

Description

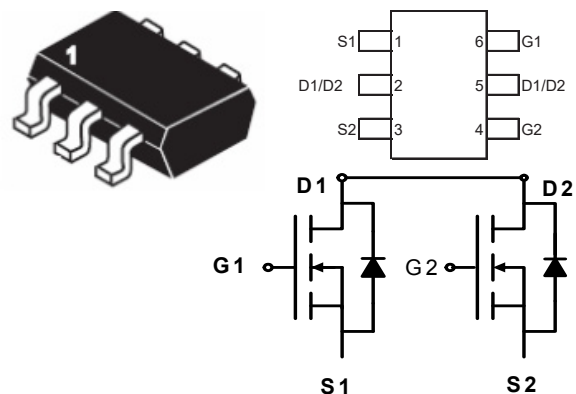
The RST8205 is the low RDSON trench N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.

It meets the RoHS and Green Product requirement with full function reliability approved.

Features

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology

SOT23-6L Pin Configuration



Product Summary

Product ID	Package	Marking	Qty(pcs)	V _{DSS}	R _{DS(on)}	I _D
RST8205	SOT23-6		3000	20V	22mΩ	6A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±10	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	5.5	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	2.75	A
I _{DM}	Pulsed Drain Current ²	22	A
EAS	Single Pulse Avalanche Energy ³	---	mJ
I _{AS}	Avalanche Current	---	A
P _D @T _C =25°C	Total Power Dissipation ⁴	1.19	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	100	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	---	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	---	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =4A	---	22	25	mΩ
		V _{GS} =2.5V, I _D =3A	---	28	37	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.7	1.2	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	---	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V, T _J =25°C	---	---	---	uA
		V _{DS} =40V, V _{GS} =0V, T _J =100°C	---	---	---	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±10V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =4A	---	9.5	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	---	---	Ω
Q _g	Total Gate Charge	V _{DS} =10V, I _D =4A, V _{GS} =4.5V	---	10.5	---	nC
Q _{gs}	Gate-Source Charge		---	2.19	---	
Q _{gd}	Gate-Drain Charge		---	2.37	---	
T _{d(on)}	Turn-On Delay Time	V _{GS} =4.5V, V _{DD} =10V, I _D =1A, R _{GEN} =10Ω	---	17	---	ns
T _r	Rise Time		---	4.75	---	
T _{d(off)}	Turn-Off Delay Time		---	41	---	
T _f	Fall Time		---	19	---	
C _{iss}	Input Capacitance	V _{DS} =8V, V _{GS} =0V, f=1MHz	---	570	---	pF
C _{oss}	Output Capacitance		---	313	---	
C _{rss}	Reverse Transfer Capacitance		---	133	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	2	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =2A, T _J =25°C	---	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _F =30A, di/dt=100A/μs, T _J =25°C	---	---	---	nS
Q _{rr}	Reverse Recovery Charge		---	---	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

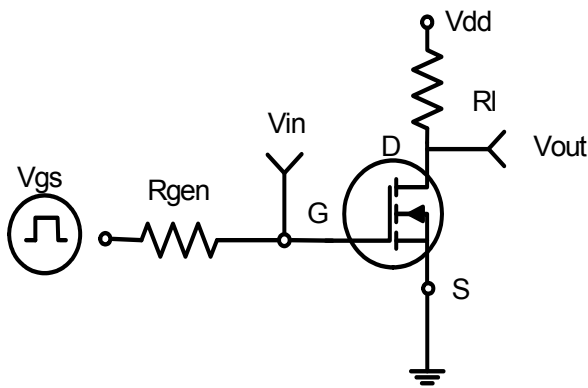


Figure 1: Switching Test Circuit

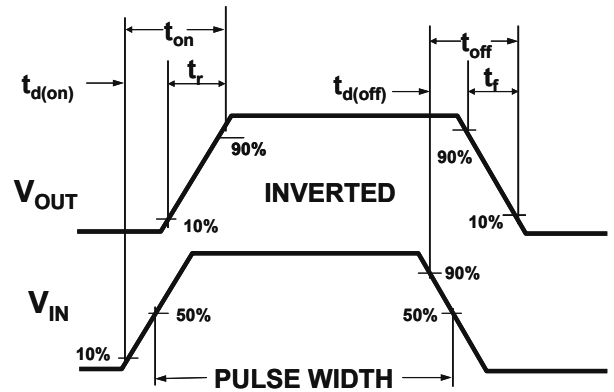


Figure 2: Switching Waveforms

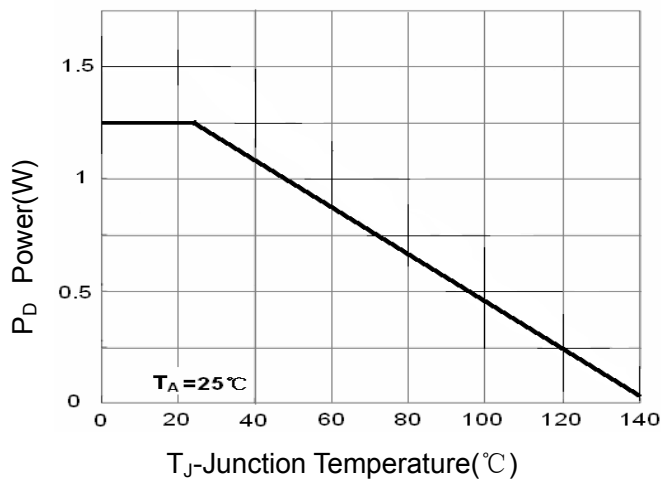


Figure 3 Power Dissipation

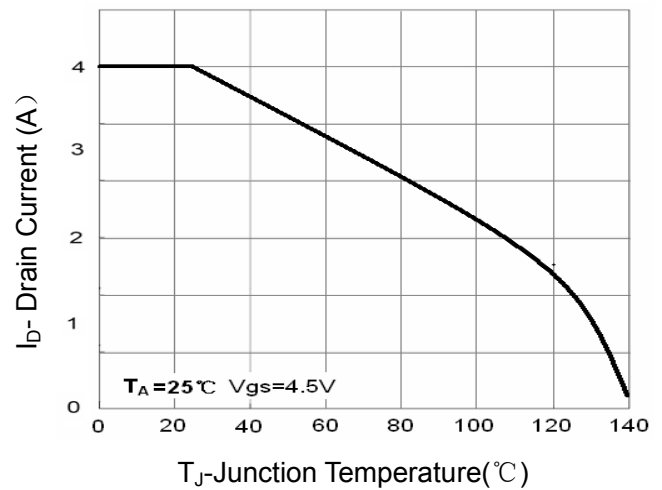


Figure 4 Drain Current

