

40V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25^\circ C$
40V	34m Ω @ $V_{GS} = 10V$	6.3A
	59m Ω @ $V_{GS} = 4.5V$	4.8A

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.

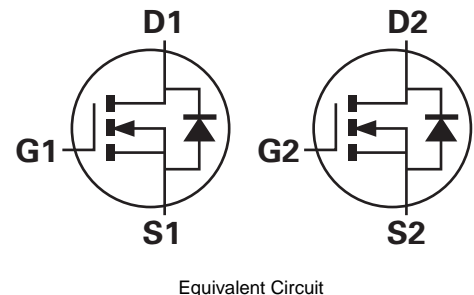
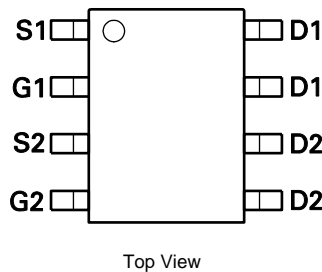
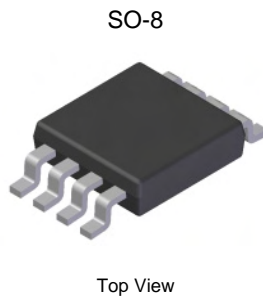
- Motor control
- Backlighting
- DC-DC Converters
- Power management functions

Features and Benefits

- Low on-resistance
- Fast switching speed
- “Green” component and RoHS compliant (Note 1)
- Qualified to AEC-Q101 Standards for High Reliability

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 Connections: See diagram below
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)



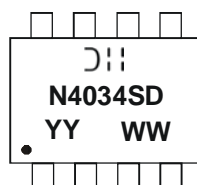
Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN4034SSD-13	N4034SD	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

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$\text{D} \parallel \parallel$ = Manufacturer’s Marking
 N4034SD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-53)

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

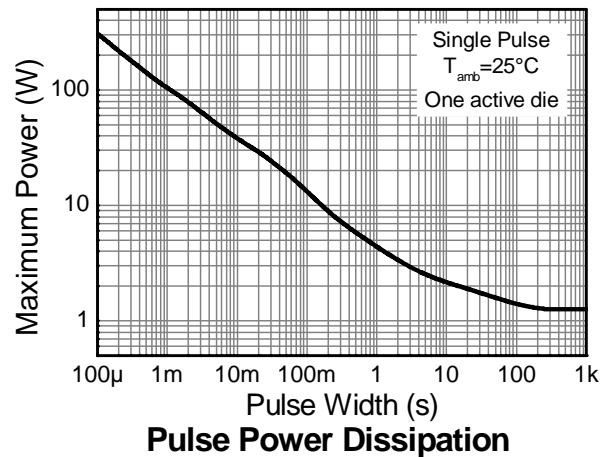
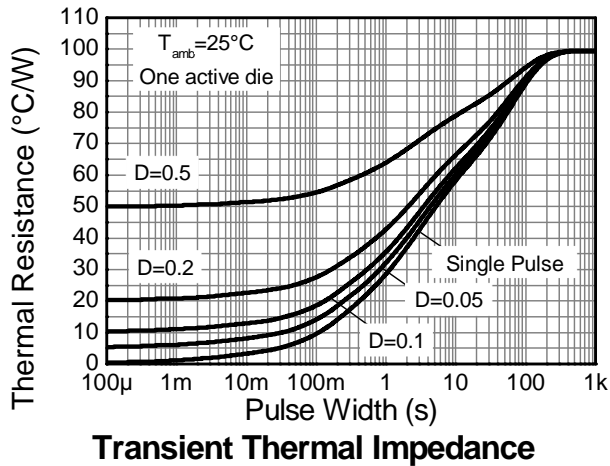
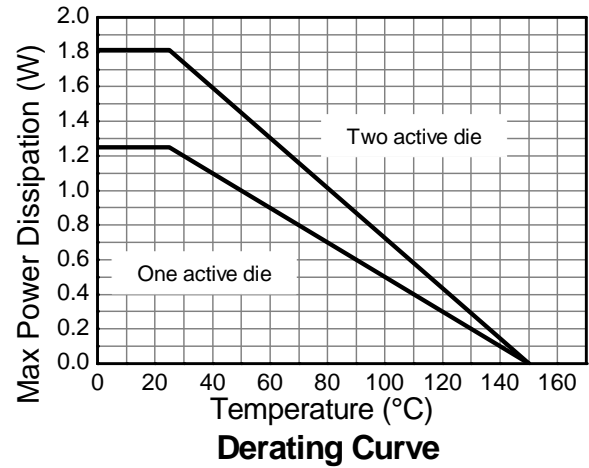
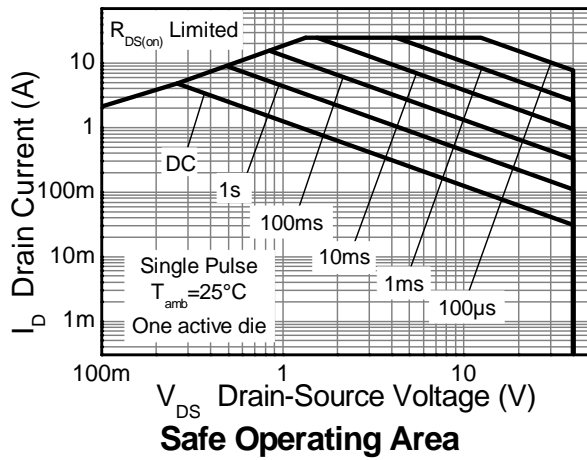
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	40	V
Gate-Source voltage			V_{GS}	± 20	V
Continuous Drain current	$V_{GS} = 10\text{V}$	(Note 2)	I_D	6.3	A
		$T_A = 70^\circ\text{C}$ (Note 4)		5.0	
		(Note 3)		4.8	
Pulsed Drain current	$V_{GS} = 10\text{V}$	(Note 5)	I_{DM}	24.8	A
Continuous Source current (Body diode)			I_S	3.3	A
Pulsed Source current (Body diode)			I_{SM}	24.8	A

