DNBT8105

1A NPN SURFACE MOUNT TRANSISTOR

Please click here to visit our online spice models database.

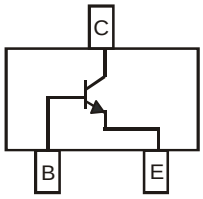
Features

- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- High Collector Current Rating
- Complementary Version Available (DPBT8105)
- **Lead Free By Design/RoHS Compliant (Note 2)**
- **"Green Device" (Note 3)**
- **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
- Terminal Connections: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

Top View



Device Schematic

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

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1) @ T_A = 25°C	P_D	600	mW
Thermal Resistance, Junction to Ambient (Note 1) @ T_A = 25°C	$R_{\theta JA}$	209	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	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	nA	V_{CB} = 60V, I_E = 0
Collector Cutoff Current	I_{CES}	—	100	nA	V_{CES} = 60V
Emitter Cutoff Current	I_{EBO}	—	100	nA	V_{EB} = 4V, I_C = 0
ON CHARACTERISTICS (Note 4)					
DC Current Gain	h_{FE}	100 100 80 30	— 300 — —	—	I_C = 1mA, V_{CE} = 5V I_C = 500mA, V_{CE} = 5V I_C = 1A, V_{CE} = 5V I_C = 2A, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	— —	0.25 0.5	V	I_C = 500mA, I_B = 50mA I_C = 1A, I_B = 100mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	1.1	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn On Voltage	$V_{BE(ON)}$	—	1.0	V	I_C = 1A, V_{CE} = 5V
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	10	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	150	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz

Notes:
1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
2. No purposefully added lead.
3. Diode's Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Short duration pulse test used to minimize self-heating effect.

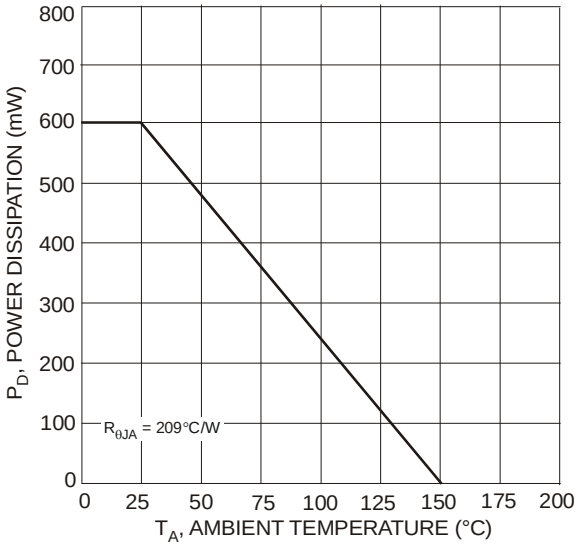


Fig. 1 Power Dissipation
vs. Ambient Temperature (Note 1)

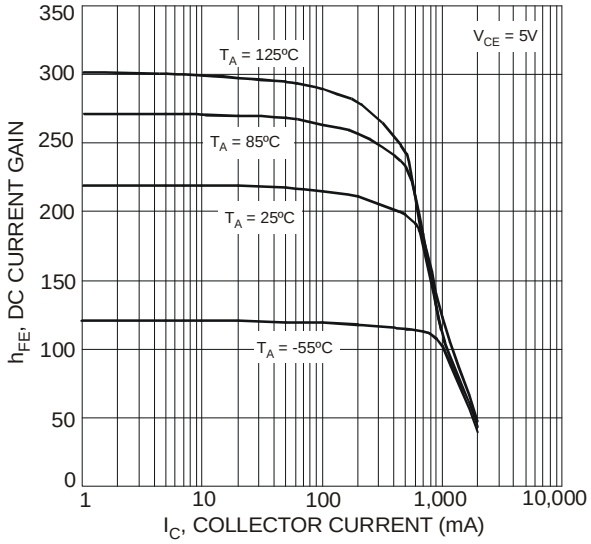


Fig. 2 DC Current Gain vs. Collector Current

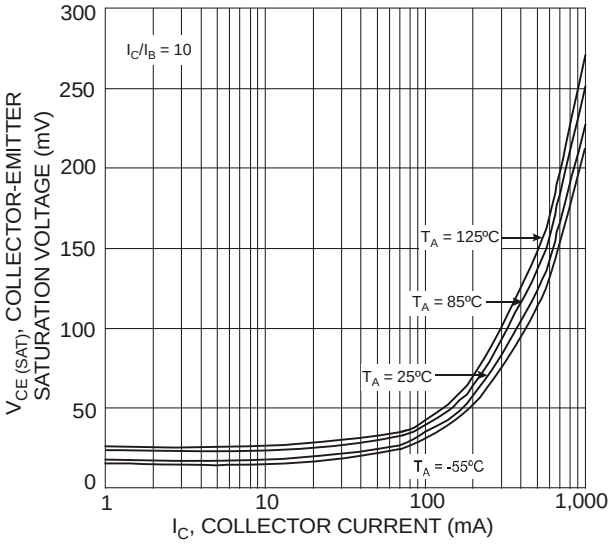


Fig. 3 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

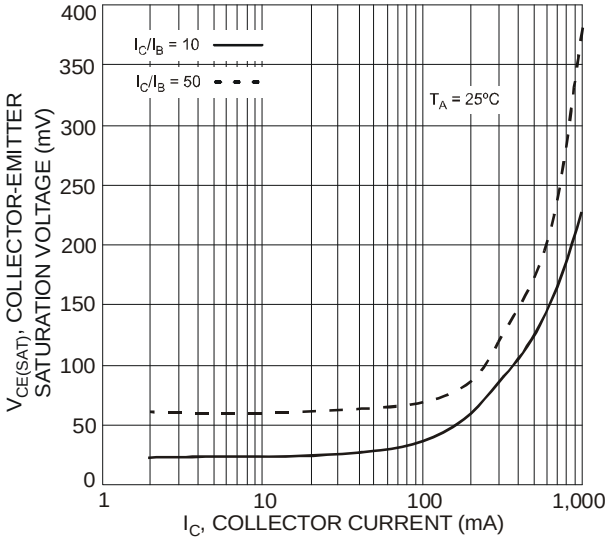


Fig. 4 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

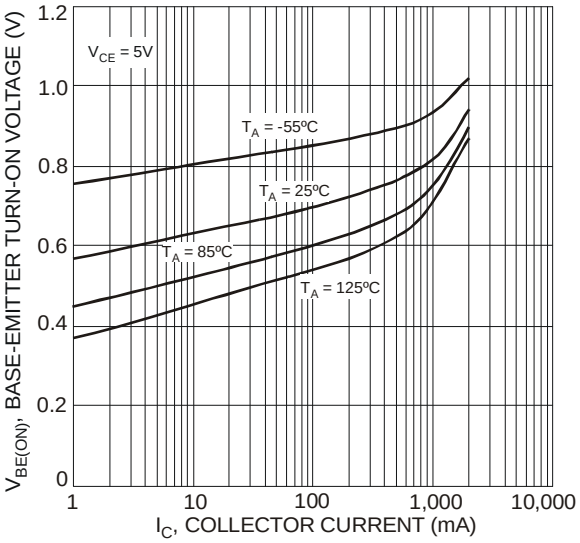


Fig. 5 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

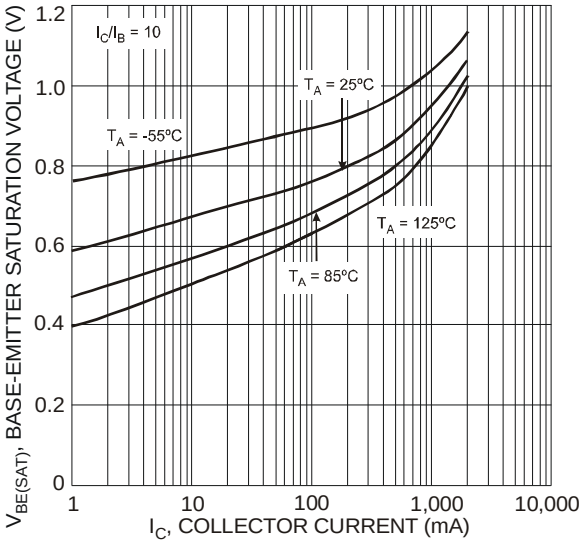


Fig. 6 Typical Base-Emitter Saturation Voltage
vs. Collector Current

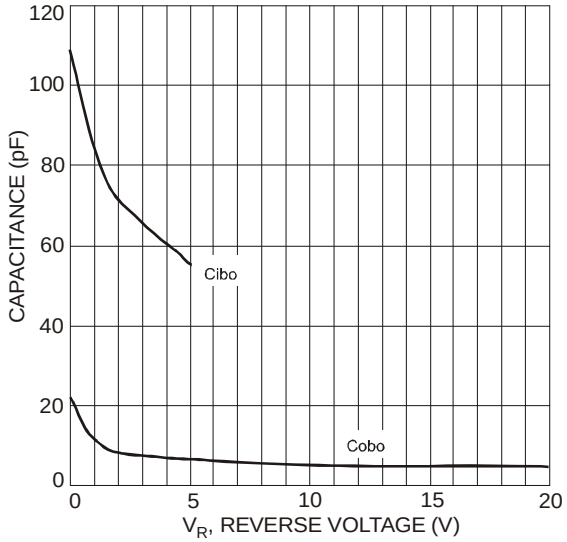


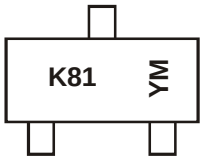
Fig. 7 Typical Capacitance Characteristics

Ordering Information (Note 5)

Part Number	Case	Packaging
DNBT8105-7	SOT-23	3000/Tape & Reel

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

Marking Information



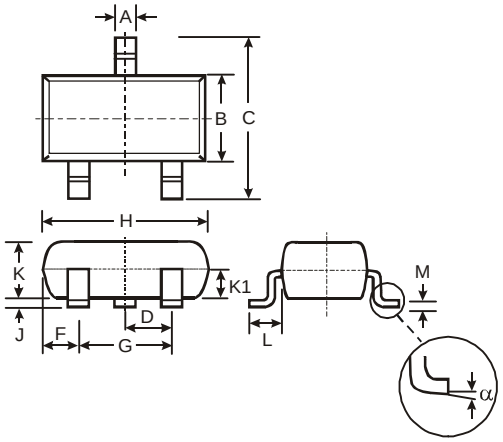
K81 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: S = 2005)
M = Month (ex: 9 = September)

Date Code Key

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	R	S	T	U	V	W	X	Y	Z	A	B	C

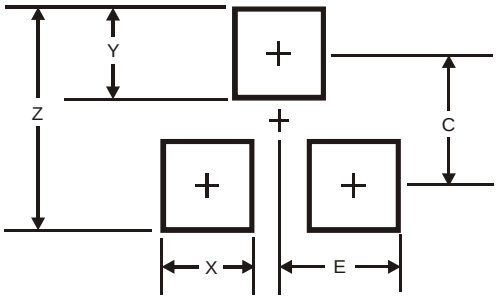
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



SOT-23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35