DMN4034SSS

40V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = 25°C
40V	34mΩ @ V_{GS} = 10V	7.2A
	59mΩ @ V_{GS} = 4.5V	5.5A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- Low on-resistance
- Fast switching speed
- Max Q_g rated
- **"Green" component and RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description and Applications

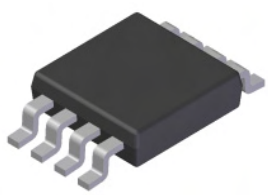
This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

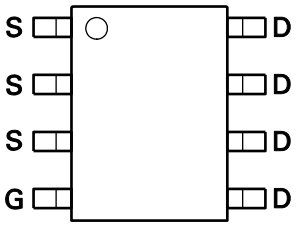
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)

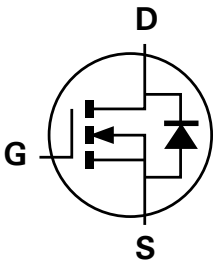
SO-8



Top View



Top View



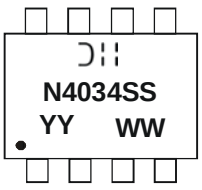
Equivalent Circuit

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN4034SSS-13	N4034SS	13	12	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website.

Marking Information



= Manufacturer's Marking
N4034SS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 09 = 2009)
WW = Week (01 - 53)

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Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	40	V
Gate-Source voltage		(Note 2)	V_{GS}	±20	V
Single Pulsed Avalanche Energy		(Note 7)	E_{AS}	27	mJ
Single Pulsed Avalanche Current		(Note 7)	I_{AS}	15.25	A
Continuous Drain current	V_{GS} = 10V	(Note 4)	I_D	7.2	A
		T_A = 70°C (Note 4)		5.8	
		(Note 3)		5.4	
Pulsed Drain current	V_{GS} = 10V	(Note 5)	I_{DM}	33.0	A
Continuous Source current (Body diode)		(Note 4)	I_S	4.1	A
Pulsed Source current (Body diode)		(Note 5)	I_{SM}	33.0	A

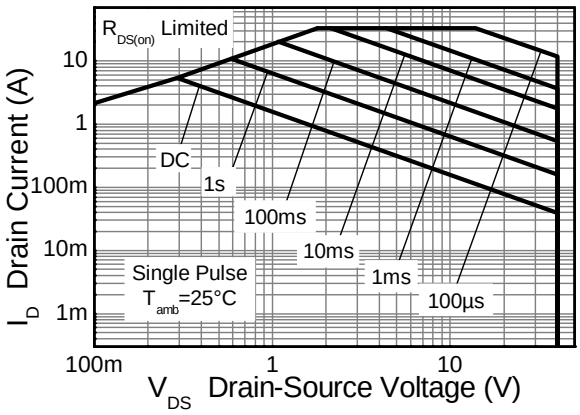
Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation	(Note 3)	P_D	1.56	W
Linear derating factor			12.5	mW/°C
	(Note 4)		2.8	W
			22.5	mW/°C
Thermal Resistance, Junction to Ambient	(Note 3)	$R_{\theta JA}$	80	°C/W
	(Note 4)		44.5	
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	37	°C/W
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	°C

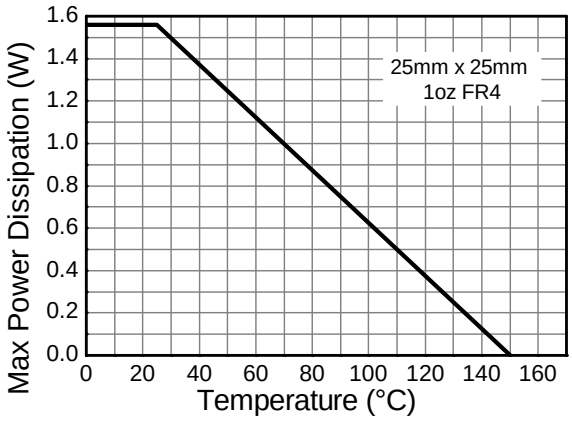
Notes:
2. AEC-Q101 V_{GS} maximum is ±16V.
3. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
4. Same as note (3), except the device is measured at t ≤ 10 sec.
5. Same as note (3), except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
6. Thermal resistance from junction to solder-point (at the end of the drain lead).
7. UIS in production with L = 100µH, V_{DD} = 40V.

