

## N-Channel 80- and 90-V (D-S) MOSFETs

PRODUCT SUMMARY				
Part Number	V <sub>(BR)DSS</sub> Min (V)	r <sub>DS(on)</sub> Max (Ω)	V <sub>GS(th)</sub> (V)	I <sub>D</sub> (A)
VN0808L	80	4 @ V <sub>GS</sub> = 10 V	0.8 to 2	0.3
VN0808LS		4 @ V <sub>GS</sub> = 10 V	0.8 to 2	0.33
VQ1006P	90	4 @ V <sub>GS</sub> = 10 V	0.8 to 2.5	0.4

### FEATURES

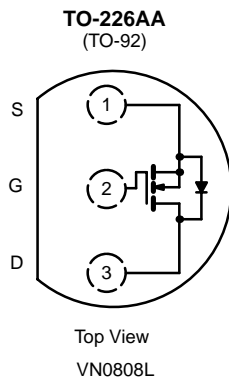
- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

### BENEFITS

- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

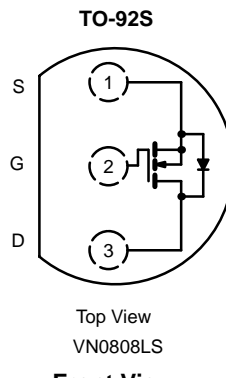
### APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



Front View:  
VN0808L

"S" VN  
0808L  
xxyy

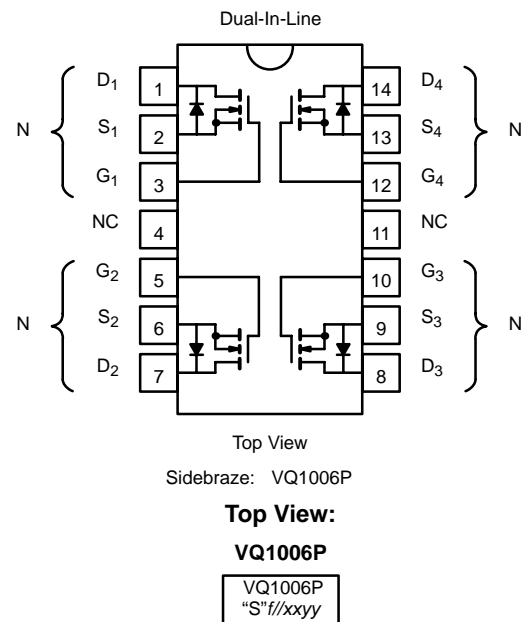


Front View:

VN0808LS

"S" VN  
0808LS  
xxyy

"S" = Siliconix Logo  
f = Factory Code  
// = Lot Traceability  
xxyy = Date Code



ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	VN0808L	VN0808LS	VQ1006P		Unit	
				Single	Total Quad		
Drain-Source Voltage	V <sub>DS</sub>	80	80	90		V	
Gate-Source Voltage	V <sub>GS</sub>	±30	±30	±20			
Continuous Drain Current (T <sub>J</sub> = 150°C)	I <sub>D</sub>	T <sub>A</sub> = 25°C	0.3	0.33	0.4	A	
		T <sub>A</sub> = 100°C	0.19	0.21	0.23		
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	1.9	1.9	2			
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> = 25°C	0.8	0.9	1.3	2	W
		T <sub>A</sub> = 100°C	0.32	0.4	0.52	0.8	
Thermal Resistance, Junction-to-Ambient	R <sub>thJA</sub>	156	139	96	62.5	°C/W	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150					°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 <sup>a</sup>	Limits				Unit
				VN0808L/LS		VQ1006P		
				Min	Max	Min	Max	
<b>Static</b>								
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	125	80		90		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\ \text{mA}$	1.6	0.8	2	0.8	2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 15\ \text{V}$			$\pm 100$		$\pm 100$	nA
							$\pm 500$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 80\ \text{V}, V_{GS} = 0\ \text{V}$			10			$\mu\text{A}$
					500			
							1	
		$V_{DS} = 72\ \text{V}, V_{GS} = 0\ \text{V}$					500	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 10\ \text{V}$	1.8	1.5		1.5		A
Drain-Source On-Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 5\ \text{V}, I_D = 0.3\ \text{A}$	3.8				5	$\Omega$
					4		4.5	
					8		8.6	
		$V_{GS} = 10\ \text{V}, I_D = 1\ \text{A}$	3.6					
			6.7					
		$T_J = 125^\circ\text{C}$						
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 10\ \text{V}, I_D = 0.5\ \text{A}$	350	170		170		mS
Common Source Output Conductance <sup>b</sup>	$g_{os}$	$V_{DS} = 10\ \text{V}, I_D = 0.1\ \text{A}$	0.23					
<b>Dynamic</b>								
Input Capacitance	$C_{iss}$	$V_{DS} = 25\ \text{V}, V_{GS} = 0\ \text{V}, f = 1\ \text{MHz}$	35		50		60	pF
Output Capacitance	$C_{oss}$		15		40		50	
Reverse Transfer Capacitance	$C_{rss}$		2		10		10	
<b>Switching<sup>c</sup></b>								
Turn-On Time	$t_{ON}$	$V_{DD} = 25\ \text{V}, R_L = 23\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}$ $R_G = 25\ \Omega$	6		10		10	ns
Turn-Off Time	$t_{OFF}$		8		10		10	

