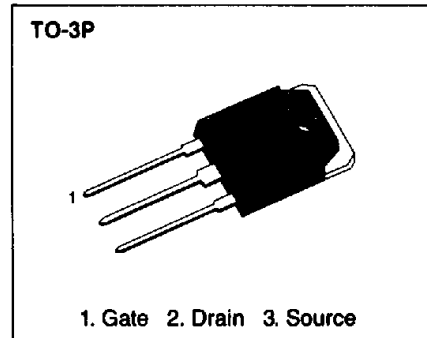


FEATURES

- 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
SSH5N90	900V	2.5 Ω	5A

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSH5N90	Unit
Drain-Source Voltage (1)	V _{DSS}	900	V _{dc}
Drain-Gate Voltage (R _{GS} =1.0M Ω)(1)	V _{DGR}	900	V _{dc}
Gate-Source Voltage	V _{GS}	± 30	V _{dc}
Continuous Drain Current T _c =25 °C	I _D	5.0	A _{dc}
Continuous Drain Current T _c =100 °C	I _D	3.5	A _{dc}
Drain Current - Pulsed (3)	I _{DM}	20.0	A _{dc}
Single Pulsed Avalanche Energy (4)	E _{AS}	430	mJ
Avalanche Current	I _{AS}	5.0	A
Total Power Dissipation at T _c =25 °C	P _D	150	Watts
Derate Above 25 °C		1.20	W/°C
Operating and Storage Junction Temperature Range	T _J , T _{STG}	-55 to +150	°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 150°C

(2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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

(4) L=51mH, V_{dd}=50V, R_G=25 Ω , Starting T_J=25°C

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

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DS}	Drain-Source Breakdown Voltage	900	-	-	V	$V_{GS}=0V, I_D=250\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	2.0	-	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
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	$V_{DS}=\text{Max. Rating}, V_{GS}=0V$
		-	-	1000	μA	$V_{DS}=0.8 \text{ Max. Rating}, V_{GS}=0V, T_C=150^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-Resistance(2)	-	1.7	2.5	Ω	$V_{GS}=10V, I_D=2.5A$
g_{fs}	Forward Transconductance (2)	3.5	-	-	S	$V_{DS}=15V, I_D=2.5A$
C_{iss}	Input Capacitance	-	1700	-	pF	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$
C_{oss}	Output Capacitance	-	140	-	pF	
C_{rss}	Reverse Transfer Capacitance	-	60	-	pF	
$t_{d(on)}$	Turn-On Delay Time	-	40	-	ns	$V_{DD}=0.5 BV_{DS}, I_D=5.0A, Z_o=9.1\Omega$ (MOSFET switching times are essentially independent of operating temperature)
t_r	Rise Time	-	90	-	ns	
$t_{d(off)}$	Turn-Off Delay Time	-	250	-	ns	
t_f	Fall Time	-	100	-	ns	
Q_g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	110	nC	$V_{GS}=10V, I_D=5A, V_{DS}=0.8 \text{ Max. Rating}$ (Gate charge is essentially independent of operating temperature)
Q_{gs}	Gate-Source Charge	-	13	-	nC	
Q_{gd}	Gate-Drain ("Miller") Charge	-	40	-	nC	

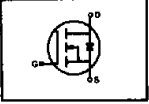
THERMAL RESISTANCE

Symbol	Characteristics		SSH5N90	Units	Remark
R_{thJC}	Junction-to-Case	MAX	0.73	K/W	
R_{thCS}	Case-to-Sink	TYP	0.24	K/W	Mounting surface flat
R_{thJA}	Junction-to-Ambient	MAX	40	K/W	Free Air Operation

