

## Excellent Integrated System Limited

Stocking Distributor

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[Diodes Incorporated](#)  
[DSS5140V-7](#)

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[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)



**DSS5140V**

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

## Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DSS4140V)
- Low Collector-Emitter Saturation Voltage,  $V_{CE(SAT)}$
- Surface Mount Package Suited for Automated Assembly
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green Device" (Note 2)**

## Mechanical Data

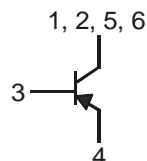
- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.003 grams (approximate)



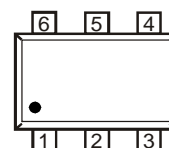
Top View



Bottom View



Device Schematic



Pin Out Configuration

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	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
Peak Base Current	$I_{BM}$	-1	A

## Thermal Characteristics

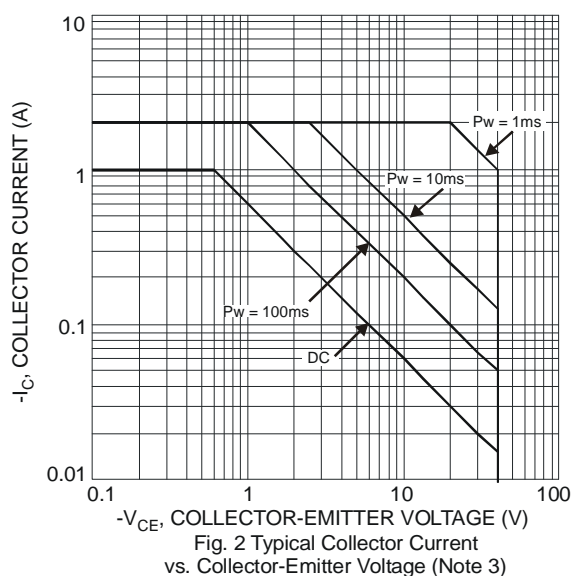
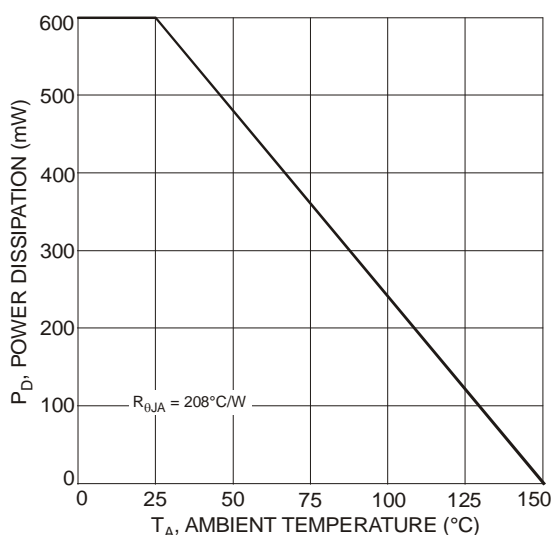
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	$P_D$	600	mW
Thermal Resistance, Junction to Ambient (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	208	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- 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](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB with minimum recommended pad layout.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-40	—	—	V	I <sub>C</sub> = -100μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage (Note 4)	V <sub>(BR)CEO</sub>	-40	—	—	V	I <sub>C</sub> = -10mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-5	—	—	V	I <sub>E</sub> = -100μA, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CBO</sub>	—	—	-100 -50	nA μA	V <sub>CB</sub> = -40V, I <sub>E</sub> = 0 V <sub>CB</sub> = -40V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C
Collector Cutoff Current	I <sub>CES</sub>	—	—	-100	nA	V <sub>CE</sub> = -40V, V <sub>EB</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -5V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 4)</b>						
DC Current Gain	h <sub>FE</sub>	300	—	—	—	V <sub>CE</sub> = -5V, I <sub>C</sub> = -1mA
		300	—	800		V <sub>CE</sub> = -5V, I <sub>C</sub> = -100mA
		250	—	—		V <sub>CE</sub> = -5V, I <sub>C</sub> = -500mA
		160	—	—		V <sub>CE</sub> = -5V, I <sub>C</sub> = 1A
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	-140	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -1mA
		—	—	-170		I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
		—	—	-310		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Collector-Emitter Saturation Resistance	R <sub>CE(SAT)</sub>	—	—	340	mΩ	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	—	-1.1	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
Base-Emitter Turn On Voltage	V <sub>BE(ON)</sub>	—	—	-1	V	V <sub>CE</sub> = -5V, I <sub>C</sub> = -1A
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Output Capacitance	C <sub>obo</sub>	—	—	15	pF	V <sub>CB</sub> = -10V, f = 1.0MHz
Current Gain-Bandwidth Product	f <sub>T</sub>	150	—	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Time	t <sub>on</sub>	—	55	—	ns	V <sub>CC</sub> = -10V I <sub>C</sub> = -0.5A, I <sub>B1</sub> = I <sub>B2</sub> = -25mA
Delay Time	t <sub>d</sub>	—	20	—	ns	
Rise Time	t <sub>r</sub>	—	35	—	ns	
Turn-Off Time	t <sub>off</sub>	—	255	—	ns	
Storage Time	t <sub>s</sub>	—	225	—	ns	
Fall Time	t <sub>f</sub>	—	30	—	ns	

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





**DSS5140V**

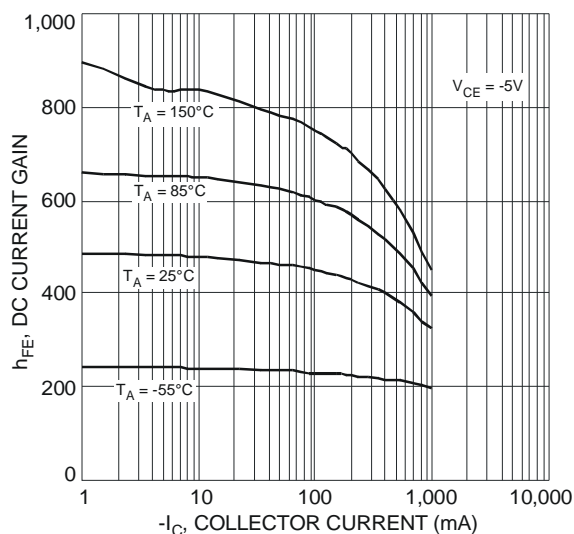


Fig. 3 Typical DC Current Gain vs. Collector Current

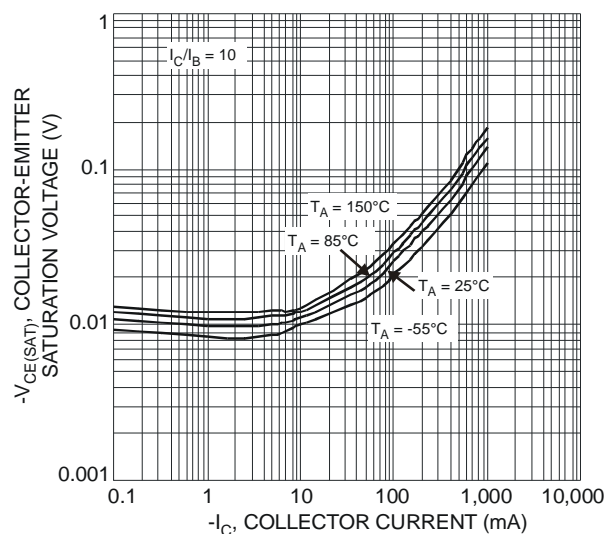


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

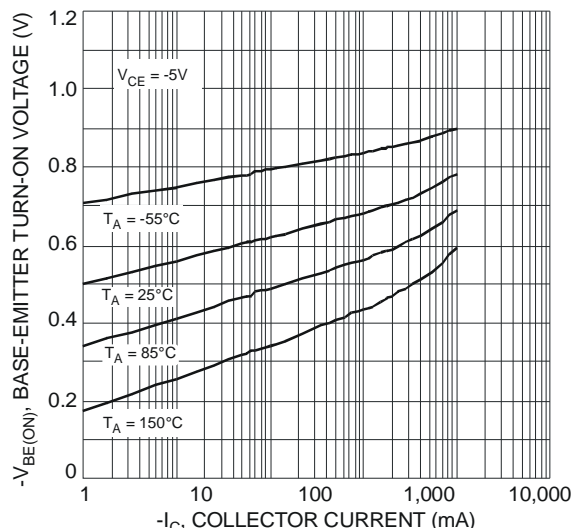


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

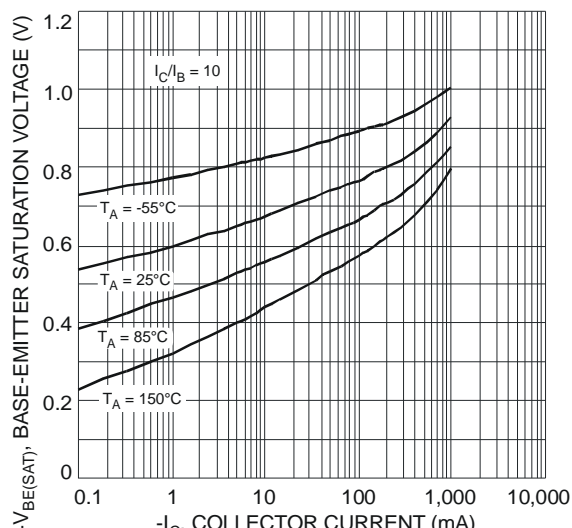


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

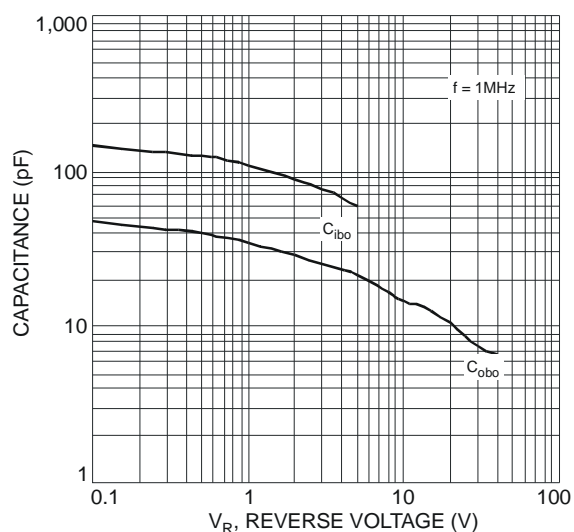


Fig. 7 Typical Capacitance Characteristics

NEW PRODUCT



**DSS5140V**

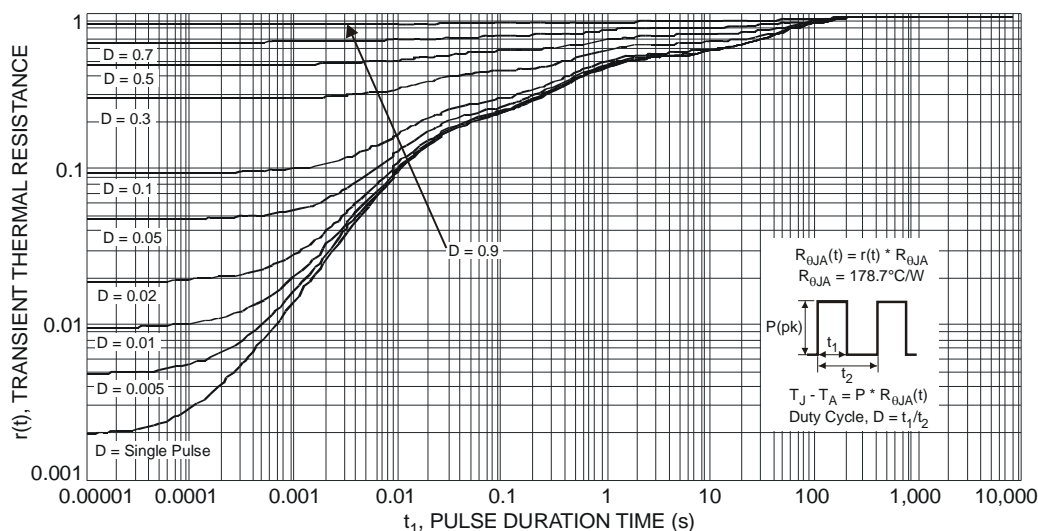


