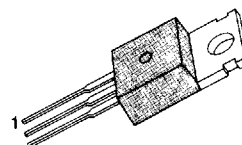


FEATURES

- Lower $R_{DS(on)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability

TO-220



1. Gate 2. Drain 3. Source

PRODUCT SUMMARY

Part Number	V _{DS}	R _{DS(on)}	I _D
SSP60N06	60V	0.018 Ω	60A
SSP60N05	50V	0.018 Ω	60A

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSP60N06	SSP60N05	Unit
Drain-Source Voltage (1)	V _{DS}	60	50	V _{dc}
Drain-Gate Voltage (R _{GS} =1.0M Ω) (1)	V _{DGR}	60	50	V _{dc}
Gate-Source Voltage	V _{GS}	± 20		V _{dc}
Continuous Drain Current T _C =25 °C	I _D	60		A _{dc}
Continuous Drain Current T _C =100 °C	I _D	42		A _{dc}
Drain Current - Pulsed (3)	I _{DM}	240		A _{dc}
Gate Current - Pulsed	I _{GM}	± 1.5		A _{dc}
Single Pulsed Avalanche Energy (4)	E _{AS}	216		mJ
Avalanche Current	I _{AS}	60		A
Total Power Dissipation @ T _C =25 °C	P _D	190		Watts
Derate above 25 °C		1.25		W/ °C
Operating and Storage Junction Temperature Range	T _J , T _{STG}	-55 to +175		°C
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T _L	300		°C

Notes : (1) T_J=25°C to 175°C(2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

(3) Repetitive rating : Pulse width limited by max. junction temperature

(4) L=60 μH , V_{dd}=30V, R_G=25 Ω , Starting T_J=25°C

ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV _{DSS}	Drain-Source Breakdown Voltage					
	SSP60N06	60	-	-	V	V _{GS} =0V, I _D =250μA
	SSP60N05	50	-	-	V	
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	Gate-Source Leakage Forward	-	-	100	nA	V _{GS} =20V
I _{GSS}	Gate-Source Leakage Reverse	-	-	-100	nA	V _{GS} =-20V
I _{DSS}	Zero Gate Voltage Drain Current	-	-	250	μA	V _{DS} =Max. Rating, V _{GS} =0V
		-	-	1000	μA	V _{DS} =0.8 Max. Rating, V _{GS} =0V, T _C =150°C
R _{DS(on)}	Static Drain-Source On-Resistance(2)	-	-	0.018	Ω	V _{GS} =10V, I _D =30A
g _{fs}	Forward Transconductance (2)	20	-	-	U	V _{DS} ≥50V, I _D =30A
C _{iss}	Input Capacitance	-	3500	-	pF	V _{GS} =0V, V _{DS} =25V, f=1.0MHz
C _{oss}	Output Capacitance	-	1020	-	pF	
C _{rss}	Reverse Transfer Capacitance	-	170	-	pF	
t _{d(on)}	Turn-On Delay Time	-	20	35	ns	V _{DD} =25V, I _D =60A, Z _o =6.0Ω (MOSFET switching times are essentially independent of operating temperature)
t _r	Rise Time	-	10	25	ns	
t _{d(off)}	Turn-Off Delay Time	-	45	60	ns	
t _f	Fall Time	-	45	60	ns	
Q _g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	120	nC	V _{GS} =10V, I _D =60A, V _{DS} =0.8 Max. Rating (Gate charge is essentially independent of operating temperature)
Q _{gs}	Gate-Source Charge	-	20	35	nC	
Q _{gd}	Gate-Drain ("Miller") Charge	-	30	45	nC	

THERMAL RESISTANCE

Symbol	Characteristics		All	Units	Remark
R _{thJC}	Junction-to-Case	MAX	0.80	K/W	
R _{thCS}	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat smooth, and greased
R _{thJA}	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

Notes : (1) T_J=25°C to 175°C

(2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%

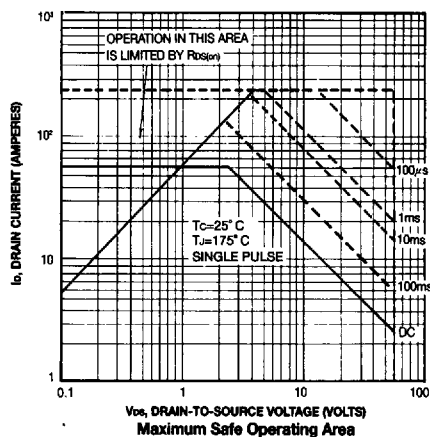
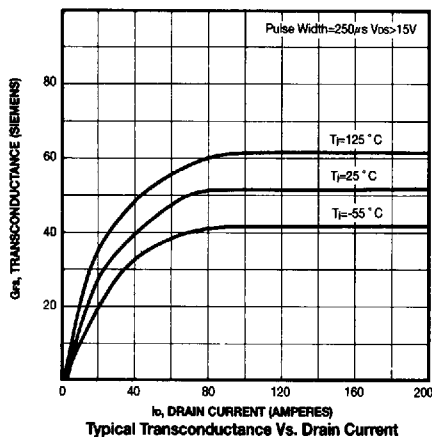
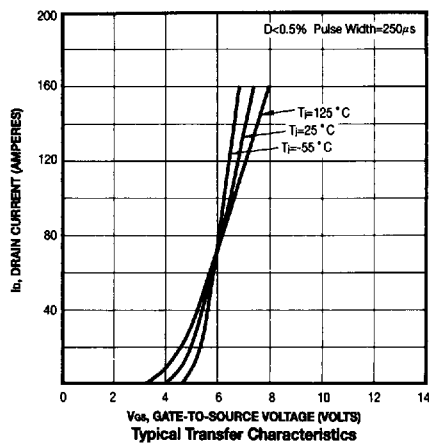
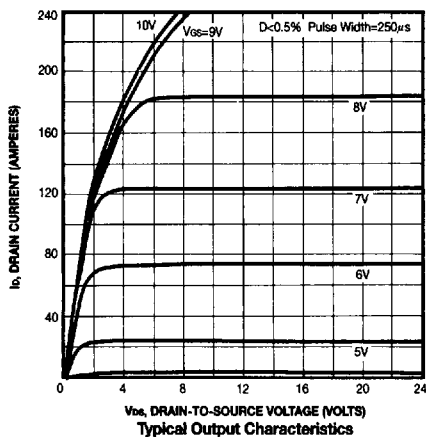
(3) Repetitive rating : Pulse width limited by max. junction temperature

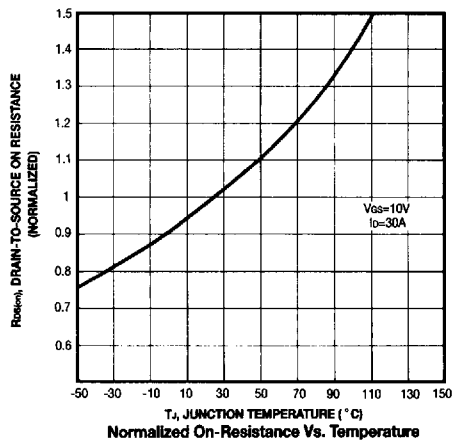
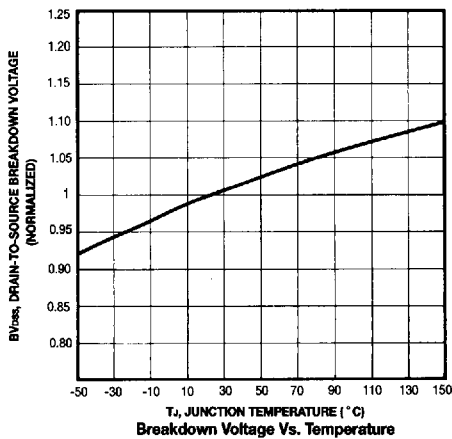
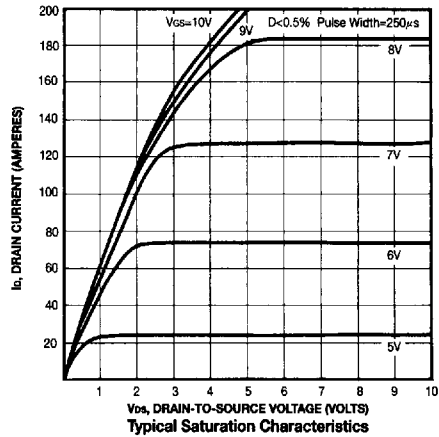
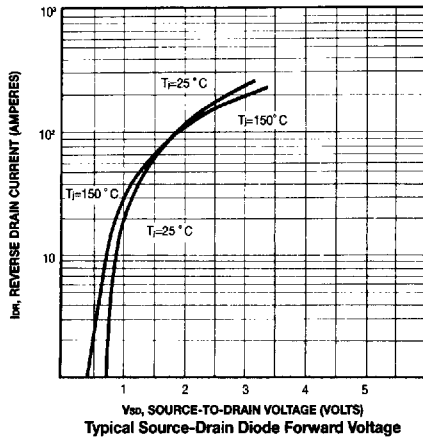
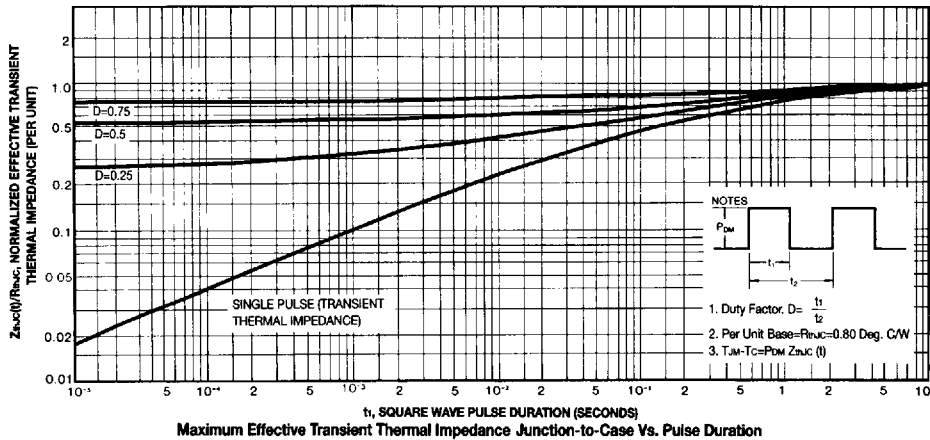
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

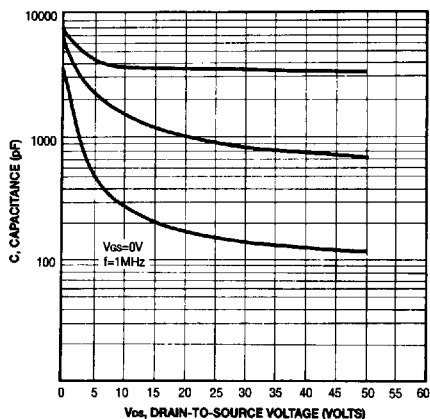
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	60	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	240	A	
V_{SD}	Diode Forward Voltage (2)	-	-	2	V	$T_J=25^\circ\text{C}$, $I_S=60\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	160	-	ns	$T_J=25^\circ\text{C}$, $I_F=60\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

Notes : (1) $T_J=25^\circ\text{C}$ to 175°C (2) Pulse test : Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

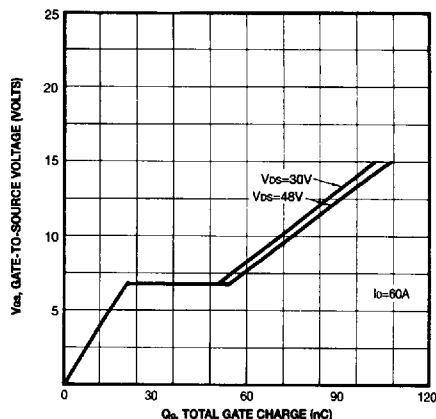
(3) Repetitive rating : Pulse width limited by max. junction temperature



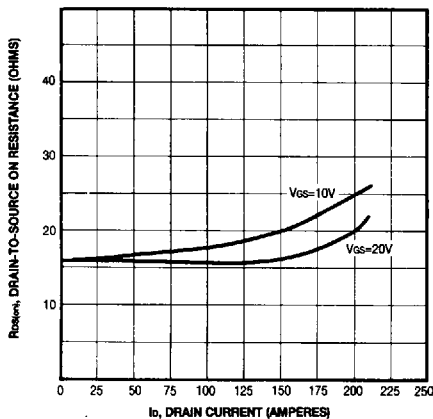




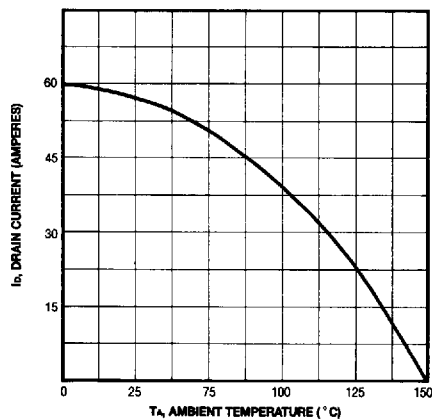
Typical Capacitance Vs. Drain to Source Voltage



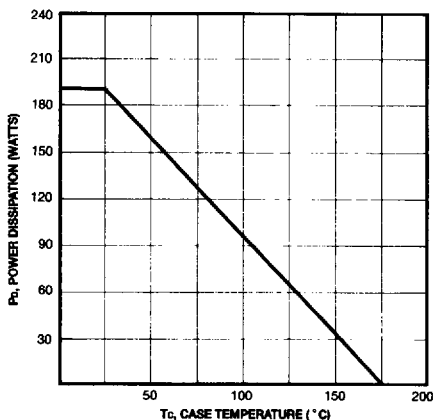
Typical Gate Charge Vs. Gate-to-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve