



### **Features**

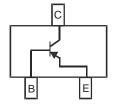
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DNLS160)
- Surface Mount Package Suited for Automated Assembly
- Lead Free/RoHS Compliant (Note 1)
- "Green Device" (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

## **Mechanical Data**

- Case: SOT-23
- 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. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.008 grams (approximate)







Schematic and Pin Configuration

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-80	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Collector Current - Continuous	Ic	-1	A
Peak Pulse Collector Current	I <sub>CM</sub>	-2	A
Base Current (DC)	IB	-300	mA

# **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^{\circ}C$	PD	300	mW
Thermal Resistance, Junction to Ambient (Note 3) @ T <sub>A</sub> = 25°C	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	۵°

Notes: 1. No purposefully added lead.

2. Diode's Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead\_free/index.php.

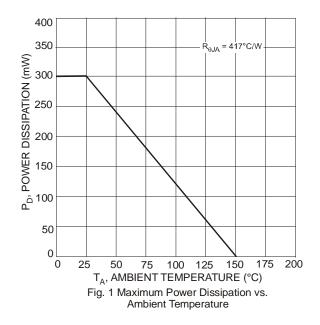
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

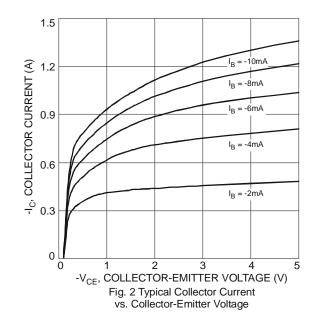


# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

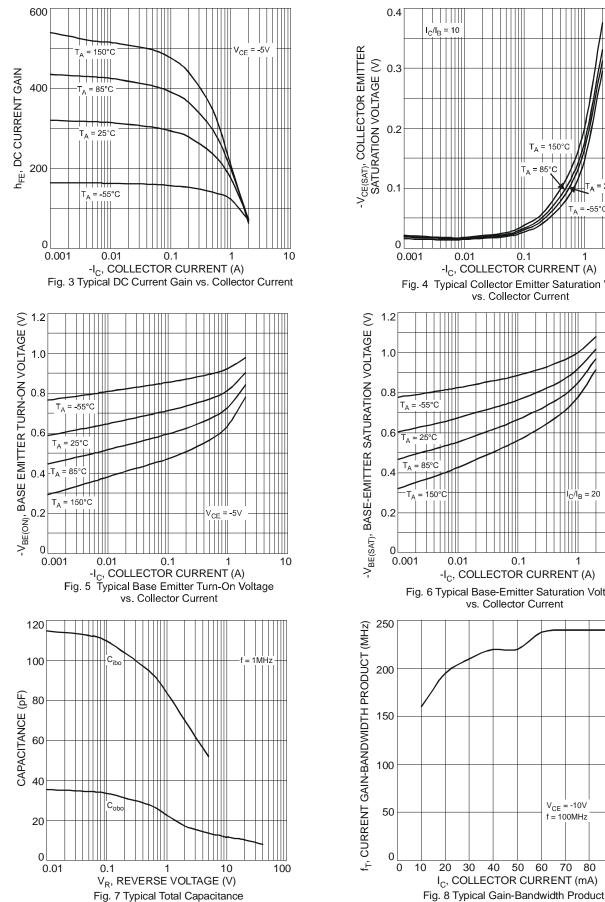
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)	Symbol	IVIIII	тур	IVIAX	Unit	Test condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-80	_	_	V	$I_{\rm C} = -100 \mu A, I_{\rm E} = 0$
Collector-Emitter Breakdown Voltage	V(BR)CEO	-60	_	_	V	$I_{\rm C} = -100 \text{m}$ , $I_{\rm E} = 0$
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-5	_	_	V	$I_{\rm E} = -100 \mu A, I_{\rm C} = 0$
Collector Cutoff Current	I <sub>CBO</sub>			-100 -50	nA	$V_{CB} = -60V, I_E = 0$
Collector Cutoff Current	I <sub>CES</sub>		_	-100	μA nA	$V_{CB} = -60V, I_E = 0, T_A = 150^{\circ}C$ $V_{CE} = -60V, V_{BE} = 0$
Emitter Cutoff Current	I <sub>EBO</sub>		_	-100	nA	$V_{\rm EB} = -5V, I_{\rm C} = 0$
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h <sub>FE</sub>	200 150 100	325 250 180		V	V <sub>CE</sub> = -5V, I <sub>C</sub> = -1mA V <sub>CE</sub> = -5V, I <sub>C</sub> = -500mA V <sub>CE</sub> = -5V, I <sub>C</sub> = -1A
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>		-90 -90 -160	-160 -175 -330	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -1mA I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Collector-Emitter Saturation Resistance	R <sub>CE(SAT)</sub>		160	330	mΩ	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	_	-0.95	-1.1	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
Base-Emitter Turn On Voltage	V <sub>BE(ON)</sub>		-0.82	-0.9	V	$V_{CE} = -5V, I_C = -1A$
SMALL SIGNAL CHARACTERISTICS			•			
Output Capacitance	Cobo		10	15	pF	V <sub>CB</sub> = -10V, f = 1.0MHz
Current Gain-Bandwidth Product	f⊤	150	220		MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz

Notes: 4. Measured under pulsed conditions. Pulse width =  $300\mu$ s. Duty cycle  $\leq 2\%$ .









T<sub>A</sub> = 150°C -T<sub>A</sub> = 85°C = 25°C = -55°C 0.01 0.1 10 1 -I<sub>C</sub>, COLLECTOR CURRENT (A) Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current  $I_{C}/I_{B} = 20$ 0.01 0.1 10 1 -I<sub>C</sub>, COLLECTOR CURRENT (A) Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

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90 100

 $V_{CE} = -10V$ 

f = 100MHz

vs. Collector Current

80

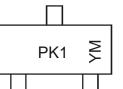


### Ordering Information (Note 5)

Device	Packaging	Shipping
DPLS160-7	SOT-23	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## **Marking Information**

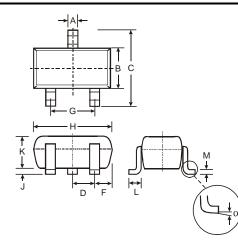


PK1 = Product Type Marking Code YM = Date Code Marking Y = Year ex: U = 2007 M = Month ex: 9 = September

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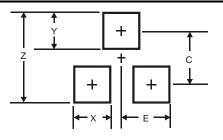
Date Code Key												
Year	2008		2009	2010		2011	2012		2013	2014		2015
Code	V		W	Х		Y	Z		А	В		С
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	Ν	D

## **Package Outline Dimensions**



	SOT-23				
Dim	Min	Max			
Α	0.37	0.51			
В	1.20	1.40			
С	2.30	2.50			
D	0.89	1.03			
F	0.45	0.60			
G	1.78	2.05			
Н	2.80	3.00			
J	0.013	0.10			
Κ	0.903	1.10			
L	0.45	0.61			
М	0.085	0.180			
α	0°	8°			
All Di	All Dimensions in mm				

# **Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Y	0.9
С	2.0
E	1.35

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