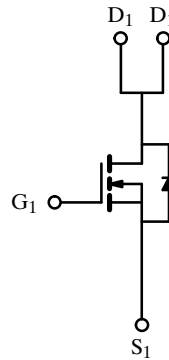
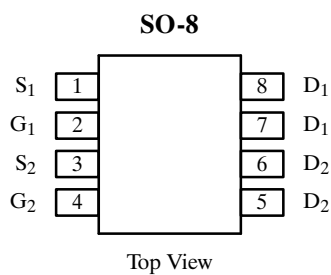


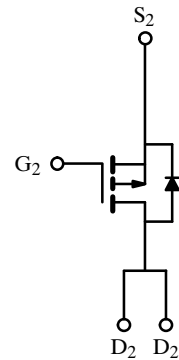
## Dual Enhancement-Mode MOSFETs (N- and P-Channel)

### Product Summary

	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
N-Channel	20	0.05 @ V <sub>GS</sub> = 4.5 V	±5.0
		0.06 @ V <sub>GS</sub> = 3.0 V	±4.2
		0.08 @ V <sub>GS</sub> = 2.7 V	±3.6
P-Channel	-20	0.11 @ V <sub>GS</sub> = -4.5 V	±3.4
		0.15 @ V <sub>GS</sub> = -3.0 V	±2.9
		0.19 @ V <sub>GS</sub> = -2.7 V	±2.6



N-Channel MOSFET



P-Channel MOSFET

### Absolute Maximum Ratings (T<sub>A</sub> = 25°C Unless Otherwise Noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V <sub>DS</sub>	20	-20	V
Gate-Source Voltage		V <sub>GS</sub>	±12	±12	
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	T <sub>A</sub> = 25°C	I <sub>D</sub>	±5.0	±3.4	A
	T <sub>A</sub> = 70°C		±4.0	±2.8	
Pulsed Drain Current		I <sub>DM</sub>	±10	±10	
Continuous Source Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	2.0	-2.0	
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 25°C	P <sub>D</sub>	2.0	2.0	W
	T <sub>A</sub> = 70°C		1.3	1.3	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C

### Thermal Resistance Ratings

Parameter	Symbol	N- or P-Channel	Unit
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	62.5	°C/W

Notes

a. Surface Mounted on FR4 Board, t ≤ 10 sec.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1225.

