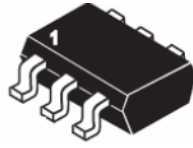
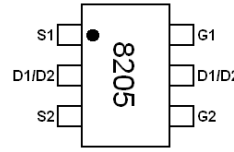
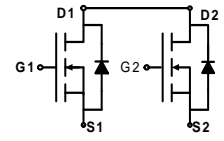


Main Product Characteristics:

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


SOT23-6

Marking and pin Assignment

Schematic diagram
Features and Benefits:

- Advanced trench MOSFET process technology
- Special designed 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:

It utilizes the latest trench 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 battery protection, power switching application and a wide variety of other applications

Absolute max Rating:

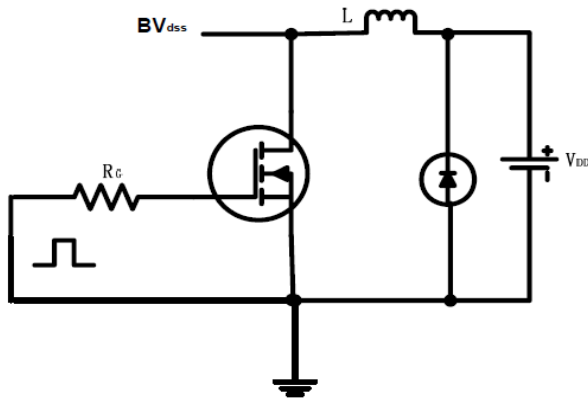
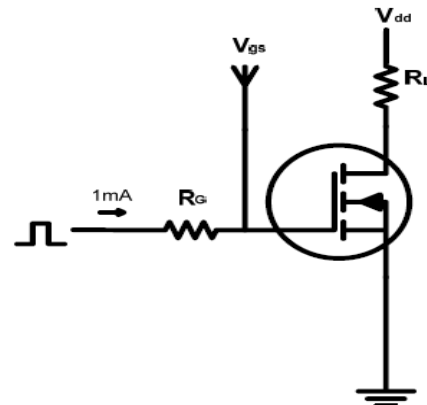
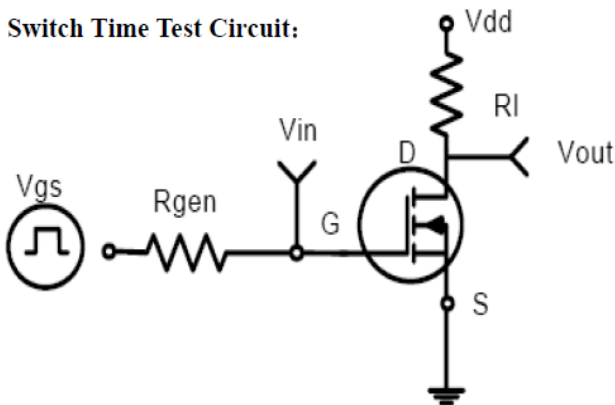
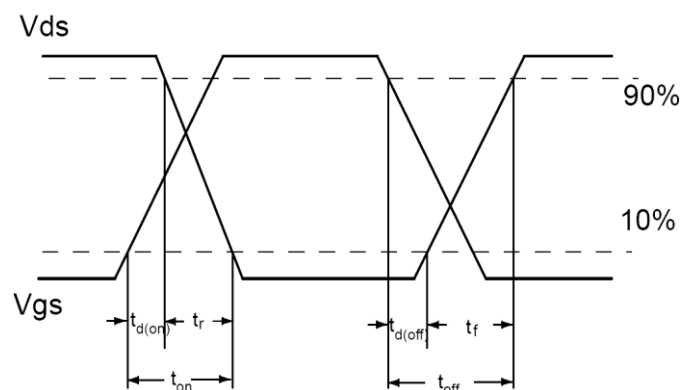
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	4	A
	I_{DM}	25	A
Maximum Power Dissipation	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Resistance

