40V PNP LOW SATURATION TRANSISTOR IN SOT23

Features

- BV_{CEO} > -40V
- I_C = -2A high Continuous Collector Current
- I_{CM} = -3A Peak Pulse Current
- Low Saturation Voltage -225mV Max @ I_C = -1A.
- $R_{CE(SAT)}$ = 90mΩ at 0.5A for a Low Equivalent On-Resistance
- 730mW Power Dissipation
- Complimentary NPN Type: DSS4240T
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

Mechanical Data

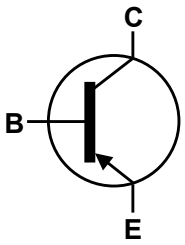
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight 0.008 grams (approximate)

Application

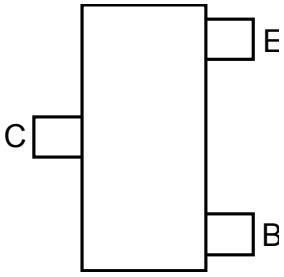
- Gate Driving MOSFETs and IGBTs
- Load Switch
- DC-DC Converters
- Battery Charging

SOT23

Top View



Device Symbol



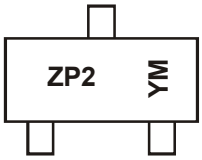
Top View
Pin-Out

Ordering Information (Note 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DSS5240T-7	AEC-Q101	ZP2	7	8	3,000
DSS5240TQ-7	Automotive	ZP2	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



ZP2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: V = 2008)
M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Code	A	B	C	D	E	F	G	H	I	J	K

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

Absolute Maximum Ratings (@T_A = +25°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
Peak Pulse Collector Current	I_{CM}	-3	A
Continuous Collector Current	I_C	-2	A
Base Current	I_B	-300	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

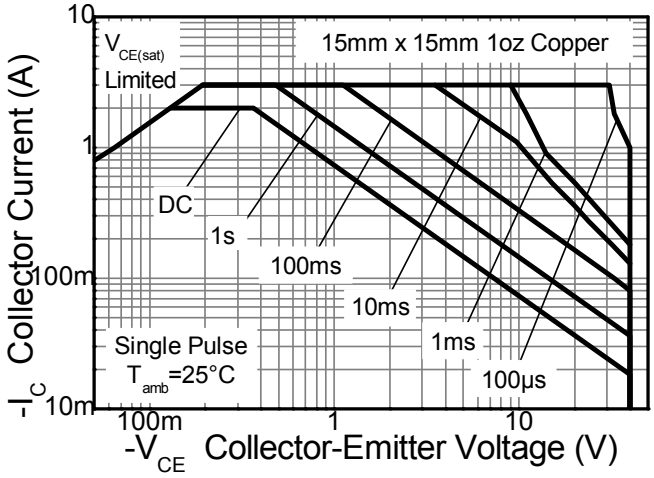
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	730	mW
Power Dissipation (Note 7)	P_D	600	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	171	°C/W
Thermal Resistance, Junction to Ambient Air (Note 7)	$R_{\theta JA}$	209	°C/W
Thermal Resistance, Junction to Lead (Note 8)	$R_{\theta JL}$	75	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

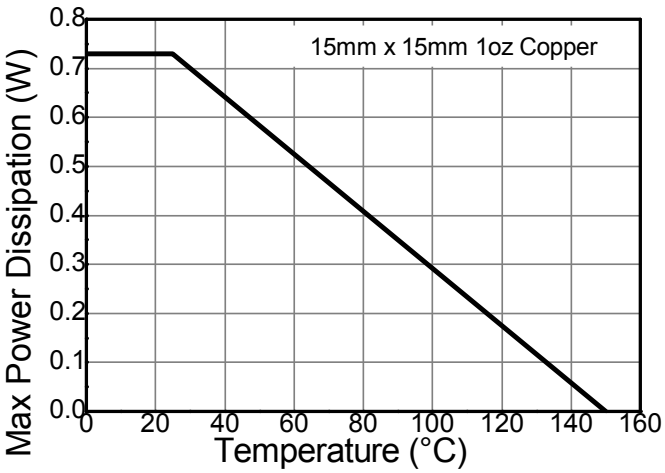
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the collector lead on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
7. Same as note (6), except the device is mounted on minimum recommended pad layout.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

