'20V PNP MEDIUM POWER TRANSISTOR IN SOT223

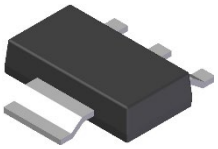
Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP68)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/**

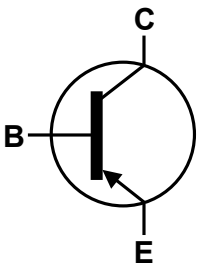
Mechanical Data

- Case: SOT223
- 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, Solderable per MIL-STD -202, Method 208 e3
- Weight: 0.112 grams (Approximate)

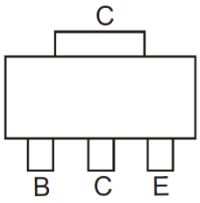
SOT223



Top View



Device Schematic



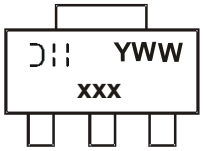
Top View
Pin Out Configuration

Ordering Information (Note 4)

Part Number	Status	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DCP69-13	Active	Standard	P12	13	12	2,500
DCP69-16-13	Obsolete	Standard	P12-16	13	12	2,500
DCP69-25-13	Obsolete	Standard	P12-25	13	12	2,500

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



xxx = Product Type Marking Code
P12 = DCP69
P12-16 = DCP69-16
P12-25 = DCP69-25
= Manufacturer's code marking
YWW = Date Code Marking
Y = Last digit of year (ex: 8 = 2018)
WW = Week code (01 – 53)

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-1	A
Peak Pulse Current	I_{CM}	-2	A

Thermal Characteristics @ T_A = 25°C unless otherwise specified

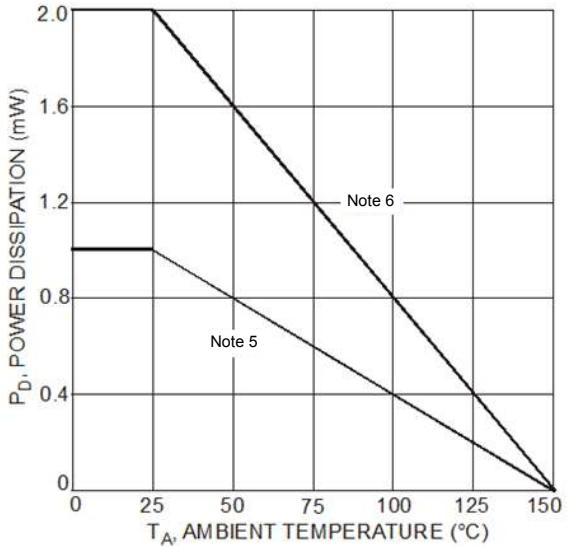
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\Theta JA}$	125	°C/W
Power Dissipation (Note 6)	P_D	2	W
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\Theta JA}$	62.5	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

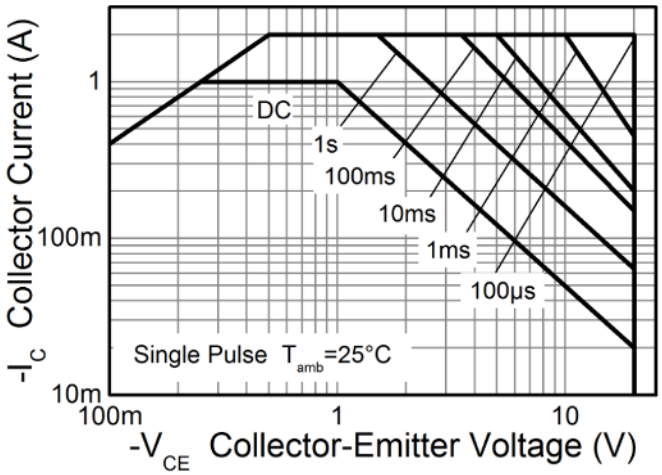
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

