SMD10P06L

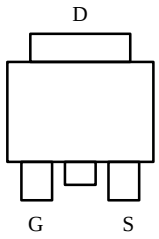
P-Channel Enhancement-Mode Transistor

Product Summary

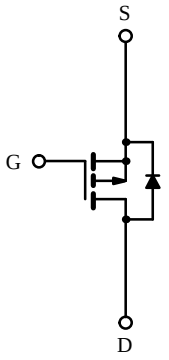
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D[a] (A)
–60	0.28 @ V_{GS} = –10 V	–10
	0.35 @ V_{GS} = –4.5 V	–7.5

175°C Rated
Maximum Junction Temperature

DPAK (TO-252)



Top View



P-Channel MOSFET

Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	–60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current[b]	T_A = 25°C	I_D	–2.0	A
	T_A = 100°C		–1.2	
Pulsed Drain Current (maximum current limited by package)		I_{DM}	–16	
Maximum 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 175	°C

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Free Air[b]	R_{thJA}		60	°C/W
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.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1405.

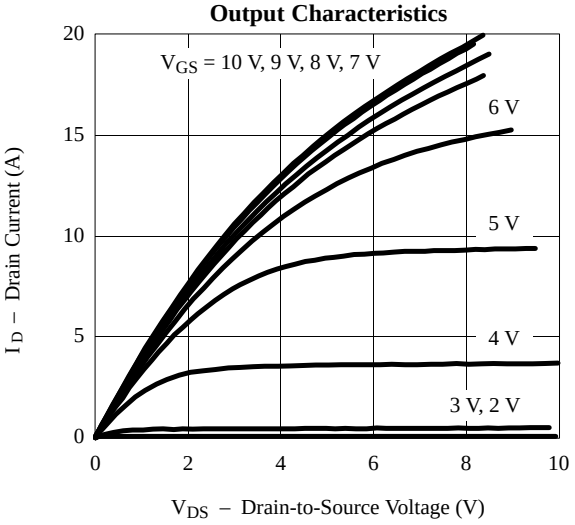
Specifications (T_J = 25°C Unless Otherwise Noted)

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	–60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 µA	–1.0		–3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –48 V, V_{GS} = 0 V			–2	µA
		V_{DS} = –48 V, V_{GS} = 0 V, T_J = 125°C			–100	
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 = –2.3 A			0.28	Ω
		V_{GS} = –4.5 V, I_D = –1.6 A			0.35	
Forward Transconductance[b]	g_{fs}	V_{DS} = –15 V, I_D = –5 A	1.0			S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = –25 V, f = 1 MHz		440		pF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			25		
Total Gate Charge[c]	Q_g	V_{DS} = –30 V, V_{GS} = –10 V, I_D = –10 A		13	24	nC
Gate-Source Charge[c]	Q_{gs}			2.0	4.0	
Gate-Drain Charge[c]	Q_{gd}			4	8.0	
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		15		ns
Rise Time[c]	t_r			50		
Turn-Off Delay Time[c]	$t_{d(off)}$			80		
Fall Time[c]	t_f			80		
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 = –2.0 A, V_{GS} = 0 V			–1.2	V
Reverse Recovery Time	t_{rr}	I_F = –2.0 A, di/dt = 100 A/µs		60		ns
Reverse Recovery Charge	Q_{rr}			0.07		µC

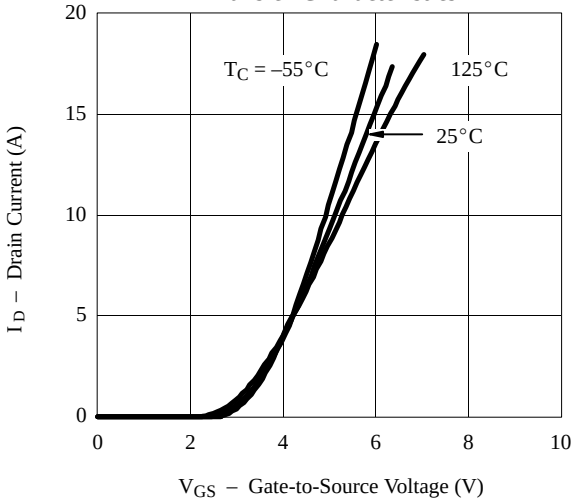
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

