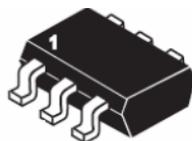
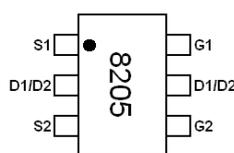
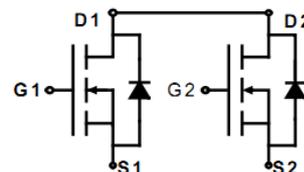


Main Product Characteristics:

V_{DSS}	20V
$R_{DS(on)}$	20.6m Ω (typ.)
I_D	4A


SOT23-6

Marking and Pin Assignment

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest 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 power switching application and a wide variety of other applications.

Absolute max Rating:

Symbol	Parameter	Max.	Units
I_D @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ①	4	A
I_{DM}	Pulsed Drain Current ②	25	
P_D @ $T_C = 25^\circ\text{C}$	Power Dissipation ③	1.5	W
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 10	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

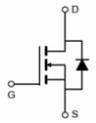
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R _{θJA}	Junction-to-ambient (t ≤ 10s) ④	—	100	°C/W

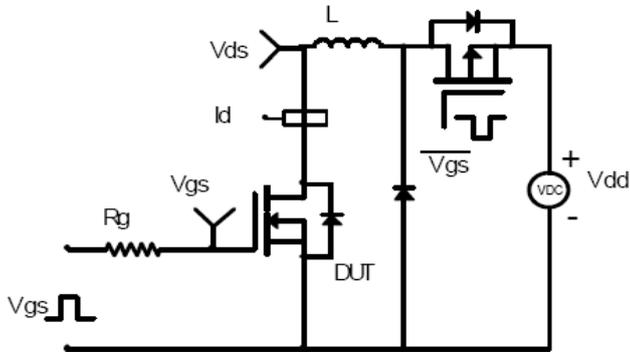
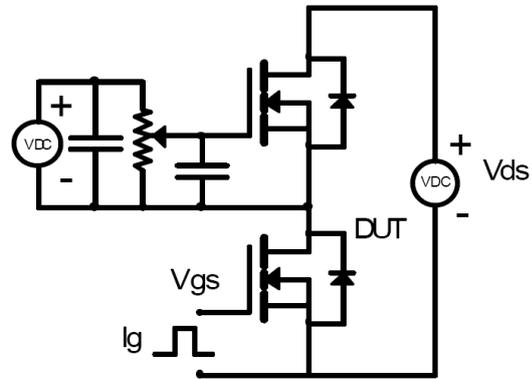
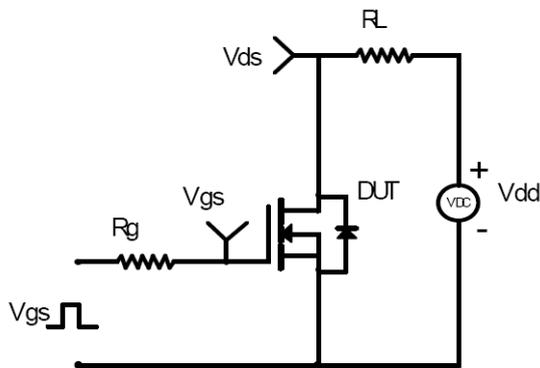
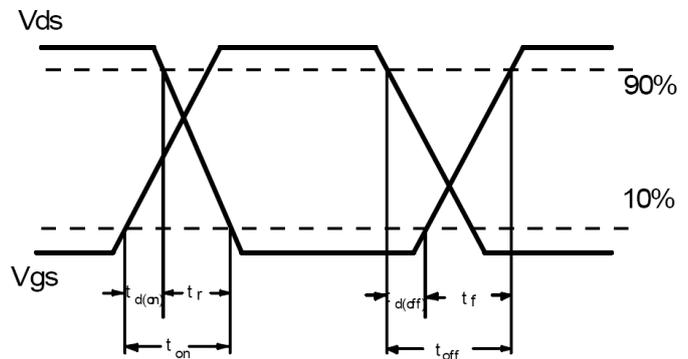
Electrical Characterizes @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	20	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	20.6	30	mΩ	V _{GS} =4V, I _D =4A
		—	24.5	45		V _{GS} =2.5V, I _D =3A
V _{GS(th)}	Gate threshold voltage	0.5	—	1.2	V	V _{DS} = V _{GS} , I _D =250μA
I _{DSS}	Drain-to-Source leakage current	—	—	1	μA	V _{DS} =20V, V _{GS} = 0V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} =10V
		—	—	-100		V _{GS} = -10V
Q _g	Total gate charge	—	10	—	nC	I _D = 4A, V _{DS} =10V, V _{GS} = 4.5V
Q _{gs}	Gate-to-Source charge	—	2.1	—		
Q _{gd}	Gate-to-Drain("Miller") charge	—	2.2	—		
t _{d(on)}	Turn-on delay time	—	8	—	ns	V _{GS} =4V, V _{DS} =10V, R _{GEN} =10Ω I _D = 1A
t _r	Rise time	—	12.2	—		
t _{d(off)}	Turn-Off delay time	—	11.5	—		
t _f	Fall time	—	1.8	—		
C _{iss}	Input capacitance	—	411	—	pF	V _{GS} = 0V V _{DS} = 8V f = 1MHz
C _{oss}	Output capacitance	—	116	—		
C _{riss}	Reverse transfer capacitance	—	83	—		

Source-Drain Ratings and Characteristics

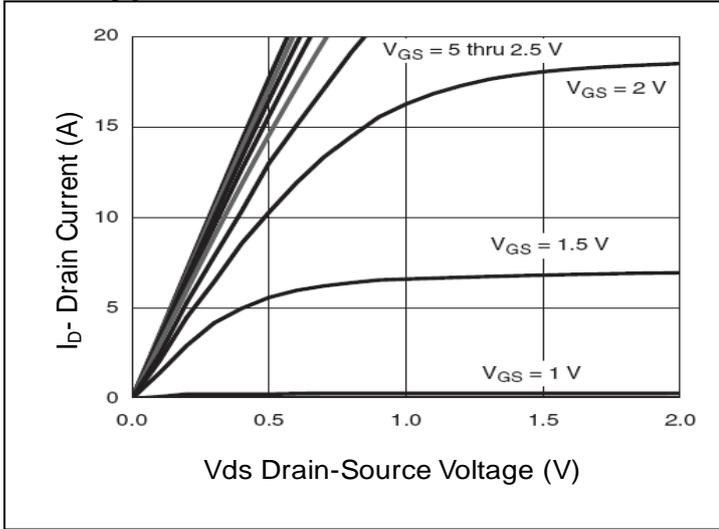
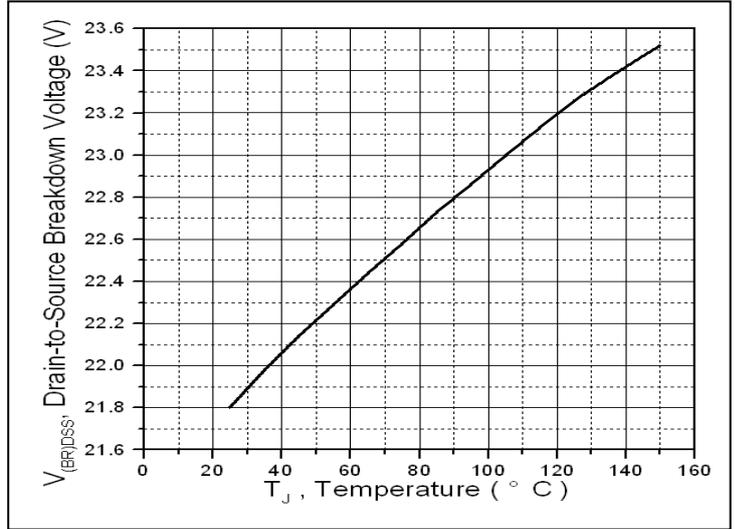
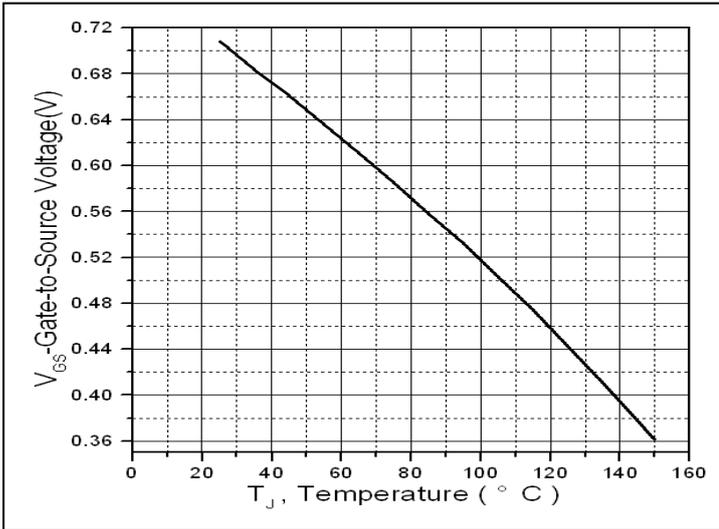
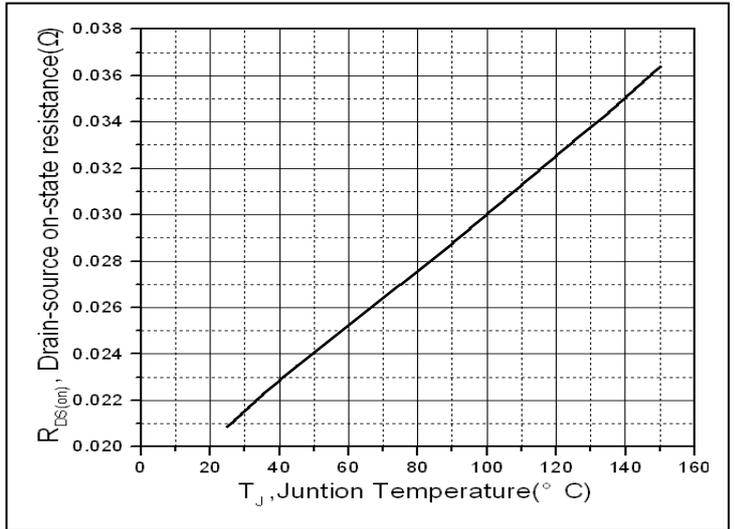
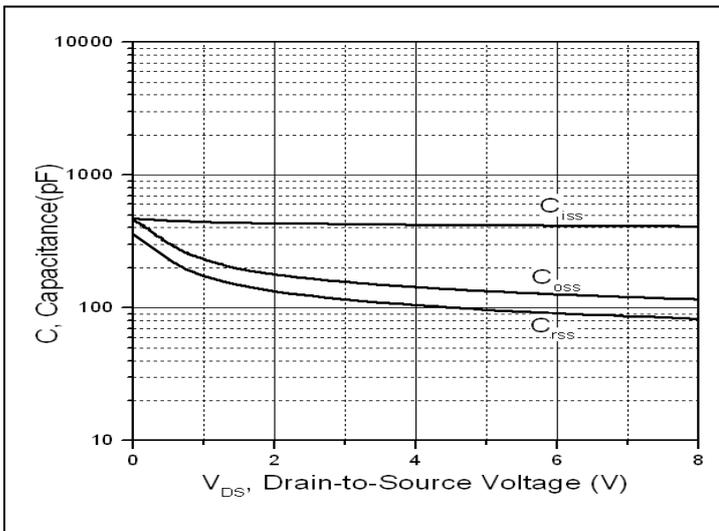
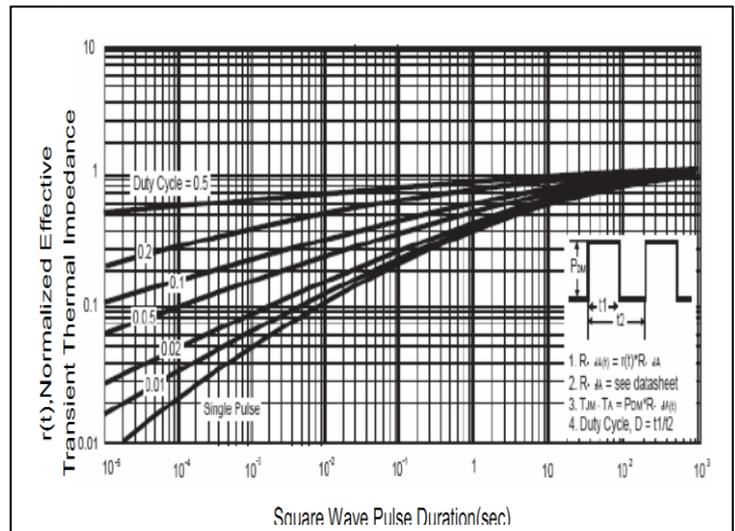
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	2	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V _{SD}	Diode Forward Voltage	—	0.8	1.2	V	I _S =2A, V _{GS} =0V