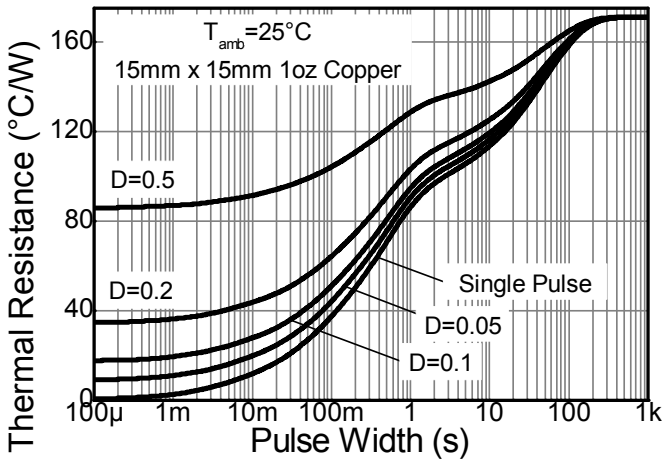
Thermal Characteristics and Derating information



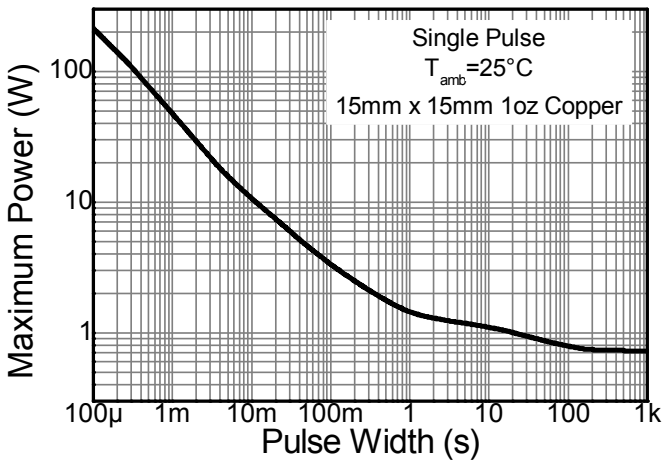
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-40	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-40	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -100µA
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -30V, I_E = 0
		—	—	-50	µA	V_{CB} = -30V, I_E = 0, T_A = +150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -4V, I_C = 0
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	300	—	—	—	V_{CE} = -2V, I_C = -0.1A
		260	—	—		V_{CE} = -2V, I_C = -0.5A
		210	—	—		V_{CE} = -2V, I_C = -1A
		100	—	—		V_{CE} = -2V, I_C = -2A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	-100	mV	I_C = -100mA, I_B = -1mA
		—	45	-110		I_C = -500mA, I_B = -50mA
		—	—	-225		I_C = -750mA, I_B = -15mA
		—	—	-225		I_C = -1A, I_B = -50mA
		—	—	-350		I_C = -2A, I_B = -200mA
Equivalent On-Resistance	$R_{CE(SAT)}$	—	90	220	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
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	V_{CE} = -10V, I_C = -100mA, f = 100MHz
Output Capacitance	C_{ob}	—	—	28	pF	V_{CB} = -10V, f = 1MHz

