

## Features

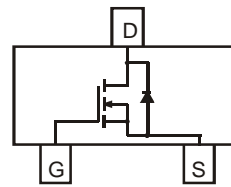
- Low On-Resistance
  - 110 mΩ @  $V_{GS} = 4.5V$
  - 145 mΩ @  $V_{GS} = 2.5V$
  - 230 mΩ @  $V_{GS} = 1.8V$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 1, 2 and 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## 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
- Terminal Connections: See Diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)



Top View

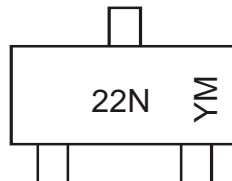

 Top View  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2230U-7	SOT23	3000/Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Product manufactured with Green Molding Compound and does not contain Halogens or  $Sb_2O_3$  Fire Retardants.
  4. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



22N = Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: U = 2007)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	U	V	W	X	Y	Z	A	B	C	D	E

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

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Units
Drain-Source Voltage	$V_{DSS}$	20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V
Drain Current (Note 5)	$I_D$	2.0	A
Pulsed Drain Current (Note 6)	$I_{DM}$	7	A

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	600	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	208	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	—	—	V	$V_{GS} = 0V, I_D = 10\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 20V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 12V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	—	1.0	V	$V_{DS} = V_{CS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	81	110	m $\Omega$	$V_{GS} = 4.5V, I_D = 2.5A$
			113	145		$V_{GS} = 2.5V, I_D = 1.5A$
			170	230		$V_{GS} = 1.8V, I_D = 1.0A$
Forward Transfer Admittance	$ Y_{fs} $	—	5	—	S	$V_{DS} = 5V, I_D = 2.4A$
Diode Forward Voltage (Note 7)	$V_{SD}$	—	0.8	1.1	V	$V_{GS} = 0V, I_S = 1.05A$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{iss}$	—	188	—	pF	$V_{DS} = 10V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	44	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	30	—	pF	
Total Gate Charge	$Q_g$	—	2.3	—	nC	$V_{DS} = 10V, I_D = 11.6A$
Gate-Source Charge	$Q_{gs}$	—	0.3	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	0.5	—	nC	
Turn-On Delay Time	$t_{d(on)}$	—	8	—	ns	$V_{DD} = 10V, R_L = 10\Omega$ $I_D = 1A, V_{GEN} = 4.5V, R_G = 6\Omega$
Rise Time	$t_r$	—	3.8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	19.6	—		
Fall Time	$t_f$	—	8.3	—		

- Notes:
- Device mounted on FR-4 PCB, or minimum recommended pad layout
  - Repetitive rating, pulse width limited by junction temperature.
  - Short duration pulse test used to minimize self-heating effect.

