



N-Channel 350- and 400-V (D-S) MOSFETs

PRODUCT SUMMARY				
Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
VN3515L	350	15 @ $V_{GS} = 4.5$ V	0.6 to 1.8	0.15
VN4012L	400	12 @ $V_{GS} = 4.5$ V	0.6 to 1.8	0.16

FEATURES

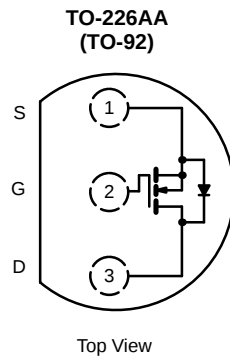
- Low On-Resistance: 8.7 Ω
- Secondary Breakdown Free: 420 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability

BENEFITS

- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"

APPLICATIONS

- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control



Device Marking
Front View

VN3515L

"S" VN
3515L
xxyy

VN3515L

"S" VN
4012L
xxyy

"S" = Siliconix Logo
xxyy = Date Code

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	VN3515L	VN4012L	Unit
Drain-Source Voltage	V_{DS}	350	400	V
Gate-Source Voltage	V_{GS}	± 20	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_A = 25^\circ\text{C}$	0.15	0.16	A
	$T_A = 100^\circ\text{C}$	0.09	0.1	
Pulsed Drain Current ^a	I_{DM}	0.6	0.65	
Power Dissipation	$T_A = 25^\circ\text{C}$	0.8	0.8	W
	$T_A = 100^\circ\text{C}$	0.32	0.32	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	156		$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

Notes

a. Pulse width limited by maximum junction temperature.

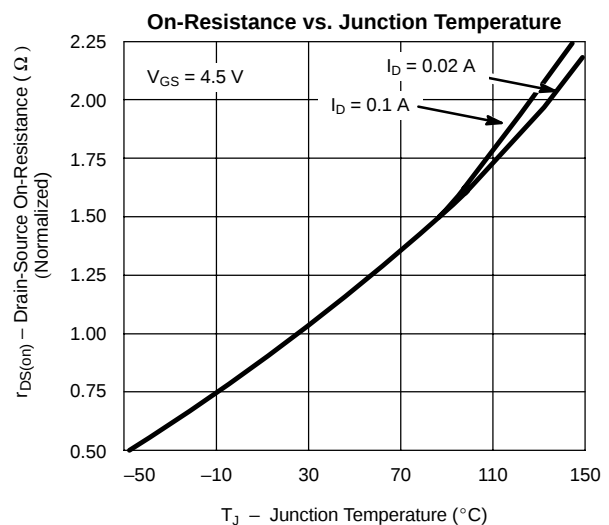
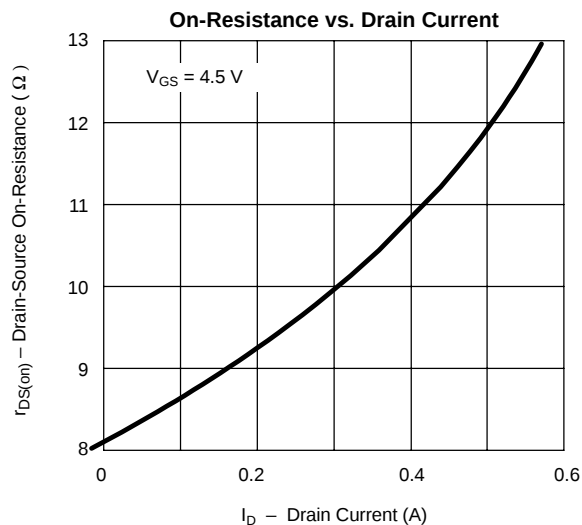
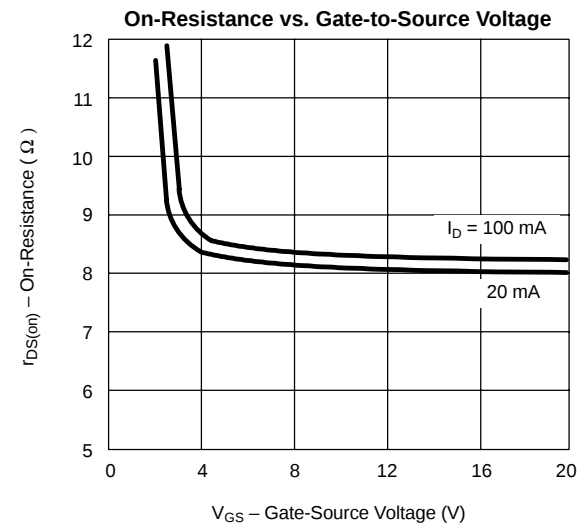
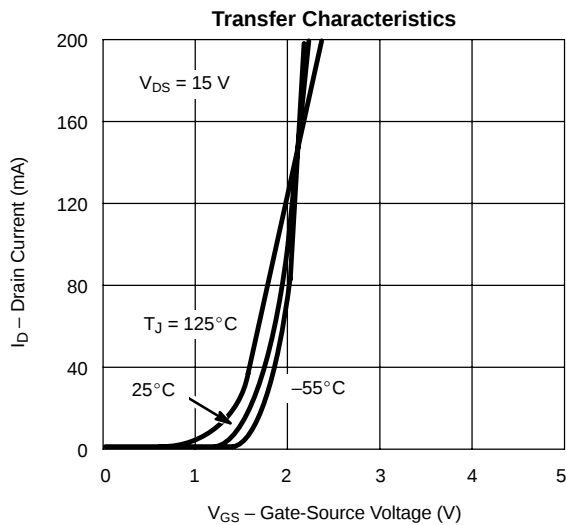
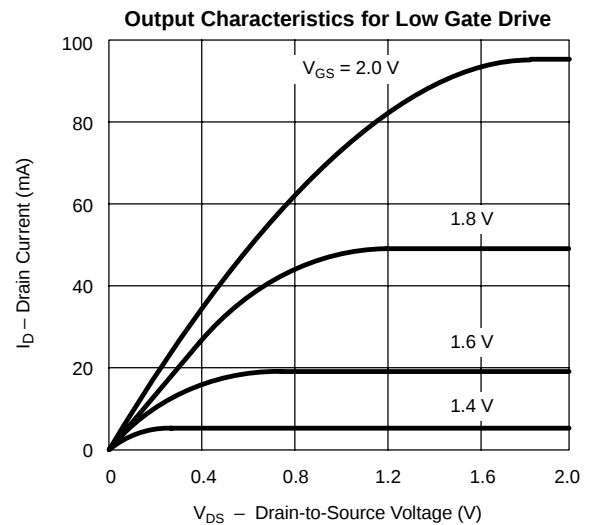
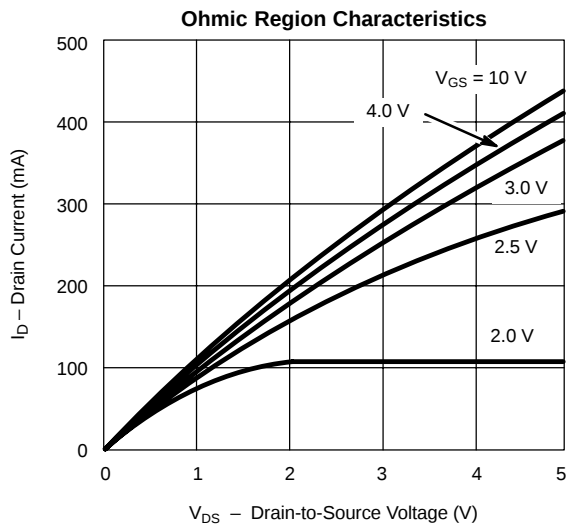
SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

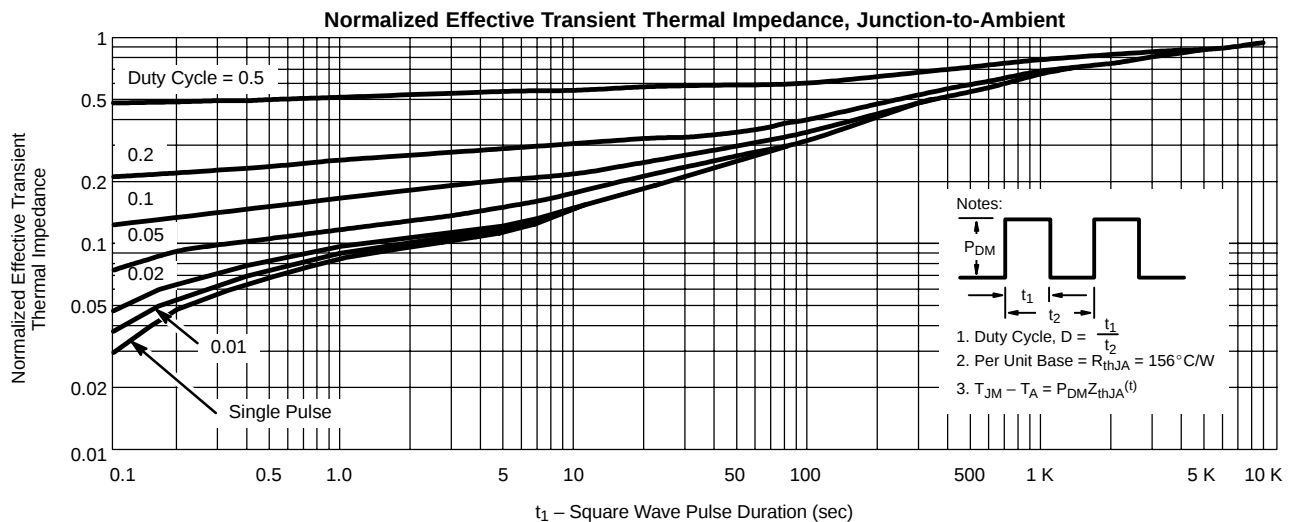
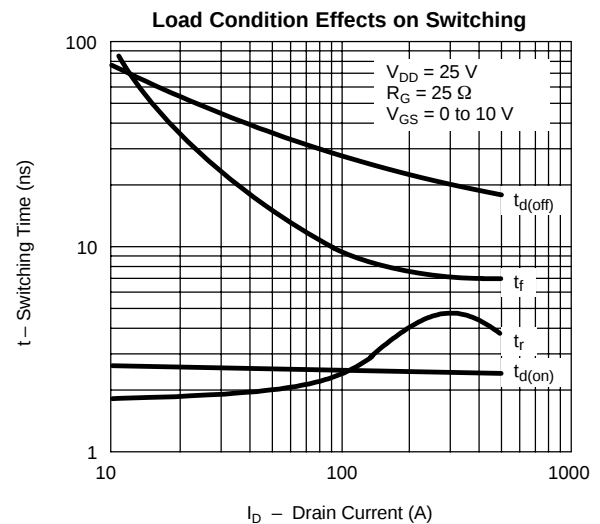
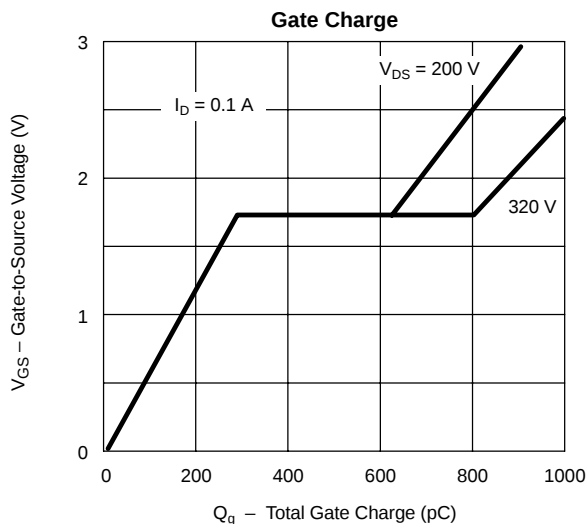
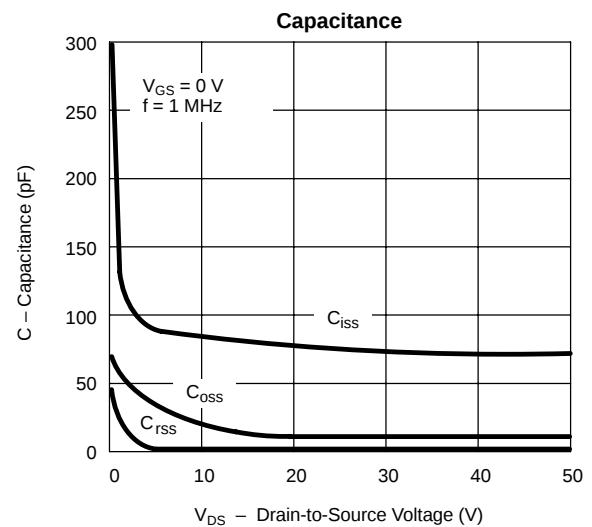
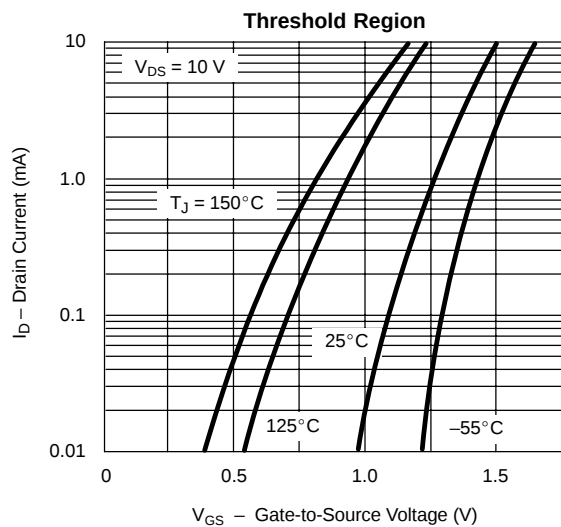
Parameter	Symbol	Test Conditions	Typ ^a	Limits				Unit
				VN3515L		VN4012L		
				Min	Max	Min	Max	
Static								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 100 μA	420	350		400		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	1.3	0.6	1.8	0.6	1.8	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	±1		±10		±10	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 0.8 x V _{(BR)DSS} , V _{GS} = 0 V			1		1	μA
		T _J = 125 °C			100		100	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	800	150		150		mA
Drain-Source On-Resistance ^b	r _{DS(on)}	V _{GS} = 3.5 V, I _D = 0.05 A	8.7					Ω
		V _{GS} = 4.5 V, I _D = 0.1 A	8.7		15		12	
		T _J = 125 °C	15.5		35		30	
		V _{GS} = 4.5 V, I _D = 0.15 A	8.7					
		T _J = 125 °C	15.5					
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 0.1 A	350	125		125		mS
Diode Forward Voltage	V _{SD}	I _S = 0.1 A, V _{GS} = 0 V	0.8					V
Dynamic								
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	85		110		110	pF
Output Capacitance	C _{oss}		20		30		30	
Reverse Transfer Capacitance	C _{rss}		5		10		10	
Switching ^c								
Turn-On Time	t _{d(on)}	V _{DD} = 25 V, R _L = 250 Ω I _D ≅ 0.1 A, V _{GEN} = 10 V R _G = 25 Ω	2.5		20		20	ns
	t _r		2		20		20	
Turn-Off Time	t _{d(off)}		27		65		65	
	t _f		9		65		65	

Notes

- a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
c. Switching time is essentially independent of operating temperature.

VNDV40

**TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)**

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