P-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

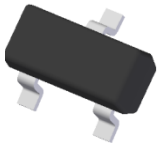
Features

- Low On-Resistance:
  - $R_{DS(ON)}$ < 100mΩ @ V_{GS} = -4.5V, I_D = -2.7A
  - $R_{DS(ON)}$ < 215mΩ @ V_{GS} = -2.5V, I_D = -2.0A
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

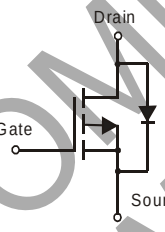
Mechanical Data

- 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 Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

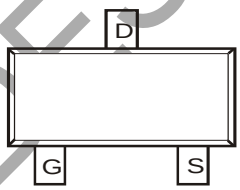
SOT23 (Standard)



TOP VIEW



EQUIVALENT CIRCUIT



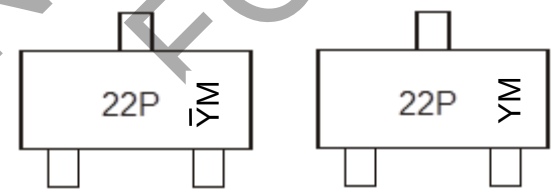
TOP VIEW

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2215L-7	SOT23 (Standard)	3000/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



Chengdu A/T Site **Shanghai A/T Site**

22P = Product Type Marking Code
$\overline{Y}$M = Date Code Marking for SAT (Shanghai Assembly/ Test Site)
YM = Date Code Marking for CAT (Chengdu Assembly/ Test Site)
Y or $\overline{Y}$ = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2007	…	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	U	…	I	J	K	L	M	N	O	P	R	S

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

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Drain Current (Note 5)	Steady State	T_A = +25°C T_A = +70°C	I_D	-2.7 -2	A
Pulsed Drain Current (Note 6)			I_{DM}	-8	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	1.08	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	115	°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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-800	nA	V_{DS} = -20V, V_{GS} = 0V
On-State Drain Current	$I_{D(ON)}$	-6	—	—	A	V_{DS} ≤ -5V, V_{GS} = -4.5V
		-3	—	—		V_{DS} ≤ -5V, V_{GS} = -2.5V
Gate-Source Leakage	I_{GSS}	—	—	±80	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.45	—	-1.25	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	80 165	100 215	mΩ	V_{GS} = -4.5V, I_D = -2.7A V_{GS} = -2.5V, I_D = -2.0A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	4	—	S	V_{DS} = -5V, I_D = -2.7A
Diode Forward Voltage (Note 7)	V_{SD}	—	—	-1.26	V	V_{GS} = 0V, I_S = -2.7A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	250	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	88	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	58	—	pF	
Gate Resistance	R_g	—	12	16	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	4.3	5.3	nC	V_{GS} = -4.5V, V_{DS} = -10V, I_D = -2.7A
Gate-Source Charge	Q_{gs}	—	0.9	—		
Gate-Drain Charge	Q_{gd}	—	2.1	—		

Notes: 5. Device mounted on FR-4 PCB. t ≤5 sec.
6. Pulse width ≤10µS, Duty Cycle ≤1%.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

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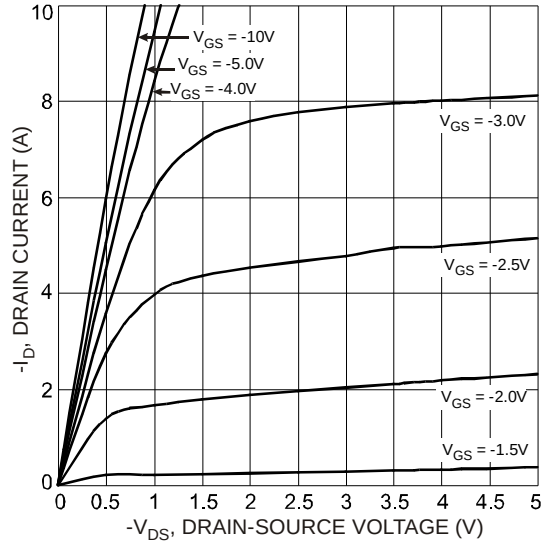


Fig. 1 Typical Output Characteristics

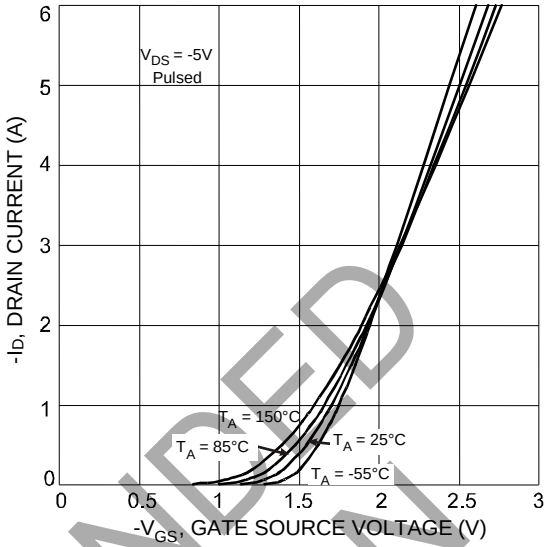


Fig. 2 Typical Transfer Characteristics

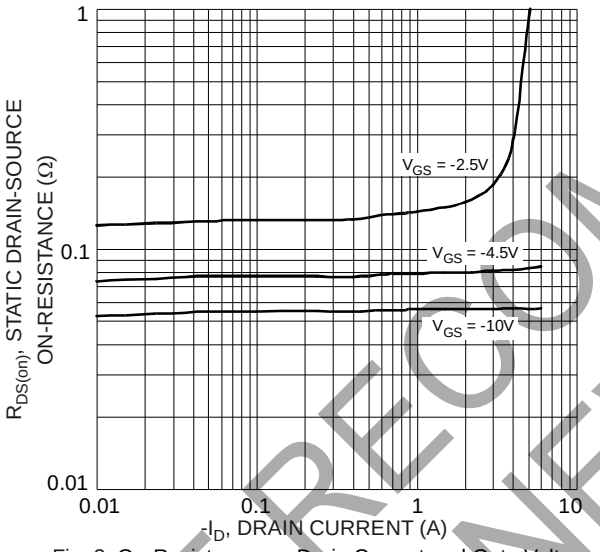


Fig. 3 On-Resistance vs. Drain Current and Gate Voltage

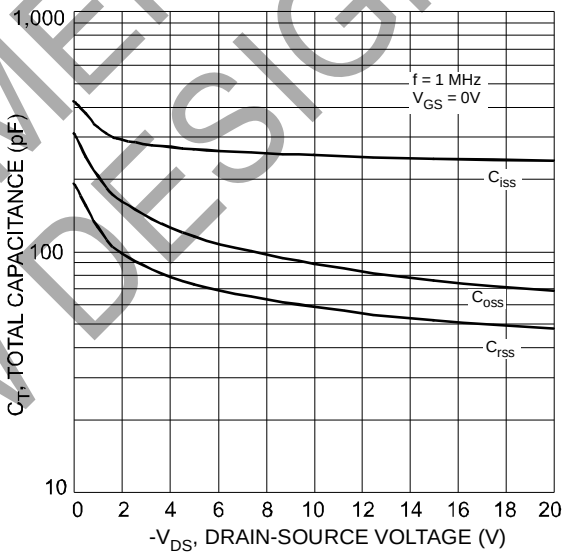


Fig. 4 Typical Total Capacitance

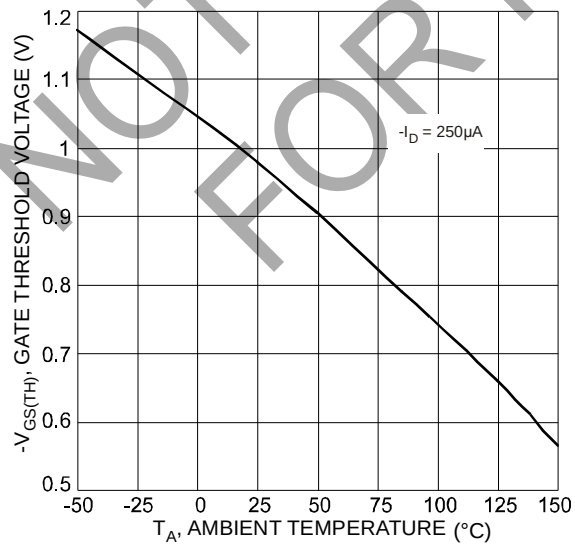


Fig. 5 Gate Threshold Voltage vs. Ambient Temperature

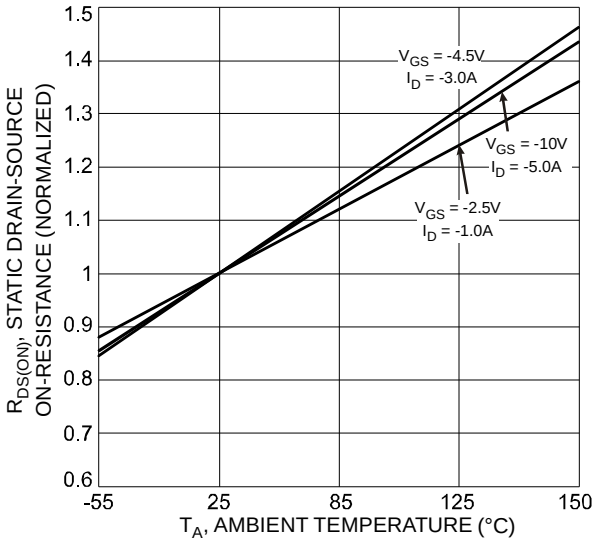


Fig. 6 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

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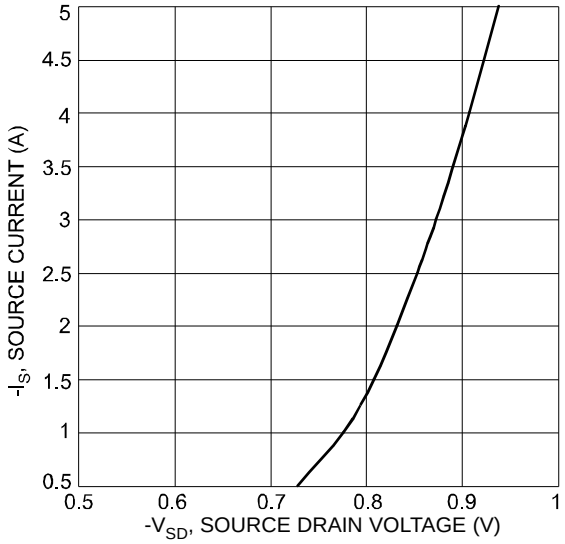


