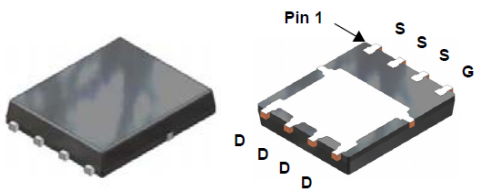
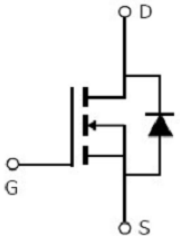
Main Product Characteristics:

V_{DSS}	30V
R_{DS}(on)	1.6mΩ (typ.)
I_D	150A



PPAK5*6-8L



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	150	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	118	
I_{DM}	Pulsed Drain Current②	340	
P_D @TC = 25°C	Power Dissipation③	90	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②	180	mJ
I_{AR}	Avalanche Current @ L=0.3mH②	60	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

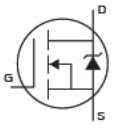
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	2	℃/W
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$)④	—	50	℃/W

Electrical Characterizes@T_A=25℃unless otherwise specified

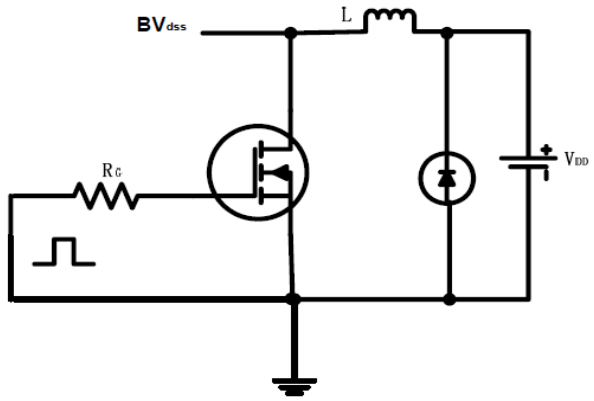
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	—	—	V	V_{GS} = 0V, ID = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	1.6	2.4	mΩ	V_{GS}=10V,I_D = 30A
		—	2.1	3.2		V_{GS}=4.5V,I_D = 25A
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4	5	mΩ	V_{GS}=4.5V,I_D = 16A
		—	5	—		T_J = 125℃
$V_{GS(th)}$	Gate threshold voltage	1	1.7	3	V	V_{DS} = V_{GS}, I_D = 250μA
		—	1.17	—		T_J = 125℃
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 24V,V_{GS} = 0V
		—	—	50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	80	—	nC	V_{DS}=15V,
Q_{gs}	Gate-to-Source charge	—	19	—		I_D=30A,
Q_{gd}	Gate-to-Drain("Miller") charge	—	38	—		V_{GS}=10V
$t_{d(on)}$	Turn-on delay time	—	20	—	ns	V_{GS}=10V, VDS=15V, R_{GEN}=1Ω, I_D=1A
t_r	Rise time	—	36	—		
$t_{d(off)}$	Turn-Off delay time	—	80	—		
t_f	Fall time	—	33	—		
C_{iss}	Input capacitance	—	7032	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	898	—		V_{DS} = 15V
C_{rss}	Reverse transfer capacitance	—	743	—		f = 1MHz

Source-Drain Ratings and Characteristics

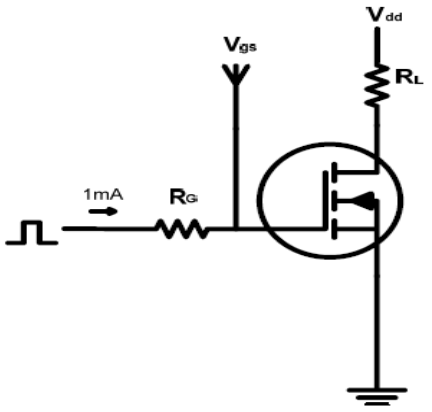
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	150	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	340	A	
V_{sd}	Diode Forward Voltage	—	0.85	1.3	V	I_S=50A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	35	—	ns	T_J = 25°C, I_F =1A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	15	—	nC	

Test circuits and Waveforms

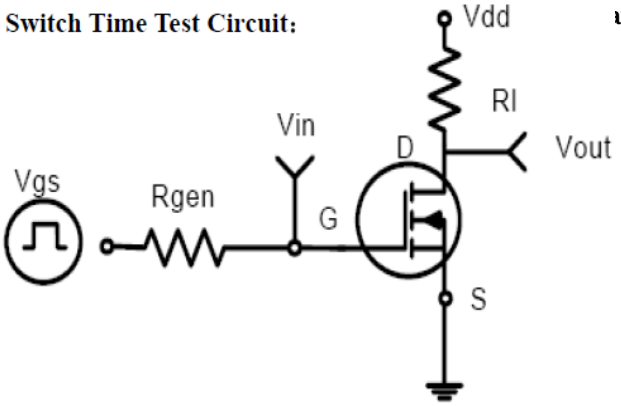
EAS test circuits:



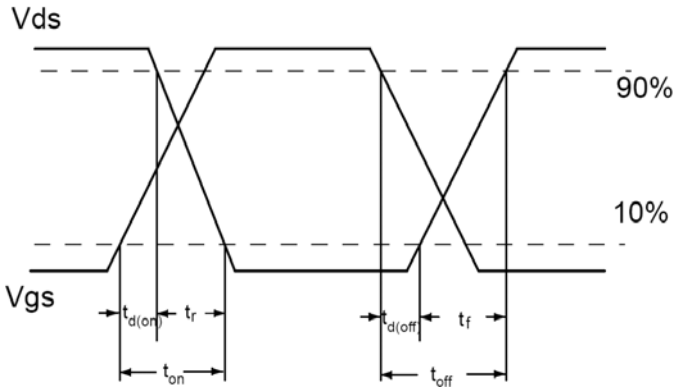
Gate charge test circuit:



Switch Time Test Circuit:



ıveforms:



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.

