

# DSS5160T-7 Datasheet



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DiGi Electronics Part Number	DSS5160T-7-DG
Manufacturer	<a href="#">Diodes Incorporated</a>
Manufacturer Product Number	DSS5160T-7
Description	TRANS PNP 60V 1A SOT23-3
Detailed Description	Bipolar (BJT) Transistor PNP 60 V 1 A 150MHz 725 mW Surface Mount SOT-23-3



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## Purchase and inquiry

Manufacturer Product Number:

DSS5160T-7

Series:

-

Transistor Type:

PNP

Voltage - Collector Emitter Breakdown (Max):

60 V

Current - Collector Cutoff (Max):

100nA (ICBO)

Power - Max:

725 mW

Operating Temperature:

-55°C ~ 150°C (TJ)

Package / Case:

TO-236-3, SC-59, SOT-23-3

Base Product Number:

DSS5160

Manufacturer:

Diodes Incorporated

Product Status:

Active

Current - Collector (Ic) (Max):

1 A

Vce Saturation (Max) @ Ib, Ic:

340mV @ 100mA, 1A

DC Current Gain (hFE) (Min) @ Ic, Vce:

150 @ 500mA, 5V

Frequency - Transition:

150MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-23-3

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99





DSS5160T

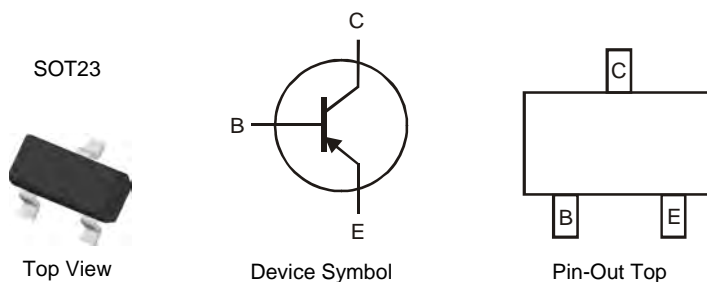
60V LOW  $V_{CE(sat)}$  PNP SURFACE MOUNT TRANSISTOR

## Features

- Epitaxial Planar Die Construction
- Ideal for Medium Power Amplification and Switching
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- 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 annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)

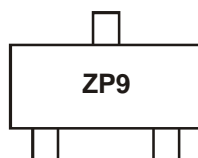


## Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DSS5160T-7	ZP9	7	8mm	3,000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For packaging details, go to our website at <http://www.diodes.com>

## Marking Information



ZP9 = Product Type Marking Code



DSS5160T

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

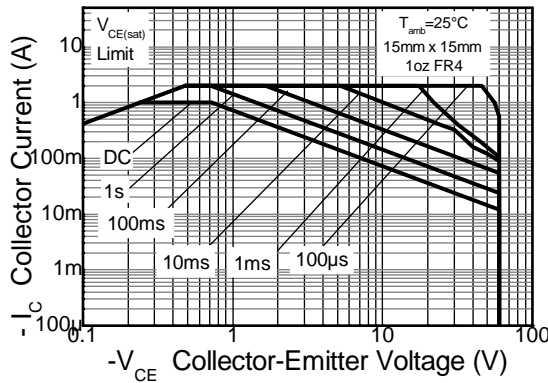
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	-80	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Continuous Collector Current	$I_C$	-1	A
Peak Pulse Collector Current	$I_{CM}$	-2	A
Base Current (DC)	$I_B$	-300	mA
Peak Base Current	$I_{BM}$	-1	A

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

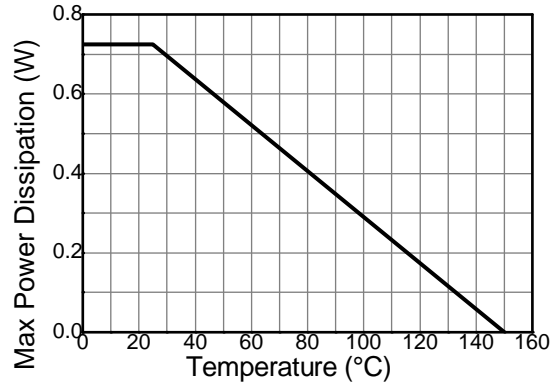
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	725	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	172	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient Air (Note 4)	$R_{\theta JA}$	79	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes: 4. Operated under pulsed conditions: pulse width  $\leq 100\text{ms}$ , duty cycle  $\leq 0.25$ .  
 5. Device mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

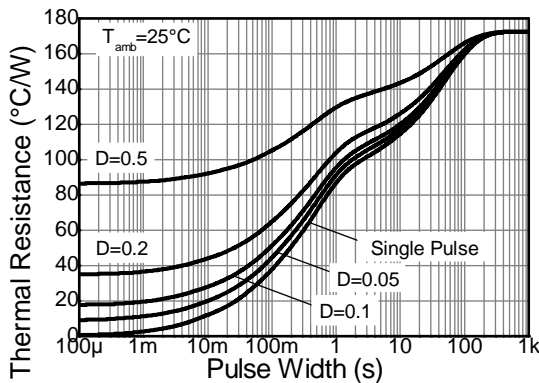
**Thermal Characteristics**



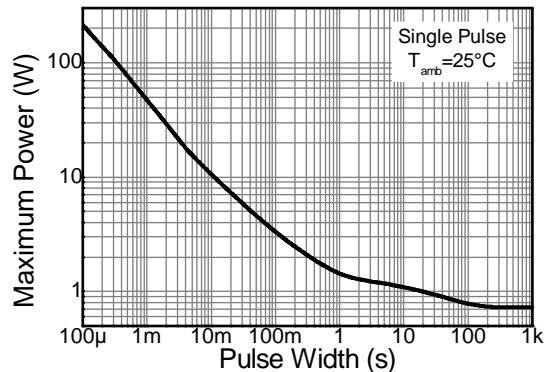
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



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**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage	$BV_{CBO}$	-80	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 6)	$BV_{CEO}$	-60	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	-100	nA	$V_{CB} = -20\text{V}, I_E = 0$
		—	—	-50	$\mu\text{A}$	$V_{CB} = -20\text{V}, I_E = 0, T_A = 150^\circ\text{C}$
Emitter-Base Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5\text{V}, I_C = 0$
		200	—	—	—	$V_{CE} = -5\text{V}, I_C = -1\text{mA}$
DC Current Gain (Note 6)	$h_{FE}$	150	—	—	—	$V_{CE} = -5\text{V}, I_C = -500\text{mA}$
		100	—	—	—	$V_{CE} = -5\text{V}, I_C = -1\text{A}$
		—	—	-175	—	$I_C = -100\text{mA}, I_B = -1\text{mA}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(sat)}$	—	—	-180	mV	$I_C = -500\text{mA}, I_B = -50\text{mA}$
		—	—	-340	mV	$I_C = -1\text{A}, I_B = -100\text{mA}$
		—	—	—	—	$I_E = -1\text{A}, I_B = -100\text{mA}$
Equivalent On-Resistance	$R_{CE(sat)}$	—	—	340	$\text{m}\Omega$	$I_E = -1\text{A}, I_B = -100\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.1	V	$I_C = -1\text{A}, I_B = -50\text{mA}$
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	—	—	-0.9	V	$V_{CE} = -5\text{V}, I_C = -1\text{A}$
Transition Frequency	$f_T$	150	—	—	MHz	$V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
Output Capacitance	$C_{ob}$	—	—	15	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{on}$	—	75	—	ns	$V_{CC} = -10\text{V}, I_C = -0.5\text{A}, I_{B1} = I_{B2} = -25\text{mA}$
Delay Time	$t_d$	—	35	—	ns	
Rise Time	$t_r$	—	40	—	ns	
Turn-Off Time	$t_{off}$	—	265	—	ns	
Storage Time	$t_s$	—	230	—	ns	
Fall Time	$t_f$	—	35	—	ns	

 Notes: 6. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .



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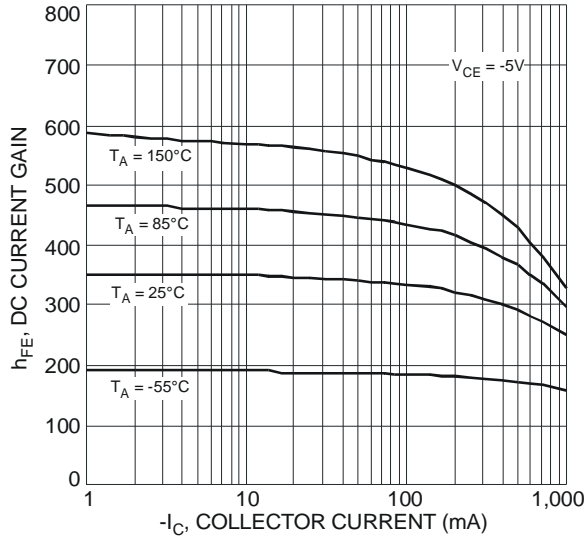


