NEW PRODUCT

DNLS160V

LOW $V_{CE(SAT)}$ NPN SURFACE MOUNT TRANSISTOR

Please click here to visit our online spice models database.

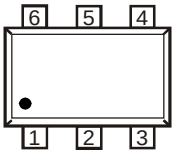
Features

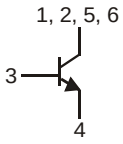
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DPLS160V)
- Surface Mount Package Suited for Automated Assembly
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green Device" (Note 2)**
- **Qualified to AEC-Q 101 Standards for High Reliability**

SOT-563

Mechanical Data

- Case: SOT-563
- 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: 0.003 grams (approximate)





Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current - Continuous	I_C	1	A
Peak Pulse Collector Current	I_{CM}	2	A
Base Current (DC)	I_B	300	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ T_A = 25°C	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 3) @ T_A = 25°C	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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.

© Diodes Incorporated

NEW PRODUCT

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80	—	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	—	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	I_E = 100μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	100 50	nA μA	V_{CB} = 60V, I_E = 0 V_{CB} = 60V, I_E = 0, T_A = 150°C
Collector Cutoff Current	I_{CES}	—	—	100	nA	V_{CE} = 60V, V_{BE} = 0
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h_{FE}	250 200 100	320 280 165	— — —	V	V_{CE} = 5V, I_C = 1mA V_{CE} = 5V, I_C = 500mA V_{CE} = 5V, I_C = 1A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	— — —	80 80 140	110 140 250	mV	I_C = 100mA, I_B = 1mA I_C = 500mA, I_B = 50mA I_C = 1A, I_B = 100mA
Collector-Emitter Saturation Resistance	$R_{CE(SAT)}$	—	140	250	mΩ	I_C = 1A, I_B = 100mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	0.91	1.1	V	I_C = 1A, I_B = 50mA
Base-Emitter Turn On Voltage	$V_{BE(ON)}$	—	0.81	0.9	V	V_{CE} = 5V, I_C = 1A
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	7	10	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	150	270	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	90	—	ns	V_{CC} = 10V I_C = 0.5A, I_{B1} = I_{B2} = 25mA
Delay Time	t_d	—	17	—	ns	
Rise Time	t_r	—	73	—	ns	
Turn-Off Time	t_{off}	—	300	—	ns	
Storage Time	t_s	—	220	—	ns	
Fall Time	t_f	—	80	—	ns	

Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

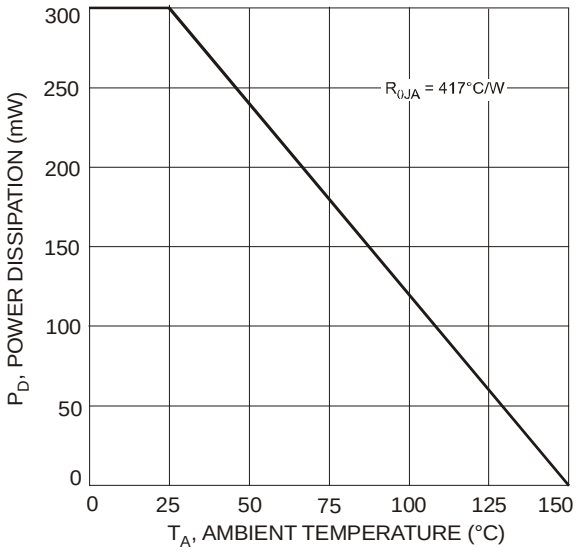


Fig. 1 Maximum Power Dissipation vs. Ambient Temperature

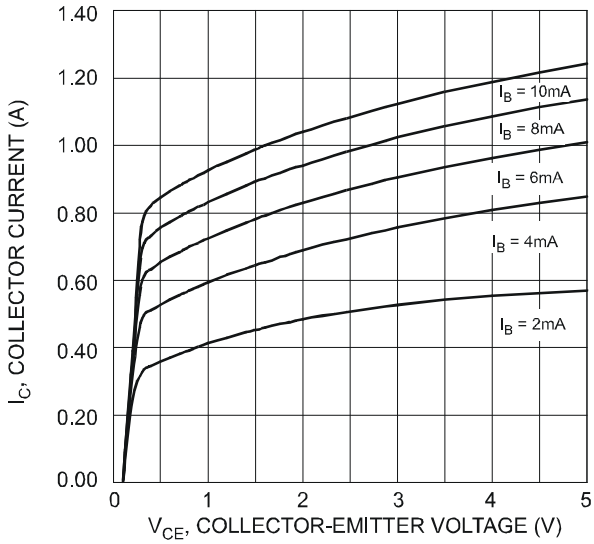


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

© Diodes Incorporated

NEW PRODUCT

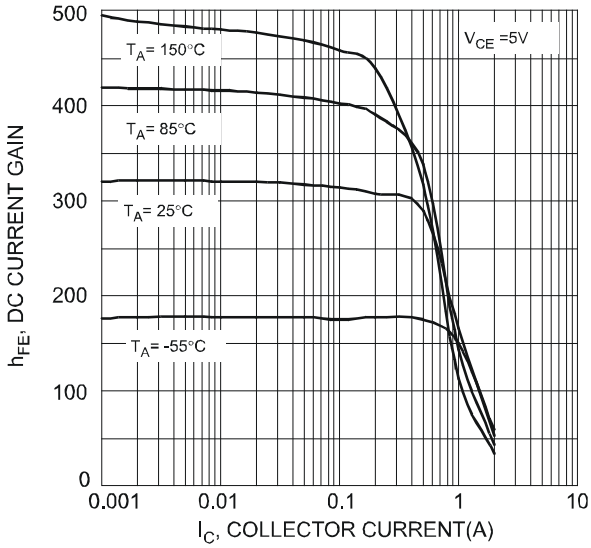


Fig. 3 Typical DC Current Gain vs. Collector Current

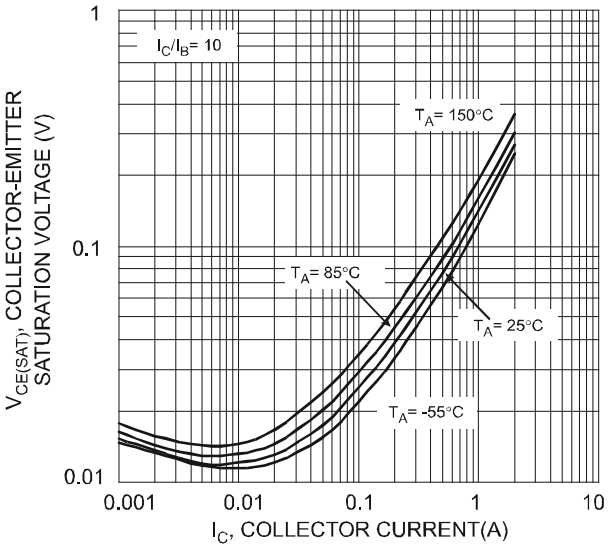


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

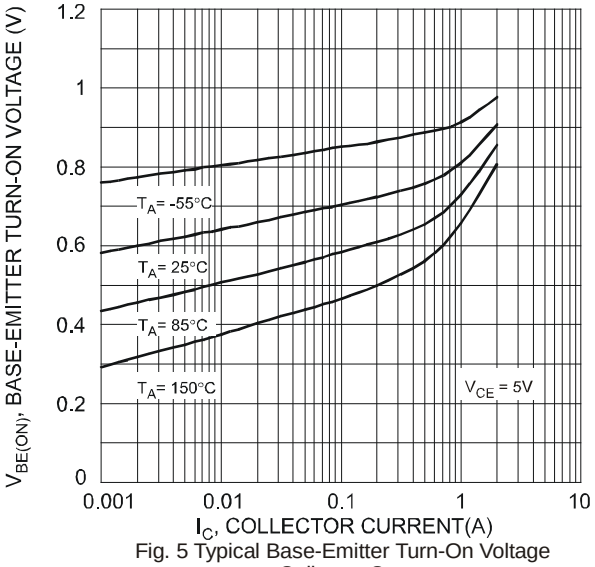


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

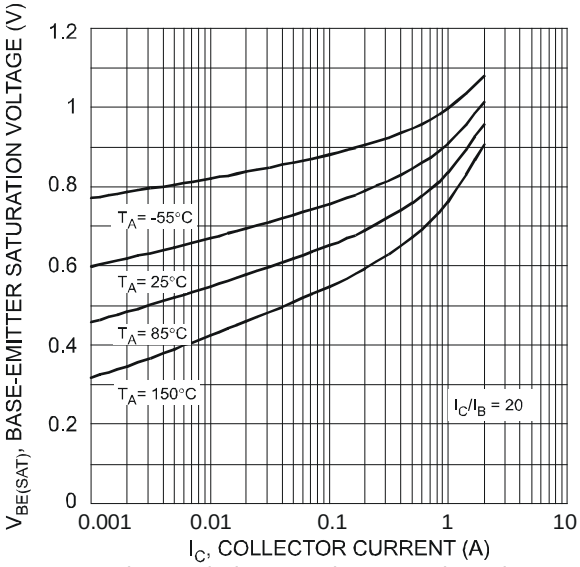


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

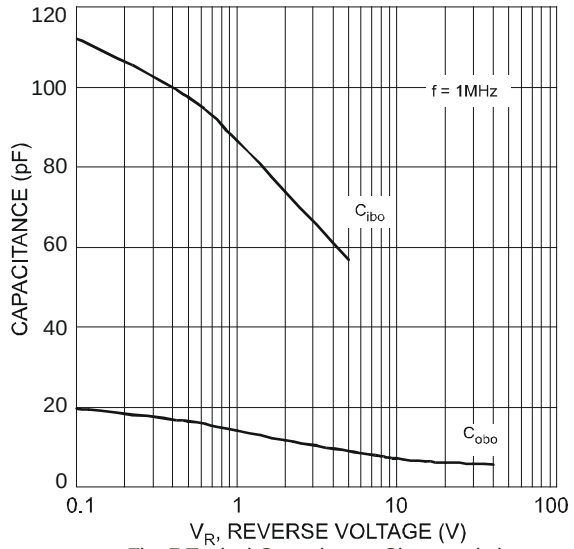


Fig. 7 Typical Capacitance Characteristics

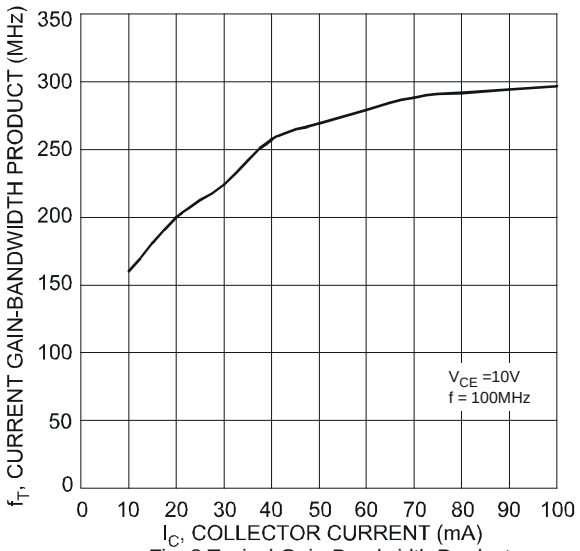


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

© Diodes Incorporated

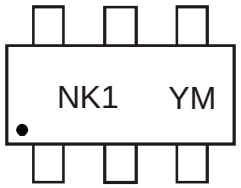
NEW PRODUCT

Ordering Information (Note 5)

Device	Packaging	Shipping
DNLS160V-7	SOT-563	3000/Tape & Reel

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

Marking Information



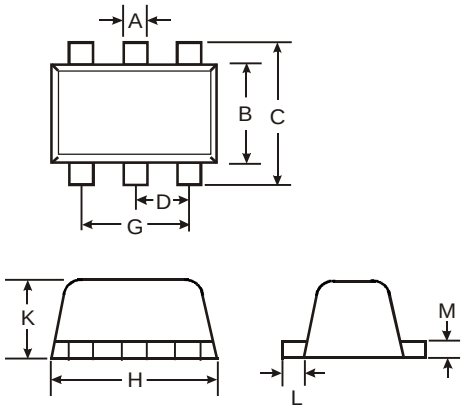
NK1 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: V = 2008
M = Month ex: 9 = September

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	V	W	X	Y	Z	A	B	C

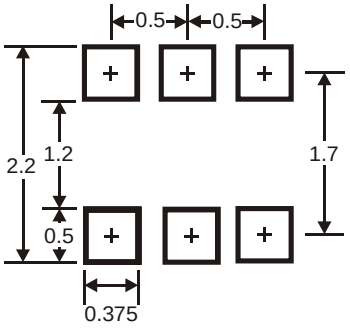
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout (in mm)



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.

© Diodes Incorporated