

## Features

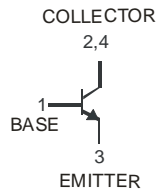
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DPLS350E)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

## Mechanical Data

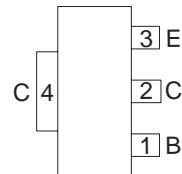
- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.115 grams (approximate)



Top View



Device Schematic



Pin Out Configuration

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	50	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Peak Pulse Collector Current	$I_{CM}$	5	A
Continuous Collector Current	$I_C$	3	A
Peak Pulse Base Current	$I_{BM}$	1	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	$P_D$	2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB; pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Device mounted on FR-4 PCB with 1inch<sup>2</sup> copper pad layout.

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS</b>						
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	100	nA	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0
		—	—	50	μA	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	100	nA	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	50	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 5)	V <sub>(BR)CEO</sub>	50	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5	—	—	V	I <sub>E</sub> = 100μA
<b>ON CHARACTERISTICS (Note 5)</b>						
DC Current Gain	h <sub>FE</sub>	200	—	—	—	V <sub>CE</sub> = 2V, I <sub>C</sub> = 0.5A
		200	—	—		V <sub>CE</sub> = 2V, I <sub>C</sub> = 1A
		100	—	—		V <sub>CE</sub> = 2V, I <sub>C</sub> = 2A
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	90	mV	I <sub>C</sub> = 0.5A, I <sub>B</sub> = 50mA
		—	—	170		I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA
		—	—	290		I <sub>C</sub> = 2A, I <sub>B</sub> = 200mA
Equivalent On-Resistance	R <sub>CE(SAT)</sub>	—	62	145	mΩ	I <sub>E</sub> = 2A, I <sub>B</sub> = 200mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	—	1.2	V	I <sub>C</sub> = 2A, I <sub>B</sub> = 200mA
Base-Emitter Turn-on Voltage	V <sub>BE(ON)</sub>	—	—	1.1	V	V <sub>CE</sub> = 2V, I <sub>C</sub> = 1A
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	100	—	—	MHz	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	30	pF	V <sub>CB</sub> = 10V, f = 1MHz

Notes: 5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

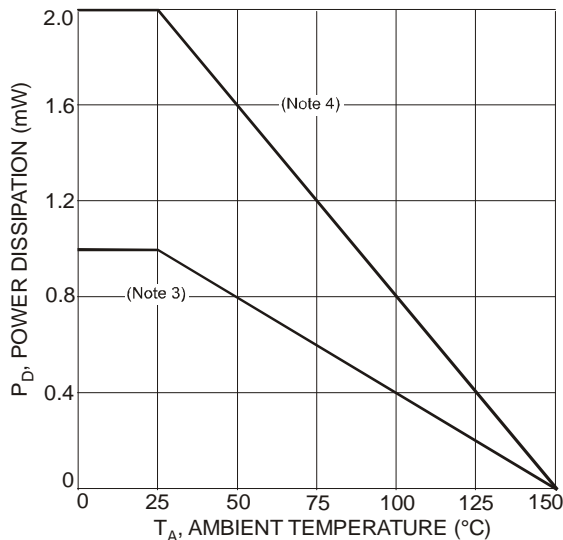


Fig. 1 Max Power Dissipation vs. Ambient Temperature

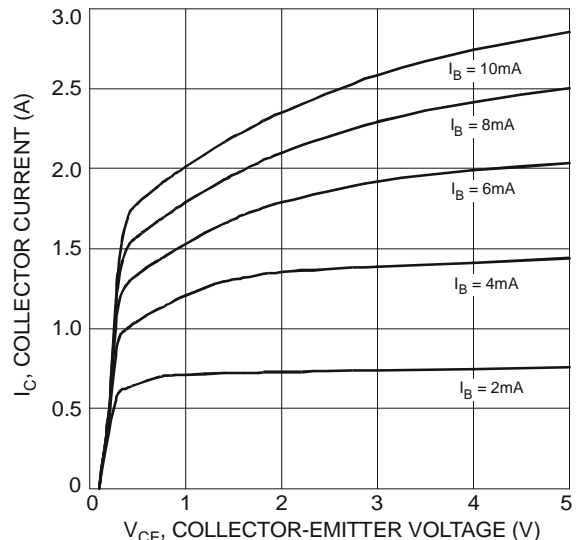


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

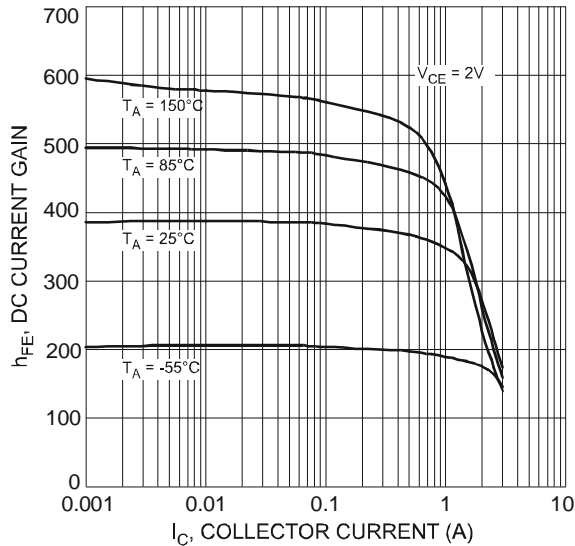


Fig. 3 Typical DC Current Gain vs. Collector Current

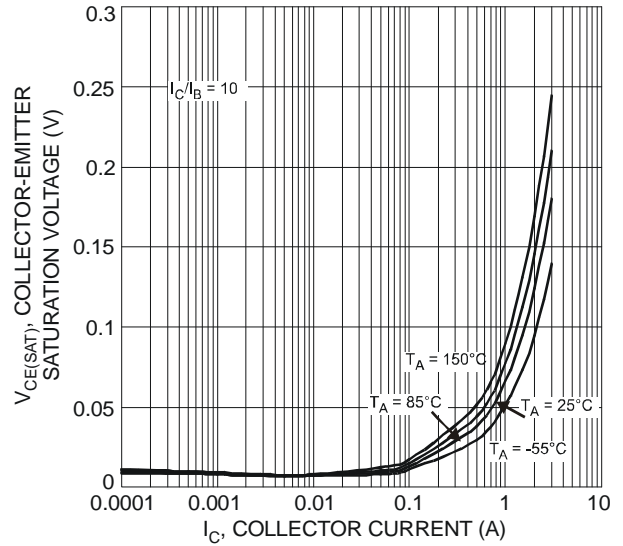


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

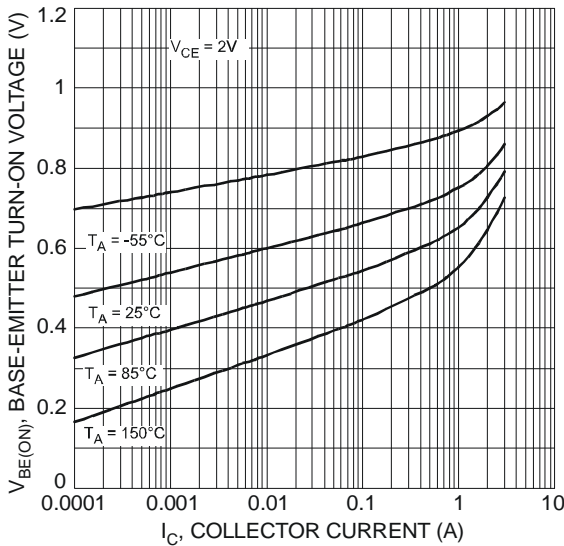


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

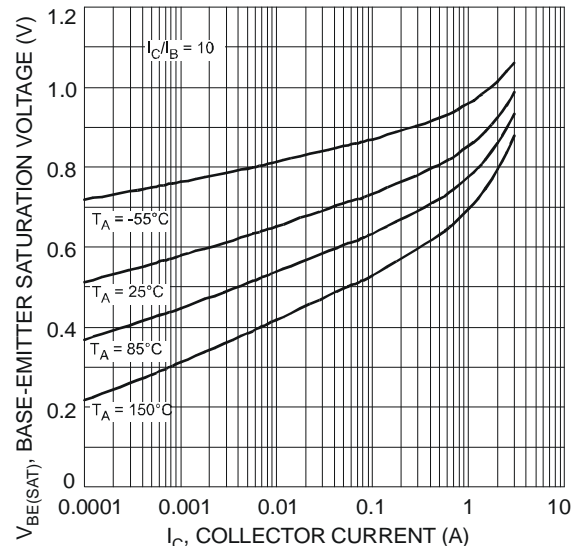


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

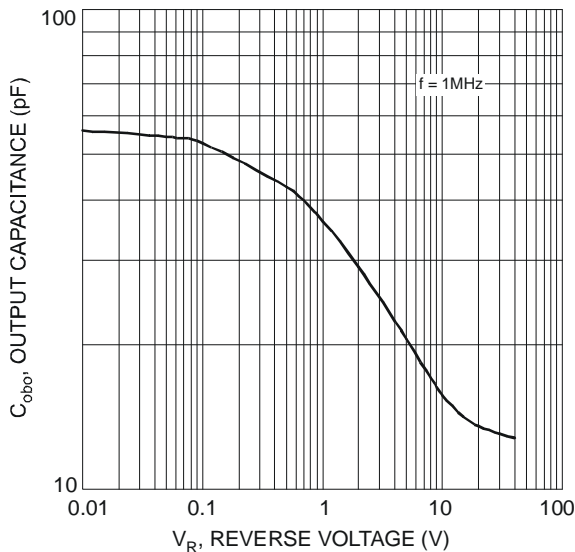


Fig. 7 Typical Output Capacitance Characteristics

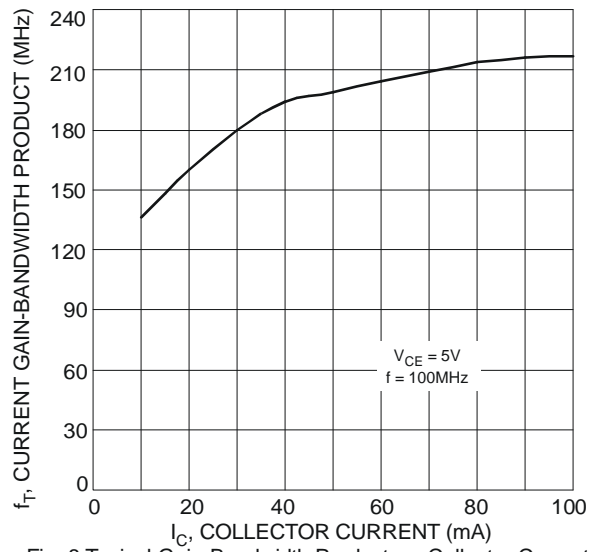


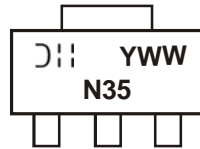
Fig. 8 Typical Current Gain-Bandwidth Product vs. Collector Current

**Ordering Information** (Note 6)

Part Number	Case	Packaging
DNLS350E-13	SOT-223	2500/Tape & Reel

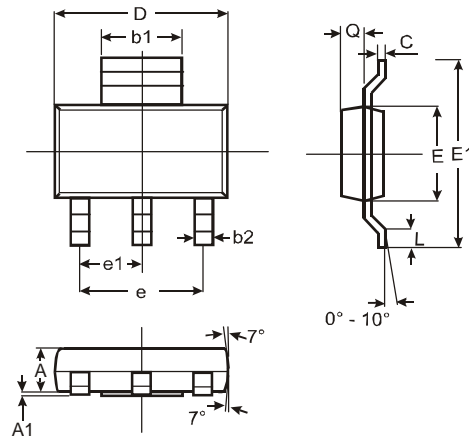
Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



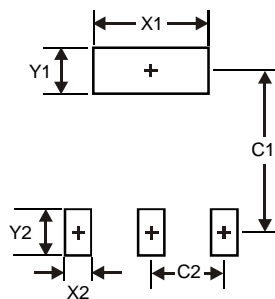
N35 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last digit of year (ex: 7 = 2007)  
 WW = Week code 01 - 52

**Package Outline Dimensions**



SOT-223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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**



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331