



**VQ3001J/P**  
Vishay Siliconix

**Dual N-/Dual P-Channel 30-V (D-S) MOSFETs**

PRODUCT SUMMARY				
	V <sub>(BR)DSS</sub> Min (V)	r <sub>DS(on)</sub> Max (Ω)	V <sub>GS(th)</sub> (V)	I <sub>D</sub> (A)
N-Channel	30	1 @ V <sub>GS</sub> = 12 V	0.8 to 2.5	0.85
P-Channel	-30	2 @ V <sub>GS</sub> = -12 V	-2 to -4.5	-0.6

**FEATURES**

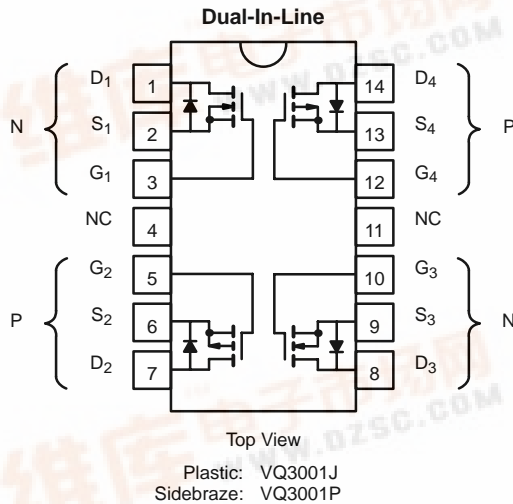
- Low On-Resistance: 0.8/1.6 Ω
- Low Threshold: 1.5/-3.1 V
- Low Input Capacitance: 38/60 pF
- Fast Switching Speed: 9/16 ns
- Low Input and Output Leakage

**BENEFITS**

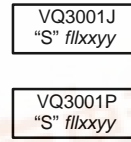
- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

**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



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

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Single		Total Quad	Unit
		N-Channel	P-Channel		
Drain-Source Voltage	V <sub>DS</sub>	30	30		V
Gate-Source Voltage	V <sub>GS</sub>	±20	±20		
		±20	±20		
Continuous Drain Current (T <sub>J</sub> = 150°C)	I <sub>D</sub>	0.85	-0.6		A
		0.52	-0.37		
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	3	-2		
Power Dissipation	P <sub>D</sub>	1.3	1.3	2	W
		0.52	0.52	0.8	
Thermal Resistance, Junction-to-Ambient	R <sub>thJA</sub>	96.2	96.2	62.5	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		-55 to 150	°C

Notes:  
a. Pulse width limited by maximum junction temperature.



SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Condition	Typ <sup>a</sup>	Limits				Unit
				N-Channel		P-Channel		
				Min	Max	Min	Max	
<b>Static</b>								
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 10 μA	55	30				V
		V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA	-55			-30		
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1 mA	1.5	0.8	2.5			
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -1 mA	-3.1			-2	-4.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100		±100	nA
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V, T <sub>J</sub> = 125 °C			±500		±500	
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V			10			μA
		V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V					-10	
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			500			
		V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C					-500	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 12 V	3	2				A
		V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -12 V	-2			-1.5		
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 5 V, I <sub>D</sub> = 0.2 A	1.2		1.75			Ω
		V <sub>GS</sub> = 12 V, I <sub>D</sub> = 1 A	0.81		1.0			
		V <sub>GS</sub> = -12 V, I <sub>D</sub> = -1 A	1.6				2.0	
		V <sub>GS</sub> = 12 V, I <sub>D</sub> = 1 A, T <sub>J</sub> = 125 °C	1.65		2.0			
		V <sub>GS</sub> = -12 V, I <sub>D</sub> = -1 A, T <sub>J</sub> = 125 °C	2.7				4.0	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.5 A	500	250				mS
		V <sub>DS</sub> = -10 V, I <sub>D</sub> = -0.5 A	390			200		
<b>Dynamic</b>								
Input Capacitance	C <sub>iss</sub>	N-Channel V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz P-Channel V <sub>DS</sub> = -15 V, V <sub>GS</sub> = 0 V, f = 1 MHz	38		110			pF
Output Capacitance	C <sub>oss</sub>		60				150	
			33		110			
Reverse Transfer Capacitance	C <sub>rss</sub>		45				100	
			8		35			
Turn-On Time	t <sub>ON</sub>	N-Channel V <sub>DD</sub> = 15 V, R <sub>L</sub> = 23 Ω I <sub>D</sub> ≅ 0.6 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 25 Ω	9		30			ns
Turn-Off Time	t <sub>OFF</sub>	P-Channel V <sub>DD</sub> = -15 V, R <sub>L</sub> = 23 Ω I <sub>D</sub> ≅ -0.6 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 25 Ω	19				30	
		14		30				
		16				30		

