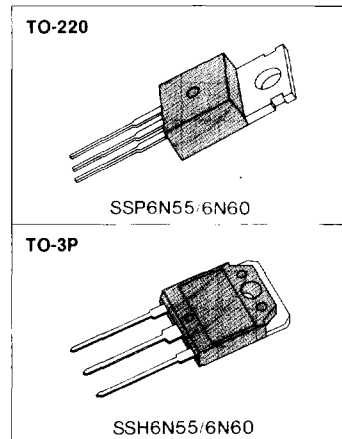


**FEATURES**

- 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	$V_{DS}$	$R_{DS(on)}$		$I_D$
		A	STD	
SSP6N55/SSH6N55	550V	1.2 $\Omega$	1.8 $\Omega$	6A
SSP6N60/SSH6N60	600V	1.2 $\Omega$	1.8 $\Omega$	6A



**MAXIMUM RATINGS**

Characteristic	Symbol	SSP6N55 SSH6N55	SSP6N60 SSH6N60	Unit
Drain-Source Voltage (1)	$V_{DSS}$	550	600	Vdc
Drain-Gate Voltage ( $R_{GS}=1.0M\Omega$ )(1)	$V_{DGR}$	550	600	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$		Vdc
Continuous Drain Current $T_C=25^\circ C$	$I_D$	6.0	6.0	Adc
Continuous Drain Current $T_C=100^\circ C$	$I_D$	4.0	4.0	Adc
Drain Current—Pulsed (3)	$I_{DM}$	24	24	Adc
Gate Current—Pulsed	$I_{GM}$	$\pm 1.5$		Adc
Single Pulsed Avalanche Energy (4)	$E_{AS}$	570		mJ
Avalanche Current	$I_{AS}$	6.0		A
Total Power Dissipation @ $T_C=25^\circ C$	$P_D$	125		Watts
Derate above $25^\circ C$		1.0		W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ C$
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	$T_L$	300		$^\circ C$

- Notes:** (1)  $T_J=25^\circ C$  to  $150^\circ C$   
 (2) Pulse test. Pulse width  $\leq 300\mu s$ . Duty Cycle  $\leq 2\%$   
 (3) Repetitive rating. Pulse with limited by max. junction temperature  
 (4)  $L=27mH$ ,  $V_{dd}=50V$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ C$

**ELECTRICAL CHARACTERISTICS** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage SSP6N55/SSH6N55/	550	—	—	V	V <sub>GS</sub> =0V I <sub>D</sub> =250μA
	SSP6N60/SSH6N60/	600	—	—	V	
V <sub>GS(th)</sub>	Gate Threshold Voltage	2.0	—	4.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA
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> =Max. Rating×0.8, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C
I <sub>D(on)</sub>	On-State Drain-Source Current (2)	6.0	—	—	A	V <sub>DS</sub> ≥10V, V <sub>GS</sub> =10V
R <sub>DS(on)</sub>	Static Drain-Source On-State A Resistance (2)	—	—	1.2	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =3.0A
	STD	—	—	1.8		
g <sub>fs</sub>	Forward Transconductance (2)	3.0	4.8	—	Ū	V <sub>DS</sub> ≥50V, I <sub>D</sub> =3.0A
C <sub>iss</sub>	Input Capacitance	—	—	1800	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz
C <sub>oss</sub>	Output Capacitance	—	—	350	pF	
C <sub>rss</sub>	Reverse Transfer Capacitance	—	—	150	pF	
t <sub>d(on)</sub>	Turn-On Delay Time	—	—	60	ns	V <sub>DD</sub> =0.5BV <sub>DSS</sub> , I <sub>D</sub> =3.0A, Z <sub>O</sub> =4.7Ω (MOSFET switching times are essentially independent of operating temperature)
t <sub>r</sub>	Rise Time	—	—	150	ns	
t <sub>d(off)</sub>	Turn-Off Delay Time	—	—	200	ns	
t <sub>f</sub>	Fall Time	—	—	120	ns	
Q <sub>g</sub>	Total Gate Charge (Gate-Source Plus Gate-Drain)	—	—	40	nC	V <sub>GS</sub> =10V, I <sub>D</sub> =7.5A, V <sub>DS</sub> =0.8 Max. Rating (Gate charge is essentially independent of operating temperature.)
Q <sub>gs</sub>	Gate-Source Charge	—	—	15	nC	
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	—	—	25	nC	