# Si9928DY

### Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

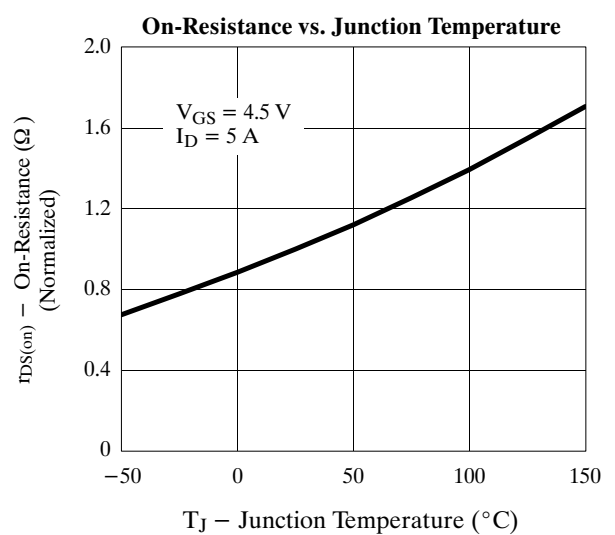
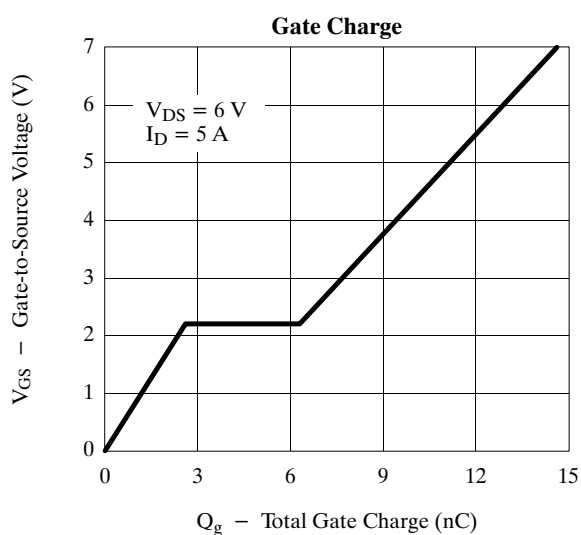
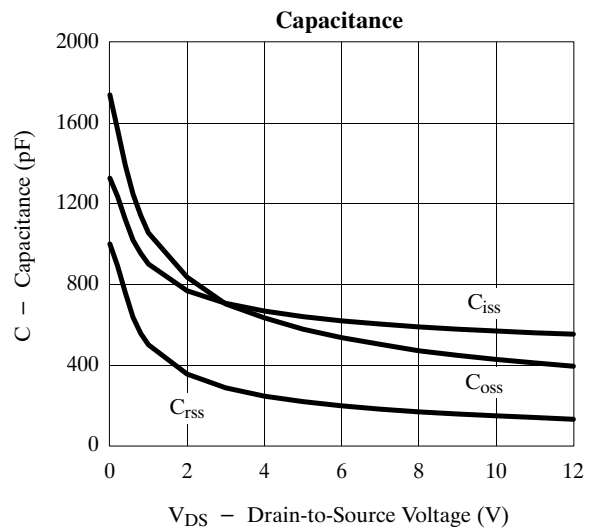
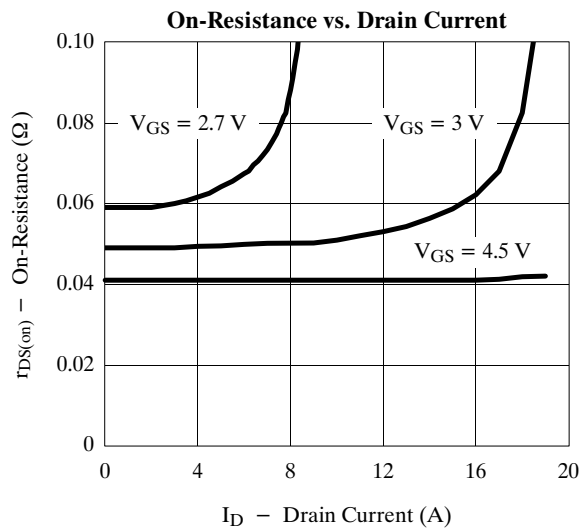
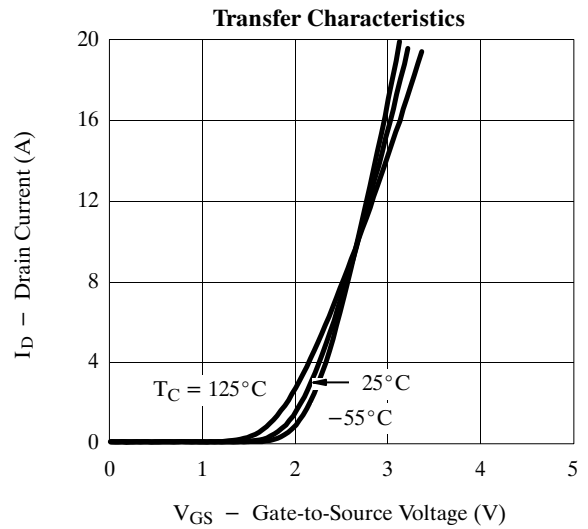
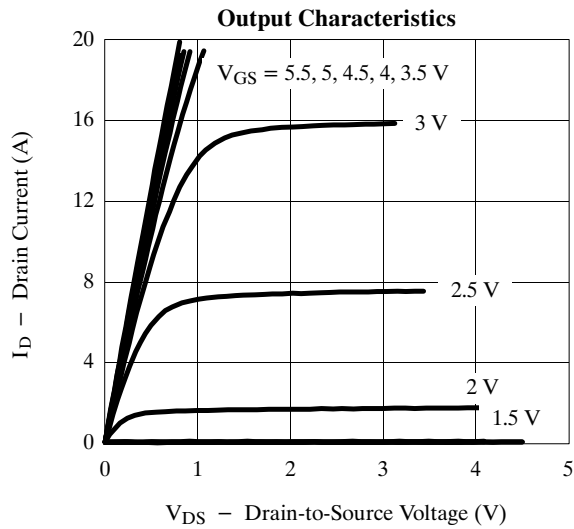
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit		
<b>Static</b>								
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	N-Ch	0.8	1.2		V	
		$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	P-Ch	-0.8	-1.1			
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$	N-Ch			$\pm 100$	nA	
			P-Ch			$\pm 100$		
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$	N-Ch			1	$\mu\text{A}$	
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$	P-Ch			-1		
		$V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 70^\circ\text{C}$	N-Ch			5		
		$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 70^\circ\text{C}$	P-Ch			-5		
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	N-Ch	10			A	
		$V_{DS} \leq -5 \text{ V}, V_{GS} = -4.5 \text{ V}$	P-Ch	-10				
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 4.5 \text{ V}, I_D = 5.0 \text{ A}$	N-Ch		0.041	0.05	$\Omega$	
		$V_{GS} = -4.5 \text{ V}, I_D = -3.2 \text{ A}$	P-Ch		0.087	0.11		
		$V_{GS} = 3.0 \text{ V}, I_D = 3.9 \text{ A}$	N-Ch		0.052	0.06		
		$V_{GS} = -3.0 \text{ V}, I_D = -2.0 \text{ A}$	P-Ch		0.120	0.15		
		$V_{GS} = 2.7 \text{ V}, I_D = 1.0 \text{ A}$	N-Ch		0.060	0.08		