Fig. 5 Typical DC Current Gain vs. Collector Current

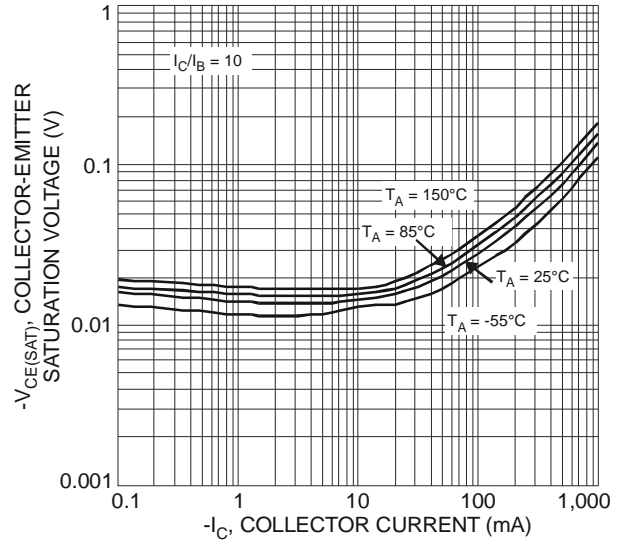


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

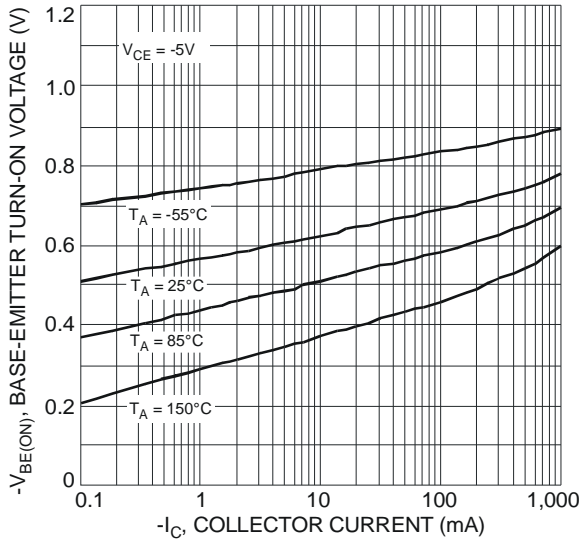


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

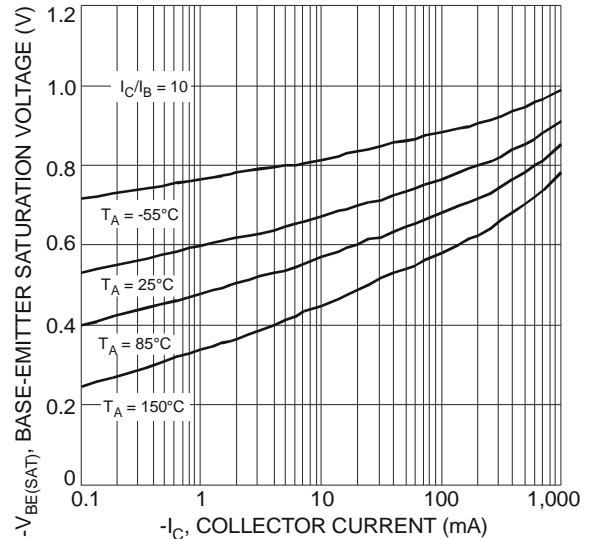


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

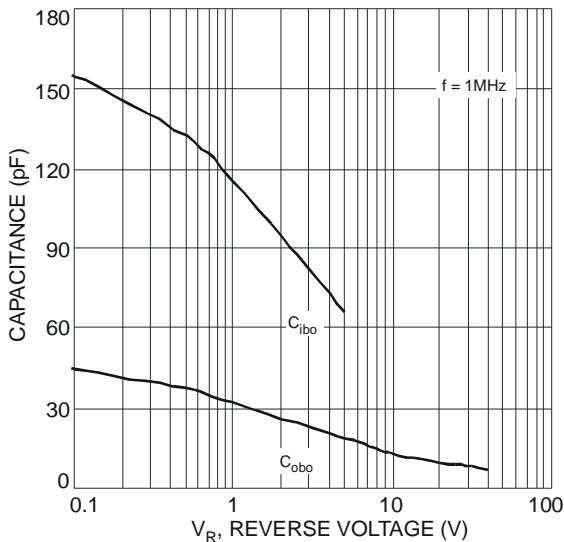
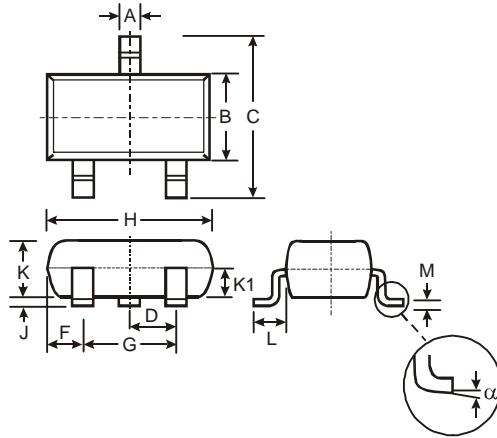


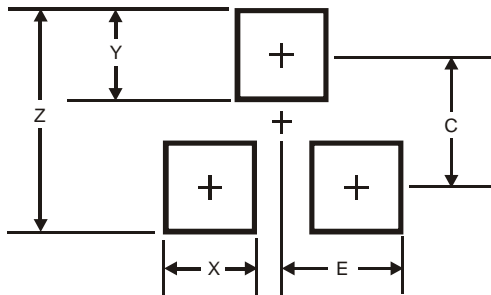
Fig. 9 Typical Capacitance Characteristics

## Package Outline Dimensions



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
$\alpha$	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



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