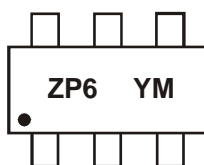
Fig. 8 Transient Thermal Response (Note 3)

## Ordering Information (Note 5)

Part Number	Case	Packaging
DSS5140V-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



ZP6 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: V = 2008)  
M = Month (ex: 9 = September)

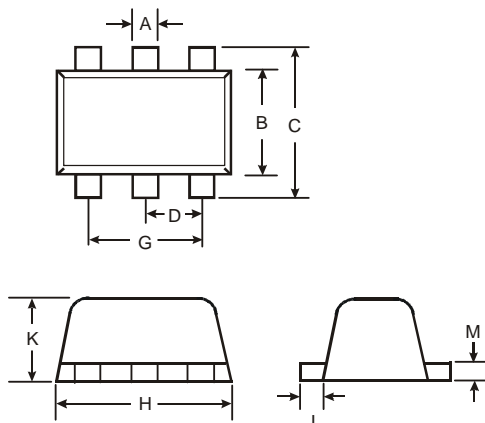
### Date Code Key

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

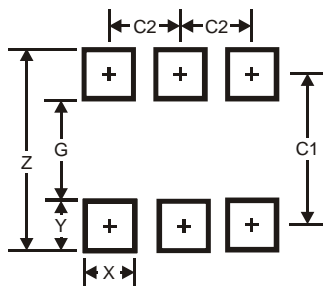


SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			



**DSS5140V**

## Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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