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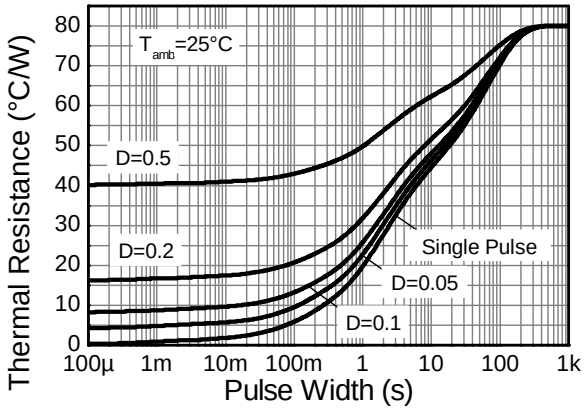
Thermal Characteristics



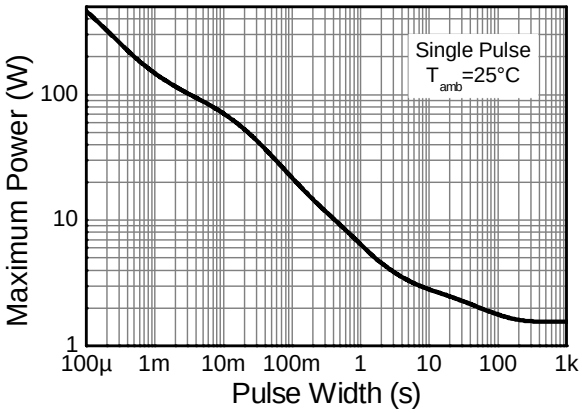
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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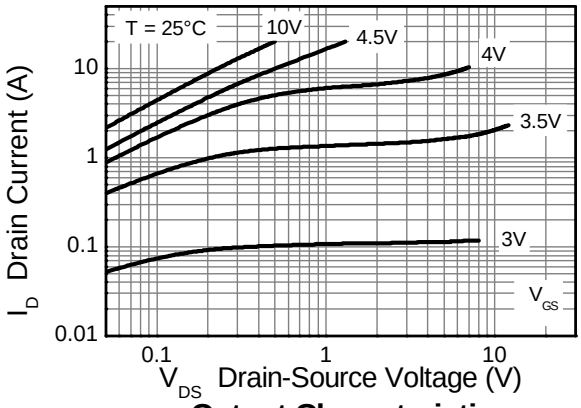
Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	40	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 40V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	0.023	0.034	Ω	V_{GS} = 10V, I_D = 6A
			0.039	0.059		V_{GS} = 4.5V, I_D = 5A
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	20.5	—	S	V_{DS} = 15V, I_D = 6A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.87	1.1	V	I_S = 6A, V_{GS} = 0V
Reverse recovery time (Note 9)	t_{rr}		11.9	—	ns	I_S = 2.5A, di/dt = 100A/μs
Reverse recovery charge (Note 9)	Q_{rr}	—	4.9	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	453	—	pF	V_{DS} = 20V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	79.1	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	40.5	—	pF	
Total Gate Charge (Note 10)	Q_g	—	4.9	8	nC	V_{GS} = 4.5V; V_{DS} = 20V, I_D = 6A
Total Gate Charge (Note 10)	Q_g	—	10	18	nC	V_{GS} = 10V; V_{DS} = 20V, I_D = 6A
Gate-Source Charge (Note 10)	Q_{gs}	—	1.8	—	nC	
Gate-Drain Charge (Note 10)	Q_{gd}	—	2.4	—	nC	
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	2.7	—	ns	V_{DD} = 20V, V_{GS} = 10V I_D = 1A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 10)	t_r	—	2.7	—	ns	
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	14	—	ns	
Turn-Off Fall Time (Note 10)	t_f	—	6	—	ns	