Typical electrical characteristics

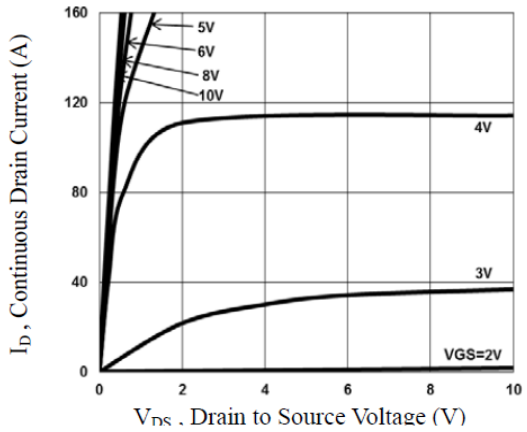


Figure 1: Typical Output Characteristics

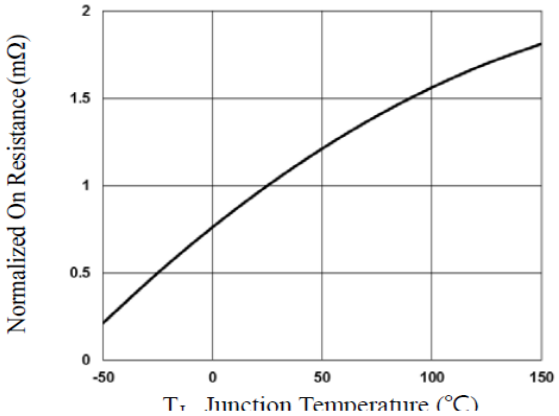


Figure 2: Normalized RDSON vs. TJ

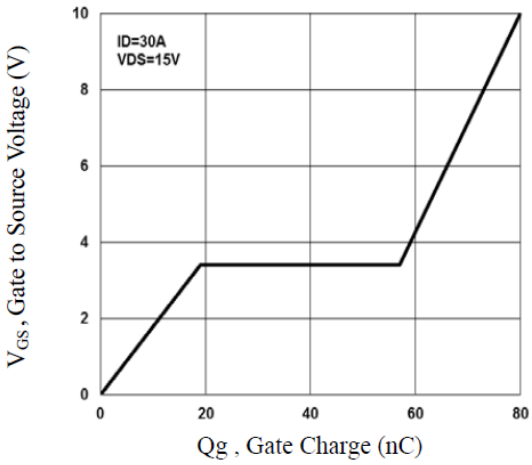


Figure 3: Gate-Charge Characteristics

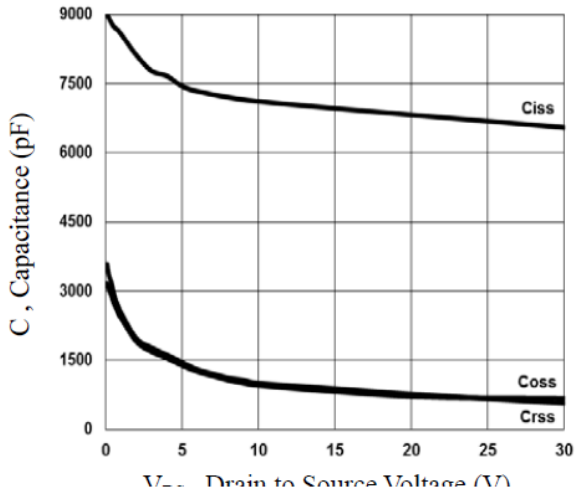


Figure 4: Capacitance Characteristics

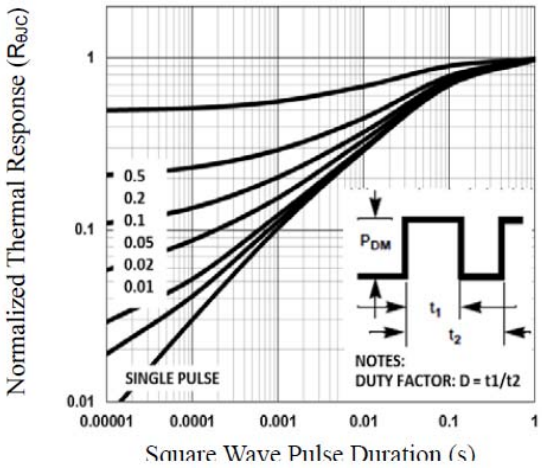


Figure 5: Normalized Thermal transient Impedance Curve

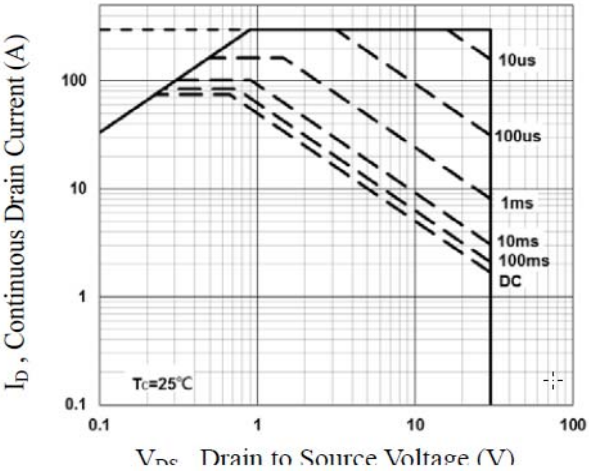
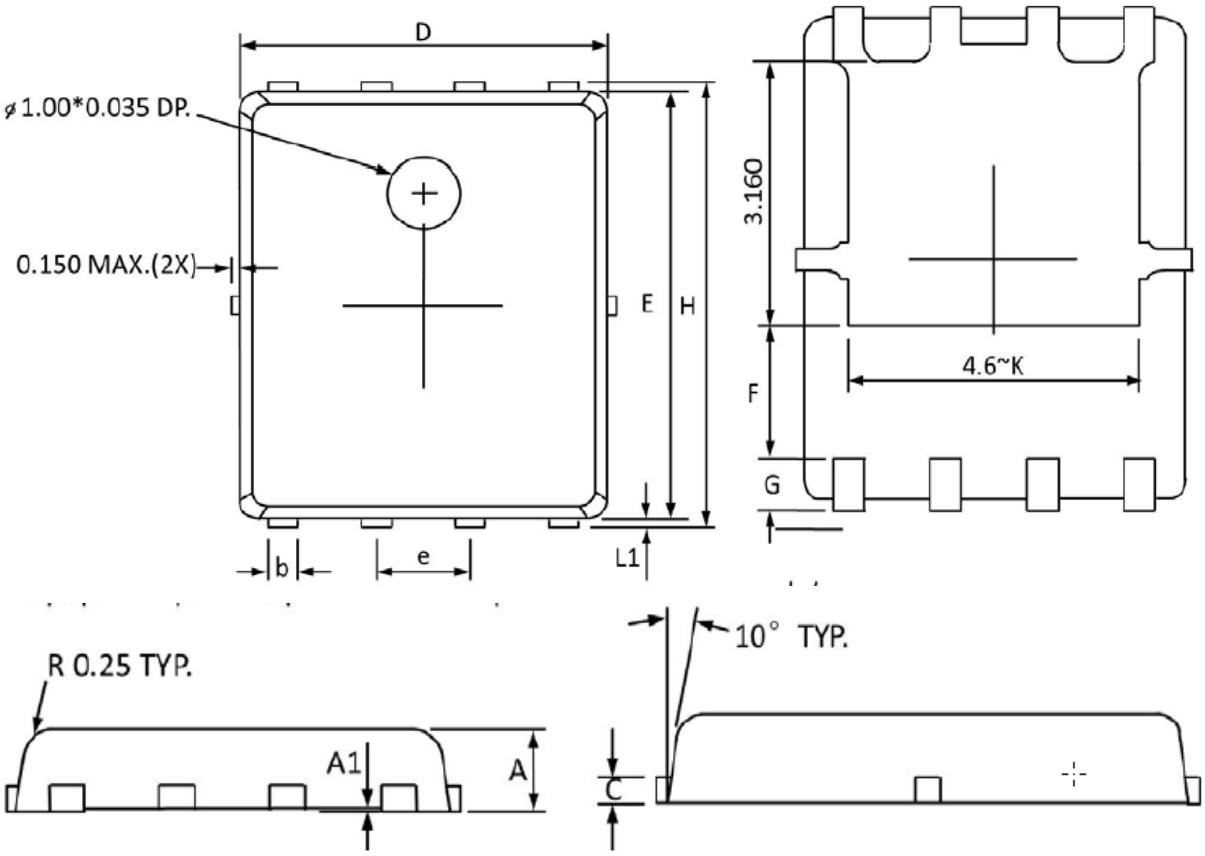


Figure 6: Maximum Safe Operation Area

Mechanical Data：

PPAK5x6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.000	0.032	0.039
A1	0.000	0.005	0.000	0.000
b	0.350	0.490	0.014	0.019
C	0.254 Ref		0.254 Ref	
D	4.900	5.100	0.193	0.200
E	5.700	5.900	0.225	0.232
e	1.27 BSC		1.27 BSC	
F	1.600 Ref		1.600 Ref	
G	0.600 Ref		0.600 Ref	
H	5.950	6.200	0.235	0.244
L1	0.100	0.180	0.004	0.007
K	3.200 Ref		3.200 Ref	

Ordering and Marking Information

Device Marking: SSF3944J7-HF

Package (Available)

PPAK 5*6-8L

Operating Temperature Range

C : -55 to 150 ºC

Devices per Unit

Package Type	Units/ Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
PPAK5*6	5000	1	5000	5	25000

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=125℃ to 150℃ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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