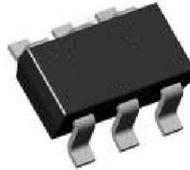
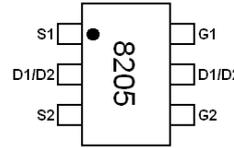


### Main Product Characteristics

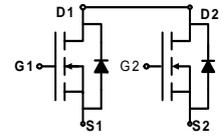
$V_{DSS}$	20V
$R_{DS(on)}$	20mΩ (typ.)
$I_D$	4A



SOT-23-6L



Marking and Pin Assignment



Schematic Diagram

### Features and Benefits

- Advanced trench MOSFET process technology
- Ideal for battery protection, load switching and general power management
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature



### Description

The SSF8205 utilizes the latest trench processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in battery protection, power switching applications and a wide variety of other applications.

### Absolute Max Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	4	A
	$I_{DM}$	25	A
Maximum Power Dissipation	$P_D$	1.25	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$

### Thermal Resistance

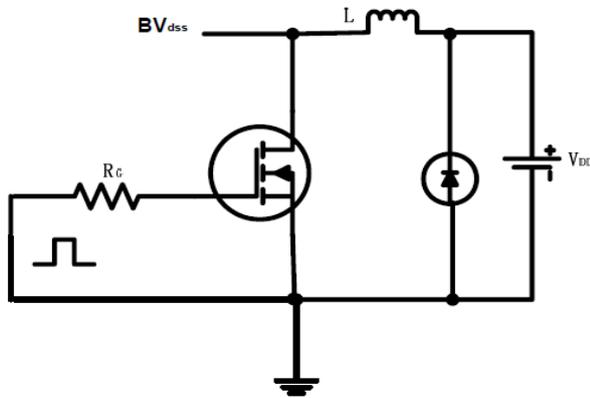
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
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### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

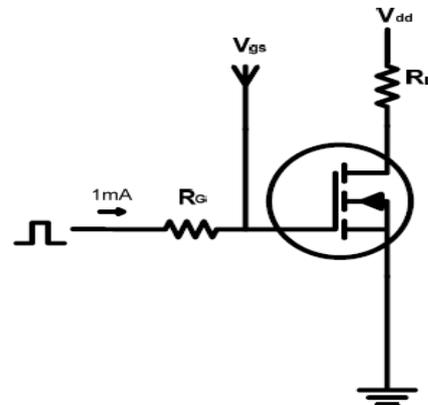
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS (Note 3)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.8	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4V, I_D=4A$		20	30	m $\Omega$
		$V_{GS}=2.5V, I_D=3A$		25	45	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=4A$		10		S
<b>DYNAMIC CHARACTERISTICS (Note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=8V, V_{GS}=0V,$ $F=1.0\text{MHz}$		800		PF
Output Capacitance	$C_{oss}$			155		PF
Reverse Transfer Capacitance	$C_{rss}$			125		PF
<b>SWITCHING CHARACTERISTICS (Note 4)</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A$ $V_{GS}=4V, R_{GEN}=10\Omega$		18.3		nS
Turn-on Rise Time	$t_r$			4.8		nS
Turn-Off Delay Time	$t_{d(off)}$			43.5		nS
Turn-Off Fall Time	$t_f$			20		nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=4A,$ $V_{GS}=4V$		11		nC
Gate-Source Charge	$Q_{gs}$			2.2		nC
Gate-Drain Charge	$Q_{gd}$			2.5		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=2A$		0.8	1.2	V
Diode Forward Current (Note 2)	$I_S$				2	A

## Test Circuits and Waveforms

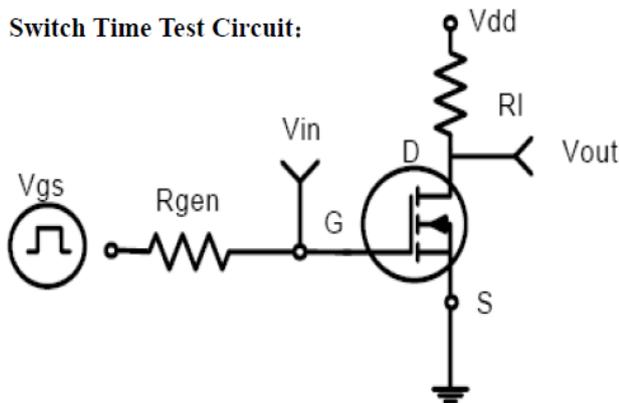
EAS test circuits:



