

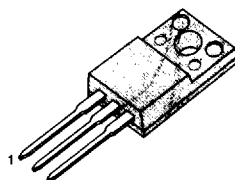
FEATURES

- 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
SSS6N60	600V	1.8 Ω	3.2A
SS64N55	550V	1.8 Ω	3.2A

TO-220F



1.Gate 2.Drain 3.Source

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSS6N60	SSS6N55	Unit
Drain-Source Voltage (1)	V _{DSS}	600	550	V _{dc}
Drain-Gate Voltage (R _{GS} =1.0M Ω)(1)	V _{DGR}	600	550	V _{dc}
Gate-Source Voltage	V _{GS}	± 20		V _{dc}
Continuous Drain Current T _c =25 °C	I _D	3.2		A _{dc}
Continuous Drain Current T _c =100 °C	I _D	2.3		A _{dc}
Drain Current - Pulsed (3)	I _{DM}	24		A _{dc}
Gate Current - Pulsed	I _{GM}	± 1.5		A _{dc}
Single Pulsed Avalanche Energy (4)	E _{AS}	183		mJ
Avalanche Current	I _{AS}	3.4		A
Total Power Dissipation at T _c =25 °C	P _D	40		Watts
Derate above 25 °C		0.32		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 max. junction temperature

(4) L=27mH, V_{GS}=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 _{DSS}	Drain-Source Breakdown Voltage					
	SSS6N60	600	-	-	V	$V_{GS}=0V, I_D=250\mu A$
	SSS6N55	550	-	-	V	
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.5	nA	$V_{DS}=V_{GS}, I_D=250\mu A$
I _{GSS}	Gate-Source Leakage Forward	-	-	100	nA	$V_{GS}=20V$
I _{GSS}	Gate-Source Leakage Reverse	-	-	-100	μA	$V_{GS}=-20V$
I _{DSS}	Zero Gate Voltage Drain Current	-	-	250	μA	$V_{DS}=\text{Max. Rating}, V_{GS}=0V$
		-	-	1000	A	$V_{DS}=0.8 \text{ Max. Rating}, V_{GS}=0V, T_c=125^\circ\text{C}$
R _{DS(on)}	Static Drain-Source On	STD	-	1.8	Ω	$V_{GS}=10V, I_D=3A$
	Resistance(2)			1.2	Ω	$V_{GS}=10V, I_D=3A$
g _{fs}	Forward Transconductance (2)	3.0	4.8	1800	Ω	$V_{DS}\geq 50V, I_D=3A$
C _{iss}	Input Capacitance	-	-	350	pF	$V_{GS}=0V, V_{DS}=25V, f=1.0\text{MHz}$
C _{oss}	Output Capacitance	-	-	150	pF	
C _{rss}	Reverse Transfer Capacitance	-	-	60	pF	
t _{d(on)}	Turn-On Delay Time	-	-	150	ns	$V_{DD}=0.5 BV_{DSS}, I_D=6A, Z_{\theta}=9.1\Omega$ (MOSFET switching times are essentially independent of operating temperature)
t _r	Rise Time	-	-	200	ns	
t _{d(off)}	Turn-Off Delay Time	-	-	120	ns	
t _f	Fall Time	-	-	77	ns	
Q _g	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	-	nC	$V_{GS}=10V, I_D=6.0A, V_{DS}=0.8 \text{ Max. Rating}$ (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	3.12	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) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

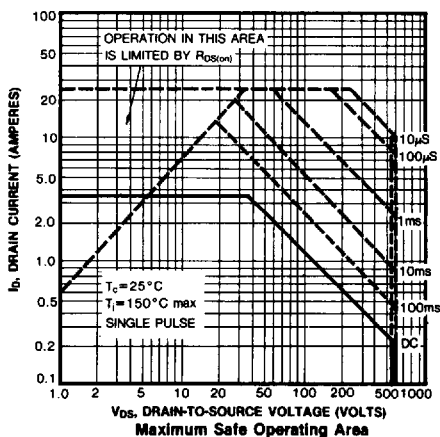
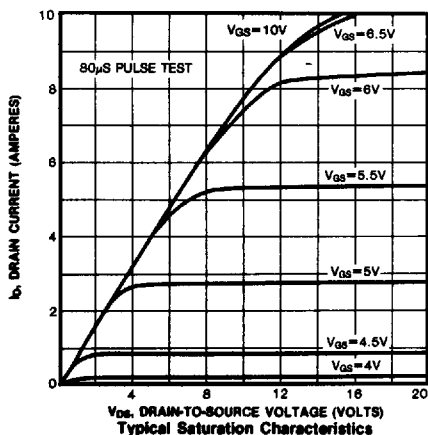
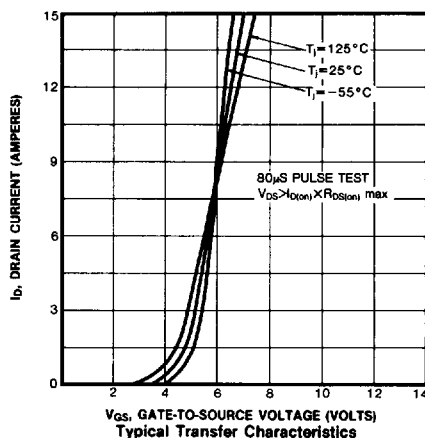
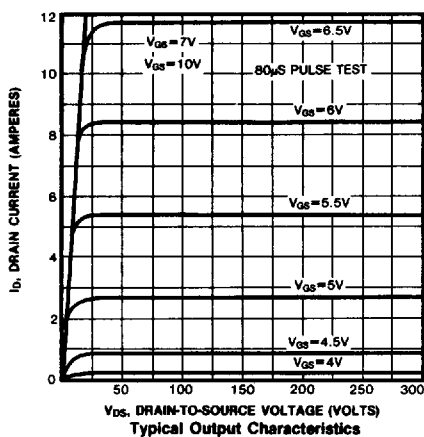
(3) Repetitive rating : Pulse width limited by max. junction temperature

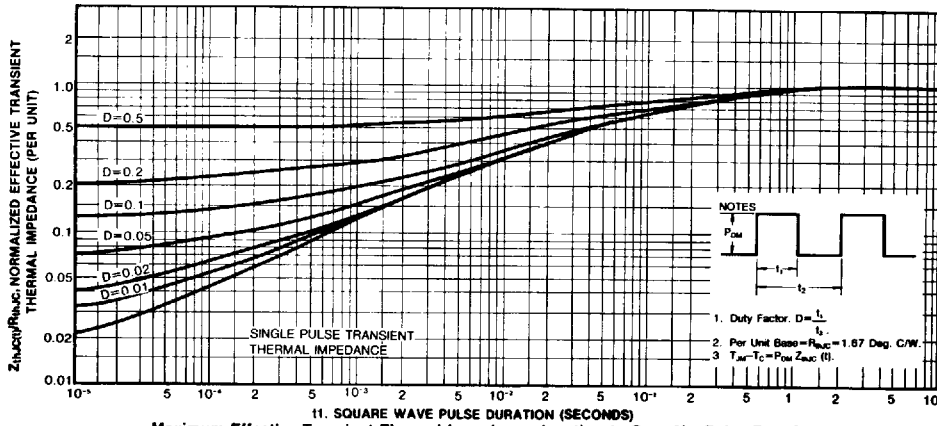
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	6	A	Modified MOSFET Symbol showing the integral reverse P-N junction rectifier
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	24	A	
V_{SD}	Diode Forward Voltage (2)	-	-	1.5	V	$T_J=25^\circ\text{C}$, $I_S=6\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	-	450	940	ns	$T_J=25^\circ\text{C}$, $I_F=6\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

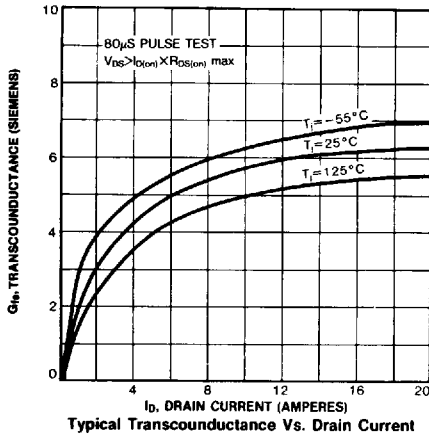
Notes: (1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

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

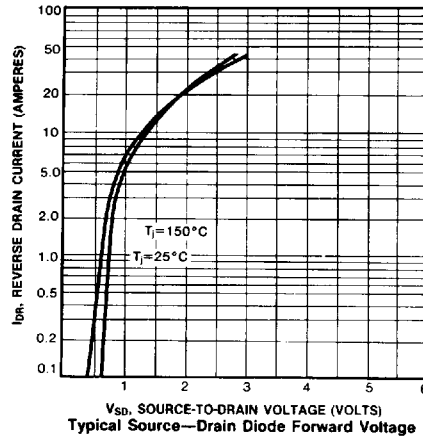




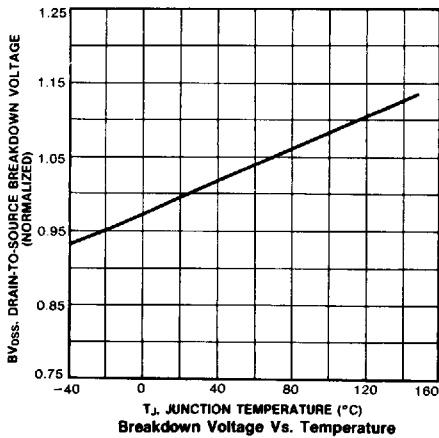
11. SQUARE WAVE PULSE DURATION (SECONDS)
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



