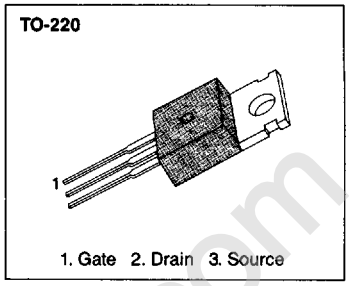
FEATURES

- 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
SSP6N60	600V	1.8Ω	6A
SSP6N55	550V	1.8Ω	6A

ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	SSP6N60	SSP6N55	Unit
Drain-Source Voltage (1)	V_{DSS}	600	550	Vdc
Drain-Gate Voltage (R_{GS}=1.0MΩ)(1)	V_{DGR}	600	550	Vdc
Gate-Source Voltage	V_{GS}	±20		Vdc
Continuous Drain Current T_C=25 °C	I_D	6.0		Adc
Continuous Drain Current T_C=100 °C	I_D	4.0		Adc
Drain Current - Pulsed (3)	I_{DM}	24		Adc
Gate Current - Pulsed	I_{GM}	±1.5		Adc
Single Pulsed Avalanche Energy (4)	E_{AS}	570		mJ
Avalanche Current	I_{AS}	6.0		A
Total Power Dissipation at T_C=25 °C	P_D	125		Watts
Derate above 25 °C		1.0		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

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

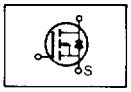
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
	Drain-Source Breakdown Voltage					
BVDSS	SSP6N60	600	-	-	V	VGS=0V, ID=250μA
	SSP6N55	550	-	-	V	
VGS(th)	Gate Threshold Voltage	2.0	-	4.0	V	VDS=VGS, ID=250μA
IGSS	Gate-Source Leakage Forward	-	-	100	nA	VGS=20V
IGSS	Gate-Source Leakage Reverse	-	-	-100	nA	VGS=-20V
IDSS	Zero Gate Voltage Drain Current	-	-	250	μA	VDS=Max. Rating, VGS=0V
		-	-	1000	μA	VDS=0.8 Max. Rating, VGS=0V, Tc=125°C
ID(on)	On-State Drain-Source Curredntt(2)	6.0	-	-	A	VDS≥10V, ID=10V
RDS(on)	Static Drain-Source On	-	-	1.8	Ω	VGS=10V, ID=3.0A
	Resistance(4)			1.2	Ω	VGS=10V, ID=3.0A
gfs	Forward Transconductance (2)	3.0	4.8	-	℧	VDS≥50V, ID=3.0A
Ciss	Input Capacitance	-	1800	-	pF	
Coss	Output Capacitance	-	350	-	pF	VGS=0V, VDS=25V, f=1.0MHz
Crss	Reverse Transfer Capacitance	-	150	-	pF	
td(on)	Turn-On Delay Time	-	30	-	ns	VDD=0.5 BVDSS, ID=6.0A, ZO=9.1Ω
tr	Rise Time	-	75	-	ns	(MOSFET switching times are essentially
td(off)	Turn-Off Delay Time	-	100	-	ns	independent of operating temperature)
tf	Fall Time	-	60	-	ns	
Qg	Total Gate Charge	-	-	77	nC	VGS=10V, ID=6.0A, VDS=0.8 Max. Rating
	(Gate-Source Plus Gate-Drain)					(Gate charge is essentially independent of
Qgs	Gate-Source Charge	-	9.3	-	nC	operating temperature)
Qgd	Gate-Drain ("Miller") Charge	-	29.3	-	nC	

THERMAL RESISTANCE

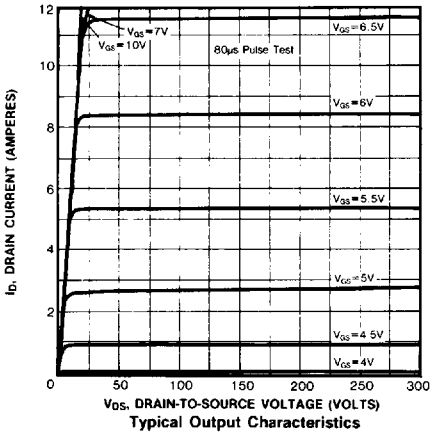
Symbol	Characteristics		All	Units	Remark
RthJC	Junction-to-Case	MAX	1.0	K/W	
RthCS	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat smooth, and greased
RthJA	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

Notes : (1) TJ=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" RDS(on), device add "A" suffix to part number

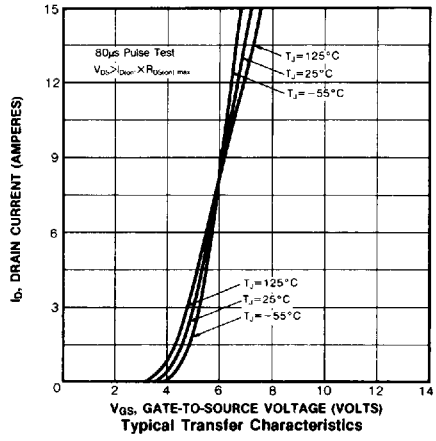
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	6.0	A	Modified MOSFET symbol 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_J=25°C, I_S=10.0A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	450	940	ns	T_J=25°C, I_F=10.0A, dI_F/dt=100A/μS

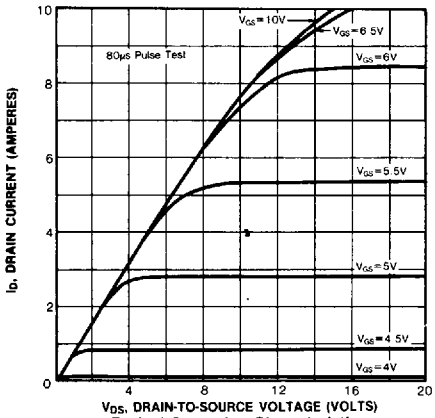
Notes : (1) T_J=25°C to150°C
(2) Pulse test : Pulse width $\leq$300μs, Duty Cycle $\leq$2%
(3) Repetitive rating : Pulse width limited by max. junction temperature



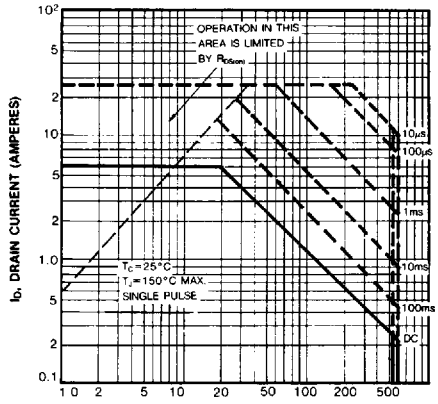
Typical Output Characteristics



Typical Transfer Characteristics

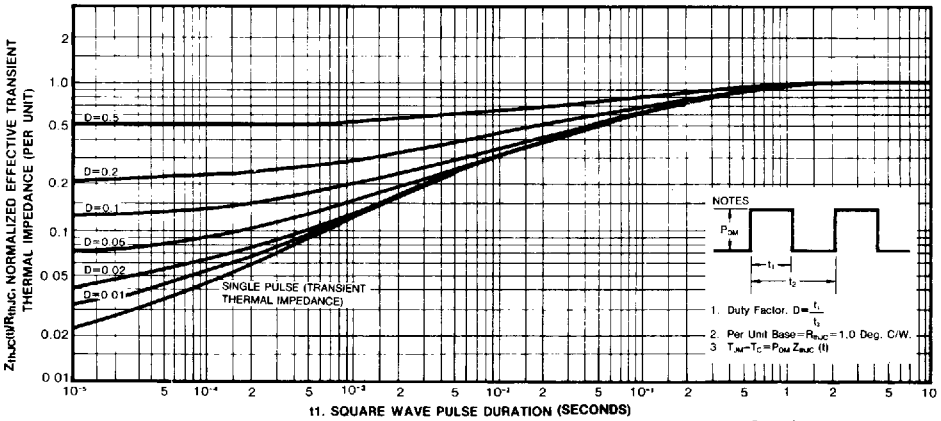


Typical Saturation Characteristics

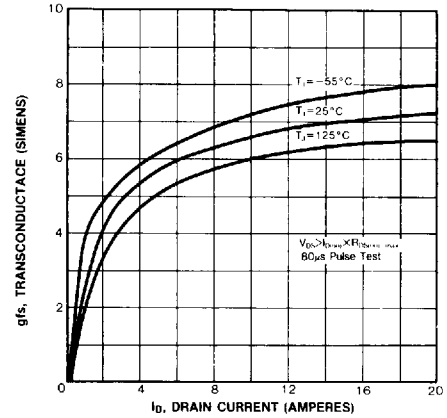


Maximum Safe Operating Area

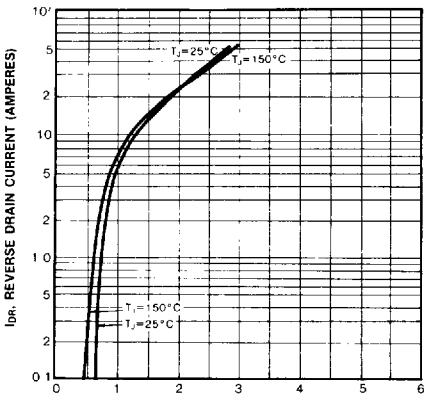
SAMSUNG ELECTRONICS



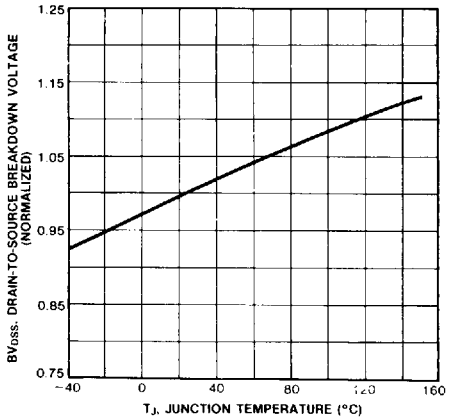
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



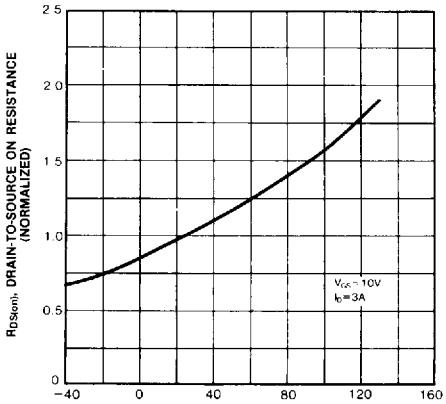
Typical Transconductance Vs. Drain Current



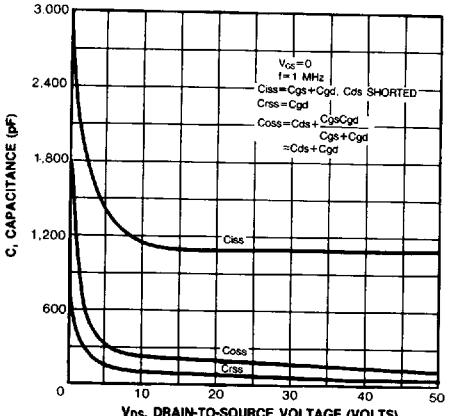
Typical Source—Drain Diode Forward Voltage



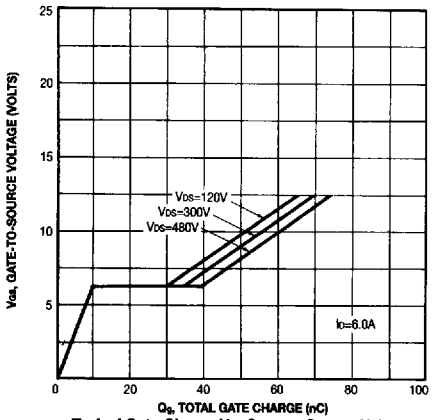
Breakdown Voltage Vs. Temperature



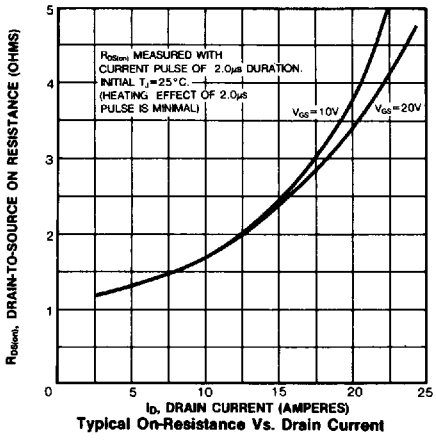
Normalized On-Resistance Vs. Temperature



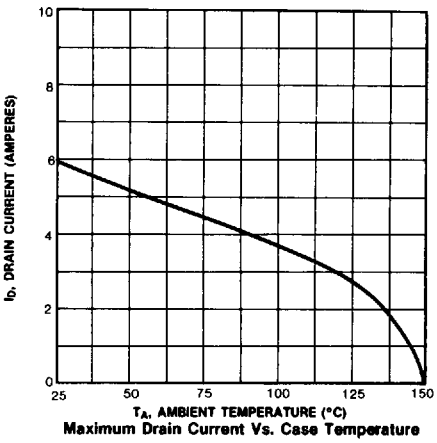
Typical Capacitance Vs. Drain to Source Voltage



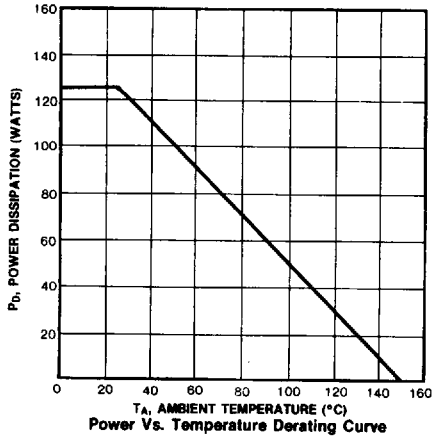
Typical Gate Charge Vs. Gate-to-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve