

N-Channel Enhancement-Mode Transistor

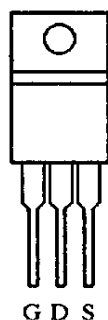
175°C Maximum Junction Temperature

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.014	60

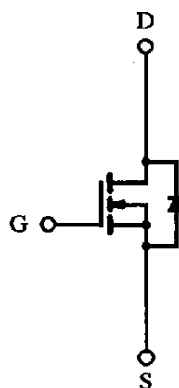
See lower-cost version: SUP60N06-14

TO-220AB



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}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	240	A
Avalanche Current ^a	I_{AR}	60	
Repetitive Avalanche Energy	E_{AR}	180	mJ
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	W
		$T_C = 100^\circ\text{C}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$
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	$^\circ\text{C/W}$
Junction-to-Case	R_{thJC}		1.0	
Case-to-Sink	R_{thCS}	1.0		

Notes:

a. Duty cycle $\leq 1\%$

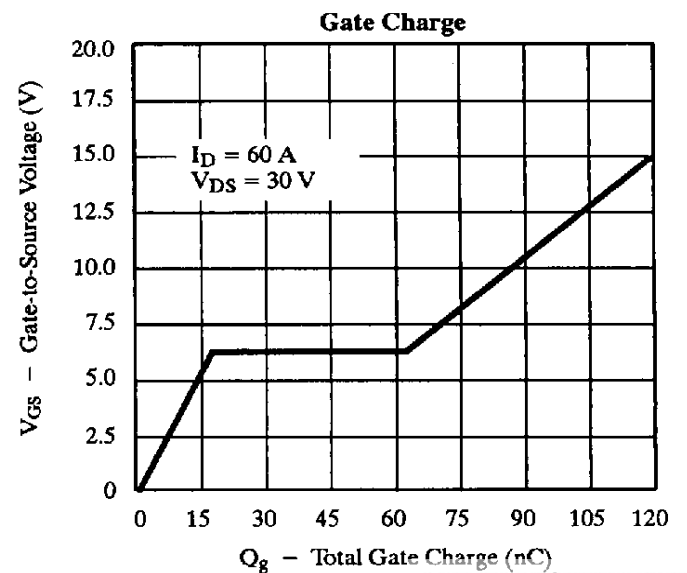
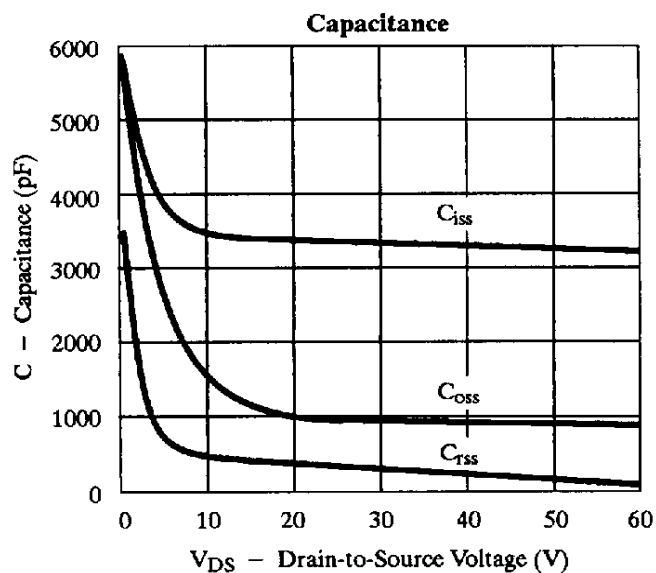
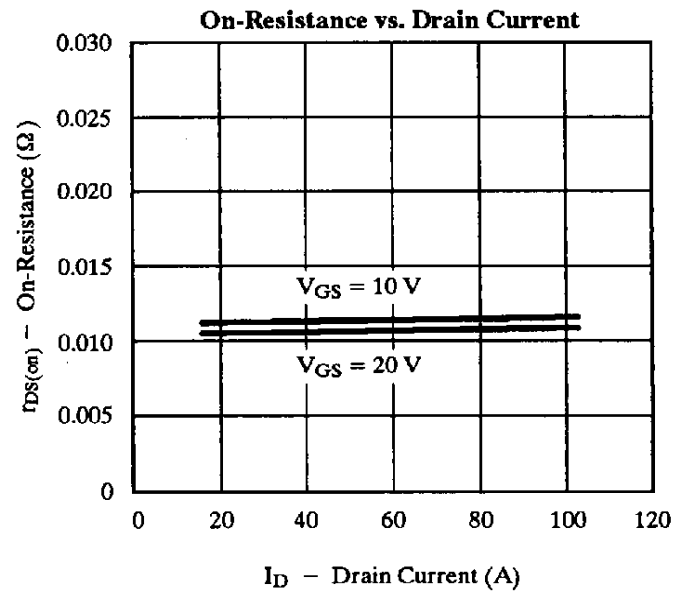
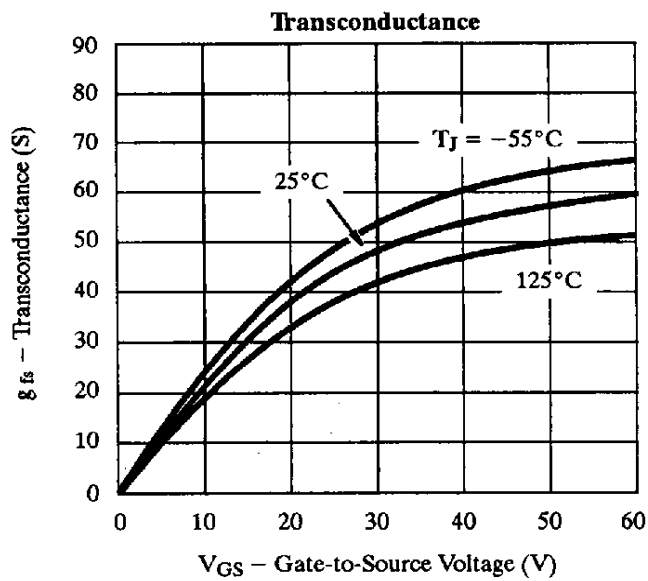
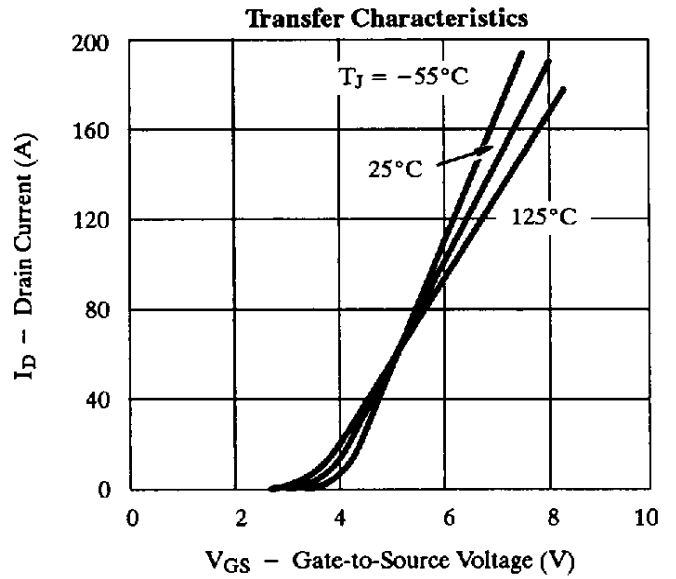
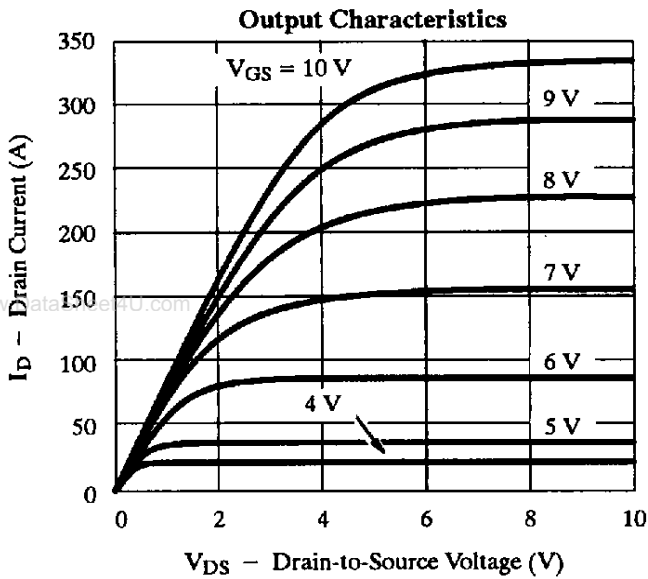
Specifications ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

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	μA
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			250	
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 175^\circ\text{C}$			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	Ω
		$V_{GS} = 10\ \text{V}, I_D = 30\ \text{A}, T_J = 125^\circ\text{C}$		0.020	0.023	
		$V_{GS} = 10\ \text{V}, I_D = 30\ \text{A}, T_J = 175^\circ\text{C}$		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	$t_{d(on)}$	$V_{DD} = 30\ \text{V}, R_L = 0.47\ \Omega$ $I_D = 60\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 2.5\ \Omega$		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

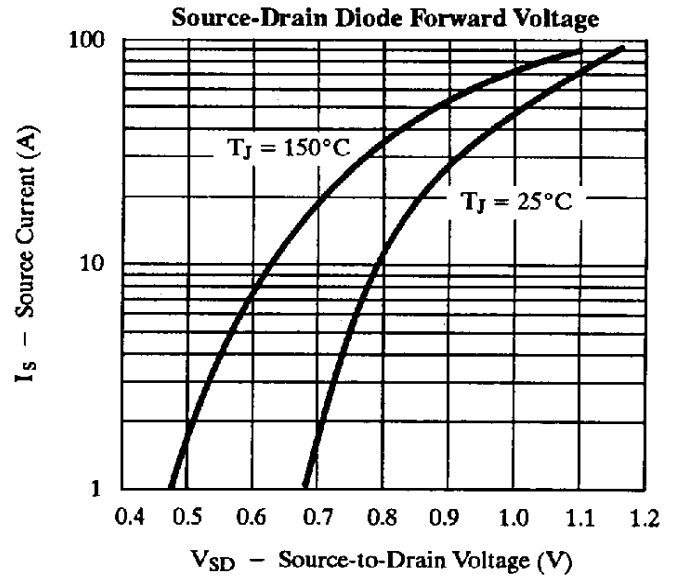
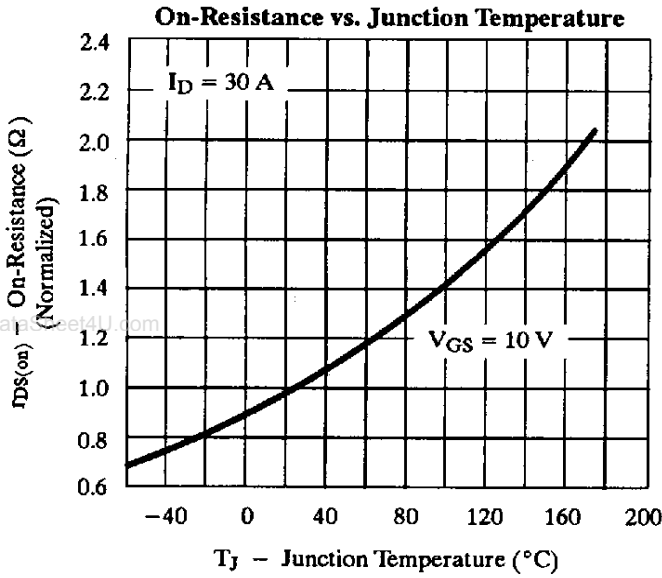
Notes:

- 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.

Typical Characteristics (25°C Unless Otherwise Noted)



Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings