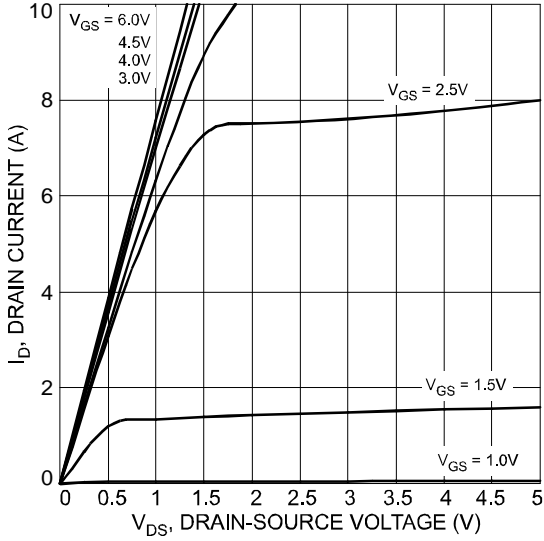


Fig. 1 Typical Output Characteristic

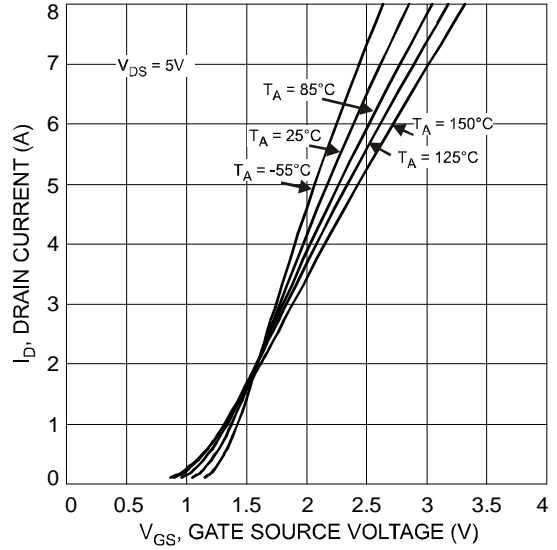


Fig. 2 Typical Transfer Characteristics

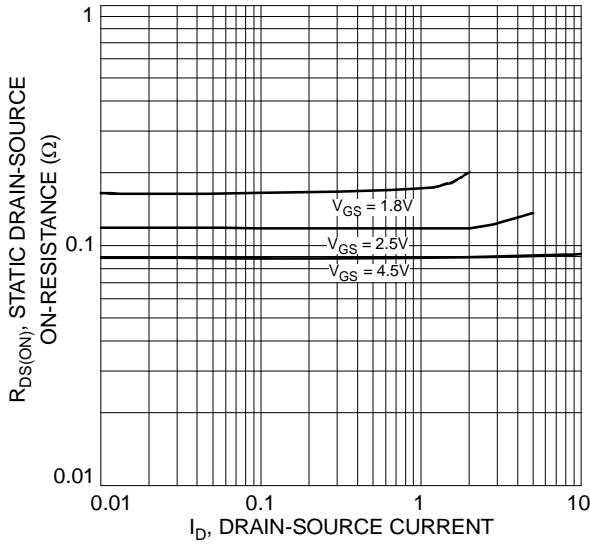


Fig. 3 On-Resistance vs. Drain-Source Current & Gate Voltage

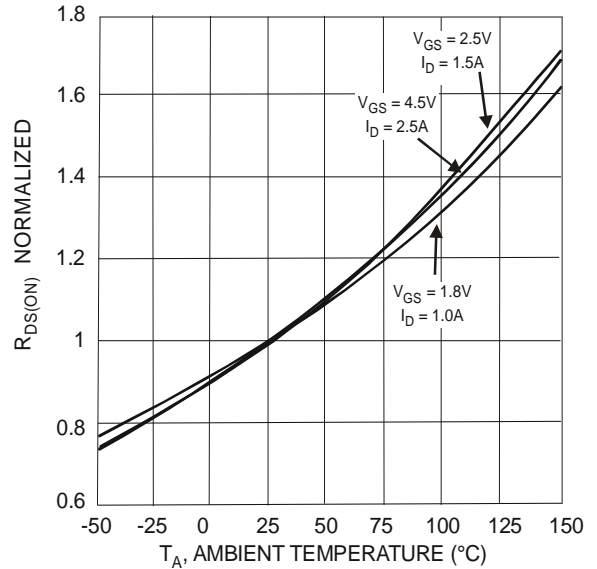


Fig. 4 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

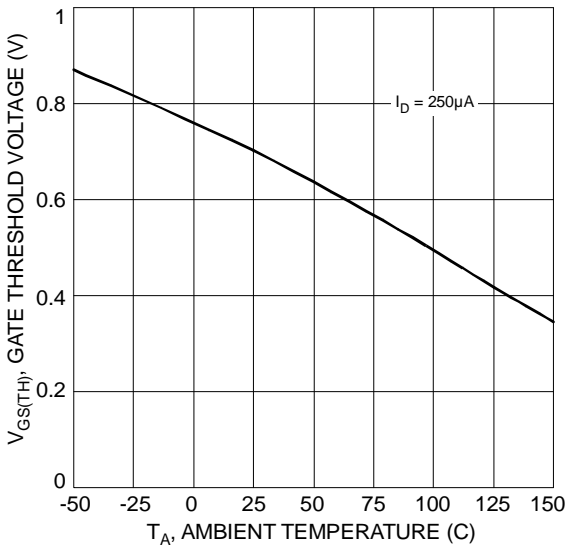


Fig. 5 Gate Threshold Variation with Temperature

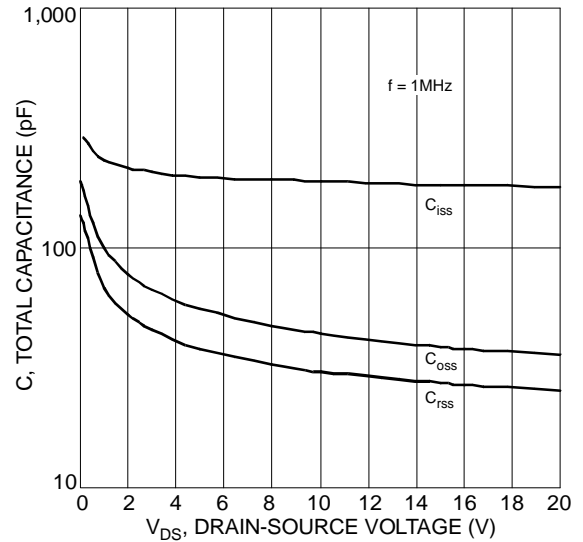


Fig. 6 Typical Total Capacitance

