

Siliconix

N-Channel Enhancement-Mode Transistor

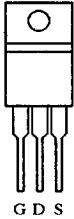
175°C Maximum Junction Temperature

Product Summary

V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
60	0.014	60

See lower-cost version: SUP60N06-14

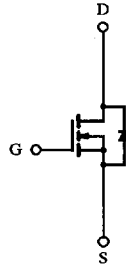
TO-220AB



G D S

Top View

DRAIN connected to TAB



N-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 (T _J = 150°C)	I _D	T _C = 25°C	60
		T _C = 100°C	50
Pulsed Drain Current	I _{DM}	240	A
Avalanche Current ^a	I _{AR}	60	
Repetitive Avalanche Energy	EAR	L = 0.1 mH	180
Power Dissipation	P _D	T _C = 25°C	150
		T _C = 100°C	75
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°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	°C/W
Junction-to-Case	R _{thJC}		1.0	
Case-to-Sink	R _{thCS}	1.0		

Notes:

a. Duty cycle ≤ 1%

P-36737—Rev. D (05/30/94)

6-125

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N-P-Channel
MOSFETs

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

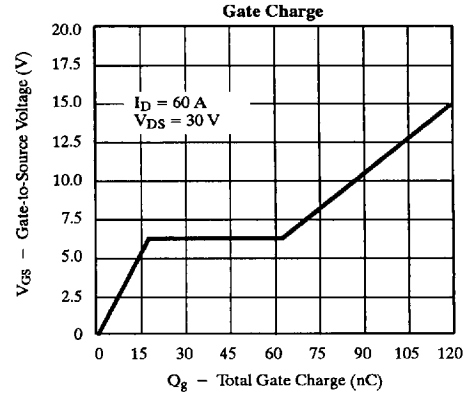
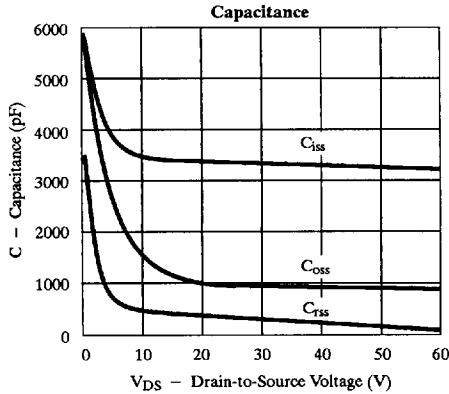
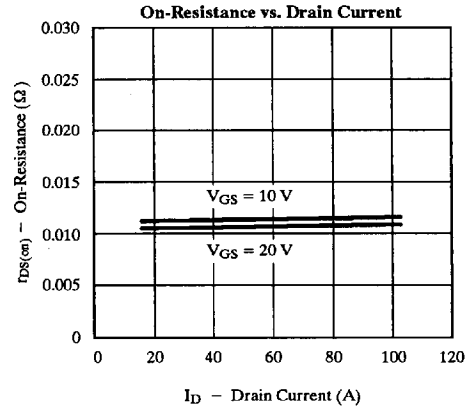
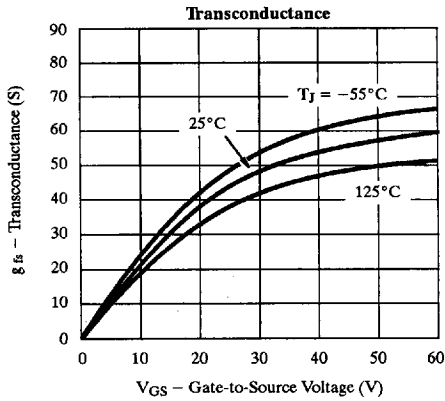
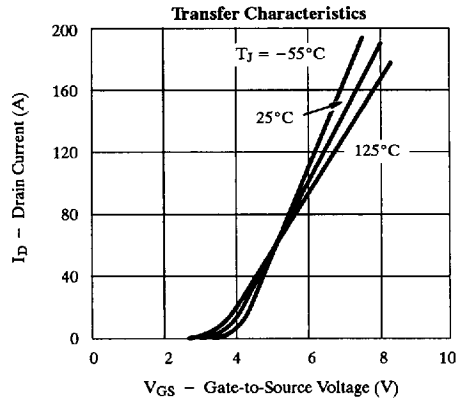
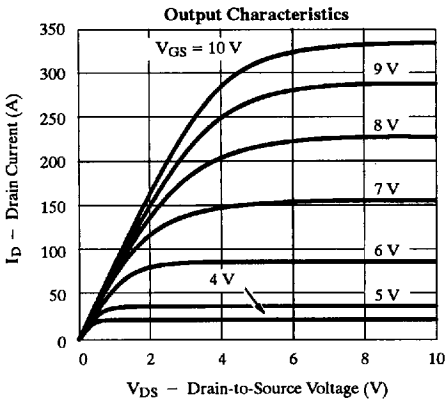
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 1\ \text{mA}$	2.0	3.0	4.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 500	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}$			25	
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			250	μA
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 175^\circ\text{C}$			500	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 10\ \text{V}$	60			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 30\ \text{A}$		0.012	0.014	
		$V_{GS} = 10\ \text{V}, I_D = 30\ \text{A}, T_J = 125^\circ\text{C}$		0.020	0.023	Ω
		$V_{GS} = 10\ \text{V}, I_D = 30\ \text{A}, T_J = 175^\circ\text{C}$		0.025	0.028	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 30\ \text{A}$	30	48		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0\ \text{V}, V_{DS} = 25\ \text{V}, f = 1\ \text{MHz}$		3450		pF
Output Capacitance	C_{oss}			1000		
Reverse Transfer Capacitance	C_{rss}			230		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\ \text{V}, V_{GS} = 10\ \text{V}, I_D = 60\ \text{A}$		95	130	nC
Gate-Source Charge ^c	Q_{gs}			20		
Gate-Drain Charge ^c	Q_{gd}			45		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\ \text{V}, R_L = 0.47\ \Omega$ $I_D \approx 60\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 2.5\ \Omega$		15	30	ns
Rise Time ^c	t_r			130	180	
Turn-Off Delay Time ^c	$t_{d(off)}$			50	100	
Fall Time ^c	t_f			20	50	
Source-Drain Diode Ratings and Characteristics ($T_C = 25^\circ\text{C}$)						
Continuous Current	I_S				60	A
Pulsed Current	I_{SM}				240	
Forward Voltage ^b	V_{SD}	$I_F = 60\ \text{A}, V_{GS} = 0\ \text{V}$		1.0	1.8	V
Reverse Recovery Time	t_{rr}	$I_F = 60\ \text{A}, di_F/dt = 100\ \text{A}/\mu\text{s}$		130	200	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			9		A
Reverse Recovery Charge	Q_{rr}			0.6		μC

