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

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

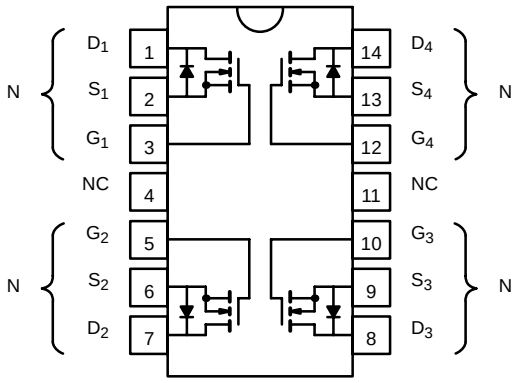
BENEFITS

- 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

Dual-In-Line



Top View

Plastic: VQ1001J
Sidebraze: VQ1001P

Device Marking
Top View

VQ1001J
"S" *fllxxyy*

VQ1001P
"S" *fllxxyy*

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

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		**Symbol**	**Single**	**Total Quad**	**Unit**
Drain-Source Voltage		V_{DS}	30		V
Gate-Source Voltage	VQ1001J	V_{GS}	±30		
	VQ1001P		±20		
Continuous Drain Current (T_J = 150°C)	T_A= 25°C	I_D	0.83		A
	T_A= 100°C		0.53		
Pulsed Drain Current[a]		I_{DM}	3		
Power Dissipation (Single)	T_A= 25°C	P_D	1.3	2	W
	T_A= 100°C		0.52	0.8	
Thermal Resistance, Junction-to-Ambient (Single)		R_{thJA}	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.

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

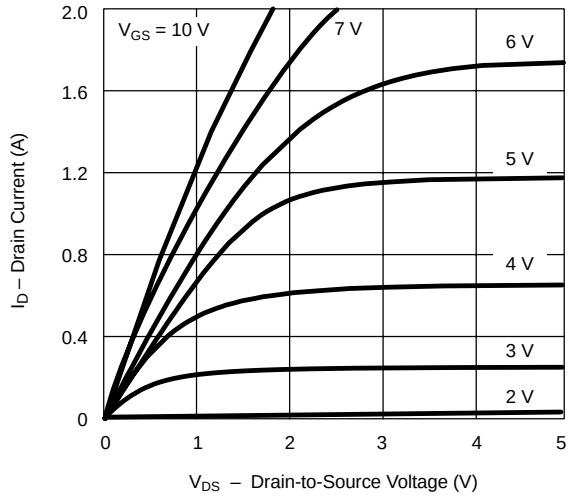
Parameter	Symbol	Test Conditions	Limits Min	Limits Typ[a]	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10 μA	30	45		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	0.8	1.5	2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±16 V			±100	nA
		T_J = 125°C			±500	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			10	μA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 125°C			500	μA
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 12 V	2	3.5		A
Drain-Source On-Resistance[b]	$r_{DS(on)}$	V_{GS} = 5 V, I_D = 0.2 A		1.2	1.75	Ω
		V_{GS} = 12 V, I_D = 1 A		0.8	1	Ω
		T_J = 125°C		1.5	2	Ω
Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 0.5 A	200	500		mS
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		38	110	pF
Output Capacitance	C_{oss}			33	110	pF
Reverse Transfer Capacitance	C_{rss}			8	35	pF
Switching[c]						
Turn-On Time	t_{ON}	V_{DD} = 15 V, R_L = 23 Ω, I_D ≅ 0.6 A, V_{GEN} = 10 V, R_G = 25 Ω		9	30	ns
Turn-Off Time	t_{OFF}			14	30	ns

Notes
a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
c. Switching time is essentially independent of operating temperature.

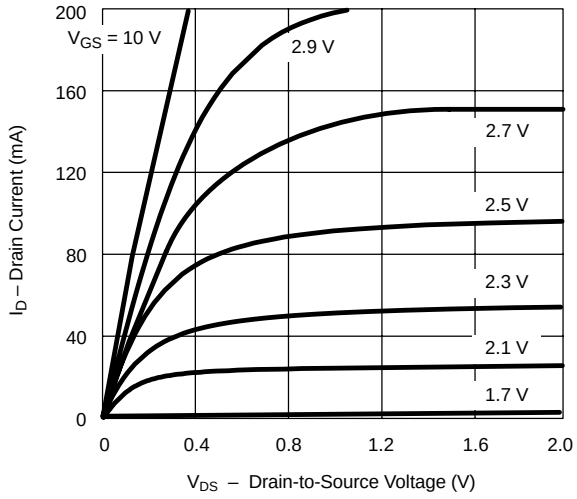
VNDQ03

TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

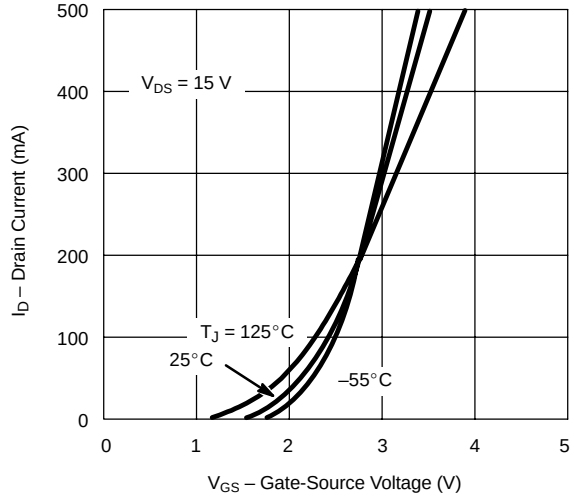
Ohmic Region Characteristics



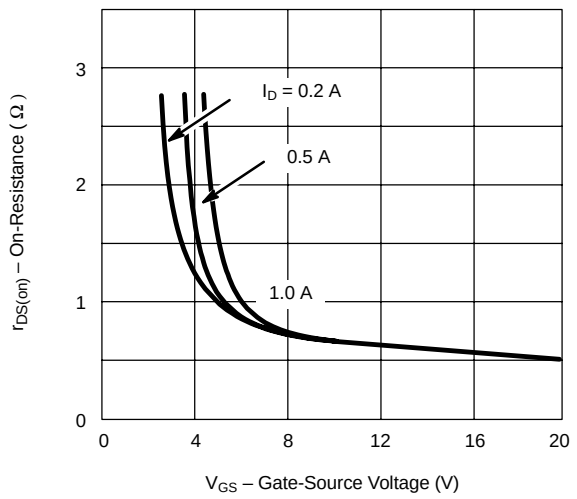
Output Characteristics for Low Gate Drive



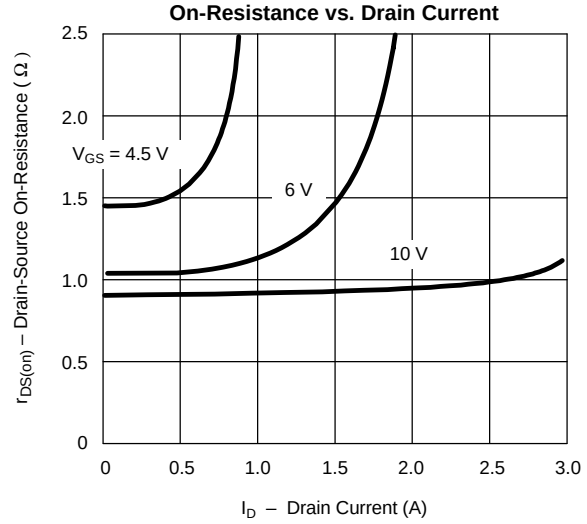
Transfer Characteristics



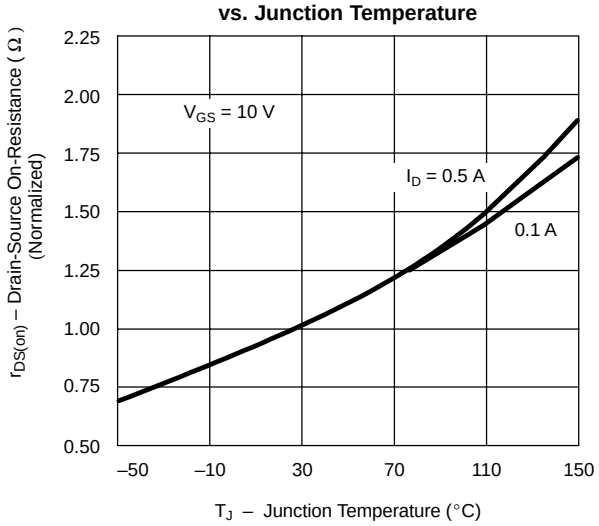
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Drain Current

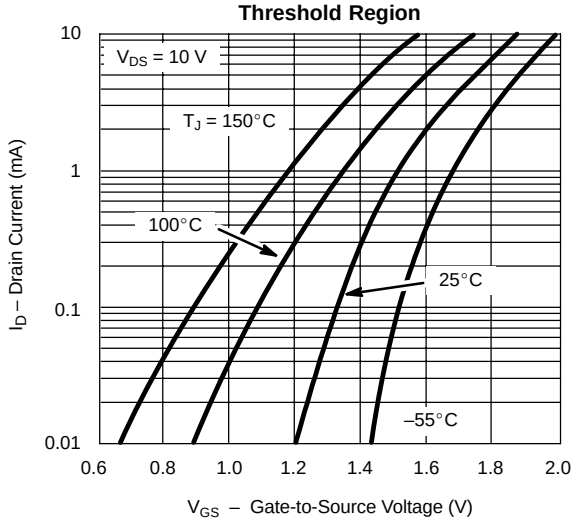


Normalized On-Resistance vs. Junction Temperature

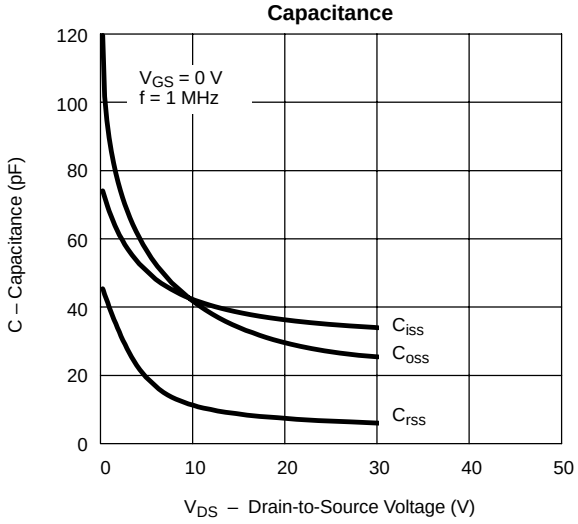


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

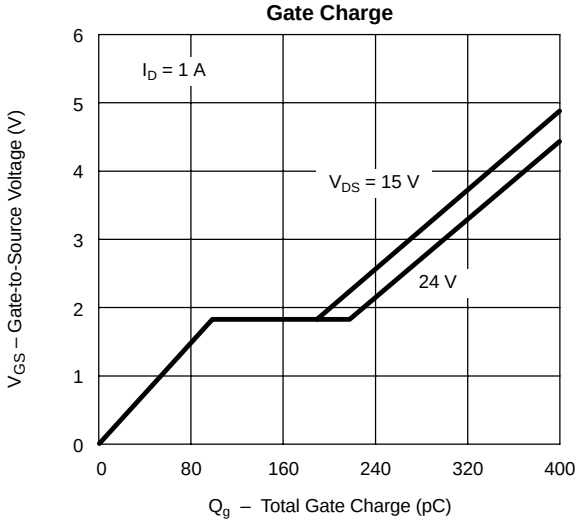
Threshold Region



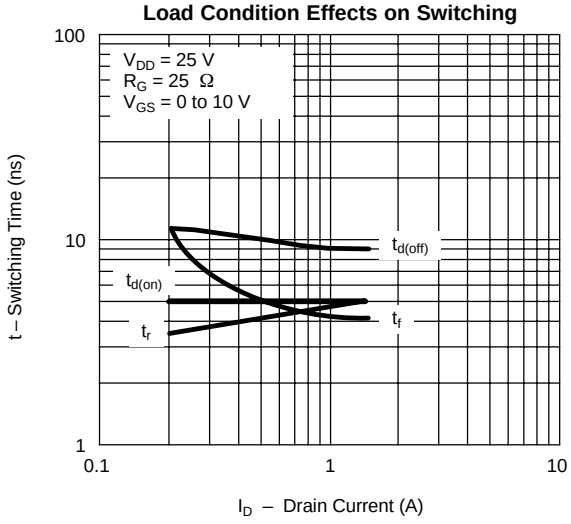
Capacitance



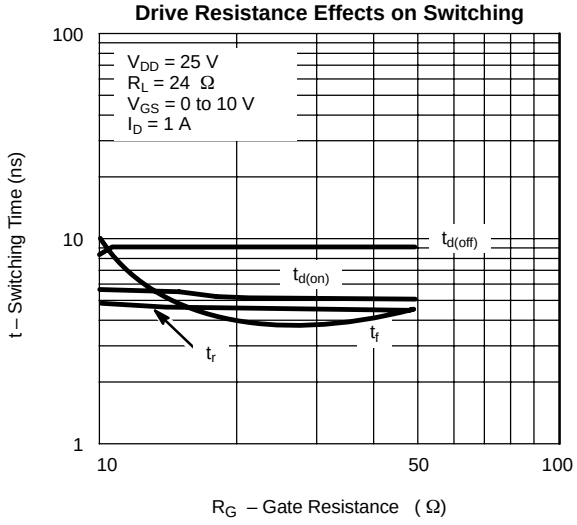
Gate Charge



Load Condition Effects on Switching



Drive Resistance Effects on Switching



Transconductance