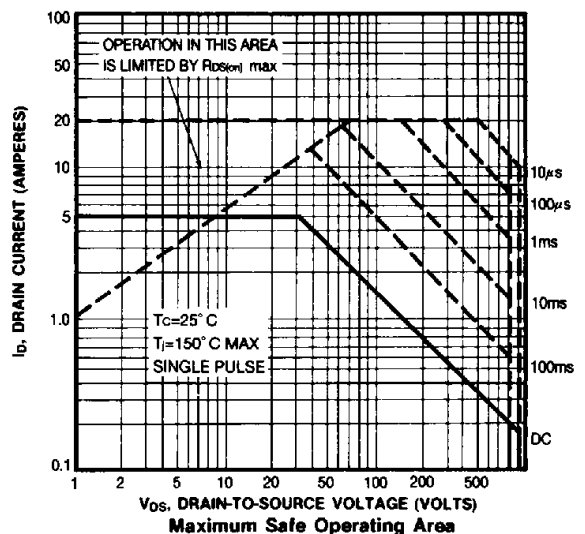
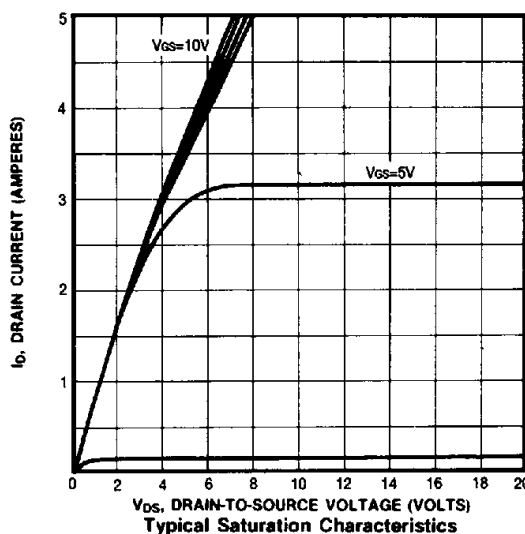
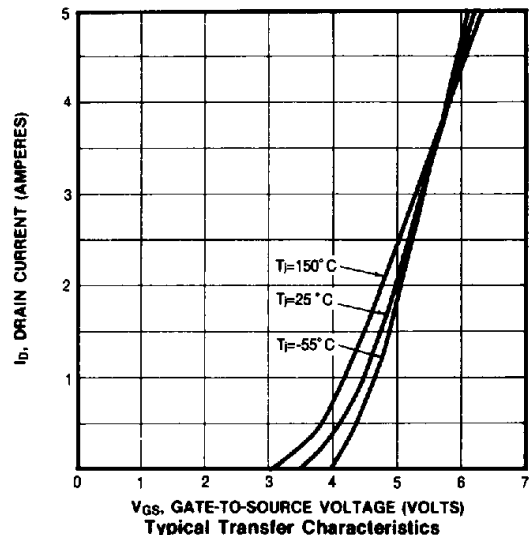
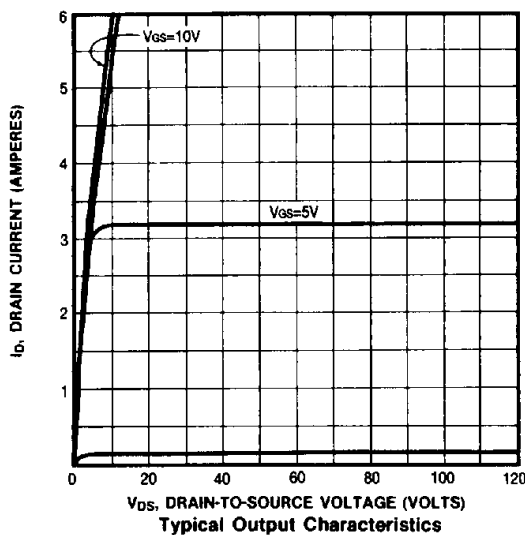
Notes : (1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