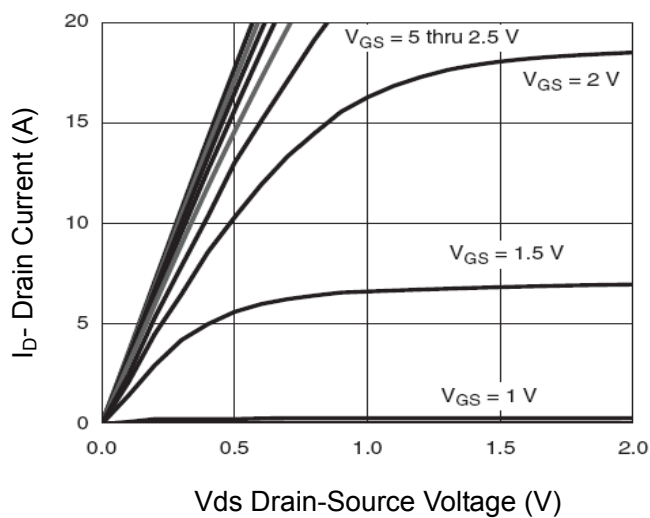


Figure 5 Output Characteristics

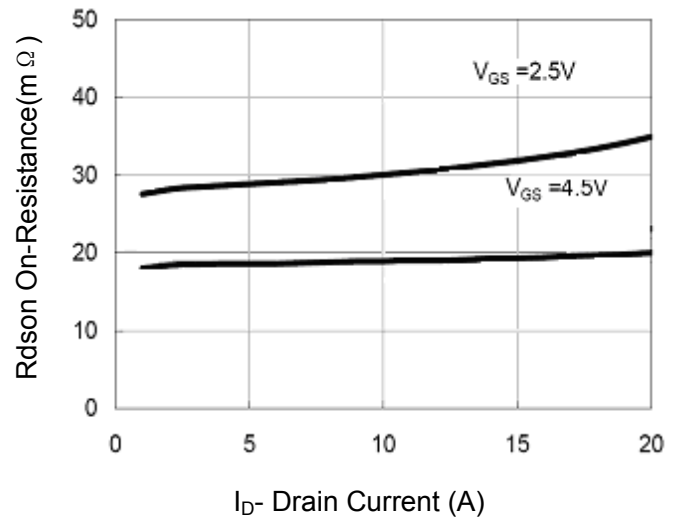


Figure 6 Drain-Source On-Resistance

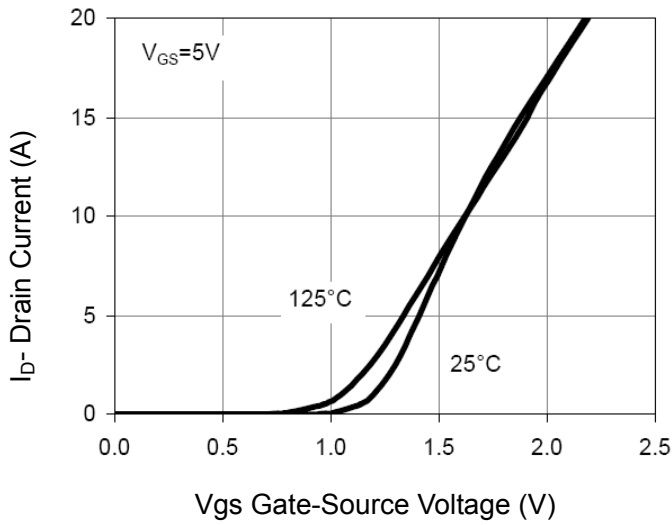


Figure 7 Transfer Characteristics

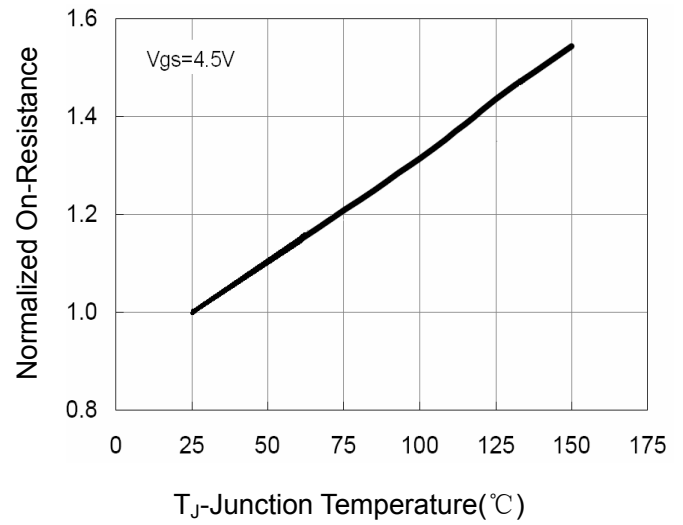


Figure 8 Drain-Source On-Resistance

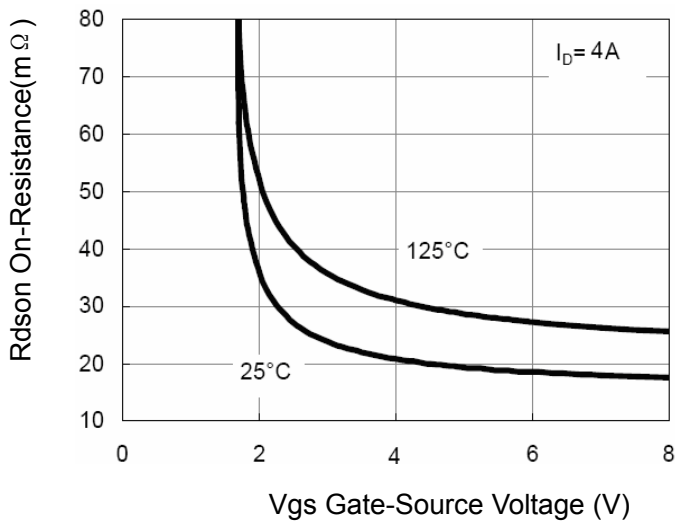


Figure 9 Rdson vs Vgs

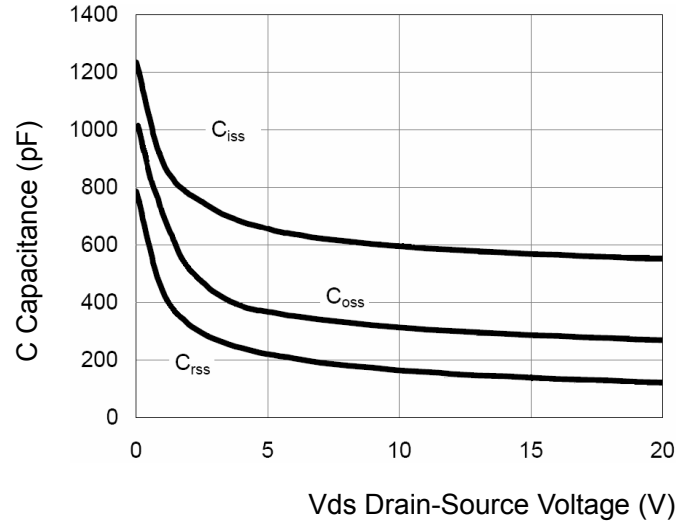


Figure 10 Capacitance vs Vds

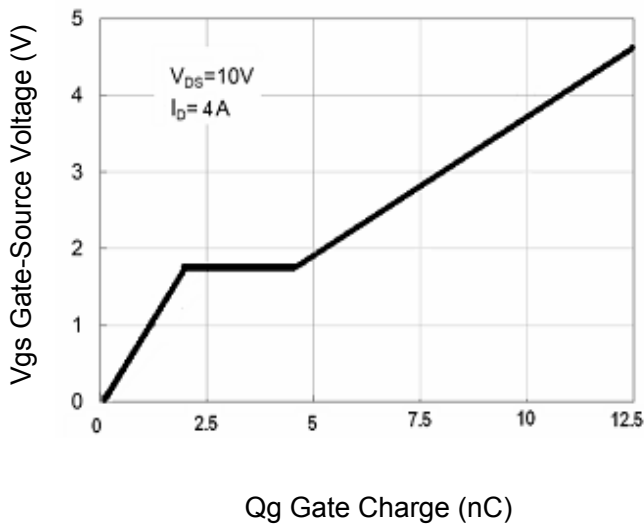


Figure 11 Gate Charge

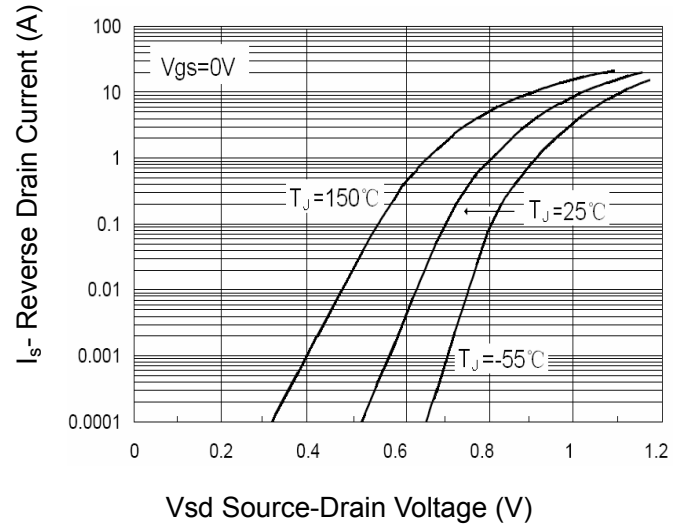


Figure 12 Source- Drain Diode Forward

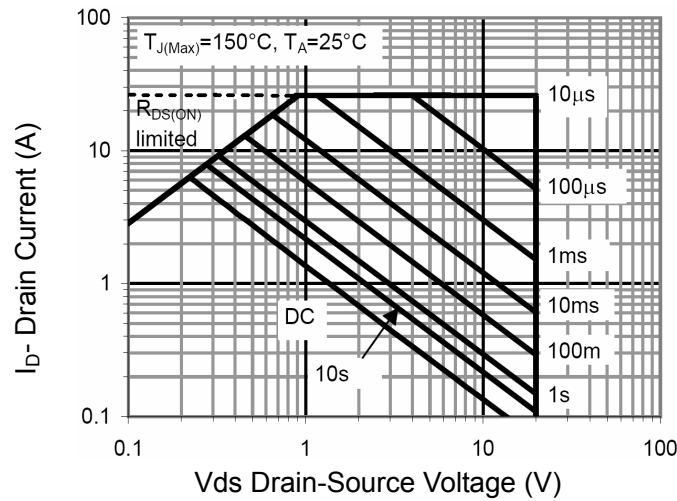