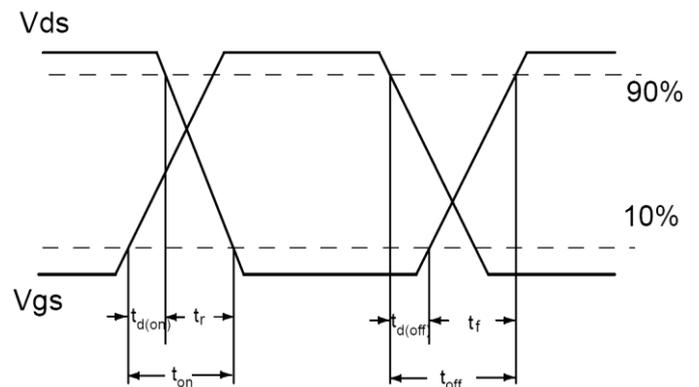
Gate charge test circuit:



Switch Time Test Circuit:



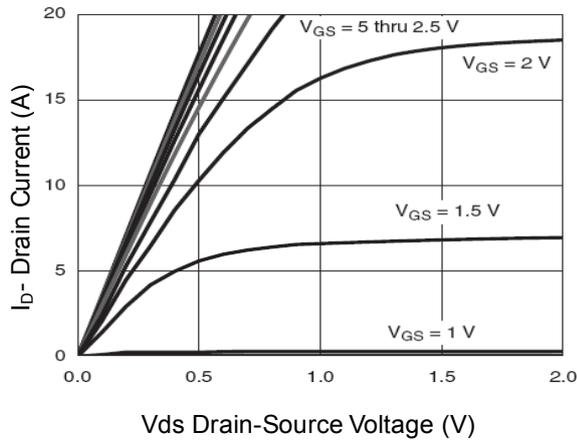
Switch Waveforms:



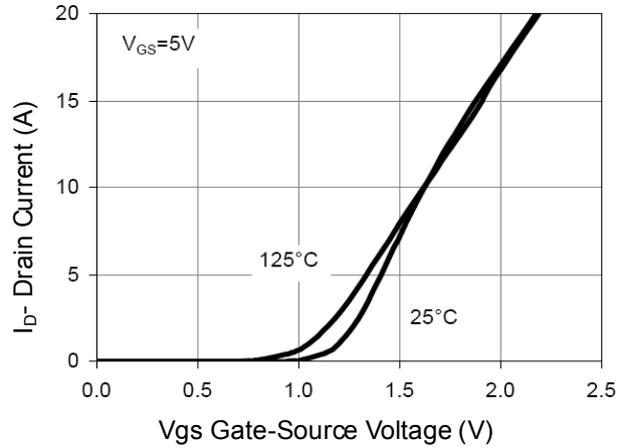
### NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

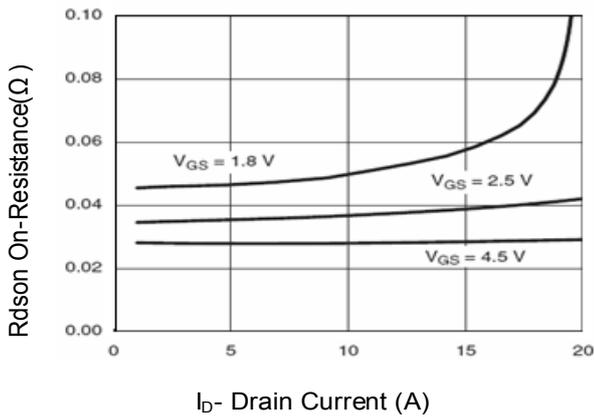
**Typical Electrical and Thermal Characteristics**



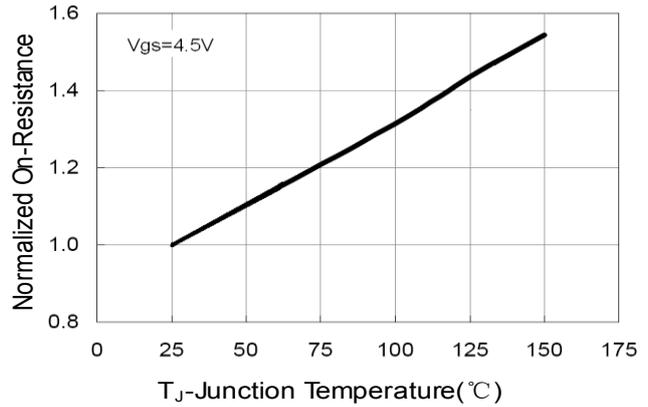
**Figure 1: Typical Output Characteristics**



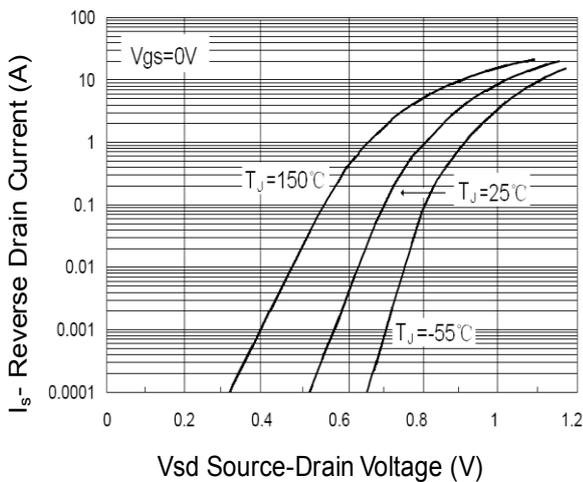
**Figure 2: Transfer Characteristics**



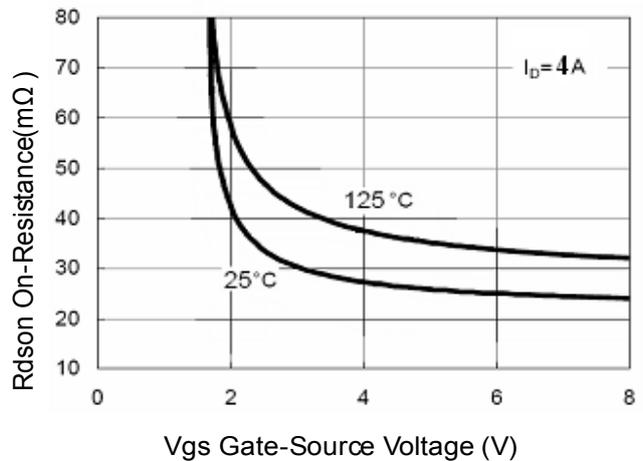
**Figure 3: Drain-Source On-Resistance**