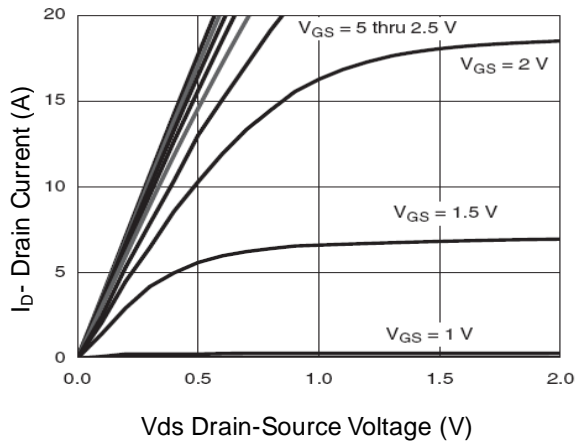
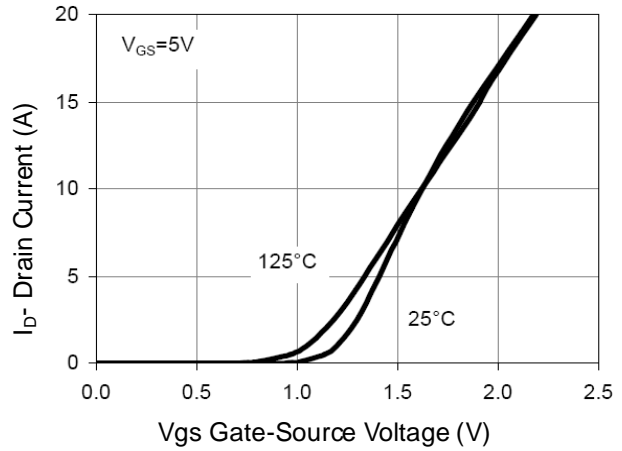
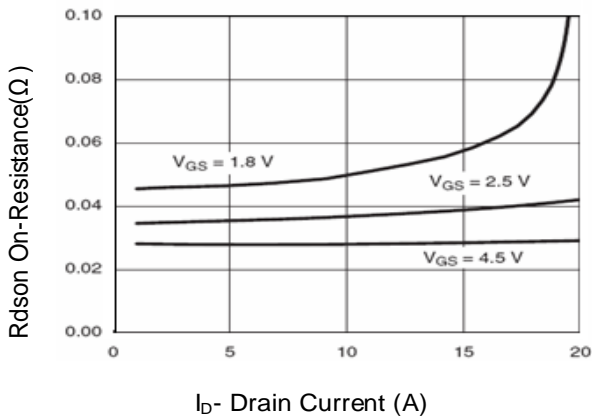
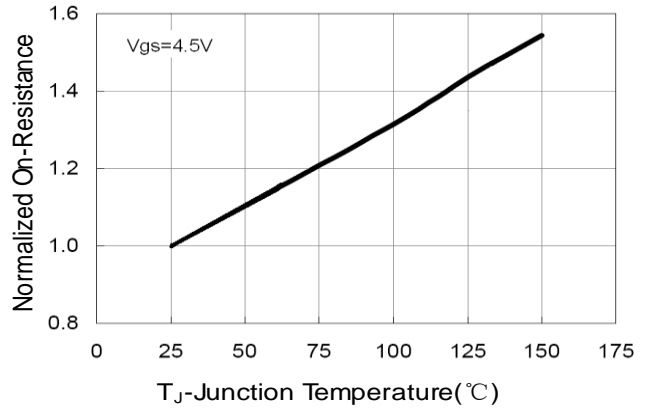
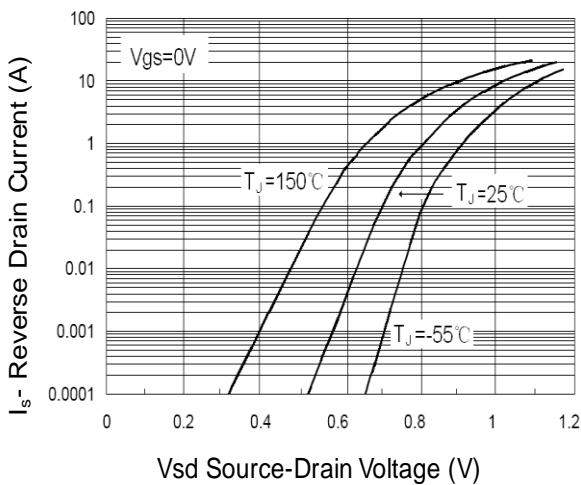
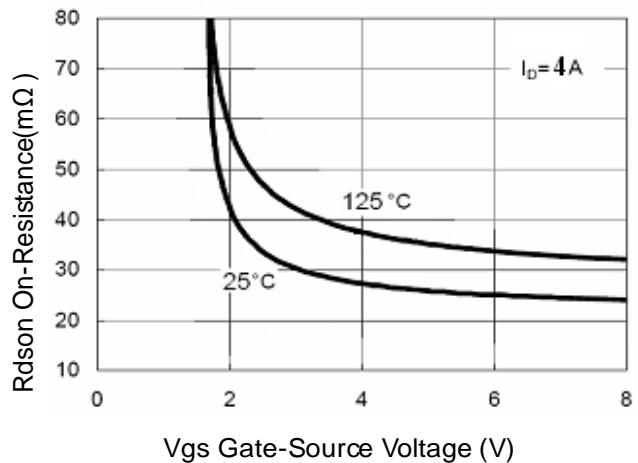
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	°C/W
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Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			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	$R_{DS(ON)}$	$V_{GS}=4V, I_D=4A$		20	30	m Ω
		$V_{GS}=2.5V, I_D=3A$		25	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=4A$		10		S
DYNAMIC CHARACTERISTICS (Note4)						
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
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	$V_{DS}=10V, I_D=4A,$ $V_{GS}=4V$		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				2	A