Figure 13 Safe Operation Area

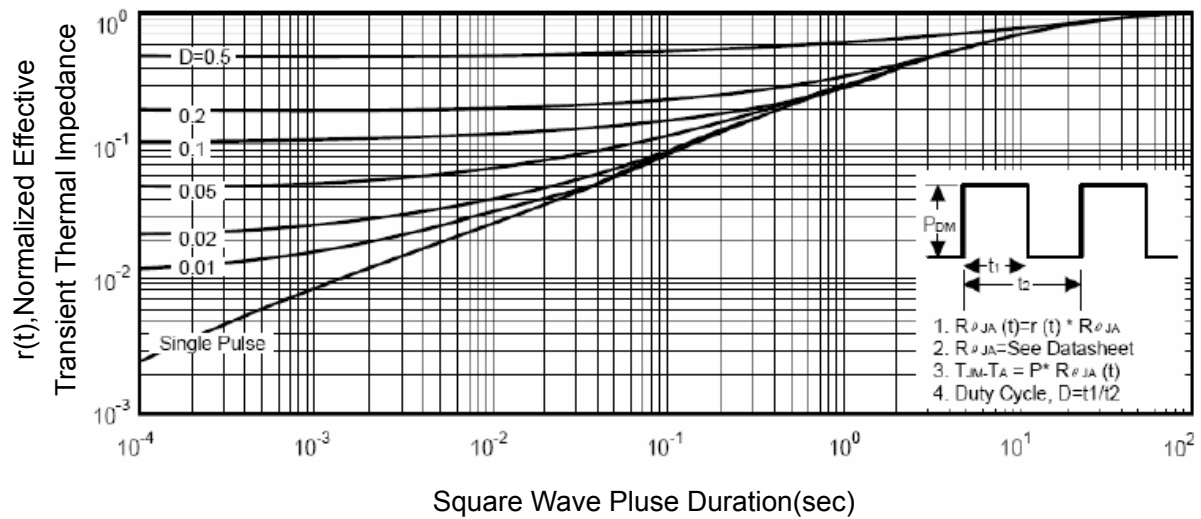
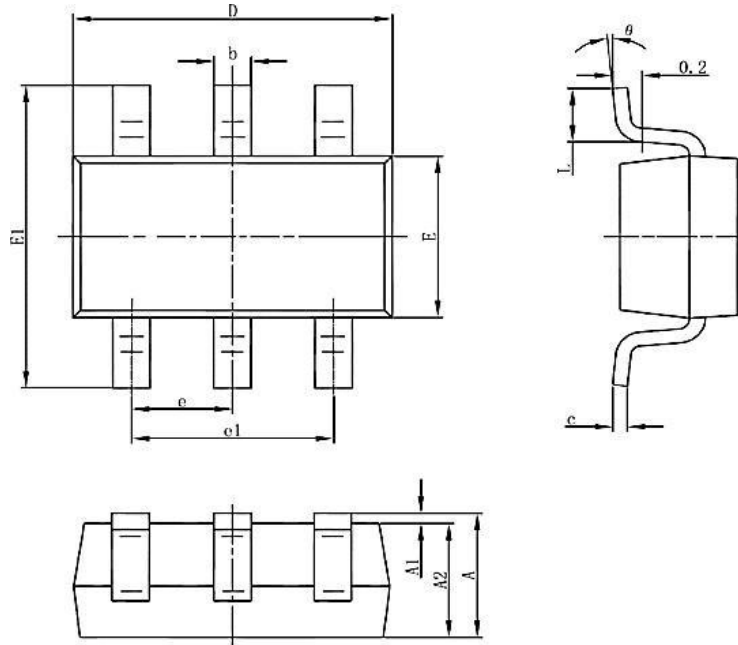


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
C	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 (BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0	8	0	8