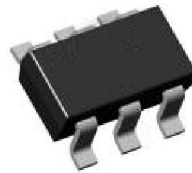
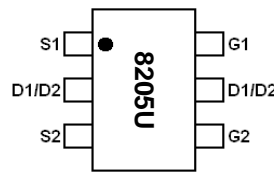


Main Product Characteristics

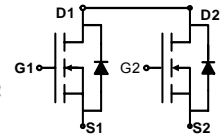
V_{DSS}	18V
$R_{DS(on)}$	20m Ω (typ.)
I_D	4.5A



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 SSF8205U 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}	18	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	4.5	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

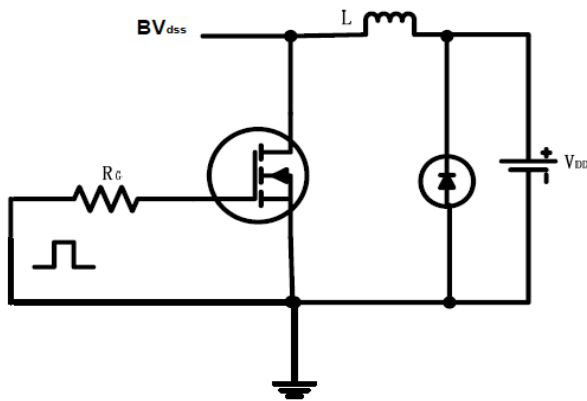
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
--------------------------------------------------	-----------------	-----	--------------------

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

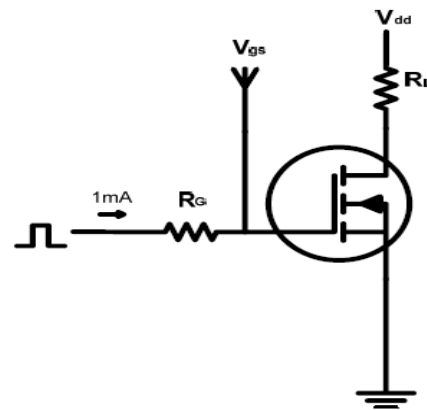
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	18			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=18V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS (Note 3)						
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	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.5A$		20	30	m Ω
		$V_{GS}=2.5V, I_D=3.5A$		25	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=4.5A$		10		S
DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=8V, V_{GS}=0V,$ $F=1.0MHz$		800		PF
Output Capacitance	C_{oss}			155		PF
Reverse Transfer Capacitance	C_{rss}			125		PF
SWITCHING CHARACTERISTICS (Note 4)						
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	$V_{DS}=10V, I_D=4.5A,$ $V_{GS}=4V$		11		nC
Gate-Source Charge	Q_{gs}			2.2		nC
Gate-Drain Charge	Q_{gd}			2.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
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				4.5	A

Test Circuits and Waveforms

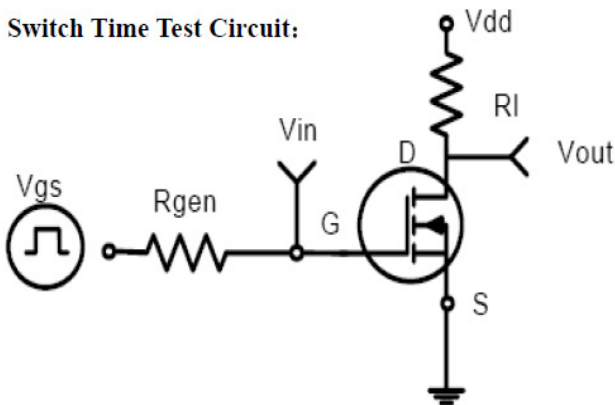
EAS test circuits:



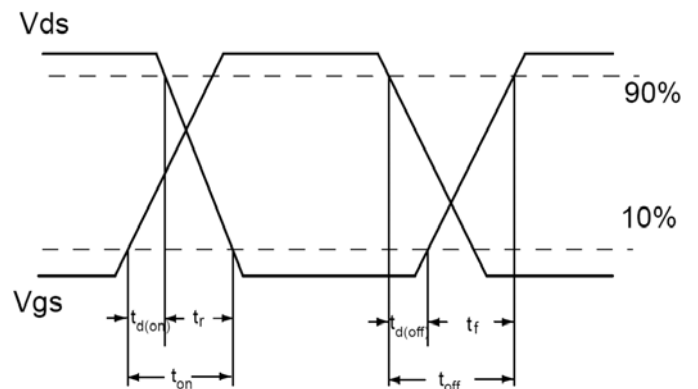
Gate charge test circuit:



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 $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

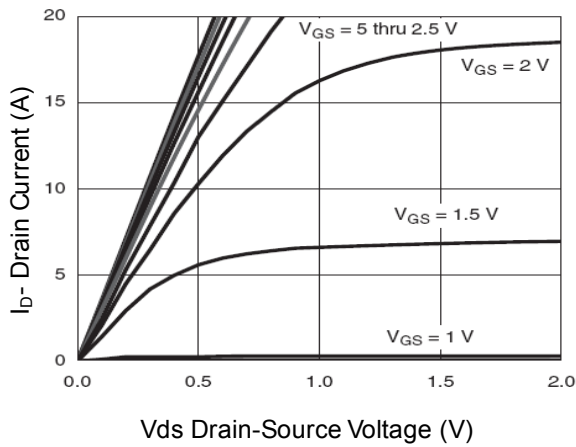


Figure 1: Typical Output Characteristics

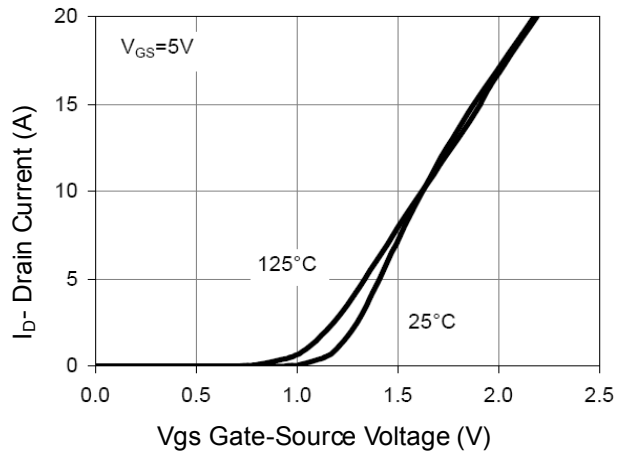


Figure 2: Transfer Characteristics

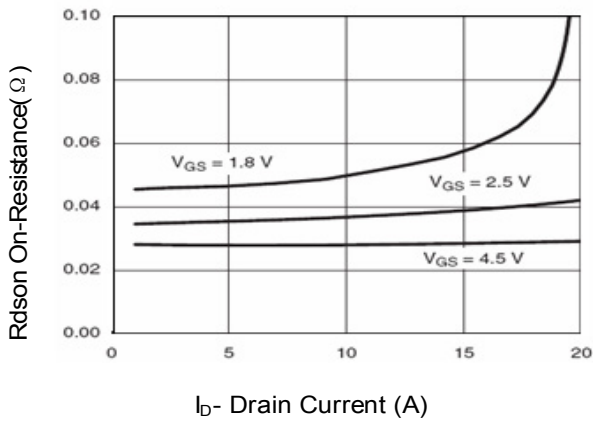


Figure 3: Drain-Source On-Resistance

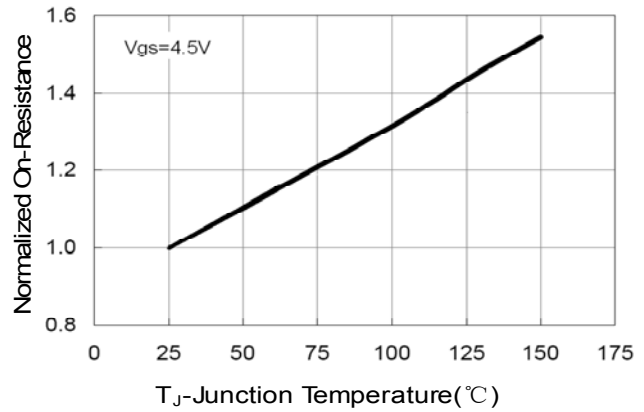


