DMN2230U-7 Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DMN2230U-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMN2230U-7
Description	MOSFET N-CH 20V 2A SOT23-3
Detailed Description	N-Channel 20 V 2A (Ta) 600mW (Ta) Surface Mount SOT-23-3

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RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMN2230U-7	Diodes Incorporated
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
20 V	2A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.8V, 4.5V	110mOhm @ 2.5A, 4.5V
Vgs(th) (Max) @ Id:	Vgs (Max):
1V @ 250µA	±12V
Input Capacitance (Ciss) (Max) @ Vds:	FET Feature:
188 pF @ 10 V	-
Power Dissipation (Max):	Operating Temperature:
600mW (Ta)	-55°C ~ 150°C (TJ)
Mounting Type:	Supplier Device Package:
Surface Mount	SOT-23-3
Package / Case:	Base Product Number:
TO-236-3, SC-59, SOT-23-3	DMN2230

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

NOT RECOMMENDED FOR NEW DESIGN
USE DMN2025U

Lead-free Green

DMN2230U

N-CHANNEL ENHANCEMENT MODE MOSFET

Features

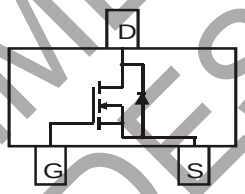
- Low On-Resistance
  - 110mΩ @ V_{GS} = 4.5V
  - 145mΩ @ V_{GS} = 2.5V
  - 230mΩ @ V_{GS} = 1.8V
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
  https://www.diodes.com/quality/product-definitions/
- **An automotive-compliant part is available under separate datasheet (DMN2230UQ)**

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

SOT23

Top View



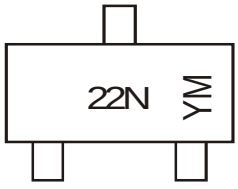
Top View
Internal Schematic

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN2230U-7	SOT23	3,000	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



22N = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: K = 2023)
M = Month (ex: 1 = January)

Date Code Key

Year	2007	…	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	U	…	K	L	M	N	O	P	R	S	T	U

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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±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°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	°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 = 10µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	—	1.0	V	V_{DS} = V_{CS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	81	110	mΩ	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
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	188	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
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 = 10Ω, I_D = 1A, V_{GEN} = 4.5V, R_G = 6Ω
Rise Time	t_r	—	3.8	—		
Turn-Off Delay Time	$t_{d(off)}$	—	19.6	—		
Fall Time	t_f	—	8.3	—		

Notes: 5. Device mounted on FR-4 PCB, or minimum recommended pad layout.
6. Repetitive rating, pulse width limited by junction temperature.
7. Short duration pulse test used to minimize self-heating effect.

