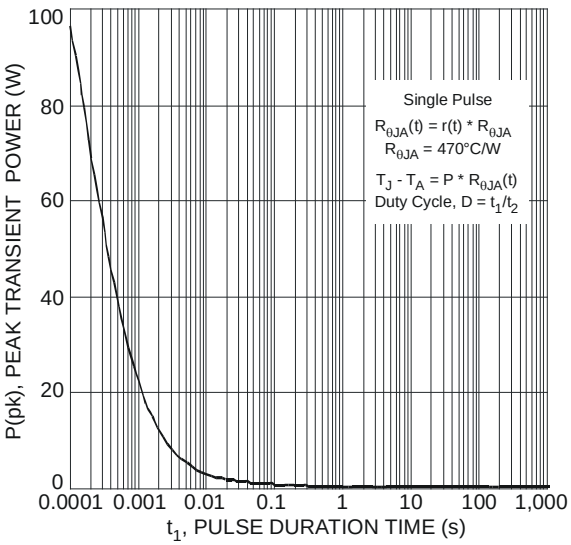


Fig. 2 Single Pulse Maximum Power Dissipation

Thermal Characteristics and Derating Information (continued)

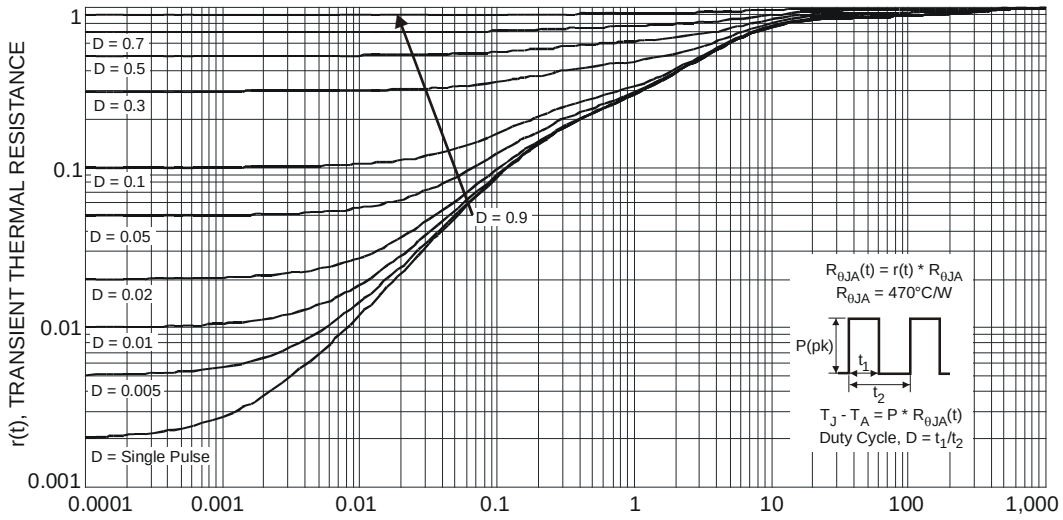


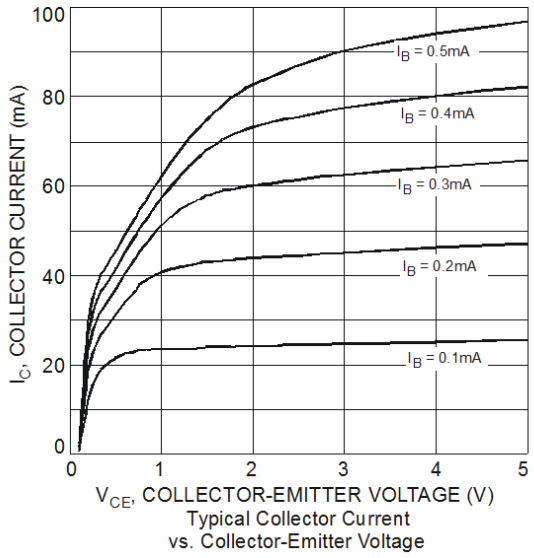
Fig. 3 Transient Thermal Response

Electrical Characteristics @T_A = 25°C unless otherwise specified

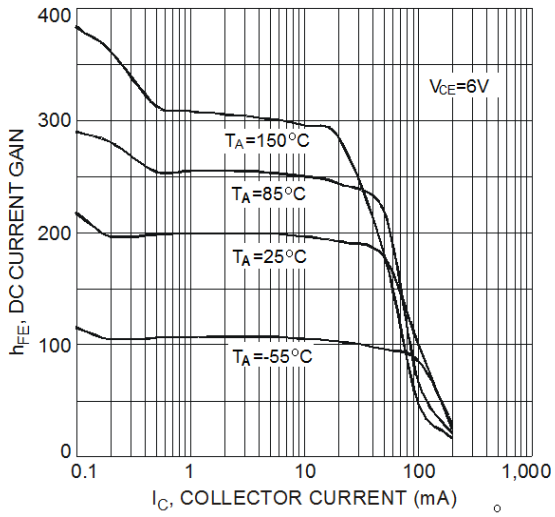
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	—	—	V	I_C = 50µA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50	—	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7	—	—	V	I_E = 50µA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB} = 60V
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 6V
ON CHARACTERISTICS (Note 7)						
