



VQ2004J
Vishay Siliconix

Quad P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY			
$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
-60	5 @ $V_{GS} = -10$ V	-2 to -4.5	-0.41

FEATURES

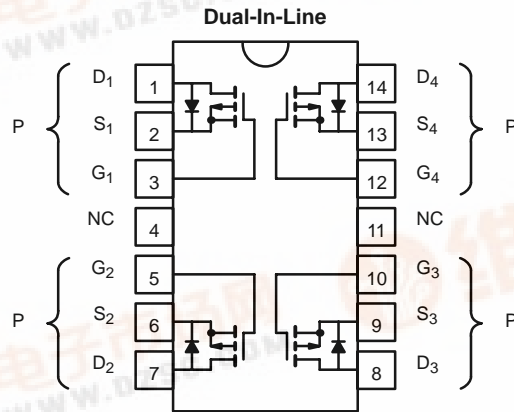
- High-Side Switching
- Low On-Resistance: 2.5 Ω
- Moderate Threshold: -3.4 V
- Fast Switching Speed: 40 ns
- Low Input Capacitance: 75 pF

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Switching
- Easily Driven Without Buffer

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply, Converter Circuits
- Motor Control



Device Marking
Top View

VQ2004J
"S" flxxyy

"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}	-60		V
Gate-Source Voltage	V_{GS}	± 30		
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	-0.41	A
		$T_A = 100^\circ\text{C}$	-0.23	
Pulsed Drain Current ^a	I_{DM}	-3		
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	1.3	W
		$T_A = 100^\circ\text{C}$	0.52	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	96	62.5	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

^a Pulse width limited by maximum junction temperature.

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SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^a	Max	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -10 μA	-60	-110		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -1 mA	-2	-3.4	-4.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±30 V T _J = 125 °C			±100	nA
					±500	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60 V, V _{GS} = 0 V			-10	μA
		V _{DS} = -48 V, V _{GS} = 0 V, T _J = 125 °C			-500	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = -10 V, V _{GS} = -10 V	-1	-2		A
Drain-Source On-Resistance ^b	r _{DS(on)}	V _{GS} = -10 V, I _D = -1 A T _J = 125 °C		2.5	5	Ω
				4.4	8	
Forward Transconductance ^b	g _{fs}	V _{DS} = -10 V, I _D = -0.5 A	200	325		mS
Common Source Output Conductance ^b	g _{os}	V _{DS} = -7.5 V, I _D = -0.1 A		0.45		
Dynamic						
Input Capacitance	C _{iss}	V _{DS} = -25 V, V _{GS} = 0 V f = 1 MHz		75	150	pF
Output Capacitance	C _{oss}			40	60	
Reverse Transfer Capacitance	C _{rss}			18	25	
Switching^c						
Turn-On Time	t _{d(on)}	V _{DD} = -25 V, R _L = 47 Ω I _D ≅ -0.5 A, V _{GEN} = -10 V R _G = 25 Ω		11	15	ns
	t _r			30	40	
Turn-Off Time	t _{d(off)}			20	30	
	t _f			20	30	