Test circuits and Waveforms
EAS test circuits:

Gate charge test circuit:

Switch Time Test Circuit:

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: $R_{DS(on)}$ vs V_{GS}

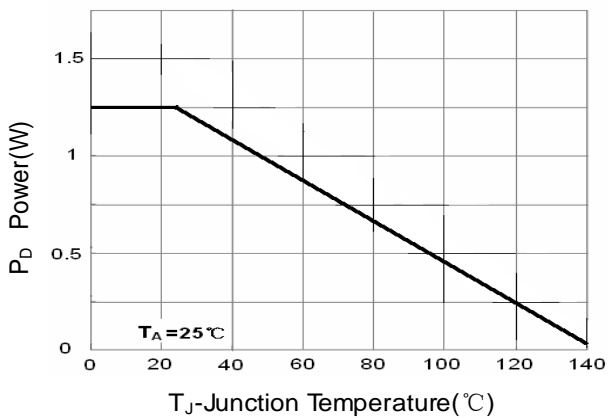


Figure 7: Power Dissipation

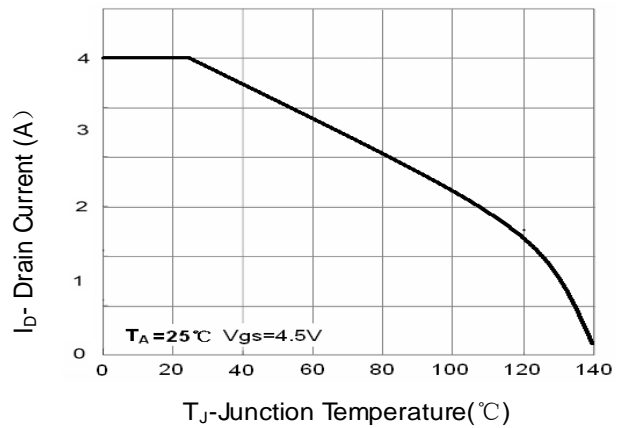


Figure 8: Drain Current

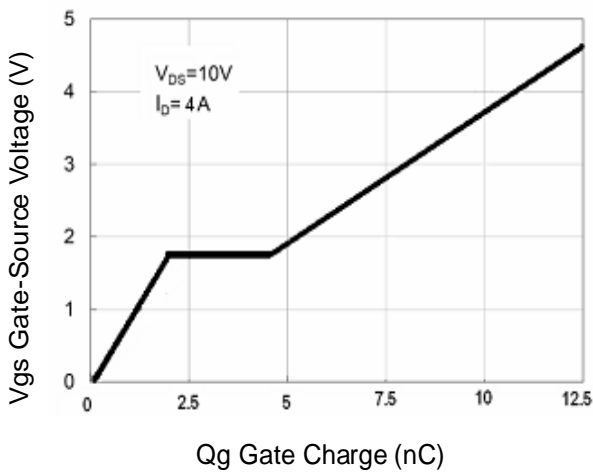


Figure 9: Gate Charge

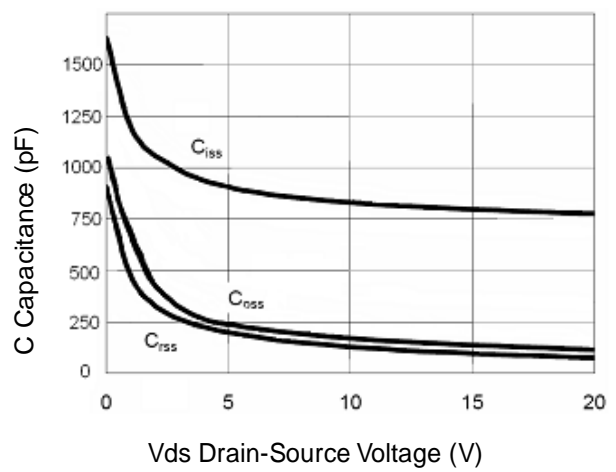


Figure 10: Capacitance vs Vds

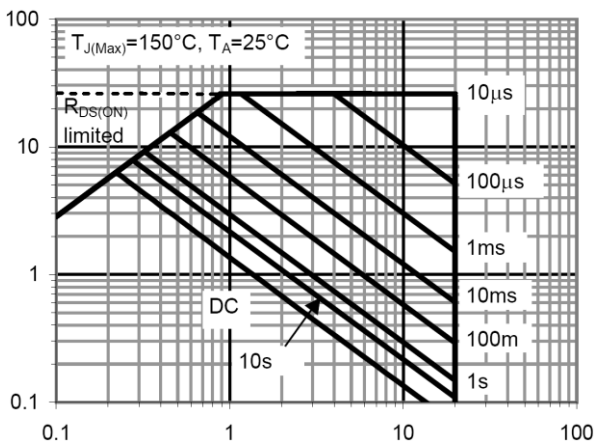


Figure 11: Safe Operation Area