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

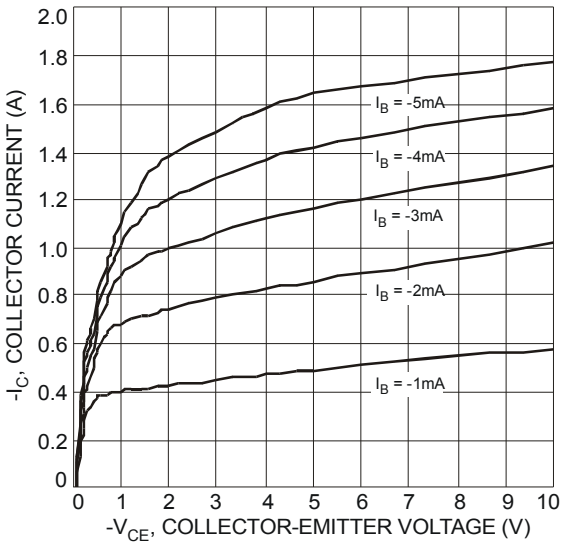


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

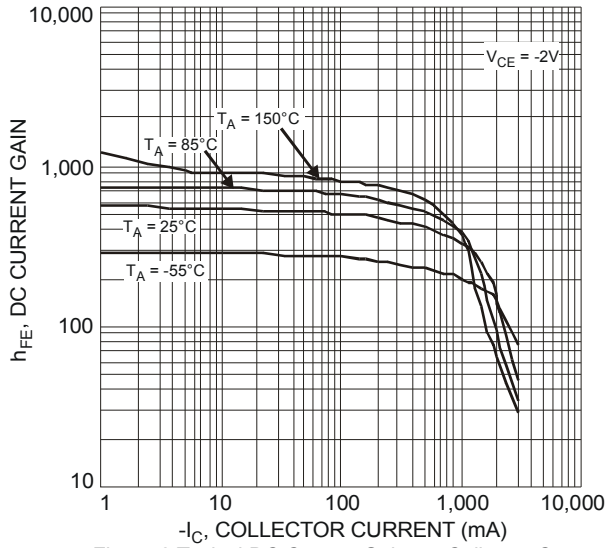


Figure 2 Typical DC Current Gain vs. Collector Current

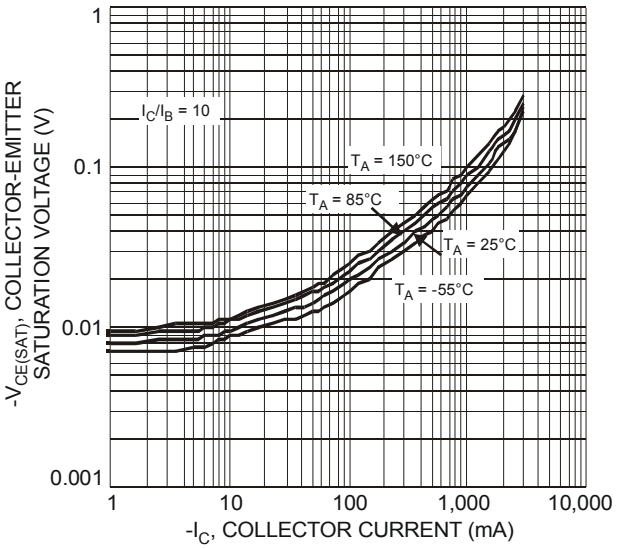


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

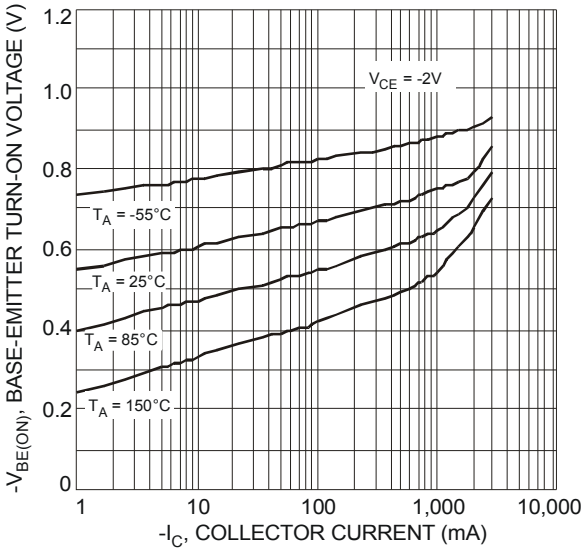


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