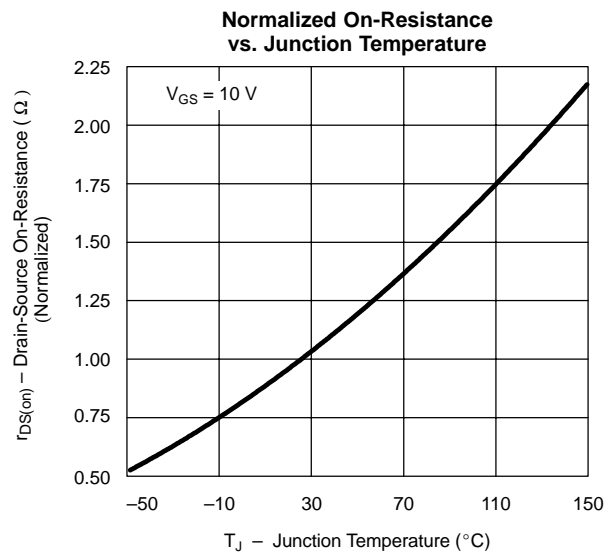
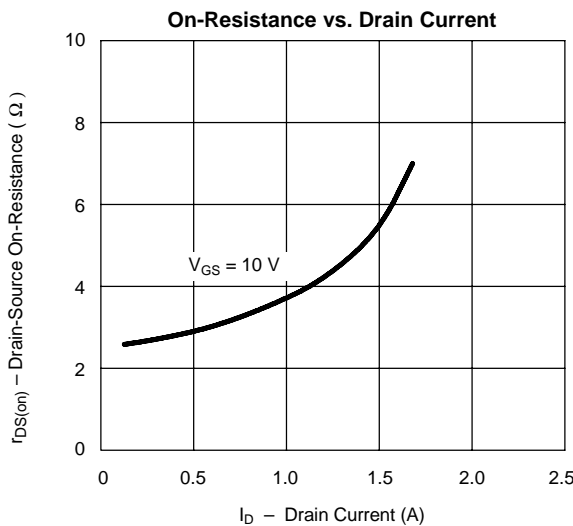
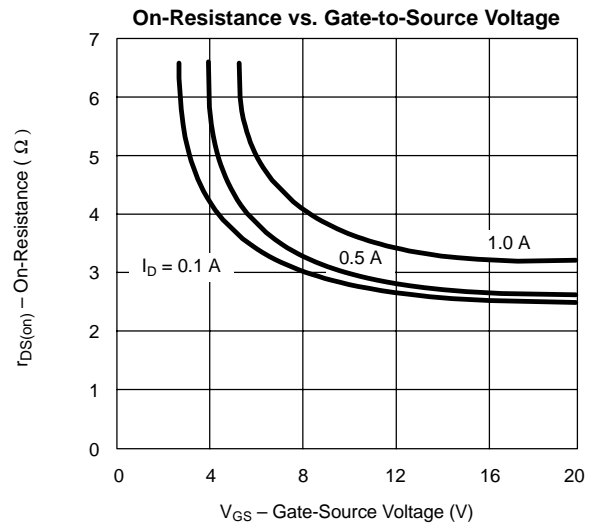
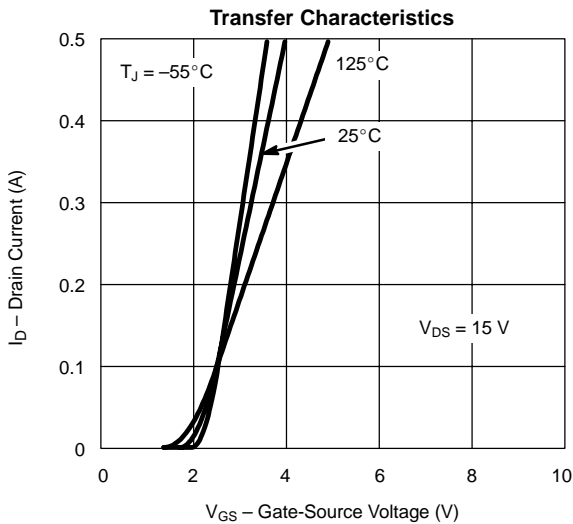
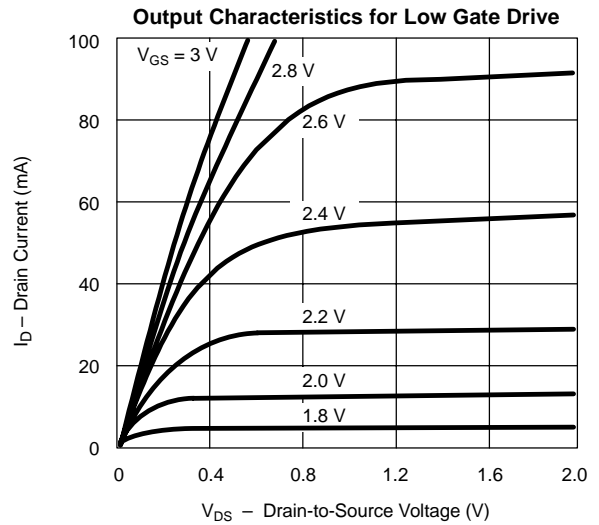
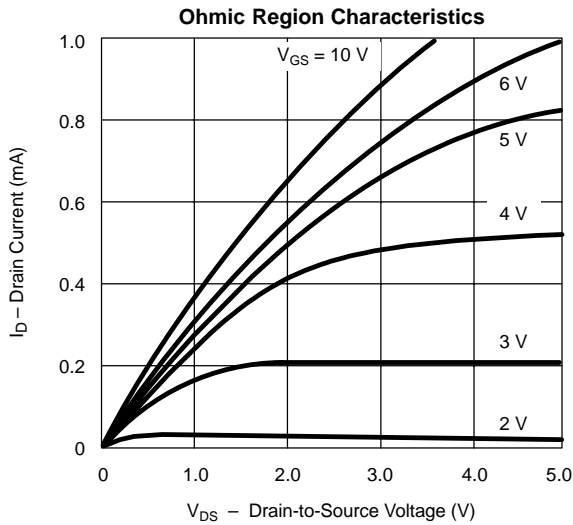
## Notes

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

VNDQ09



**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**



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