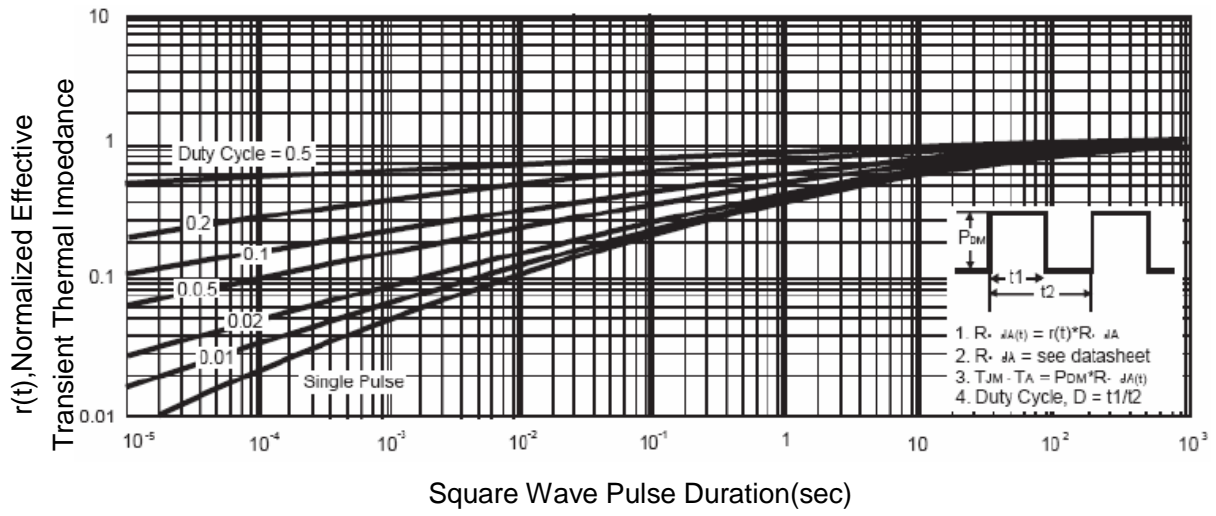
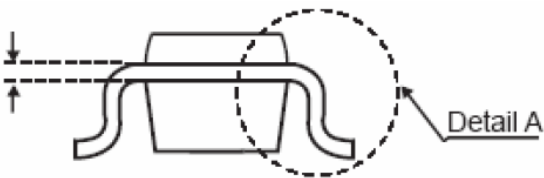
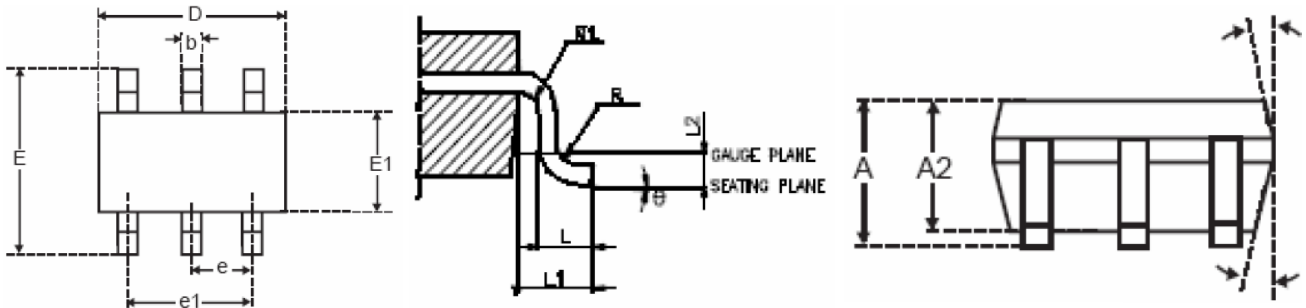


Figure 12: Normalized Maximum Transient Thermal Impedance

Mechanical Data:
SOT23-6 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°
$\theta 1$	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)
SOT23-6
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
SOT23-6	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°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

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