

Features

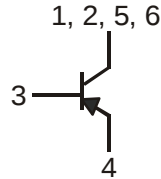
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DSS4220V)
- Low Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$
- High Current Gain (h_{FE}) at High I_C
- Surface Mount Package Suited for Automated Assembly
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green Device" (Note 2)**



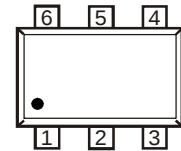
Top View



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}	-20	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current - Continuous	I_C	-2	A
Peak Pulse Collector Current	I_{CM}	-4	A
Base Current (DC)	I_B	-0.3	A
Peak Base Current	I_{BM}	-0.6	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.
 3. Device mounted on FR-4 PCB with minimum recommended pad layout.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-20	—	—	V	I _C = -100μA, I _E = 0
Collector-Emitter Breakdown Voltage (Note 4)	V _{(BR)CEO}	-20	—	—	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} = -20V, I _E = 0 V _{CB} = -20V, I _E = 0, T _A = 150°C
Collector Cutoff Current	I _{CES}	—	—	-100	nA	V _{CE} = -20V, 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}	220 220 220 155 60	— — — — —	— — — — —	—	V _{CE} = -2V, I _C = -1mA V _{CE} = -2V, I _C = -100mA V _{CE} = -2V, I _C = -500mA V _{CE} = -2V, I _C = -1A V _{CE} = -2V, I _C = -2A
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	— — — — — —	— — — — — —	-80 -115 -220 -210 -455 -390	mV	I _C = -100mA, I _B = -1mA I _C = -500mA, I _B = -50mA I _C = -1A, I _B = -50mA I _C = -1A, I _B = -100mA I _C = -2A, I _B = -100mA I _C = -2A, I _B = -200mA
Collector-Emitter Saturation Resistance	R _{CE(SAT)}	—	—	210	mΩ	I _C = -1A, I _B = -100mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	-1.1 -1.1	V	I _C = -1A, I _B = -50mA I _C = -1A, I _B = -100mA
Base-Emitter Turn On Voltage	V _{BE(ON)}	—	—	-1	V	V _{CE} = -5V, I _C = -1A
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C _{obo}	—	—	20	pF	V _{CB} = -10V, f = 1.0MHz
Current Gain-Bandwidth Product	f _T	150	—	—	MHz	V _{CE} = -10V, I _C = -50mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t _{on}	—	60	—	ns	V _{CC} = -10V I _C = -1A, I _{B1} = I _{B2} = -50mA
Delay Time	t _d	—	20	—	ns	
Rise Time	t _r	—	40	—	ns	
Turn-Off Time	t _{off}	—	167	—	ns	
Storage Time	t _s	—	140	—	ns	
Fall Time	t _f	—	27	—	ns	

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

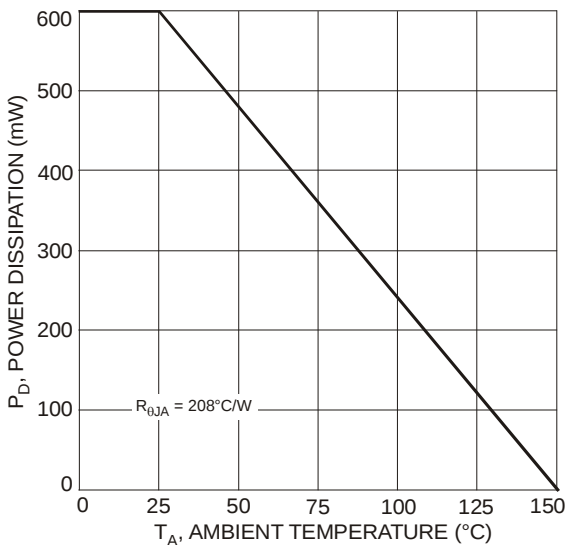


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

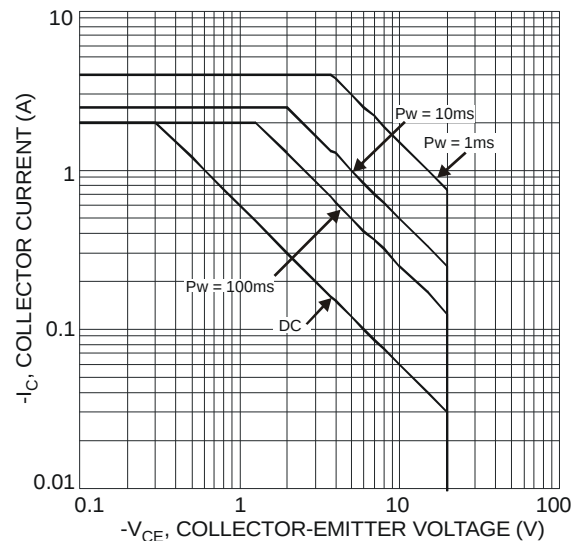


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)

