

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)
VQ1001J	30	1 @ $V_{GS} = 12$ V	0.8 to 2.5	0.83
VQ1001P		1 @ $V_{GS} = 12$ V	0.8 to 2.5	0.53

Features

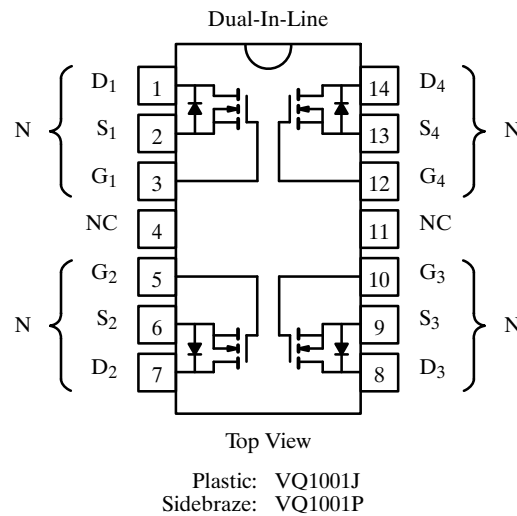
- Low On-Resistance: 0.85 Ω
- Low Threshold: 1.4 V
- Low Input Capacitance: 38 pF
- Fast Switching Speed: 9 ns
- Low Input and Output Leakage

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	Single	Total Quad	Unit	
Drain-Source Voltage	V_{DS}	30		V	
Gate-Source Voltage	V_{GS}	± 30			
		± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.83	A	
		$T_A = 100^\circ\text{C}$	0.53		
Pulsed Drain Current	I_{DM}	3			
Power Dissipation (Single)	P_D	$T_A = 25^\circ\text{C}$	1.3	2	W
		$T_A = 100^\circ\text{C}$	0.52	0.8	
Maximum Junction-to-Ambient (Single)	R_{thJA}	96	62.5	$^\circ\text{C}/\text{W}$	
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.

