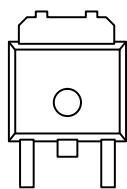


### P-Channel Enhancement-Mode Transistors

#### Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D^a$ (A)
-50	0.28	-10

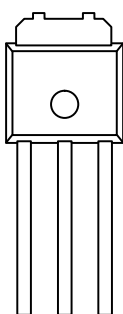
TO-252



Top View

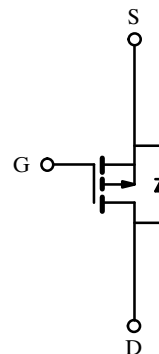
Order Number: SMD10P05

TO-251



Top View

Order Number: SMU10P05



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	-50	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current <sup>b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-2.0	A
		$T_A = 100^\circ\text{C}$	-1.3	
Pulsed Drain Current (maximum current limited by package)	$I_{DM}$	-16		
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	40	W
		$T_A = 25^\circ\text{C}$	2.0 <sup>b</sup>	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$	
Lead Temperature ( $1/16''$ from case for 10 sec.)	$T_L$	300		

#### Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Free Air, PC Board Mount <sup>b</sup>	$R_{thJA}$	50	60	$^\circ\text{C}/\text{W}$
Junction-to-Ambient Free Air, Vertical Mount		50	60	
Junction-to-Case	$R_{thJC}$	2.3	3.0	

Notes:

- Calculated Rating for  $T_C = 25^\circ\text{C}$ , for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).
- Surface mounted on PC board or mounted vertically in free air.

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

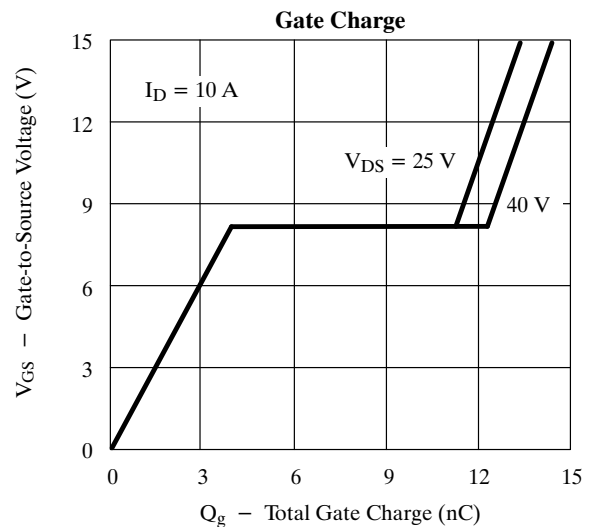
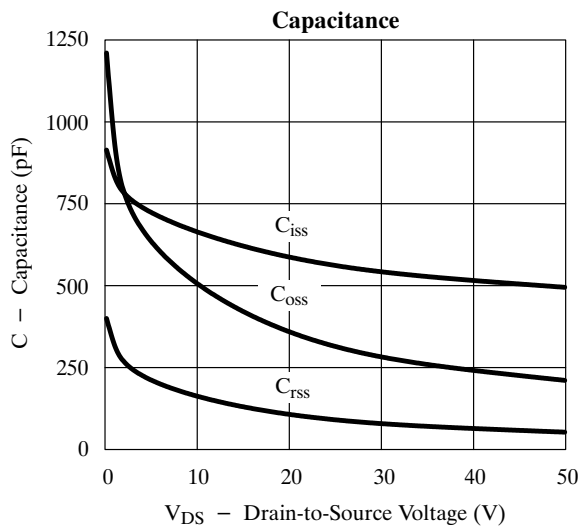
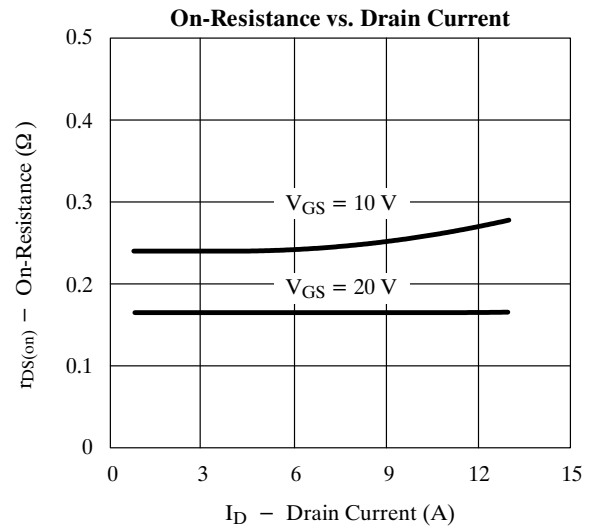
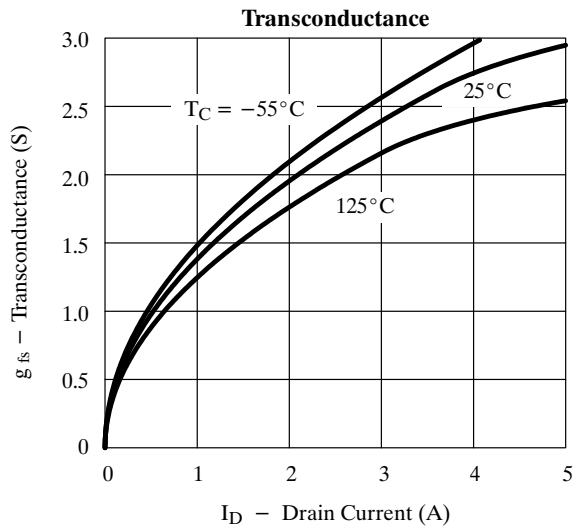
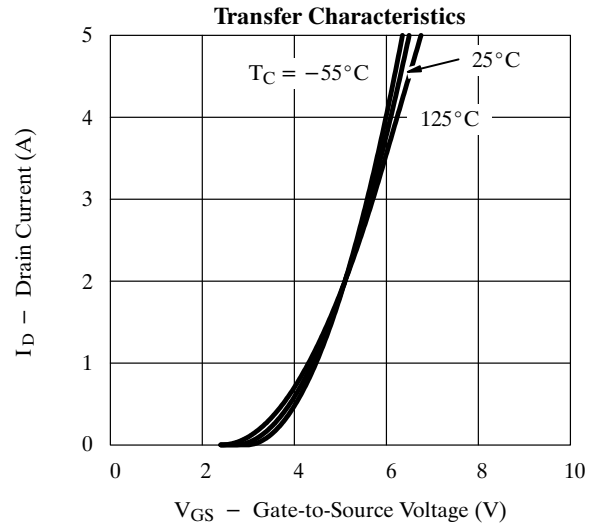
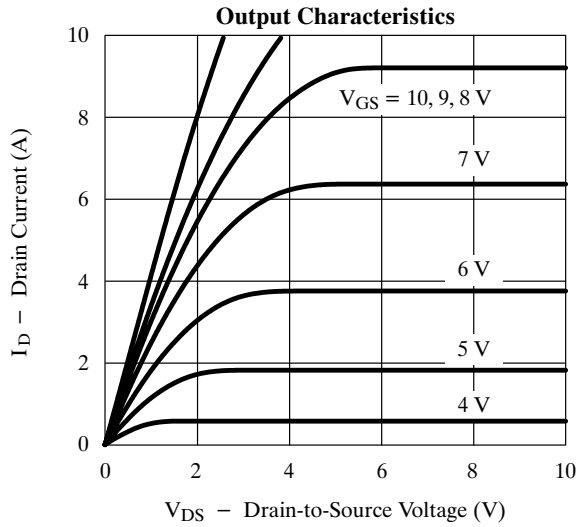
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-50			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-2.0		-4.0	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}$			-25	$\mu\text{A}$
		$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			-250	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-10			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.25	0.28	$\Omega$
		$V_{GS} = -10\text{ V}, I_D = -5\text{ A}, T_J = 125^\circ\text{C}$		0.4	0.50	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -5\text{ A}$	1.0	3		S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		530		$\text{pF}$
Output Capacitance	$C_{oss}$			325		
Reverse Transfer Capacitance	$C_{rss}$			85		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = -25\text{ V}, V_{GS} = -10\text{ V}, I_D = -10\text{ A}$		13	20	$\text{nC}$
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			3.6	5.0	
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			9	12.0	
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 3\ \Omega$ $I_D = -10\text{ A}, V_{GEN} = -10\text{ V}, R_G = 25\ \Omega$		10	30	$\text{ns}$
Rise Time <sup>c</sup>	$t_r$			50	95	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			25	90	
Fall Time <sup>c</sup>	$t_f$			50	75	
<b>Source-Drain Diode Ratings and Characteristics</b>						
Continuous Current	$I_S$				-2.0	A
Pulsed Current	$I_{SM}$				-24	
Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = -2\text{ A}, V_{GS} = 0\text{ V}$			-2.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = -2\text{ A}, di_F/dt = 100\text{ A}/\mu\text{s}$		70		ns
Reverse Recovery Charge	$Q_{rr}$				0.07	

**Notes:**

- For design aid only; not subject to production testing.
- Pulse test; pulse width and duty cycle.
- Independent of operating temperature.

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

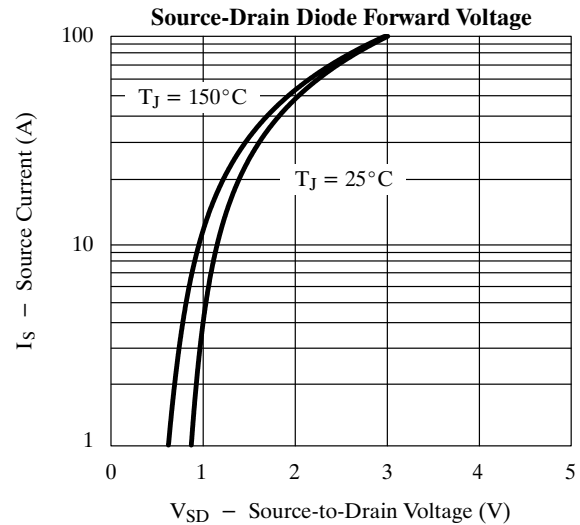
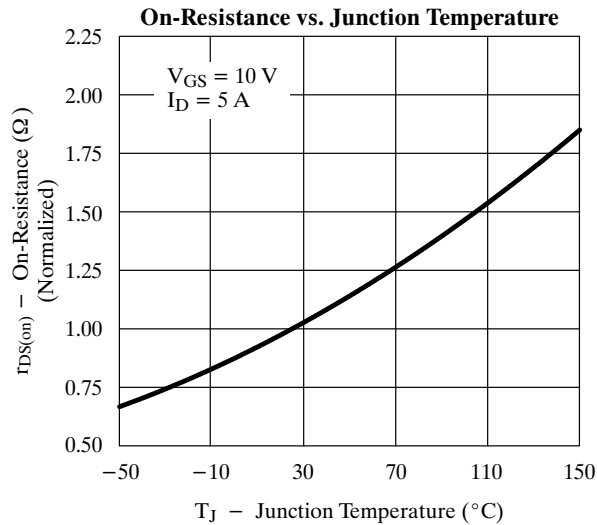
Negative signs omitted for clarity.



## SMD/SMU10P05

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

Negative signs omitted for clarity.



### Thermal Ratings