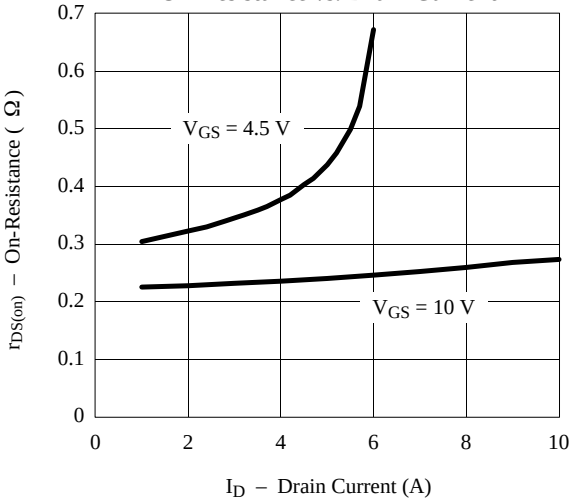
Output Characteristics



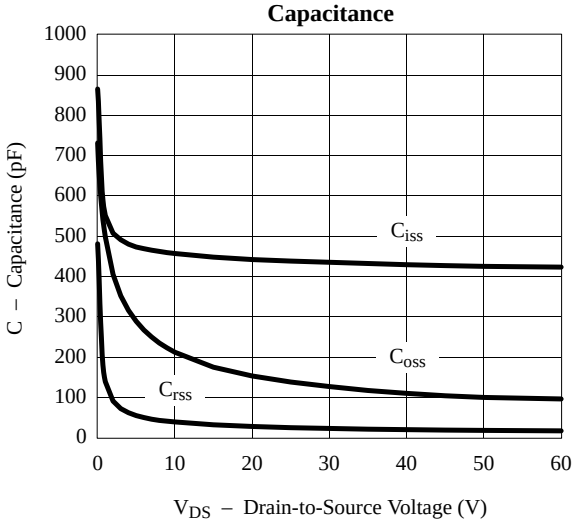
Transfer Characteristics



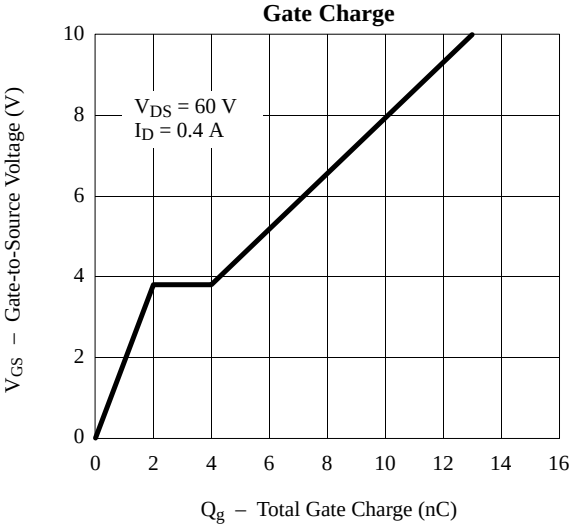
On-Resistance vs. Drain Current



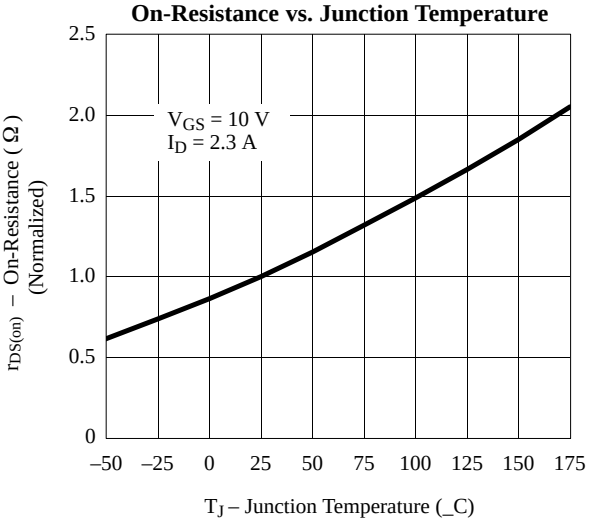
Capacitance



Gate Charge

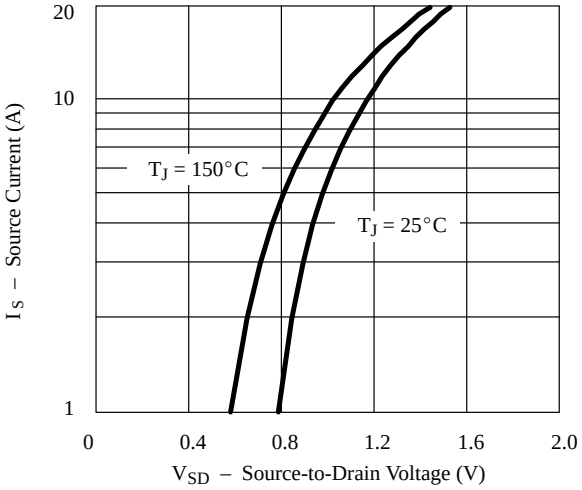


On-Resistance vs. Junction Temperature

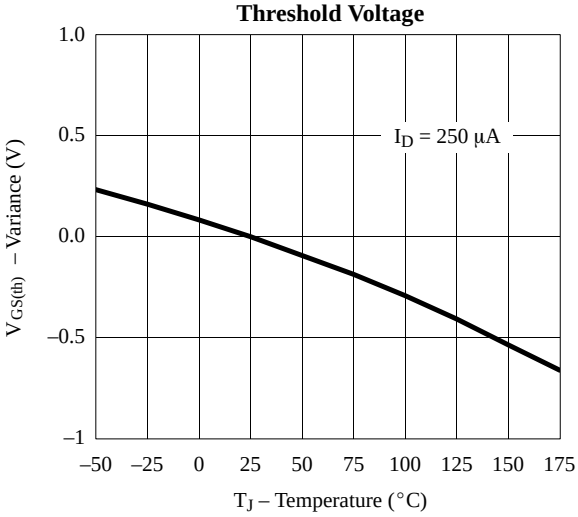


Typical Characteristics (25°C Unless Otherwise Noted)

Source-Drain Diode Forward Voltage

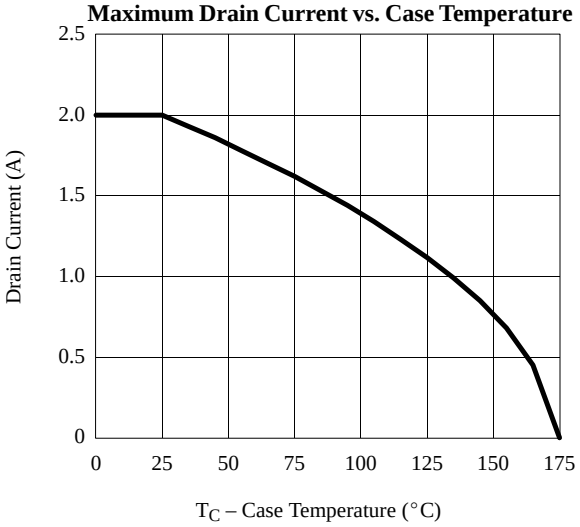


Threshold Voltage

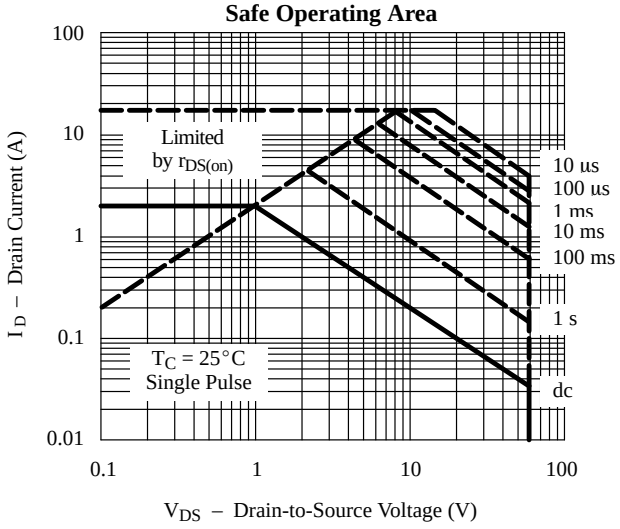


Thermal Ratings

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case