VN0808L/M, VQ1006P

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

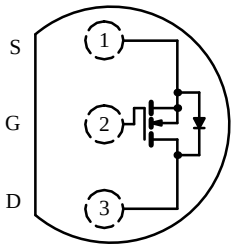
Benefits

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

Applications

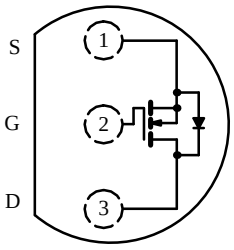
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

TO-226AA
(TO-92)



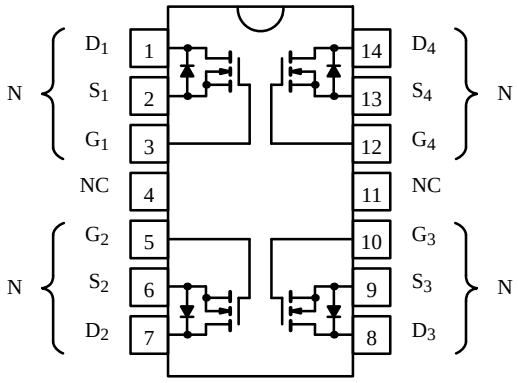
Top View
VN0808L

TO-237
(Tab Drain)



Top View
VN0808M

Dual-In-Line



Top View
Sidebraze: VQ1006P

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	VN0808L	VN0808M	VQ1006P Single	VQ1006P Total Quad	Unit
Drain-Source Voltage		V_{DS}	80	80	90		V
Gate-Source Voltage		V_{GS}	±30	±30	±20		V
Continuous Drain Current (T_J = 150°C)	T_A= 25°C	I_D	0.3	0.33	0.4		A
	T_A= 100°C		0.19	0.21	0.23		A
Pulsed Drain Current[a]		I_{DM}	1.9	1.9	2		A
Power Dissipation	T_A= 25°C	P_D	0.8	1	1.3	2	W
	T_A= 100°C		0.32	0.4	0.52	0.8	W
Maximum Junction-to-Ambient		R_{thJA}	156	125	96	62.5	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150				°C

Notes
a. Pulse width limited by maximum junction temperature.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70214.

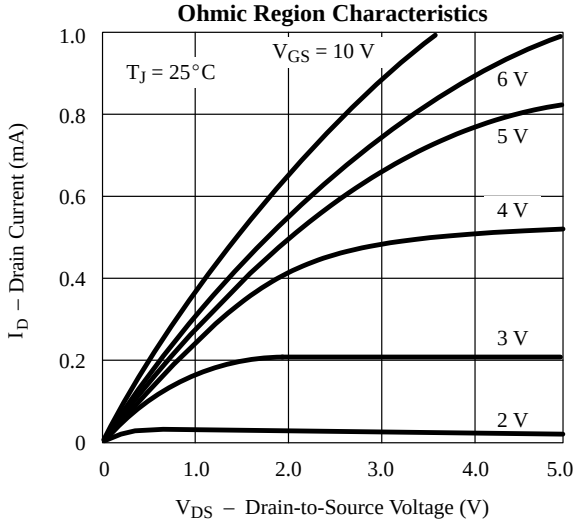
Specifications[a]

Parameter	Symbol	Test Conditions	Typ[b]	Limits VN0808L/M Min	Limits VN0808L/M Max	Limits VQ1006P Min	Limits VQ1006P Max	Unit
Static								
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10 µA	125	80		90		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	1.6	0.8	2	0.8	2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 15 V			± 100		± 100	nA
		T_J = 125°C					± 500	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80 V, V_{GS} = 0 V			10			µA
		T_J = 125°C			500			µA
		V_{DS} = 72 V, V_{GS} = 0 V					1	µA
		T_J = 125°C					500	µA
On-State Drain Current[c]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 10 V	1.8	1.5		1.5		A
Drain-Source On-Resistance[c]	$r_{DS(on)}$	V_{GS} = 5 V, I_D = 0.3 A	3.8				5	Ω
		V_{GS} = 10 V, I_D = 1 A	3.6		4		4.5	Ω
		T_J = 125°C	6.7		8		8.6	Ω
Forward Transconductance[c]	g_{fs}	V_{DS} = 10 V, I_D = 0.5 A	350	170		170		mS
Common Source Output Conductance[c]	g_{os}	V_{DS} = 10 V, I_D = 0.1 A	0.23					mS
Dynamic								
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	35		50		60	pF
Output Capacitance	C_{oss}		15		40		50	pF
Reverse Transfer Capacitance	C_{rss}		2		10		10	pF
Switching[d]								
Turn-On Time	t_{ON}	V_{DD} = 25 V, R_L = 23 Ω I_D ≅ 1 A, V_{GEN} = 10 V R_G = 25 Ω	6		1 0		1 0	ns
Turn-Off Time	t_{OFF}		8		10		10	ns

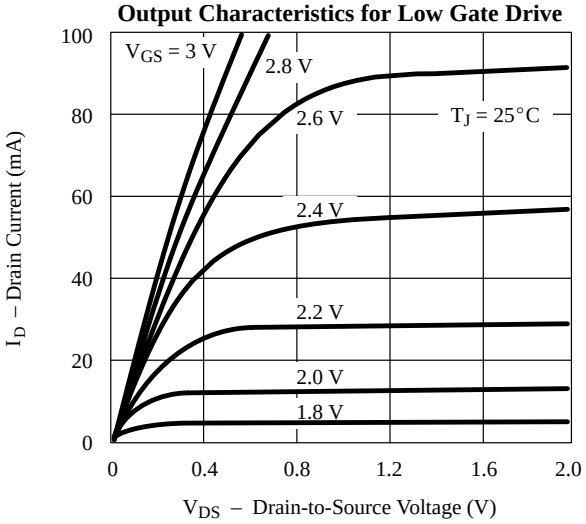
Notes
a. T_A = 25°C unless otherwise noted. VNDQ09
b. For DESIGN AID ONLY, not subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 2%.
d. Switching time is essentially independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

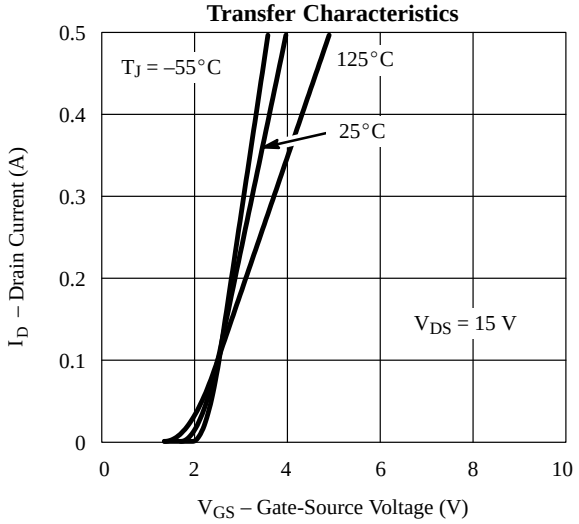
Ohmic Region Characteristics



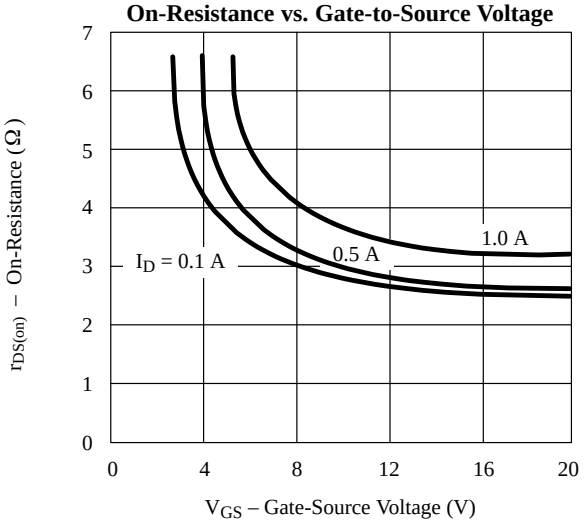
Output Characteristics for Low Gate Drive



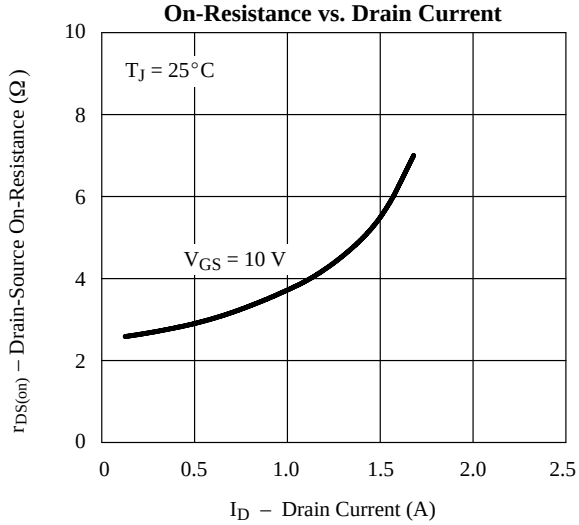
Transfer Characteristics



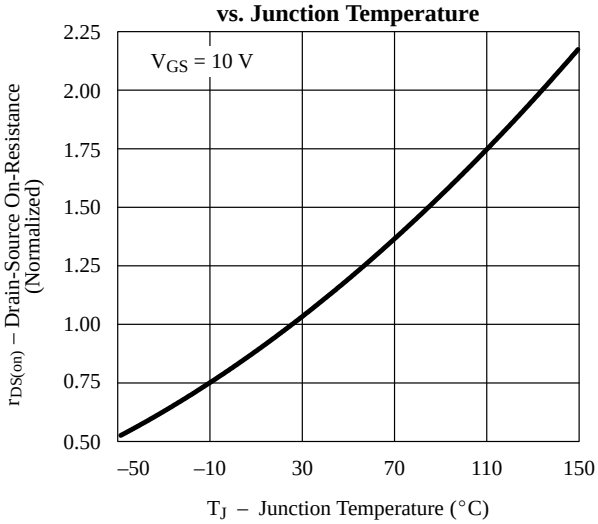
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Drain Current

