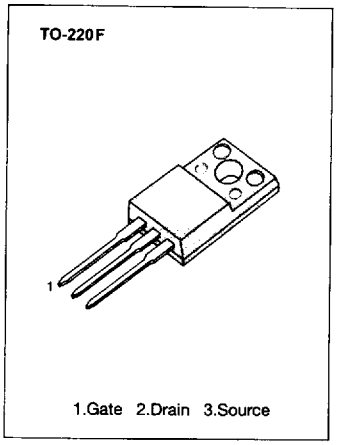
FEATURES

- 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	BV_{DSS}	$R_{DS(on)}$	I_D
SSS7N60	600V	1.2Ω	4.0A
SSS7N55	550V	1.2Ω	4.0A

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ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSS7N60	SSS7N55	Unit
Drain-Source Voltage (1)	V_{DSS}	600	550	Vdc
Drain-Gate Voltage (R_{GS}=1.0MΩ)	V_{DGR}	600	550	Vdc
Gate-Source Voltage	V_{GS}	±20		Vdc
Continuous Drain Current T_C=25 °C	I_D	4.0		Adc
Continuous Drain Current T_C=100 °C	I_D	2.8		Adc
Drain Current - Pulsed (3)	I_{DM}	28		Adc
Single Pulsed Avalanche Energy (4)	E_{AS}	183		mJ
Avalanche Current	I_{AS}	4.0		A
Total Power Dissipation at T_C=25 °C	P_D	42		Watts
Derate above 25 °C		0.33		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≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by max. junction temperature
(4) L=27mH, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C

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

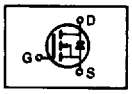
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage					
	SSS7N60	600	-	-	V	V_{GS}=0V, I_D=250μA
	SSS7N55	550	-	-	V	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	-	4.5	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	Gate-Source Leakage Forward	-	-	100	nA	V_{GS}=20V
I_{GSS}	Gate-Source 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=125°C
$R_{DS(on)}$	Static Drain-Source On-Resistance(2)	-	-	1.2	Ω	V_{GS}=10V, I_D=3.5A
g_{fs}	Forward Transconductance (2)	3.0	4.8	-	℧	V_{DS}≥50V, I_D=3.5A
C_{iss}	Input Capacitance	-	1600	-	pF	V_{GS}=0V, V_{DS}=25V, f=1.0MHz
C_{oss}	Output Capacitance	-	310	-	pF	
C_{rss}	Reverse Transfer Capacitance	-	120	-	pF	
$t_{d(on)}$	Turn-On Delay Time	-	25	-	ns	V_{DD}=0.5 BV_{DSS}, I_D=7.0A, Z_O=9.1Ω (MOSFET switching times are essentially independent of operating temperature)
t_r	Rise Time	-	55	-	ns	
$t_{d(off)}$	Turn-Off Delay Time	-	80	-	ns	
t_f	Fall Time	-	50	-	ns	
Q_g	Total Gate Charge (Gate-Soure Plus Gate-Drain)	-	-	72	nC	V_{GS}=10V, I_D=7.0A, V_{DS}=0.8 Max. Rating (Gate charge is essentially independent of operating temperature)
Q_{gs}	Gate-Source Charge	-	9.3	-	nC	
Q_{gd}	Gate-Drain ("Miller") Charge	-	29.3	-	nC	

THERMAL RESISTANCE

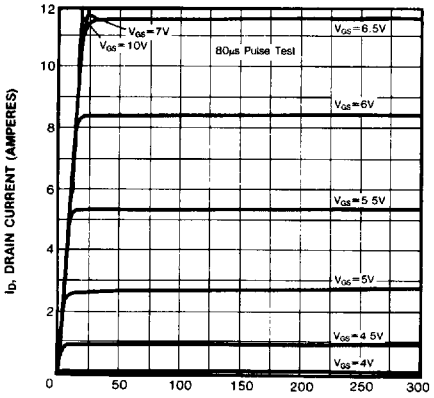
Symbol	Characteristics		All	Units	Remark
R_{thJC}	Junction-to-Case	MAX	3.0	K/W	
R_{thCS}	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat, smooth and greased
R_{thJA}	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

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

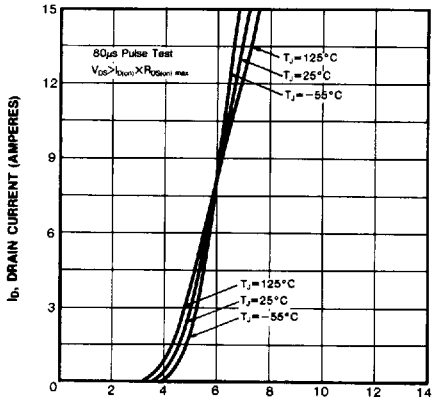
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	7.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	28	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.5	V	T_J=25°C, I_S=7.0A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	450	940	ns	T_J=150°C, I_F=7.0A, dI_F/dt=100A/μS