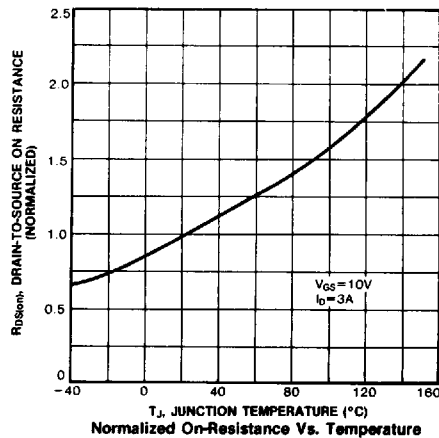
Typical Transconductance Vs. Drain Current



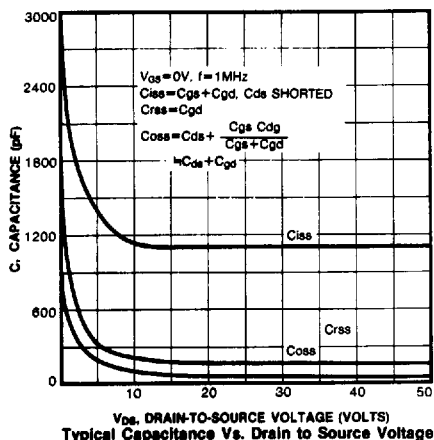
Typical Source-Drain Diode Forward Voltage



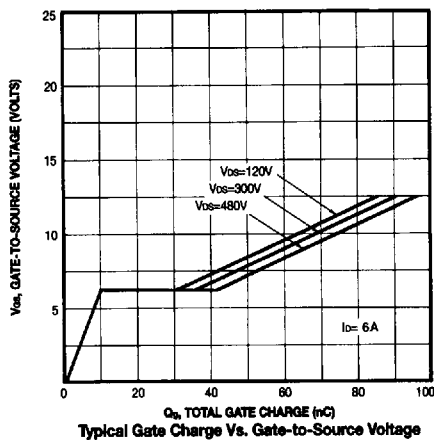
Breakdown Voltage Vs. Temperature



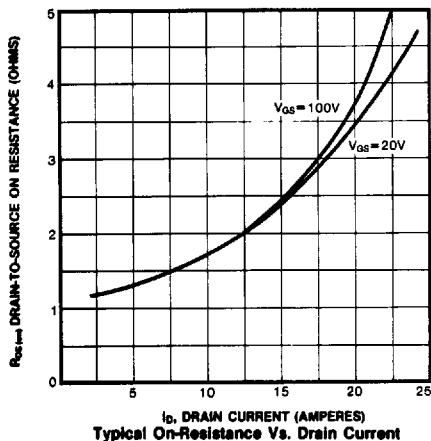
Normalized On-Resistance Vs. Temperature



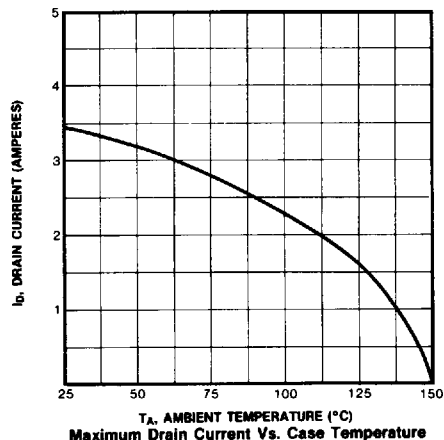
Typical Capacitance Vs. Drain to Source Voltage



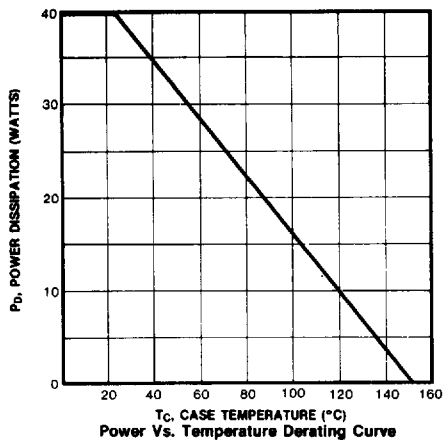
Typical Gate Charge Vs. Gate-to-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve