Lead-free Green

450V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
-450V	150Ω @ V_{GS} = -10V	-0.1A

Features and Benefits

- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Description and Applications

This 450V enhancement mode p-channel MOSFET provides users with a competitive specification offering efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of telecom and general high-voltage switching circuits.

- Load switching
- Uninterrupted power supplies

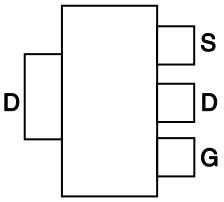
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

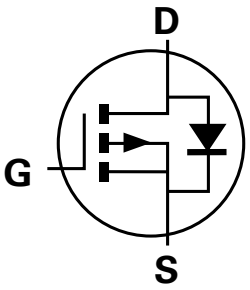
SOT223



Top View



Pinout - Top View



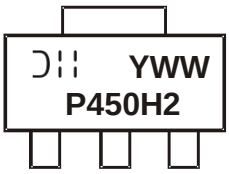
Equivalent Circuit

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMP45H150DHE-13	SOT223	2,500	Tape & 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



= Manufacturer's Marking
P450H2 = Product Type Marking Code
YWW = Date Code Marking
Y = Year (ex: 5 = 2025)
WW = Week (01 to 53)

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-450	V
Gate-Source Voltage		V_{GSS}	±30	V
Continuous Drain Current (Note 5) V_{GS} = -10V	T_A = +25°C T_A = +70°C	I_D	-0.1 -0.077	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	-0.45	A
Maximum Body Diode Continuous Current		I_S	-0.1	A
Avalanche Energy, L = 60mH		E_{AS}	2	mJ
Avalanche Current, L = 60mH		I_{AS}	0.25	A
Peak Diode Recovery dv/dt (I_{SD} ≤ 1.0A, di/dt ≤ 100A/µs)		dv/dt	4.5	V/ns

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	2.1	W
	T_A = +70°C		1.35	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	59.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	-450	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -450V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±30V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(TH)}$	-2.0	-3.0	-4.0	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	40	150	Ω	V_{GS} = -10V, I_D = -50mA
Diode Forward Voltage	V_{SD}	—	-0.8	-1.2	V	V_{GS} = 0V, I_S = -50mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	59.2	—	pF	V_{DS} = -25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	11	—		
Reverse Transfer Capacitance	C_{rss}	—	1	—		
Forward Transconductance	g_{FS}	40	—	—	ms	V_{DS} = -25V, I_D = -50mA
Gate Resistance	R_G	—	50	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q_g	—	1.8	—	nC	V_{DS} = -225V, I_D = -100mA V_{GS} = -10V
Gate-Source Charge	Q_{gs}	—	0.3	—		
Gate-Drain Charge	Q_{gd}	—	0.9	—		
Turn-On Delay Time	$t_{D(ON)}$	—	12	—	ns	V_{DD} = -225V, R_G = 3.0Ω I_D = -100mA
Turn-On Rise Time	t_R	—	9	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	19	—		
Turn-Off Fall Time	t_F	—	87	—		
Body Diode Reverse-Recovery Time	t_{RR}	—	108	—	ns	V_{GS} = 0V, I_S = -1A, V_{DD} = -100V di/dt = 100A/µs
Body Diode Reverse-Recovery Charge	Q_{rr}	—	391	—	nC	V_{GS} = 0V, I_S = -1A, V_{DD} = -100V di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

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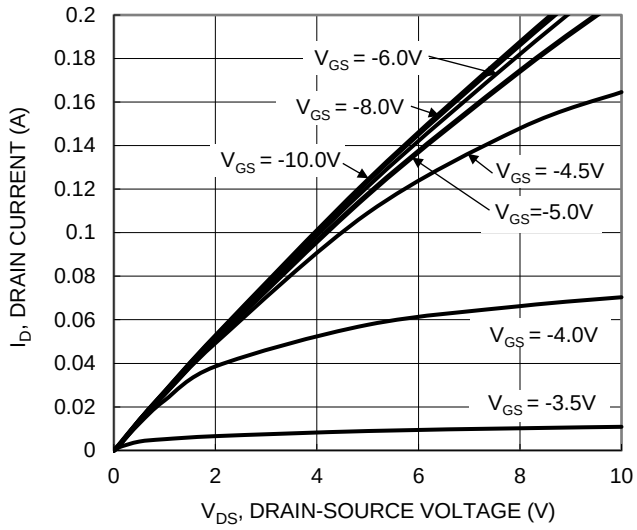