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

Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Notes 3 & 6)	P_D	1.25	W mW/ $^\circ\text{C}$
	(Notes 3 & 7)		10.0	
	(Notes 4 & 6)		1.80	
			14.3	
			2.14	
Thermal Resistance, Junction to Ambient	(Notes 3 & 6)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
	(Notes 3 & 7)		70	
	(Notes 4 & 6)		58	
Thermal Resistance, Junction to Lead	(Notes 6 & 8)	$R_{\theta JL}$	55	$^\circ\text{C/W}$
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

- Notes:
- AEC-Q101 V_{GS} maximum is $\pm 16\text{V}$.
 - 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.
 - Same as note (3), except the device is measured at $t \leq 10$ sec.
 - Same as note (3), except the device is pulsed with $D = 0.02$ and pulse width 300 μs . The pulse current is limited by the maximum junction temperature.
 - For a dual device with one active die.
 - For a device with two active die running at equal power.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

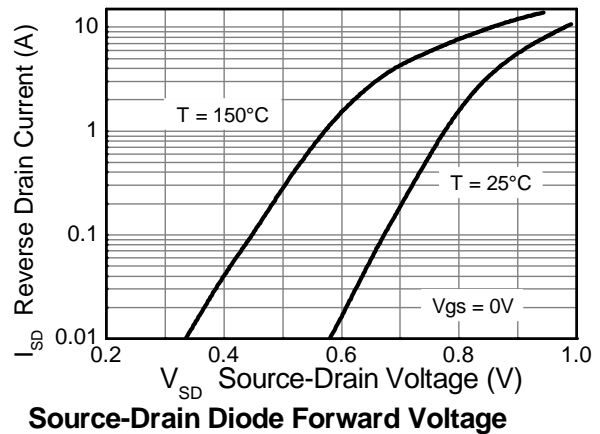
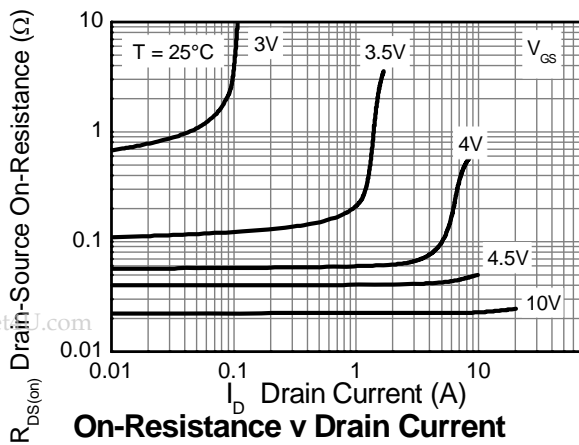
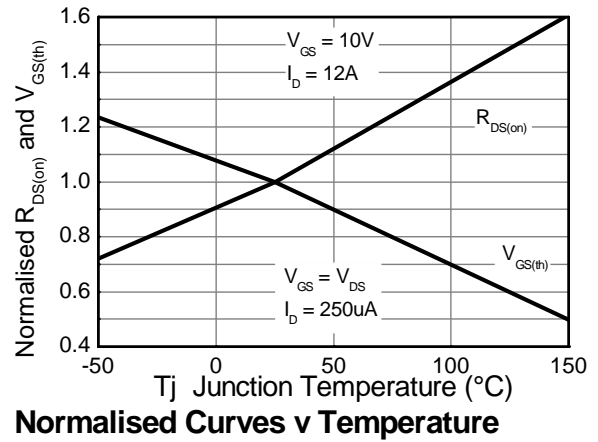
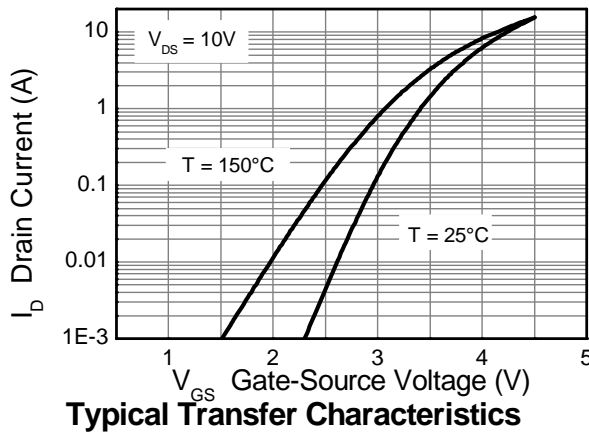
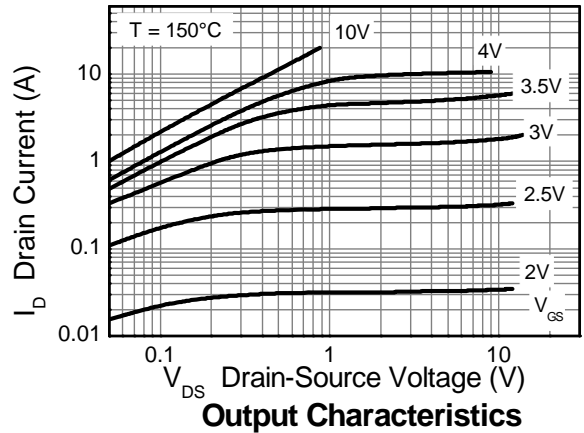
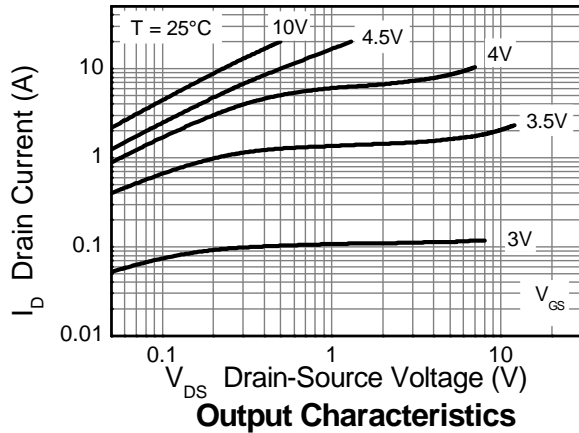