		$V_{GS} = -2.7 \text{ V}, I_D = -1.0 \text{ A}$	P-Ch		0.135	0.19		
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 10 \text{ V}, I_D = 5.0 \text{ A}$	N-Ch		13		S	
		$V_{DS} = -9 \text{ V}, I_D = -3.2 \text{ A}$	P-Ch		8			
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_S = 5.0 \text{ A}, V_{GS} = 0 \text{ V}$	N-Ch		0.9	1.2	V	
		$I_S = -2.0 \text{ A}, V_{GS} = 0 \text{ V}$	P-Ch		-0.9	-1.2		
<b>Dynamic<sup>a</sup></b>								
Total Gate Charge	$Q_g$	N-Channel $V_{DS} = 6 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 5.0 \text{ A}$ P-Channel $V_{DS} = -6 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -3.2 \text{ A}$	N-Ch		10	20	nC	
			P-Ch		8	20		
Gate-Source Charge	$Q_{gs}$		N-Ch		2.6			
			P-Ch		1.6			
Gate-Drain Charge	$Q_{gd}$		N-Ch		3.7			
			P-Ch		3.5			
Turn-On Delay Time	$t_{d(on)}$	N-Channel $V_{DD} = 6 \text{ V}, R_L = 6 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_G = 6 \Omega$ P-Channel $V_{DD} = -6 \text{ V}, R_L = 6 \Omega$ $I_D \cong -1 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_G = 6 \Omega$	N-Ch		13	30	ns	
			P-Ch		22	40		
Rise Time	$t_r$		N-Ch		9	40		
			P-Ch		43	80		
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		30	60		
			P-Ch		35	70		
Fall Time	$t_f$		N-Ch		9	30		
			P-Ch		20	40		
Source-Drain Reverse Recovery Time	$t_{rr}$		$I_F = 5.0 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$	N-Ch		100		150
			$I_F = -2.0 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$	P-Ch		75		100