**Figure 4: Drain-Source On-Resistance**



**Figure 5 : Source- Drain Diode Forward**



**Figure 6: Rdson vs Vgs**

## Typical Electrical and Thermal Characteristics

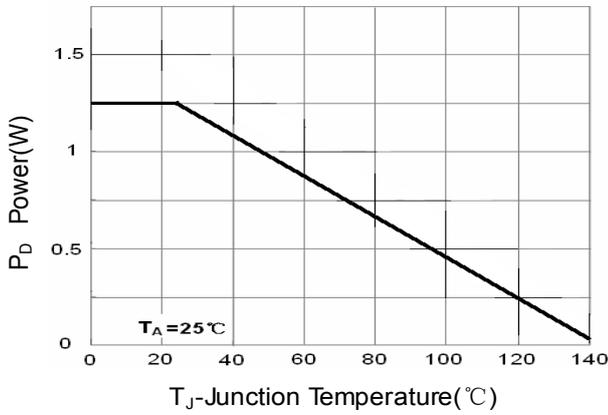


Figure 7: Power Dissipation

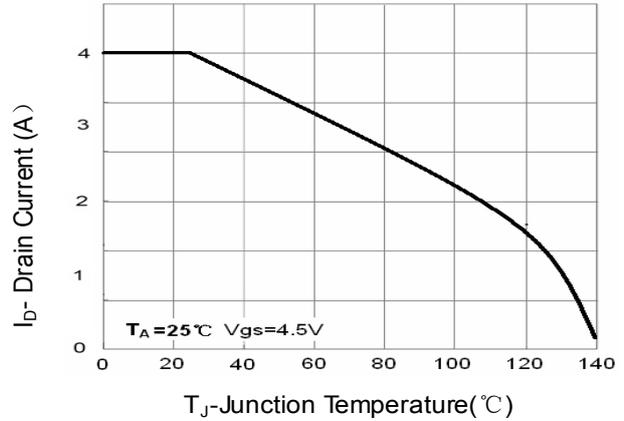


Figure 8: Drain Current

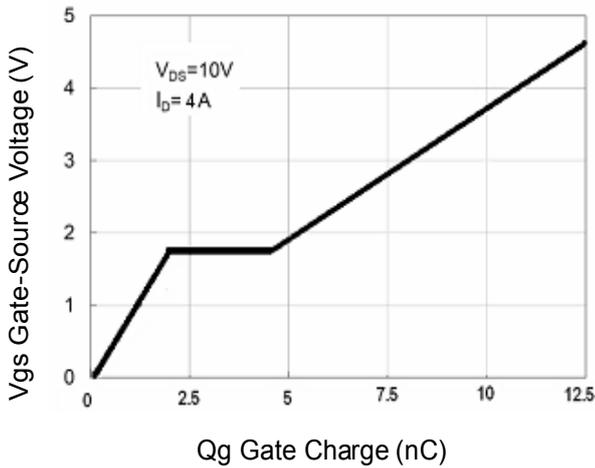


Figure 9: Gate Charge

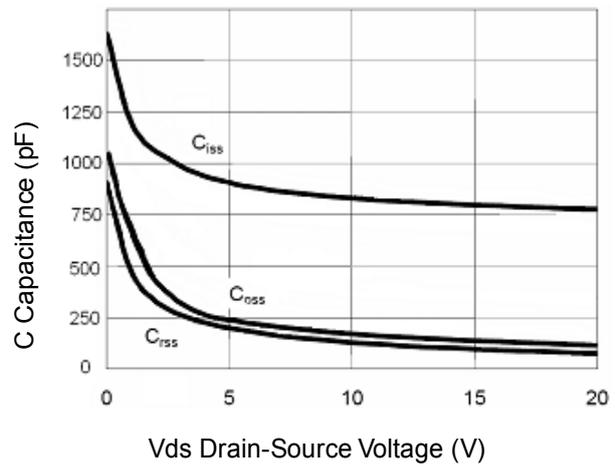


Figure 10: Capacitance vs  $V_{DS}$

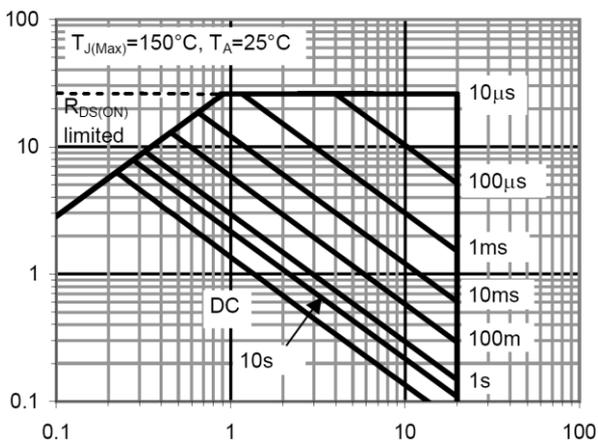
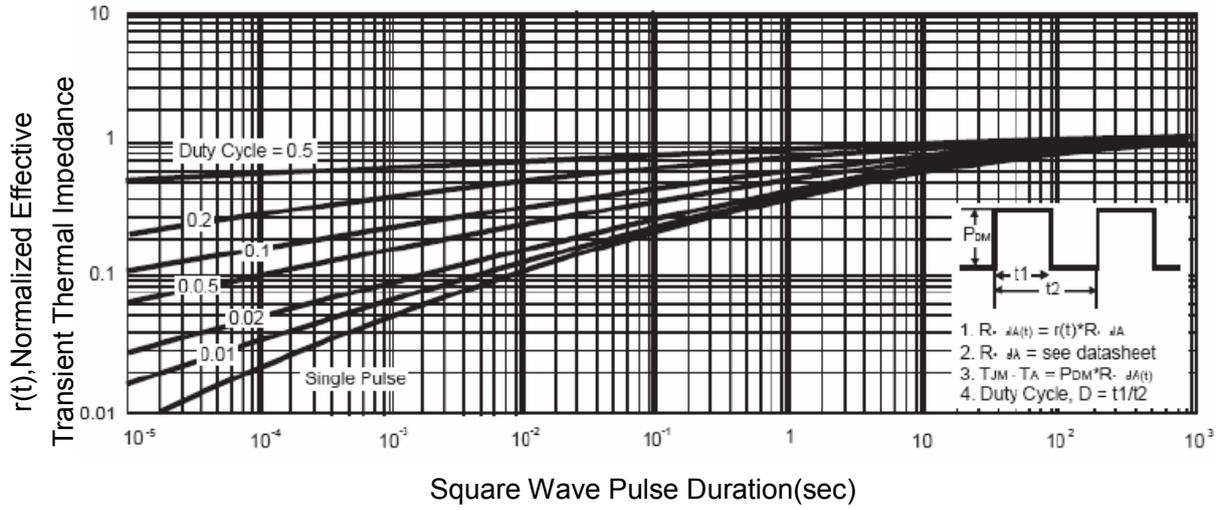


Figure 11: Safe Operation Area

**Typical Electrical and Thermal Characteristics**

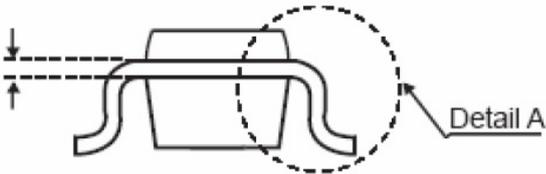
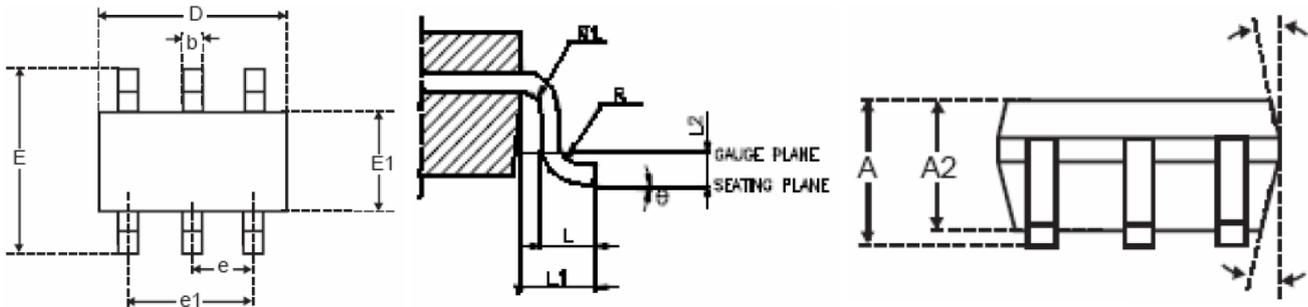


**Figure 12: Normalized Maximum Transient Thermal Impedance**

### Mechanical Data

#### SOT-23-6L

Dimensions in Millimeters (UNIT:mm)



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D	2.90 BSC.		
E	2.80 BSC.		
E1	1.60 BSC.		
e	0.95 BSC.		
e1	1.90 BSC.		
L	0.30	0.45	0.60
L1	0.60 REF		
L2	0.25 BSC.		
R	0.10		
R1	0.10		0.25
$\theta$	0°	4°	8°
$\theta 1$	5°	10°	15°

#### NOTES:

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

## Ordering and Marking Information

**Device Marking: 8205**

Package (Available)  
 SOT-23-6L  
 Operating Temperature Range  
 C : -55 to 150 °C

## Devices per Unit

Package Type	Units/ Tape	Tapes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-23-6L	3000pcs	10pcs	30000pcs	4pcs	120000pcs

## Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	$T_j=125^{\circ}\text{C}$ to $150^{\circ}\text{C}$ @ 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)	$T_j=125^{\circ}\text{C}$ or $150^{\circ}\text{C}$ @ 100% of Max $V_{GSS}$	168 hours 500 hours 1000 hours	3 lots x 77 devices