

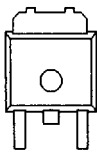
Siliconix

P-Channel Enhancement-Mode Transistors

Product Summary

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

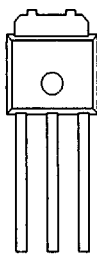
TO-252



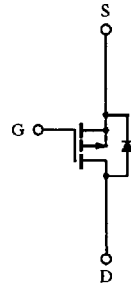
G D S
Top View

Drain Connected to Tab

TO-251



G D S
Top View



P-Channel MOSFET

Order Number: SMD10P05

Order Number: SMU10P05

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}	± 20		
Continuous Drain Current ^b	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 ^b	
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 ^b	R_{thJA}	50	60	$^\circ\text{C/W}$
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.

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

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

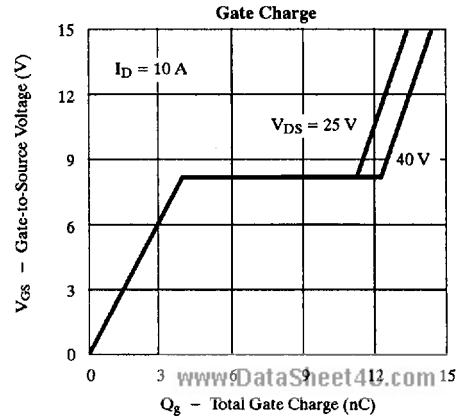
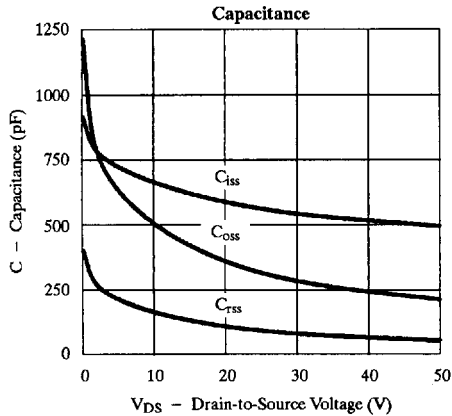
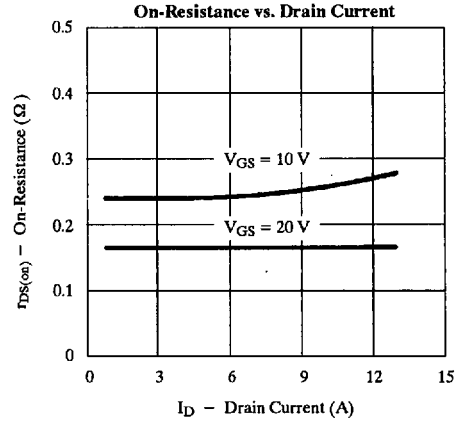
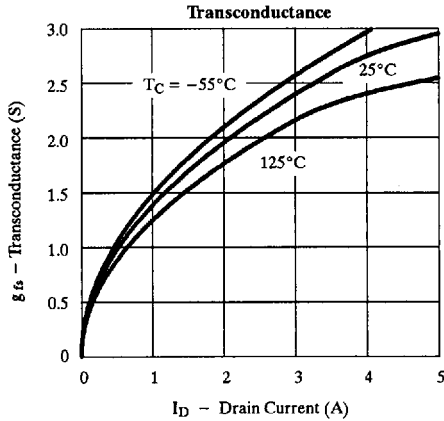
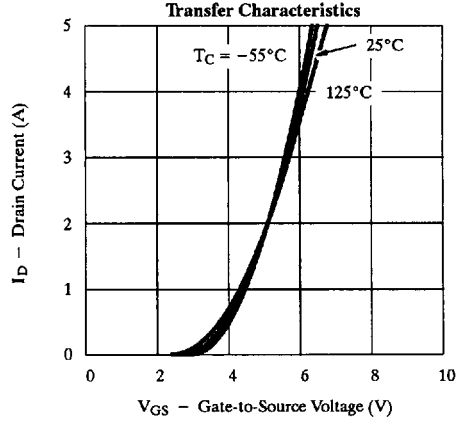
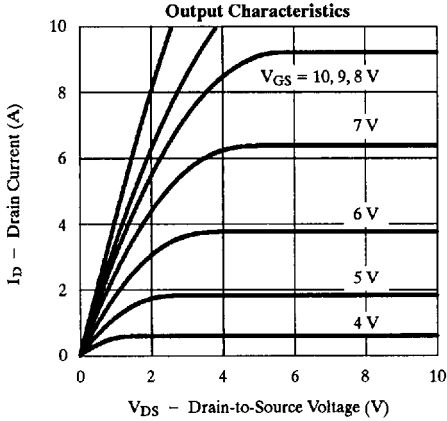
Notes:

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

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Typical Characteristics (25°C Unless Otherwise Noted)

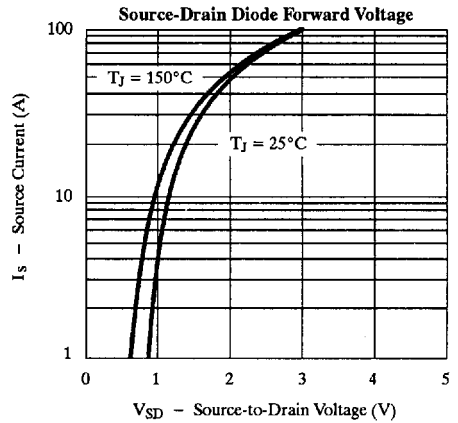
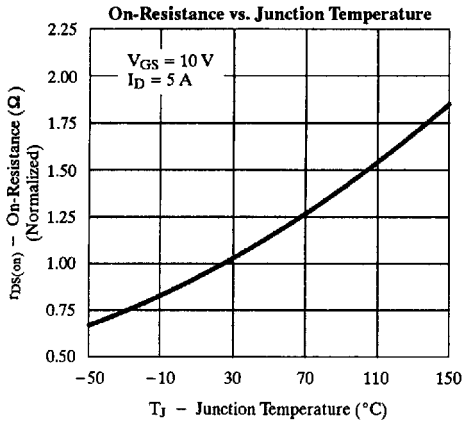
Negative signs omitted for clarity.



SMD/SMU10P05

Typical Characteristics (25°C Unless Otherwise Noted)

Negative signs omitted for clarity.



Thermal Ratings