DC Current Gain 2DC4617Q 2DC4617R 2DC4617S	h_{FE}	120 180 270	— — —	270 390 560	—	V_{CE} = 6V, I_C = 1mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.4	V	I_C = 50mA, I_B = 5mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	2	3.5	pF	V_{CB} = 12V, f = 1MHz, I_E = 0
Current Gain-Bandwidth Product	f_T	—	140	—	MHz	V_{CE} = 12V, I_C = 2mA, f = 1MHz
Current Gain-Bandwidth Product	f_T	—	180	—	MHz	V_{CE} = 12V, I_C = 0mA, f = 1MHz
Current Gain-Bandwidth Product	f_T	—	180	—	MHz	V_{CE} = 12V, I_C = 2mA, f = 100MHz

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

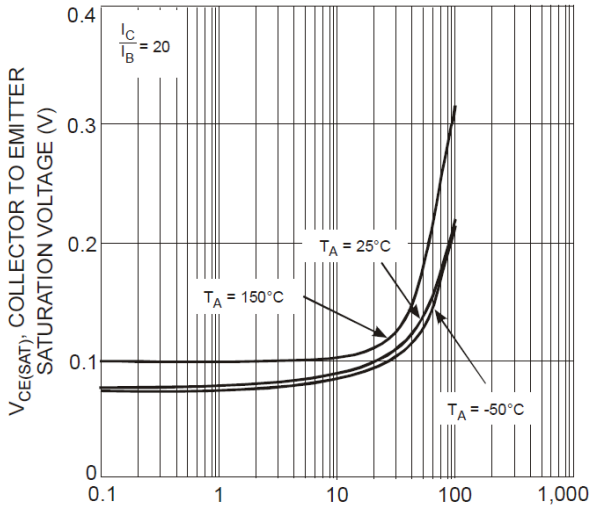
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



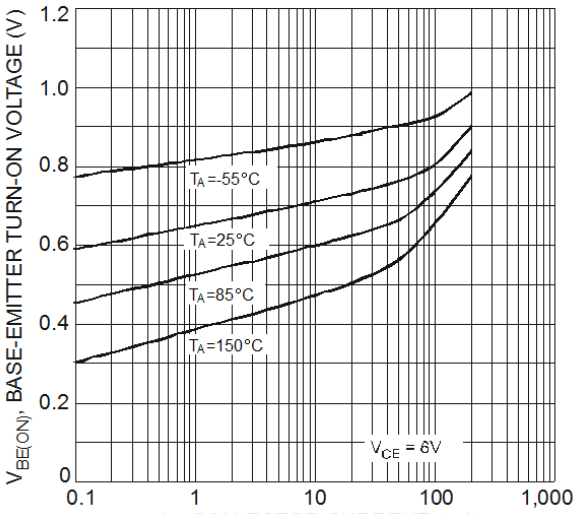
Typical Collector Current
vs. Collector-Emitter Voltage