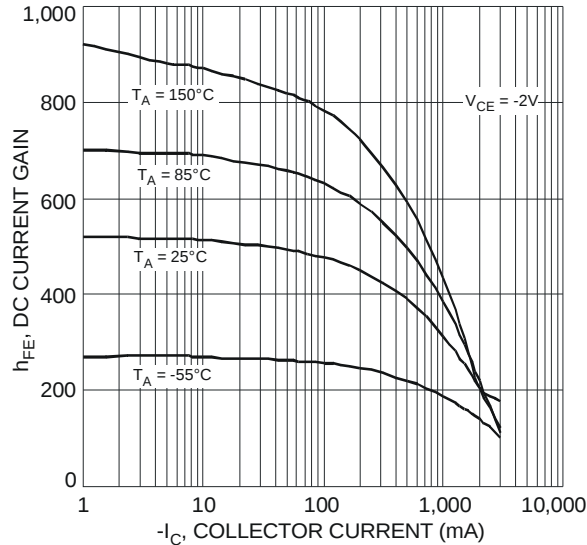


Fig. 3 Typical DC Current Gain vs. Collector Current

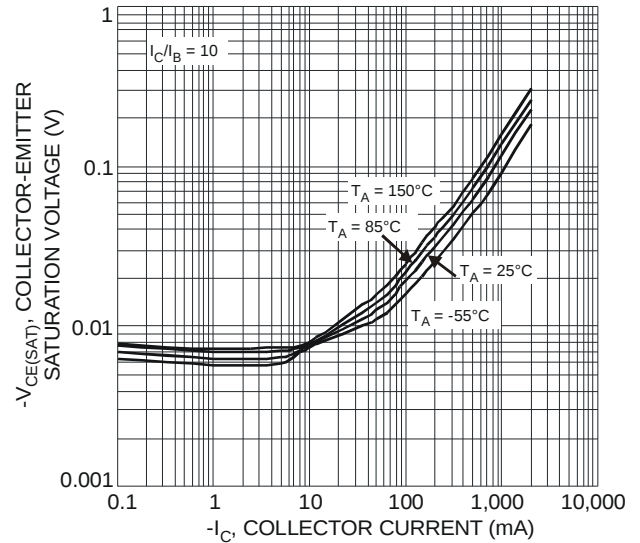


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

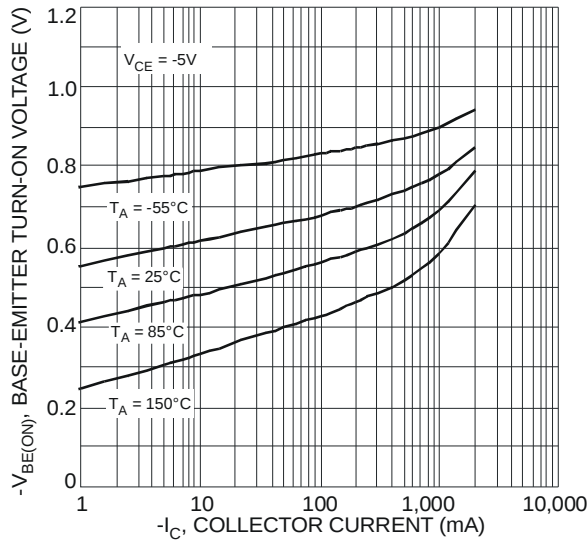


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

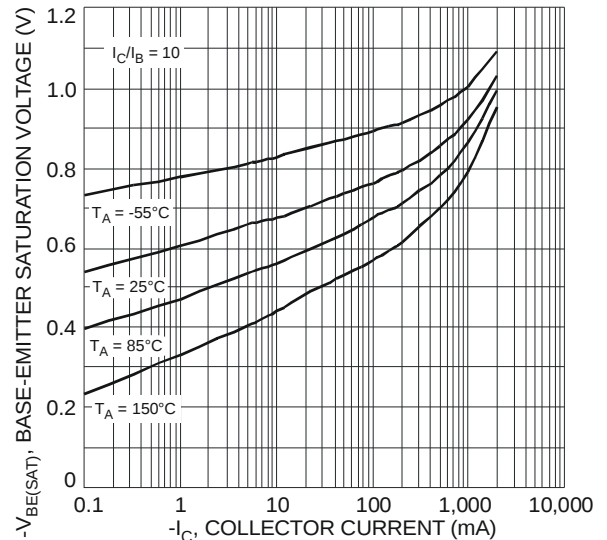


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

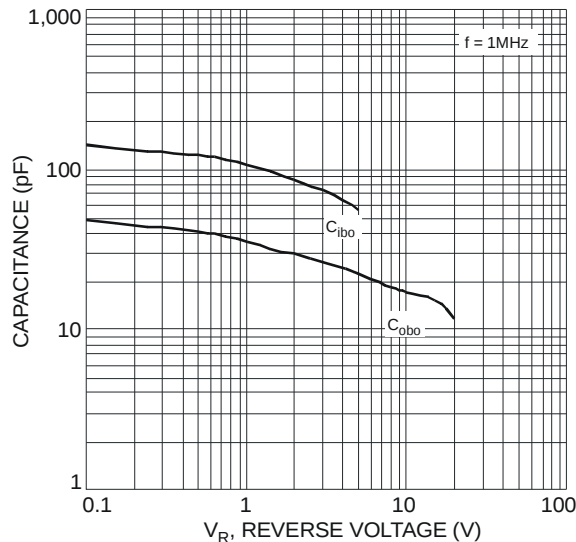


Fig. 7 Typical Capacitance Characteristics

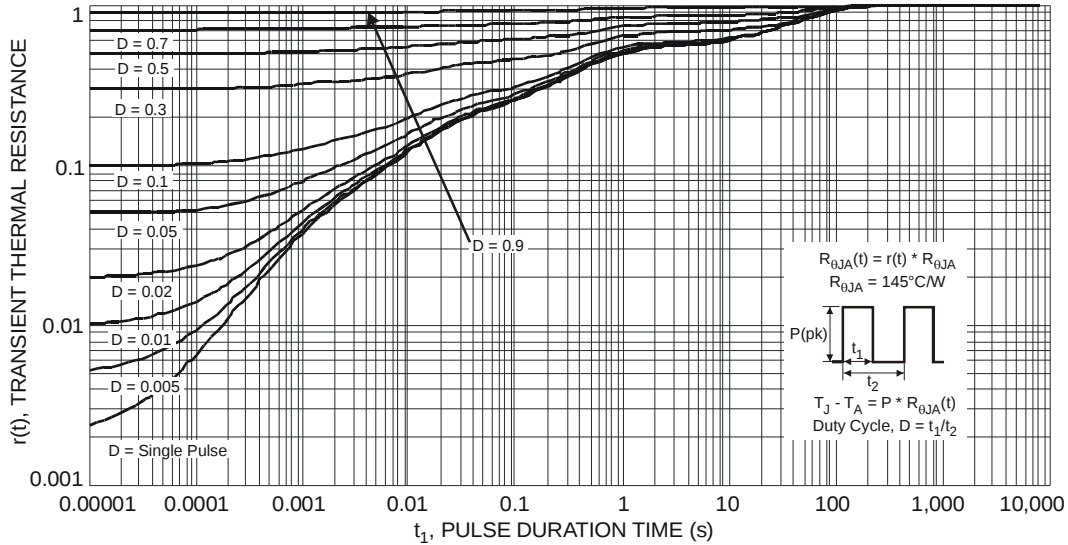


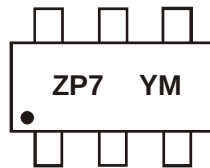
Fig. 8 Transient Thermal Response (Note 3)

Ordering Information (Note 5)

Part Number	Case	Packaging
DSS5220V-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



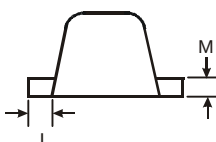
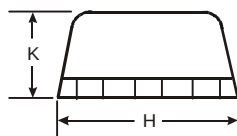
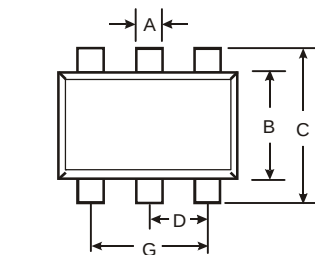
ZP7 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: V = 2008)
M = Month (ex: 9 = September)

Date Code Key

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

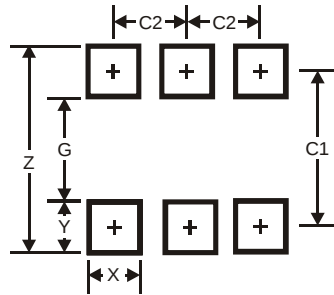
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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



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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