

## Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirement of Automotive Applications.

## Features

- $BV_{CEO} > -40V$
- $I_C = -2A$  High Continuous Collector Current
- $I_{CM} = -3A$  Peak Pulse Current
- Low Saturation Voltage  $-225mV$  Max @  $I_C = -1A$
- $R_{CE(sat)} = 90m\Omega$  at  $0.5A$  for a Low Equivalent On-Resistance
- 730mW Power Dissipation
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DSS5240TQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

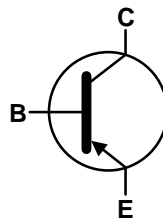
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (Ⓔ)
- Weight 0.008 grams (Approximate)

## Application

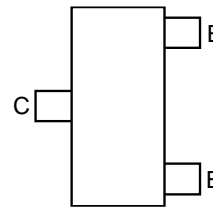
- Gate Driving MOSFETs and IGBTs
- Load Switch
- DC-DC Converters
- Battery Charging



Top View



Device Symbol



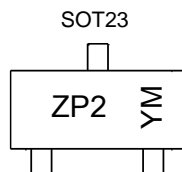
Top View  
Pin-Out

## Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DSS5240TQ-7	Automotive	ZP2	7	8	3000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



ZP2 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: G = 2019)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
Code	G	H	I	J	K	L	M	N	O	P	Q	
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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-40	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-40	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Peak Pulse Collector Current	I <sub>CM</sub>	-3	A
Continuous Collector Current	I <sub>C</sub>	-2	A
Base Current	I <sub>B</sub>	-300	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

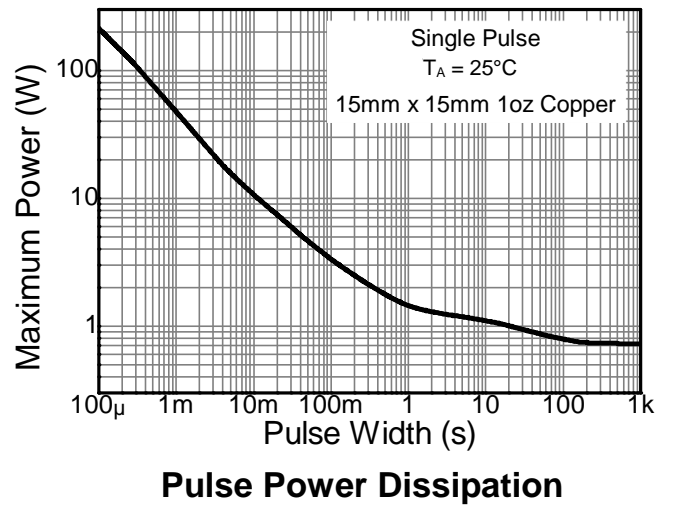
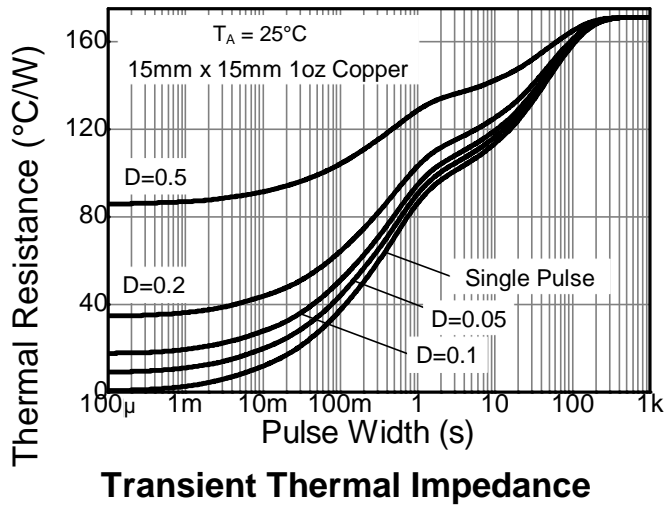
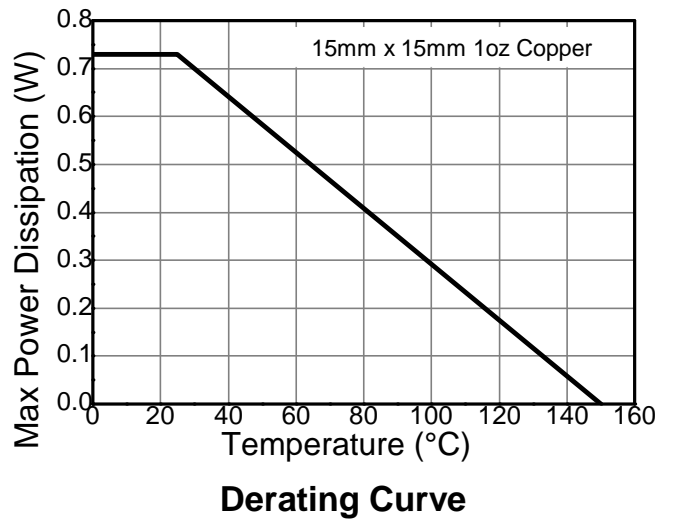
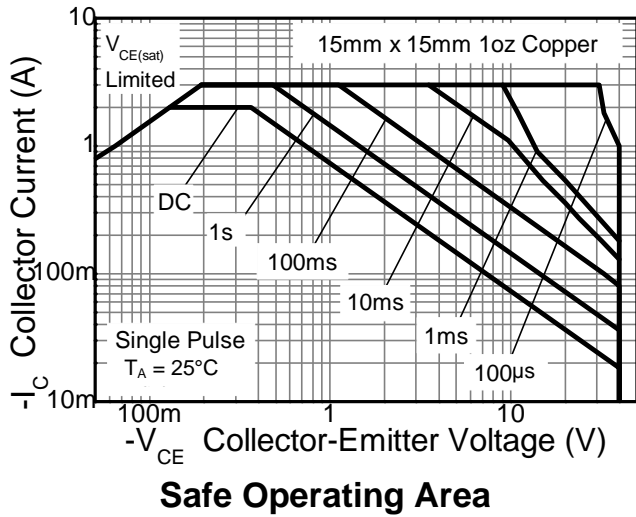
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	730	mW
Power Dissipation (Note 6)	P <sub>D</sub>	600	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	171	°C/W
Thermal Resistance, Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	209	°C/W
Thermal Resistance, Junction to Lead (Note 7)	R <sub>θJL</sub>	75	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  6. Same as Note 7, except the device is mounted on minimum recommended pad layout.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**