Notes:
5. Device mounted on FR-4 PCB; pad layout as shown on in Diodes Inc. suggested pad layout document, which can be found on our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.
6. Device mounted on FR-4 PCB with 1in^2 copper pad layout
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



P_D v T_A



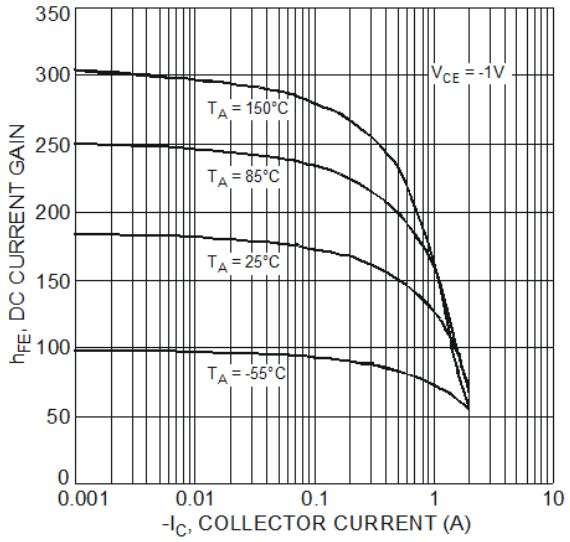
Safe Operating Area

Electrical Characteristics @ T_A = 25°C unless otherwise specified

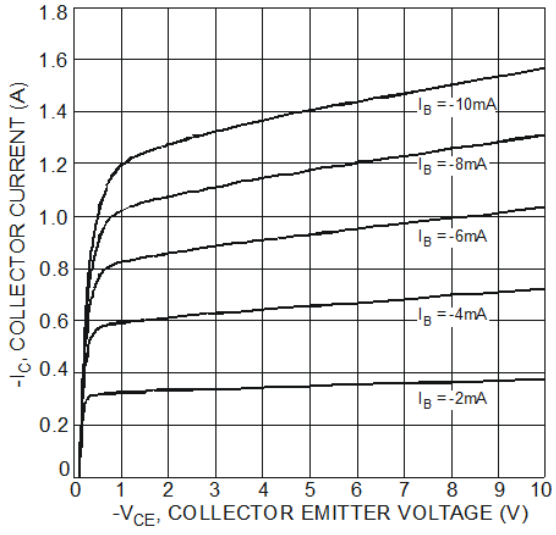
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS							
Collector-Base Breakdown Voltage		BV_{CBO}	-25	—	—	V	I_C = -100µA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 8)		BV_{CEO}	-20	—	—	V	I_C = -10mA, I_B = 0
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	—	—	V	I_E = -100µA, I_C = 0
Collector-Base Cut-Off Current		I_{CBO}	—	—	-100 -10	nA µA	V_{CB} = -25V, I_E = 0 V_{CB} = -25V, I_E = 0, T_A = 150°C
Emitter-Base Cut-Off Current		I_{EBO}	—	—	-100	nA	V_{EB} = -5.0V, I_C = 0
ON CHARACTERISTICS (Note 8)							
DC Current Gain	DCP69, DCP69-16, DCP69-25	h_{FE}	50 60	— —	— —	—	V_{CE} = -10V, I_C = -5.0mA V_{CE} = -1V, I_C = -1A
	DCP69		85	—	375		V_{CE} = -1V, I_C = -500mA
	DCP69-16		100	—	250		V_{CE} = -1V, I_C = -500mA
	DCP69-25		160	—	375		V_{CE} = -1V, I_C = -500mA
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	-0.5	V	I_C = -1A, I_B = -100mA
Base-Emitter Turn-On Voltage		$V_{BE\ (on)}$	—	—	-0.7 -1	V	V_{CE} = -10V, I_C = -5.0mA V_{CE} = -1V, I_C = -1A
SMALL SIGNAL CHARACTERISTICS							
Transition frequency		f_T	40	200	—	MHz	V_{CE} = -5V, I_C = -50mA, f = 100MHz
Output Capacitance		C_{obo}	—	17	—	pF	V_{CB} = -10V, f = 1 MHz

Notes: 8. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.