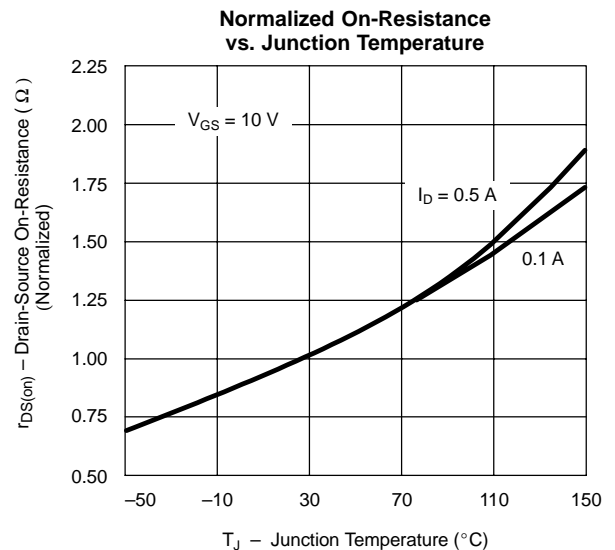
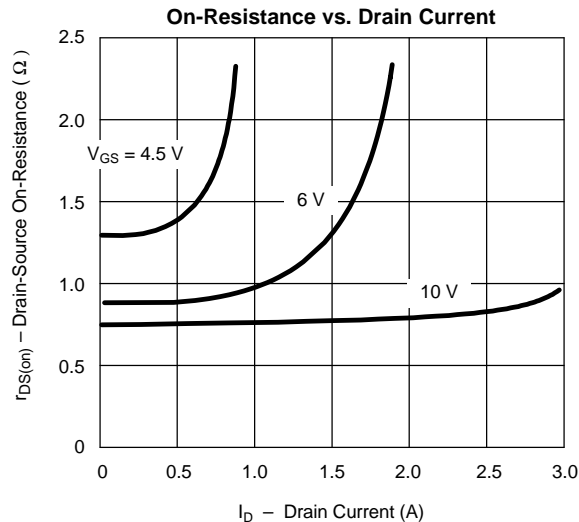
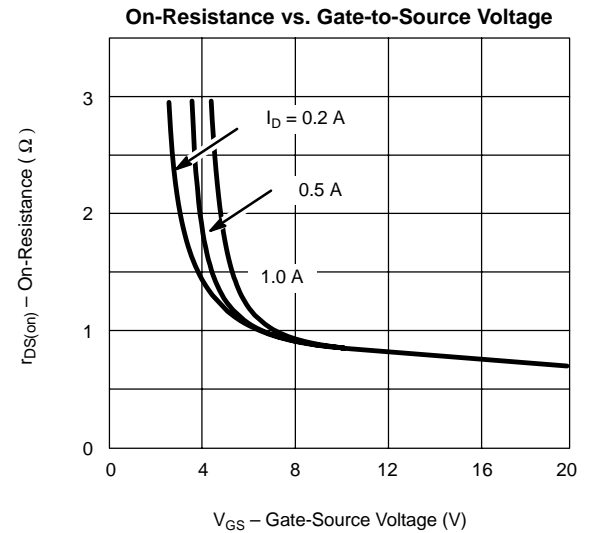
