DMN3730U

30V N-CHANNEL ENHANCEMENT MODE MOSFET IN SOT23

Product Summary

$V_{(BR)DSS}$	Max $R_{DS(on)}$	I_D Max (Note 5) T_A = 25°C
30V	460mΩ @ V_{GS}= 4.5V	0.94A
	560mΩ @ V_{GS}= 2.5V	0.85A

Features and Benefits

- Low $V_{GS(th)}$, can be driven directly from a battery
- Low $R_{DS(on)}$
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **ESD Protected Gate 2kV**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Load switch
- Portable applications
- Power Management Functions

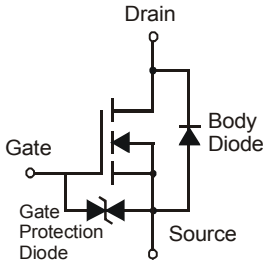
Mechanical Data

- 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.
- Weight: 0.08 grams (approximate)

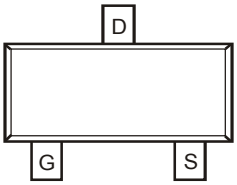
ESD PROTECTED TO 2kV

SOT23

Top View



Equivalent Circuit



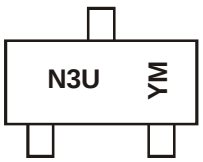
Top View
Pin-Out

Ordering Information (Note 3)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN3730U-7	N3U	7	8	3,000

Notes:
1. No purposefully added lead
2. Diodes Inc's "Green" policy can be found on our website at http://www.diodes.com.
3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



N3U = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: Y = 2011)
M = Month (ex: 9 = September)

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	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°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current	Steady State	T_A = 25°C (Note 5) T_A = 85°C (Note 5) T_A = 25°C (Note 4)	I_D	0.94 0.68 0.75	A
Pulsed Drain Current (Note 6)			I_{DM}	10	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 4)	P_D	0.45	W
	(Note 5)		0.71	W
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	275	°C/W
	(Note 5)		177	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
4. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout
5. Device mounted on 25mm X 25mm square copper plate with FR-4 substrate PC board, 2oz copper
6. Device mounted on minimum recommended pad layout test board, 10µs pulse duty cycle = 1%.