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

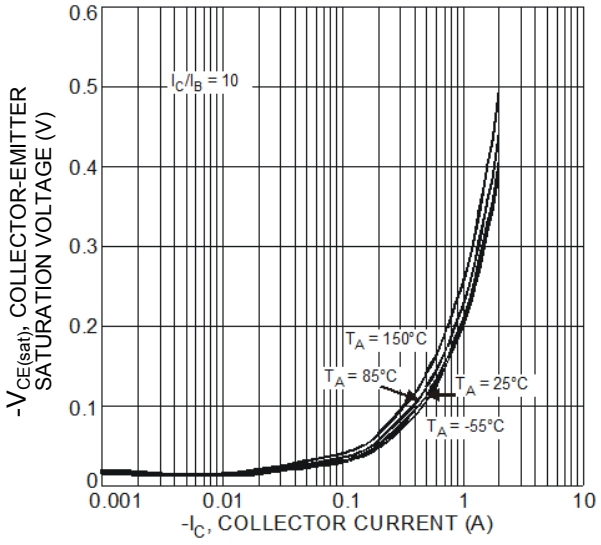


h_{FE} v I_C (DCP69-16)

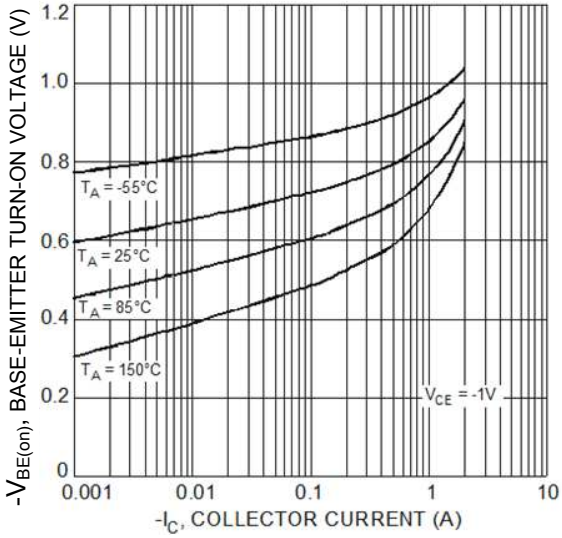


I_C v V_{CE}

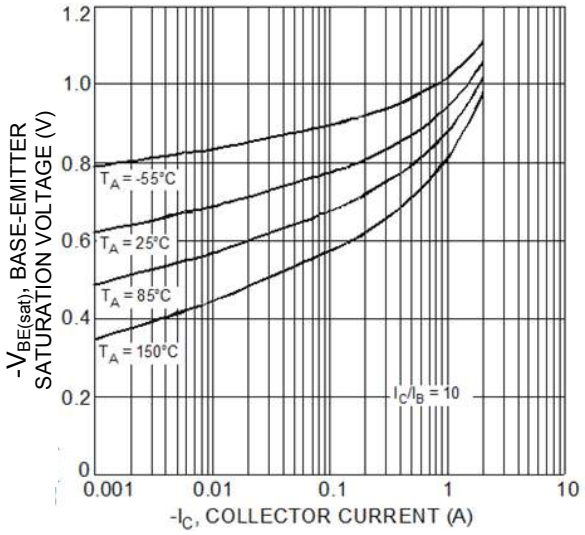
Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.) (continued)



