12V PNP MEDIUM POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > -12V
- I_C = -3A High Continuous Current
- Low Saturation Voltage $V_{CE(sat)}$ < -0.25V @ -1.5A
- Complementary NPN Type: 2DD2678
- **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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

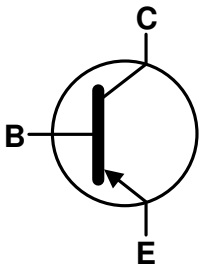
- Package: SOT89
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

Application

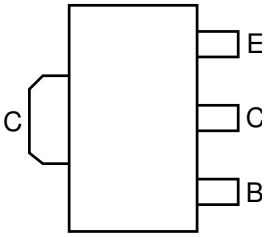
- Medium power switching
- Amplifications

SOT89

Top View



Device Symbol



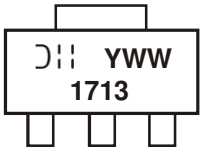
Pin Out – Top View

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
2DB1713-13	SOT89	1713	13	12	2500	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



1713 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$= Last Digit of Year (ex: 3 = 2023)
WW = Week Code (01 to 53)

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-15	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-6	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-6	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	0.9	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	139	°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

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout.
6. Device mounted on FR-4 PCB with 1inch^2 copper pad layout.

Thermal Characteristics and Derating Information

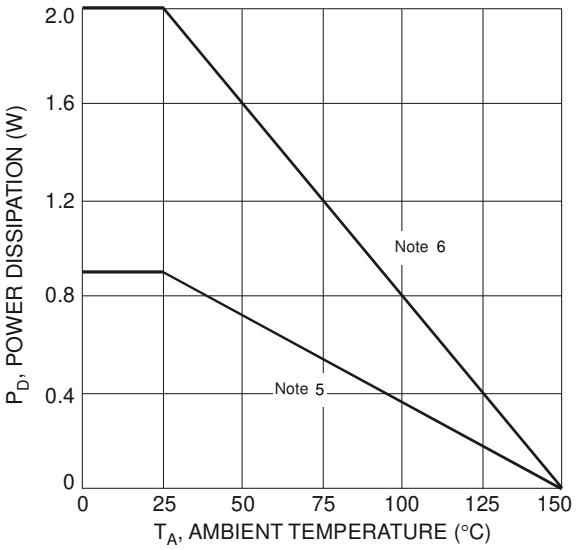


Figure 1. Power Dissipation vs. Ambient Temperature

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

Characteristic	Symbol	Min	Typ	Max	Unit	Conditions
OFF CHARACTERISTICS (Note 7)						
Collector-Base Breakdown Voltage	BV_{CBO}	-15	—	—	V	I_C = -10μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	-12	—	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	I_E = -10μA
Collector Cut-Off Current	I_{CBO}	—	—	-0.1	μA	V_{CB} = -15V
Emitter Cut-Off Current	I_{EBO}	—	—	-0.1	μA	V_{EB} = -6V
ON CHARACTERISTICS (Note 7)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-120	-250	mV	I_C = -1.5A, I_B = -30mA
DC Current Gain	h_{FE}	270	—	680	—	V_{CE} = -2V, I_C = -500mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	40	—	pF	V_{CB} = -10V, I_E = 0, f = 1MHz
Current Gain-Bandwidth Product	f_T	—	180	—	MHz	V_{CE} = -2V, I_C = -100mA, f = 100MHz