Thermal Characteristics

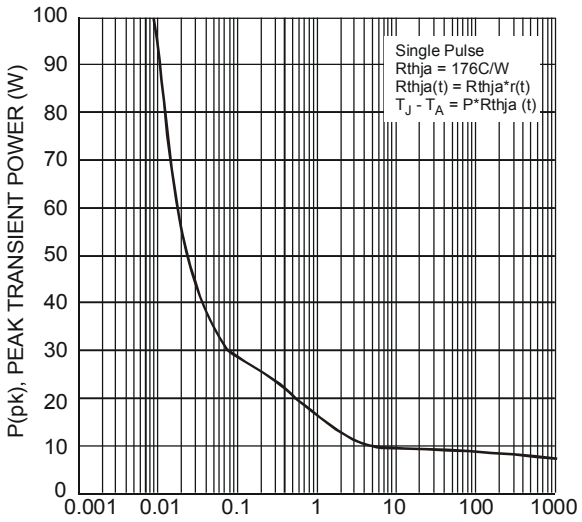


Fig. 1 Single Maximum Power Dissipation

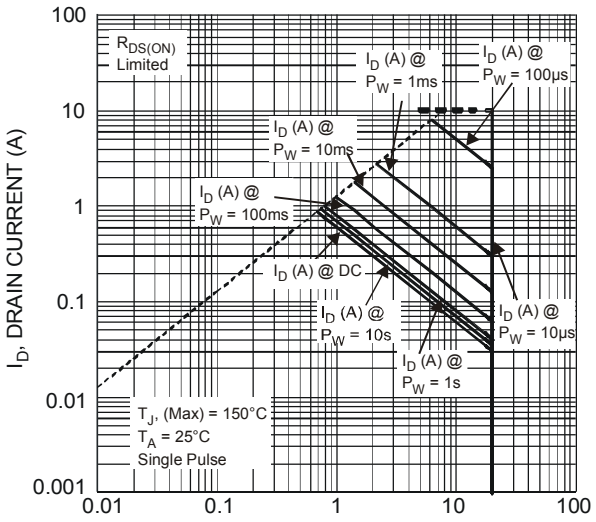


Fig. 2 SOA, Safe Operation Area

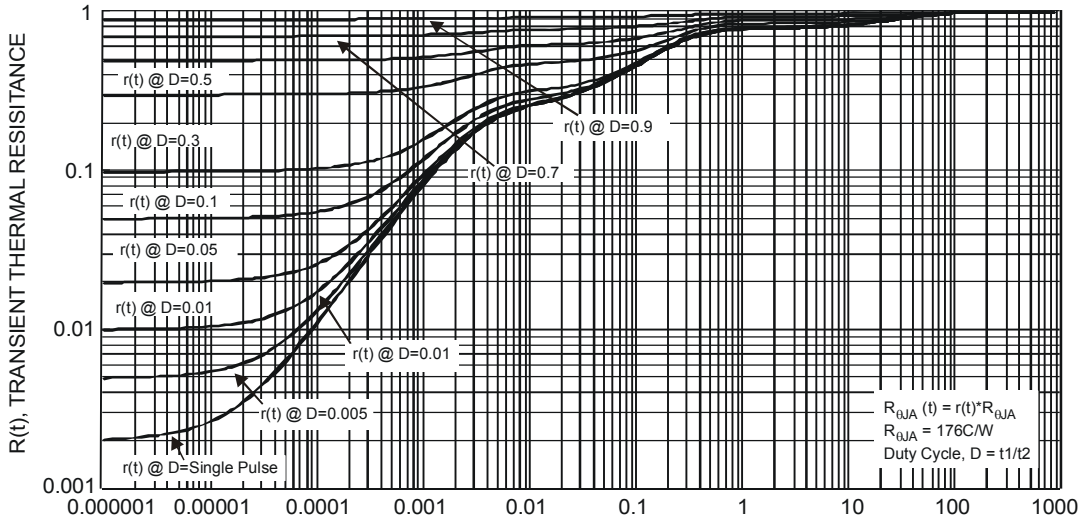


Fig. 3 Transient Thermal Resistance

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS} = 0V, I_D = 10μA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	3	μA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	0.45	-	0.95	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance (Note 7)	$R_{DS(on)}$	-	-	460	mΩ	V_{GS} = 4.5V, I_D = 200mA
				560		V_{GS} = 2.5V, I_D = 100mA
				730		V_{GS} = 1.8V, I_D = 75mA
Forward Transfer Admittance	$\|Y_{fs}\|$	40	-	-	mS	V_{DS} = 3V, I_D = 10mA
Diode Forward Voltage (Note 7)	V_{SD}	-	0.7	1.2	V	V_{GS} = 0V, I_S = 300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	64.3	-	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	6.1	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	4.5	-	pF	
Gate Resistance	R_g	-	70	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	1.6	-	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 1A
Gate-Source Charge	Q_{gs}	-	0.2	-	nC	
Gate-Drain Charge	Q_{gd}	-	0.2	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	3.5	-	ns	V_{DS} = 10V, I_D = 1A V_{GS} = 10V, R_G = 6Ω
Turn-On Rise Time	t_r	-	2.8	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	38	-	ns	
Turn-Off Fall Time	t_f	-	13	-	ns	

Notes: 7. Measured under pulsed conditions to minimize self-heating effect. Pulse width ≤ 300μs; duty cycle ≤ 2%
8. For design aid only, not subject to production testing.

