



# SMP60N03-10L

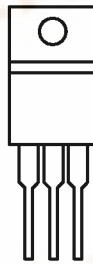
Siliconix

## N-Channel 30-V (D-S), 150°C MOSFET, Logic Level

### Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.01	60

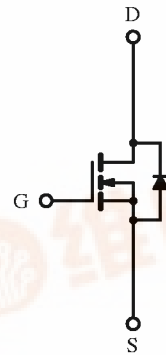
TO-220AB



G D S

Top View

DRAIN connected to TAB



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current	$I_D$	$T_C = 25^\circ\text{C}$	60	A
		$T_C = 100^\circ\text{C}$	51	
Pulsed Drain Current	$I_{DM}$	240		
Avalanche Current	$I_{AR}$	60		
Avalanche Energy	L = 0.1 mH	$E_{AS}$	180	mJ
Repetitive Avalanche Energy <sup>a</sup>	L = 0.05 mH	$E_{AR}$	90	
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	105	W
		$T_C = 100^\circ\text{C}$	42	
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	$R_{thJA}$		80	$^\circ\text{C}/\text{W}$
Junction-to-Case	$R_{thJC}$		1.2	
Case-to-Sink	$R_{thCS}$	1.0		

Notes:

a. Duty cycle  $\leq 1\%$

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70280.

A SPICE Model data sheet is available for this product (FaxBack document #70525).



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## Specifications (T<sub>J</sub> = 25° C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1 mA	0.8		3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 500	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V			25	μA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125° C			250	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 10 V	60			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A		0.007	0.010	Ω
		V <sub>GS</sub> = 5 V, I <sub>D</sub> = 30 A		0.010	0.015	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 125° C		0.009	0.014	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 30 A		45		S
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		2600		pF
Output Capacitance	C <sub>oss</sub>			1500		
Reverse Transfer Capacitance	C <sub>rss</sub>			750		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 60 A		100	120	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			10	15	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			45	75	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, R <sub>L</sub> = 1 Ω I <sub>D</sub> = 30 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		14	30	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			25	50	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			65	100	
Fall Time <sup>c</sup>	t <sub>f</sub>			45	80	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25° C)</b>						
Continuous Current	I <sub>S</sub>				60	A
Pulsed Current	I <sub>SM</sub>				240	
Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 60 A, V <sub>GS</sub> = 0 V			1.6	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 60 A, di <sub>F</sub> /dt = 100 A/μs		160		ns
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>			13		A
Reverse Recovery Charge	Q <sub>rr</sub>			1.0		μC

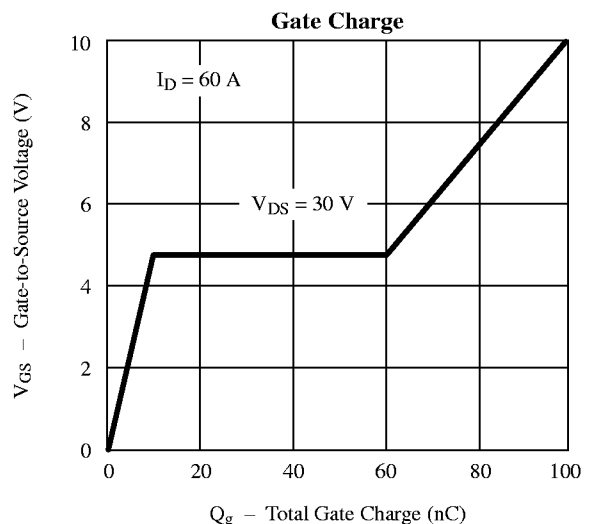
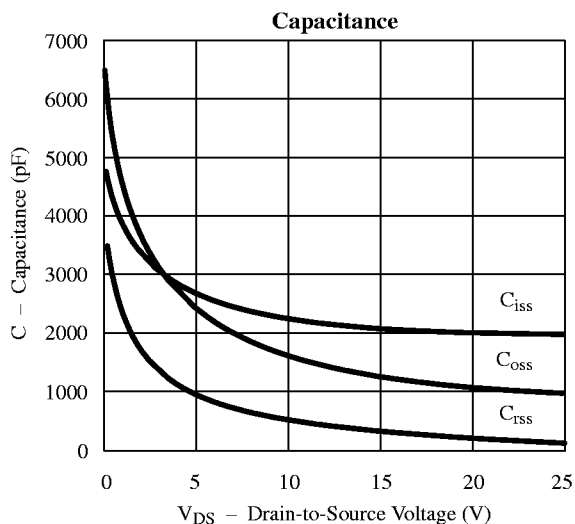
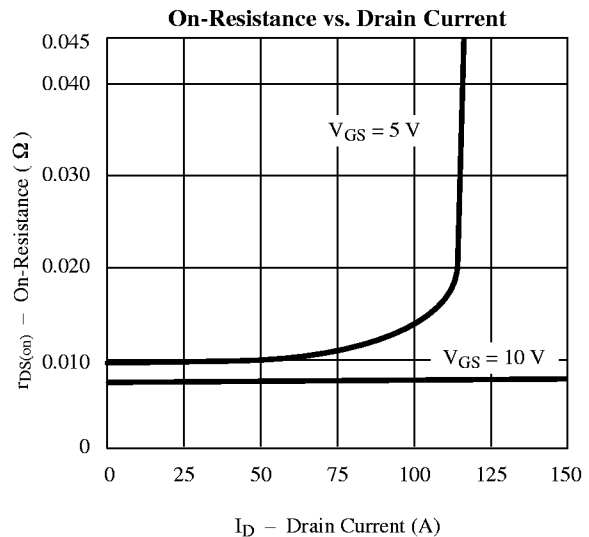
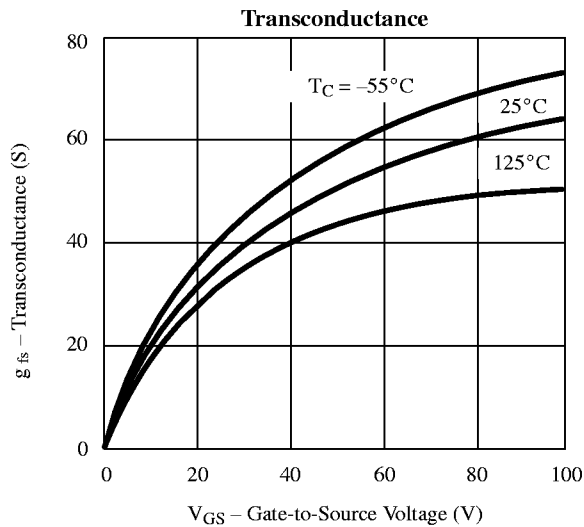
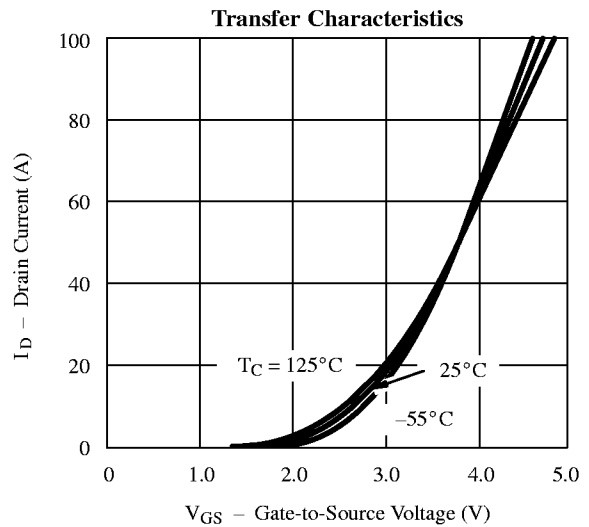
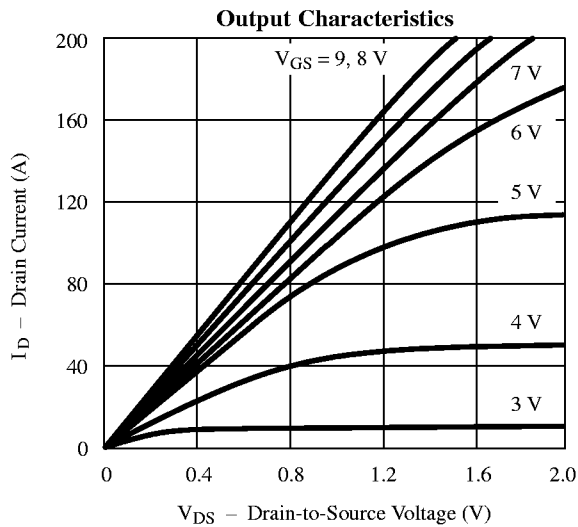
Notes:

- 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)

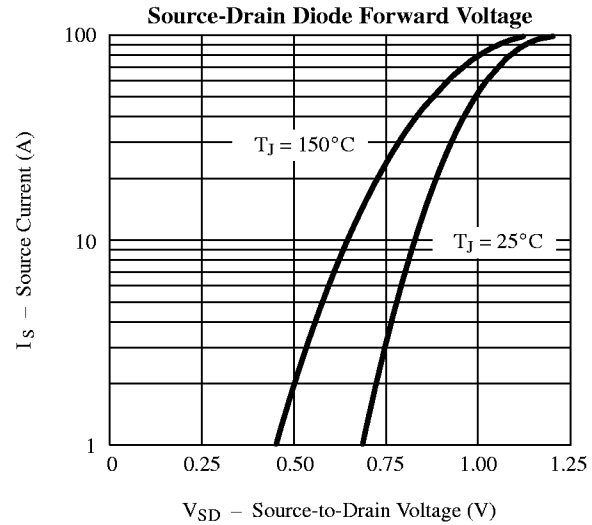
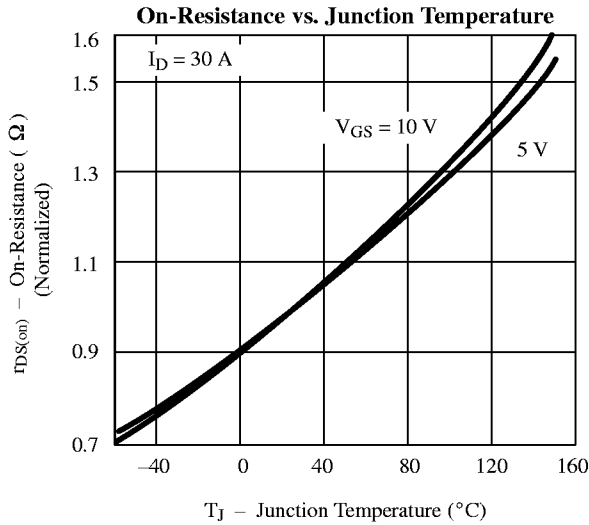


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## Typical Characteristics (25°C Unless Otherwise Noted)



## Thermal Ratings

