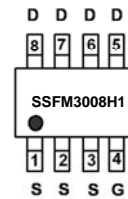
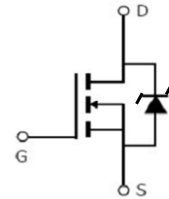


**Main Product Characteristics:**

$V_{DSS}$	30V
$R_{DS(on)}$	7.4mohm(typ.)
$I_D$	20A


**SOP-8**

**Marking and pin Assignment**

**Schematic diagram**
**Features and Benefits:**

- Advanced trench 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 FRRMOS (fast reverse recovery MOS) trench processing techniques to achieve the high cell density and reduces the on-resistance, fast switching and soft reverse recovery time. 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	20	A
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	16	
$I_{DM}$	Pulsed Drain Current②	136	
$P_D @ TC = 25^\circ C$	Power Dissipation③	3.1	W
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy @ $L=0.1mH$	100	mJ
$I_{AS}$	Avalanche Current @ $L=0.1mH$	44	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 175	$^\circ C$

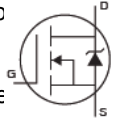
**Thermal Resistance**

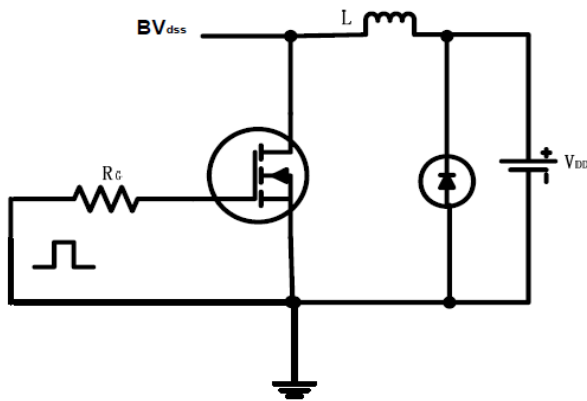
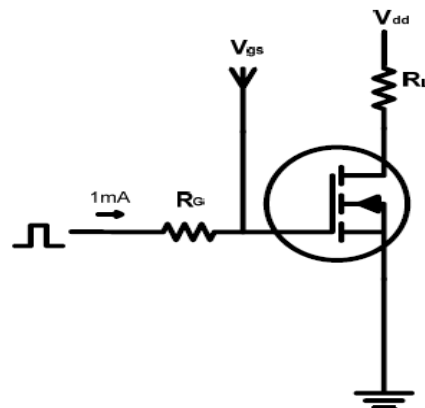
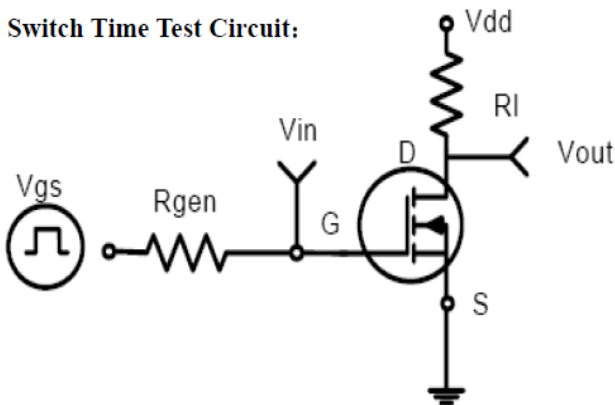
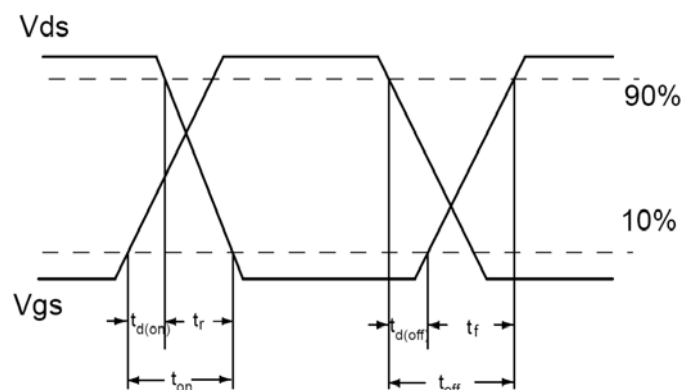
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	22	$^\circ C/W$
$R_{\theta JA}$	Junction-to-ambient ( $t \leq 10s$ ) ④	—	35	$^\circ C/W$
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	65	$^\circ C/W$

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

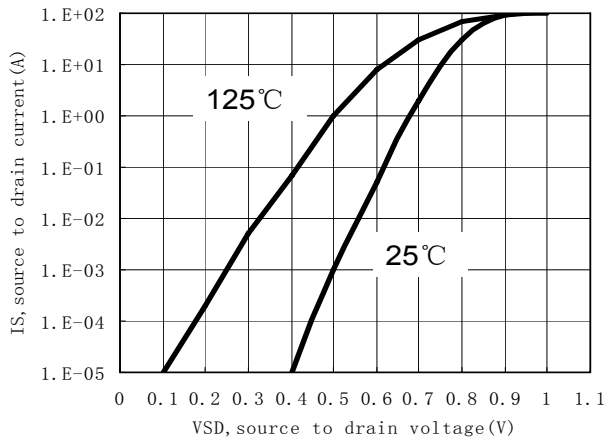
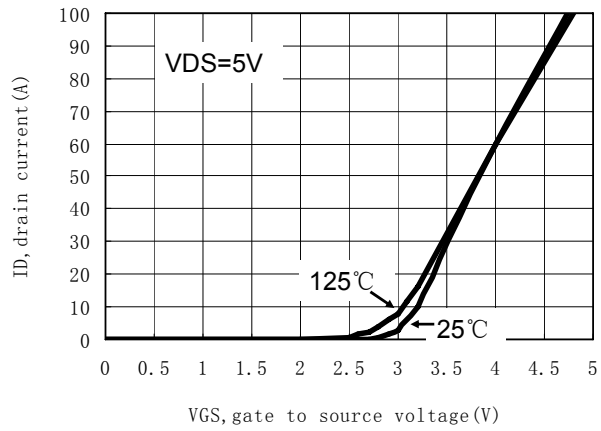
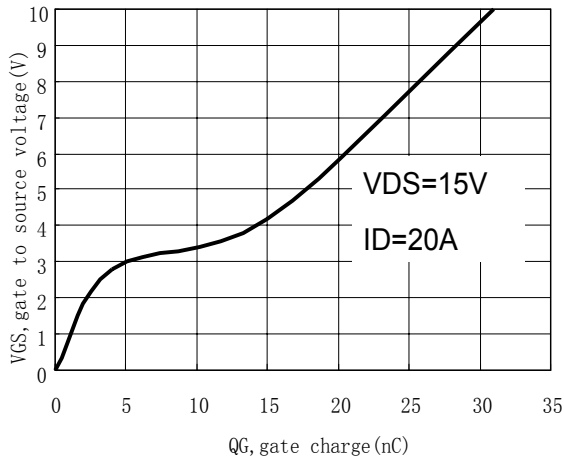
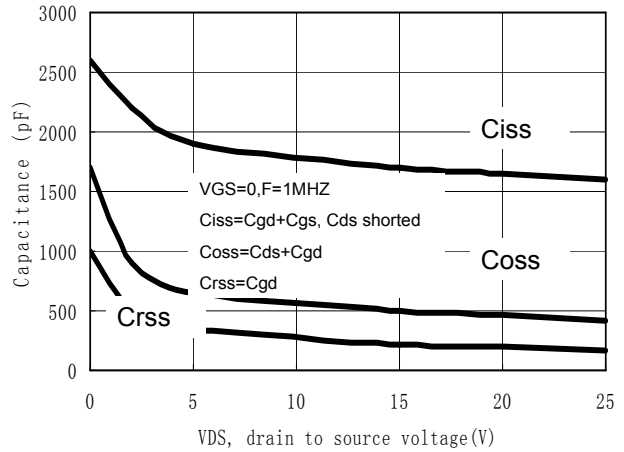
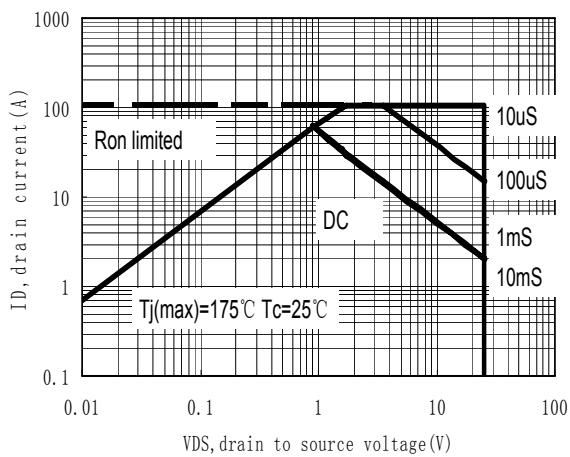
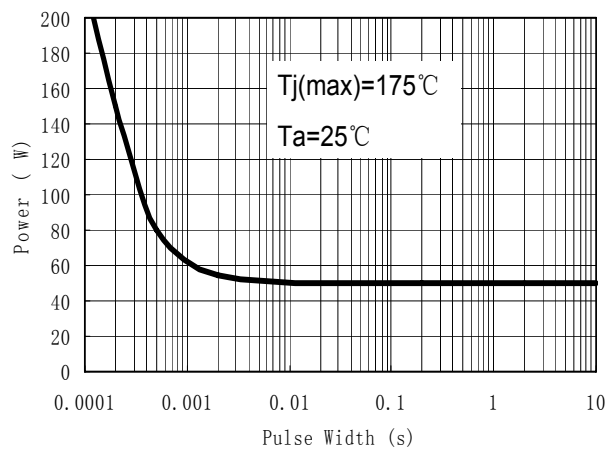
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	36.5	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	7.4	8	$m\Omega$	$V_{GS}=10V, I_D=20A$
		—	11.5	14	$m\Omega$	$V_{GS}=4.5V, I_D=10A$
$V_{GS(th)}$	Gate threshold voltage	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	10	$\mu A$	$V_{DS} = 30V, V_{GS} = 0V$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		-100	—	—		$V_{GS} = -20V$
$G_{fs}$	Forward Transconductance	4	7.6	—	S	$V_{DS} = 15V, I_D = 16A$
$Q_g$	Total gate charge	—	17.6	—	nC	$V_{DS}=15V,$ $I_D=16A,$ $V_{GS}=4.5V$
$Q_{gs}$	Gate-to-Source charge	—	6.5	—		
$Q_{gd}$	Gate-to-Drain("Miller") charge	—	8.6	—		
$t_{d(on)}$	Turn-on delay time	—	32.8	—	ns	$V_{GS}=4.5V, V_{DS}=15V,$ $R_{GEN}=3\Omega, I_D=16A$
$t_r$	Rise time	—	104.3	—		
$t_{d(off)}$	Turn-Off delay time	—	12.9	—		
$t_f$	Fall time	—	8.5	—		
$C_{iss}$	Input capacitance	—	1844	—	pF	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1MHz$
$C_{oss}$	Output capacitance	—	342	—		
$C_{rss}$	Reverse transfer capacitance	—	215	—		

**Source-Drain Ratings and Characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current	—	—	20	A	MOSFET symb showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current	—	—	136	A	
$V_{SD}$	Diode Forward Voltage	—	0.7	1.0	V	$I_S=1.0A, V_{GS}=0V$
$t_{rr}$	Reverse Recovery Time	—	16.5	—	ns	$T_J = 25^{\circ}\text{C}, I_F = 3A, di/dt = 100A/\mu s$
$Q_{rr}$	Reverse Recovery Charge	—	8.2	—	nC	

**Test circuits and Waveforms**
**EAS test circuits:**

**Gate charge test circuit:**

**Switch Time Test Circuit:**

**Waveforms:**

**Notes:**

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-ambient thermal resistance.
- ④ The 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  $T_A = 25^\circ C$
- ⑤ These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)} = 175^\circ C$ .

**Typical electrical characteristics**

**Figure 1: Body-Diode Characteristics**

**Figure 2: Typical Transfer Characteristics**

**Figure 3: Gate-Charge Characteristics**

**Figure 4: Capacitance Characteristics**

**Figure 5: Maximum Forward Biased Safe Operating Area**

**Figure 6: Single Pulse Power Rating Junction-to-Case**

Typical thermal characteristics

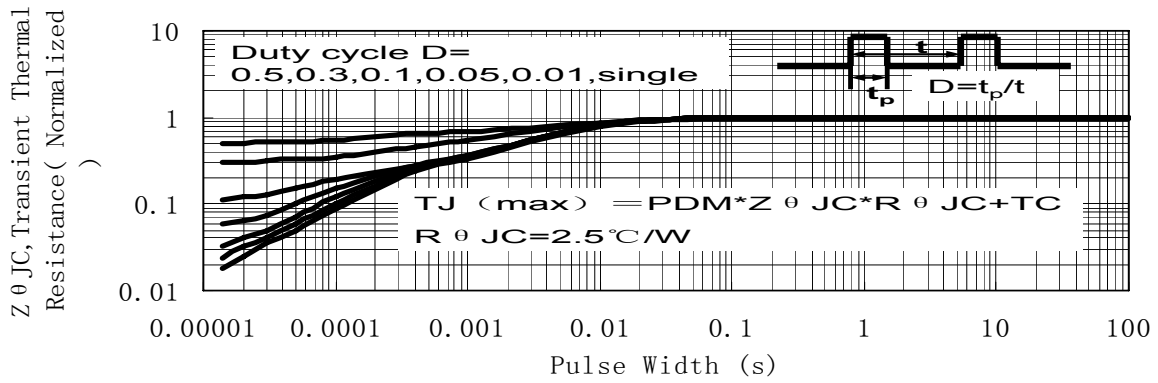
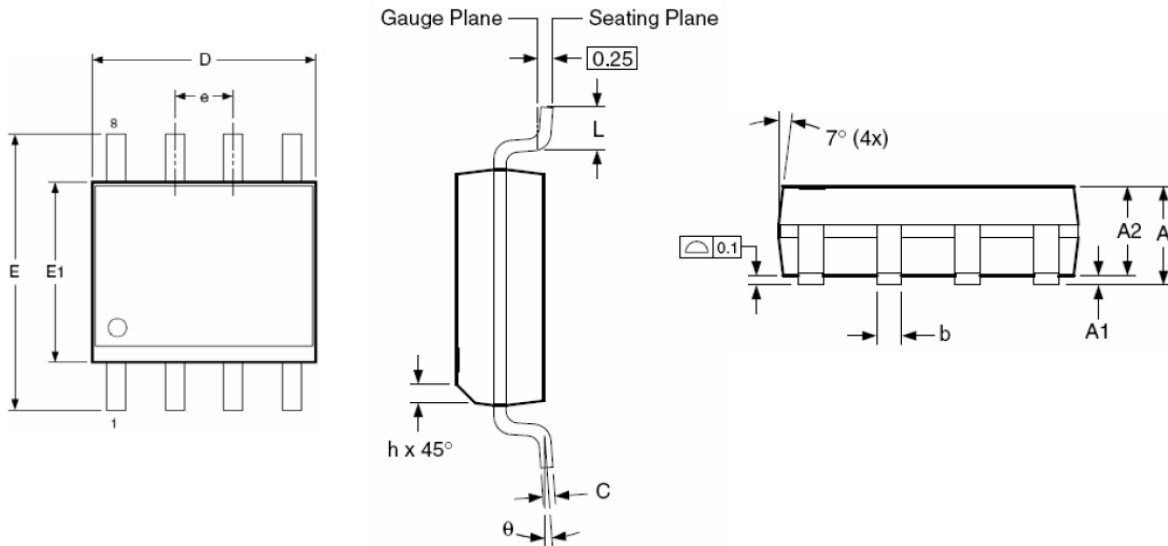
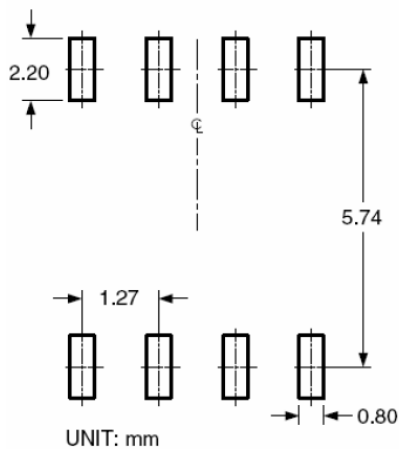


Figure 7: Normalized Thermal transient Impedance Curve

**Mechanical Data:**
**SOP-8 PACKAGE INFORMATION**

**RECOMMENDED LAND PATTERN**

**Dimensions in millimeters**

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

**Dimensions in inches**

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	0.228	0.236	0.244
h	0.010	—	0.020
L	0.016	—	0.050
θ	0°	—	8°

**Notes:**

1. Dimensions are inclusive of plating
2. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
3. Dimension L is measured in gauge plane.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

**Ordering and Marking Information**
**Device Marking: SSFM3008H1**
**Package (Available)**
**SOP-8**
**Operating Temperature Range**
**C : -55 to 175 °C**
**Devices per Unit**

Package Type	Units/ Tube	Tubes/ Inner Box	Units/Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOP-8	2500	2	5000	8	40000

**Reliability Test Program**

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=125^{\circ}\text{C}$ to $175^{\circ}\text{C}$ @ 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)	$T_j=125^{\circ}\text{C}$ to $175^{\circ}\text{C}$ @ 100% of Max $V_{GSS}$	168 hours 500 hours 1000 hours	3 lots x 77 devices

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