Dual N-Channel Enhancement Power Mosfet

General Description

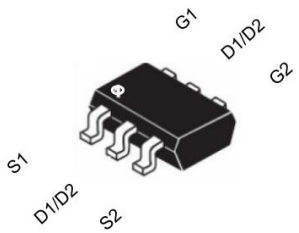
These This device uses advanced trench technology to provide excellent Rds(on),low gate charge and operation with gate voltages as low as 2.5V.

Features

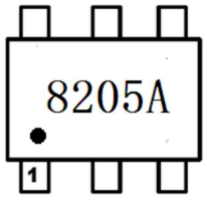
- V_{DS} = 20V,ID =6A
  $R_{DS(ON)}$,19.5mΩ (Typ) @ VGS =4.5V
  $R_{DS(ON)}$, 25mΩ (Typ) @ VGS =2.5V
- Trench Power Technology
- Low RDS(ON)
- Low Gate Charge
- Optimized for Fast-switching Applications

Application

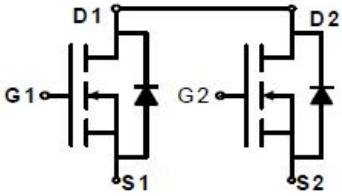
- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial



SOT23-6 top view



Marking and pin Assignment



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8205A	8205A	SOT23-6	233mm	8mm	3000

Absolute Maximum Ratings(TA=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±10	V
Drain Current-Continuous[Note3]	TC=25℃	I_D	6	A
	TC=70℃		4.8	A
Drain Current-Pulsed[Note1]		I_{DM}	24	A
Avalanche Energy[Note4]		E_{AS}	7.4	mJ
Maximum Power Dissipation	TC=25℃	P_D	1.5	W
Storage Temperature Range		T_{STG}	-55 to +150	℃
Operating Junction Temperature Range		T_J	-55 to +150	℃

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	14.4	-	℃/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	-	83	-	℃/W

Electrical Characteristics(TJ=25℃ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250uA	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	VGS(TH)	V_{DS}=V_{GS},I_{DS}=250uA	0.5	0.7	1.2	V
Drain-Source On-State Resistance	RDS(ON)	V_{GS}=4.5V,I_{DS}=3A	-	19.5	25	mΩ
		V_{GS}=2.5V,I_{DS}=3A	-	25	31.5	

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	VDS =10V, VGS = 0V, f=1MHz	-	466	-	pF
Output Capacitance	C_{oss}		-	65	-	
Reverse Transfer Capacitance	C_{rss}		-	58	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=4.5V,V_{Ds}=10V, R_{GEN}=2.5Ω I_D=6A	-	15	-	ns
Rise Time	t_r		-	17	-	
Turn-Off Delay Time	$T_{d(off)}$		-	42	-	
Fall Time	t_f		-	10	-	
Total Gate Charge at 10V	Q_g	V_{DS}=10V,I_{DS}=6A, V_{GS}=10V	-	5.7	-	nC
Gate to Source Gate Charge	Q_{gs}		-	0.8	-	
Gate to Drain“Miller”Charge	Q_{gd}		-	1.4	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{DS}=6A	-	-	1.2	V

Notes:

1: Repetitive rating, pulse width limited by maximum junction temperature.

2: Surface mounted on FR4 Board, t≤10sec.

3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

4: EAS condition: VDD=20V,VG=10V,V_{GATE}=20V,Start T_J=25℃.