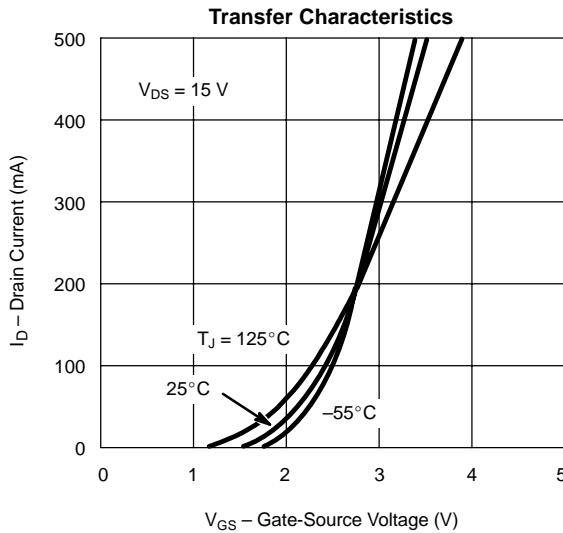
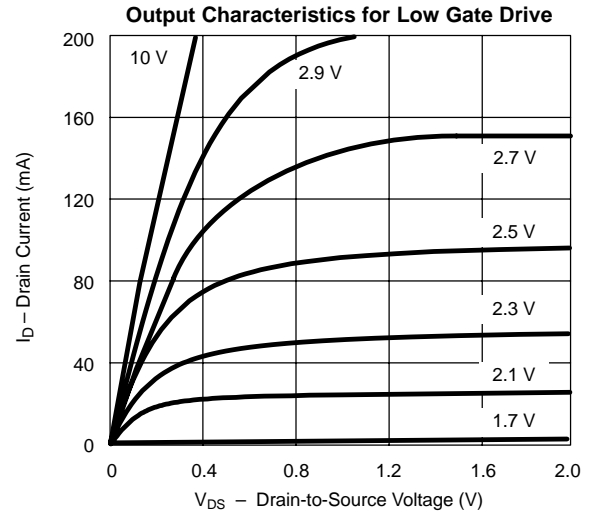
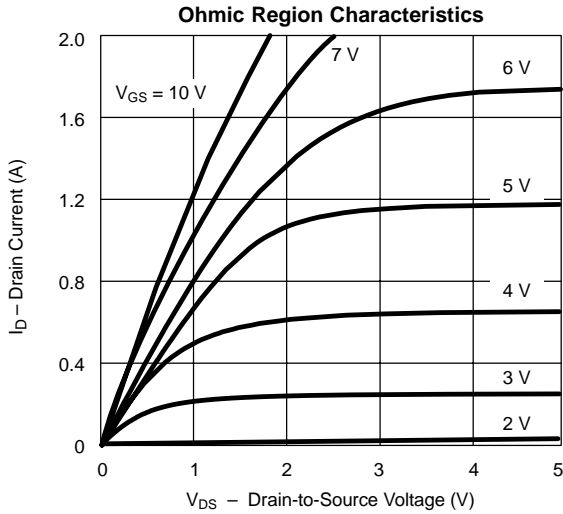
Notes

- a. For DESIGN AID ONLY, not subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

VNDQ03/VPEA03



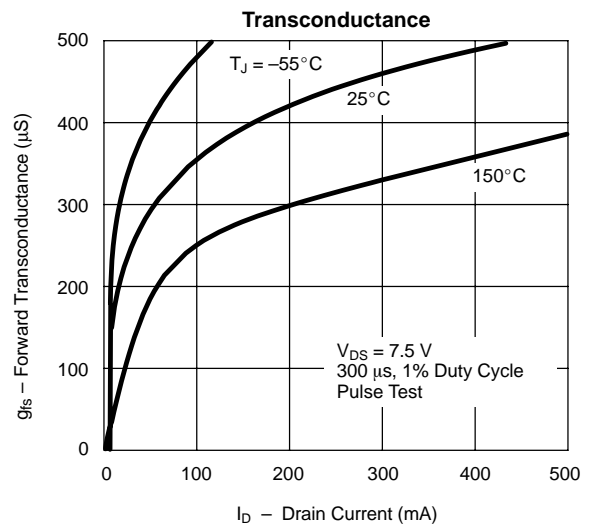
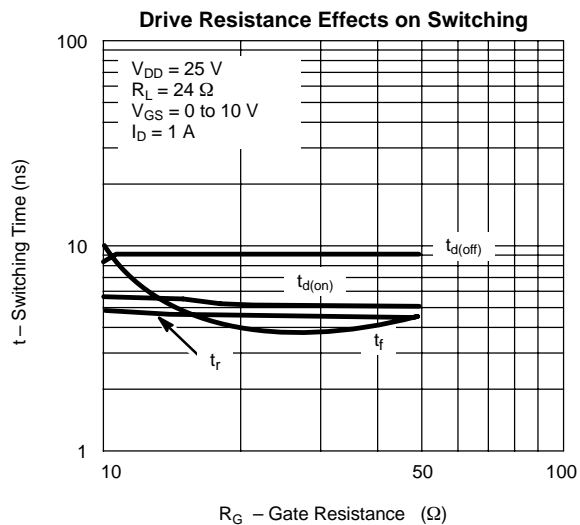
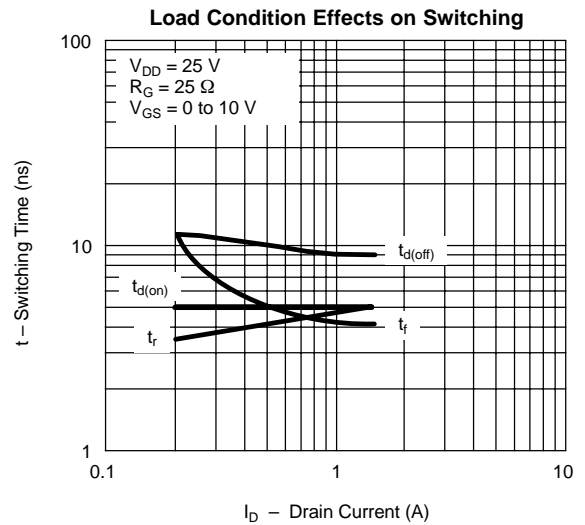
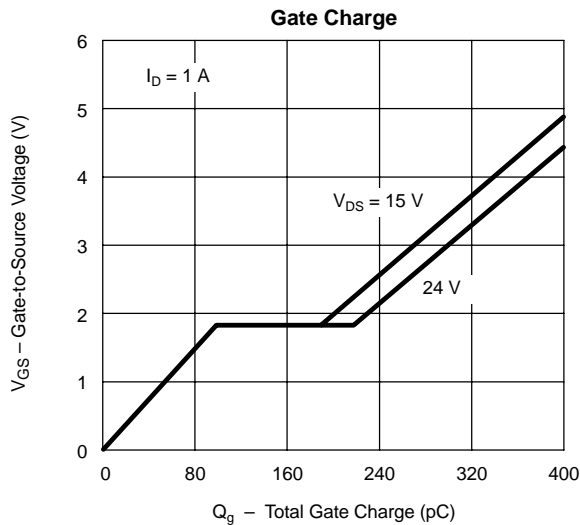
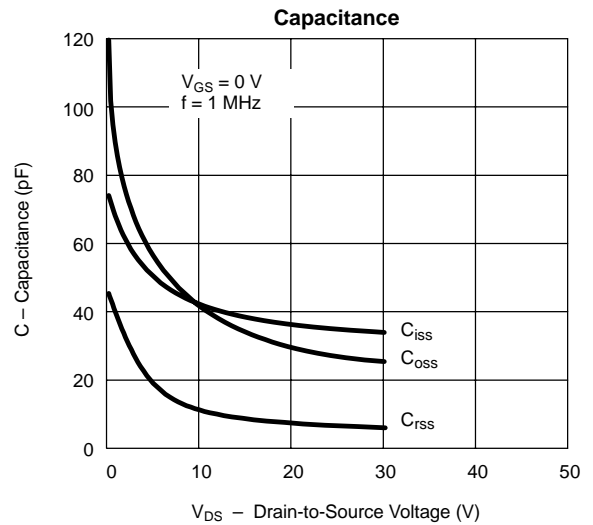
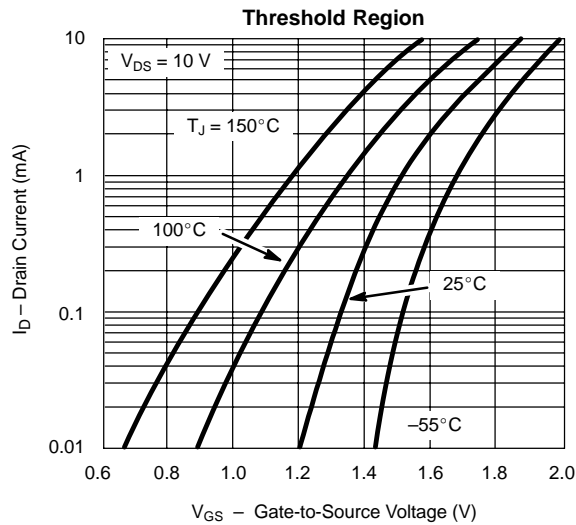
**TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED) N-CHANNEL**