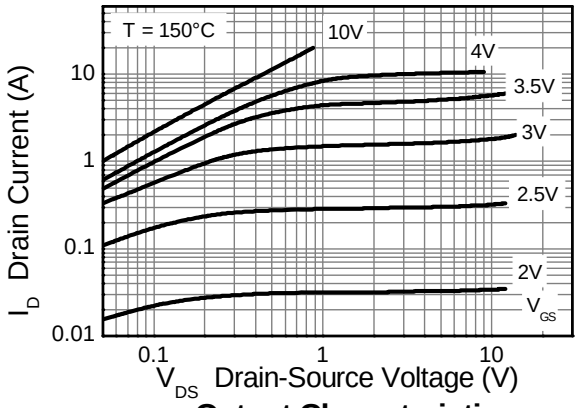
Notes:
8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

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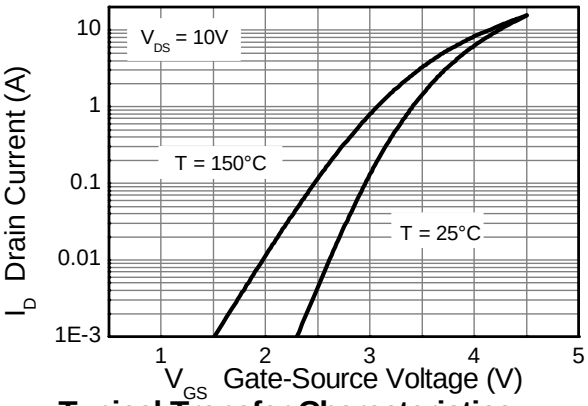
Typical Characteristics



