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

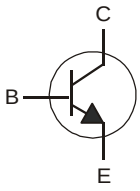
Features

- 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**

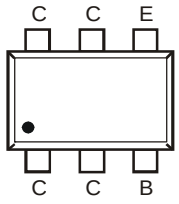
Mechanical Data

- 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)

SOT363



Top View
Device Schematic



Top View
Pin Out Configuration

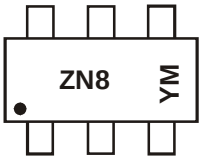
Top View

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℃ 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°C	P_D	625	mW
Thermal Resistance, Junction to Ambient (Note 4) @ T_A = 25°C	$R_{\theta JA}$	200	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

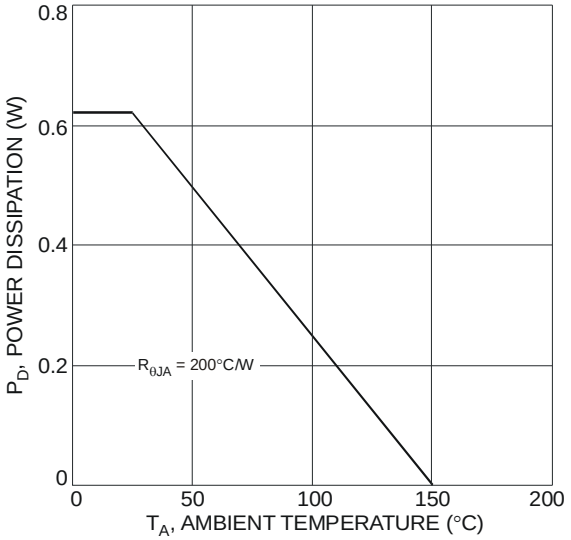


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

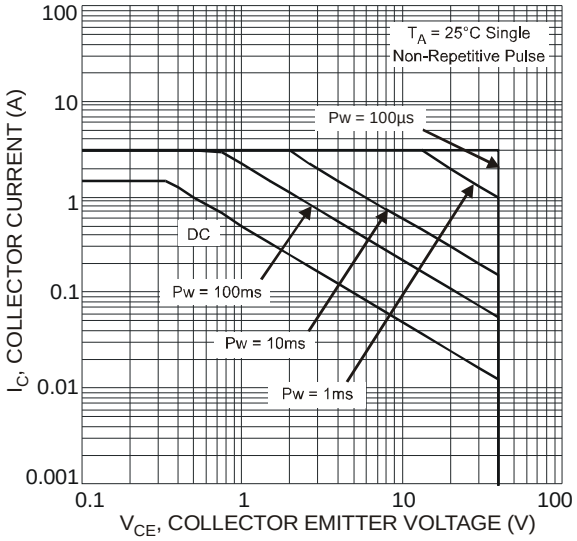


Fig. 2 Safe Operating Area

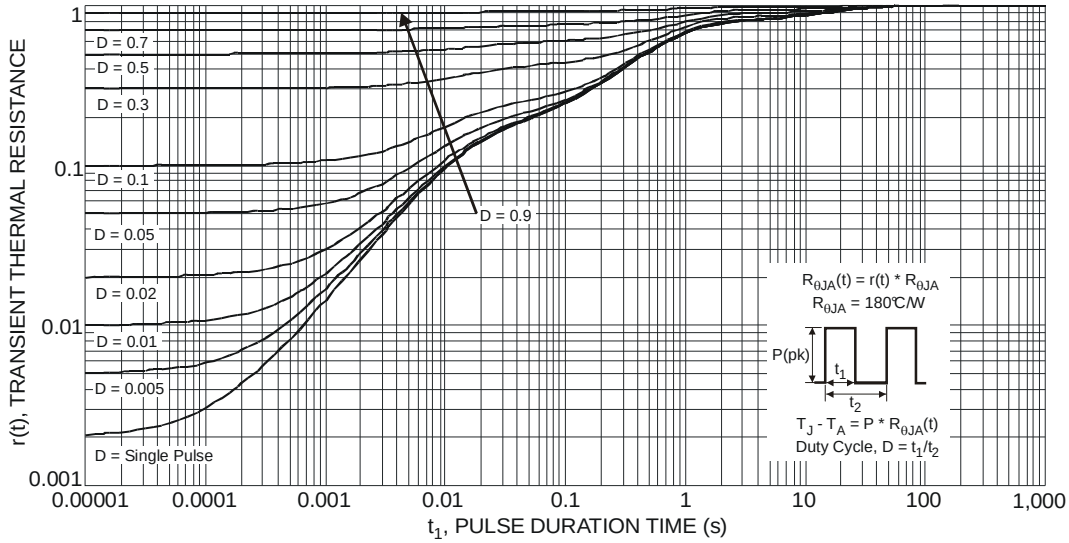


Fig. 3 Transient Thermal Response

Electrical Characteristics @T_A = 25℃ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	150	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 5)	BV_{CEO}	40	55	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	5	8.5	—	V	I_E = 100μA, I_C = 0
Collector Cutoff Current	I_{CBO}	— —	— —	100 50	nA μA	V_{CB} = 30V, I_E = 0 V_{CB} = 30V, I_E = 0, T_A = 150℃
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 4V, I_C = 0
DC Current Gain (Note 5)	h_{FE}	350 300 300 150	— — — —	— — — —	—	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 (Note 5)	$V_{CE(sat)}$	— — — — —	45 52 100 105 190	70 100 180 180 320	mV	I_C = 100mA, I_B = 1mA I_C = 500mA, I_B = 50mA I_C = 750mA, I_B = 15mA I_C = 1A, I_B = 50mA I_C = 2A, I_B = 200mA
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	—	105	200	mΩ	I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1.1	V	I_C = 2A, I_B = 200mA
Base-Emitter Turn On Voltage	$V_{BE(on)}$	—	—	0.75	V	V_{CE} = 2V, I_C = 100mA
Output Capacitance	C_{obo}	—	—	20	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	100	250	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
Turn-On Time	t_{on}	—	64	—	ns	V_{CC} = 10V I_C = 1A, I_{B1} = -I_{B2} = 50mA
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 = 300μs. Duty cycle ≤2%.

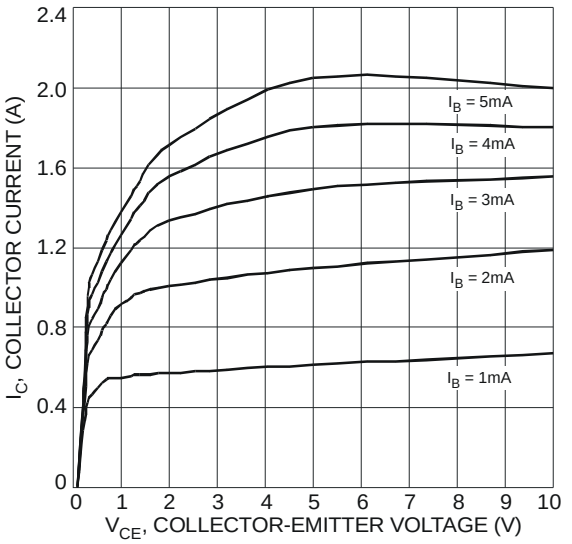


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

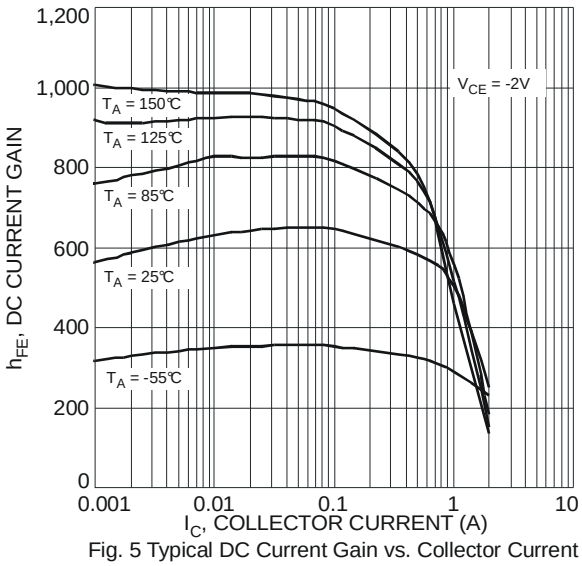


Fig. 5 Typical DC Current Gain vs. Collector Current

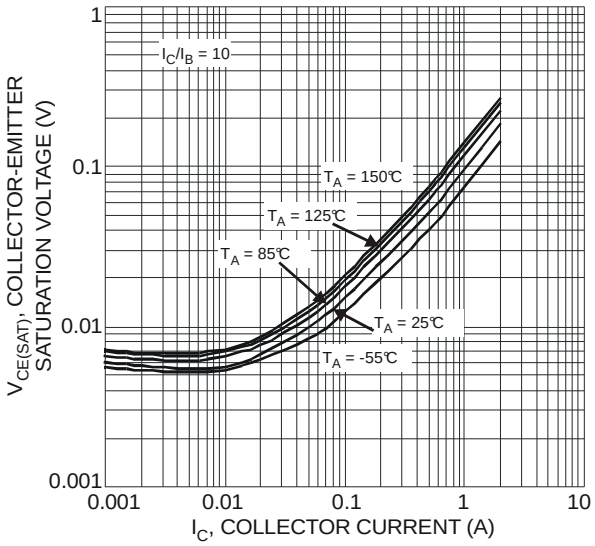


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

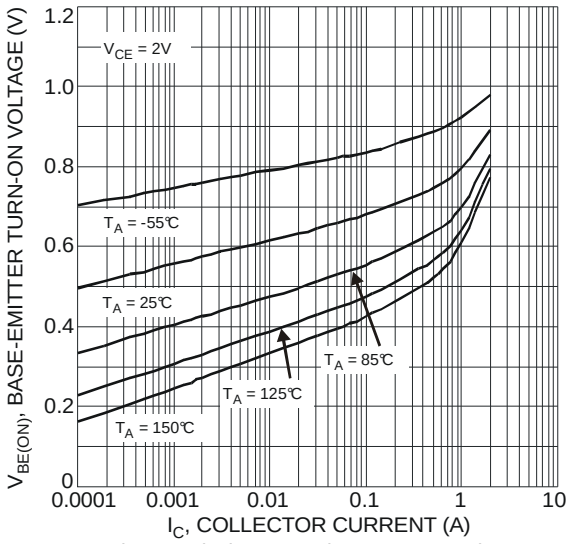


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

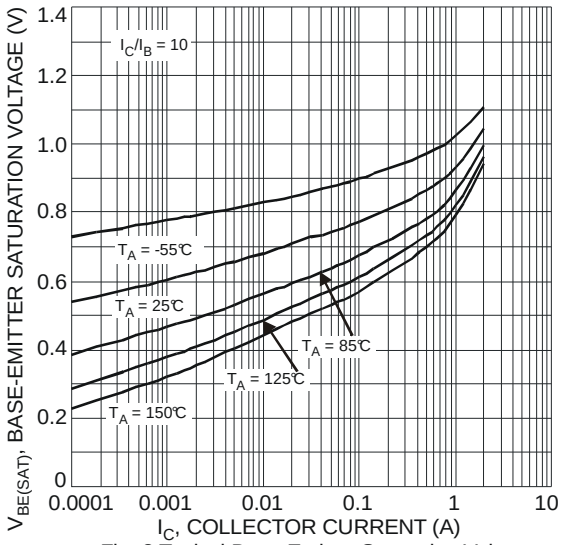


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

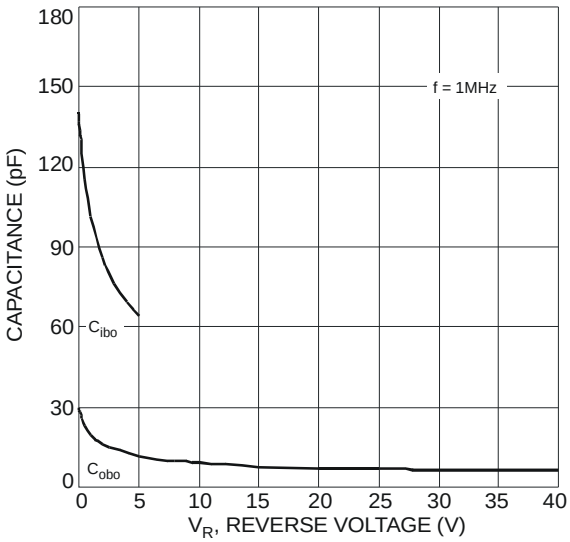
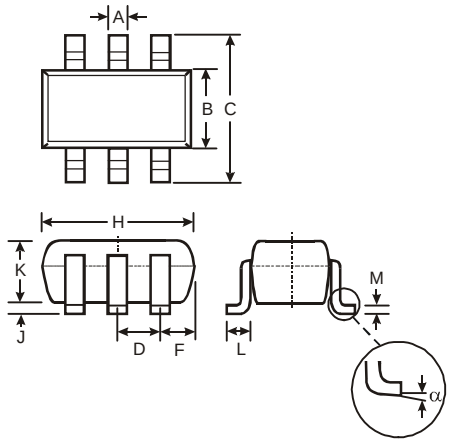


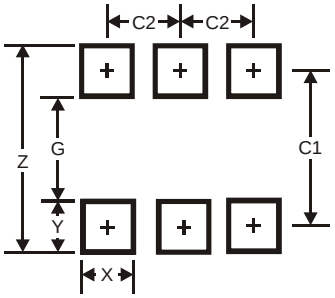
Fig. 9 Typical Capacitance Characteristics

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