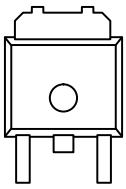
SMD/SMU10P05

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

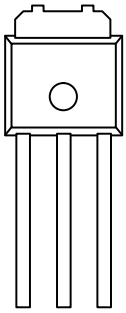


Top View

Order Number: SMD10P05

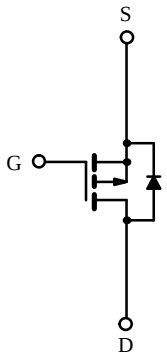
Drain Connected to Tab

TO-251



Top View

Order Number: SMU10P05



P-Channel MOSFET

Absolute Maximum Ratings (T_C = 25°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]	T_A = 25°C	I_D	–2.0	A
	T_A = 100°C		–1.3	
Pulsed Drain Current (maximum current limited by package)		I_{DM}	–16	
Power Dissipation	T_C = 25°C	P_D	40	W
	T_A = 25°C		2.0[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°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	°C/W
Junction-to-Ambient Free Air, Vertical Mount		50	60	
Junction-to-Case	R_{thJC}	2.3	3.0	

Notes:

a. Calculated Rating for T_C = 25°C, for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).

b. Surface mounted on PC board or mounted vertically in free air.

Specifications (T_J = 25°C Unless Otherwise Noted)

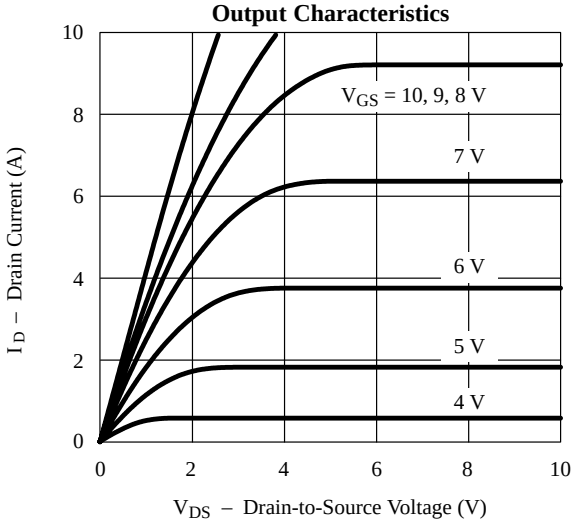
Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –250 µA	–50			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 µA	–2.0		–4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –40 V, V_{GS} = 0 V			–25	µA
		V_{DS} = –40 V, V_{GS} = 0 V, T_J = 125°C			–250	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = –5 V, V_{GS} = –10 V	–10			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = –10 V, I_D = –5 A		0.25	0.28	Ω
		V_{GS} = –10 V, I_D = –5 A, T_J = 125°C		0.4	0.50	
Forward Transconductance[b]	g_{fs}	V_{DS} = –15 V, I_D = –5 A	1.0	3		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = –25 V, f = 1 MHz		530		pF
Output Capacitance	C_{oss}			325		
Reverse Transfer Capacitance	C_{rss}			85		
Total Gate Charge[c]	Q_g	V_{DS} = –25 V, V_{GS} = –10 V, I_D = – 10 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 V, R_L = 3 Ω I_D ≃ –10 A, V_{GEN} = –10 V, R_G = 25 Ω		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 A, V_{GS} = 0 V			–2.3	V
Reverse Recovery Time	t_{rr}	I_F = –2 A, dI_F/dt = 100 A/µs		70		ns
Reverse Recovery Charge	Q_{rr}			0.07		µC

Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

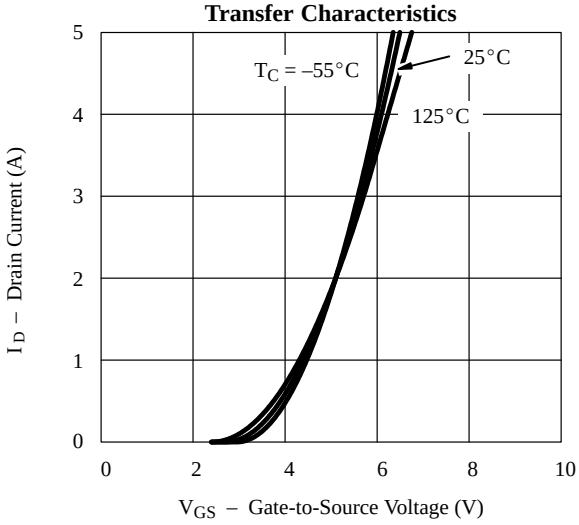
Typical Characteristics (25°C Unless Otherwise Noted)

Negative signs omitted for clarity.