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**THERMAL RESISTANCE**

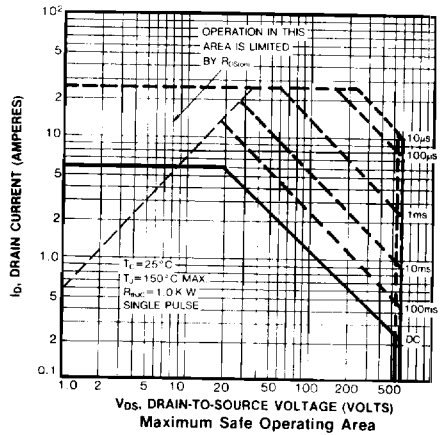
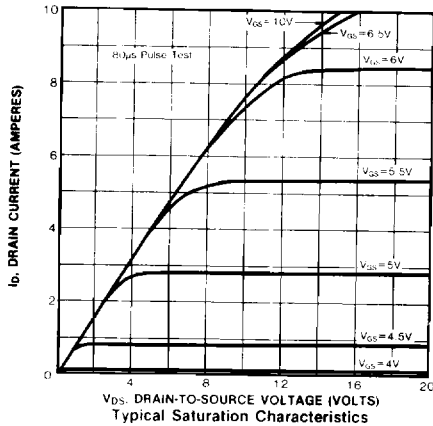
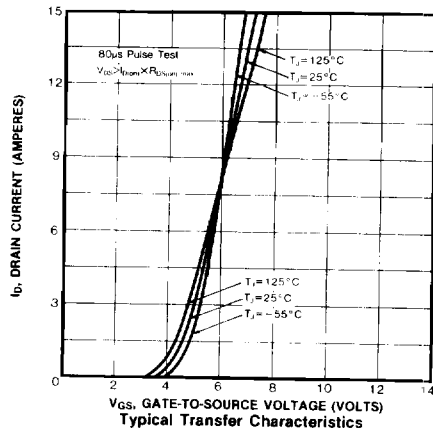
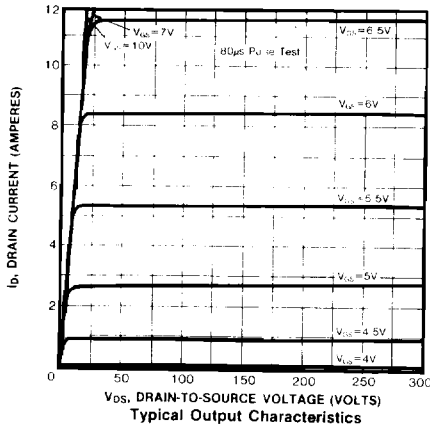
Symbol	Characteristic		SSP6N55/60	SSH6N55/60	Unit	
R <sub>thJC</sub>	Junction-to-Case	MAX	1.0	1.0	K/W	
R <sub>thCS</sub>	Case-to-Sink	TYP	0.5	0.24	K/W	Mounting surface flat, smooth, and greased
R <sub>thJA</sub>	Junction-to-Ambient	MAX	80	40	K/W	Free Air Operation

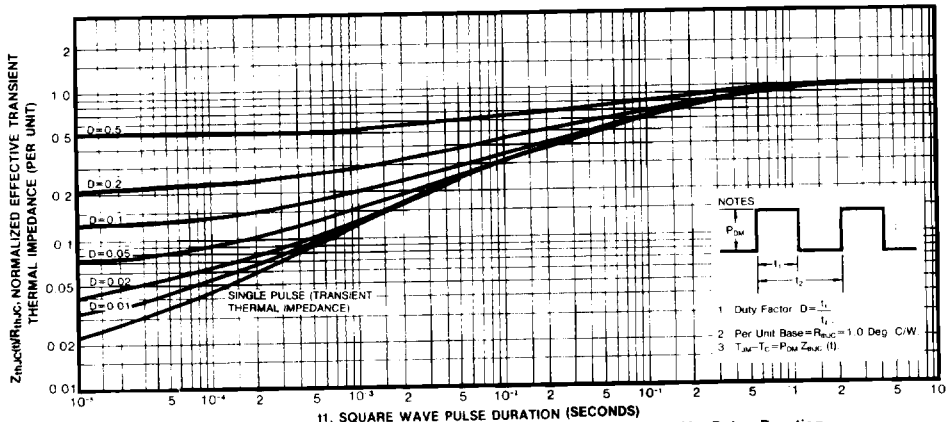
- Notes: (1) T<sub>J</sub>=25°C to 150°C  
 (2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%  
 (3) Repetitive rating: Pulse width limited by max. junction temperature  
 (4) For Ultra low "A" R<sub>DS(on)</sub>, device add "A" suffix to part number

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

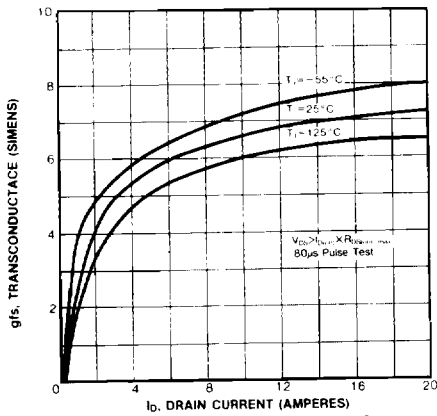
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	6.0	A	Modified MOSFET showing the integral reverse P-N junction rectifier 
$I_{SM}$	Pulse Source Current(Body Diode)(3)	—	—	24.0	A	
$V_{SD}$	Diode Forward Voltage (2)	—	—	1.5	V	$T_C=25^\circ\text{C}$ , $I_S=10.0\text{A}$ , $V_{GS}=0\text{V}$
$t_{rr}$	Reverse Recovery Time	—	450	940	ns	$T_J=150^\circ\text{C}$ , $I_F=10.0\text{A}$ , $dI_F/dt=100\text{A}/\mu\text{S}$

**Notes:** (1)  $T_J=25^\circ\text{C}$  to  $150^\circ\text{C}$  (2) Pulse test: Pulse width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2\%$   
 (3) Repetitive rating: Pulse with limited by max. junction temperature

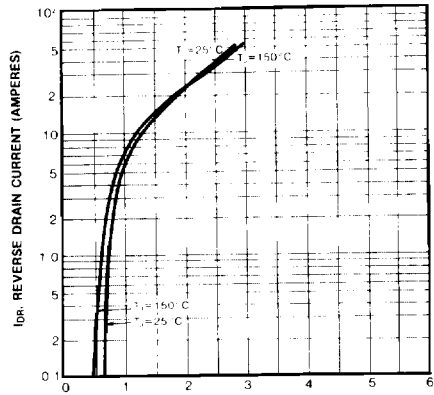




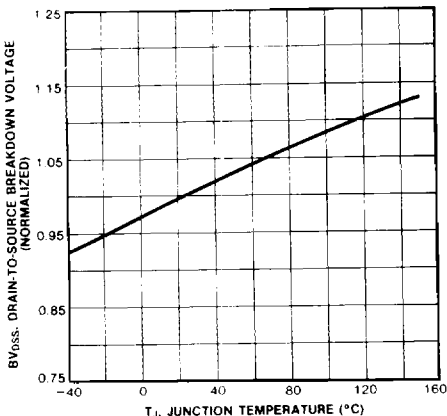
11. SQUARE WAVE PULSE DURATION (SECONDS)  
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



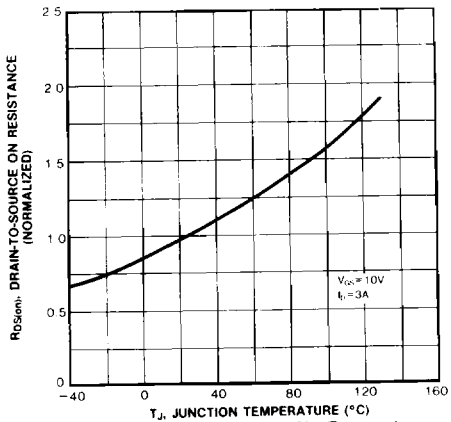
Typical Transconductance Vs. Drain Current



Typical Source-Drain Diode Forward Voltage



Breakdown Voltage Vs. Temperature



Normalized On-Resistance Vs. Temperature

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