



**THE DATASHEET OF
DNLS350Y-13**



LOW VCE(SAT) NPN SURFACE MOUNT TRANSISTOR

Features

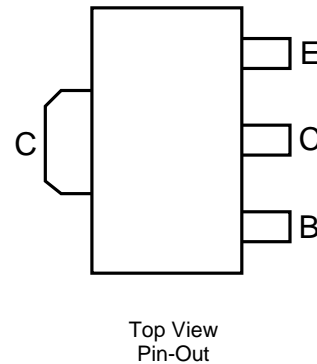
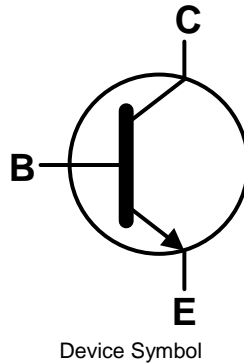
- $BV_{CEO} > 50V$
- $I_C = 3.0A$ Continuous Current
- Complementary PNP Type Available (DPLS350Y)
- Ideally Suited for Automated Assembly Processes
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT89
- 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 Ⓔ③
- Weight: 0.052 grams (Approximate)

Applications

- Ideal for Medium Power Switching or Amplification Applications

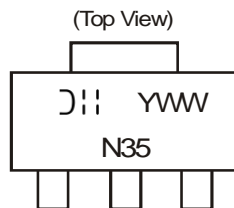


Ordering Information (Note 4)

Device	Package	Shipping
DNLS350Y-13	SOT89	2500/Tape & Reel

- Notes::
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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



= Manufacturer's Marking
 N35 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 7 = 2017)
 WW = Week Code (01 to 52)

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}	50	V
Emitter-Base Voltage	V _{EBO}	5	V
Peak Pulse Collector Current	I _{CM}	5	A
Continuous Collector Current	I _C	3	A
Base Current	I _B	0.5	A

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

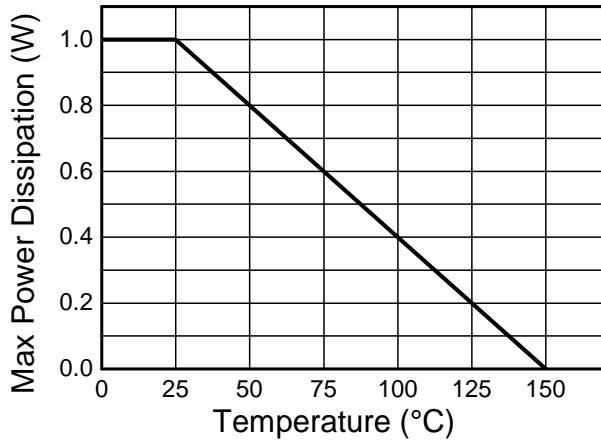
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	1
		(Note 6)	1.6
		(Note 7)	2.0
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5)	125
		(Note 6)	78
		(Note 7)	62.5
Thermal Resistance, Junction to Lead	R _{θJL}	5.7	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

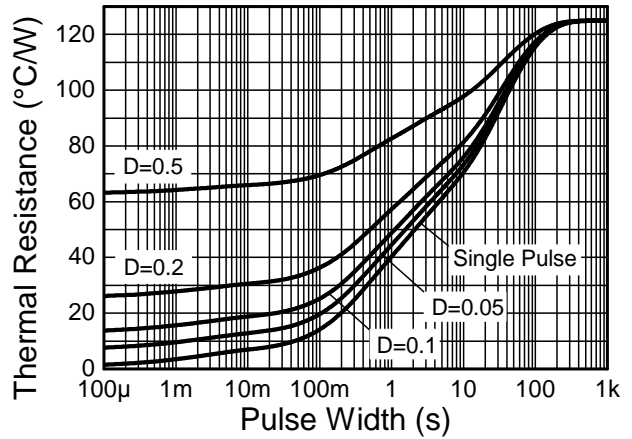
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
 7. Same as note (5), except the device is mounted on 50mm x 50mm 1oz copper.
 8. Thermal resistance from junction to solder-point (on the exposed collector pad).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

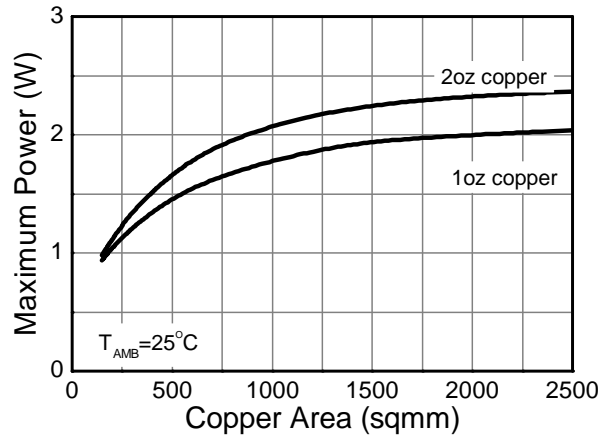
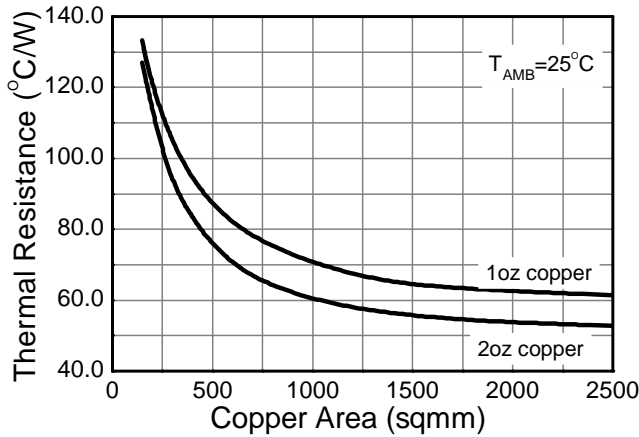
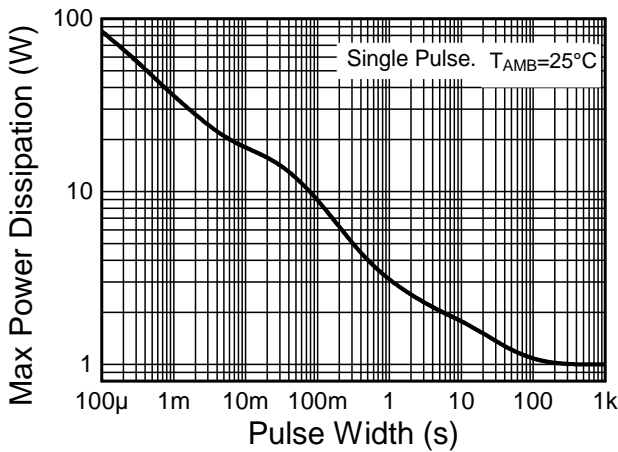
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance

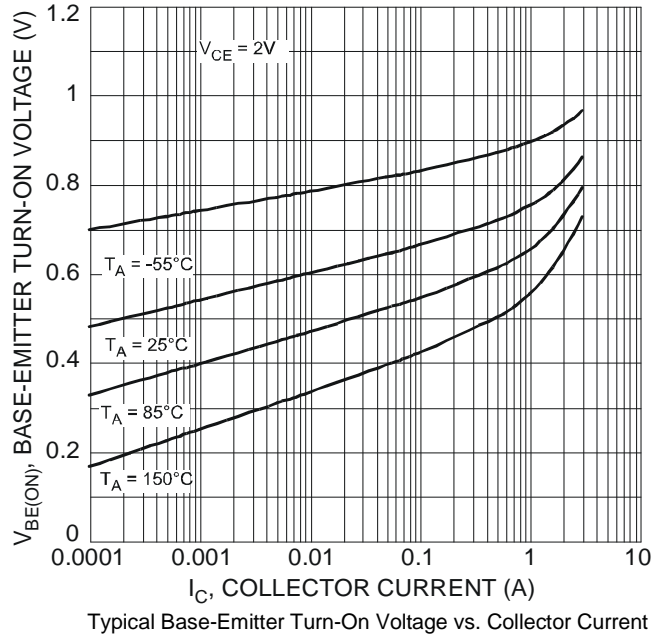
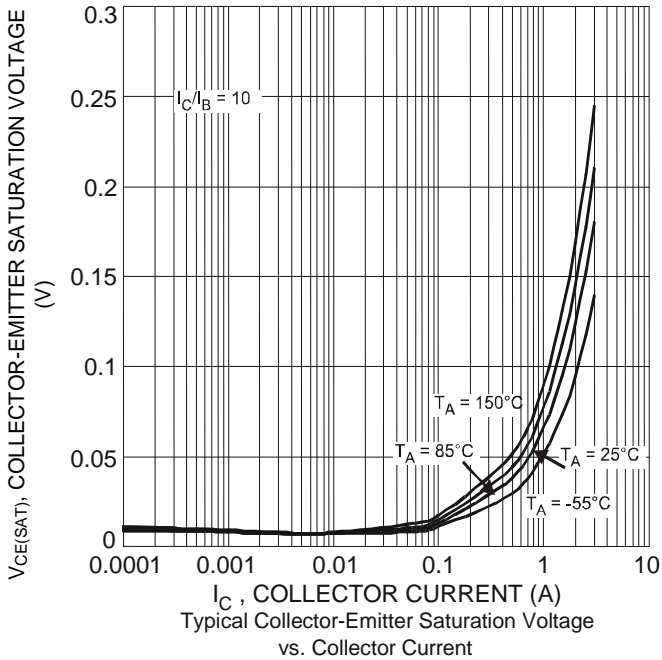
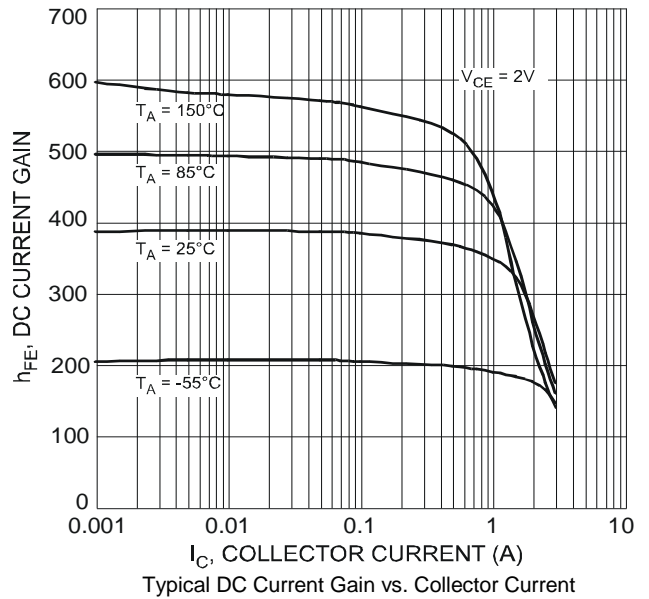
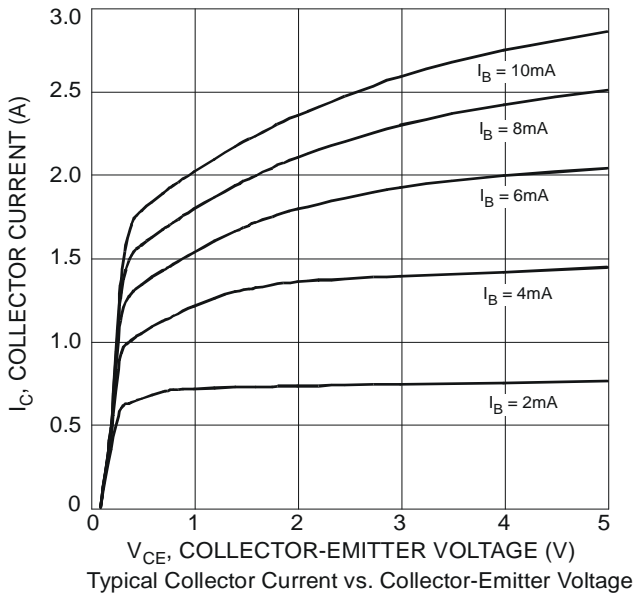