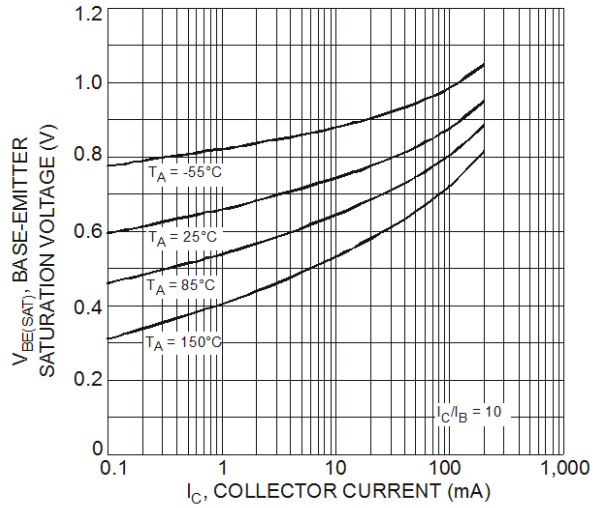
Typical DC Current Gain
vs. Collector Current



Collector Emitter Saturation Voltage
vs. Collector Current



Typical Base-Emitter Turn-On Voltage
vs. Collector Current



Typical Base-Emitter Saturation Voltage
vs. Collector Current

Package Outline Dimensions

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

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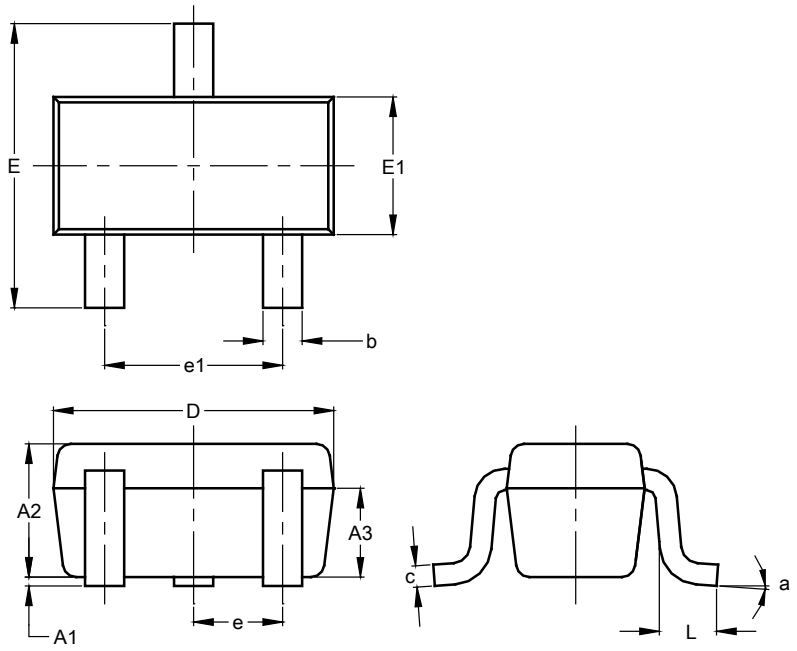
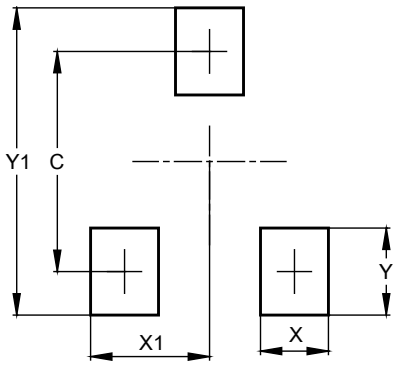


SOT523			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

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

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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