Figure 1.Typical Output Characteristic

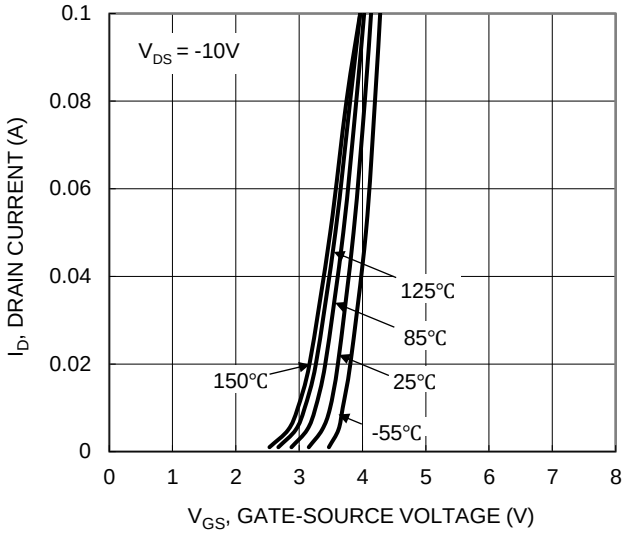


Figure 2. Typical Transfer Characteristic

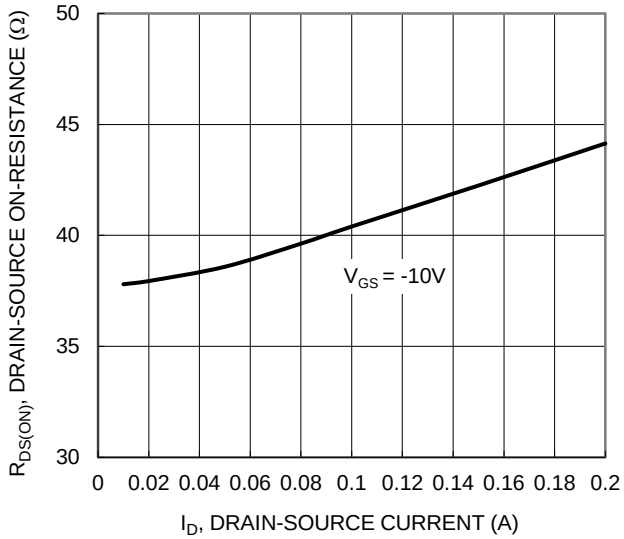


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

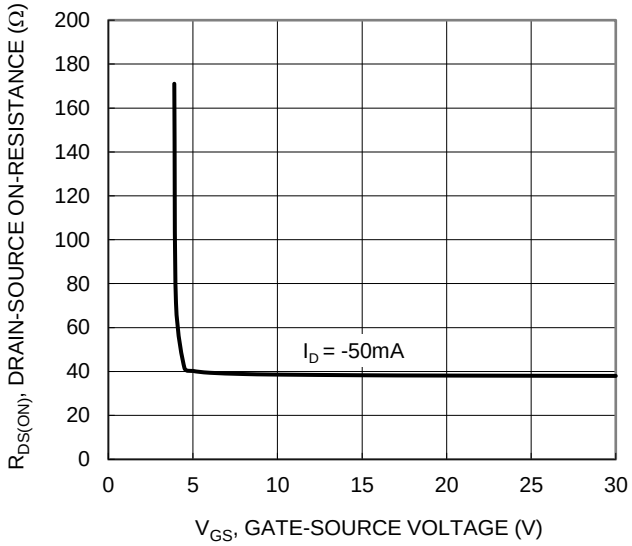


Figure 4. Typical Transfer Characteristic

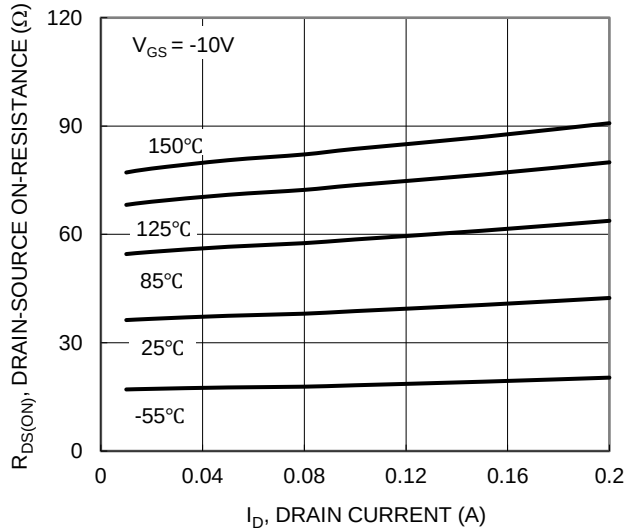


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

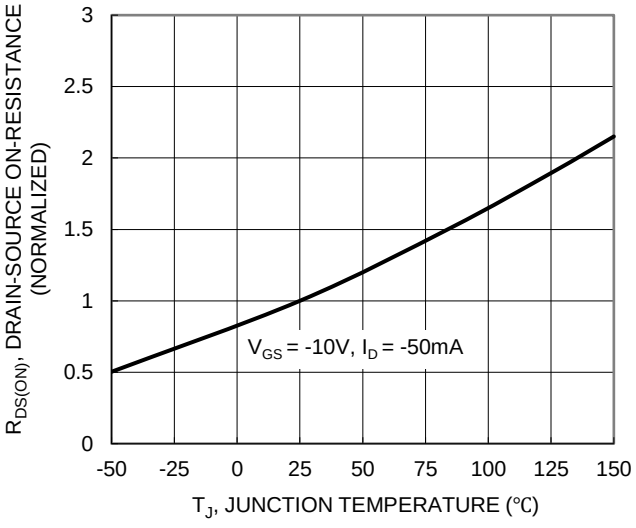


Figure 6. On-Resistance Variation with Temperature

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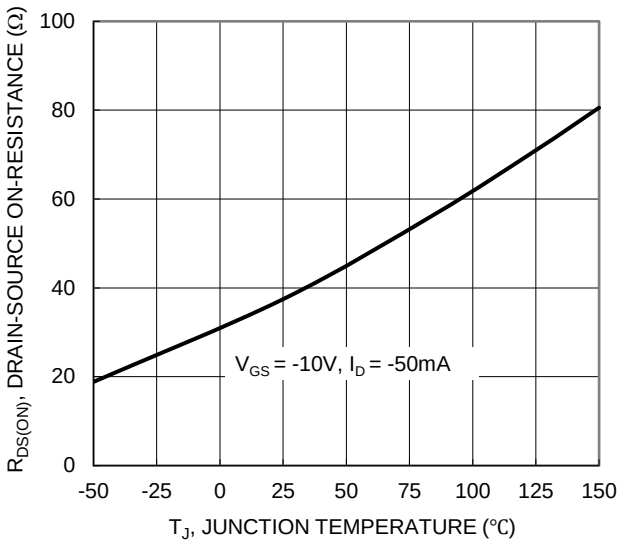


Figure 7. On-Resistance Variation with Temperature

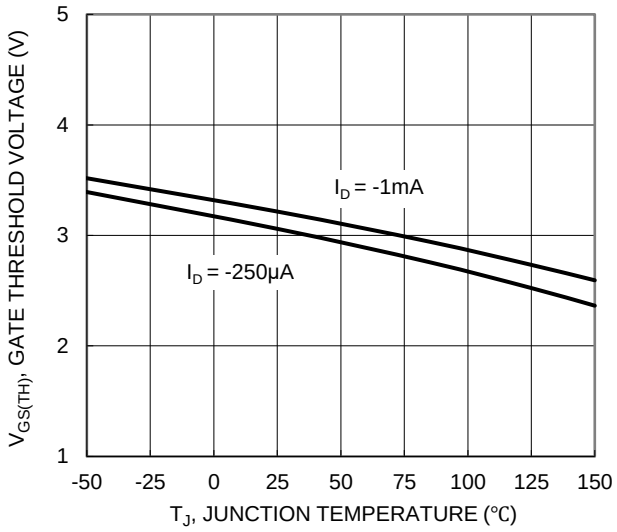


Figure 8. Gate Threshold Variation vs. Junction Temperature

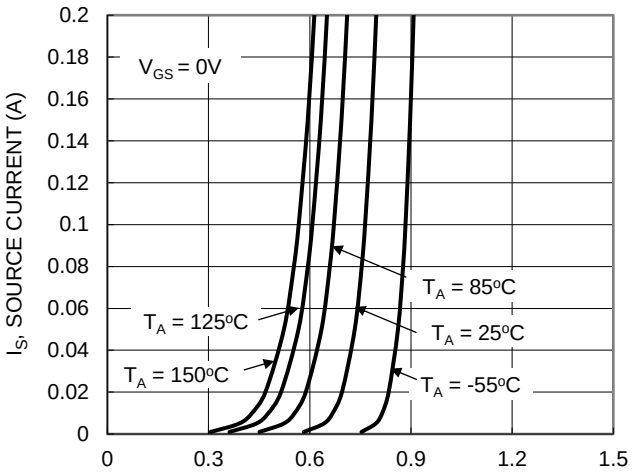


Figure 9. Diode Forward Voltage vs. Current

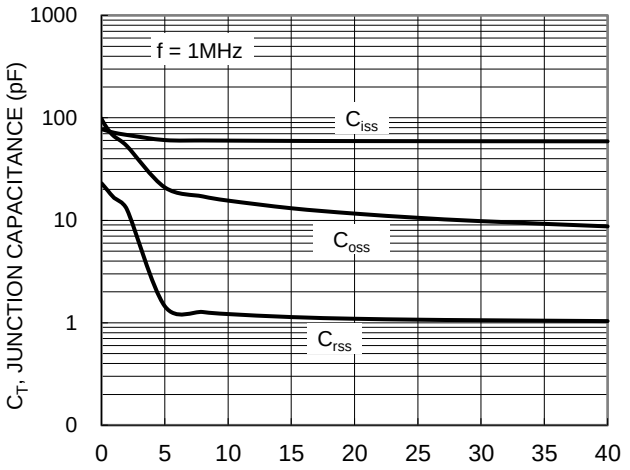


Figure 10. Typical Junction Capacitance

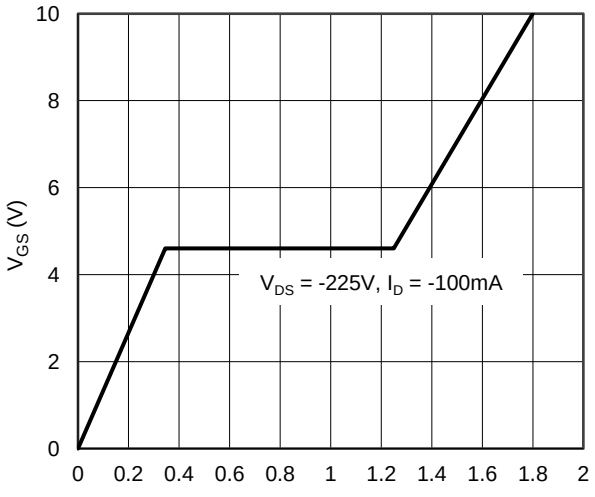


Figure 11. Gate Charge