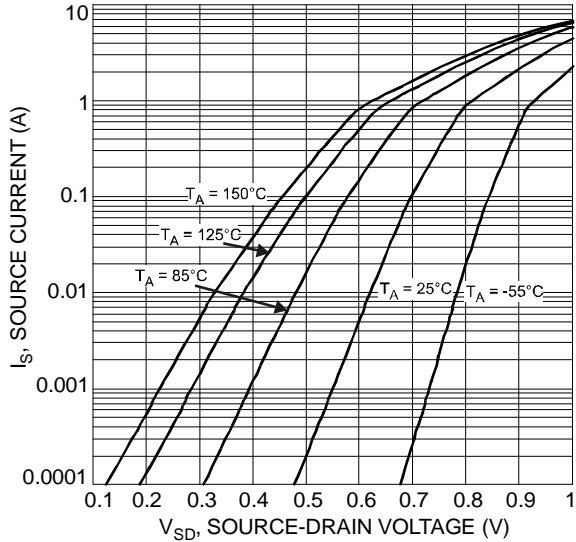


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

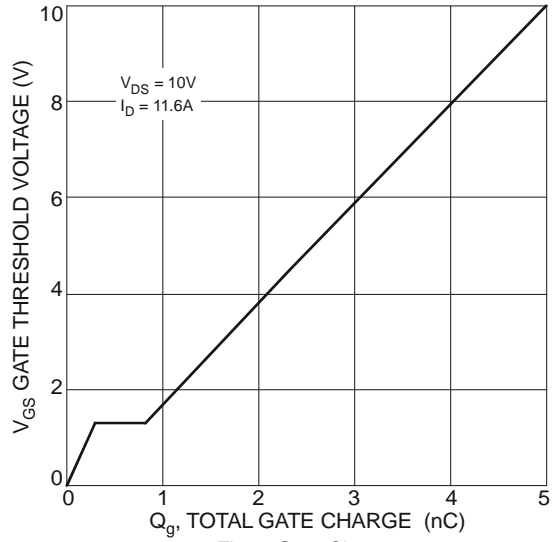


Fig. 8 Gate Charge

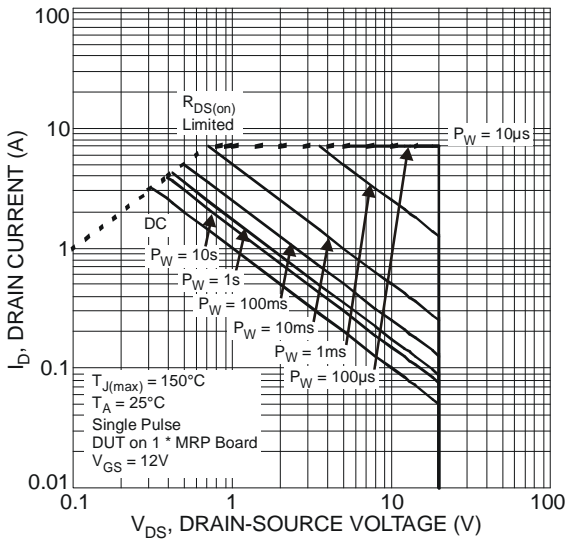
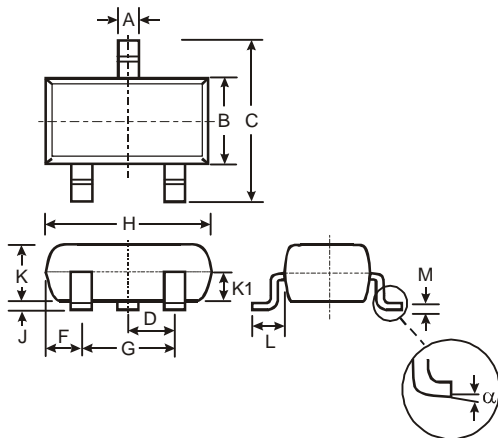


Fig. 9 SOA, Safe Operation Area

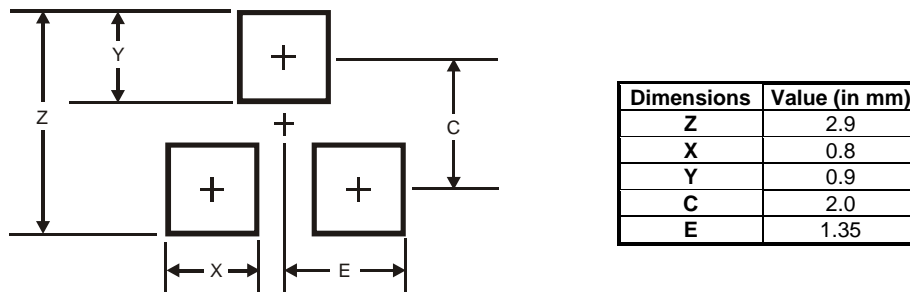
**Package Outline Dimensions**



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
$\alpha$	0°	8°	-

All Dimensions in mm

## Suggested Pad Layout



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