Figure 4: Drain-Source On-Resistance

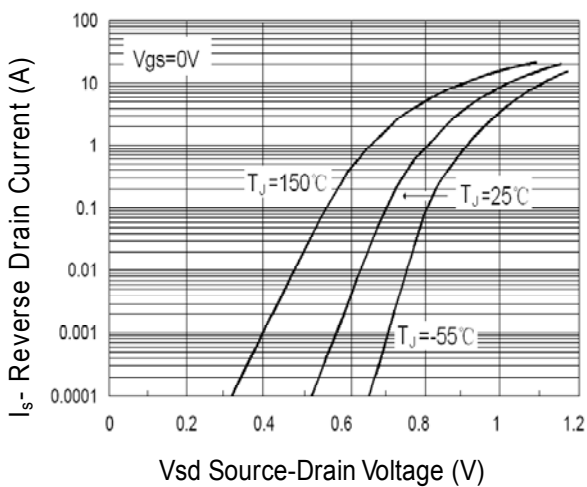


Figure 5 : Source- Drain Diode Forward

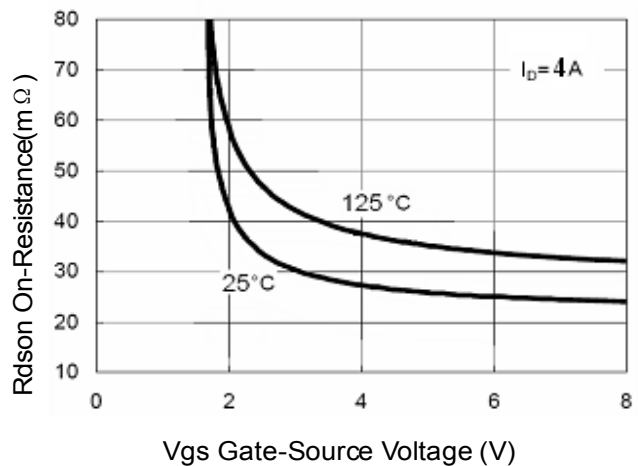


Figure 6: Rds(on) vs Vgs

Typical Electrical and Thermal Characteristics

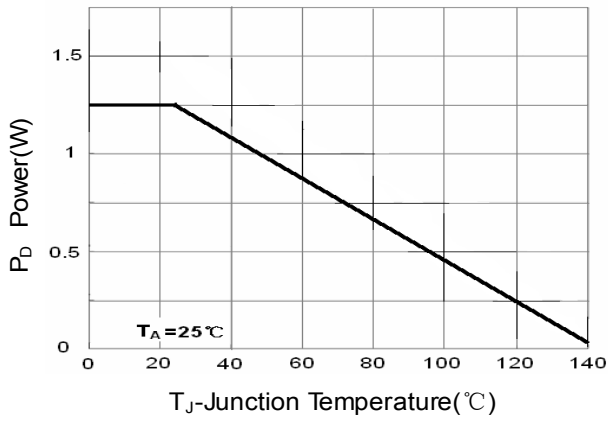


Figure 7: Power Dissipation

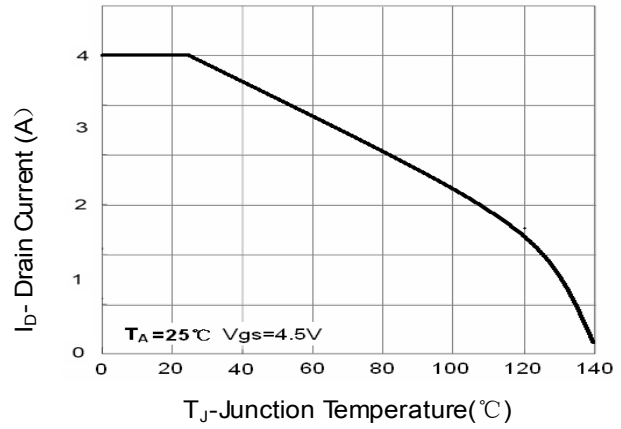


Figure 8: Drain Current

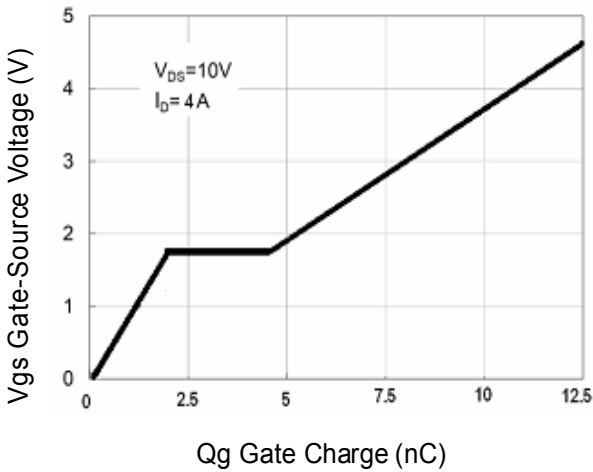


Figure 9: Gate Charge

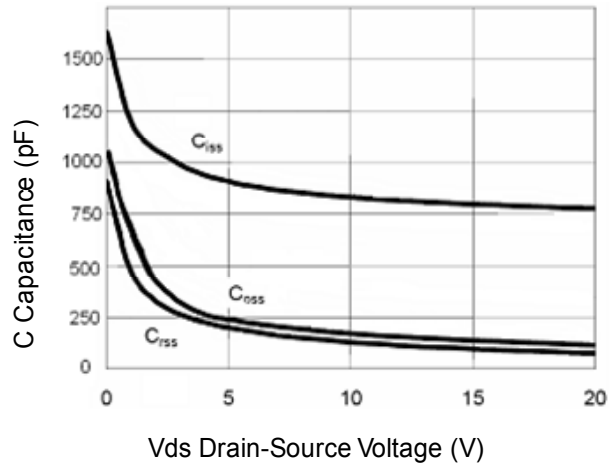


Figure 10: Capacitance vs Vds

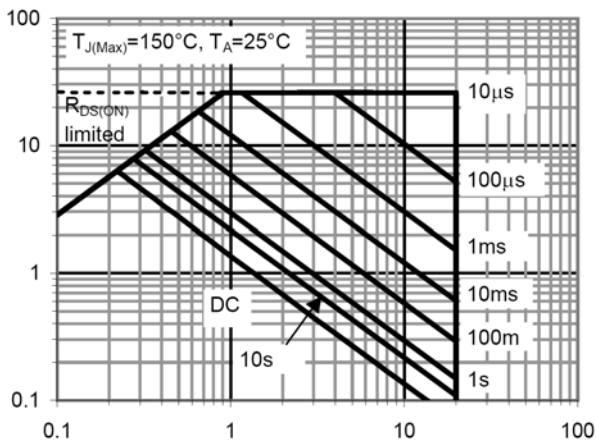


Figure 11: Safe Operation Area

Typical Electrical and Thermal Characteristics

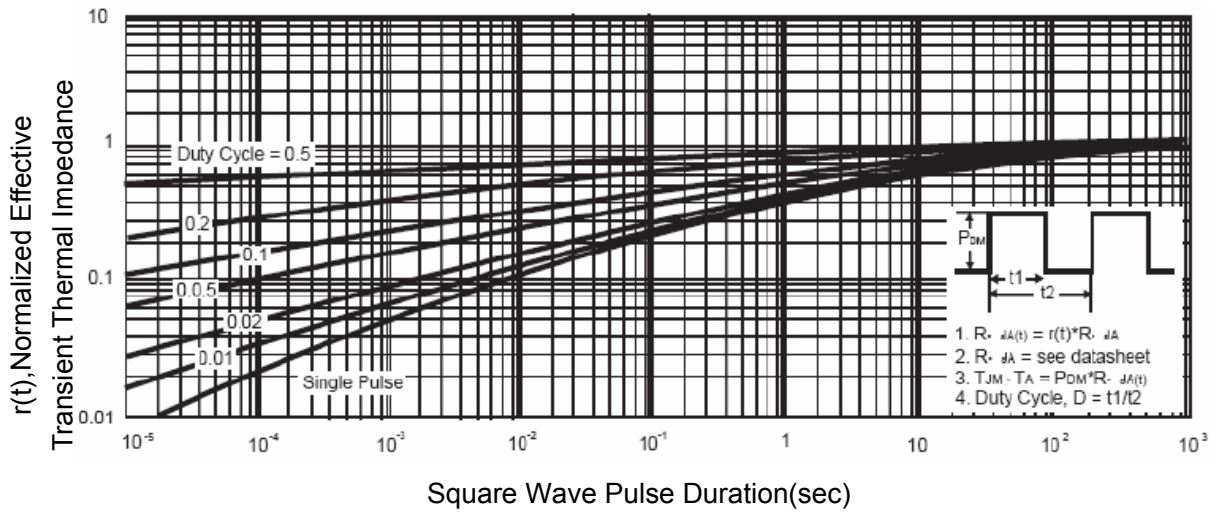
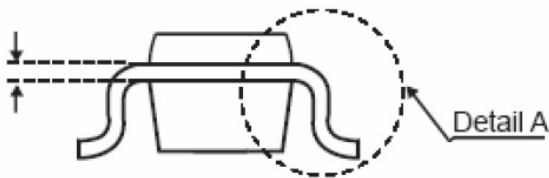
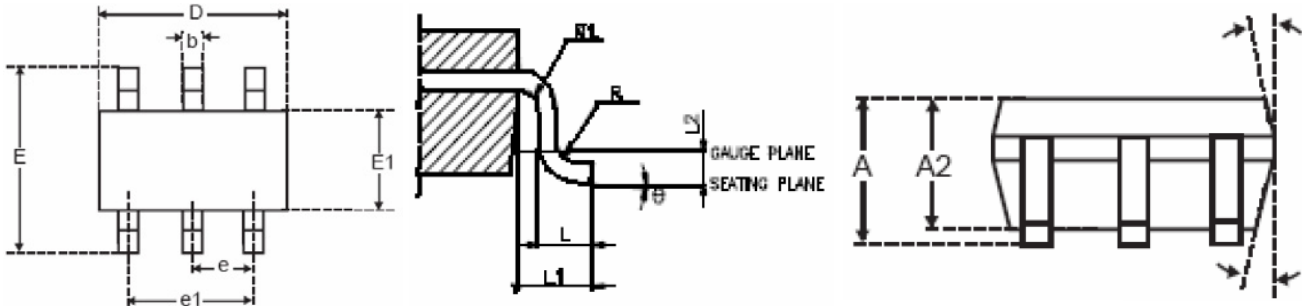


Figure 12: Normalized Maximum Transient Thermal Impedance

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
θ	0°	4°	8°
θ 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

<p>Device Marking: 8205U</p> <p style="text-align: center;"> Package (Available) SOT-23-6L Operating Temperature Range C : -55 to 150 °C </p>

Devices per Unit

Package Type	Units/ Tube	Tubes/ 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)	$T_j=125^{\circ}\text{C}$ or 150°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°C @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices