

N-CHANNEL ENHANCEMENT MODE MOSFET

Features

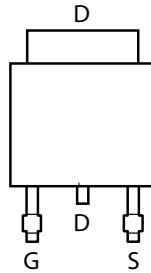
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected**
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

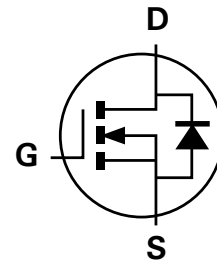
- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.33 grams (approximate)



TOP VIEW



PIN OUT -TOP VIEW



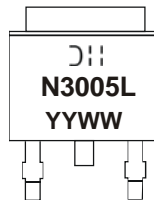
Equivalent Circuit

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN3005LK3-13	TO252-3L	2500 / Tape & Reel

- 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



☺☺☺ = Manufacturer's Marking
 N3005L = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01 - 53)

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}	±20	V
Continuous Drain Current (Note 4) V _{GS} = 10V	Steady State	T _A = 25°C	I _D	14.5	A
		T _A = 85°C		10.5	
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _A = 25°C	I _D	22	A
		T _A = 85°C		16	
Pulsed Drain Current (Note 6)			I _{DM}	48	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P _D	1.68	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 4)	R _{θJA}	74.3	°C/W
Power Dissipation (Note 5)	P _D	4.1	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 5)	R _{θJA}	30.8	°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}	30	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	-	-	1.0	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	1.0	1.5	2.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	3.6	5.0	mΩ	V _{GS} = 10V, I _D = 20A
			4.9	6.5		V _{GS} = 4.5V, I _D = 20A
Forward Transfer Admittance	Y _{fs}	-	22	-	S	V _{DS} = 15V, I _D = 15A
Diode Forward Voltage	V _{SD}	-	0.8	1.0	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	-	4342	-	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	1801	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	669	-	pF	
Gate Resistance	R _g	-	1.76	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	-	46.9	-	nC	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 15A
Gate-Source Charge	Q _{gs}	-	14.3	-	nC	
Gate-Drain Charge	Q _{gd}	-	18.6	-	nC	
Turn-On Delay Time	t _{D(on)}	-	7.9	-	ns	V _{DS} = 15V, V _{GS} = 10V, R _L = 1.3Ω R _G = 3Ω
Turn-On Rise Time	t _r	-	22.8	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	73.4	-	ns	
Turn-Off Fall Time	t _f	-	43.5	-	ns	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
 - Device mounted on 2" x 2" FR-4 PCB with high coverage 2oz. copper, single sided.
 - Repetitive rating, pulse width limited by junction temperature and current limited by package.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

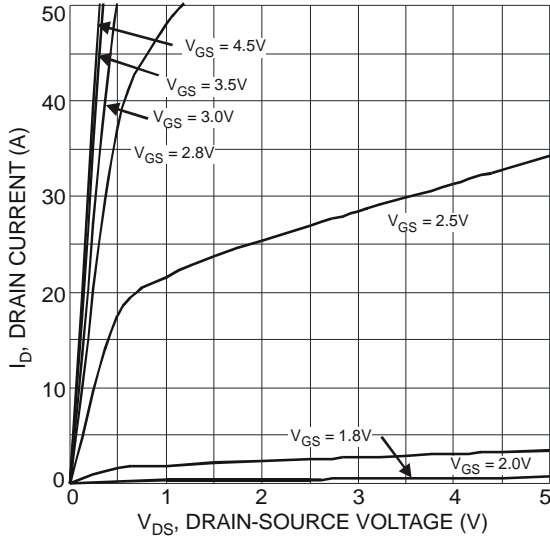


Fig. 1 Typical Output Characteristics

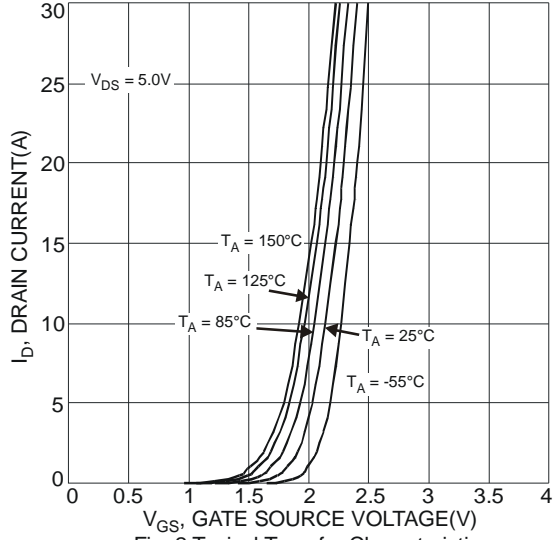


Fig. 2 Typical Transfer Characteristics

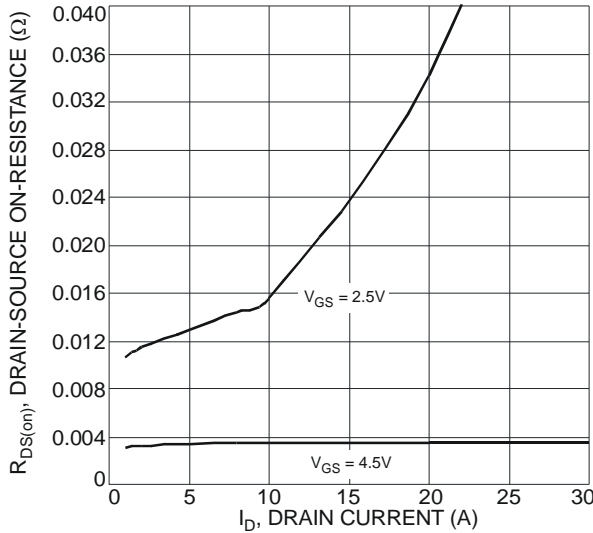


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

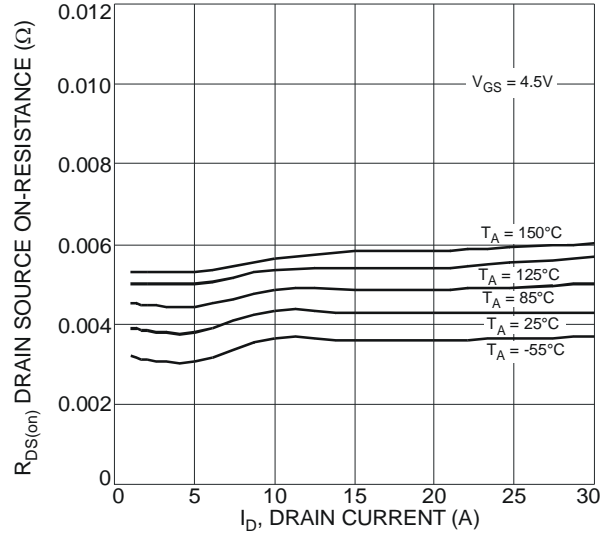


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

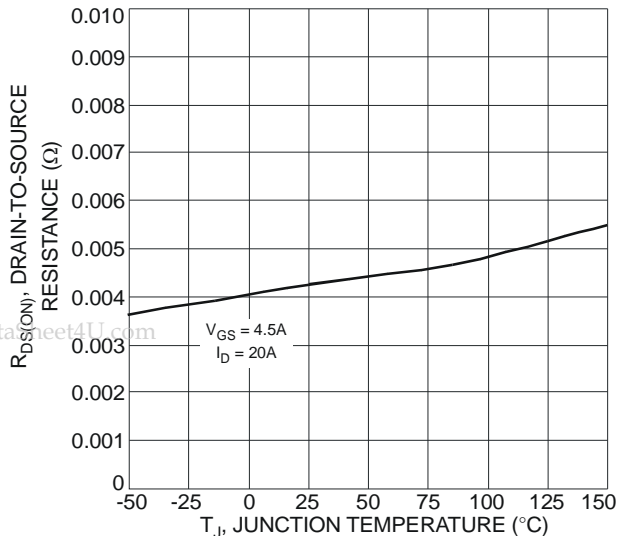


Fig. 5 On-Resistance Variation with Temperature

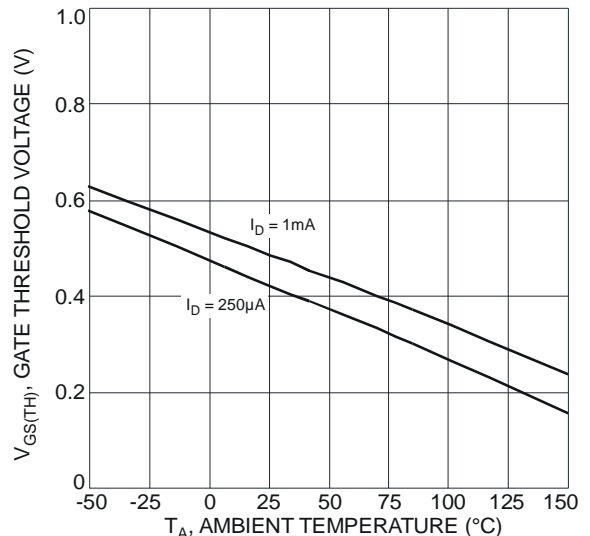


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

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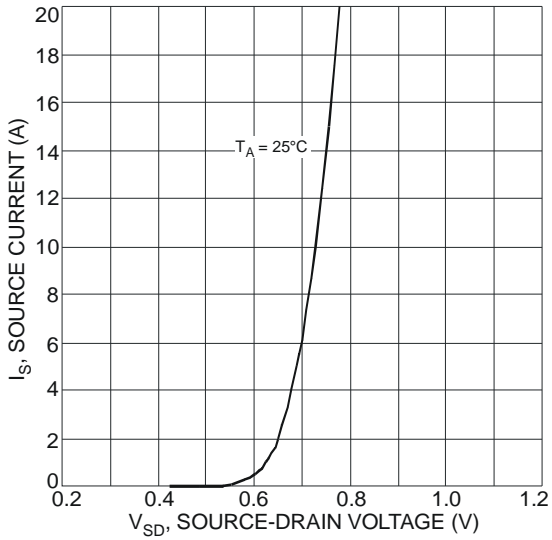


Fig. 7 Diode Forward Voltage vs. Current

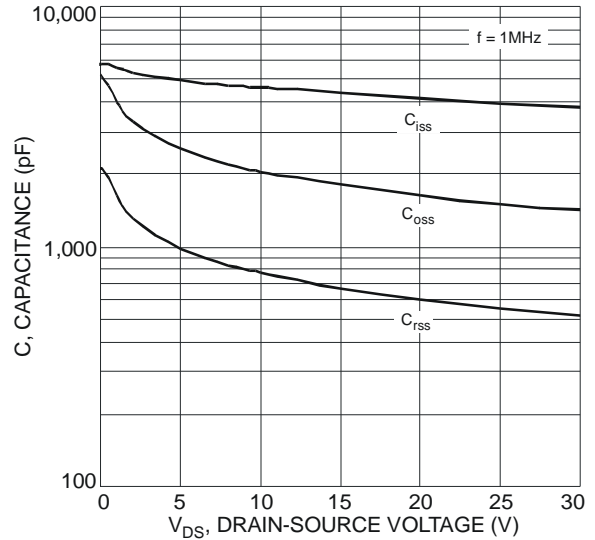


Fig. 8 Typical Capacitance

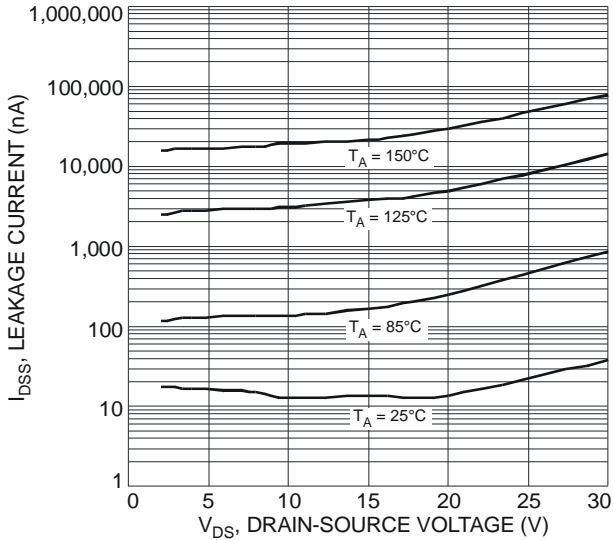


Fig. 9 Typical Drain-Source Leakage Current vs Voltage

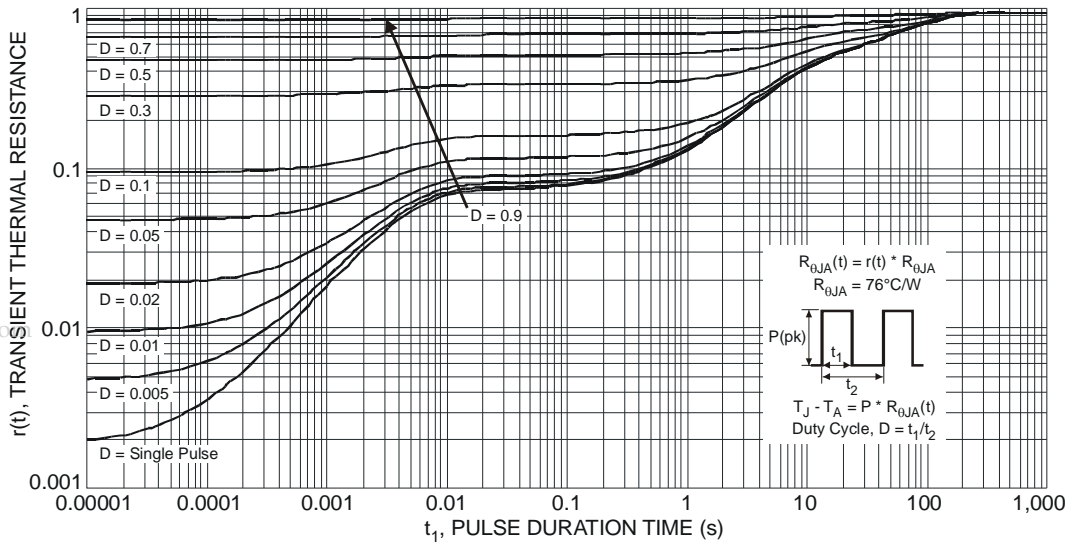
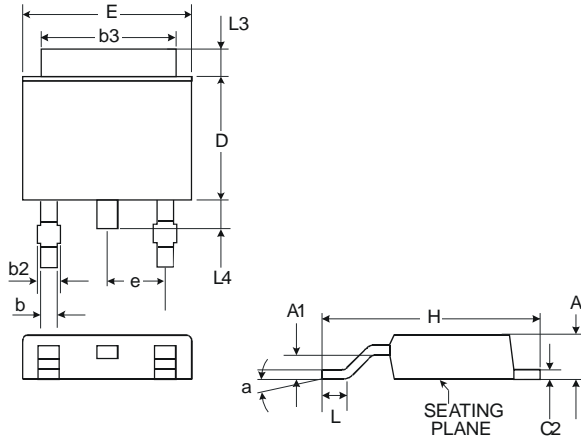


Fig. 10 Transient Thermal Response

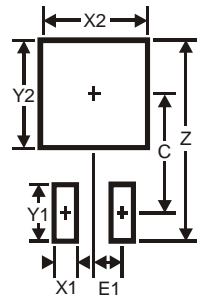
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Package Outline Dimensions



TO252-3L			
Dim	Min	Typ	Max
A	2.19	2.29	2.39
A1	0.97	1.07	1.17
b	0.64	0.76	0.88
b2	0.76	0.95	1.14
b3	5.21	5.33	5.50
C2	0.45	0.51	0.58
D	6.00	6.10	6.20
E	6.45	6.58	6.70
e	2.286 Typ.		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L3	0.88	1.08	1.27
L4	0.64	0.83	1.02
a	0°	-	10°
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

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