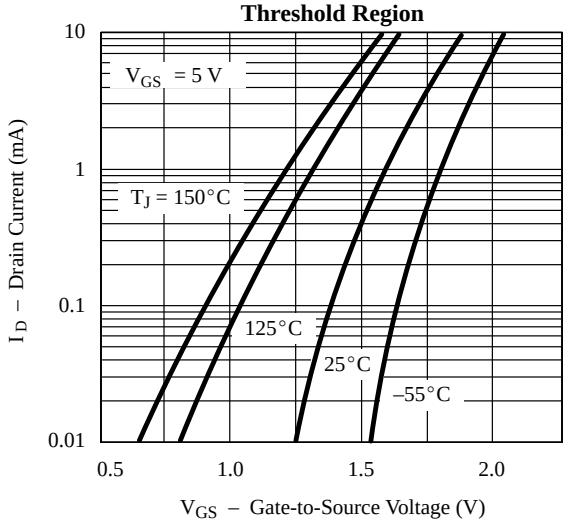


Normalized On-Resistance vs. Junction Temperature

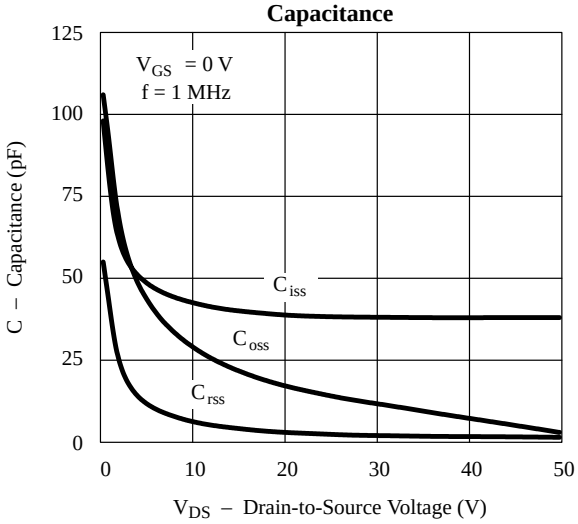


Typical Characteristics (25°C Unless Otherwise Noted) (Cont'd)

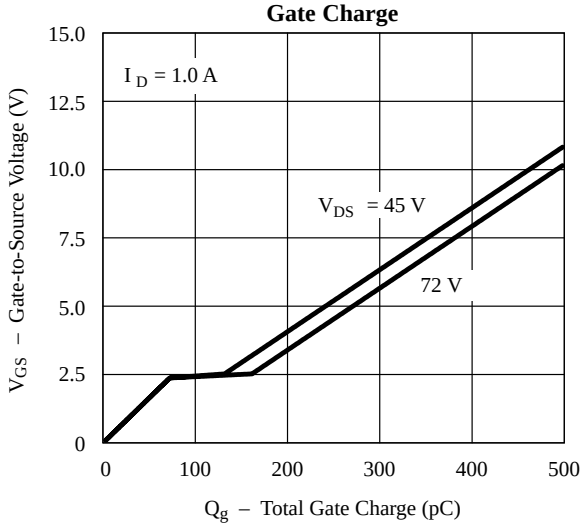
Threshold Region



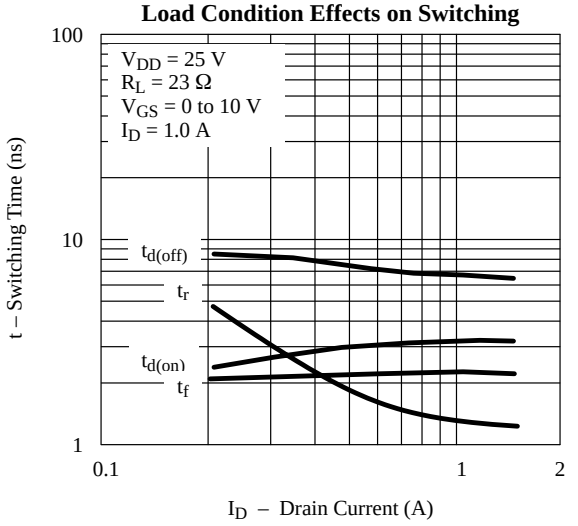
Capacitance



Gate Charge



Load Condition Effects on Switching



Normalized Effective Transient Thermal Impedance, Junction-to-Ambient (TO-226AA)