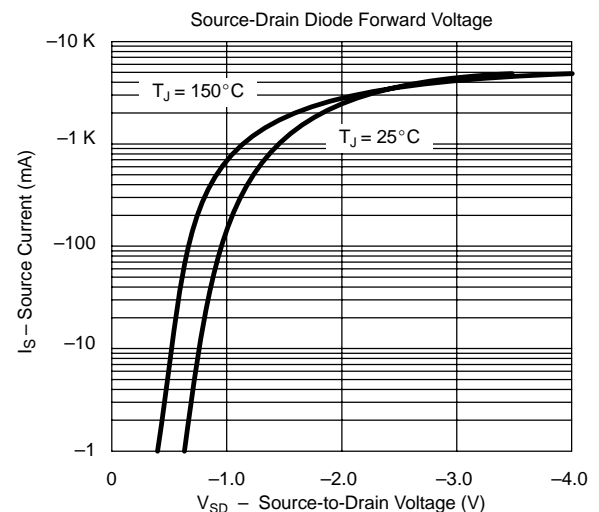
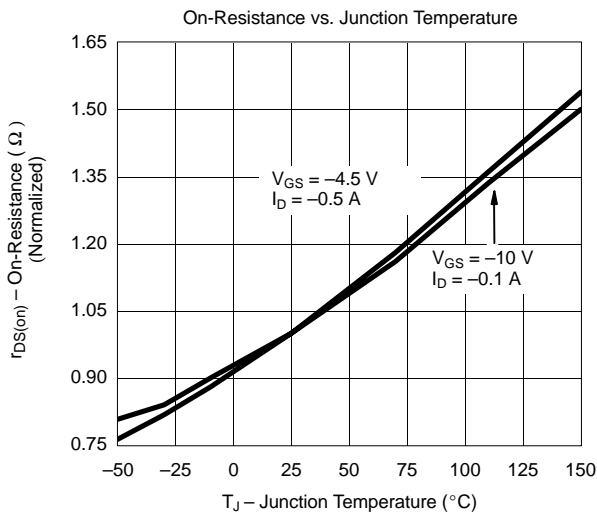
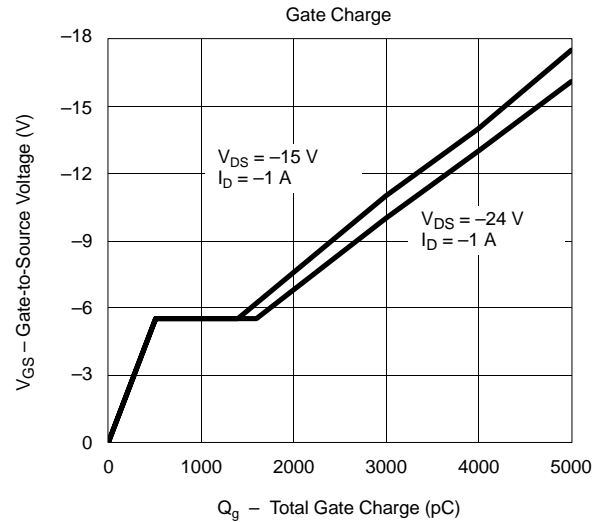
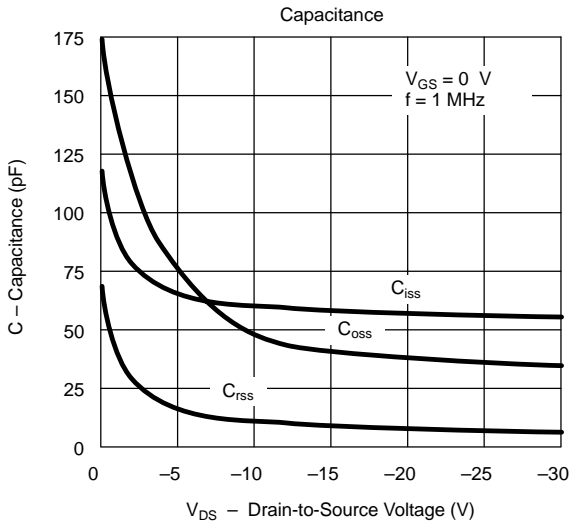
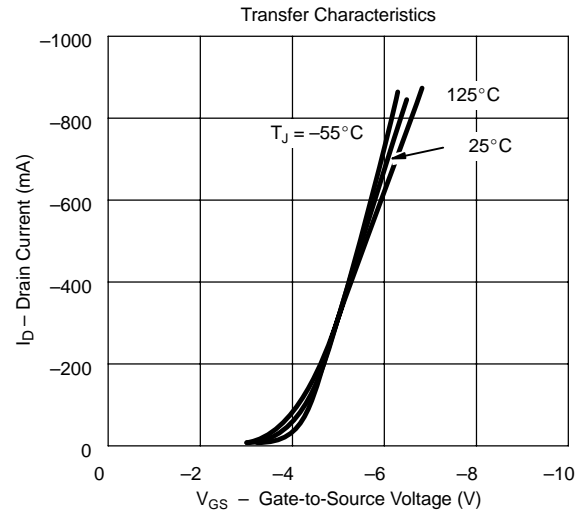
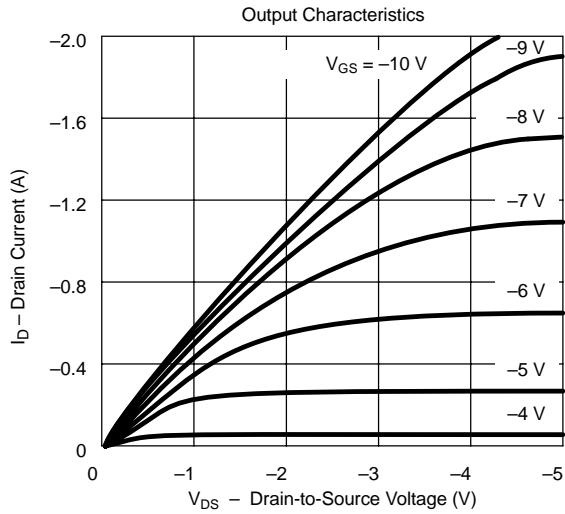
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### N-CHANNEL





**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED) P-CHANNEL**



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

