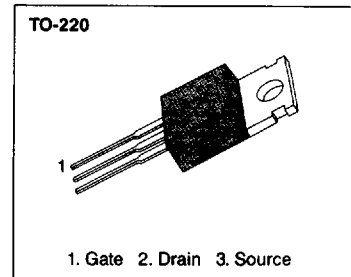


FEATURES

- 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_{DSS}	$R_{DS(on)}$	I_D
SSP5N90	900V	2.5 Ω	5.0A

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSP5N90	Unit
Drain-Source Voltage (1)	V_{DSS}	900	Vdc
Drain-Gate Voltage ($R_{GS}=1.0M\Omega$) (1)	V_{DGR}	900	Vdc
Gate-Source Voltage	V_{GS}	± 30	Vdc
Continuous Drain Current $T_C=25^\circ C$	I_D	5	Adc
Continuous Drain Current $T_C=100^\circ C$	I_D	3.5	Adc
Drain Current - Pulsed (3)	I_{DM}	20.0	Adc
Single Pulsed Avalanche Energy (4)	EAS	430	mJ
Avalanche Current	I_{AS}	5	A
Total Power Dissipation at $T_C=25^\circ C$	P_D	150	Watts
Derate above $25^\circ C$		1.2	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 width limited by max. junction temperature

(4) $L=51mH$, $V_{GS}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

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

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV _{DSS}	Drain-Source Breakdown Voltage	900	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.5	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)	-	-	2.5	Ω	V _{GS} =10V, I _D =2.5A
g _{fs}	Forward Transconductance (2)	3.8	-	-	Ω	V _{DS} =15V, I _D =2.5A
C _{iss}	Input Capacitance	-	1700	-	pF	V _{GS} =0V, V _{DS} =25V, f=1.0MHz
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 _{DSS} , I _D =5.0A, Z _O =9.1Ω (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 =5.0A, V _{DS} =0.8 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	

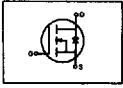
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THERMAL RESISTANCE

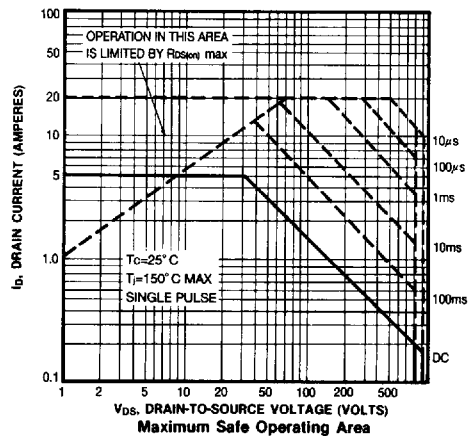
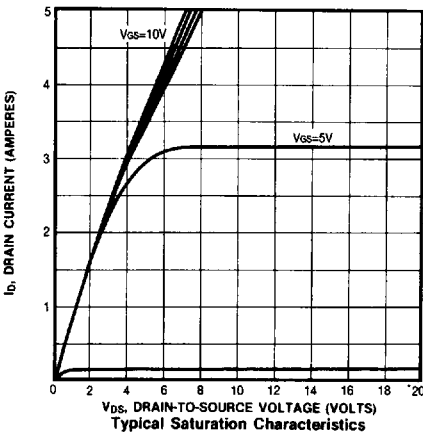
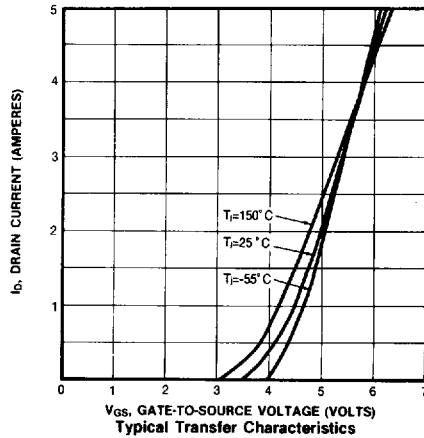
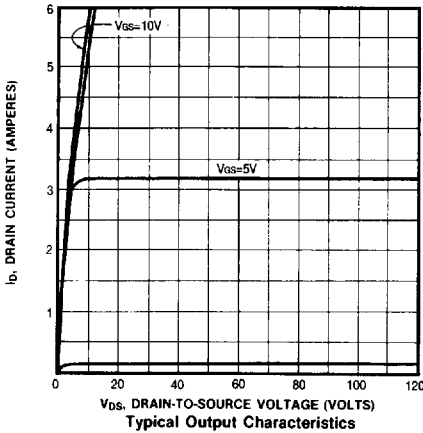
Symbol	Characteristics		SSP5N90	Units	Remark
R _{thJC}	Junction-to-Case	MAX	0.83	K/W	
R _{thCS}	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat
R _{thJA}	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

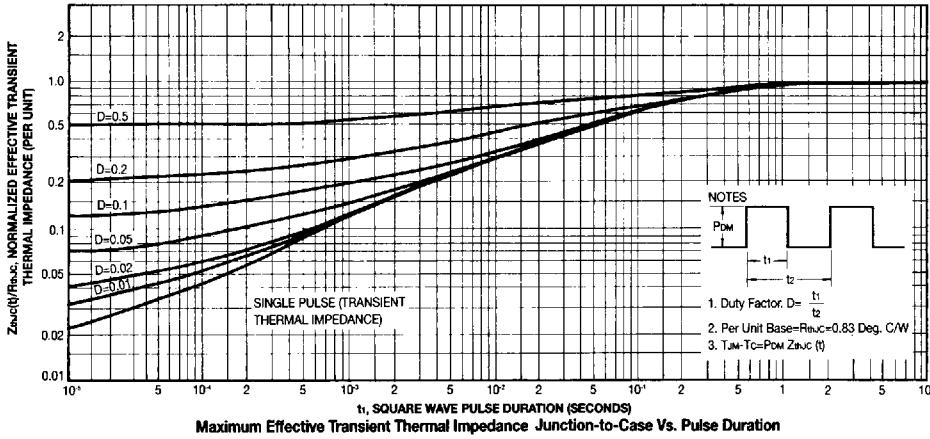
- Notes : (1) T_J=25°C to 150°C
 (2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%
 (3) Repetitive rating : Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

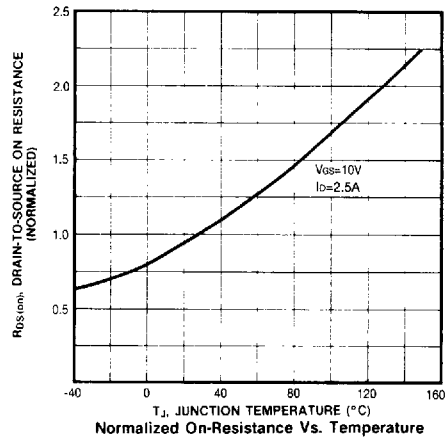
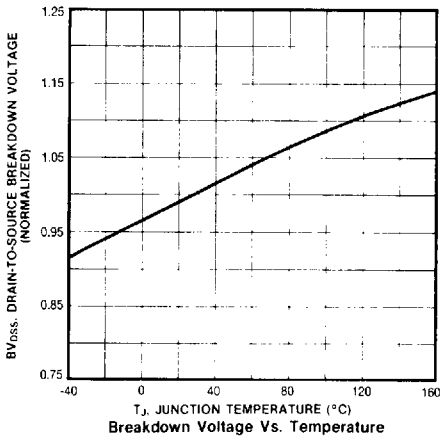
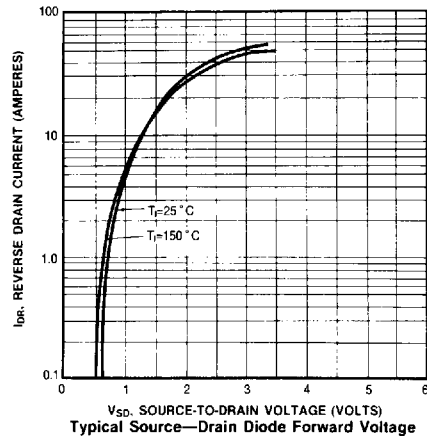
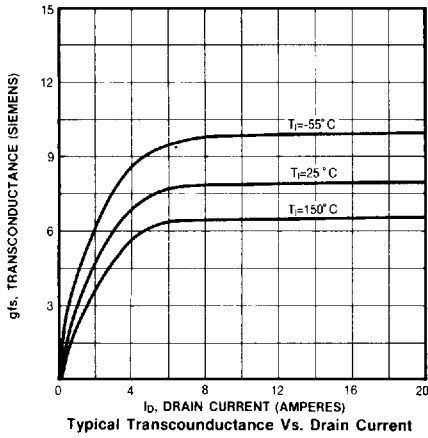
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	5.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	20.0	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.5	V	$T_J=25^\circ\text{C}$, $I_S=5.0\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	500	-	ns	$T_J=25^\circ\text{C}$, $I_F=5.0\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

- 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





Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



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