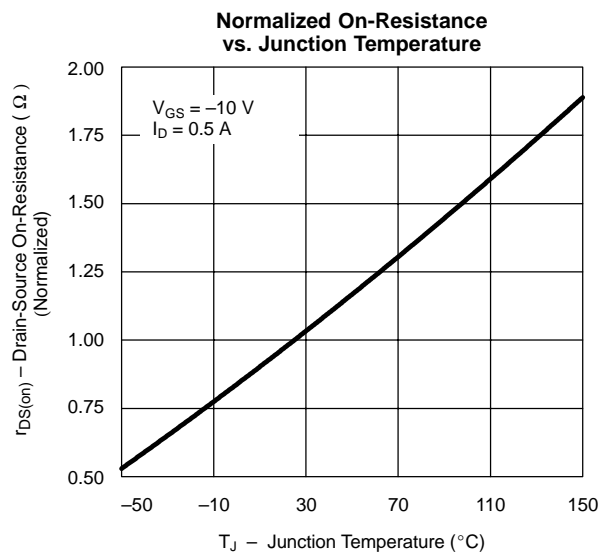
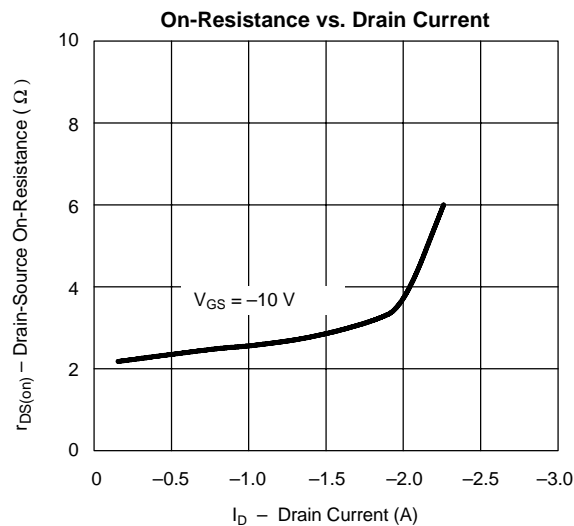
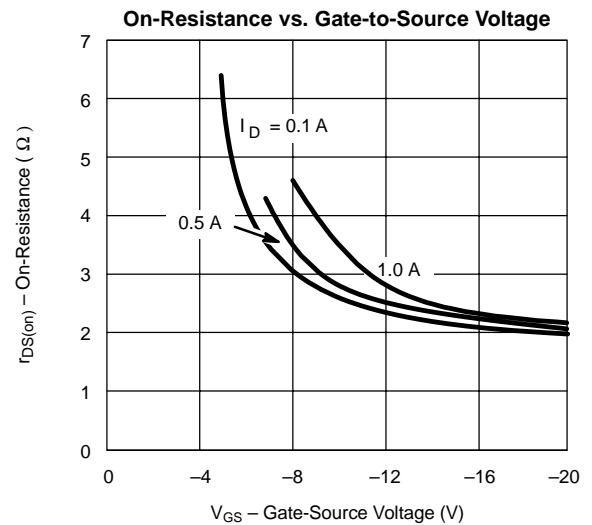
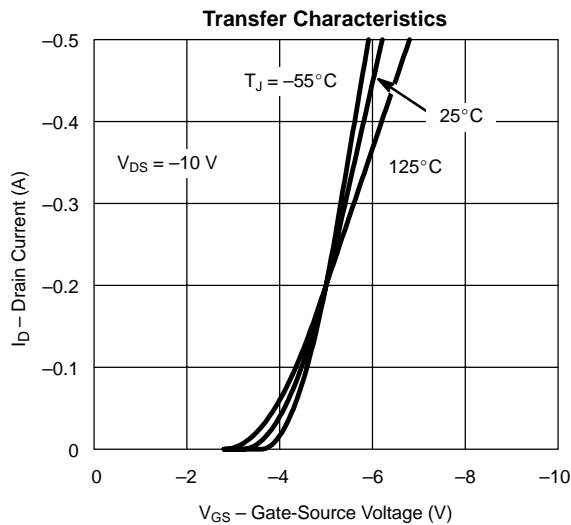
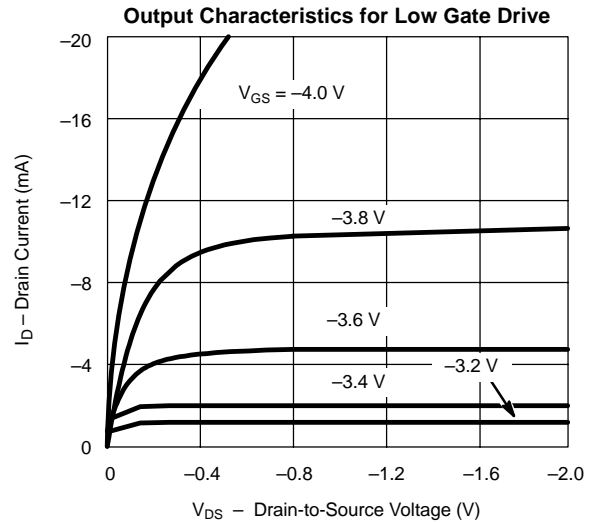
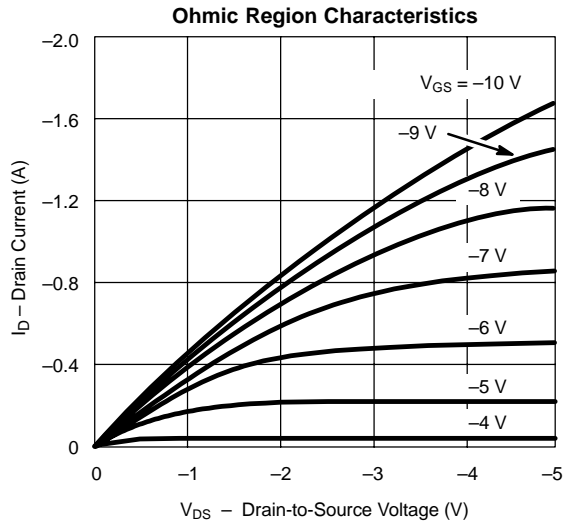
Notes

- 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.

VPDV10



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





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