Electrical Characteristics @T_A = 25°C unless otherwise specified

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}	—	—	0.5	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 9)	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 9 & 10)	g _{fs}	—	20.5	—	S	V _{DS} = 15V, I _D = 6A
Diode Forward Voltage (Note 9)	V _{SD}	—	0.87	1.1	V	I _S = 6A, V _{GS} = 0V
Reverse recovery time (Note 10)	t _{rr}	—	11.2	—	ns	I _S = 2, di/dt = 100A/μs
Reverse recovery charge (Note 10)	Q _{rr}	—	4.8	—	nC	
DYNAMIC CHARACTERISTICS (Note 10)						
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 11)	Q _g	—	4.9	—	nC	V _{GS} = 4.5V
Total Gate Charge (Note 11)	Q _g	—	10	—	nC	V _{GS} = 10V
Gate-Source Charge (Note 11)	Q _{gs}	—	1.8	—	nC	
Gate-Drain Charge (Note 11)	Q _{gd}	—	2.4	—	nC	
Turn-On Delay Time (Note 11)	t _{D(on)}	—	2.7	—	ns	V _{DD} = 20V, V _{GS} = 10V I _D = 1A, R _G = 6.0Ω
Turn-On Rise Time (Note 11)	t _r	—	2.7	—	ns	
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	14	—	ns	
Turn-Off Fall Time (Note 11)	t _f	—	6	—	ns	

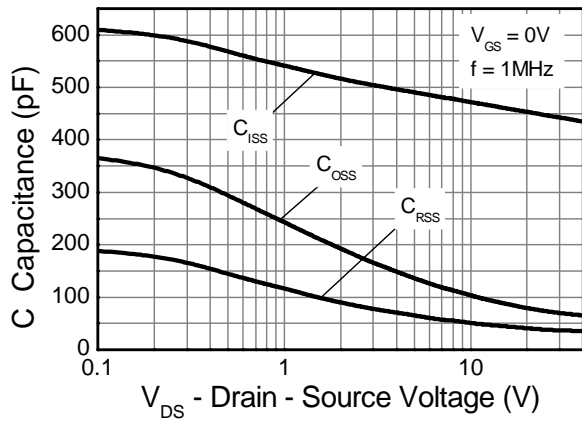
- Notes:
9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
 10. For design aid only, not subject to production testing.
 11. Switching characteristics are independent of operating junction temperatures.

Typical Characteristics

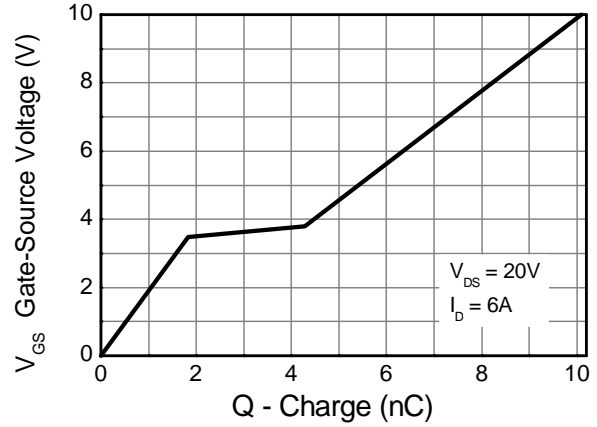


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Typical Characteristics - continued

