



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

PRODUCT SUMMARY				
	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
N-Channel	30	1 @ $V_{GS} = 12$ V	0.8 to 2.5	0.85
P-Channel	-30	2 @ $V_{GS} = -12$ V	-2 to -4.5	-0.6

FEATURES

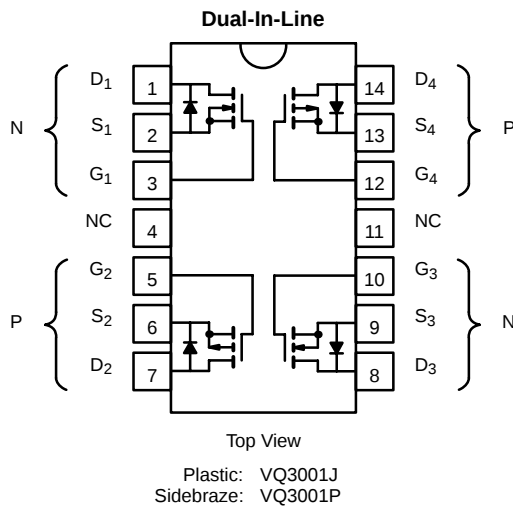
- Low On-Resistance: 0.8/1.6 Ω
- Low Threshold: 1.5/-3.1 V
- Low Input Capacitance: 38/60 pF
- Fast Switching Speed: 9/16 ns
- Low Input and Output Leakage

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

VQ3001J
"S" flxxyy

VQ3001P
"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
			N-Channel	P-Channel		
Drain-Source Voltage		V_{DS}	30	30		V
Gate-Source Voltage	VQ3001J	V_{GS}	± 20	± 20		
	VQ3001P		± 20	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_A = 25^\circ\text{C}$	I_D	0.85	-0.6		A
	$T_A = 100^\circ\text{C}$		0.52	-0.37		
Pulsed Drain Current ^a		I_{DM}	3	-2		
Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	1.3	1.3	2	W
	$T_A = 100^\circ\text{C}$		0.52	0.52	0.8	
Thermal Resistance, Junction-to-Ambient		R_{thJA}	96.2	96.2	62.5	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		-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 Condition	Typ ^a	Limits				Unit	
				N-Channel		P-Channel			
				Min	Max	Min	Max		
Static									
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	55	30				V	
		V _{GS} = 0 V, I _D = −10 μA	−55			−30			
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	1.5	0.8	2.5				
		V _{DS} = V _{GS} , I _D = −1 mA	−3.1			−2	−4.5		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100		±100	nA	
		V _{DS} = 0 V, V _{GS} = ±20 V, T _J = 125°C			±500		±500		
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V			10			μA	
		V _{DS} = −24 V, V _{GS} = 0 V					−10		
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125°C			500				
		V _{DS} = −24 V, V _{GS} = 0 V, T _J = 125°C					−500		
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 12 V	3	2				A	
		V _{DS} = −10 V, V _{GS} = −12 V	−2			−1.5			
Drain-Source On-State 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	0.81		1.0				
		V _{GS} = −12 V, I _D = −1 A	1.6				2.0		
		V _{GS} = 12 V, I _D = 1 A, T _J = 125°C	1.65		2.0				
		V _{GS} = −12 V, I _D = −1 A, T _J = 125°C	2.7				4.0		
Forward Transconductance ^b	g _{fs}	V _{DS} = 10 V, I _D = 0.5 A	500	250				mS	
		V _{DS} = −10 V, I _D = −0.5 A	390			200			
Dynamic									
Input Capacitance	C _{iss}	N-Channel V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz P-Channel V _{DS} = −15 V, V _{GS} = 0 V, f = 1 MHz	38		110			pF	
			60				150		
Output Capacitance	C _{oss}		33		110				
			45				100		
Reverse Transfer Capacitance	C _{rss}		8		35				
			15				60		
Turn-On Time	t _{ON}	N-Channel V _{DD} = 15 V, R _L = 23 Ω I _D ≅ 0.6 A, V _{GEN} = 10 V, R _G = 25 Ω	9		30			ns	
			19				30		
Turn-Off Time	t _{OFF}		P-Channel V _{DD} = −15 V, R _L = 23 Ω I _D ≅ −0.6 A, V _{GEN} = −10 V, R _G = 25 Ω	14		30			
				16					30

Notes

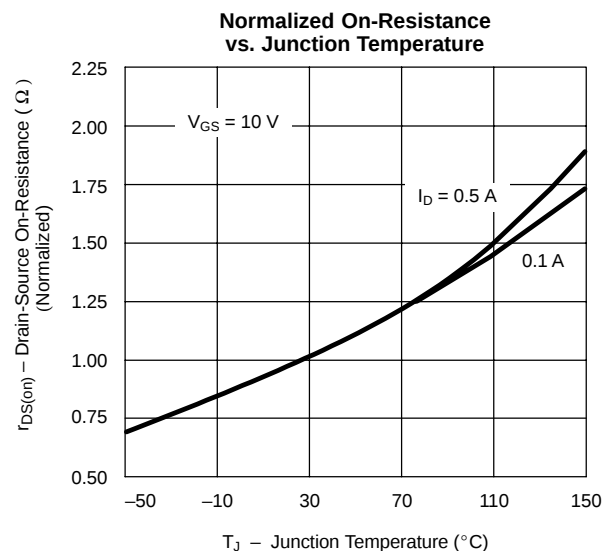
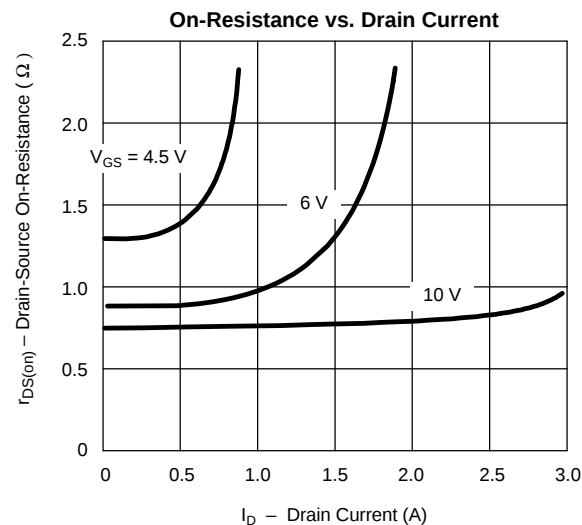
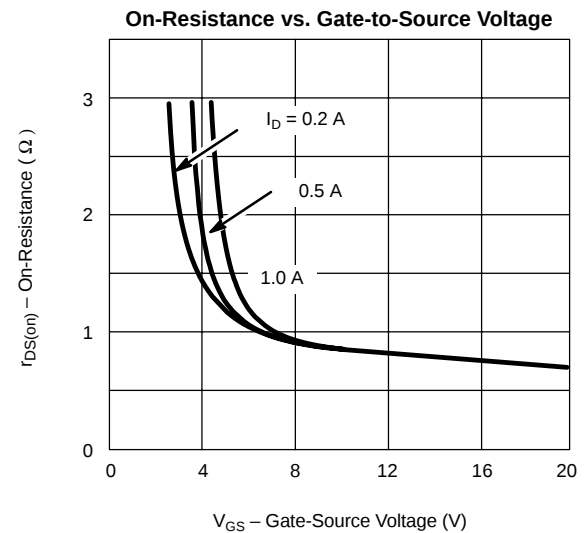
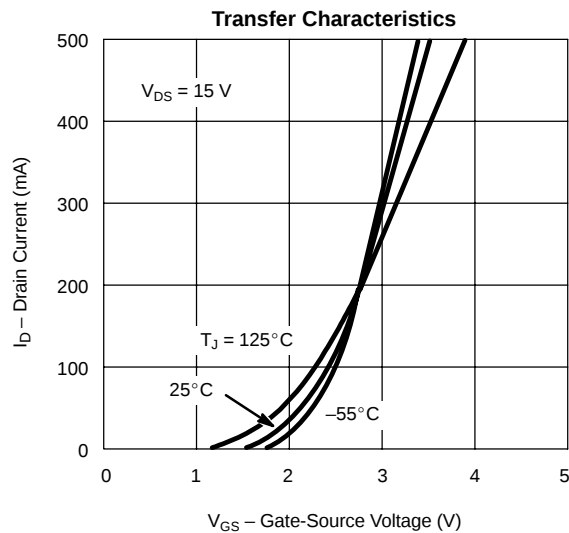
