DSS5240TQ

40V PNP LOW SATURATION TRANSISTOR IN SOT23

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
- $R_{CE(sat)}$ = 90mΩ 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/

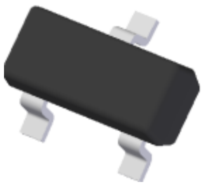
Mechanical Data

- Package: SOT23
- Package 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 ⓔ3
- Weight 0.008 grams (Approximate)

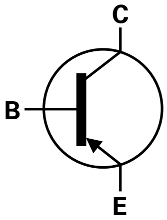
Application

- Gate driving MOSFETs and IGBTs
- Load switches
- DC-DC converters
- Battery charging

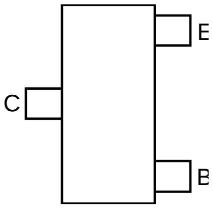
SOT23



Top View



Device Symbol



Top View
Pin-Out

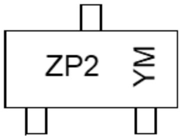
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DSS5240TQ-7	SOT23	ZP2	7	8	3000	Reel

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

SOT23



ZP2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: M = 2025)
M = Month (ex: 9 = September)

Date Code Key

Year	2019	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	G	-	M	N	P	R	S	T	U	V	W	X

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 5)	P_D	730	mW
Power Dissipation (Note 6)	P_D	600	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	171	°C/W
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	209	°C/W
Thermal Resistance, Junction to Lead (Note 7)	$R_{\theta JL}$	75	°C/W
Thermal Resistance, Junction to Case (Note 8)	$R_{\theta JC}$	51	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

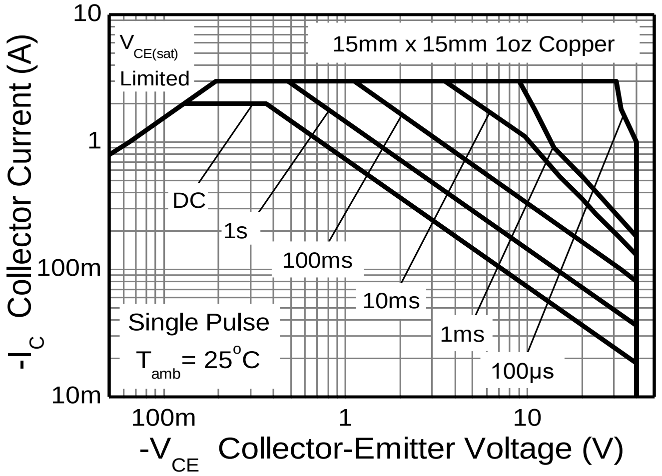
ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge — Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge — Machine Model	ESD MM	400	V	C
Electrostatic Discharge — Charged Device Model	ESD CDM	1,000	V	IV

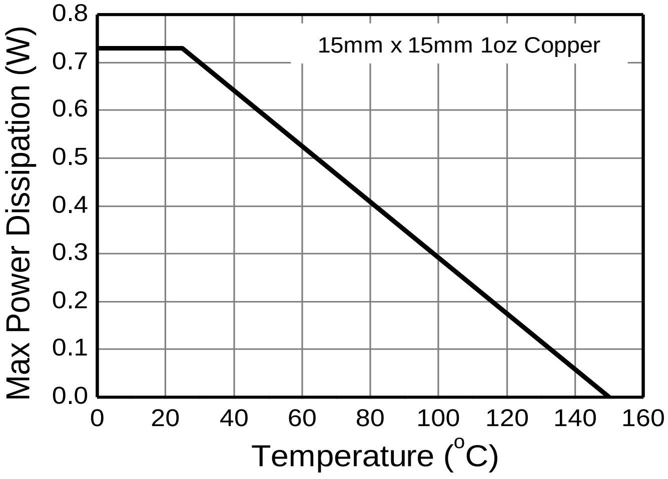
Notes:

5. For a device mounted with the collector lead on 15mm × 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. Thermal resistance from junction to the top of the case.
9. Refer to JEDEC specification JESD22-A114, JESD22-A115 and JESD22-C101.

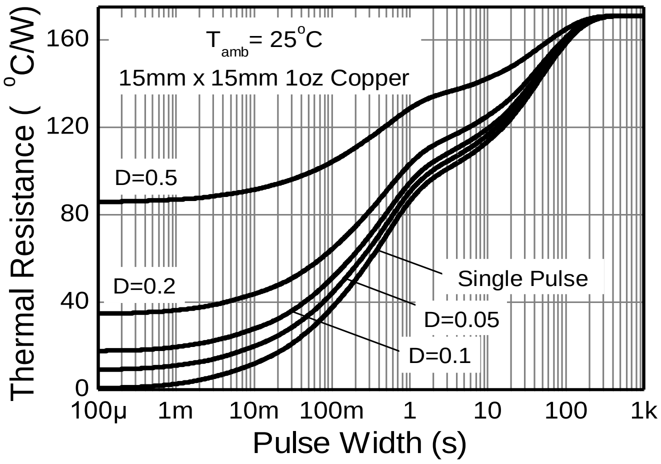
Thermal Characteristics and Derating Information