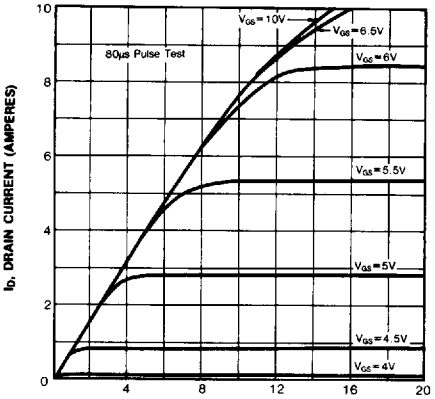
Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%
(3) Repetitive rating : Pulse width limited by max. junction temperature



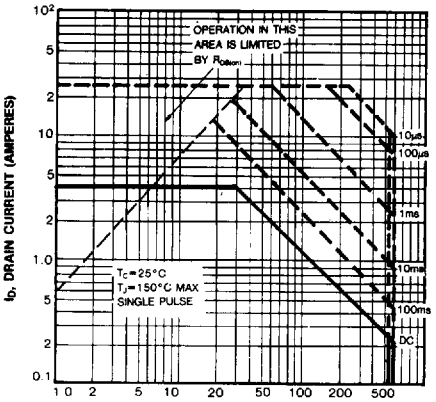
Typical Output Characteristics



Typical Transfer Characteristics



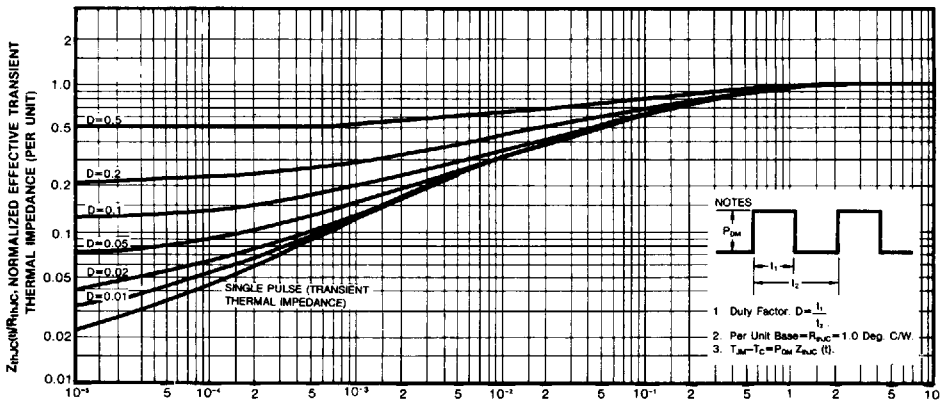
Typical Saturation Characteristics



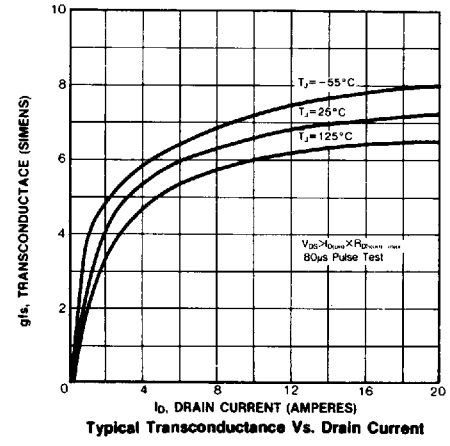
Maximum Safe Operating Area

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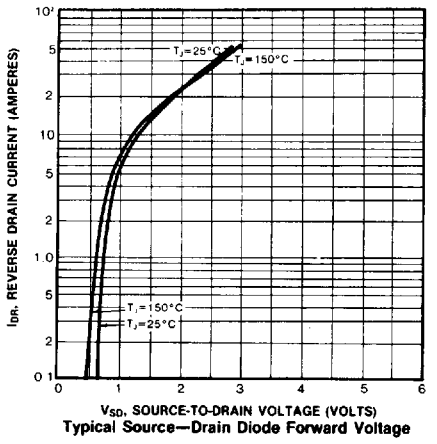
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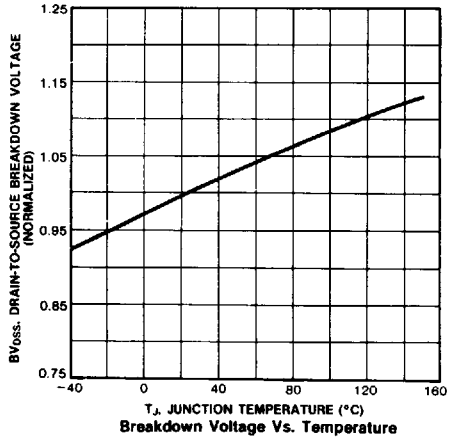
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



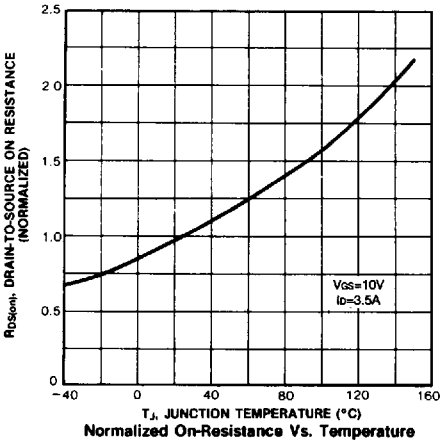
Typical Transconductance Vs. Drain Current



Typical Source—Drain Diode Forward Voltage



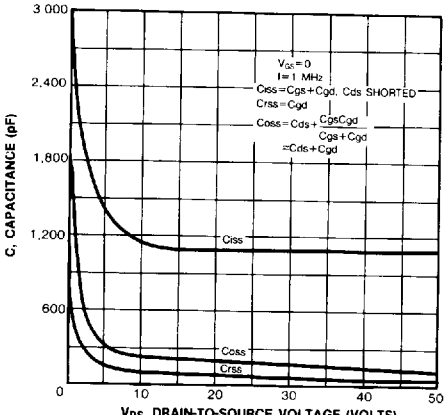
Breakdown Voltage Vs. Temperature



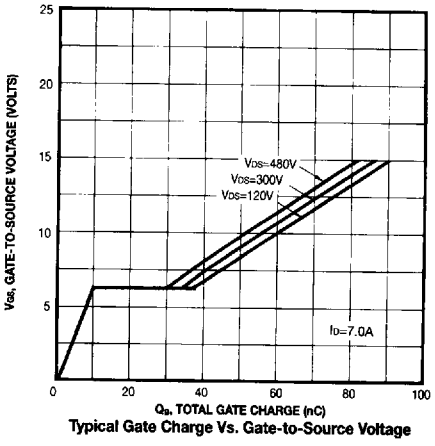
Normalized On-Resistance Vs. Temperature

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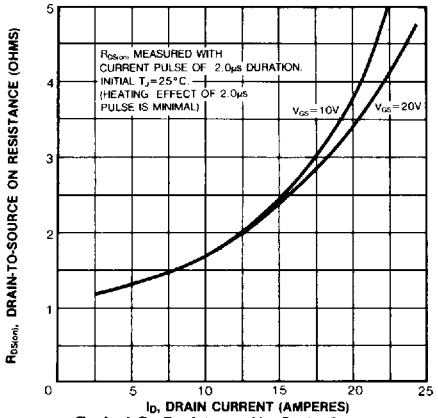
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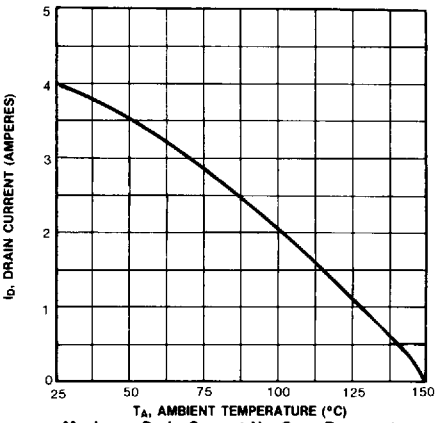
Typical Capacitance Vs. Drain to Source Voltage



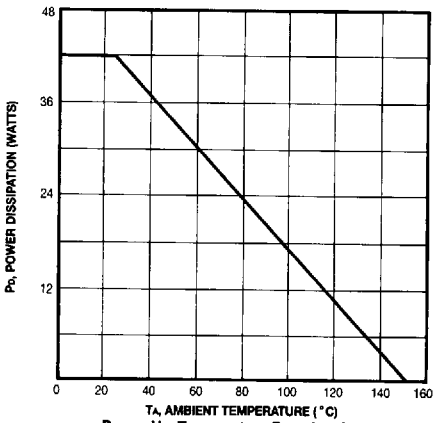
Typical Gate Charge Vs. Gate-to-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve

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