

40V LOW $V_{CE(SAT)}$ NPN SURFACE MOUNT TRANSISTOR
Features

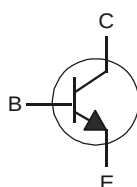
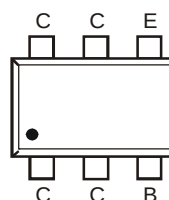
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching
- Complementary PNP Type Available (DSS5240Y)
- Ultra Small Surface Mount Package
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT363
- 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 Plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.006 grams (approximate)



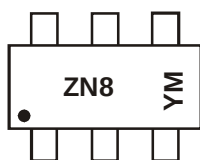
Top View


 Top View
 Device Schematic

 Top View
 Pin Out Configuration

Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DSS4240Y-7	ZN8	7	8mm	3,000

- Notes:
1. No purposefully added lead.
 2. Diode's 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


ZN8 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: V = 2008)
 M = Month (ex: 9 = September)

Date Code Key

Year	2010	2011	2012	2013	2014	2015
Code	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

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	2	A
Peak Pulse Collector Current	I_{CM}	3	A
Peak Base Current	I_{BM}	0.3	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	P_D	625	mW
Thermal Resistance, Junction to Ambient (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 4. Device mounted on FR-4 PCB, with minimum recommended pad layout.

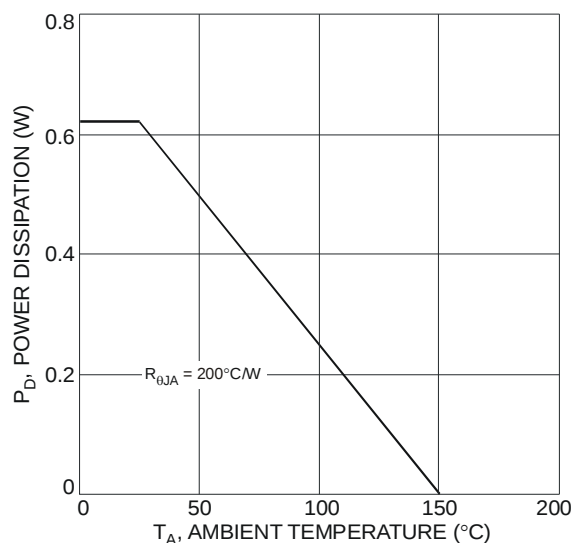


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

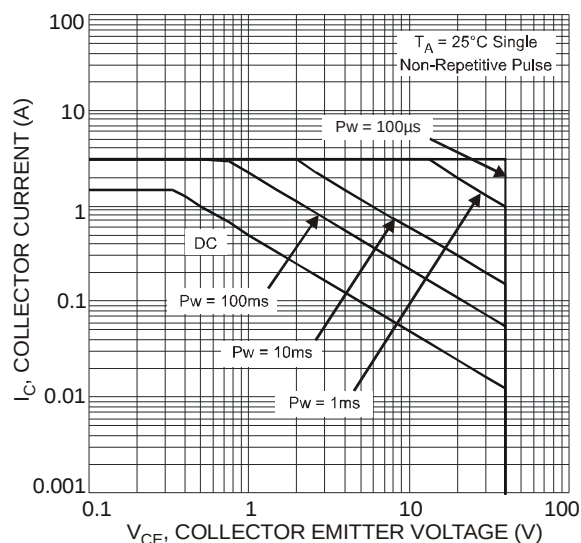


Fig. 2 Safe Operating Area

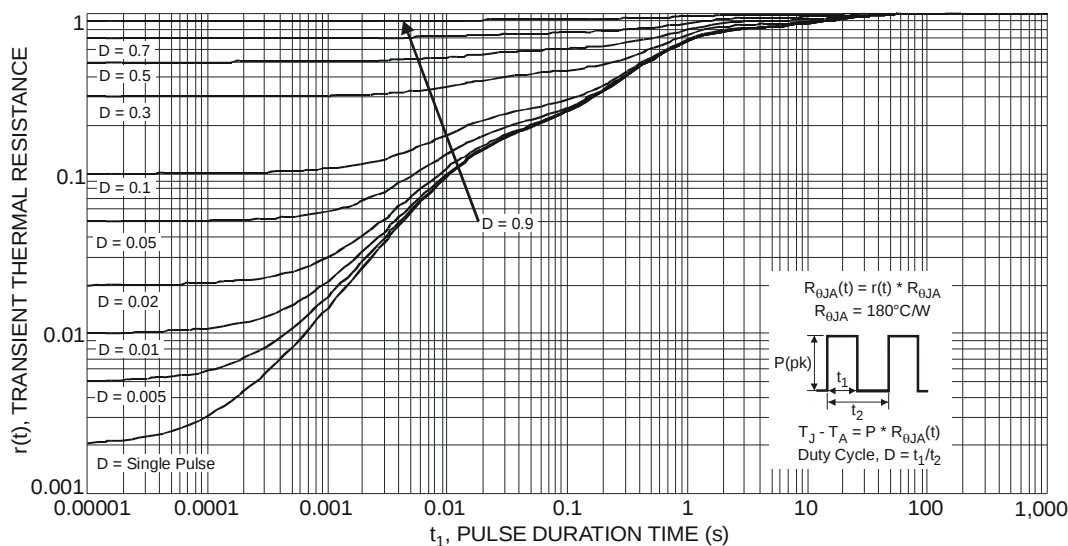


Fig. 3 Transient Thermal Response

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	150	—	V	$I_C = 100\mu\text{A}$, $I_E = 0$
Collector-Emitter Breakdown Voltage (Note 5)	BV_{CEO}	40	55	—	V	$I_C = 10\text{mA}$, $I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	8.5	—	V	$I_E = 100\mu\text{A}$, $I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	100 50	nA μA	$V_{CB} = 30\text{V}$, $I_E = 0$ $V_{CB} = 30\text{V}$, $I_E = 0$, $T_A = 150^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	$V_{EB} = 4\text{V}$, $I_C = 0$
DC Current Gain (Note 5)	h_{FE}	350 300 300 150	— — — —	— — — —	—	$V_{CE} = 2\text{V}$, $I_C = 100\text{mA}$ $V_{CE} = 2\text{V}$, $I_C = 500\text{mA}$ $V_{CE} = 2\text{V}$, $I_C = 1\text{A}$ $V_{CE} = 2\text{V}$, $I_C = 2\text{A}$
Collector-Emitter Saturation Voltage (Note 5)	$V_{CE(sat)}$	— — — — —	45 52 100 105 190	70 100 180 180 320	mV	$I_C = 100\text{mA}$, $I_B = 1\text{mA}$ $I_C = 500\text{mA}$, $I_B = 50\text{mA}$ $I_C = 750\text{mA}$, $I_B = 15\text{mA}$ $I_C = 1\text{A}$, $I_B = 50\text{mA}$ $I_C = 2\text{A}$, $I_B = 200\text{mA}$
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	105	200	m Ω	$I_C = 500\text{mA}$, $I_B = 50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1.1	V	$I_C = 2\text{A}$, $I_B = 200\text{mA}$
Base-Emitter Turn On Voltage	$V_{BE(on)}$	—	—	0.75	V	$V_{CE} = 2\text{V}$, $I_C = 100\text{mA}$
Output Capacitance	C_{obo}	—	—	20	pF	$V_{CB} = 10\text{V}$, $f = 1.0\text{MHz}$
Current Gain-Bandwidth Product	f_T	100	250	—	MHz	$V_{CE} = 10\text{V}$, $I_C = 50\text{mA}$, $f = 100\text{MHz}$
Turn-On Time	t_{on}	—	64	—	ns	$V_{CC} = 10\text{V}$ $I_C = 1\text{A}$, $I_{B1} = -I_{B2} = 50\text{mA}$
Delay Time	t_d	—	20	—	ns	
Rise Time	t_r	—	44	—	ns	
Turn-Off Time	t_{off}	—	315	—	ns	
Storage Time	t_s	—	275	—	ns	
Fall Time	t_f	—	40	—	ns	

Notes: 5. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

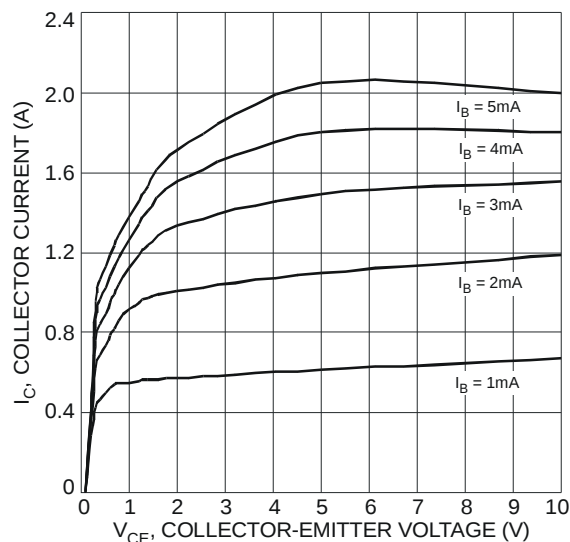


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

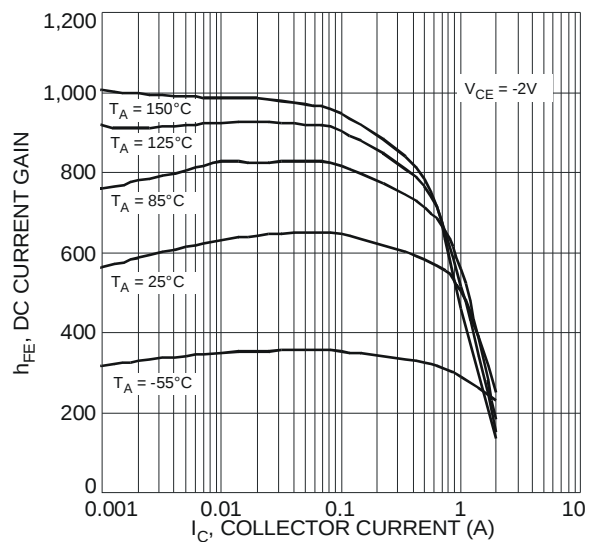


Fig. 5 Typical DC Current Gain vs. Collector Current

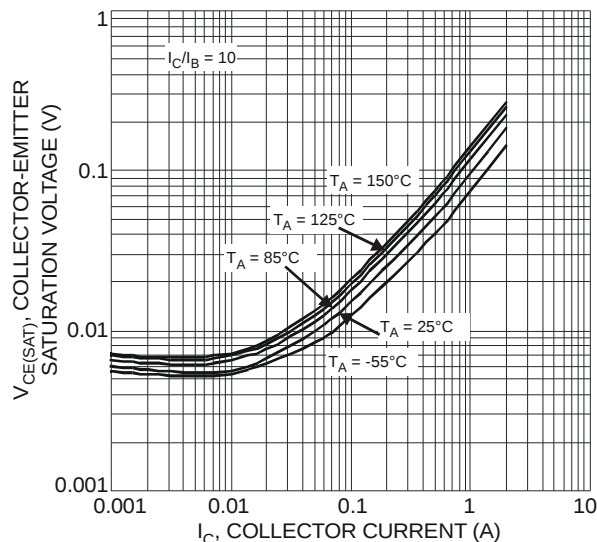


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

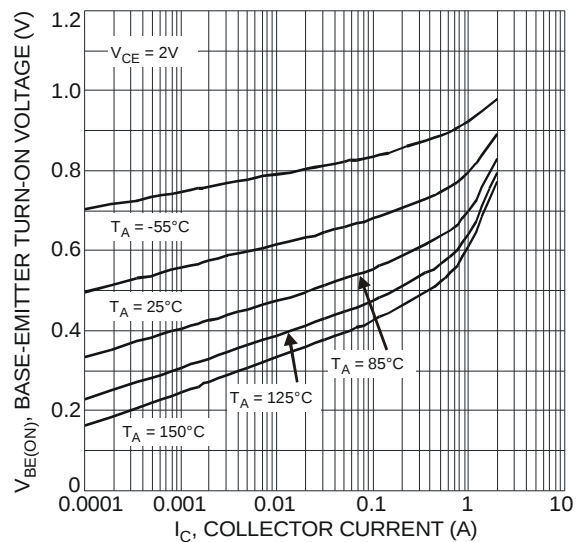


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

