50V PNP LOW SATURATION POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > -50V
- I_C = -3A High Continuous Collector Current
- I_{CM} up to -5A Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage $V_{CE(sat)}$ < -180mV @ 1A
- $R_{CE(sat)}$ = 67mΩ @ 2A for a Low Equivalent On-Resistance
- **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**

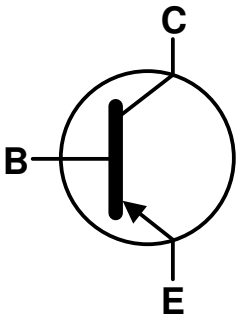
Mechanical Data

- Case: 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 (e3)
- Weight: 0.052 grams (Approximate)

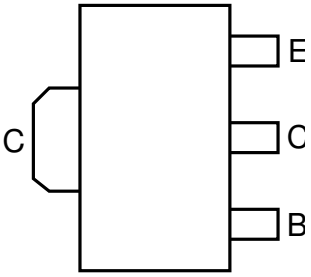
SOT89



Top View



Device Symbol



Top View
Pin-Out

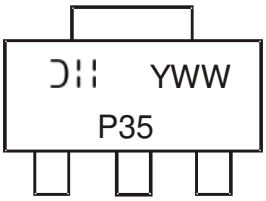
Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DPLS350Y-13	P35	13	12	2,500
DPLS350Y-13R	P35	13	12	4,000
DPLS350YTC	P35	13	12	4,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
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 http://www.diodes.com/products/packages.html.

Marking Information

(Top View)



P35 = Product Type Marking Code:
YWW = Date Code Marking
Y = Last Digit of Year ex: 5 = 2015
WW = Week Code 01 - 53

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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}	-6	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-5	A
Base Current	I_B	-500	mA

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1	W
	(Note 6)		1.6	
	(Note 7)		2.0	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	125	°C/W
	(Note 6)		78	
	(Note 7)		62.5	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	5.7	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

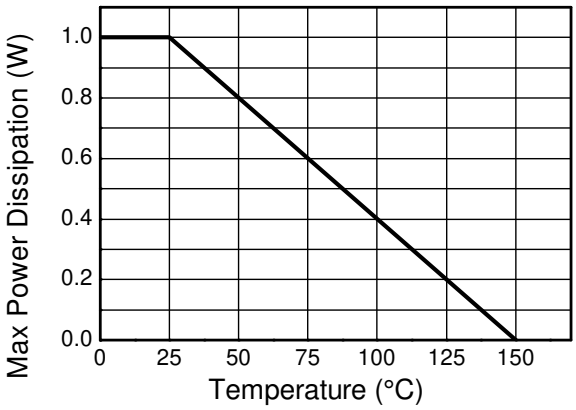
ESD Ratings (Note 9)

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

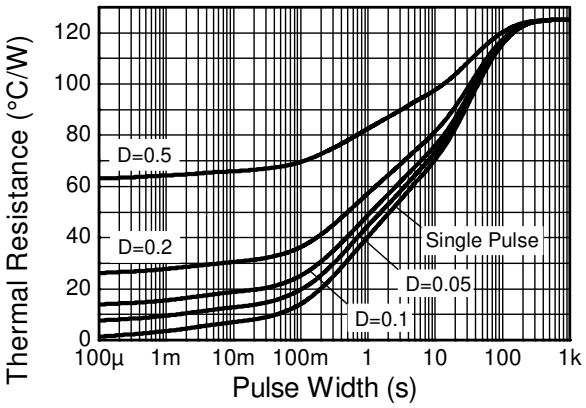
Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as note (5), except the device is mounted on 25mm x 25mm 1oz copper.
7. Same as note (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.

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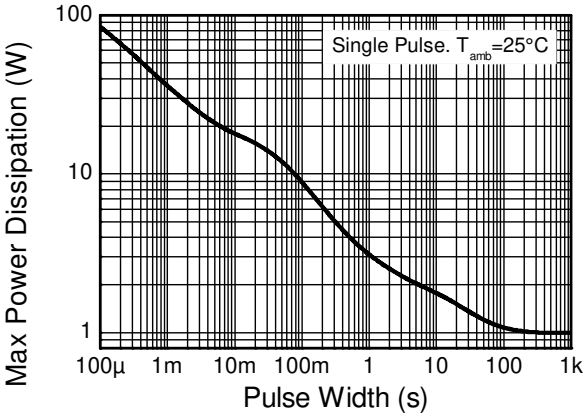
Thermal Characteristics and Derating Information



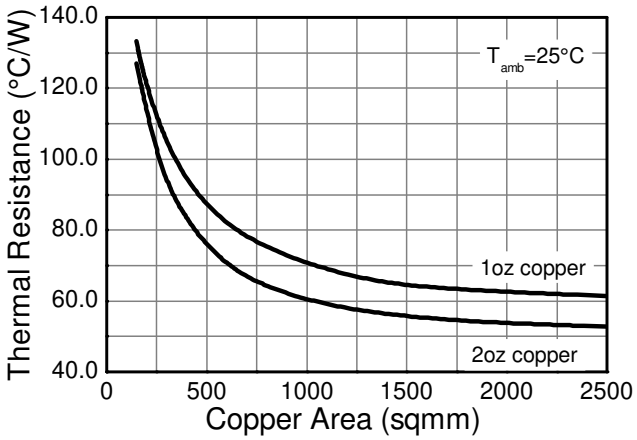
Derating Curve

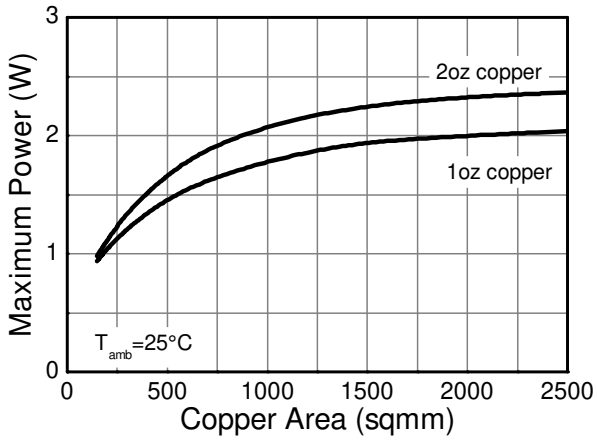


Transient Thermal Impedance



Pulse Power Dissipation





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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-50	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	I_E = -100µA
Collector-Emitter Cut-off Current	I_{CES}	—	—	-100	nA	V_{CE} = -50V
Collector Cut-off Current	I_{CBO}	—	—	-100	nA	V_{CB} = -50V
				-50	µA	V_{CB} = -50V, T_A = +150°C
Emitter Cut-off Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5V
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	200	—	—	—	I_C = -100mA, V_{CE} = -2V
		200		—		I_C = -500mA, V_{CE} = -2V
		200		450		I_C = -1A, V_{CE} = -2V
		130		—		I_C = -2A, V_{CE} = -2V
		80		—		I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	—	-90	mV	I_C = -500mA, I_B = -50mA
				-180		I_C = -1A, I_B = -50mA
				-320		I_C = -2A, I_B = -100mA
				-270		I_C = -2A, I_B = -200mA
				-390		I_C = -3A, I_B = -300mA
Equivalent On-Resistance	$R_{CE(sat)}$	—	67	135	mΩ	I_C = -2A, I_B = -200mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	—	-1.1	V	I_C = -2A, I_B = -100mA
				-1.2		I_C = -3A, I_B = -300mA
Base-Emitter Turn-On Current (Note 10)	$V_{BE(on)}$	—	—	-1.1	V	I_C = -1A, V_{CE} = -2V
Transition Frequency	f_T	100	—	—	MHz	I_C = -100mA, V_{CE} = -5V, f = 100MHz
Collector Output Capacitance	C_{obo}	—	—	35	pF	V_{CB} = -10V, I_E = 0, f = 1MHz
Turn-On Time	$t_{(ON)}$	—	87	—	ns	V_{CC} = -30v, I_{CC} = 150mA I_{B1} = - I_{B2} =15mA
Delay Time	t_D	—	41	—	ns	
Rise Time	t_R	—	46	—	ns	
Turn-Off Time	$t_{(OFF)}$	—	294	—	ns	
Storage Time	t_S	—	250	—	ns	
Fall Time	t_F	—	44	—	ns	

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

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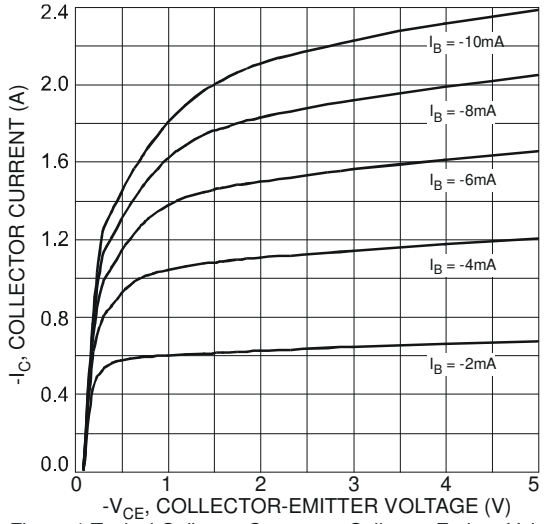