VQ1001J/P

Specifications^a

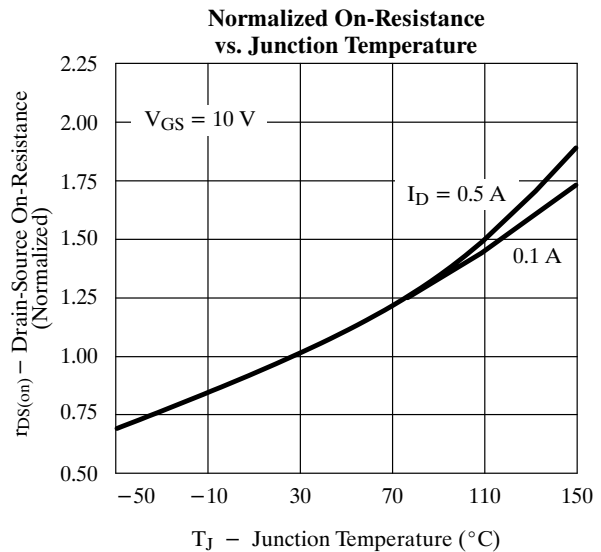
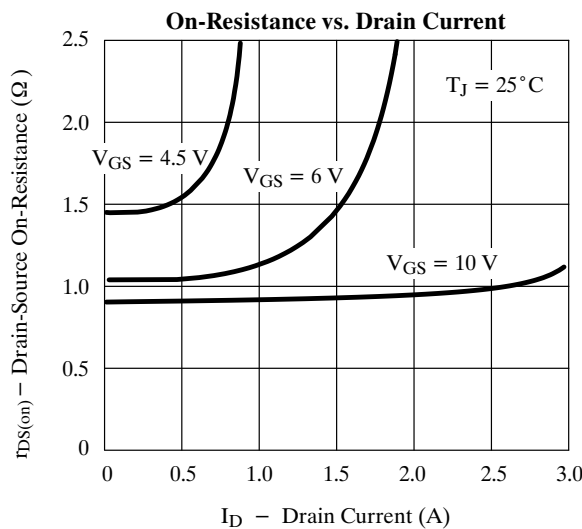
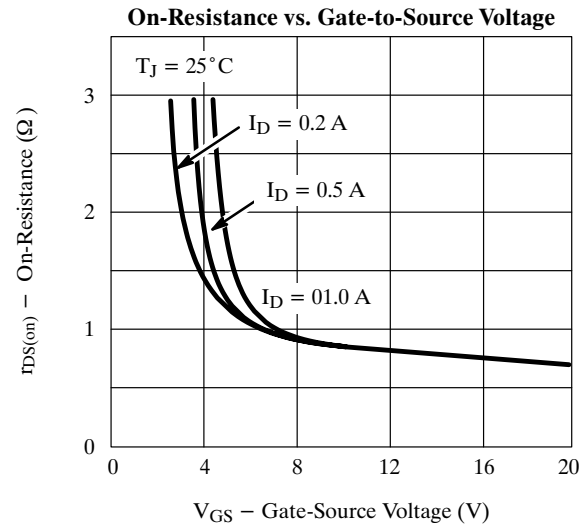
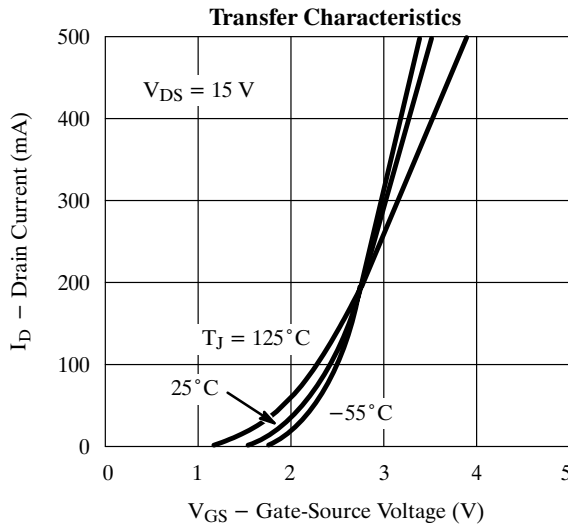
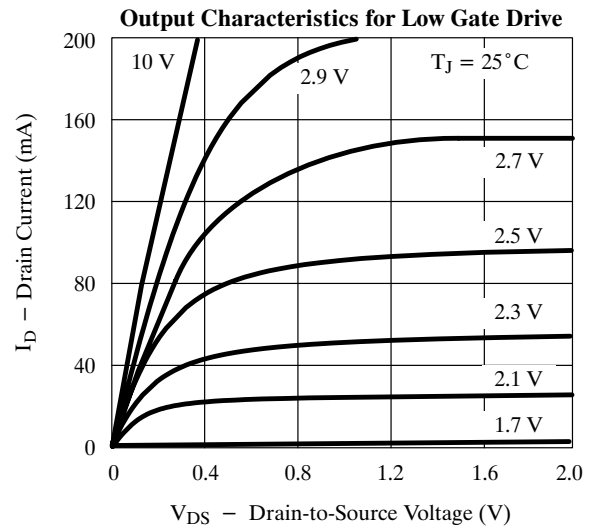
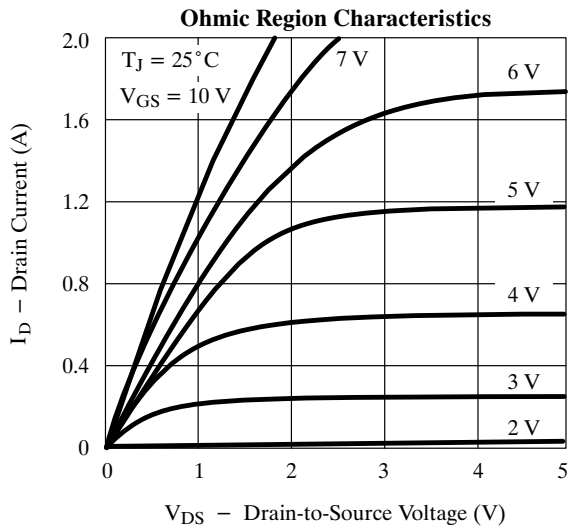
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^b	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	30	45		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\ \text{mA}$	0.8	1.5	2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 15\ \text{V}$ $T_J = 125^\circ\text{C}$			± 100	nA
					± 500	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\ \text{V}, V_{GS} = 0\ \text{V}$			10	μA
		$V_{DS} = 24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			500	
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 12\ \text{V}$	2	3.5		A
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = 5\ \text{V}, I_D = 0.2\ \text{A}$		1.2	1.75	Ω
		$V_{GS} = 12\ \text{V}, I_D = 1\ \text{A}$		0.8	1	
		$T_J = 125^\circ\text{C}$		1.5	2	
Forward Transconductance ^c	g_{fs}	$V_{DS} = 10\ \text{V}, I_D = 0.5\ \text{A}$	200	500		mS
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = 15\ \text{V}, V_{GS} = 0\ \text{V}, f = 1\ \text{MHz}$		38	110	pF
Output Capacitance	C_{oss}			33	110	
Reverse Transfer Capacitance	C_{rss}			8	35	
Switching^d						
Turn-On Time	t_{ON}	$V_{DD} = 15\ \text{V}, R_L = 23\ \Omega, I_D \cong 0.6\ \text{A}$ $V_{GEN} = 10\ \text{V}, R_G = 25\ \Omega$		9	30	ns
Turn-Off Time	t_{OFF}			14	30	

Notes

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

VNDQ03

Typical Characteristics (25°C Unless Otherwise Noted)



VQ1001J/P

Typical Characteristics (25°C Unless Otherwise Noted)