Notes

- a. For design aid only; not subject to production testing.  
 b. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

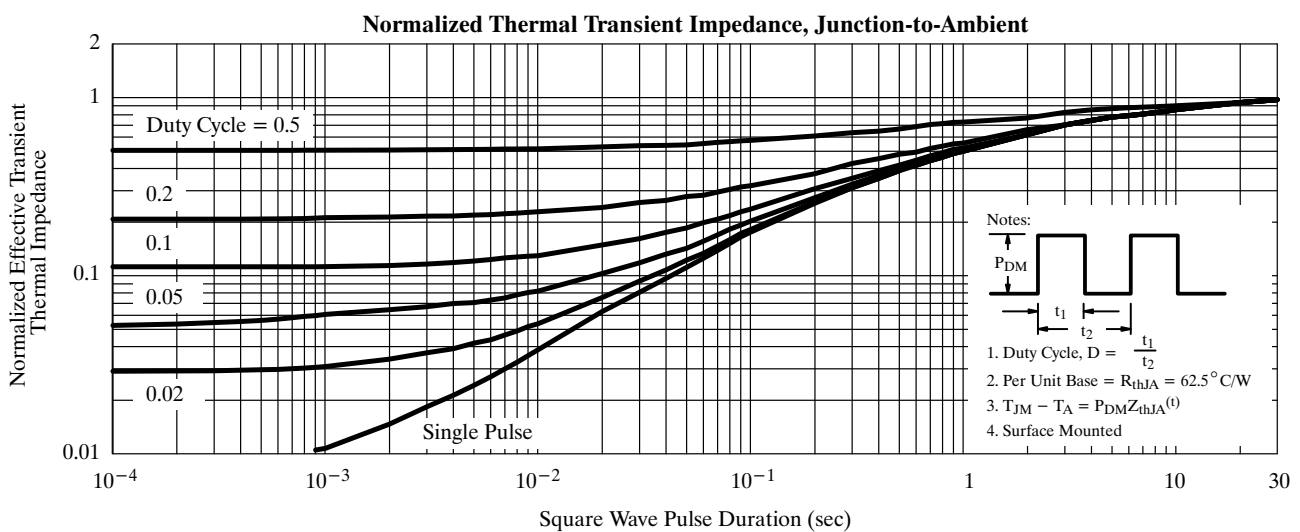
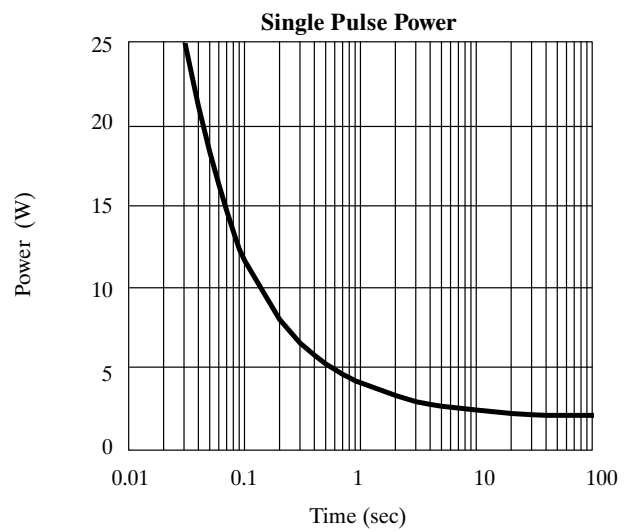
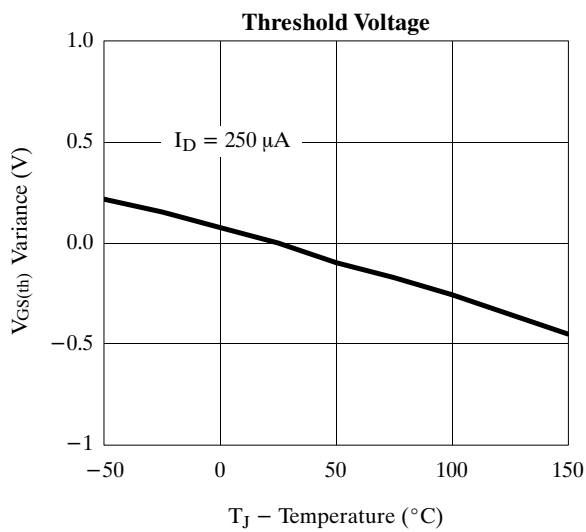
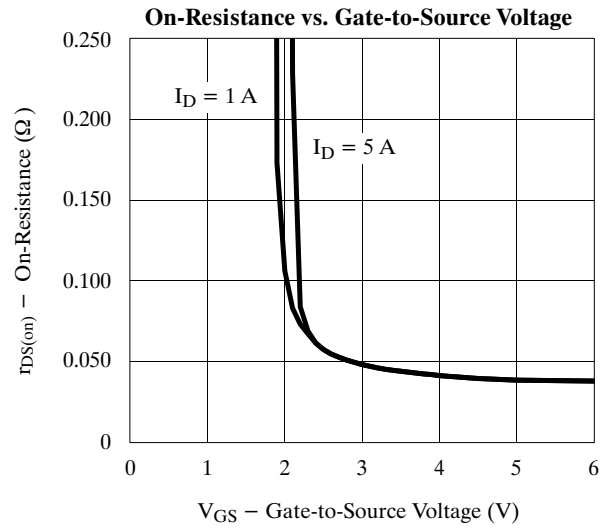
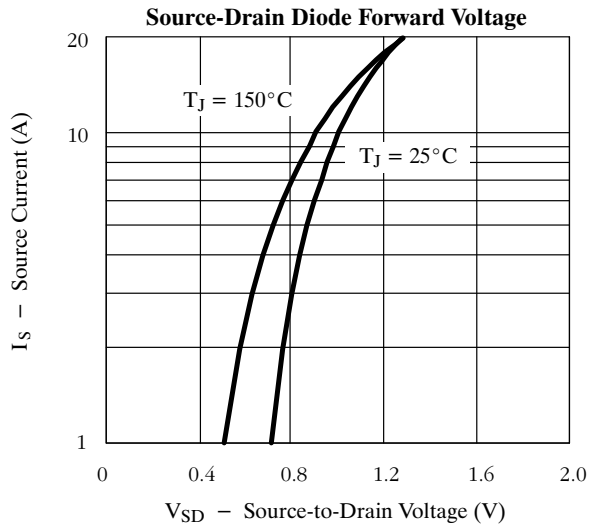
## Typical Characteristics (25°C Unless Noted)