Figure 1 Typical Collector Current vs.Collector-Emitter Voltage

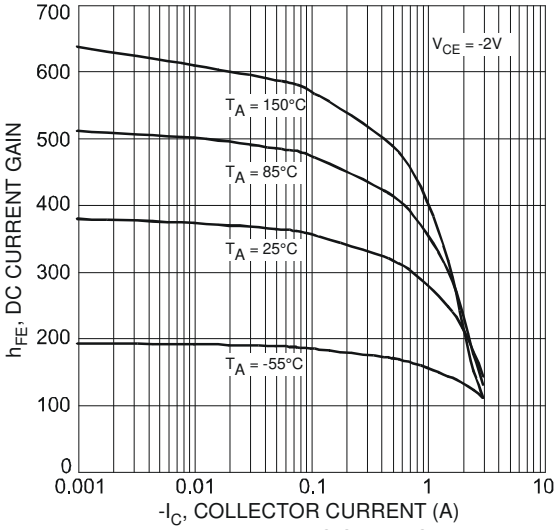


Figure 2 Typical DC Current Gain vs. Collector Current

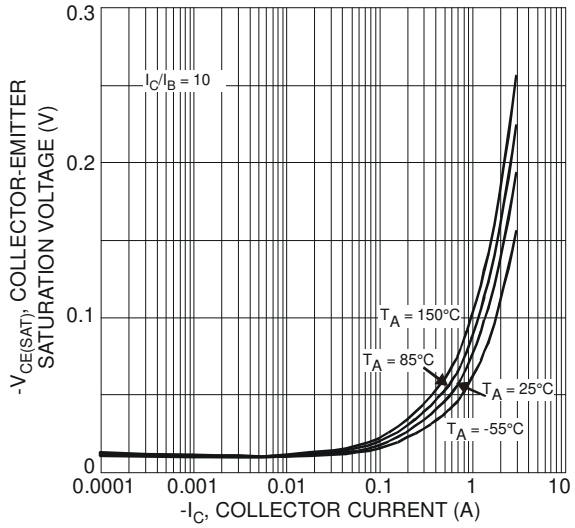


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

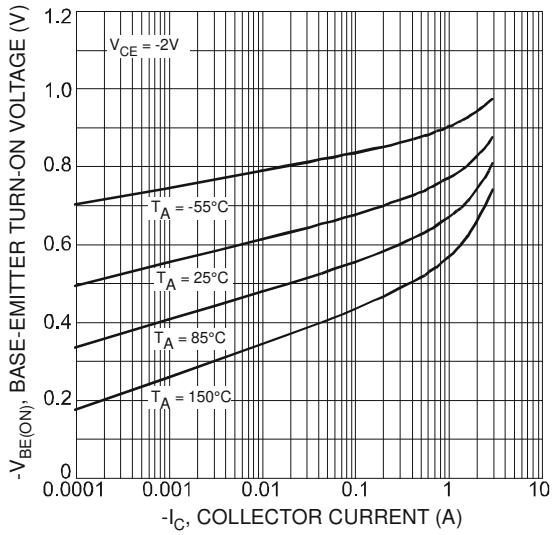


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

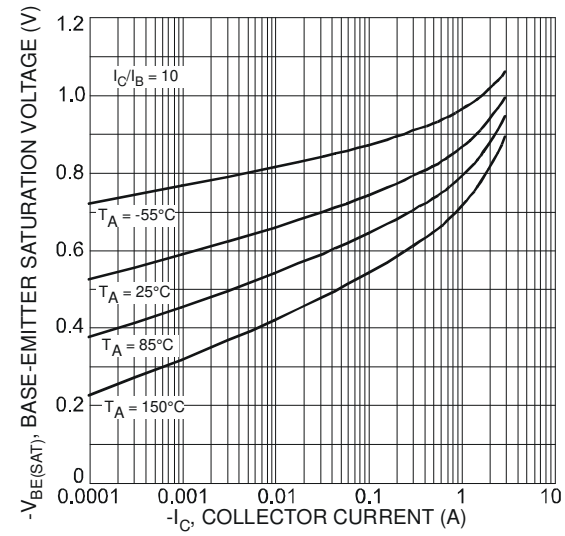


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

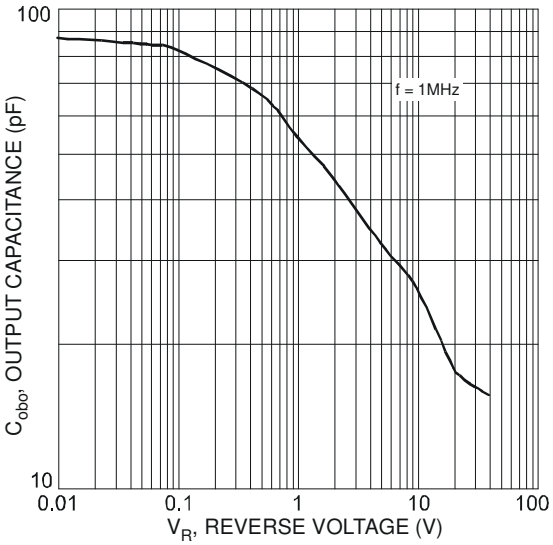


Figure 6 Typical Output Capacitance Characteristics

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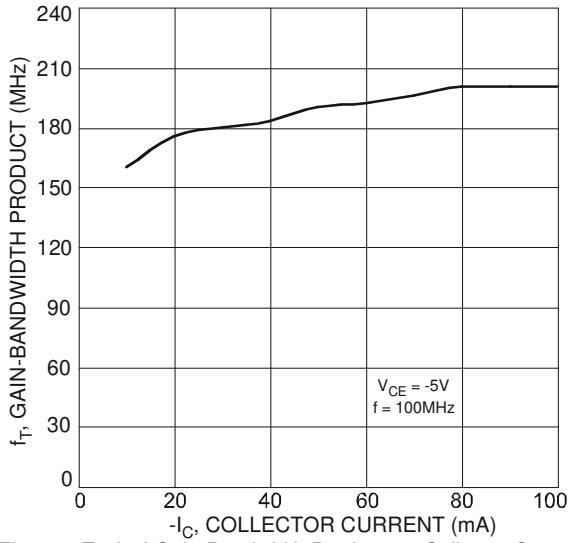


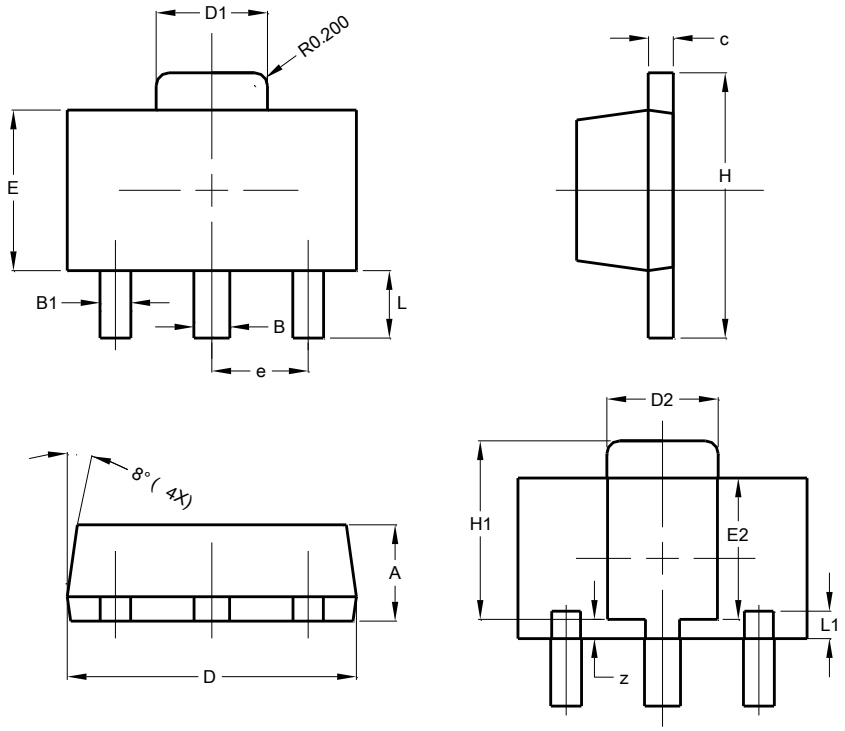
Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

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Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

SOT89

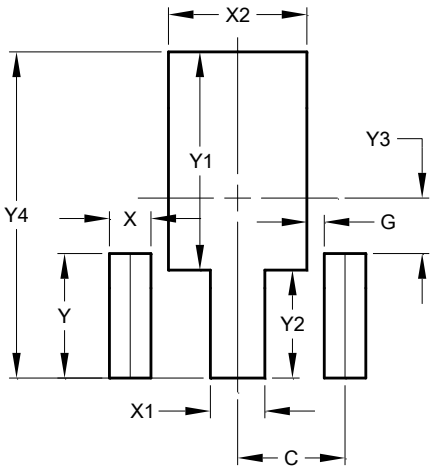


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf 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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