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

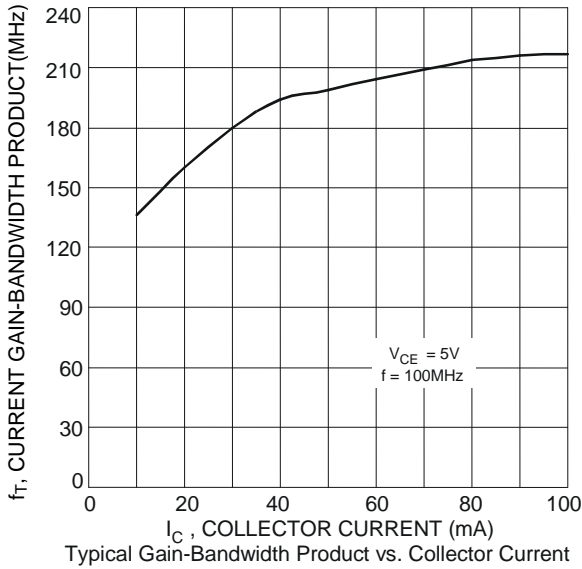
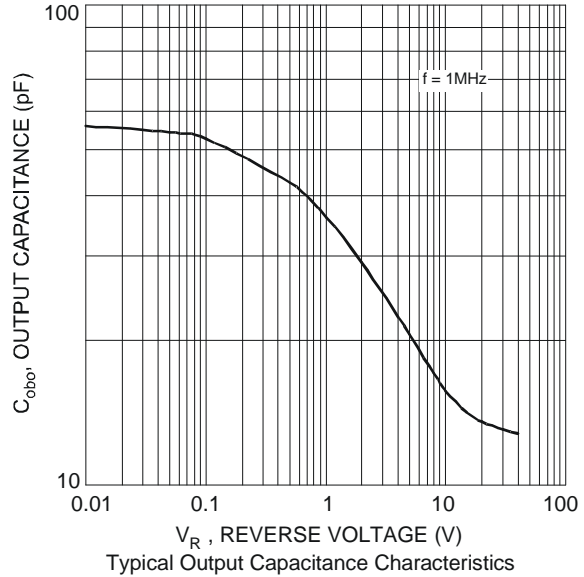
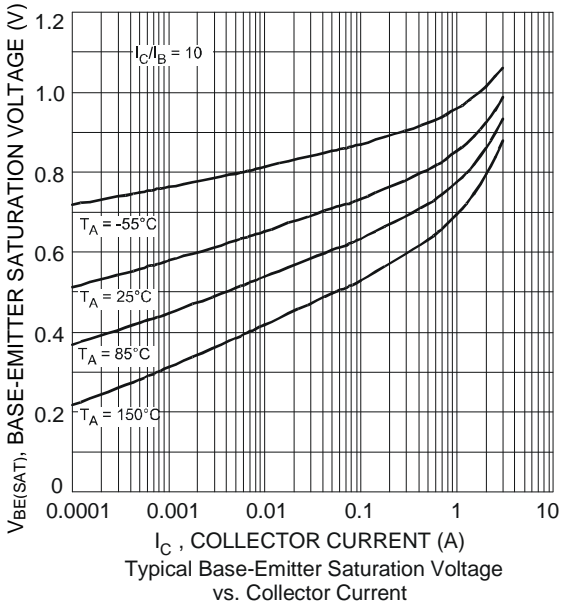
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)						
Collector-Base Cutoff Current	I _{CBO}	—	—	100	nA	V _{CB} = 50V, I _E = 0
		—	—	50	μA	V _{CB} = 50V, I _E = 0, T _A = +150°C
Emitter-Base Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V, I _C = 0
Collector-Emitter Cutoff Current	I _{CES}	—	—	100	nA	V _{CE} = 50V, V _{BE} = 0
Collector-Base Breakdown Voltage	BV _{CBO}	50	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CEO}	50	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	5	—	—	V	I _E = 100μA
ON CHARACTERISTICS (Note 10)						
DC Current Gain	h _{FE}	300	—	—	—	V _{CE} = 2V, I _C = 0.1A
		300	—	—		V _{CE} = 2V, I _C = 0.5A
		300	—	700		V _{CE} = 2V, I _C = 1A
		200	—	—		V _{CE} = 2V, I _C = 2A
		100	—	—		V _{CE} = 2V, I _C = 3A
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	38	80	mV	I _C = 0.5A, I _B = 50mA
		—	70	160		I _C = 1A, I _B = 50mA
		—	130	280		I _C = 2A, I _B = 100mA
		—	124	260		I _C = 2A, I _B = 200mA
		—	180	370		I _C = 3A, I _B = 300mA
Equivalent On-Resistance	R _{CE(SAT)}	—	62	130	mΩ	I _E = 2A, I _B = 200mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	1.1	V	I _C = 2A, I _B = 100mA
		—	—	1.2	V	I _C = 3A, I _B = 300mA
Base-Emitter Turn-on Voltage	V _{BE(ON)}	—	—	1.1	V	V _{CE} = 2V, I _C = 1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	100	—	—	MHz	V _{CE} = 5V, I _C = 100mA, f = 100MHz
Output Capacitance	C _{obo}	—	—	25	pF	V _{CB} = 10V, f = 1MHz

