

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
	59m $Ω$ @ V _{GS} = 4.5V	5.5A

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

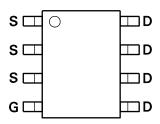
- 100% Unclamped Inductive Switch (UIS) test in production
- Low on-resistance
- Fast switching speed
- Max Q_q rated
- "Green" component and RoHS compliant (Note 1)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

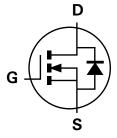
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin annealed over Copper lead frame.
 Solderable per MIL-STD-202, Method 208
- Weight: 0.074 grams (approximate)







Top View



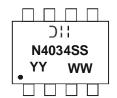
Equivalent Circuit

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



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





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

Characteristic			Symbol	Value	Unit	
Drain-Source voltage	voltage			40	V	
Gate-Source voltage		(Note 2)	V _{GS}	±20	V	
Single Pulsed Avalanche Er	ngle Pulsed Avalanche Energy (No		E _{AS}	27	mJ	
Single Pulsed Avalanche Current		(Note 7)	I _{AS}	15.25	А	
Continuous Drain current		(Note 4)		7.2		
	$V_{GS} = 10V$	$T_A = 70^{\circ}C$ (Note 4)	I _D	5.8	Α	
		(Note 3)		5.4		
Pulsed Drain current	sed Drain current V _{GS} = 10V (Note 5)		I _{DM}	33.0	Α	
Continuous Source current ((Body diode)	(Note 4)	Is	4.1	А	
Pulsed Source current (Body diode)		(Note 5)	I _{SM}	33.0	Α	

Thermal Characteristics @TA = 25°C unless otherwise specified

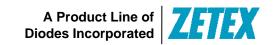
Characteristic	Symbol	Value	Unit	
Power dissipation Linear derating factor	(Note 3)	,	1.56 12.5	W
	(Note 4)	P _D	2.8 22.5	mW/°C
Thermal Resistance, Junction to Ambient	(Note 3)	D	80	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	44.5	°C/W
Thermal Resistance, Junction to Lead	(Note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

Notes:

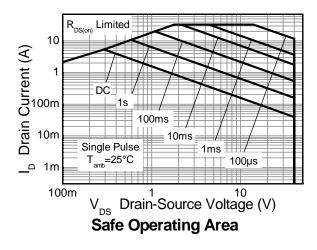
- 2. AEC-Q101 V_{GS} maximum is $\pm 16V$.
- 3. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
- 4. Same as note (3), except the device is measured at $t \le 10$ 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.

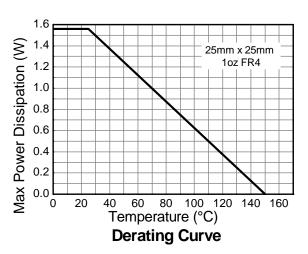
 6. Thermal resistance from junction to solder-point (at the end of the drain lead).
- 7. UIS in production with L = $100\mu H$, $V_{DD} = 40V$.