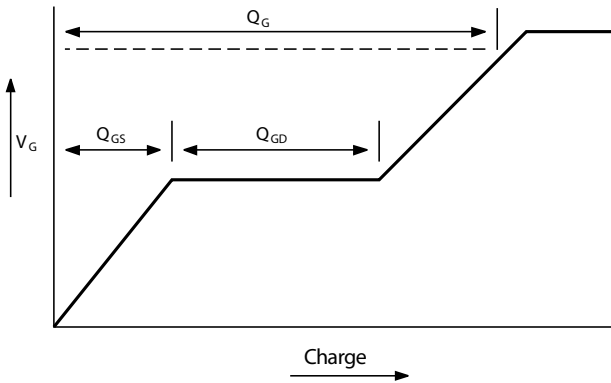


Capacitance v Drain-Source Voltage

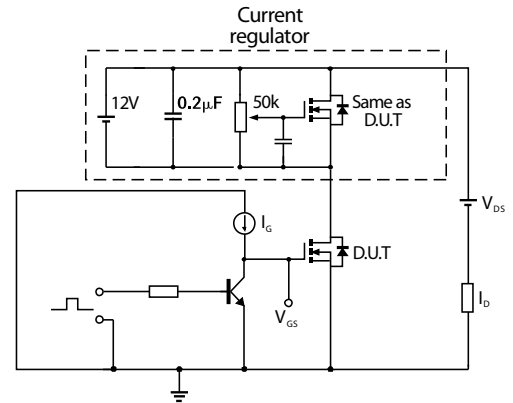


Gate-Source Voltage v Gate Charge

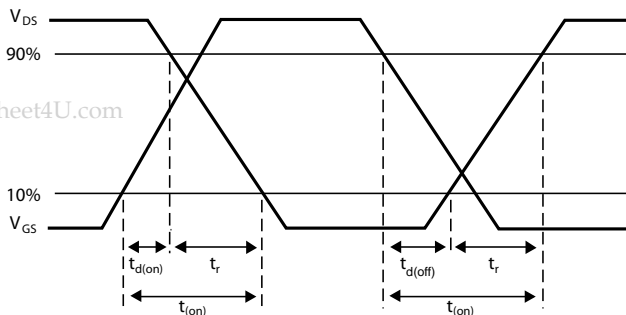
Test Circuits



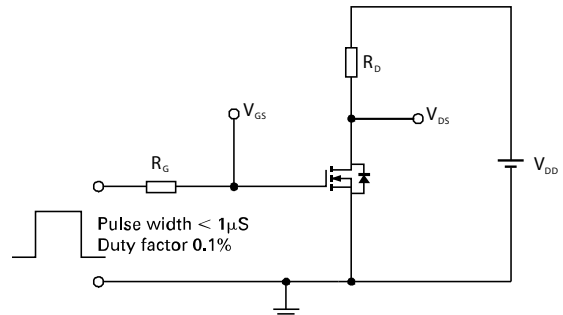
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

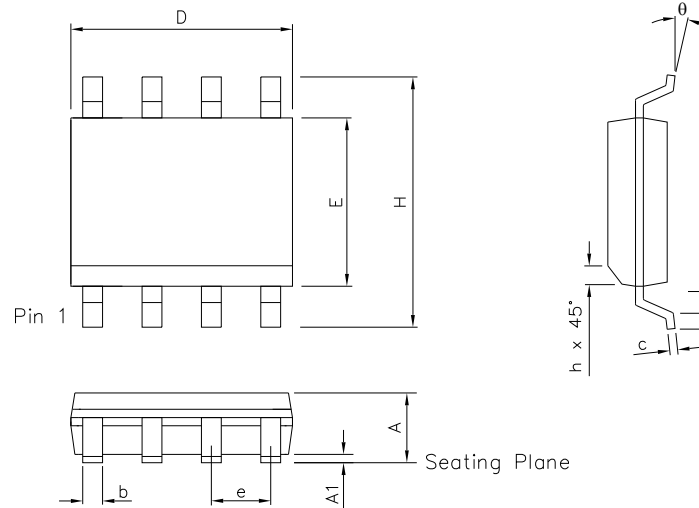


Switching time test circuit

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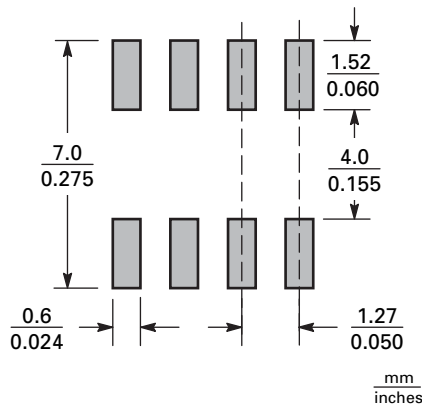
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Package Outline Dimensions



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	theta	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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