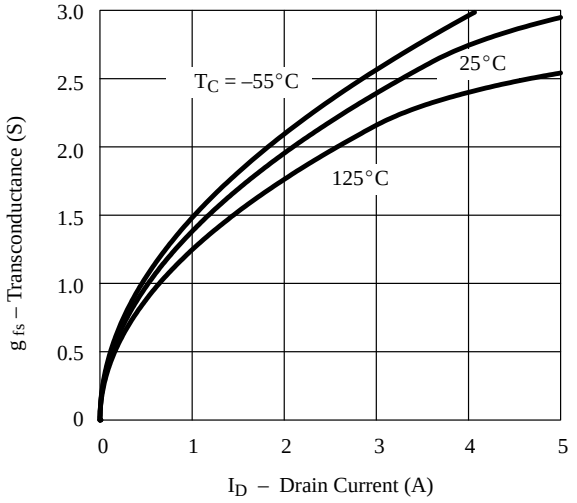
Output Characteristics



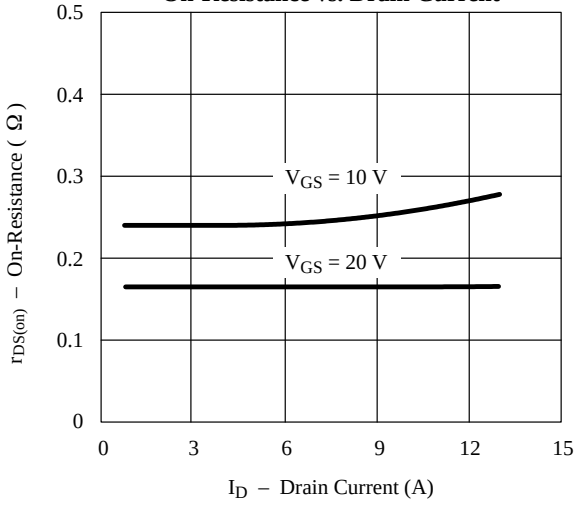
Transfer Characteristics



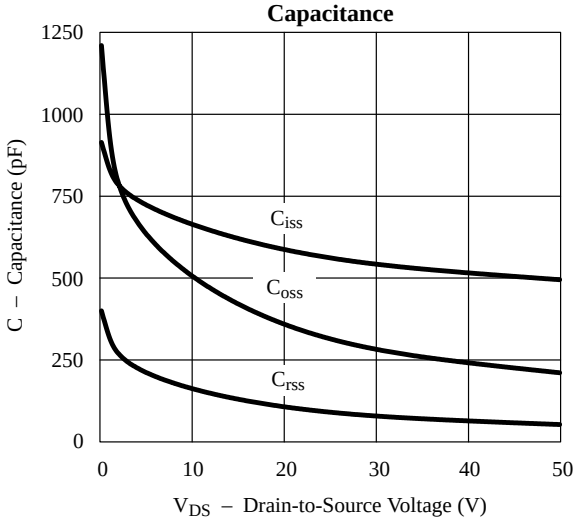
Transconductance



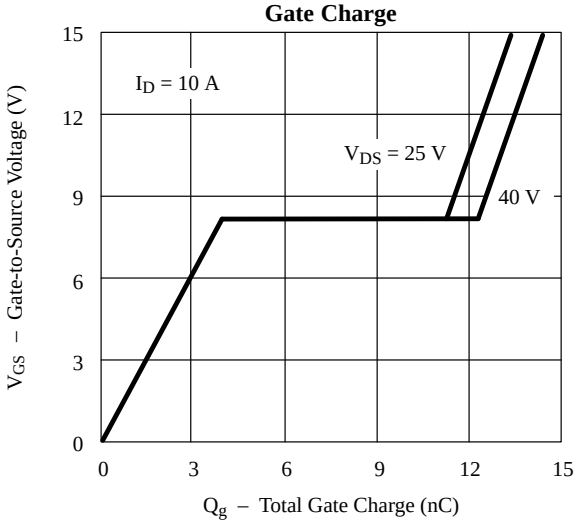
On-Resistance vs. Drain Current



Capacitance

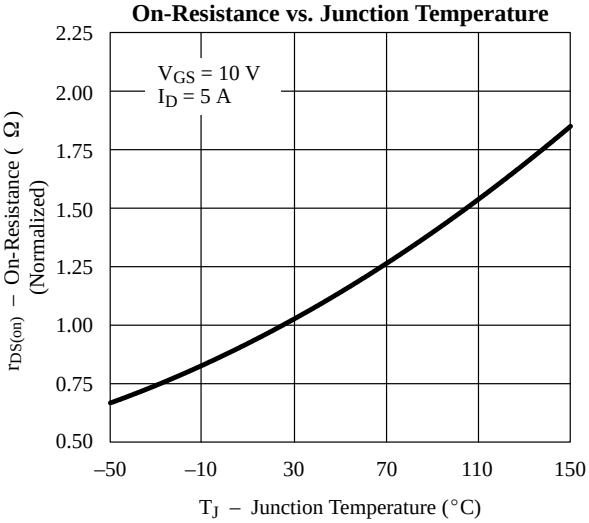


Gate Charge

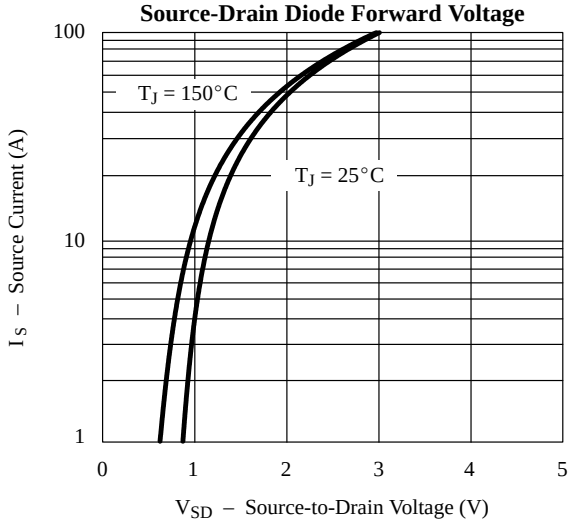


Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

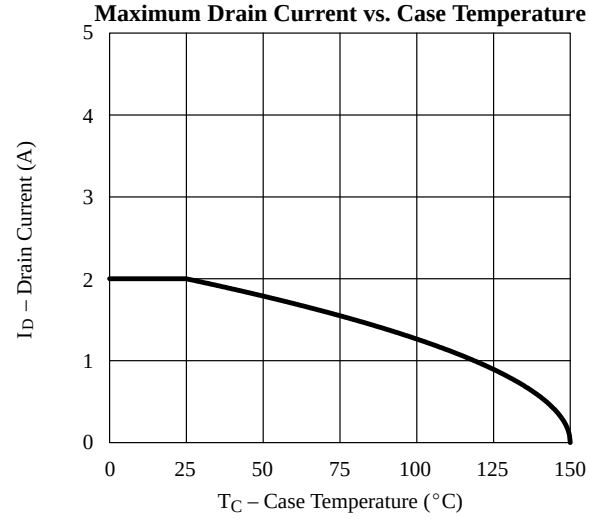


Source-Drain Diode Forward Voltage

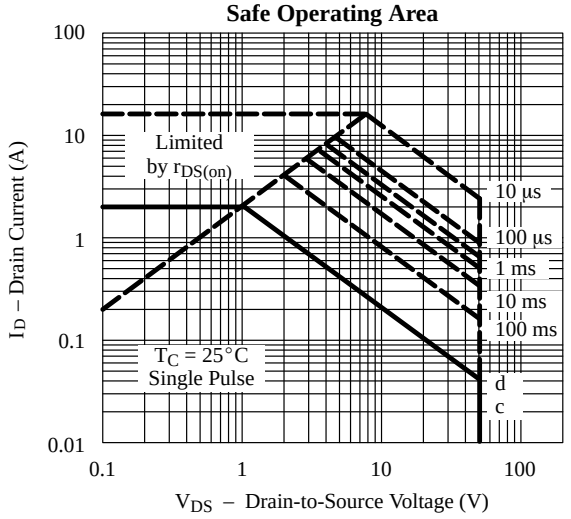


Thermal Ratings

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case