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

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

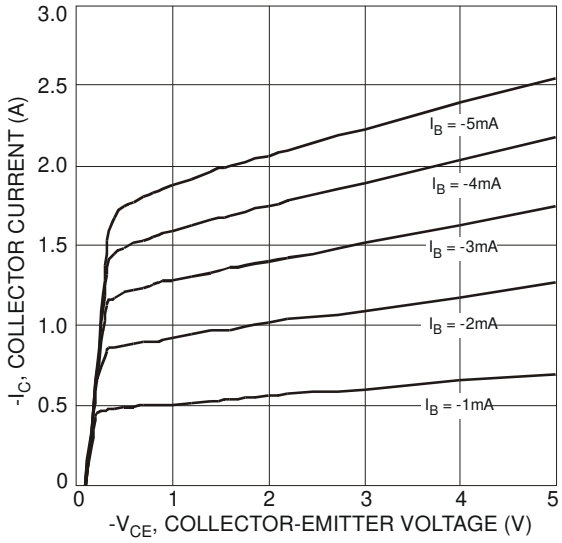


Figure 2. Typical Collector Current vs. Collector-Emitter Voltage

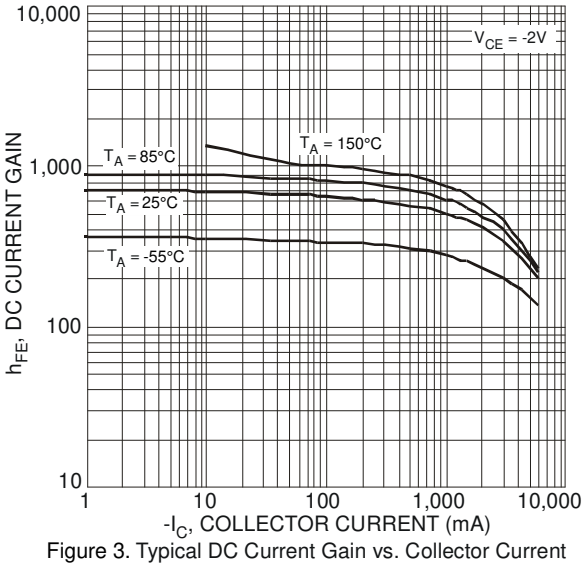


Figure 3. Typical DC Current Gain vs. Collector Current

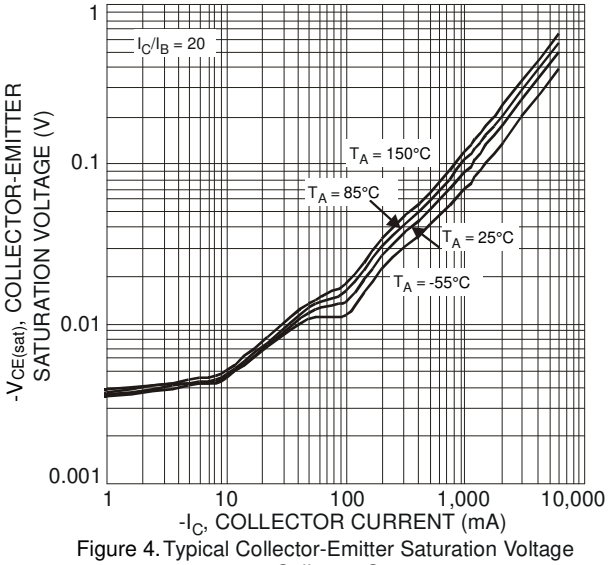


Figure 4. Typical Collector-Emitter Saturation Voltage vs. Collector Current

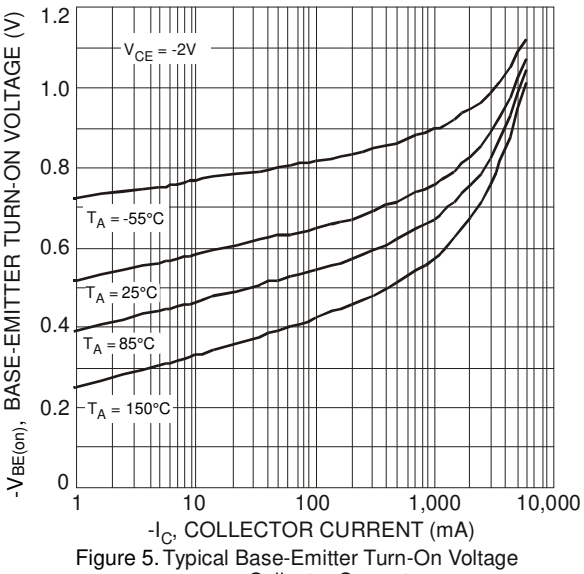


Figure 5. Typical Base-Emitter Turn-On Voltage vs. Collector Current

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

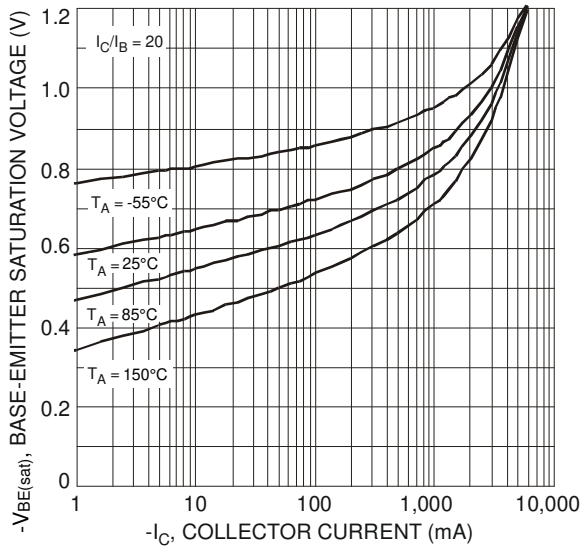