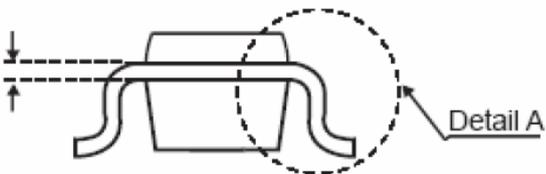
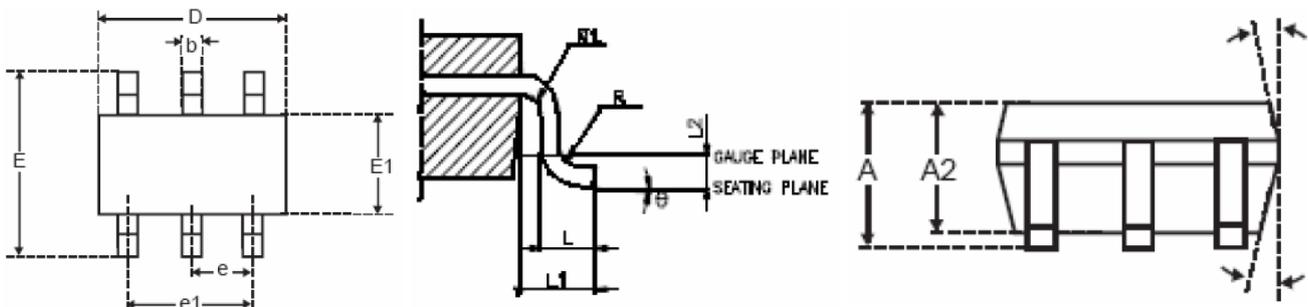
Test circuits and Waveforms

EAS Test Circuit:

Gate charge test circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical electrical and thermal characteristics

Figure 1: Typical Output Characteristics

Figure 2: Drain-to-Source Breakdown Voltage vs. Temperature

Figure 3: Gate to source cut-off voltage

Figure 4: Normalized On-Resistance Vs. Case Temperature

Figure 5: Capacitance

Figure 6: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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.

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