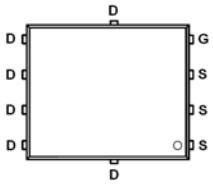
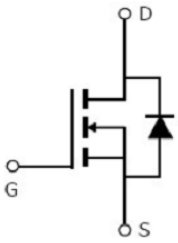
Main Product Characteristics:

V_{DSS}	80V
R_{DS}(on)	7.5mΩ(typ.)
I_D	70A

PQFN5*6



Marking and pin Assignment



Schematic diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V①	70	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	60	
I_{DM}	Pulsed Drain Current②	280	
P_D @TC = 25°C	Power Dissipation③	98	W
	Linear Derating Factor	2.0	W/°C
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	375	mJ
I_{AS}	Avalanche Current @ L=0.3mH	50	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

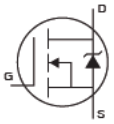
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	1.31	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	62	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

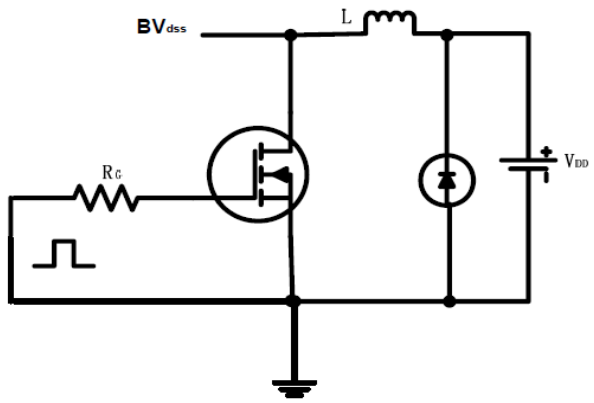
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	80	—	—	V	V_{GS} = 0V, ID = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	7.5	9	mΩ	V_{GS}=10V,I_D = 30A
		—	13	16		T_J = 125℃
$V_{GS(th)}$	Gate threshold voltage	1	—	3	V	V_{DS} = V_{GS}, I_D = 250μA
		—	1.02	—		T_J = 125℃
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 80V,V_{GS} = 0V
		—	—	50		T_J = 125℃
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		-100	—	—		V_{GS} = -20V
Q_g	Total gate charge	—	93.6	—	nC	I_D = 30A, V_{DS}=30V, V_{GS} = 10V
Q_{gs}	Gate-to-Source charge	—	20.2	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	33.3	—		
$t_{d(on)}$	Turn-on delay time	—	17.3	—	ns	V_{GS}=10V, VDS=30V, R_L=15Ω, R_{GEN}=2.5Ω
t_r	Rise time	—	15.2	—		
$t_{d(off)}$	Turn-Off delay time	—	52	—		
t_f	Fall time	—	19	—		
C_{iss}	Input capacitance	—	4373	—	pF	V_{GS} = 0V V_{DS} = 25V f = 1MHz
C_{oss}	Output capacitance	—	352	—		
C_{rss}	Reverse transfer capacitance	—	306	—		

Source-Drain Ratings and Characteristics

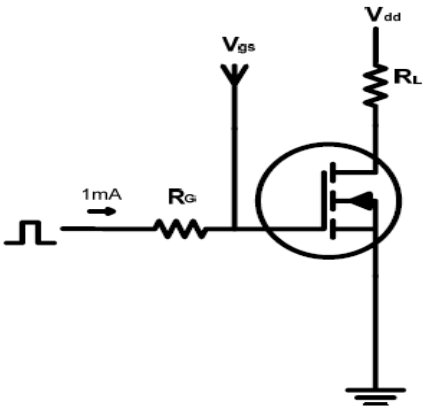
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	70	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	280	A	
V_{sd}	Diode Forward Voltage	—	0.85	1.3	V	I_S=30A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	36	—	ns	T_J = 25°C, I_F =45A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	62	—	nC	

Test circuits and Waveforms

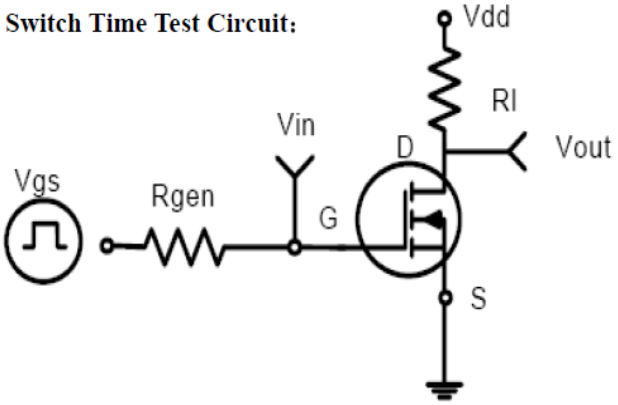
EAS test circuits:



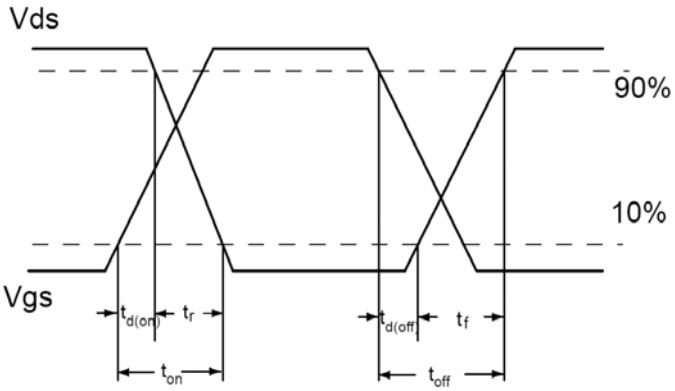
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①The maximum current rating is limited by bond-wires.
②Repetitive rating; pulse width limited by max. junction temperature.
③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C
⑤These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C.
⑥ The maximum current rating is limited by bond-wires.

Typical electrical and thermal characteristics

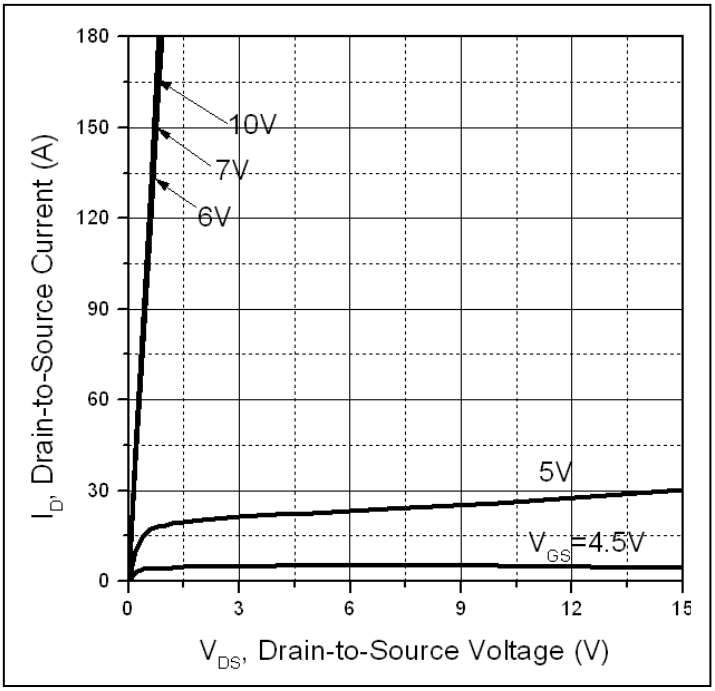


Figure 1: Typical Output Characteristics

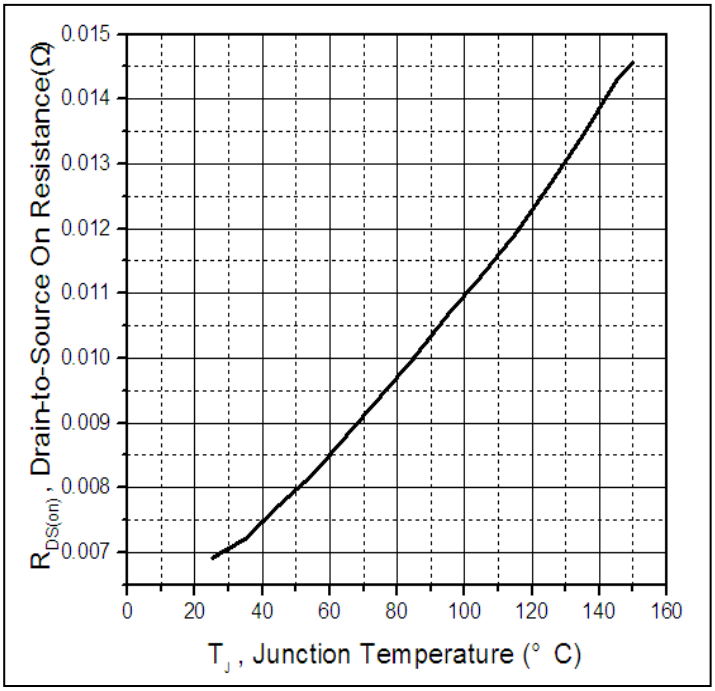


Figure 2. Normalized On-Resistance Vs. Case Temperature

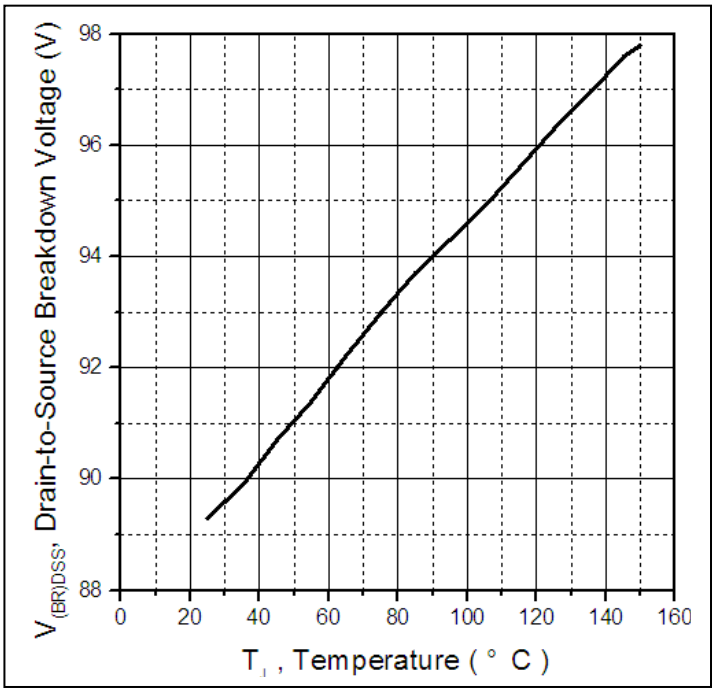


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

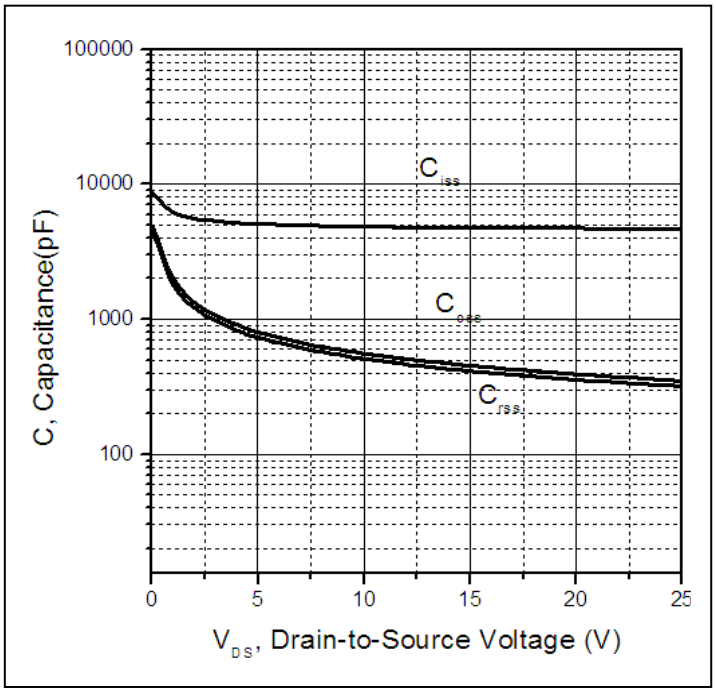
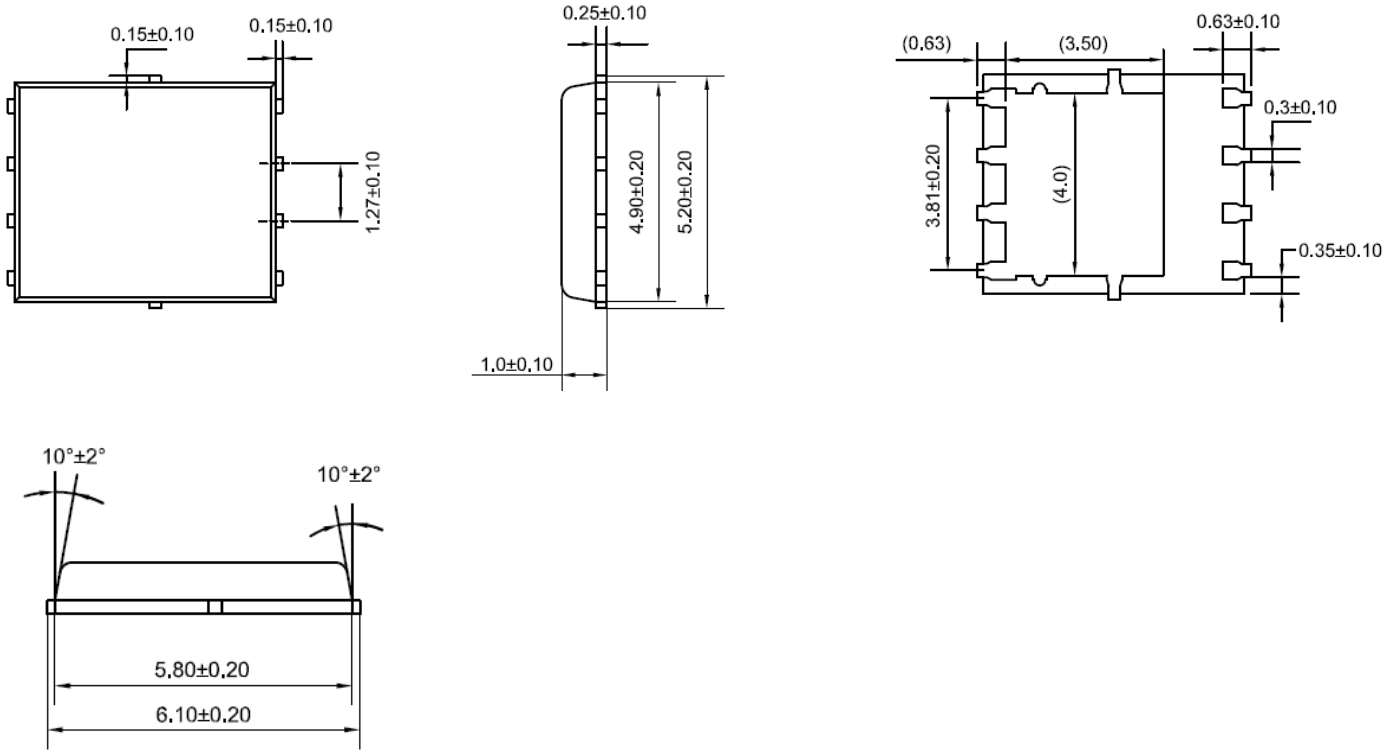


Figure 4: Typical Capacitance Vs. Drain-to-Source Voltage

Mechanical Data：

PQFN 5*6 Package Outline Dimension. (Unit: mm)



Ordering and Marking Information

Device Marking: SSF7509J7

Package (Available)

PQFN5*6

Operating Temperature Range

C : -55 to 150 °C

Devices per Unit

Package Type	Units/ Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
PQFN 5*6	3000	10	30000	4	120000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=125℃ to 150℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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