



## Quad N-Channel 30-V (D-S) MOSFETs

PRODUCT SUMMARY				
Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max ( $\Omega$ )	$V_{GS(th)}$ (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

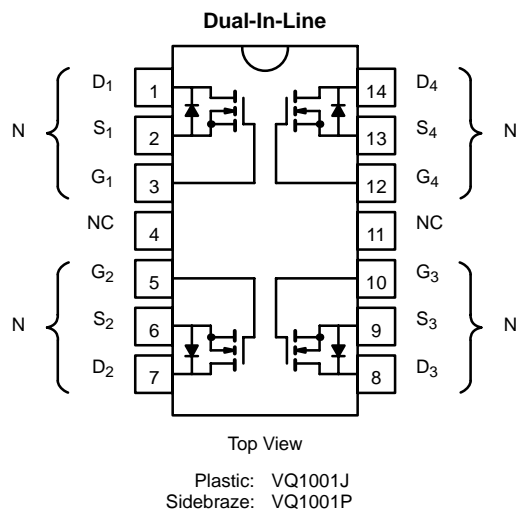
- Low On-Resistance: 0.85  $\Omega$
- Low Threshold: 1.4 V
- Low Input Capacitance: 38 pF
- Fast Switching Speed: 9 ns
- Low Input and Output Leakage

### 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



Device Marking  
Top View

VQ1001J  
"S" flfxyy

VQ1001P  
"S" flfxyy

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

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	$V_{GS}$	VQ1001J	$\pm 30$		
		VQ1001P	$\pm 20$		
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 <sup>a</sup>	$I_{DM}$	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	
Thermal Resistance, Junction-to-Ambient (Single)	$R_{thJA}$	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 ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ <sup>a</sup>	Max	
<b>Static</b>						
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	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 16\ \text{V}$ $T_J = 125^\circ\text{C}$			$\pm 100$	nA
					$\pm 500$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\ \text{V}, V_{GS} = 0\ \text{V}$			10	$\mu\text{A}$
		$V_{DS} = 24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			500	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 12\ \text{V}$	2	3.5		A
Drain-Source On-Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 5\ \text{V}, I_D = 0.2\ \text{A}$		1.2	1.75	$\Omega$
		$V_{GS} = 12\ \text{V}, I_D = 1\ \text{A}$		0.8	1	
		$T_J = 125^\circ\text{C}$		1.5	2	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 10\ \text{V}, I_D = 0.5\ \text{A}$	200	500		mS
<b>Dynamic</b>						
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	
<b>Switching<sup>c</sup></b>						
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	