**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-40	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-40	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-100	nA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0
		—	—	-50	μA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0, T <sub>A</sub> = +150°C
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -4V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 9)</b>						
DC Current Gain	h <sub>FE</sub>	300	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -0.1A
		260	—	—		V <sub>CE</sub> = -2V, I <sub>C</sub> = -0.5A
		210	—	—		V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A
		100	—	—		V <sub>CE</sub> = -2V, I <sub>C</sub> = -2A
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-100	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -1mA
		—	-45	-110		I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
		—	—	-225		I <sub>C</sub> = -750mA, I <sub>B</sub> = -15mA
		—	—	-225		I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
		—	—	-350		I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Equivalent On-Resistance	R <sub>CE(sat)</sub>	—	90	220	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> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Turn-on Voltage	V <sub>BE(on)</sub>	—	—	-0.75	V	V <sub>CE</sub> = -2V, I <sub>C</sub> = -100mA
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>t</sub>	100	—	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	28	pF	V <sub>CB</sub> = -10V, f = 1MHz

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

**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

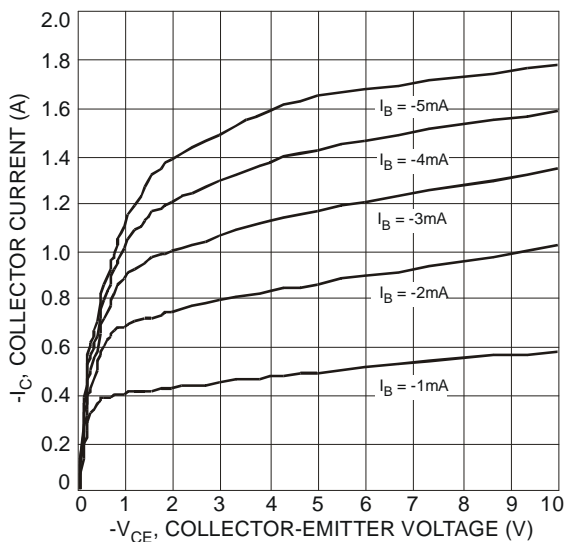


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

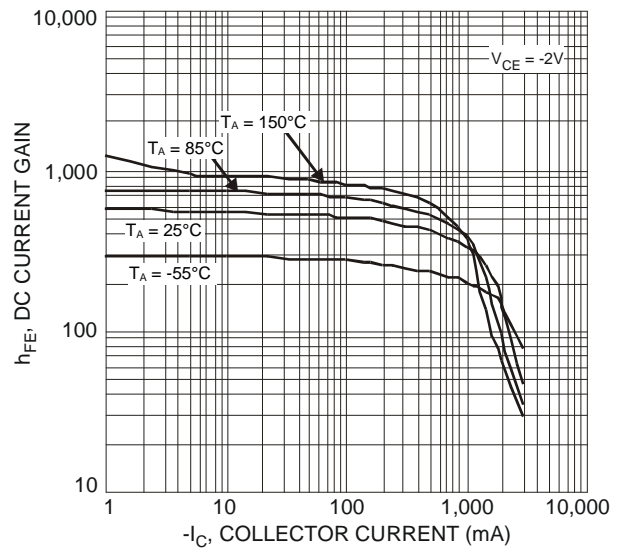


Figure 2 Typical DC Current Gain vs. Collector Current

**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.) (continued)

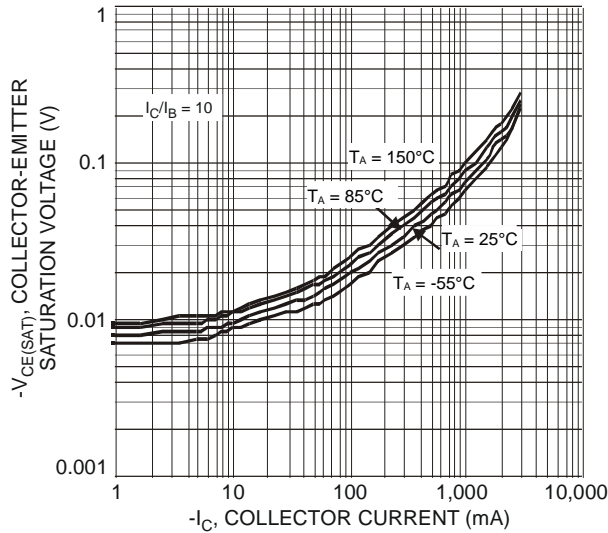


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

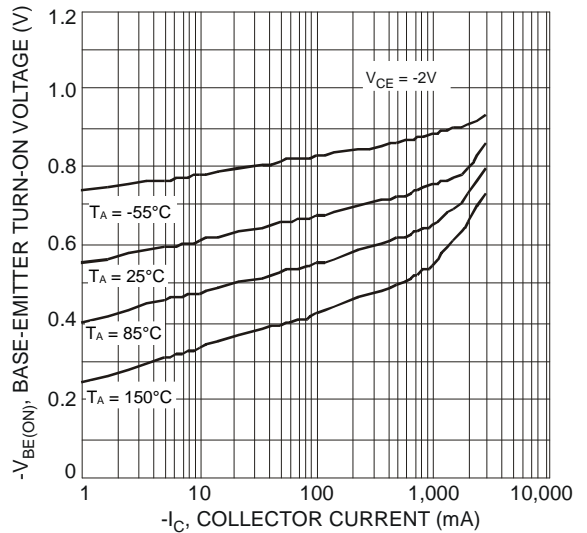


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

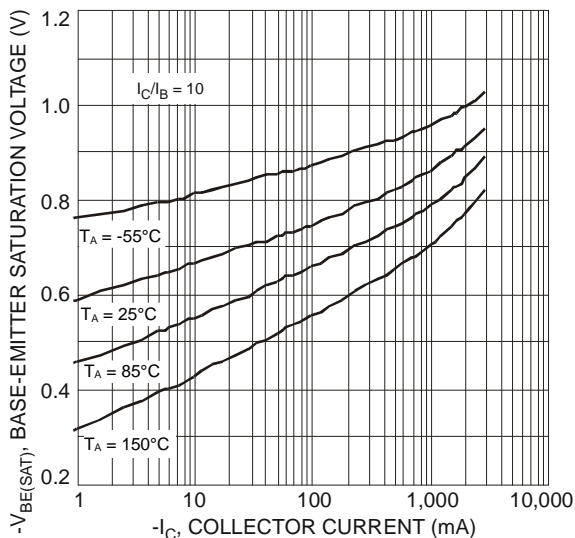


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

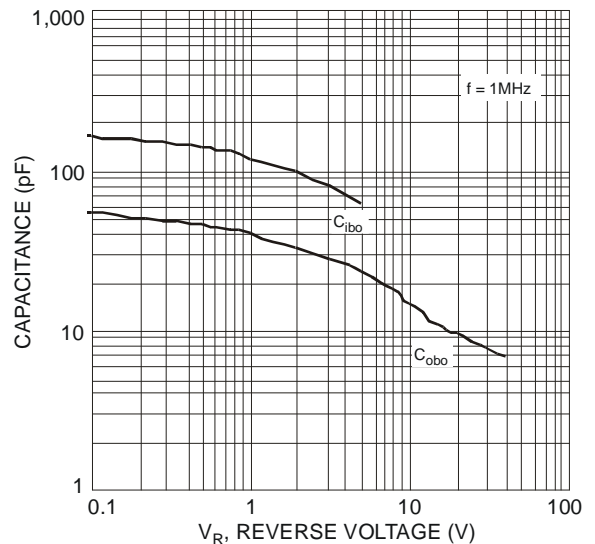


Figure 6 Typical Capacitance Characteristics

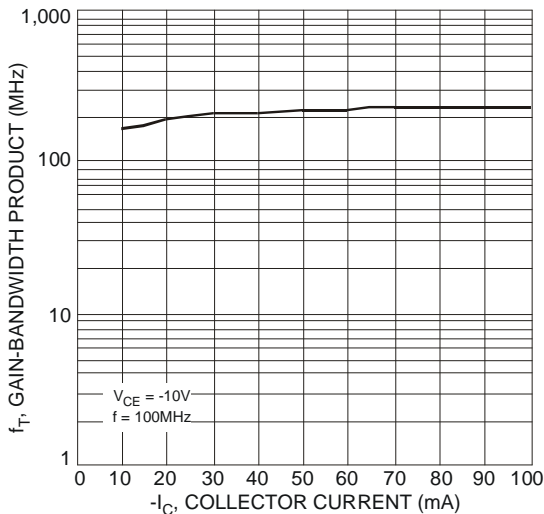
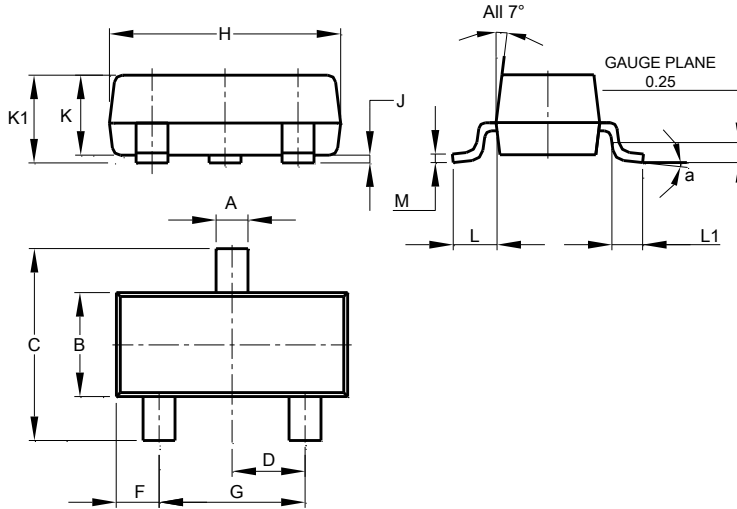


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

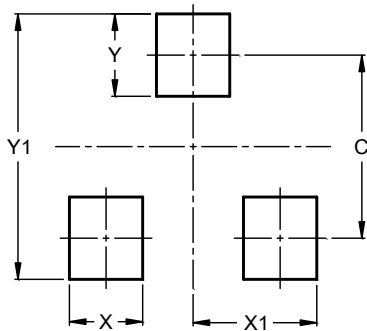


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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