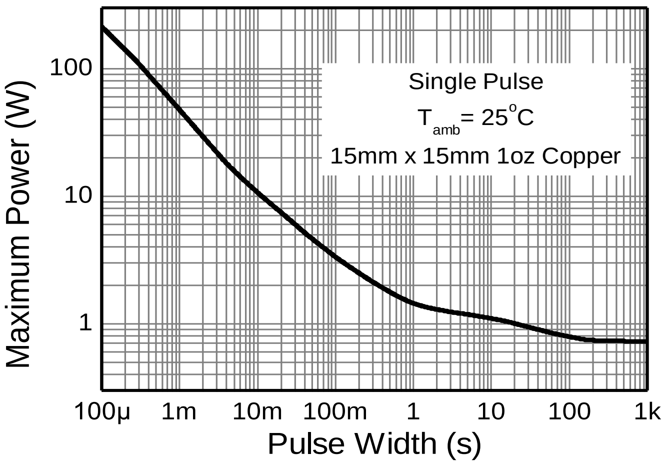
Safe Operating Area



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 10)	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 10)						
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_{obo}	—	—	28	pF	V_{CB} = -10V, f = 1MHz

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

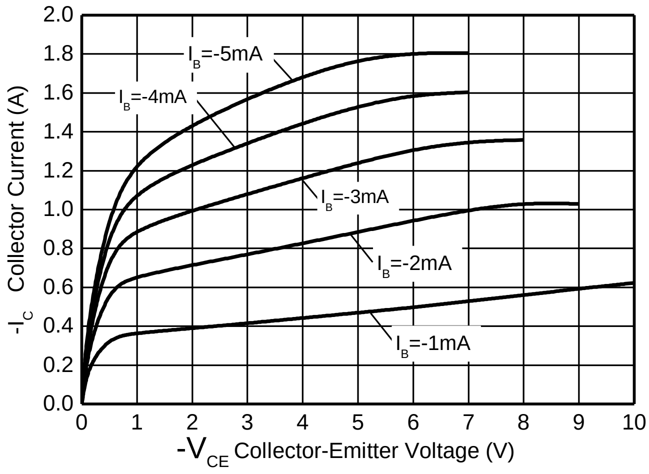


Fig. 5 I_C v V_{CE}

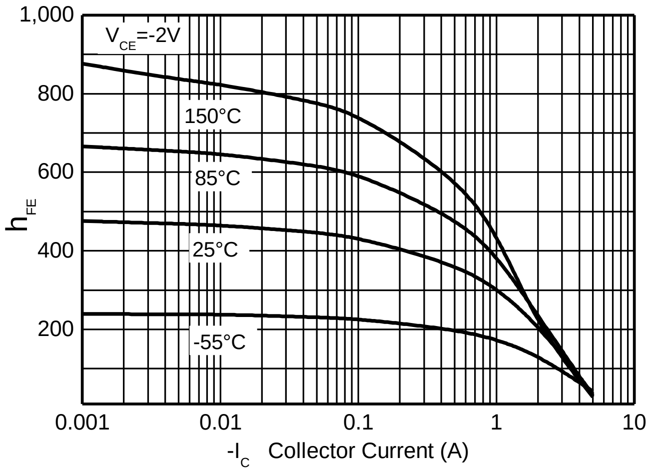


Fig. 6 h_{FE} v I_C

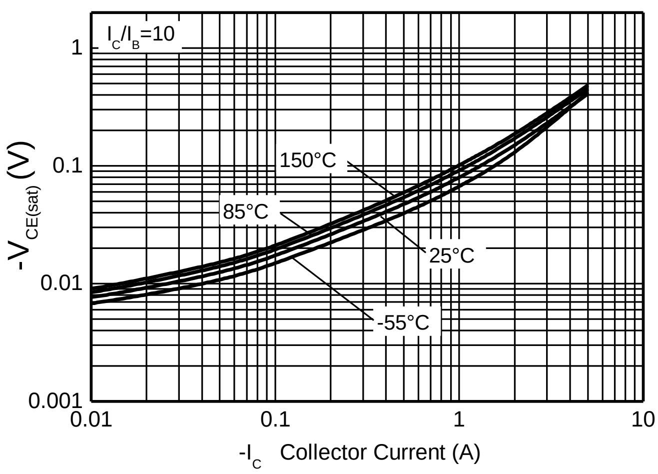


Fig. 7 $V_{CE(sat)}$ v I_C

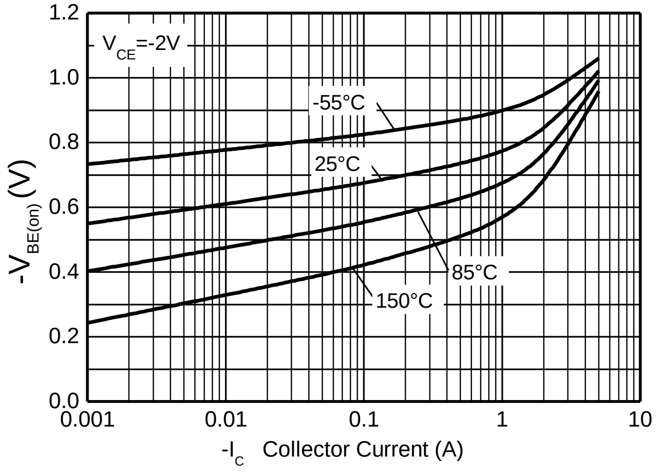