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

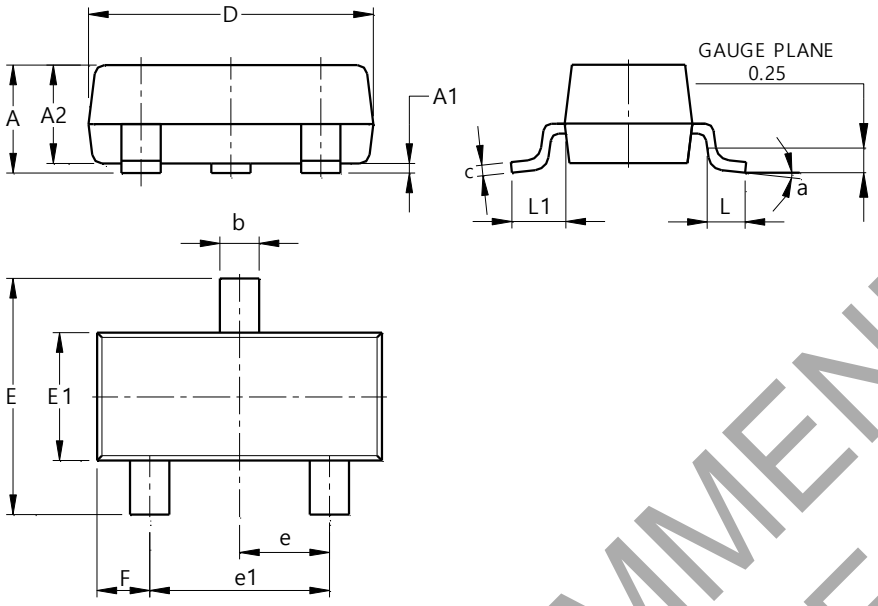
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Package Outline Dimensions

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SOT23 (Standard)



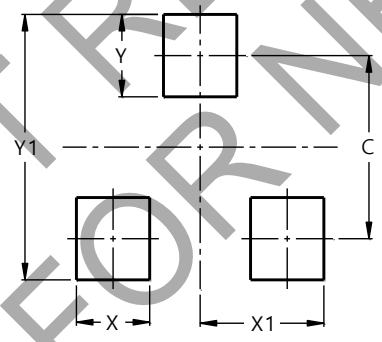
SOT23 (Standard)			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

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Suggested Pad Layout

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

SOT23 (Standard)



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

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