

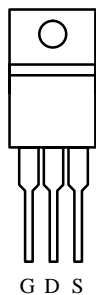
**P-Channel Enhancement-Mode Transistor**

**Product Summary**

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-60	0.045	-40

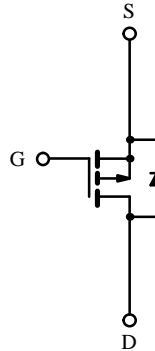
**175°C Rated**  
Maximum Junction Temperature

TO-220AB



Top View

DRAIN connected to TAB



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	-60	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current	$I_D$	$T_C = 25^\circ\text{C}$	-40	A
		$T_C = 100^\circ\text{C}$	-30	
Pulsed Drain Current	$I_{DM}$	-100		
Avalanche Current	$I_{AR}$	-40		
Avalanche Energy	L = 0.1 mH	$E_{AS}$	90	mJ
Repetitive Avalanche Energy <sup>a</sup>	L = 0.05 mH	$E_{AR}$	45	
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	125	W
		$T_C = 100^\circ\text{C}$	62	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$	

**Thermal Resistance Ratings**

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient	$R_{thJA}$		80	$^\circ\text{C/W}$
Junction-to-Case	$R_{thJC}$		1.2	
Case-to-Sink	$R_{thCS}$	1.0		

Notes:

a. Duty cycle  $\leq 1\%$ .

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1433.

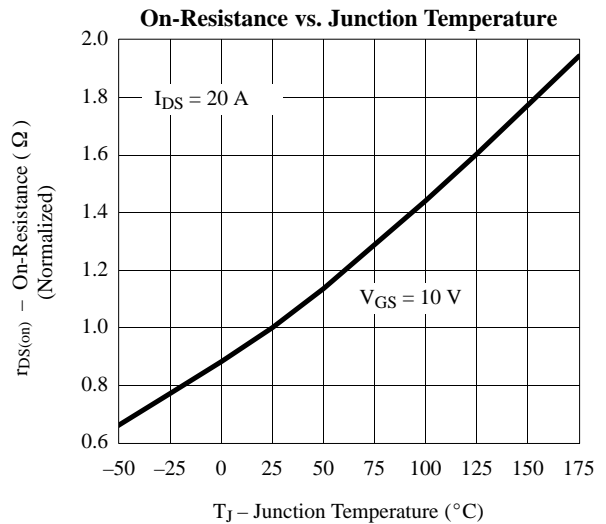
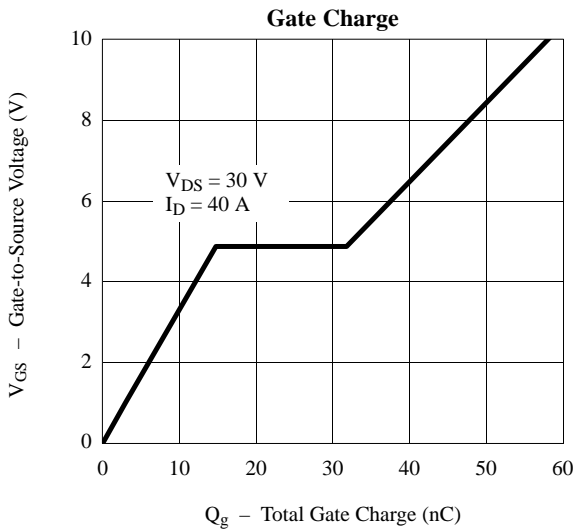
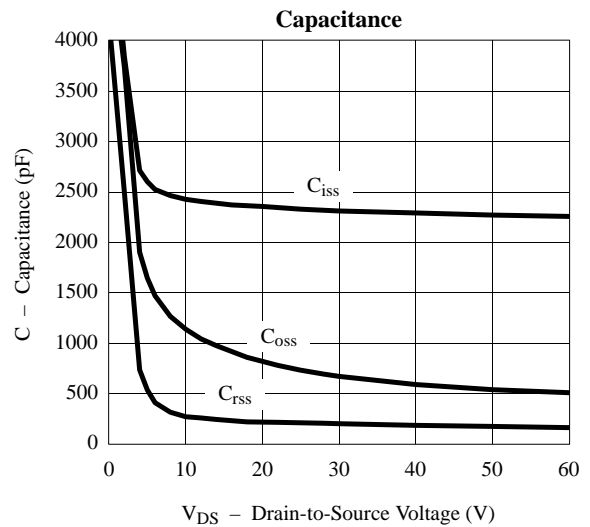
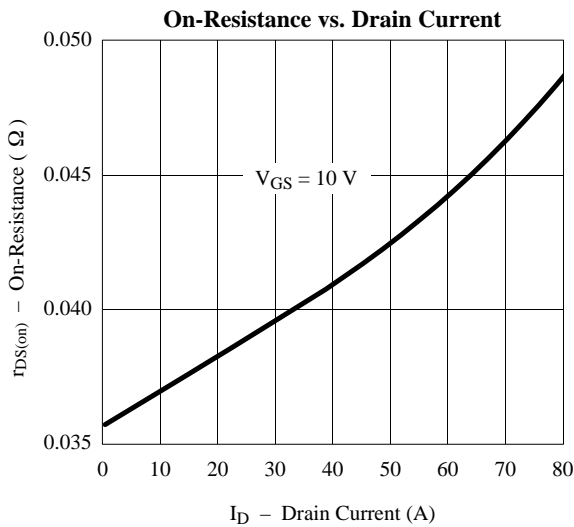
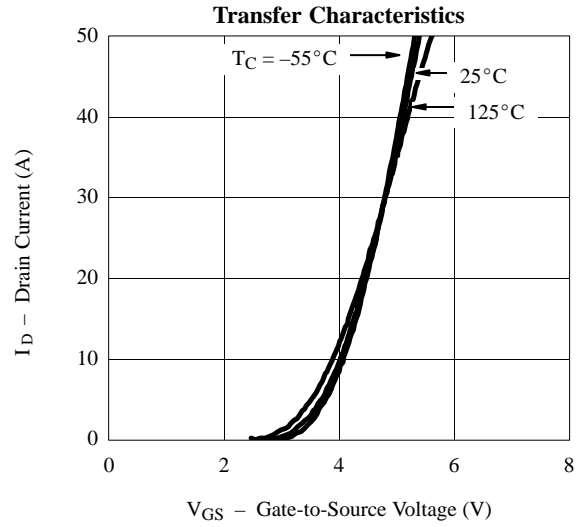
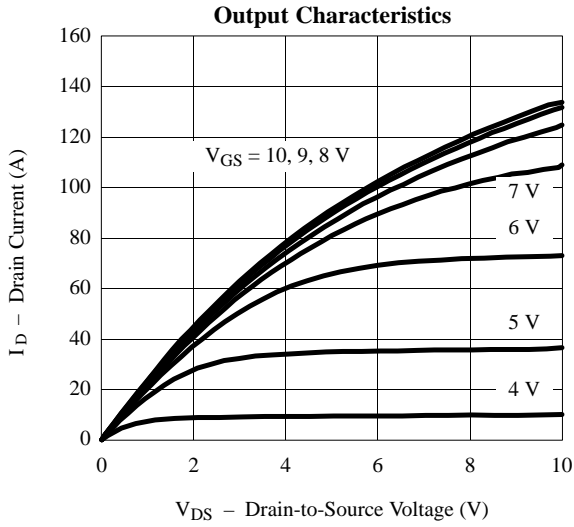
## Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -1\ \text{mA}$	-1		-3	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			$\pm 500$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -48\ \text{V}, V_{GS} = 0\ \text{V}$			-25	$\mu\text{A}$
		$V_{DS} = -48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			-250	
		$V_{DS} = -48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 175^\circ\text{C}$			-500	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = -10\ \text{V}, V_{GS} = -10\ \text{V}$	-40			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -20\ \text{A}$		0.038	0.045	$\Omega$
		$V_{GS} = -10\ \text{V}, I_D = -20\ \text{A}, T_J = 125^\circ\text{C}$			0.080	
		$V_{GS} = -10\ \text{V}, I_D = -20\ \text{A}, T_J = 175^\circ\text{C}$			0.090	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = -15\ \text{V}, I_D = -20\ \text{A}$		28		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\ \text{V}, V_{DS} = -25\ \text{V}, f = 1\ \text{MHz}$		2600		$\text{pF}$
Output Capacitance	$C_{oss}$			800		
Reverse Transfer Capacitance	$C_{rss}$			200		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = -30\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -40\ \text{A}$		60	100	$\text{nC}$
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			15	20	
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			17	50	
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -30\ \text{V}, R_L = 1.5\ \Omega$ $I_D \cong -20\ \text{A}, V_{GEN} = -10\ \text{V}, R_G = 2.5\ \Omega$		11	30	$\text{ns}$
Rise Time <sup>c</sup>	$t_r$			12	35	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			70	140	
Fall Time <sup>c</sup>	$t_f$			75	150	
<b>Source-Drain Diode Ratings and Characteristics (<math>T_C = 25^\circ\text{C}</math>)</b>						
Continuous Current	$I_S$				-40	A
Pulsed Current	$I_{SM}$				-100	
Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = -40\ \text{A}, V_{GS} = 0\ \text{V}$		-1.2	-1.6	V
Reverse Recovery Time	$t_{rr}$	$I_F = -40\ \text{A}, di_F/dt = 100\ \text{A}/\mu\text{s}$		81		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$				7	A
Reverse Recovery Charge	$Q_{rr}$				0.3	$\mu\text{C}$

Notes:

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

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



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