Typical Performance Characteristics

Figure 1. Output Characteristics

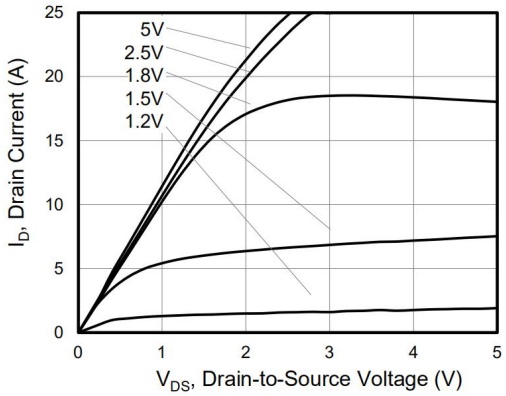


Figure 2. Transfer Characteristics

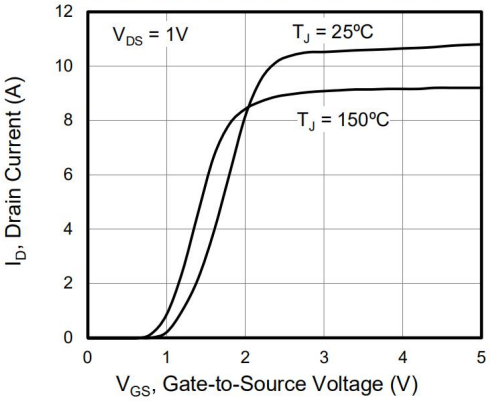


Figure 3. On-Resistance vs. Drain Current

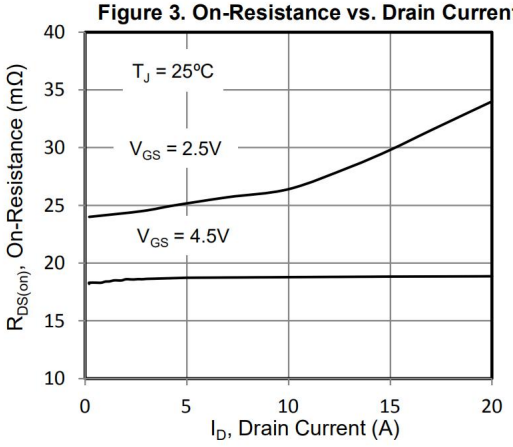


Figure 4. Capacitance

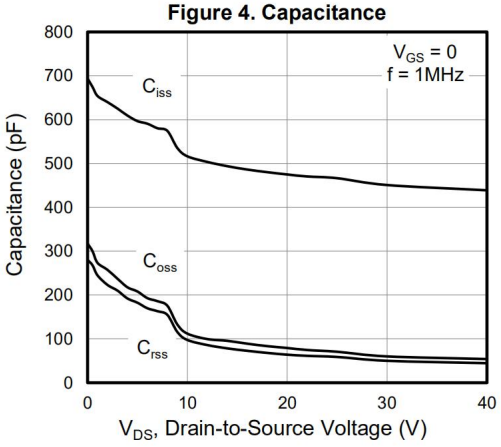


Figure 5. Gate Charge

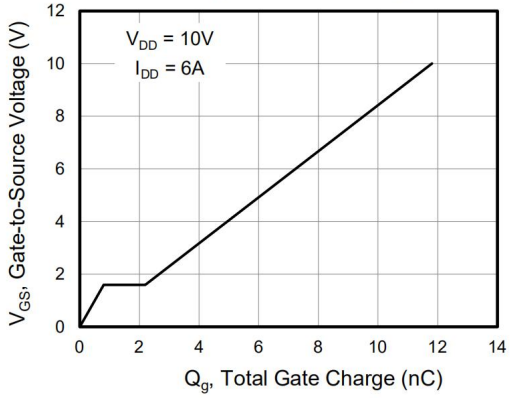


Figure 6. Body Diode Forward Voltage

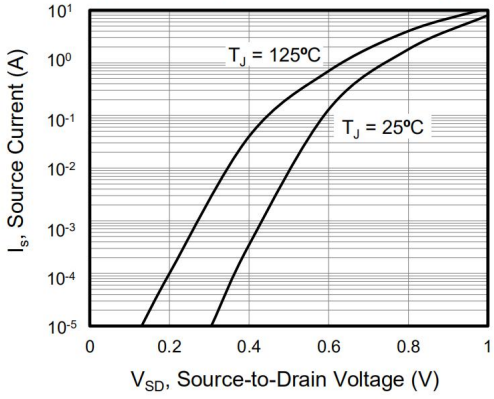


Figure 7. On-Resistance vs. Junction Temperature

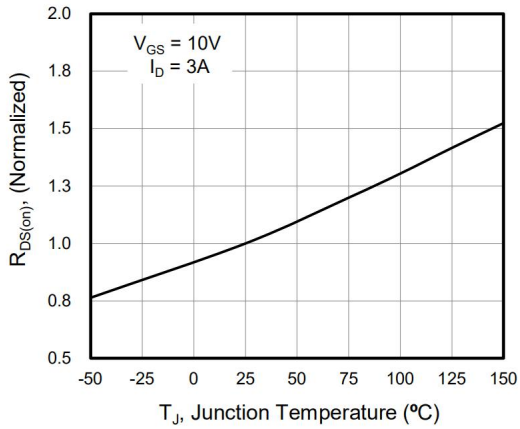


Figure 8. Threshold Voltage vs. Junction Temperature

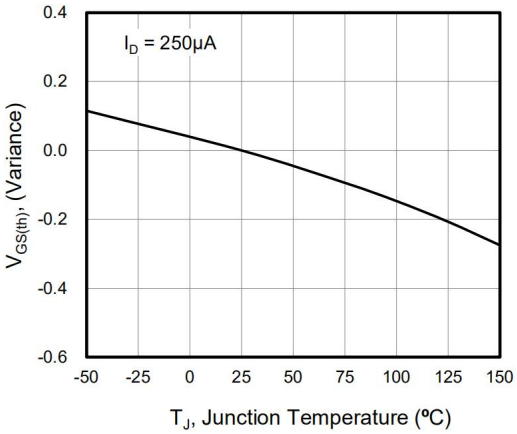


Figure 9. Transient Thermal Impedance

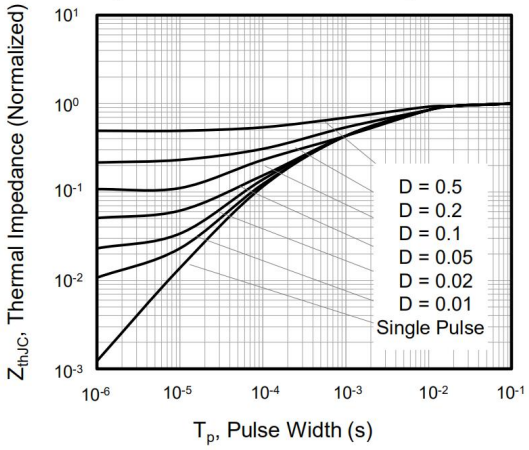


Figure 10. Safe operation area

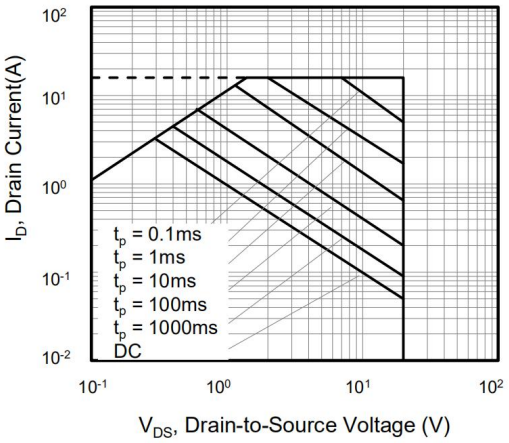


Figure A：Gate Charge Test Circuit and Waveform