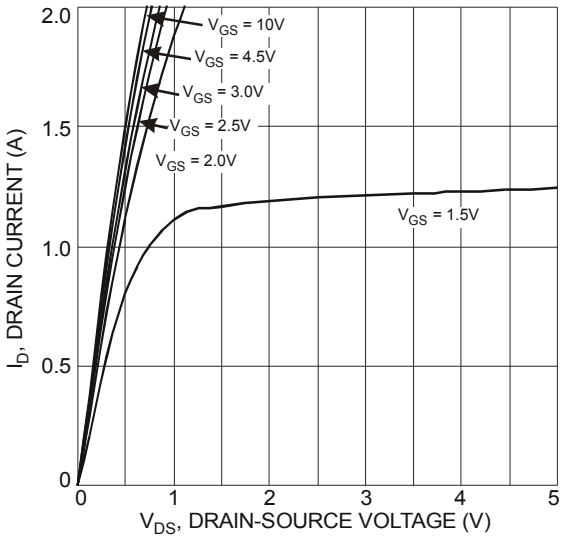


Fig. 4 Typical Output Characteristic

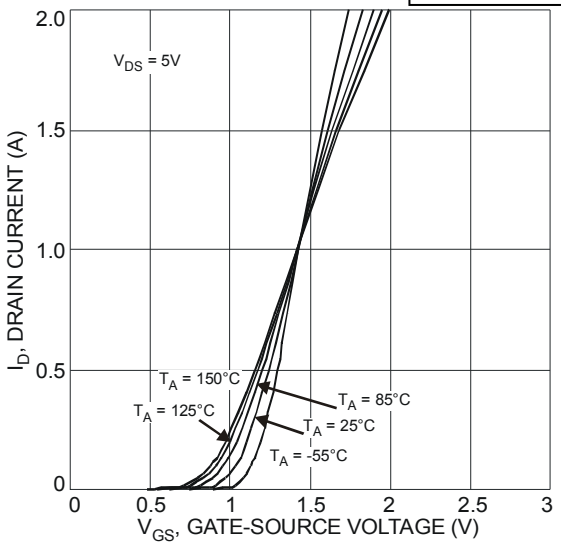


Fig. 5 Typical Transfer Characteristic

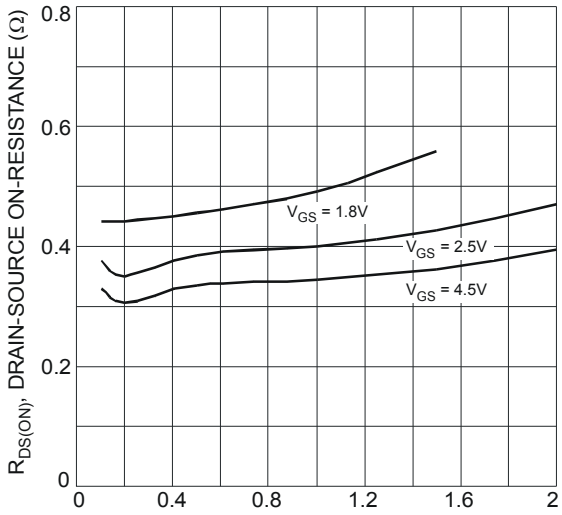


Fig. 6 Typical On-Resistance
vs. Drain Current and Gate Voltage

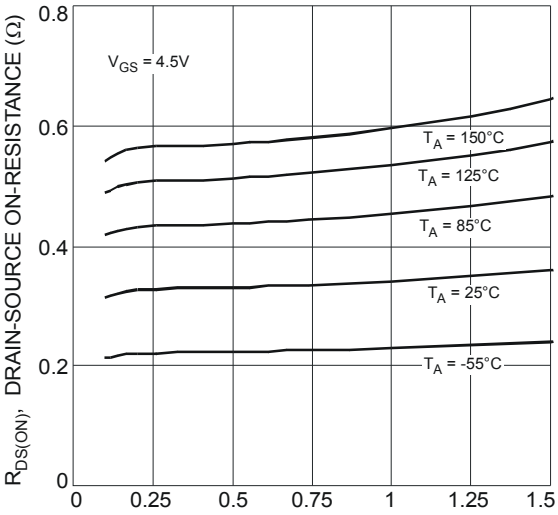


Fig. 7 Typical On-Resistance
vs. Drain Current and Temperature

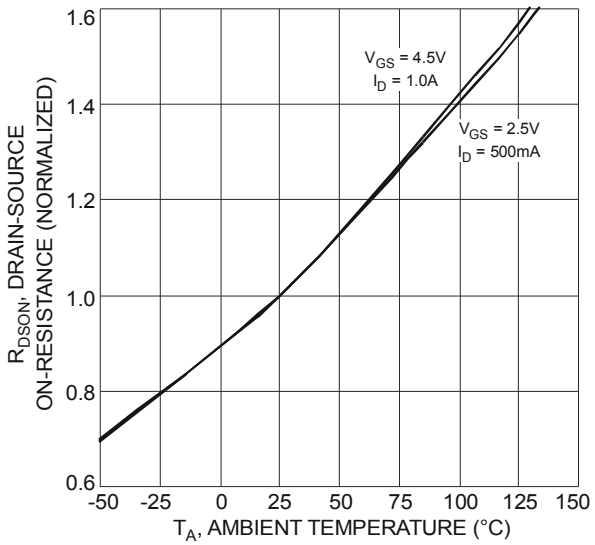