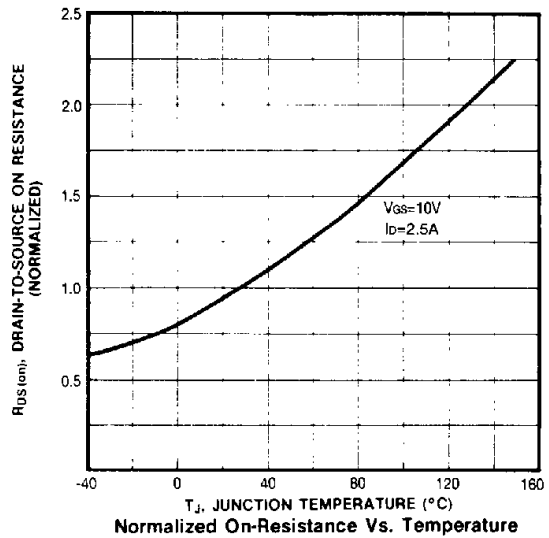
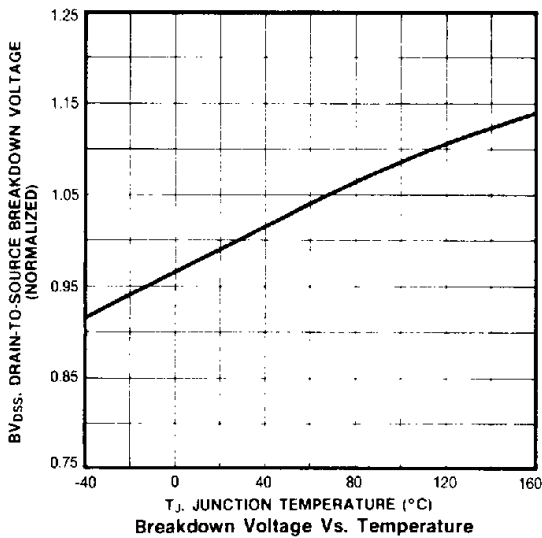
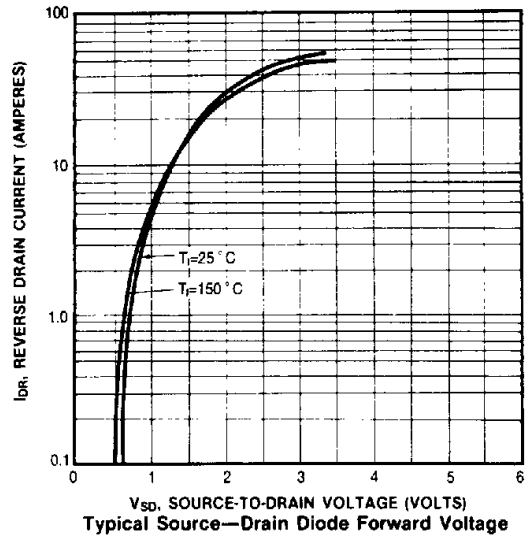
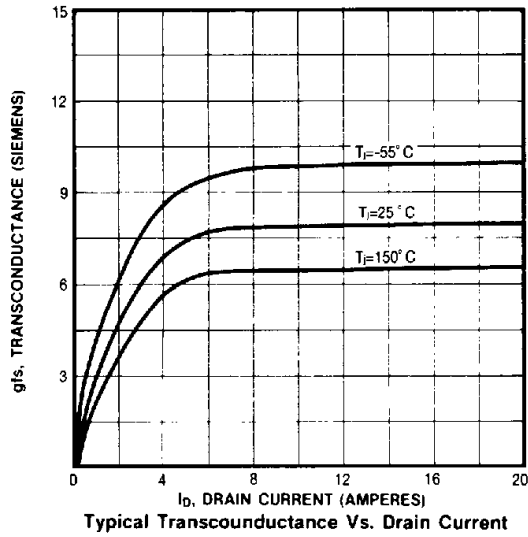
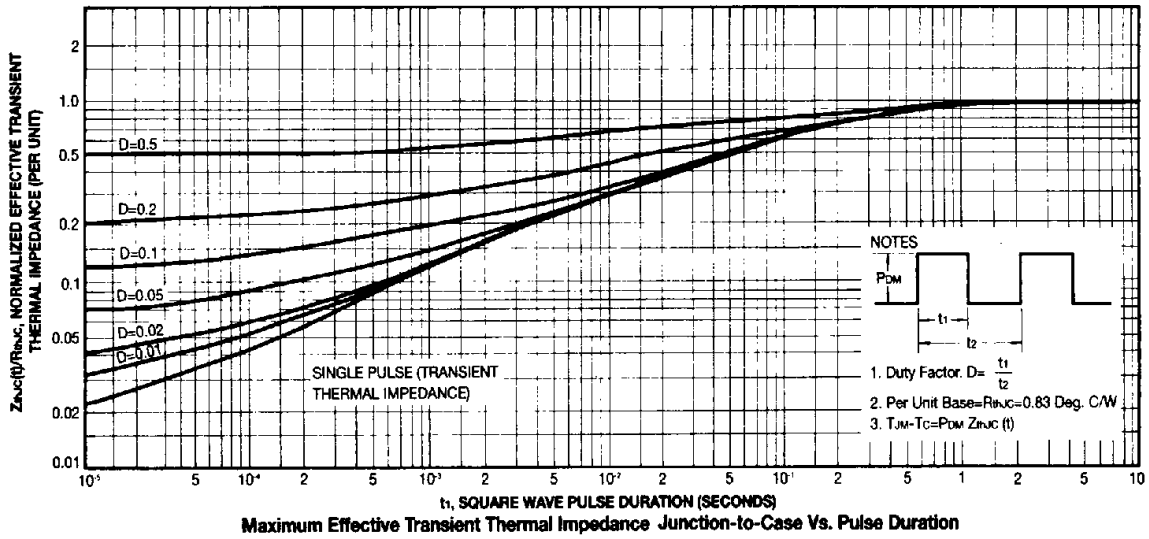
(3) Repetitive rating : Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	5	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	20	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.5	V	$T_J=25^\circ\text{C}$, $I_S=5\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	500	-	ns	$T_J=25^\circ\text{C}$, $I_F=5\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

- Notes : (1) $T_J=25^\circ\text{C}$ to 150°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





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