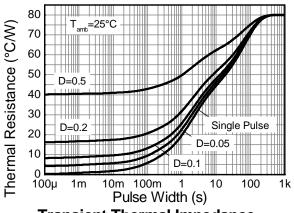


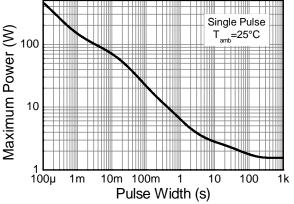


Thermal Characteristics









Transient Thermal Impedance

Pulse Power Dissipation





Electrical Characteristics @T_A = 25°C unless otherwise specified

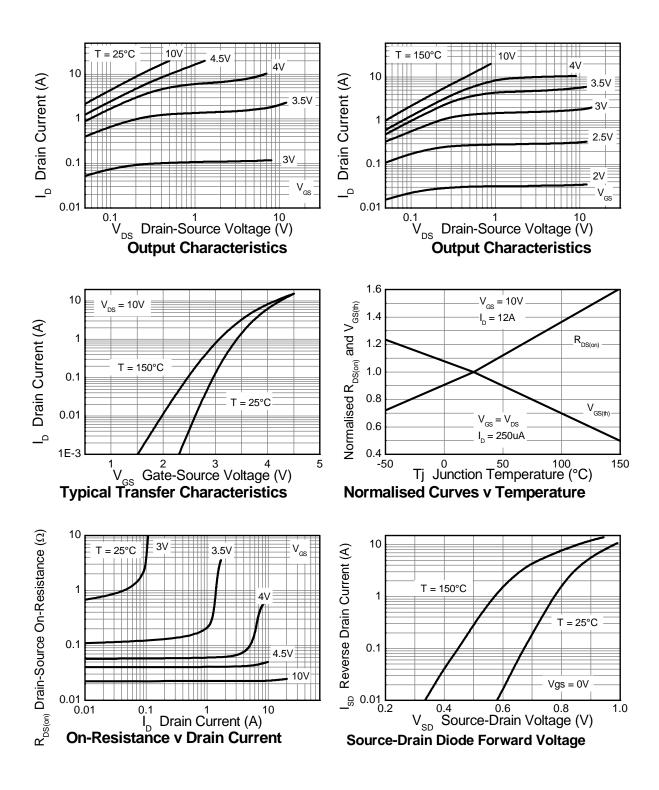
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	40	_	_	V	$I_D = 250 \mu A, V_{GS} = 0 V$	
Zero Gate Voltage Drain Current	I _{DSS}		_	1	μА	$V_{DS} = 40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(th)}$	1.0	_	3.0	V	$I_D = 250\mu A$, $V_{DS} = V_{GS}$	
Static Drain-Source On-Resistance (Note 8)	0		0.023	0.034	Ω	$V_{GS} = 10V, I_D = 6A$	
Static Drain-Source Off-Resistance (Note 8)	R _{DS (ON)}	_	0.039	0.059	12	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		
Reverse recovery charge (Note 9)	Q _{rr}	_	4.9	_	nC	I _S = 2.5A, di/dt = 100A/μs	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}		453	_	pF	.,	
Output Capacitance	Coss	_	79.1	_	pF	$V_{DS} = 20V, V_{GS} = 0V$ f = 1MHz	
Reverse Transfer Capacitance	C_{rss}		40.5	_	pF	71 - 1101112	
Total Gate Charge (Note 10)	Qg	_	4.9	8	nC	V _{GS} = 4.5V	
Total Gate Charge (Note 10)	Qg	_	10	18	nC	V _{DS} = 20V	
Gate-Source Charge (Note 10)	Q _{gs}	_	1.8	_	nC	$V_{GS} = 10V$ $I_D = 6A$	
Gate-Drain Charge (Note 10)	Q _{gd}	_	2.4	_	nC]	
Turn-On Delay Time (Note 10)	t _{D(on)}	_	2.7	_	ns		
Turn-On Rise Time (Note 10)	tr		2.7	_	ns	$V_{DD} = 20V, V_{GS} = 10V$	
Turn-Off Delay Time (Note 10)	t _{D(off)}		14	_	ns	$I_D = 1A, R_G \cong 6.0\Omega$	
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.

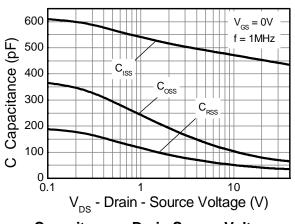


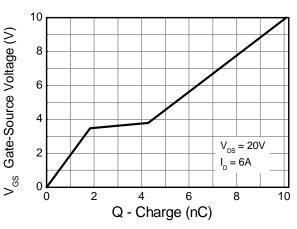
Typical Characteristics





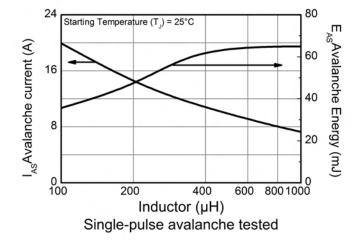
Typical Characteristics – continued





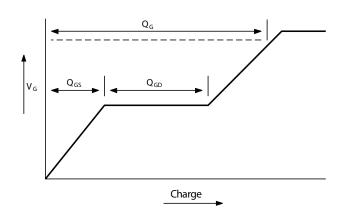
Capacitance v Drain-Source Voltage

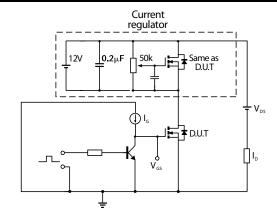
Gate-Source Voltage v Gate Charge





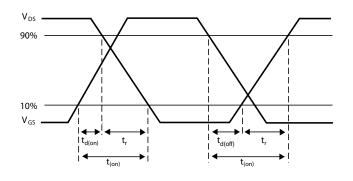
Test Circuits

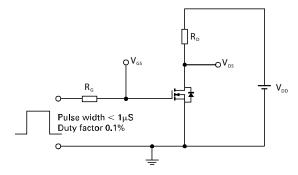




Basic gate charge waveform

Gate charge test circuit



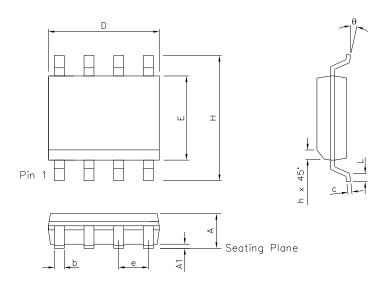


Switching time waveforms

Switching time test circuit

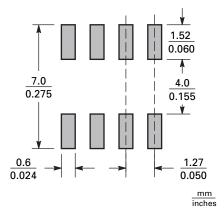


Package Outline Dimensions



DIM	Inc	hes	s Millimet		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
Α	0.053	0.069	1.35	1.75	е	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	С	0.008	0.010	0.19	0.25
Н	0.228	0.244	5.80	6.20	θ	0°	8°	0°	8°
Е	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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