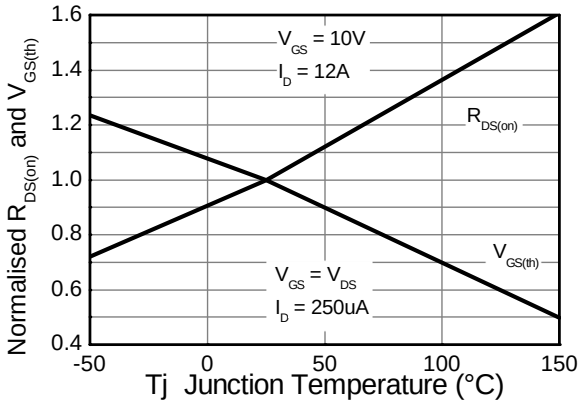
Output Characteristics



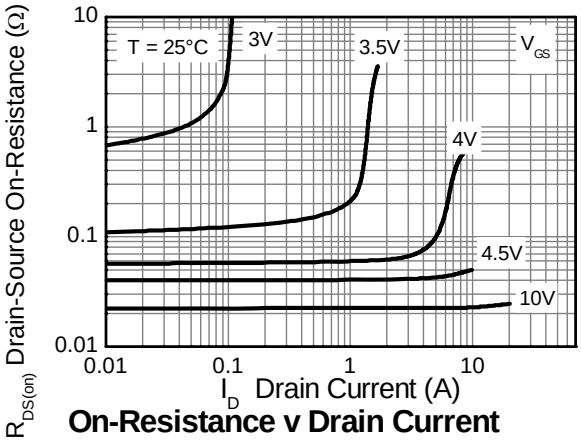
Output Characteristics



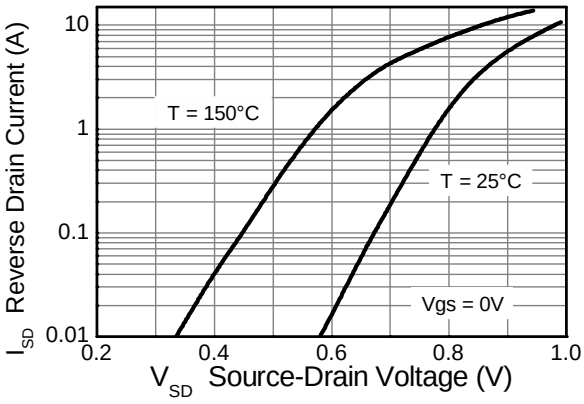
Typical Transfer Characteristics



Normalised Curves v Temperature



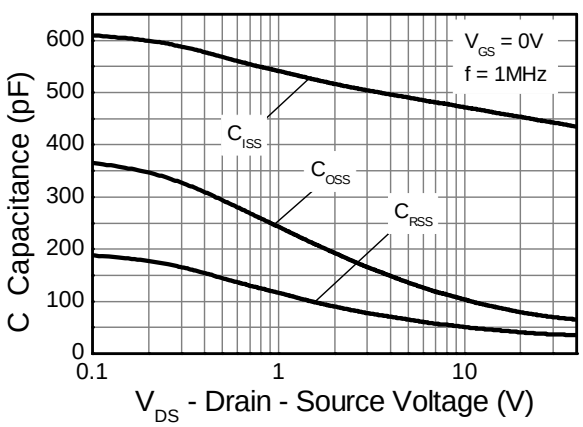
On-Resistance v Drain Current



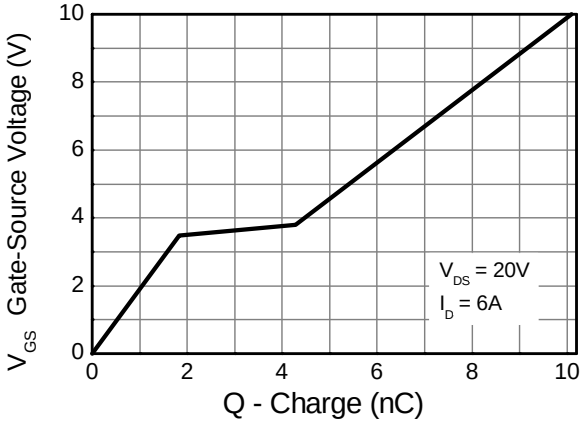
Source-Drain Diode Forward Voltage

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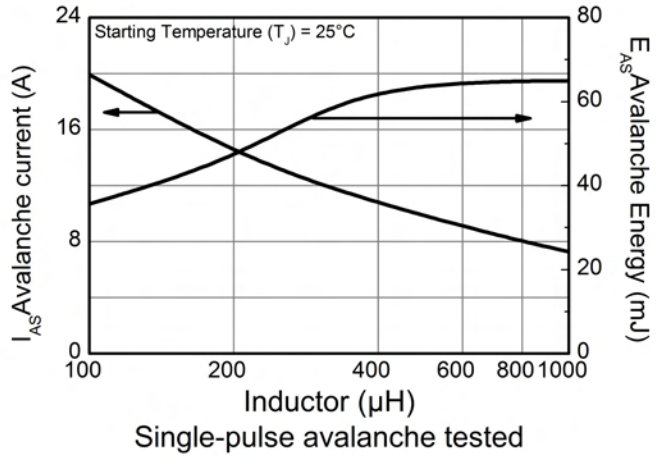
Typical Characteristics – continued



Capacitance v Drain-Source Voltage

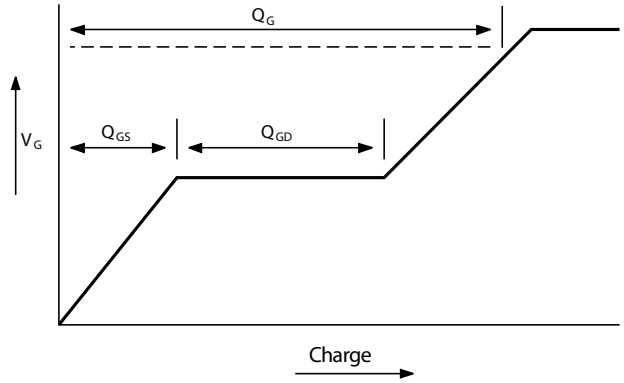


Gate-Source Voltage v Gate Charge

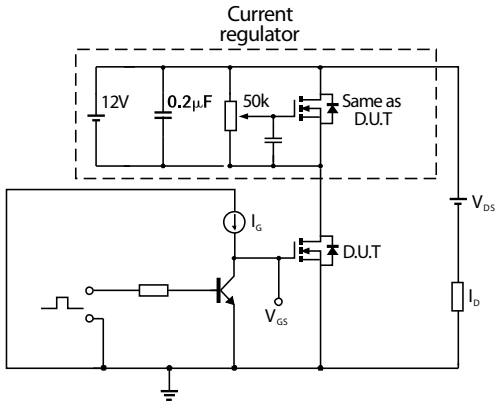


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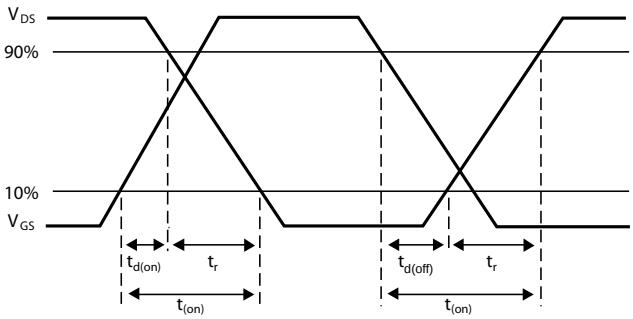
Test Circuits



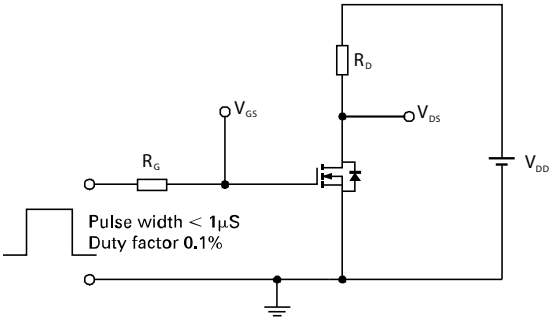
Basic gate charge waveform



Gate charge test circuit



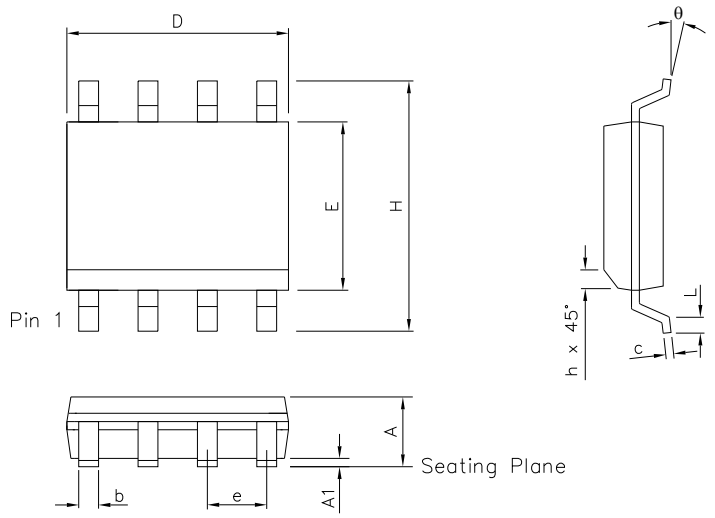
Switching time waveforms



Switching time test circuit

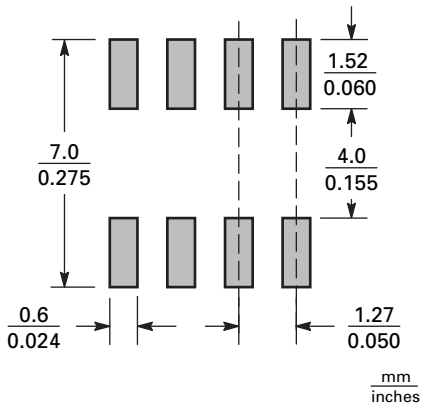
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Package Outline Dimensions



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	θ	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

Suggested Pad Layout



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