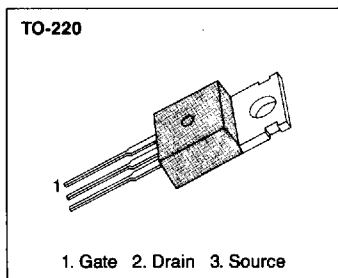


## FEATURES

- 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



## PRODUCT SUMMARY

Part Number	V <sub>DS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
SSP60N06	60V	0.018 $\Omega$	60A
SSP60N05	50V	0.018 $\Omega$	60A

## ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSP60N06	SSP60N05	Unit
Drain-Source Voltage (1)	V <sub>DSS</sub>	60	50	V <sub>dc</sub>
Drain-Gate Voltage (R <sub>GS</sub> =1.0M $\Omega$ )(1)	V <sub>DGR</sub>	60	50	V <sub>dc</sub>
Gate-Source Voltage	V <sub>GS</sub>	$\pm 20$		V <sub>dc</sub>
Continuous Drain Current T <sub>c</sub> =25 °C	I <sub>D</sub>	60		A <sub>dc</sub>
Continuous Drain Current T <sub>c</sub> =100 °C	I <sub>D</sub>	42		A <sub>dc</sub>
Drain Current - Pulsed (3)	I <sub>DM</sub>	240		A <sub>dc</sub>
Gate Current - Pulsed	I <sub>GM</sub>	$\pm 1.5$		A <sub>dc</sub>
Single Pulsed Avalanche Energy (4)	E <sub>AS</sub>	216		mJ
Avalanche Current	I <sub>AS</sub>	60		A
Total Power Dissipation @ T <sub>c</sub> =25 °C	P <sub>D</sub>	190		Watts
Derate above 25 °C		1.25		W/ °C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175		°C
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T <sub>L</sub>	300		°C

Notes : (1) T<sub>J</sub>=25°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

(4) L=60 $\mu\text{H}$ , V<sub>GS</sub>=30V, R<sub>G</sub>=25 $\Omega$ , Starting T<sub>J</sub>=25°C

**ELECTRICAL CHARACTERISTICS** (Tc=25°C unless otherwise specified)

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

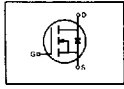
4

**THERMAL RESISTANCE**

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

- Notes : (1) T<sub>J</sub>=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	$T_J=25^\circ\text{C}$ , $I_S=60\text{A}$ , $V_{GS}=0\text{V}$
$t_r$	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  $175^\circ\text{C}$   
 (2) Pulse test : Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$   
 (3) Repetitive rating : Pulse width limited by max. junction temperature