## N-Channel



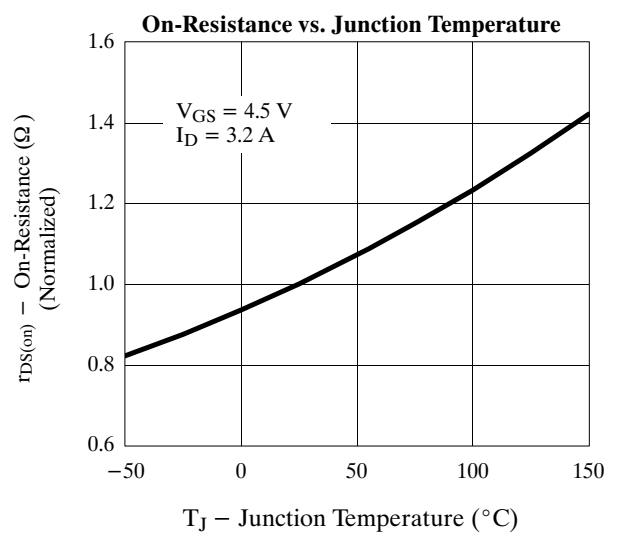
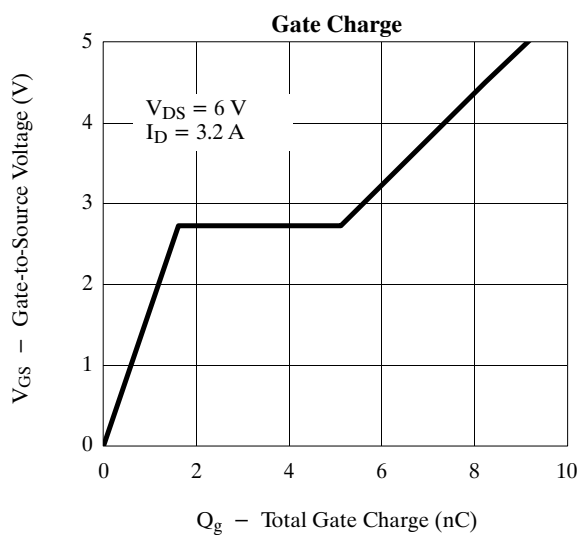
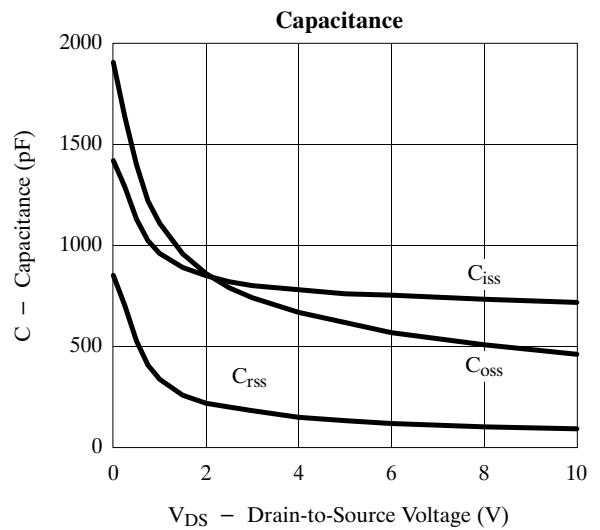
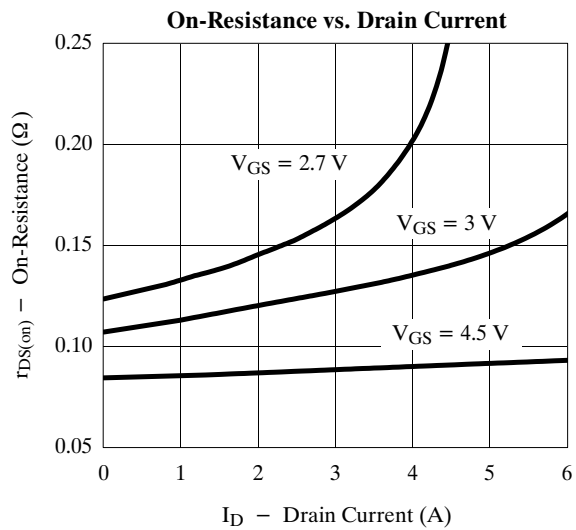
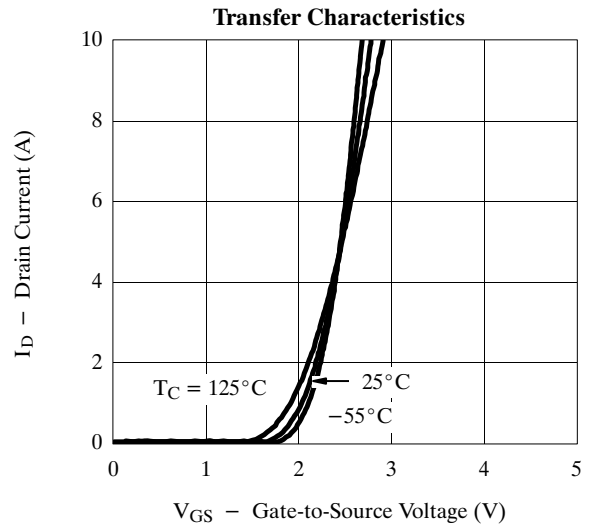
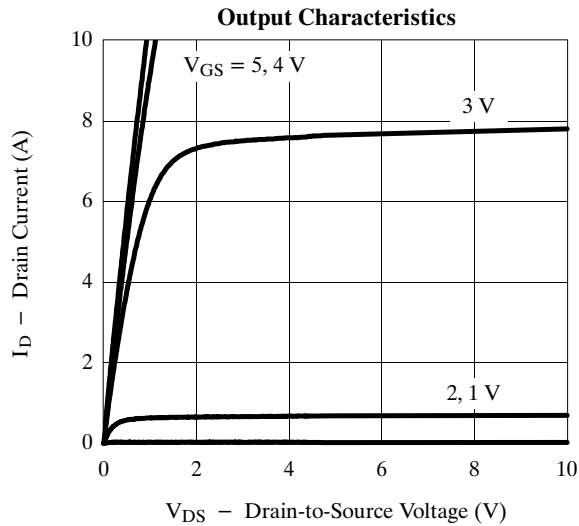
## Typical Characteristics (25°C Unless Noted)

## N-Channel



## Typical Characteristics (25°C Unless Noted)

## P-Channel



## Typical Characteristics (25°C Unless Noted)

## P-Channel

