

N-Channel Enhancement-Mode MOS Transistors

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
VN0808L	80	4 @ $V_{GS} = 10$ V	0.8 to 2	0.3
VN0808M		4 @ $V_{GS} = 10$ V	0.8 to 2	0.33
VQ1006P	90	4 @ $V_{GS} = 10$ V	0.8 to 2.5	0.4

Features

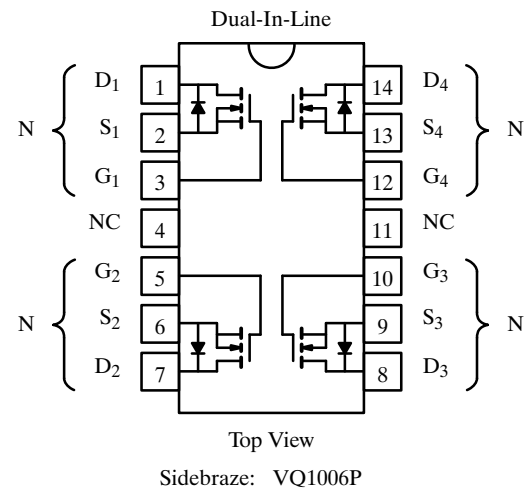
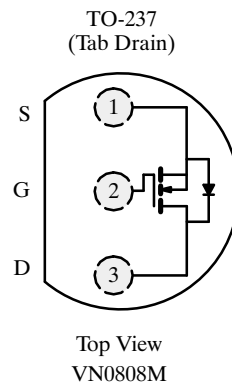
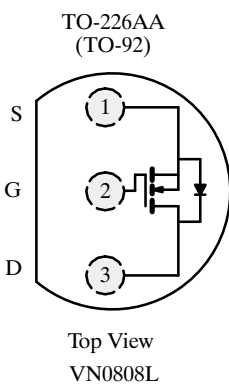
- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

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



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	VN0808L	VN0808M	VQ1006P		Unit	
				Single	Total Quad		
Drain-Source Voltage	V_{DS}	80	80	90		V	
Gate-Source Voltage	V_{GS}	± 30	± 30	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.3	0.33	0.4	A	
		$T_A = 100^\circ\text{C}$	0.19	0.21	0.23		
Pulsed Drain Current ^a	I_{DM}	1.9	1.9	2			
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.8	1	1.3	2	W
		$T_A = 100^\circ\text{C}$	0.32	0.4	0.52	0.8	
Maximum Junction-to-Ambient	R_{thJA}	156	125	96	62.5	$^\circ\text{C/W}$	
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^a

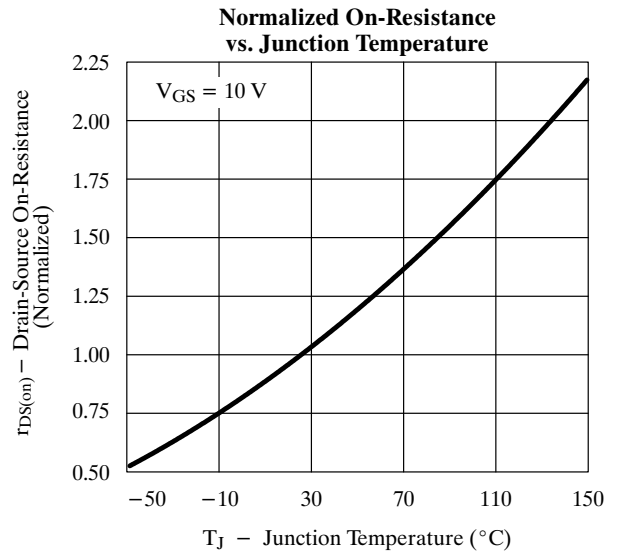
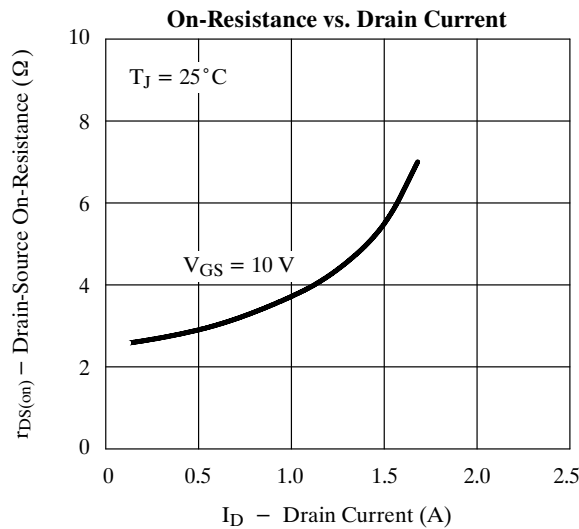
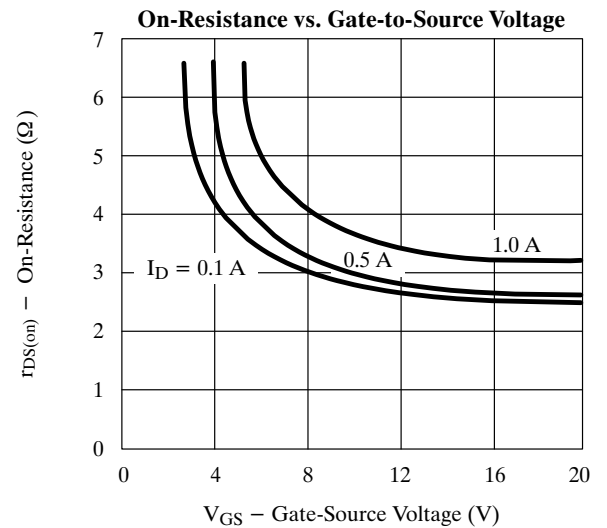
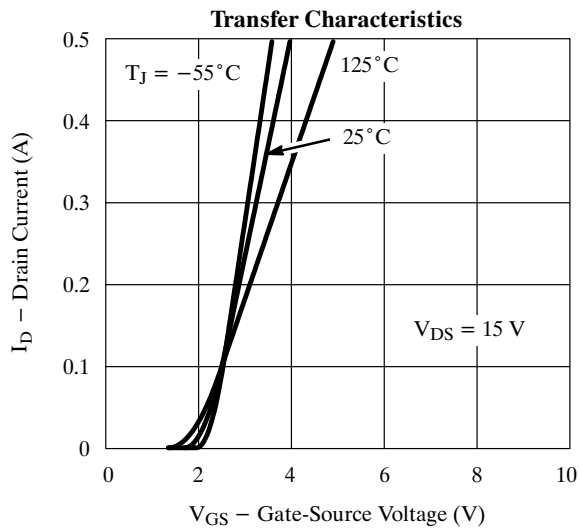
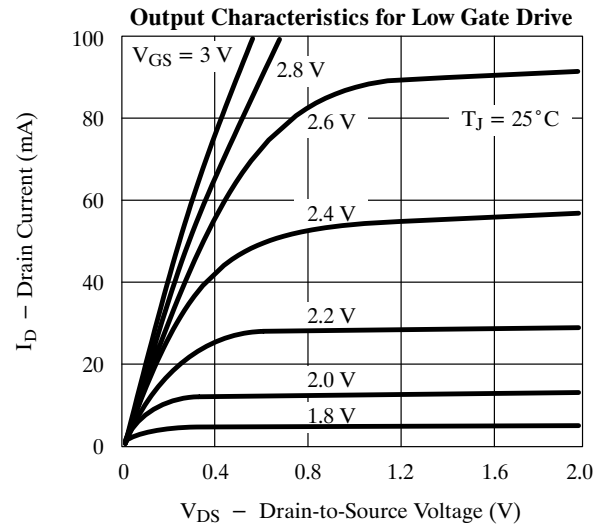
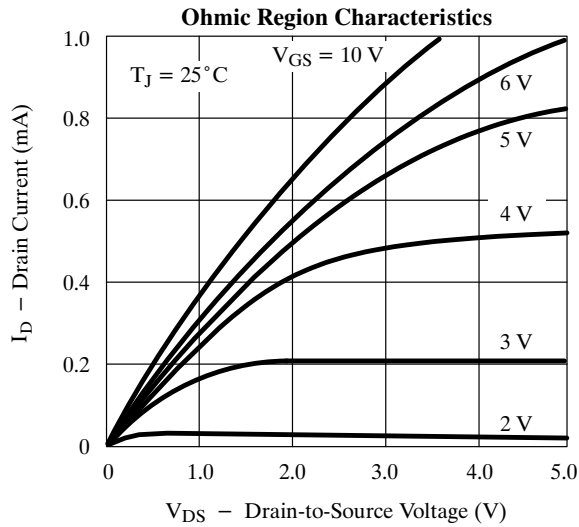
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit	
				VN0808L/M		VQ1006P			
				Min	Max	Min	Max		
Static									
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\text{ }\mu\text{A}$	125	80		90		V	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\text{ mA}$	1.6	0.8	2	0.8	2.5		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 15\text{ V}$ $T_J = 125^\circ\text{C}$			± 100		± 100	nA	
							± 500		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			10			μA	
					500				
		$V_{DS} = 72\text{ V}, V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$					1		
									500
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$	1.8	1.5		1.5		A	
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = 5\text{ V}, I_D = 0.3\text{ A}$	3.8				5	Ω	
		$V_{GS} = 10\text{ V}, I_D = 1\text{ A}$	3.6		4		4.5		
		$T_J = 125^\circ\text{C}$	6.7		8		8.6		
Forward Transconductance ^c	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 0.5\text{ A}$	350	170		170		mS	
Common Source Output Conductance ^c	g_{os}	$V_{DS} = 10\text{ V}, I_D = 0.1\text{ A}$	0.23						
Dynamic									
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		
Switching^d									
Turn-On Time	t_{ON}	$V_{DD} = 25\text{ V}, R_L = 23\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}$ $R_G = 25\text{ }\Omega$	6		10		10	ns	
Turn-Off Time	t_{OFF}		8		10		10		

Notes

- $T_A = 25^\circ\text{C}$ unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
- Switching time is essentially independent of operating temperature.

VNDQ09

Typical Characteristics (25°C Unless Otherwise Noted)



VN0808L/M, VQ1006P

Typical Characteristics (25°C Unless Otherwise Noted) (Cont'd)

