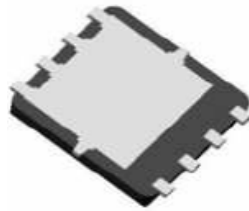
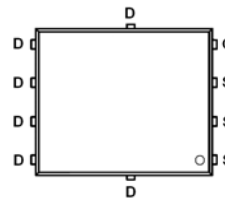


**Main Product Characteristics:**

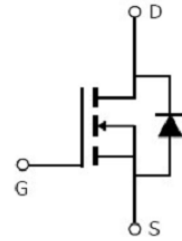
$V_{DSS}$	60V
$R_{DS(on)}$	11m $\Omega$ (typ.)
$I_D$	40A



PQFN 5x6



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
- 175°C 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
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	40	A
	Continuous Drain Current, $V_{GS} @ 10V$ (Silicon limited)	60	
$I_{DM}$	Pulsed Drain Current②	80	
$P_D @ TC = 25^\circ C$	Power Dissipation③	115	W
	Linear Derating Factor	0.74	W/°C
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy @ L=0.3mH	235	mJ
$I_{AS}$	Avalanche Current @ L=0.3mH	39	A
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 175	°C

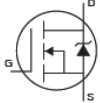
## Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case <sup>③</sup>	—	1.31	°C/W
$R_{\theta JA}$	Junction-to-ambient <sup>④</sup>	—	62	°C/W

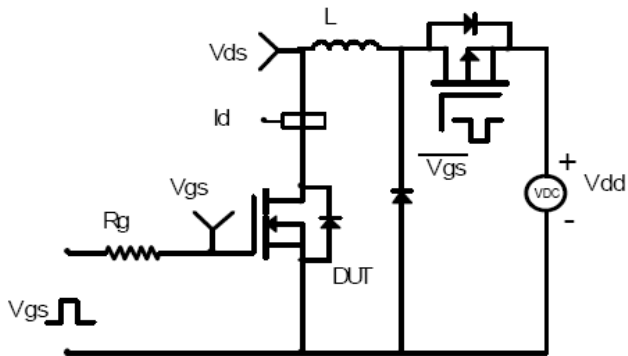
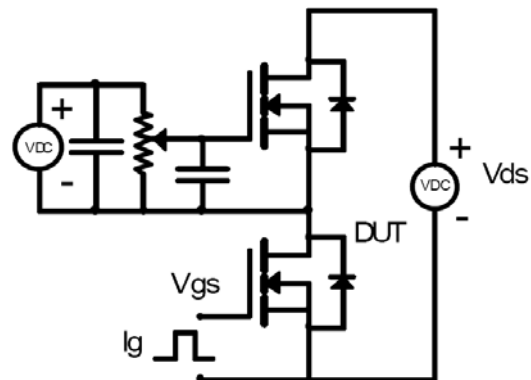
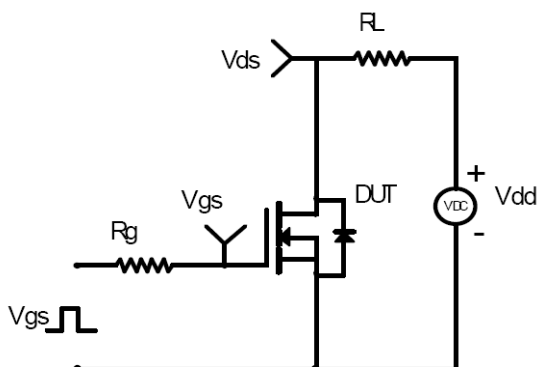
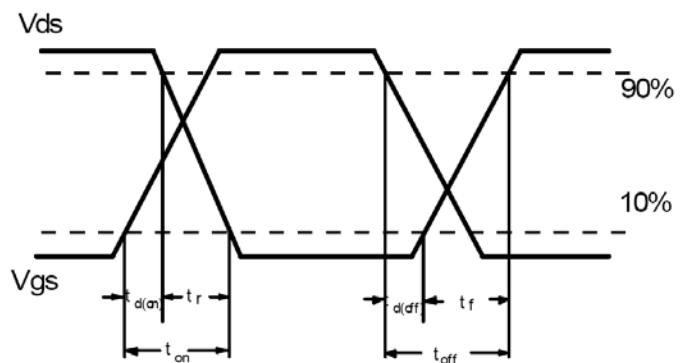
## Electrical Characteristics @ $T_A=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	11	16	mΩ	$V_{GS}=10V, I_D = 30A$
		—	6.5	9		$V_{GS}=10V, I_D = 14A$
$V_{GS(th)}$	Gate threshold voltage	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 60V, V_{GS} = 0V$ $T_J = 150^\circ\text{C}$
		—	—	10		
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
$Q_g$	Total gate charge	—	45	—	nC	$I_D = 15A,$ $V_{DS}=30V,$ $V_{GS} = 10V$
$Q_{gs}$	Gate-to-Source charge	—	4	—		
$Q_{gd}$	Gate-to-Drain("Miller") charge	—	15	—		
$t_{d(on)}$	Turn-on delay time	—	15	—	ns	$V_{GS}=10V, V_{DS}=30V,$ $R_L=15\Omega,$ $R_{GEN}=2.5\Omega$
$t_r$	Rise time	—	14	—		
$t_{d(off)}$	Turn-Off delay time	—	40	—		
$t_f$	Fall time	—	7.3	—		
$C_{iss}$	Input capacitance	—	1480	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output capacitance	—	190	—		$V_{DS} = 25V$
$C_{rss}$	Reverse transfer capacitance	—	135	—		$f = 1\text{MHz}$

## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	40	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode)	—	—	80	A	
$V_{SD}$	Diode Forward Voltage	—	—	1.3	V	$I_S=30A, V_{GS}=0V$
$t_{rr}$	Reverse Recovery Time	—	33	—	ns	$T_J = 25^\circ\text{C}, I_F = 15A,$ $di/dt = 100A/\mu s$
$Q_{rr}$	Reverse Recovery Charge	—	61	—	nC	

## Test Circuits and Waveforms

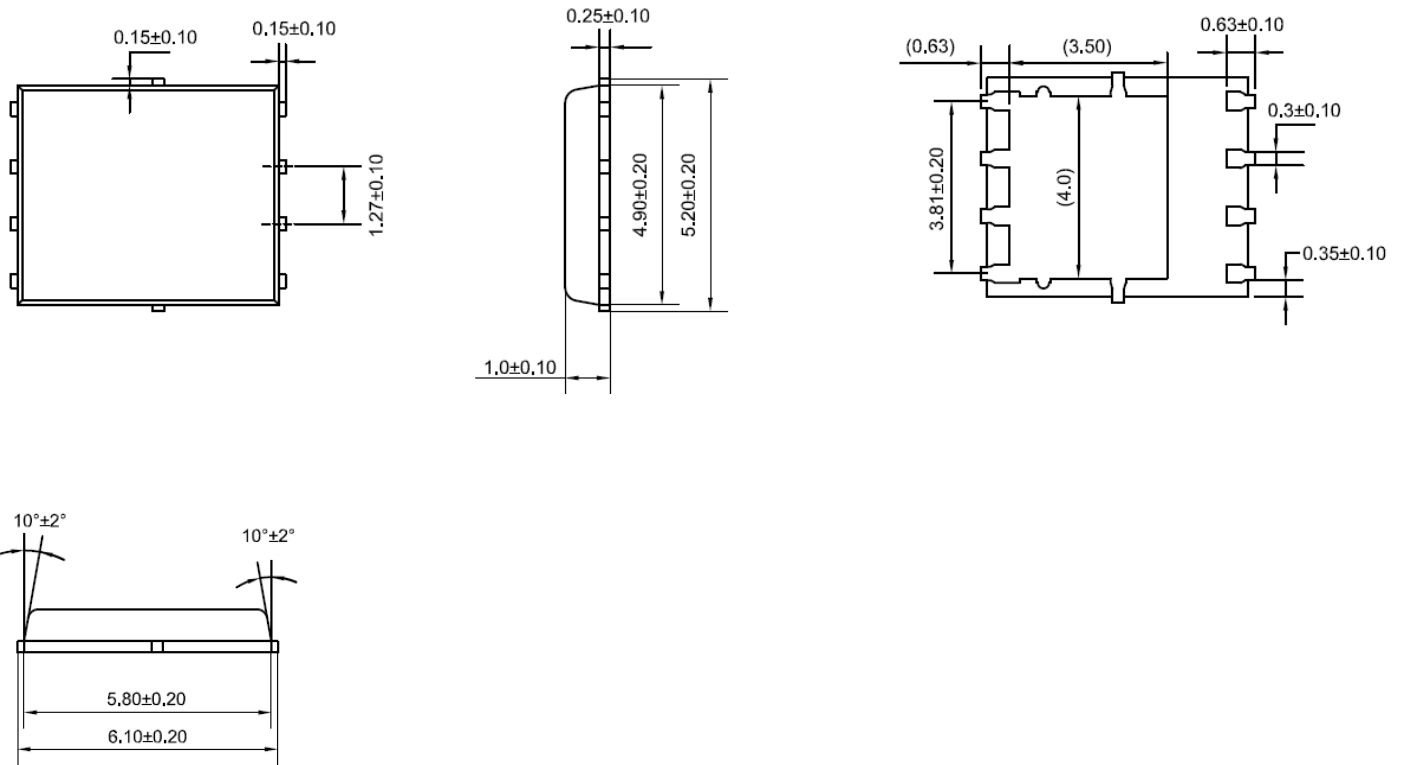
**EAS Test Circuit**

**Gate charge test circuit**

**Switching Time Test Circuit**

**Switching Waveforms**


### Notes:

- ① Continuous current tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$

Mechanical Data

PQFN 5X6 Package Outline Dimension. (Unit: mm)



**Ordering and Marking Information**
**Device Marking: SSF6014J7**

**Package (Available)**  
**PQFN 5X6**  
**Operating Temperature Range**  
**C : -55 to 175 °C**

**Devices per Unit**

Package Type	Units/Tape	Tapes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
PQFN 5x6	3000	10	30000	4	120000

**Reliability Test Program**

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=150^{\circ}\text{C}$ @ 80% of Max $V_{DSS}/V_{CES}/V_R$	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	$T_j=150^{\circ}\text{C}$ @ 100% of Max $V_{GSS}$	168 hours 500 hours 1000 hours	3 lots x 77 devices

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