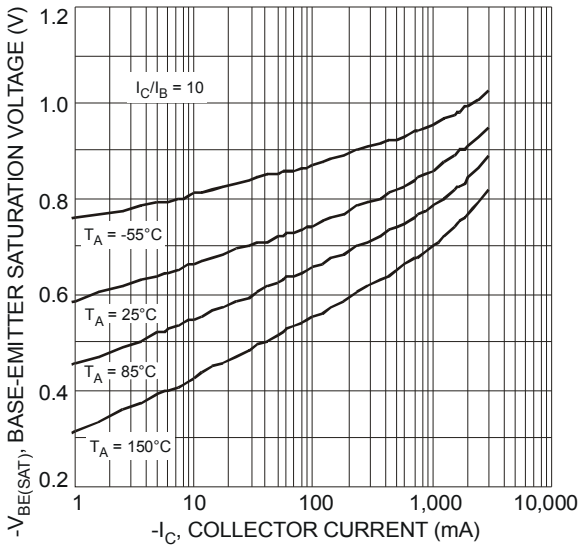


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

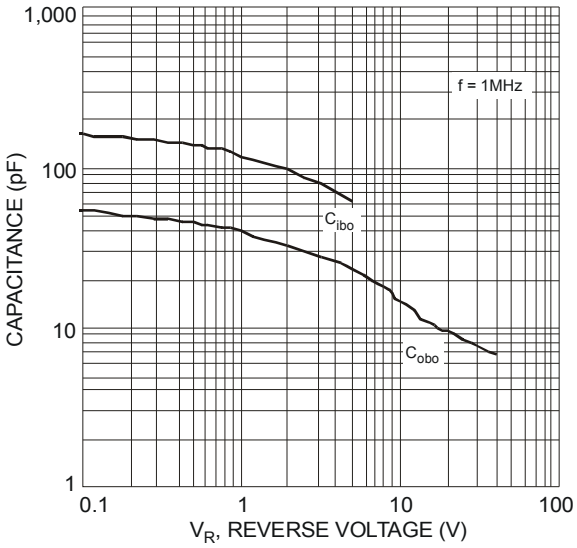


Figure 6 Typical Capacitance Characteristics

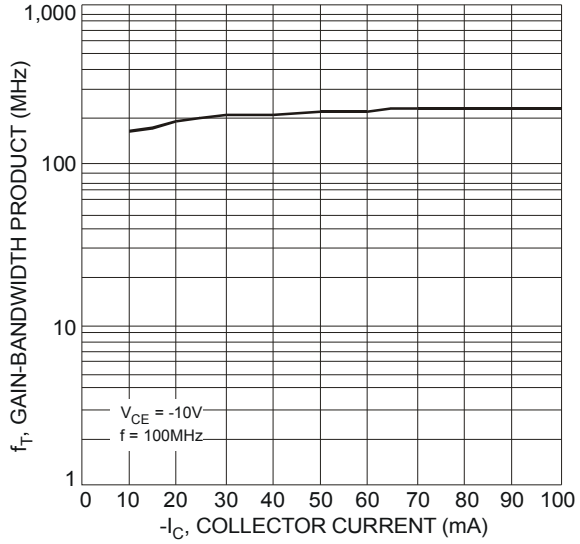
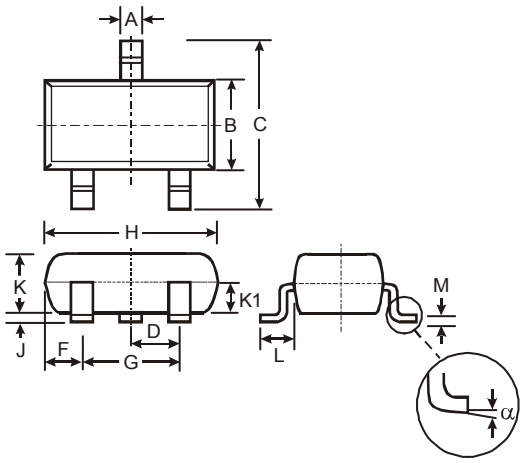


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

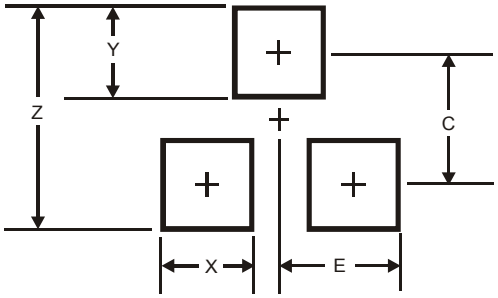
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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