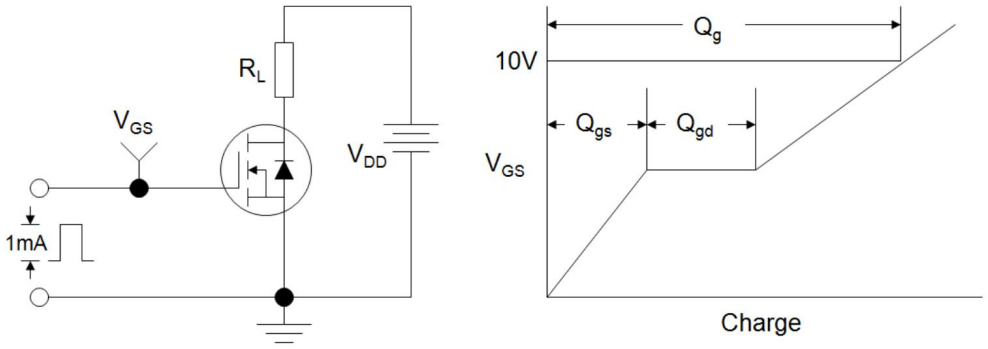


Figure B：Resistive Switching Test Circuit and Waveform

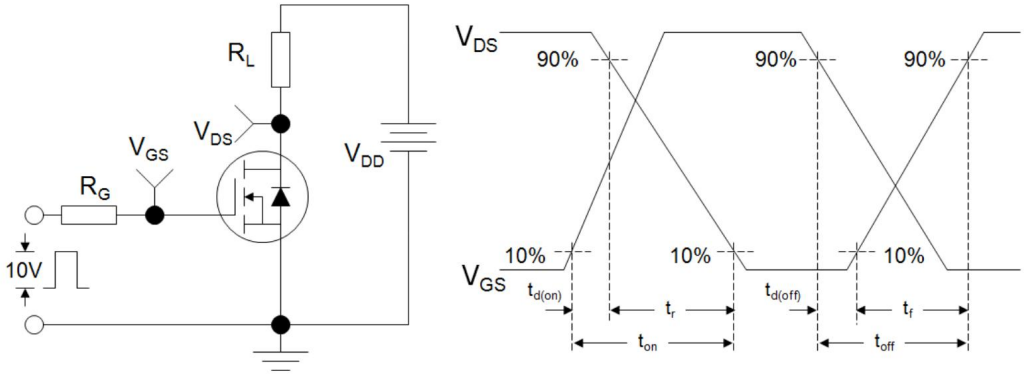
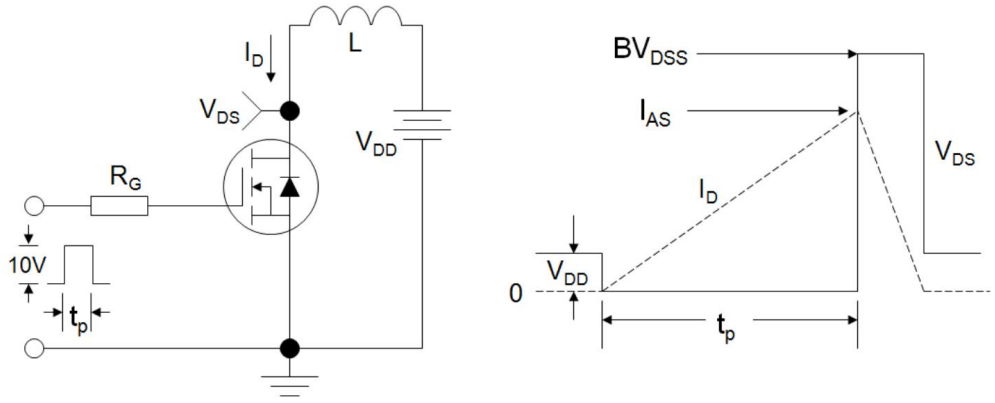


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



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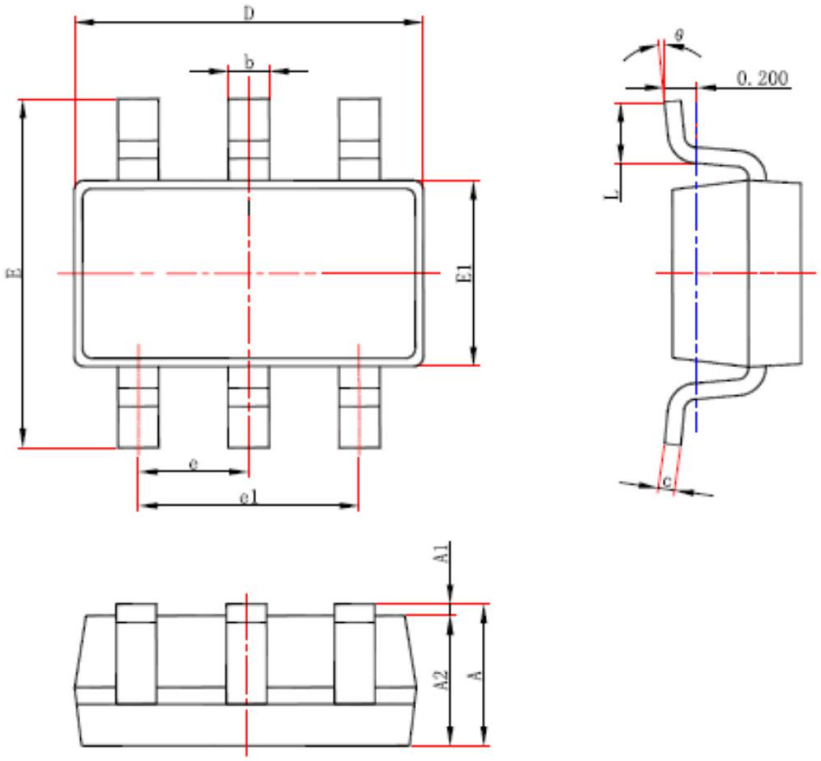

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		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°