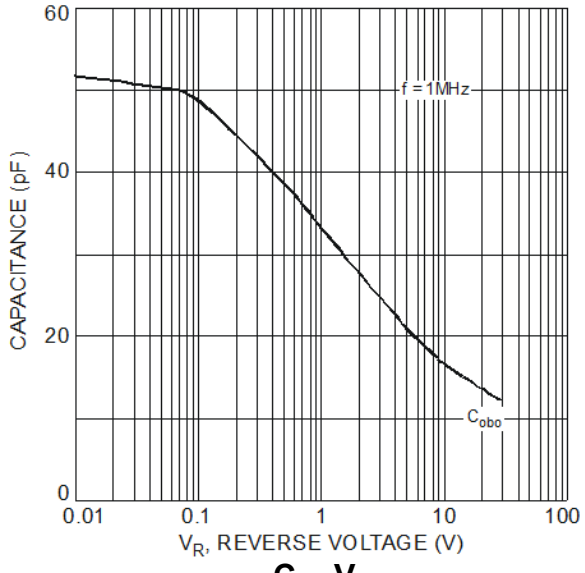
$V_{CE(sat)}$ v I_C



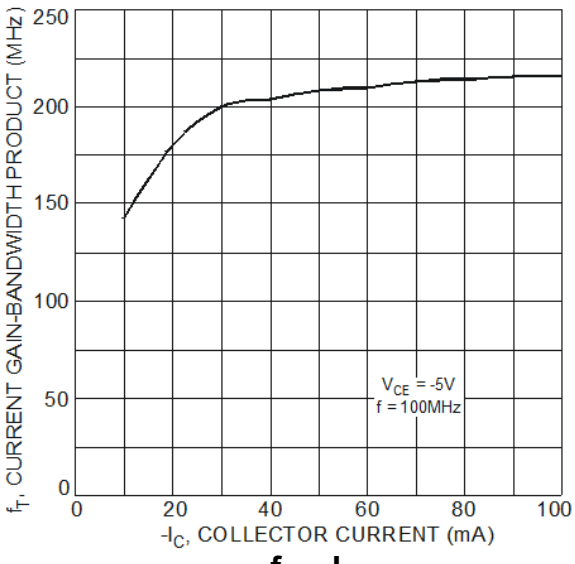
$V_{BE(on)}$ v I_C



$V_{BE(sat)}$ v I_C



C v V_R

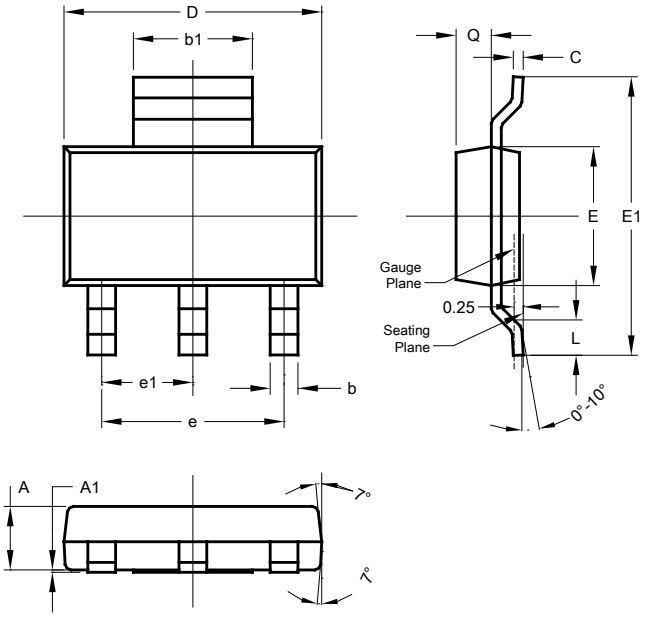


f_T v I_C

Package Outline Dimensions

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

SOT223

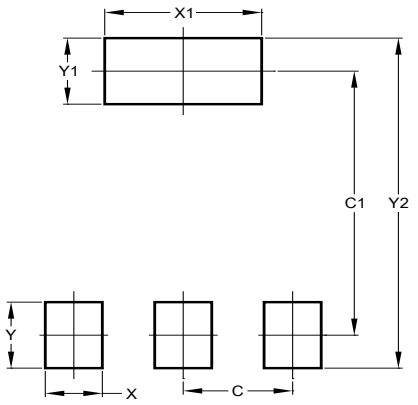


SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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