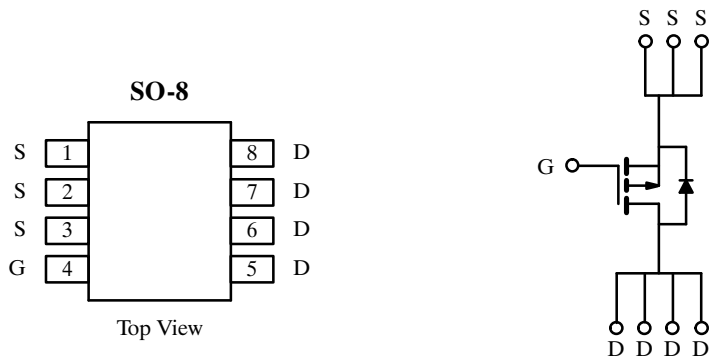


## P-Channel Enhancement-Mode MOSFET

### Product Summary

$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.040 @ $V_{GS} = -10$ V	$\pm 5.8$
	0.070 @ $V_{GS} = -4.5$ V	$\pm 4.5$



P-Channel MOSFET

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	A
		$T_A = 70^\circ\text{C}$	
Pulsed Drain Current	$I_{DM}$	$\pm 30$	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-2.3	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	W
		$T_A = 70^\circ\text{C}$	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$

### Thermal Resistance Ratings

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	50	$^\circ\text{C}/\text{W}$

Notes

a. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1233.

## Si4431DY

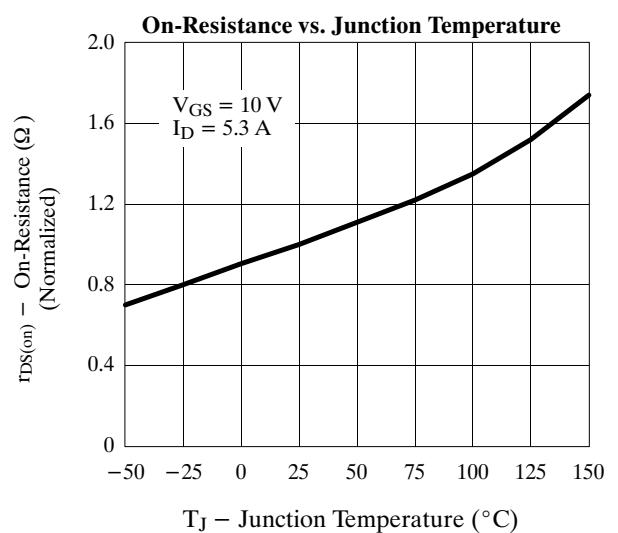
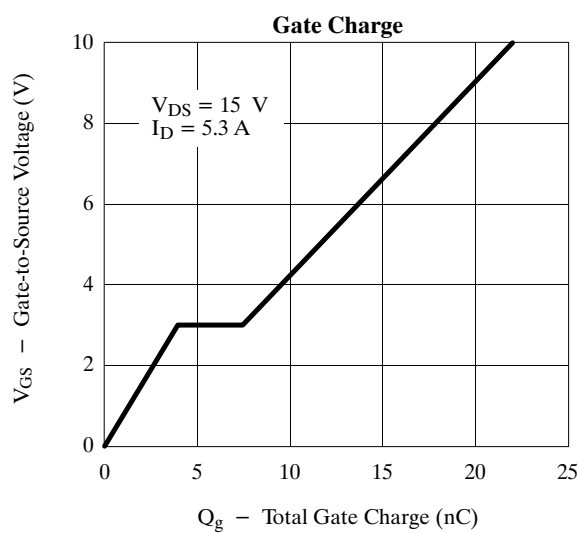
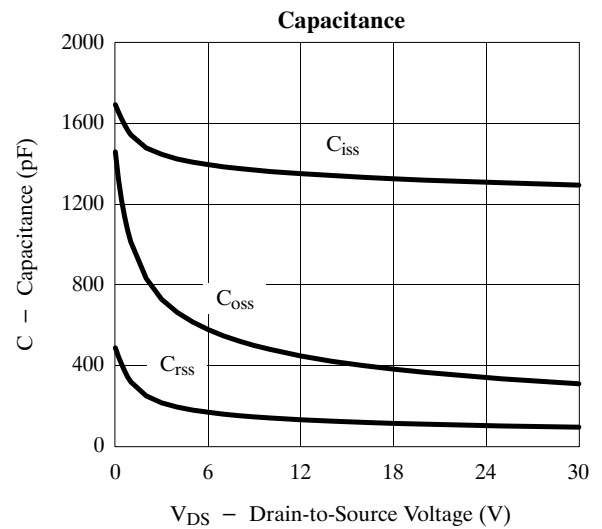
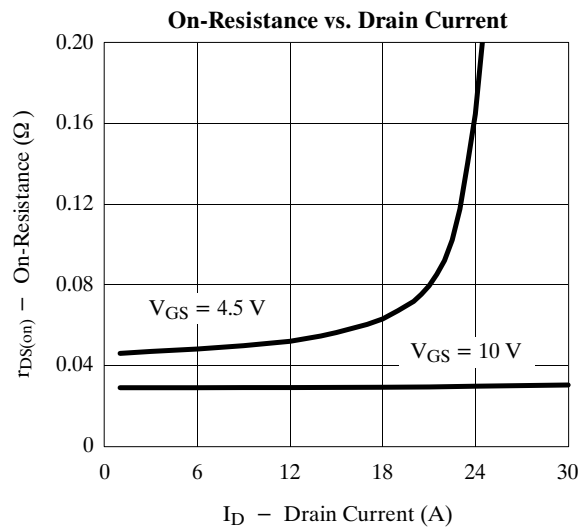
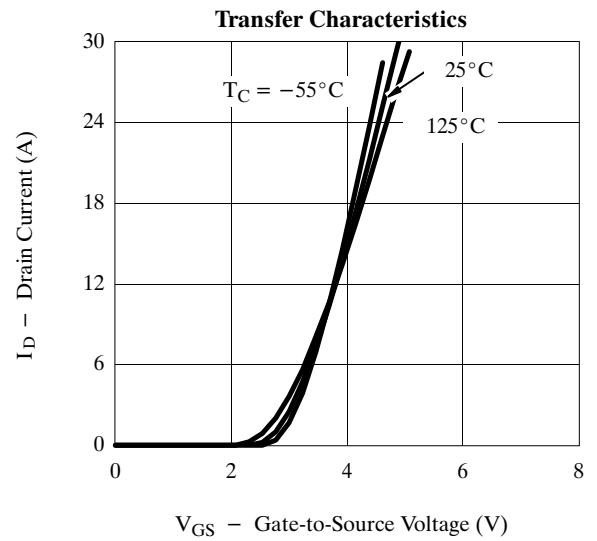
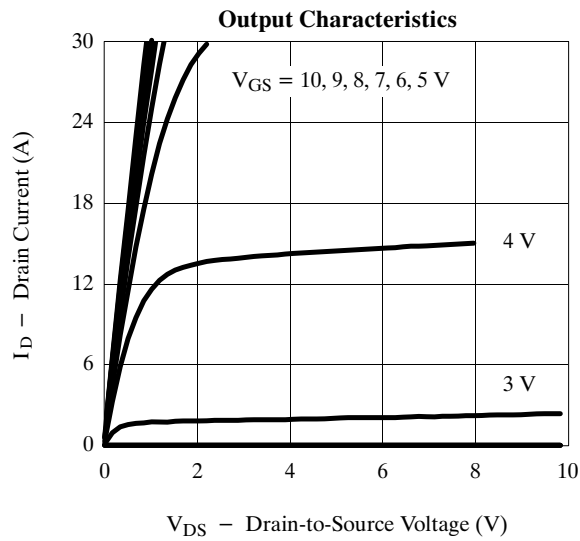
### Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1.0			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -30\ \text{V}, V_{GS} = 0\ \text{V}$			-1	$\mu\text{A}$
		$V_{DS} = -30\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-25	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} \leq -5\ \text{V}, V_{GS} = -10\ \text{V}$	-30			A
		$V_{DS} \leq -5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-7			
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -5.3\ \text{A}$		0.029	0.040	$\Omega$
		$V_{GS} = -4.5\ \text{V}, I_D = -2.0\ \text{A}$		0.047	0.070	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = -15\ \text{V}, I_D = -5.3\ \text{A}$		9.3		S
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_S = -2.3\ \text{A}, V_{GS} = 0\ \text{V}$		-0.78	-1.2	V
<b>Dynamic<sup>a</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -15\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -5.3\ \text{A}$		22	35	nC
Gate-Source Charge	$Q_{gs}$			3.95		
Gate-Drain Charge	$Q_{gd}$			3.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}, R_L = 15\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_G = 6\ \Omega$		11.5	20	ns
Rise Time	$t_r$			12	20	
Turn-Off Delay Time	$t_{d(off)}$			38	55	
Fall Time	$t_f$			15	25	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -2.3\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		50	80	

Notes

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

## Typical Characteristics (25°C Unless Otherwise Noted)



## Si4431DY

### Typical Characteristics (25°C Unless Otherwise Noted)