Fig. 8 On-Resistance Variation with Temperature

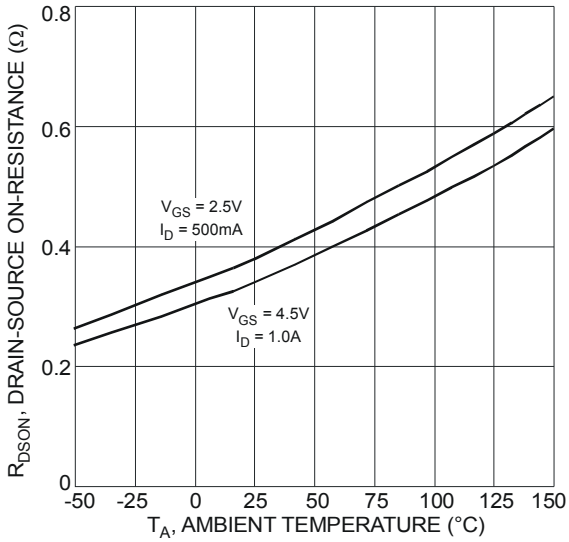


Fig. 9 On-Resistance Variation with Temperature

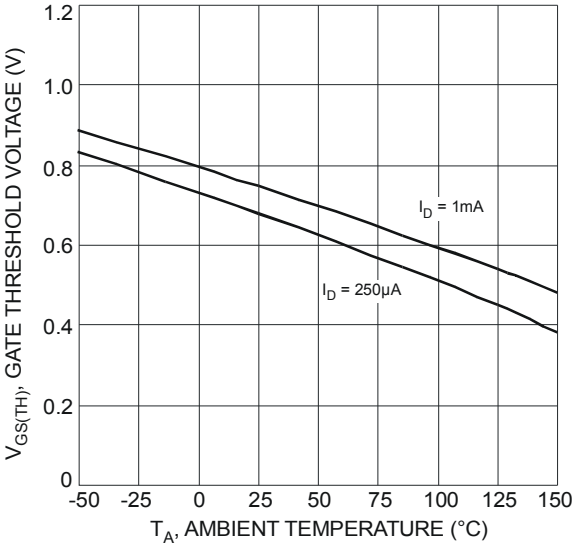


Fig. 10 Gate Threshold Variation vs. Ambient Temperature

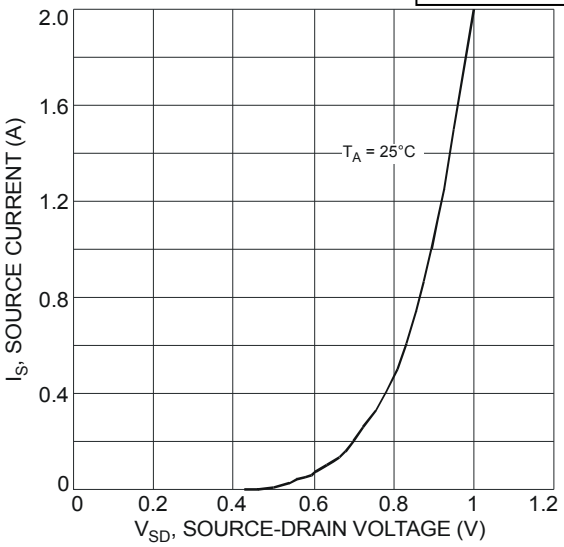


Fig. 11 Diode Forward Voltage vs. Current

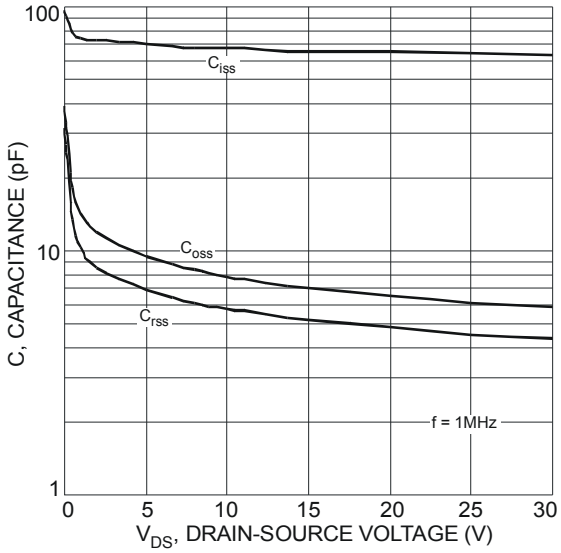


Fig. 12 Typical Total Capacitance

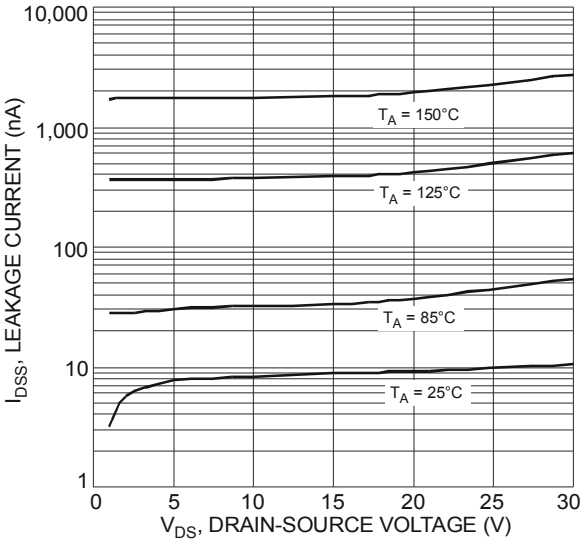


Fig. 13 Typical Leakage Current
vs. Drain-Source Voltage

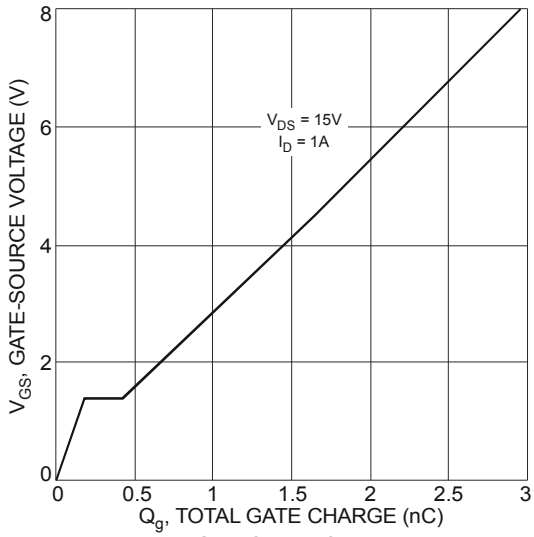
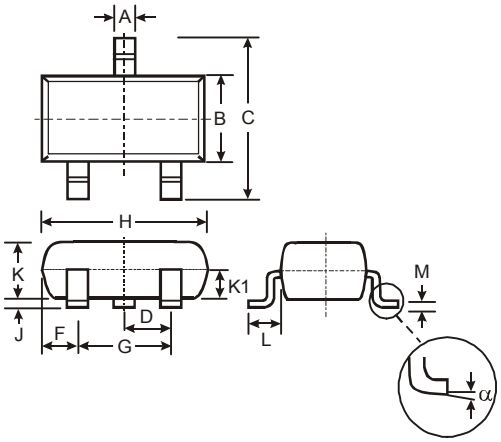


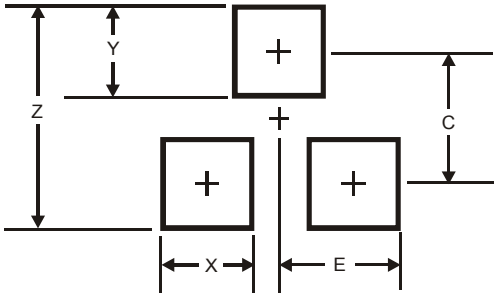
Fig. 14 Gate-Charge Characteristics

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
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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