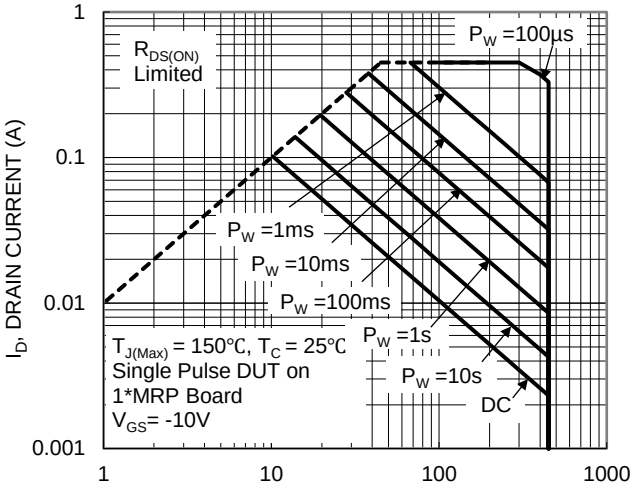


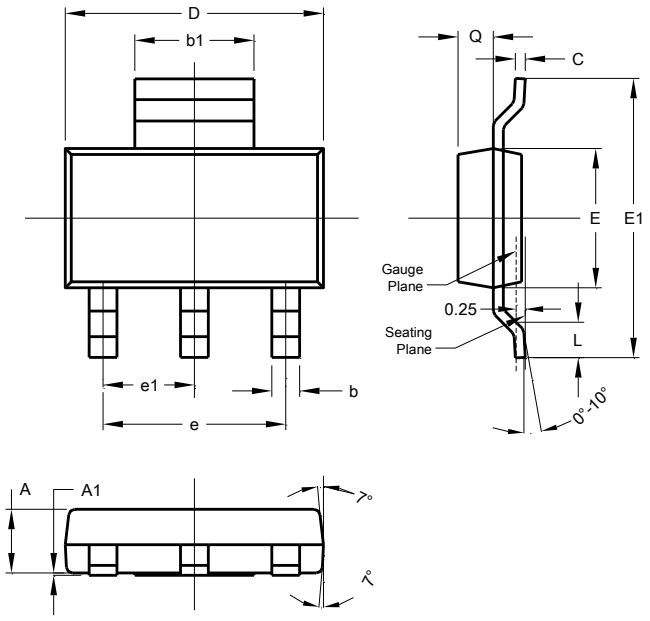
Figure 12. SOA, Safe Operation Area

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Package Outline Dimensions

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

SOT223

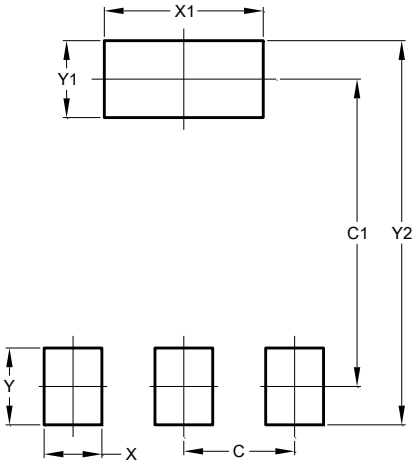


SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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