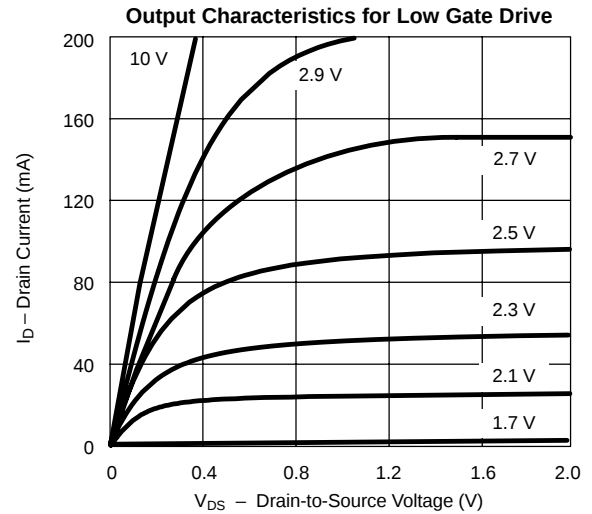
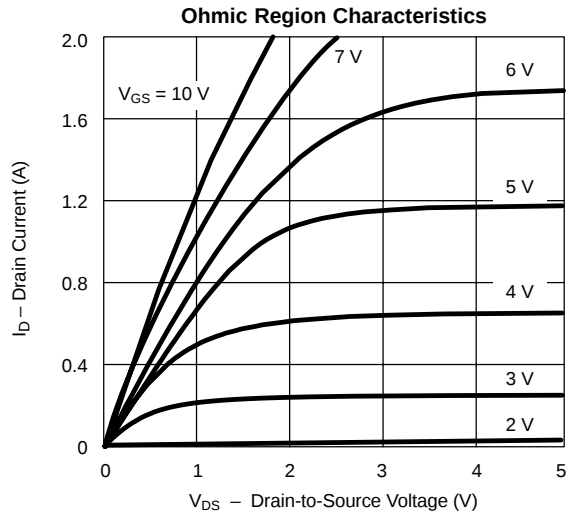
- a. For DESIGN AID ONLY, not subject to production testing.
 b. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.

VNDQ03/VPEA03



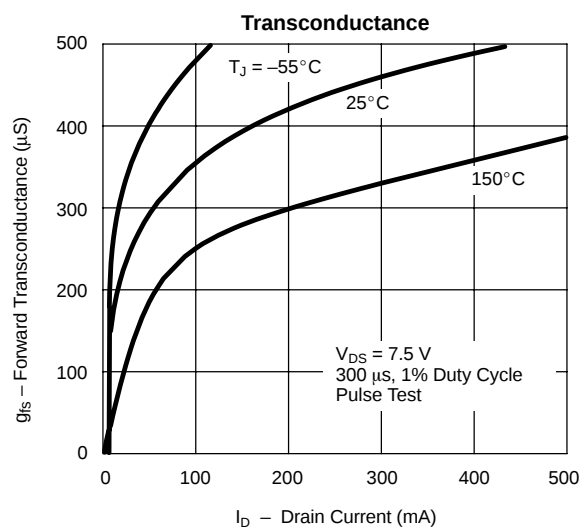
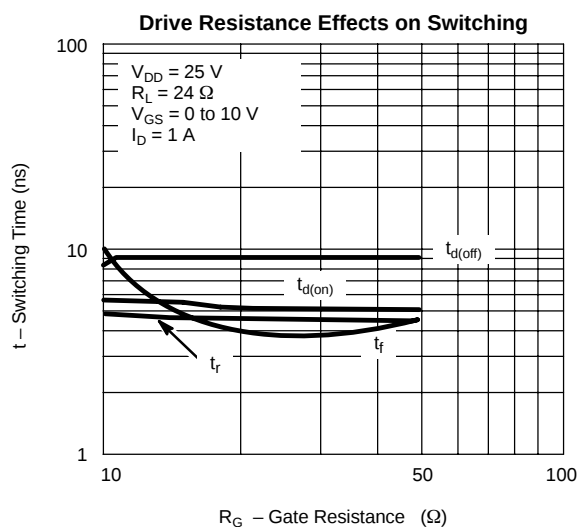
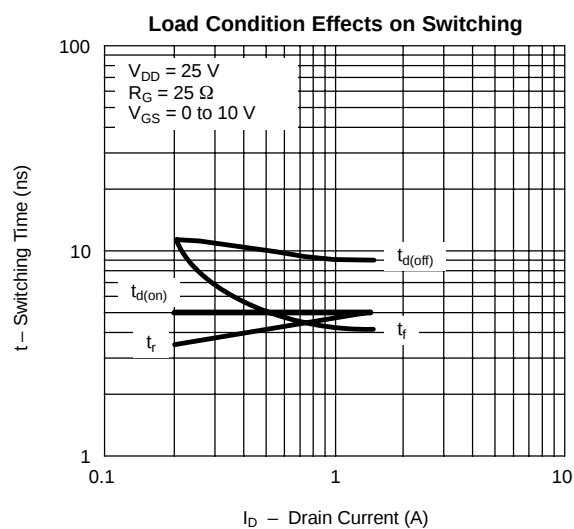
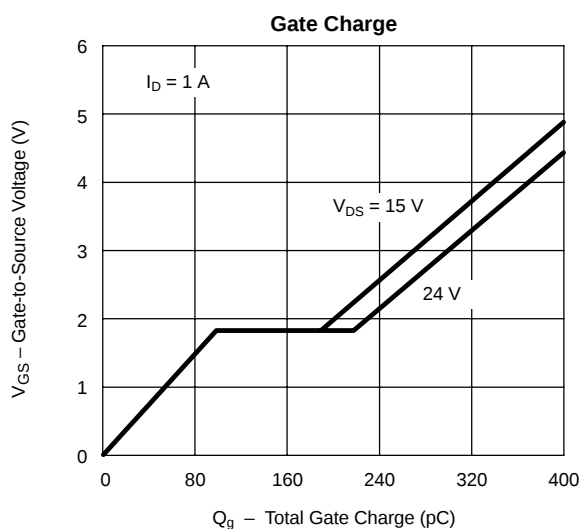
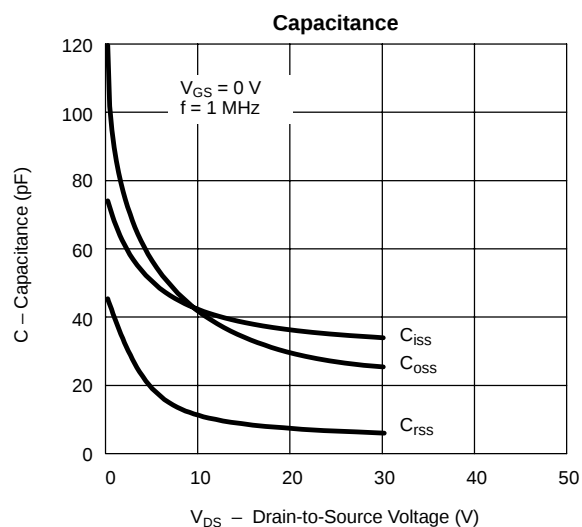
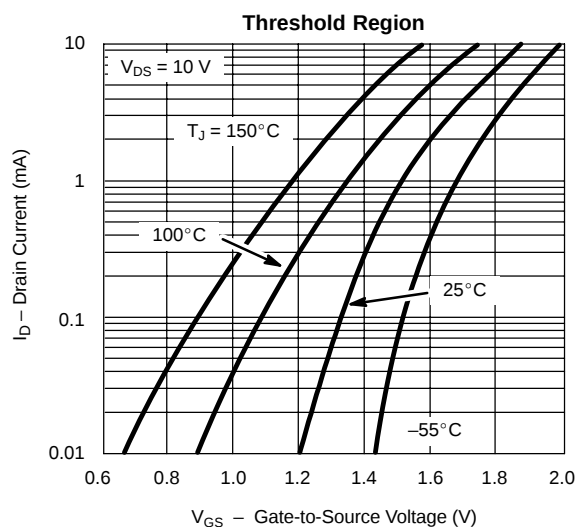
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

N-CHANNEL



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

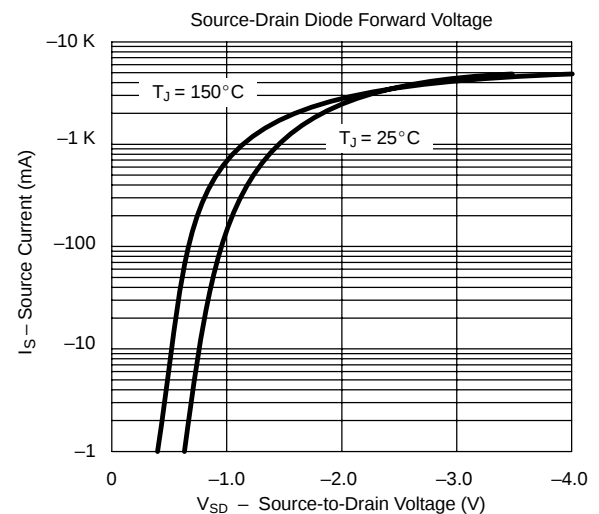
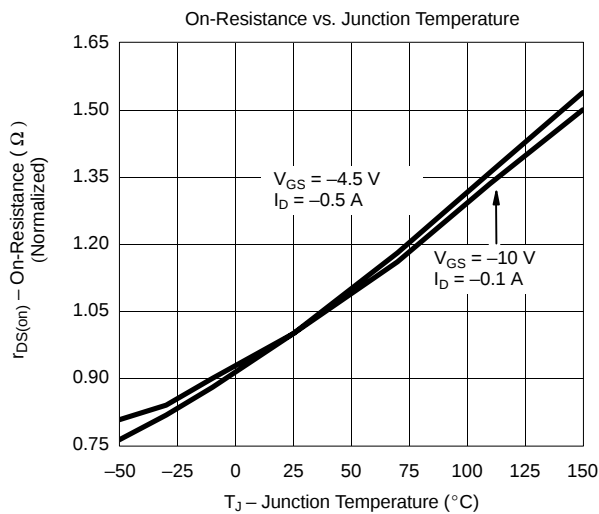
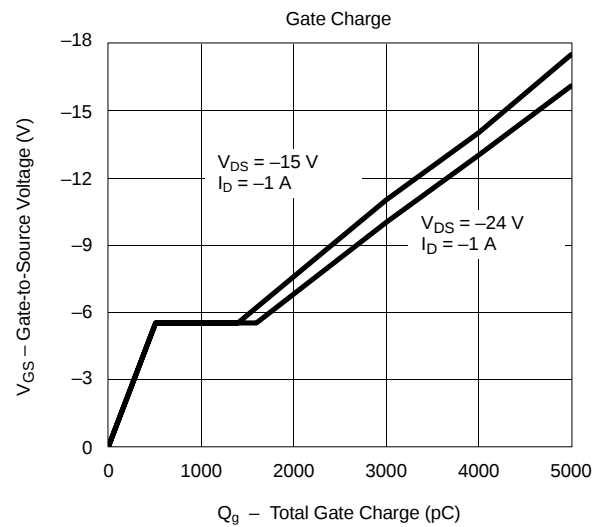
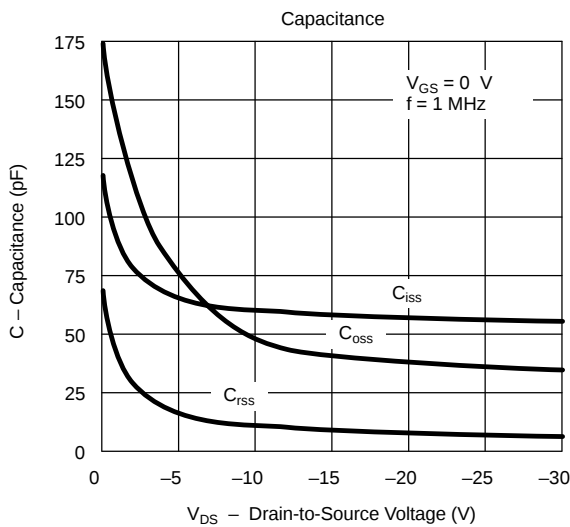
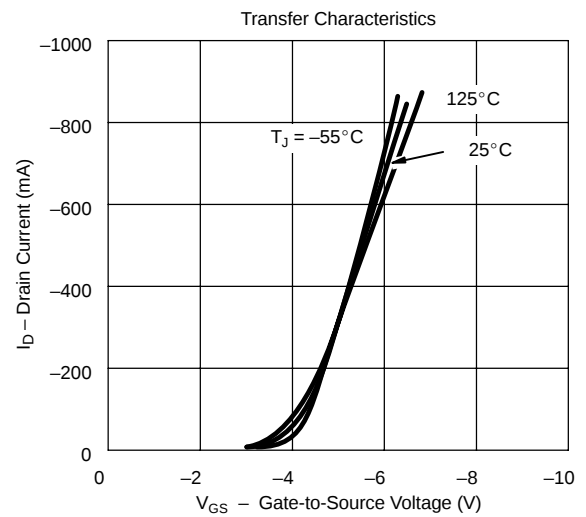
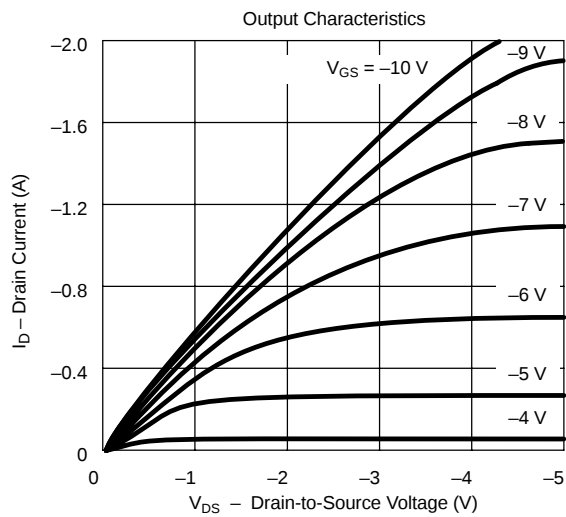
N-CHANNEL





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

P-CHANNEL



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

P-CHANNEL

