



**THE DATASHEET OF  
DN350T05-7**



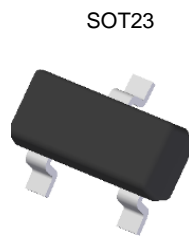
## 350V NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

### Features

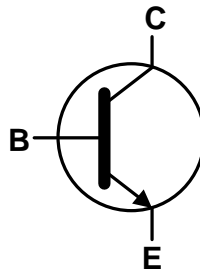
- $BV_{CEO} > 250V$
- $I_C = 0.5A$  Continuous Collector Current
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DP350T05)
- Ideal for Medium Power Amplification and Switching
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

### Mechanical Data

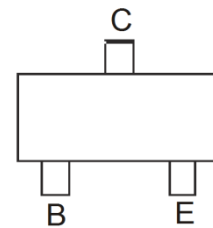
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208  $\text{e3}$
- Weight: 0.008 grams (Approximate)



Top View



Device Symbol



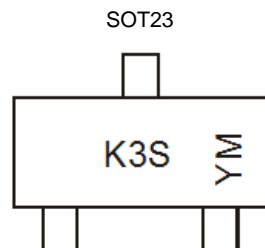
Top View  
Pin-Out

### Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DN350T05-7	AEC-Q101	K3S	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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



K3S = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: E = 2017  
 M = Month ex: 9 = September

#### Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024
Code	E	F	G	H	I	J	K	L

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

**Absolute Maximum Ratings** (@T<sub>A</sub> = 25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	350	V
Collector-Emitter Voltage	V <sub>CEO</sub>	350	V
Emitter-Base Voltage	V <sub>EBO</sub>	5.0	V
Continuous Base Current	I <sub>B</sub>	25	mA
Continuous Collector Current	I <sub>C</sub>	500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>					
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	350	—	V	I <sub>C</sub> = 100μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	350	—	V	I <sub>C</sub> = 1.0mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5.0	—	V	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CB0</sub>	—	50	nA	V <sub>CB</sub> = 250V, I <sub>E</sub> = 0
Collector Cutoff Current	I <sub>EBO</sub>	—	50	nA	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 6)</b>					
DC Current Gain	h <sub>FE</sub>	20	—	—	I <sub>C</sub> = 1.0mA, V <sub>CE</sub> = 10V
		30	—		I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V
		30	200		I <sub>C</sub> = 30mA, V <sub>CE</sub> = 10V
		20	200		I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V
		15	—		I <sub>C</sub> = 100mA, V <sub>CE</sub> = 10V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	0.30	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.0mA
		—	0.35		I <sub>C</sub> = 20mA, I <sub>B</sub> = 2.0mA
		—	0.50		I <sub>C</sub> = 30mA, I <sub>B</sub> = 3.0mA
		—	1.0		I <sub>C</sub> = 50mA, I <sub>B</sub> = 5.0mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	0.75	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.0mA
		—	0.80		I <sub>C</sub> = 20mA, I <sub>B</sub> = 2.0mA
		—	0.90		I <sub>C</sub> = 30mA, I <sub>B</sub> = 3.0mA
Base-Emitter On Voltage	V <sub>BE(ON)</sub>	—	2.0	V	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 10V
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	C <sub>obo</sub>	—	7.0	pF	V <sub>CB</sub> = 20V, f = 1.0MHz, I <sub>E</sub> = 0
Transition Frequency	f <sub>T</sub>	50	—	MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 20mA

- Notes:
5. For a device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper; device is measured under still air conditions whilst operating in a steady-state.
  6. Short duration pulse test used to minimize self-heating effect.

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

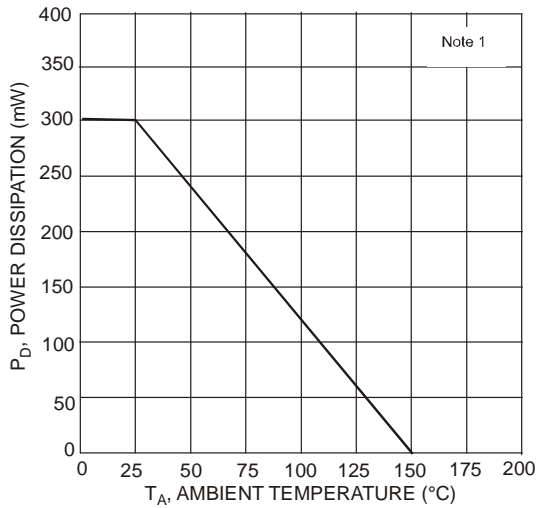


Fig. 1, Max Power Dissipation vs. Ambient Temperature

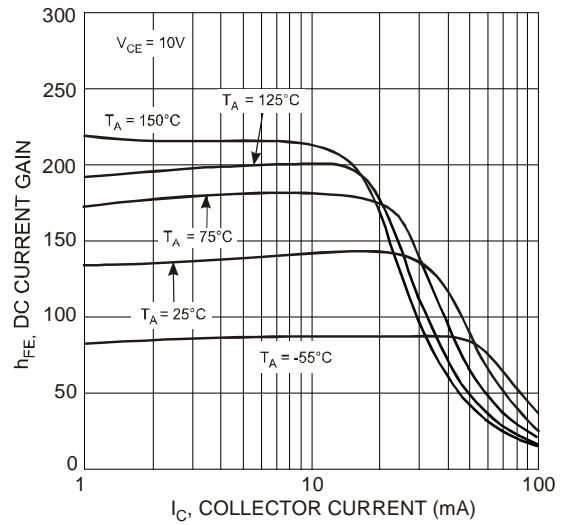


Fig. 2, DC Current Gain vs. Collector Current

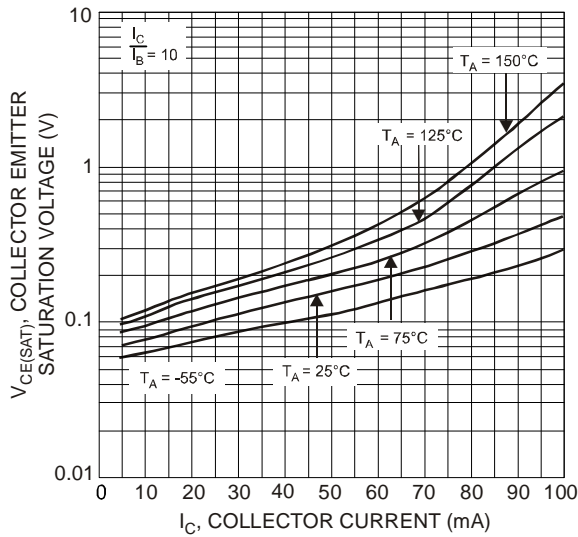


Fig. 3, Collector-Emitter Saturation Voltage vs. Collector Current

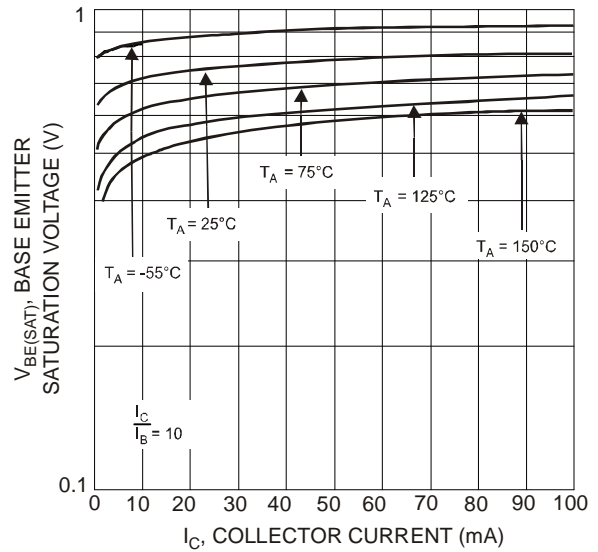


Fig. 4, Base Emitter Saturation Voltage vs. Collector Current

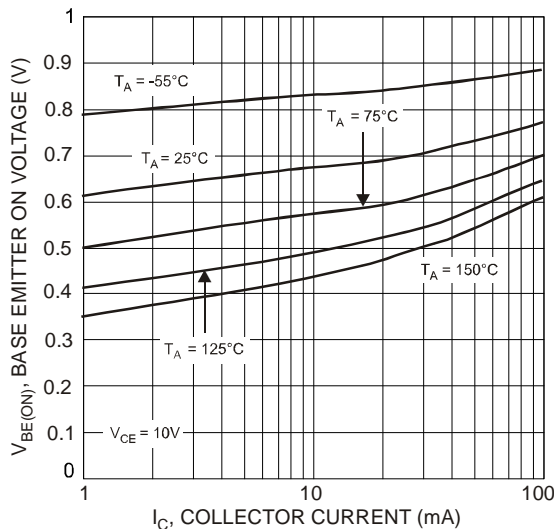


Fig. 5, Base-Emitter On Voltage vs. Collector Current

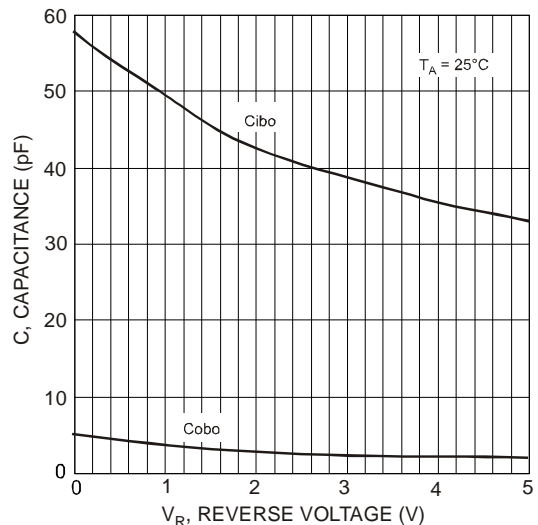
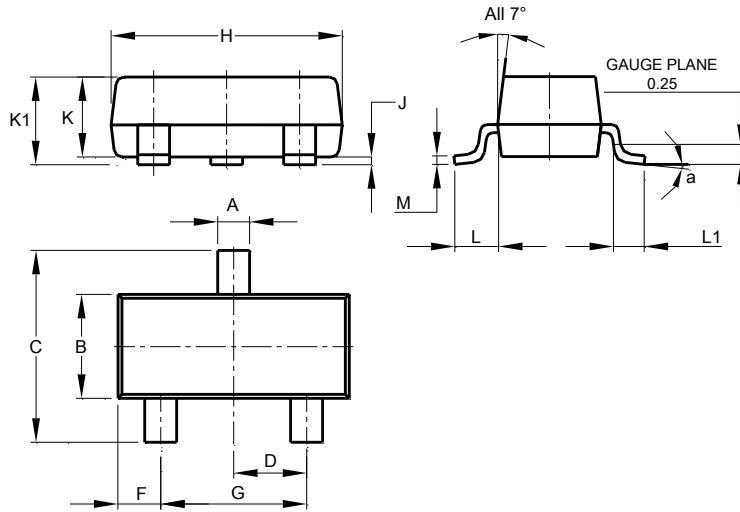


Fig. 6, Capacitance vs. Reverse Voltage

**Package Outline Dimensions**

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

**SOT23**

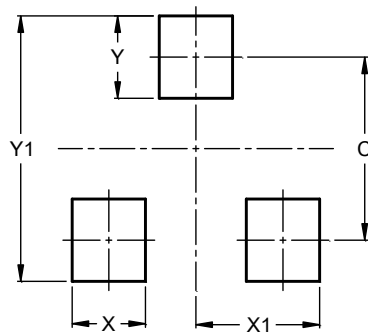


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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