Notes: 10. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



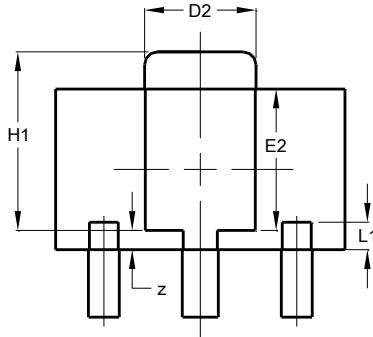
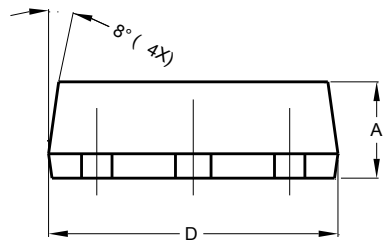
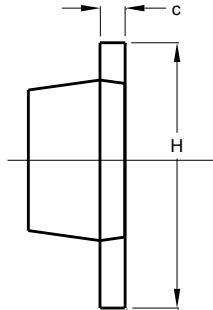
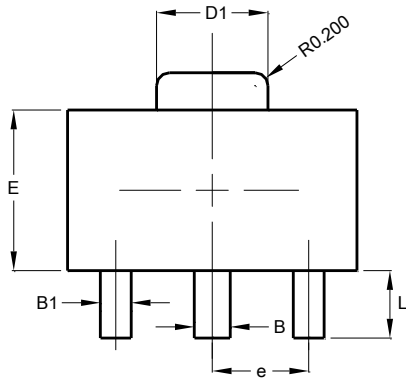
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (Cont.)



Package Outline Dimensions

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

SOT89

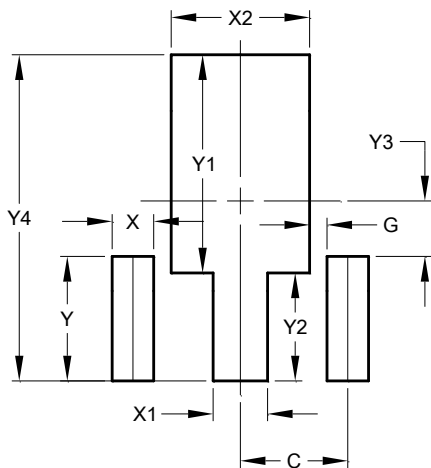


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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