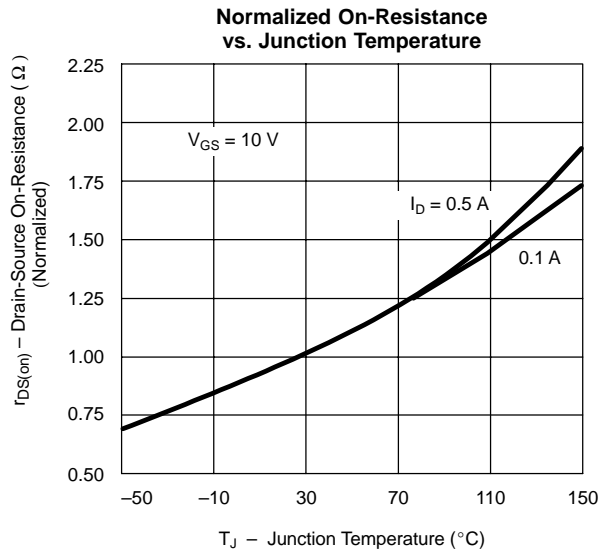
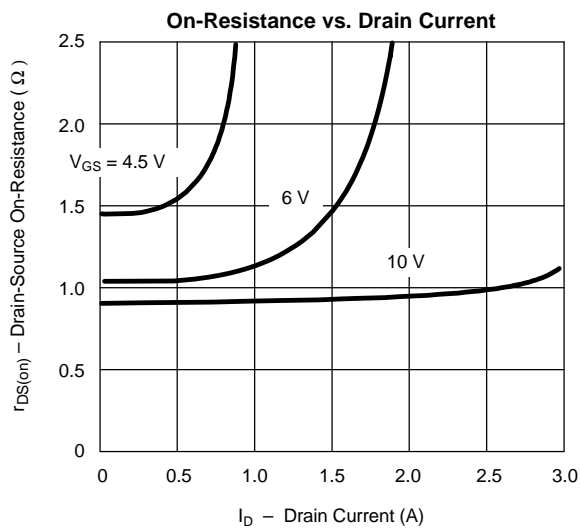
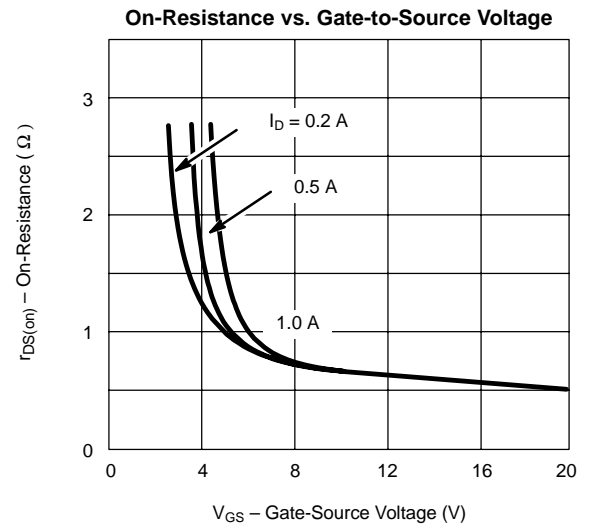
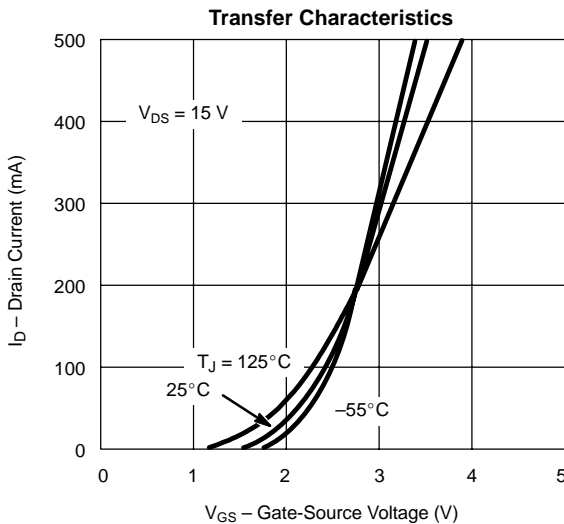
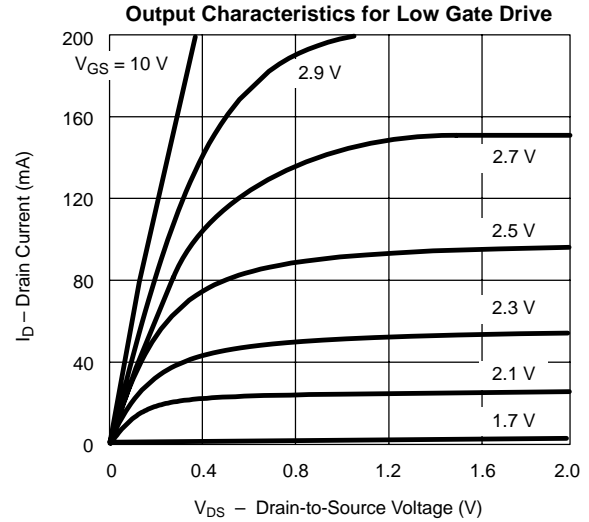
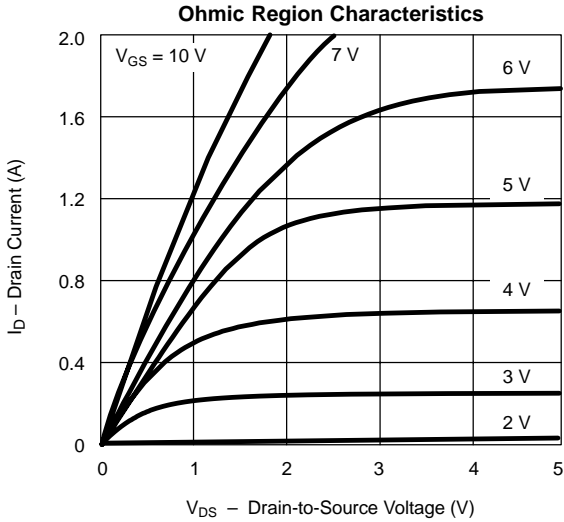
## Notes

- 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.

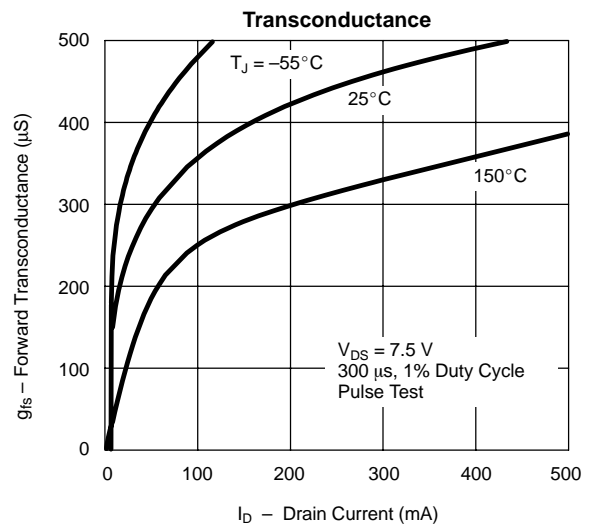
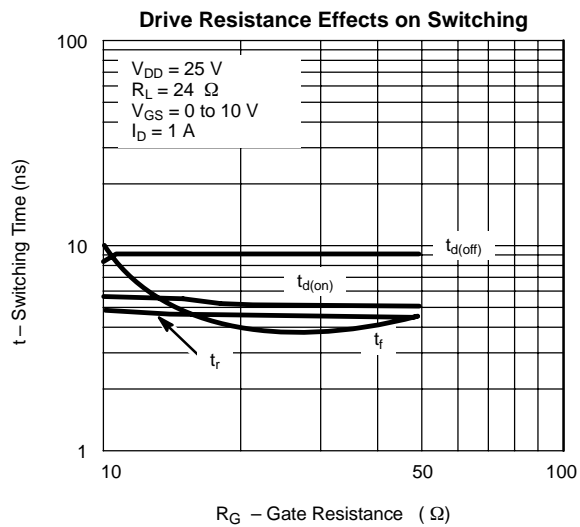
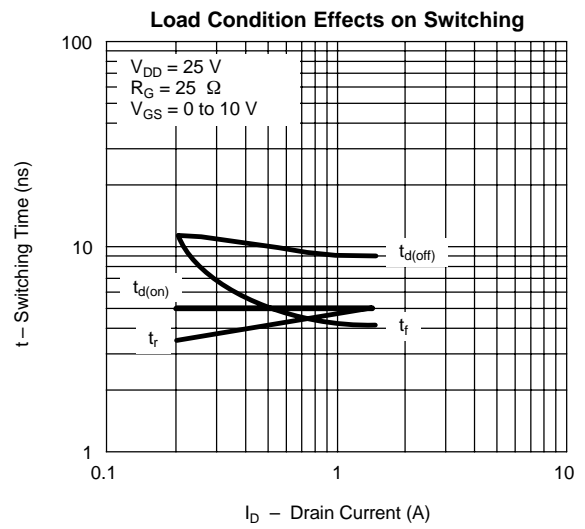
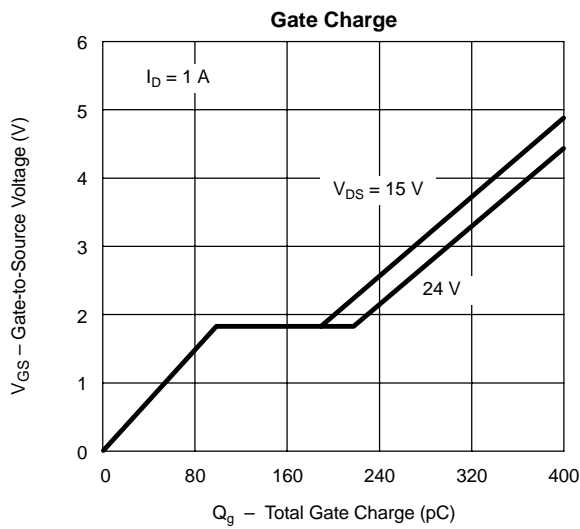
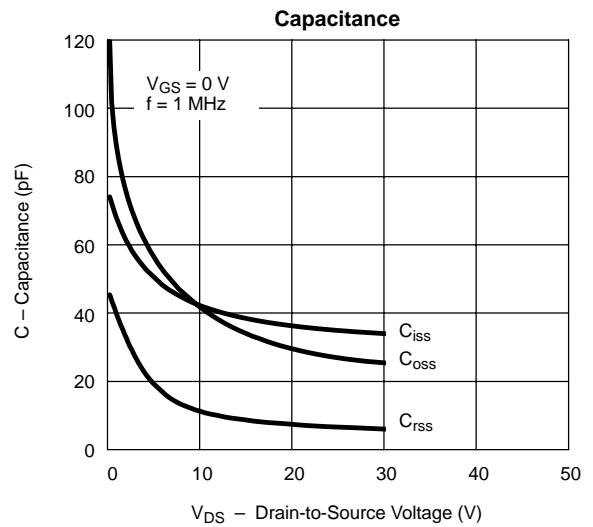
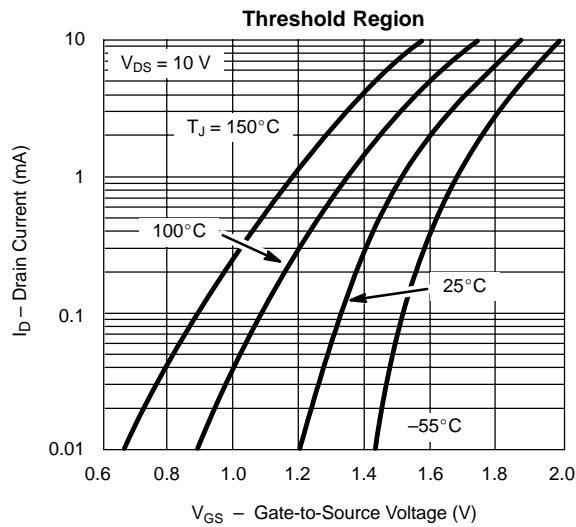
VNDQ03



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



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





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