Figure 6. Typical Base-Emitter Saturation Voltage vs. Collector Current

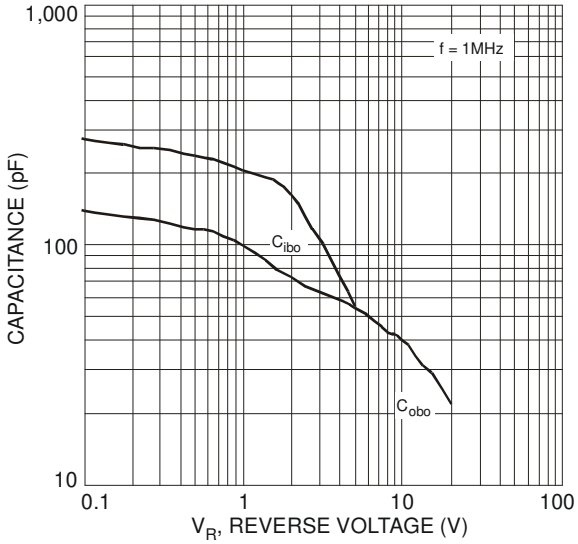


Figure 7. Typical Capacitance Characteristics

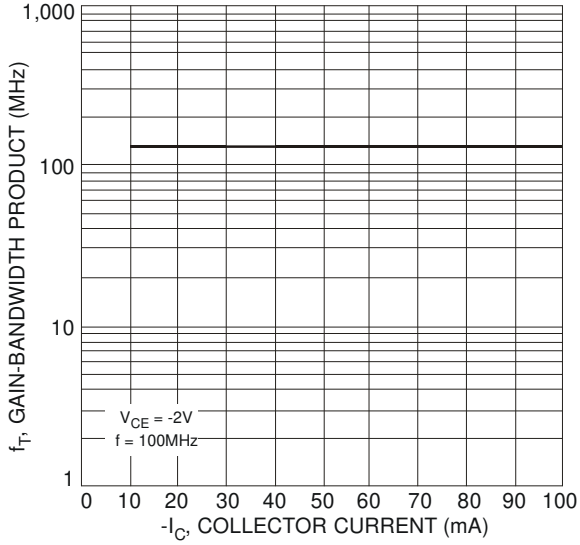


Figure 8. Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

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

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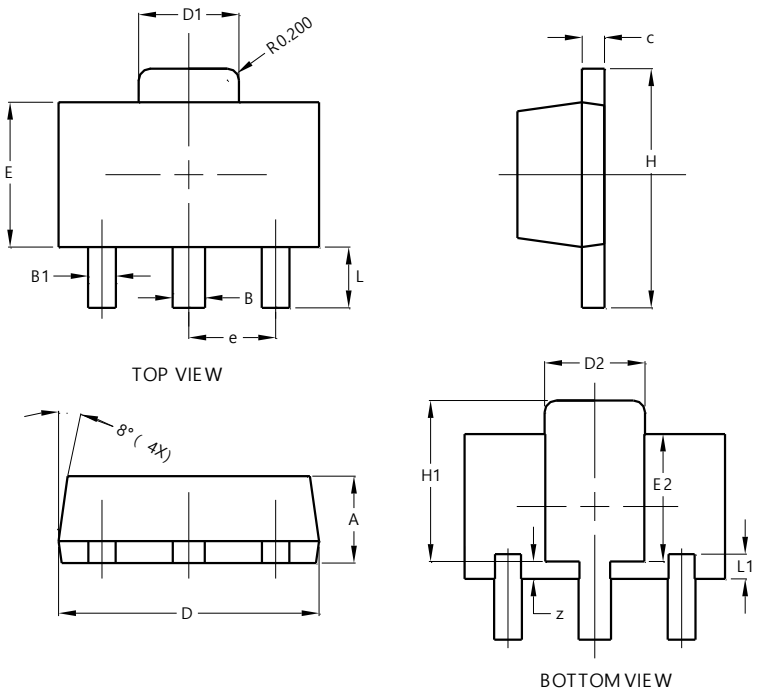
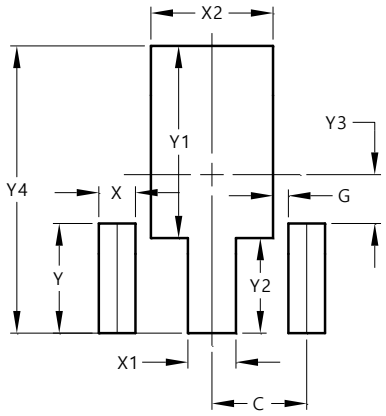


SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

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

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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