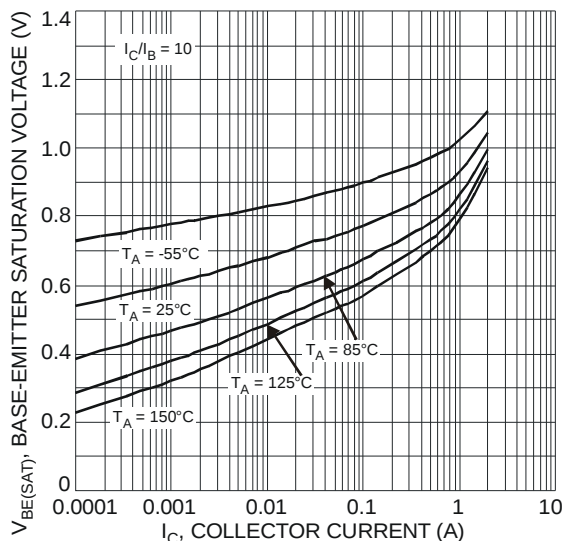


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

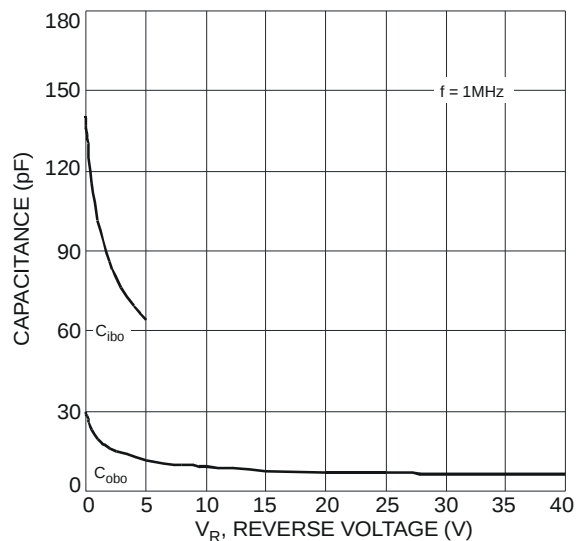
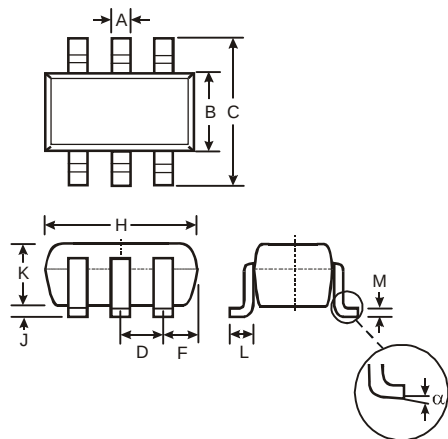


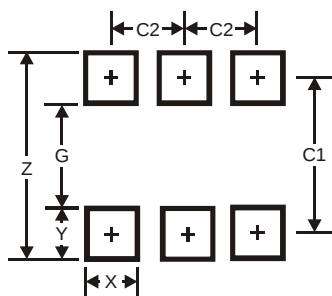
Fig. 9 Typical Capacitance Characteristics

Package Outline Dimensions



SOT363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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