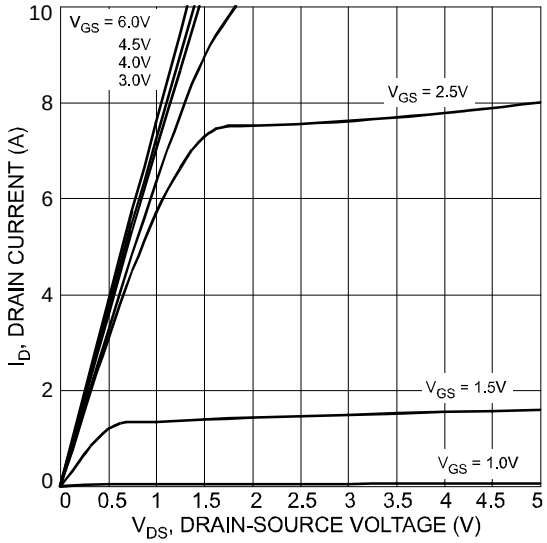


Fig. 1 Typical Output Characteristic

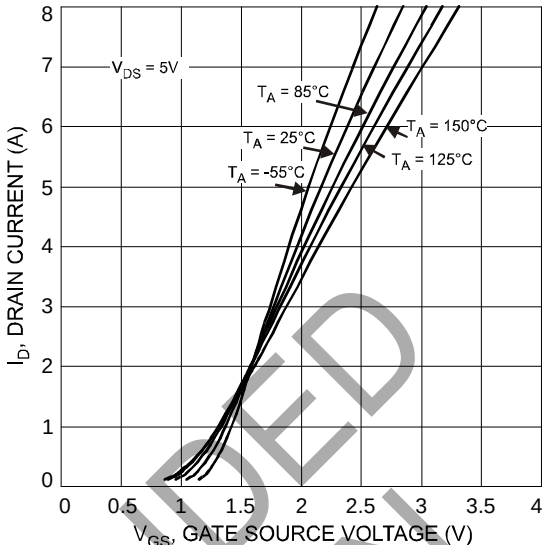


Fig. 2 Typical Transfer Characteristics

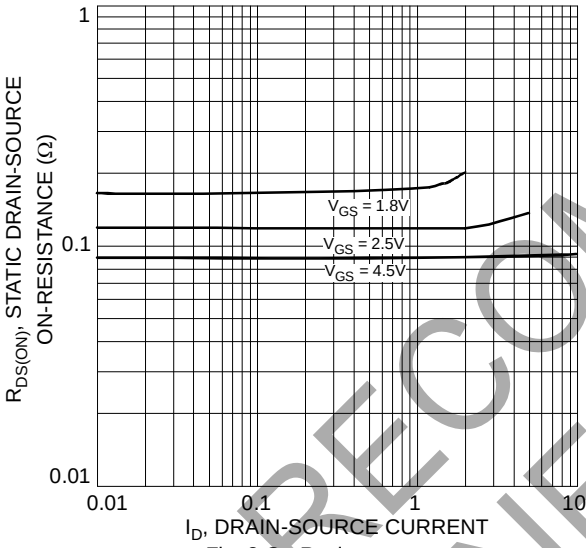


Fig. 3 On-Resistance vs. Drain-Source Current & Gate Voltage

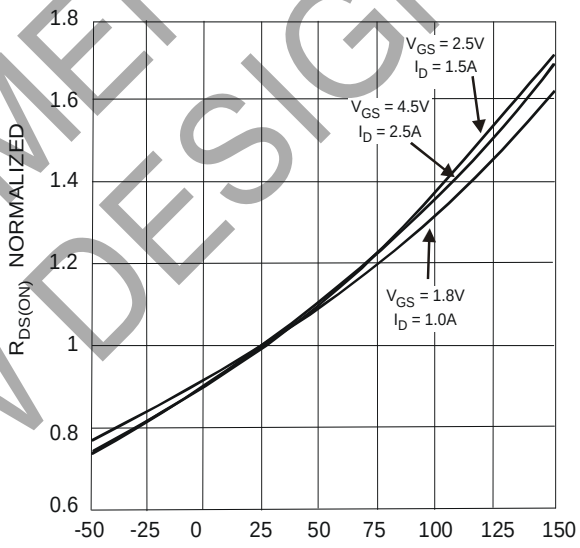


Fig. 4 Normalized Static Drain-Source On-Resistance vs. Ambient Temperature

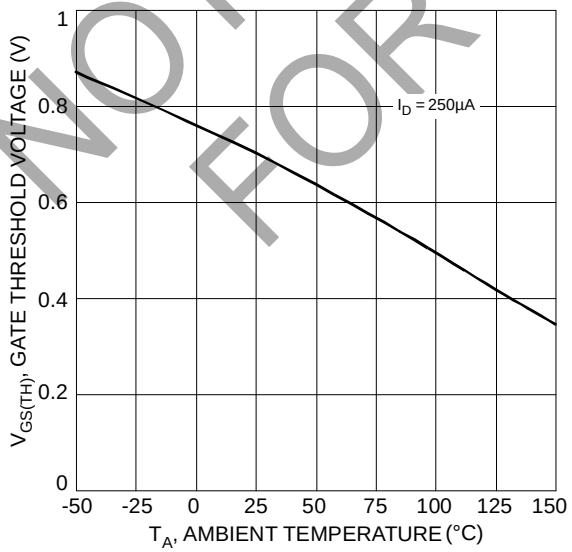


Fig. 5 Gate Threshold Variation with Temperature

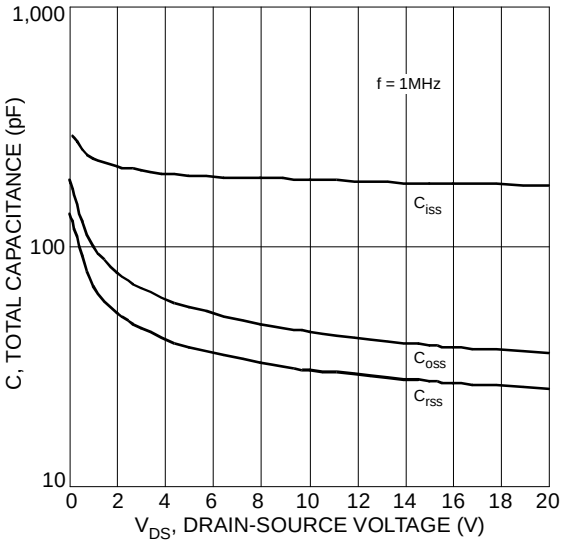


Fig. 6 Typical Total Capacitance

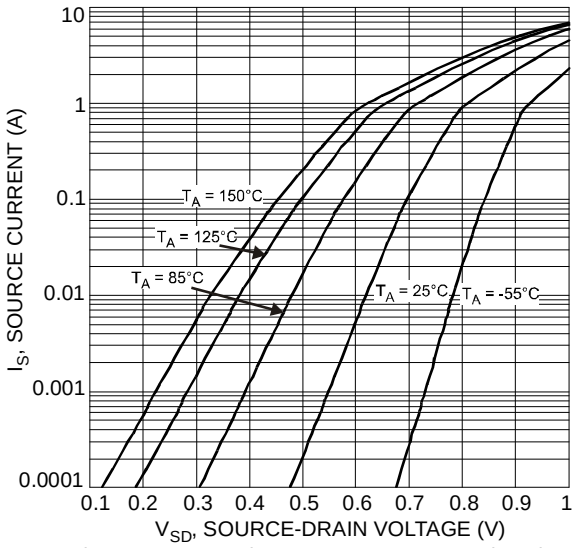


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

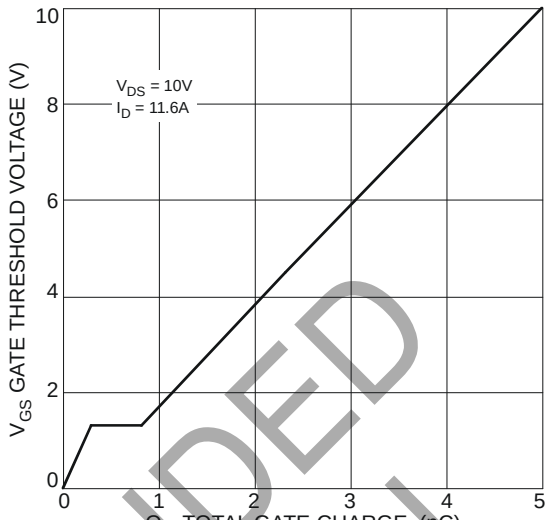


Fig. 8 Gate Charge

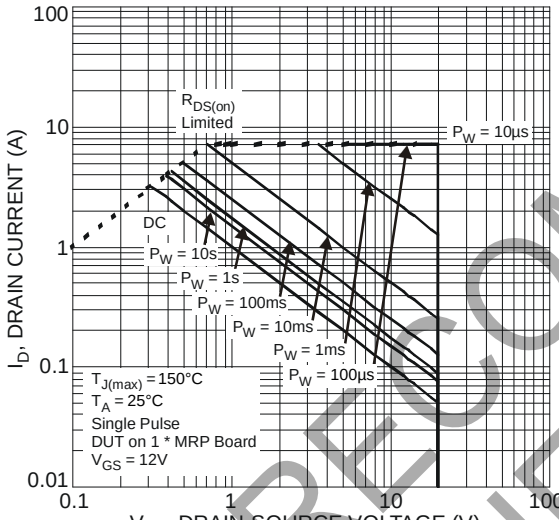
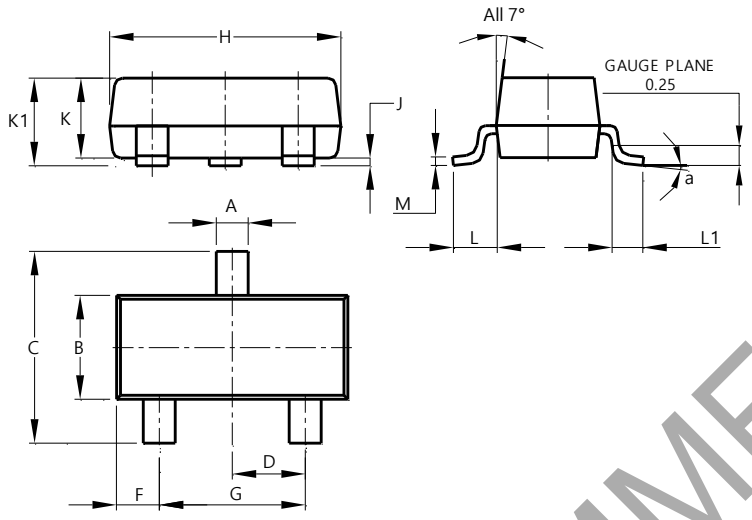


Fig. 9 SOA, Safe Operation Area

Package Outline Dimensions

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

SOT23

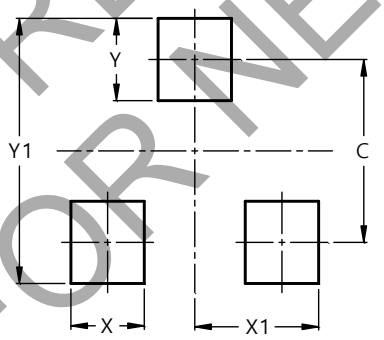


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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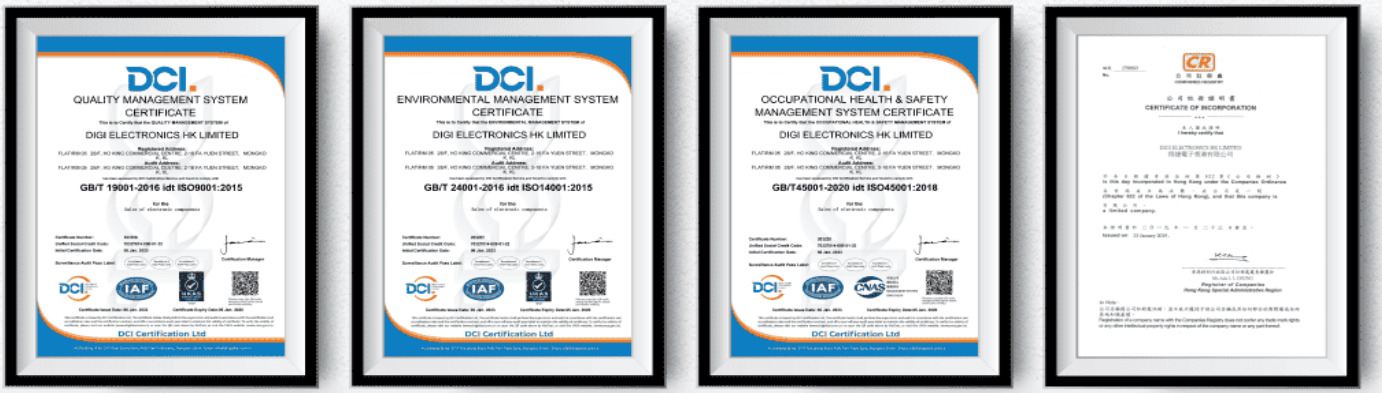

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