Fig. 8 $V_{BE(on)}$ v I_C

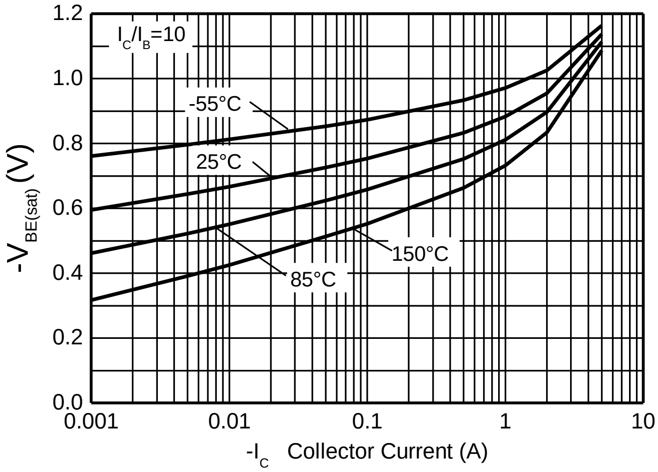


Fig. 9 $V_{BE(sat)}$ v I_C

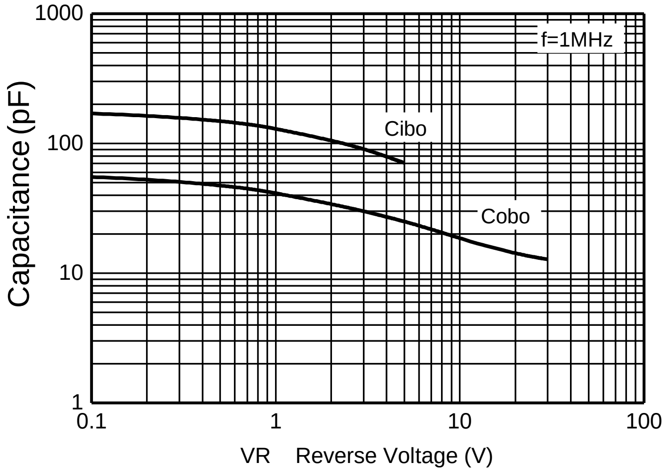
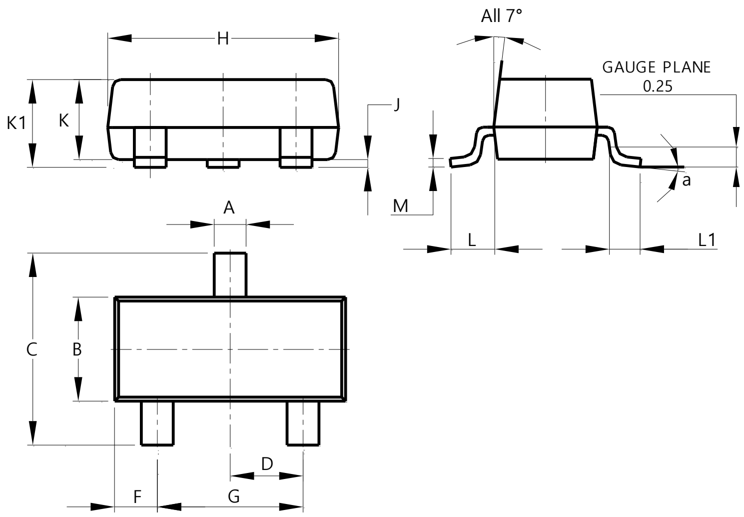


Fig. 10 Typical Junction Capacitance

Package Outline Dimensions

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

SOT23

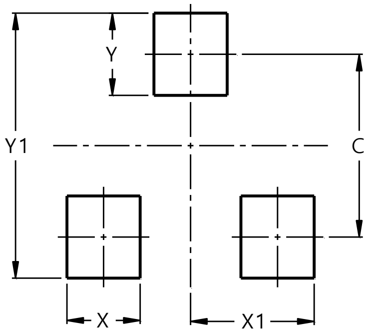


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	—
All Dimensions in mm			

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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