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)

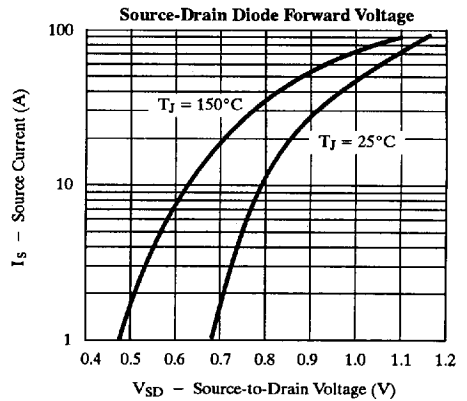
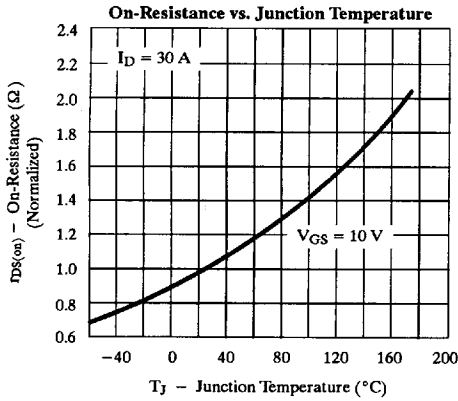


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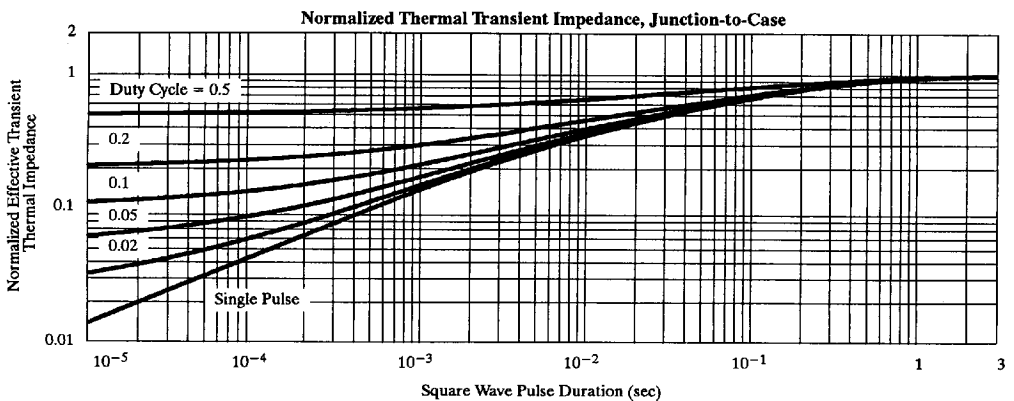
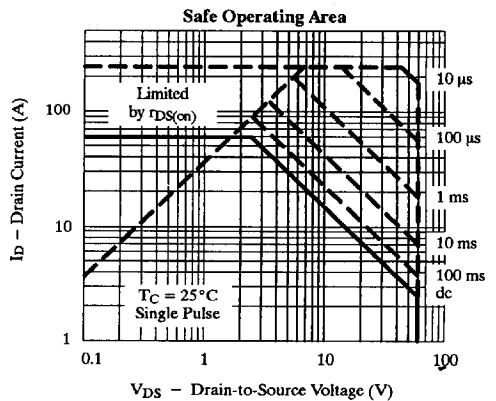
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N-/P-Channel
MOSFETs

SMP60N06-14

Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings



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