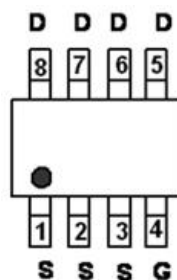
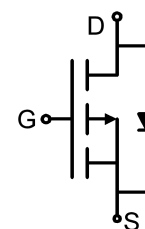


**Main Product Characteristics:**

$V_{DSS}$	-40V
$R_{DS(on)}$	11.6m $\Omega$ (typ.)
$I_D$	-13A ①


**SOP-8**

**Pin Assignments**

**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 ①	-13	A
$I_{DM}$	Pulsed Drain Current ②	-52	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	4	W
$V_{DS}$	Drain-Source Voltage	-40	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy @ L=0.5mH	128	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

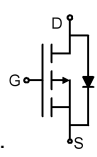
## Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient ( $t \leq 10s$ ) ④	—	31.2	$^{\circ}C/W$

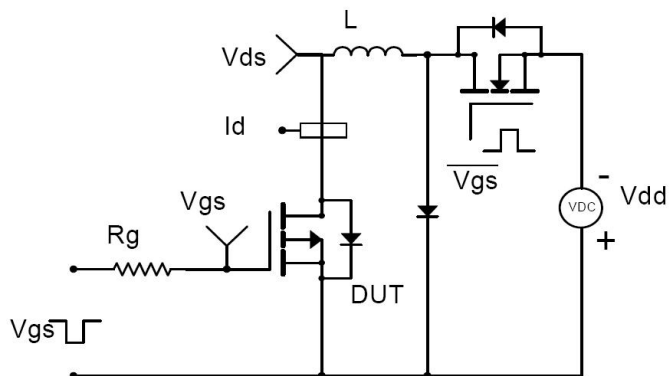
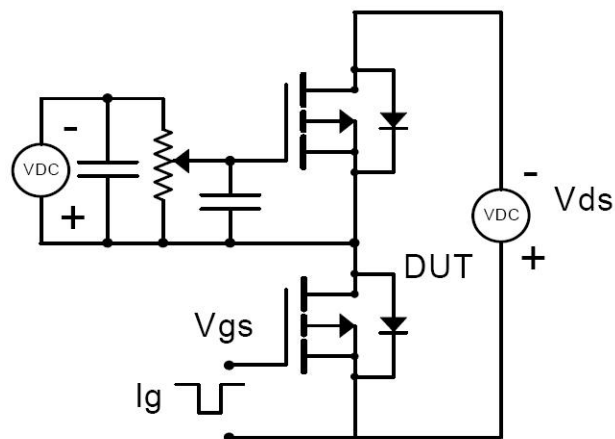
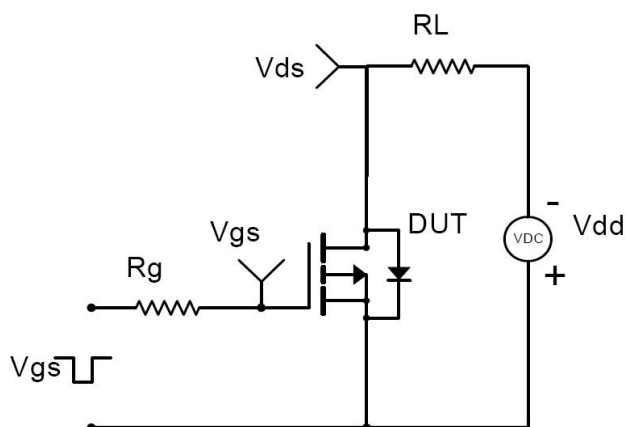
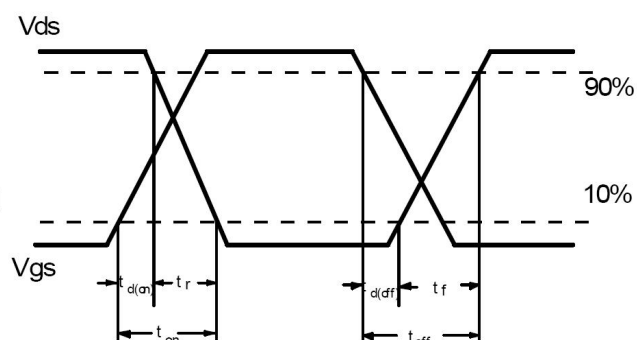
## Electrical Characterizes @ $T_A=25^{\circ}C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-40	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	11.6	15	$m\Omega$	$V_{GS}=-10V, I_D = -10A$
		—	15	22	$m\Omega$	$V_{GS}=-4.5V, I_D = -8A$
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2.5	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	-1	$\mu A$	$V_{DS} = -40V, V_{GS} = 0V$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
$Q_g$	Total gate charge	—	20	—	nC	$I_D = -10A,$ $V_{DS}=-32V,$ $V_{GS} = -4.5V$
$Q_{gs}$	Gate-to-Source charge	—	8	—		
$Q_{gd}$	Gate-to-Drain("Miller") charge	—	8.5	—		
$t_{d(on)}$	Turn-on delay time	—	21.8	—	ns	$V_{GS}=-10V, V_{DS} =-20V,$ $R_{GEN}=3\Omega, I_D =-20A$
$t_r$	Rise time	—	87.2	—		
$t_{d(off)}$	Turn-Off delay time	—	49.5	—		
$t_f$	Fall time	—	54.8	—		
$C_{iss}$	Input capacitance	—	3860	—	pF	$V_{GS} = 0V$ $V_{DS} = -25V$ $f = 1MHz$
$C_{oss}$	Output capacitance	—	250	—		
$C_{rss}$	Reverse transfer capacitance	—	240	—		

## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode) ①	—	—	-13	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	-52	A	
$V_{SD}$	Diode Forward Voltage	—	—	-1.2	V	$I_S=-1A, V_{GS}=0V$

## 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

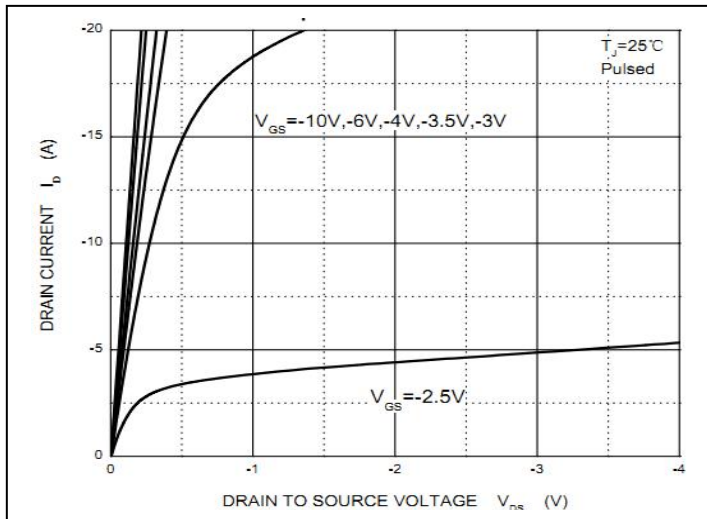


Figure 1. Typical Output Characteristics

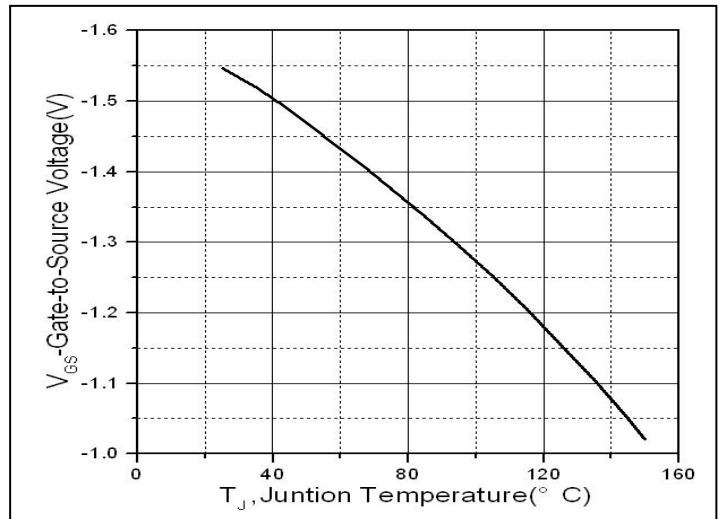


Figure 2. Normalized  $V_{GS(th)}$  vs. Junction Temperature

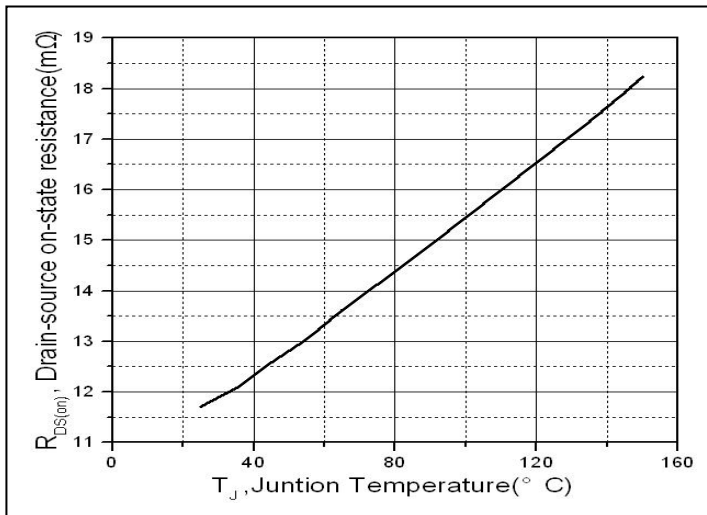


Figure 3. Normalized On-Resistance vs. Junction Temperature

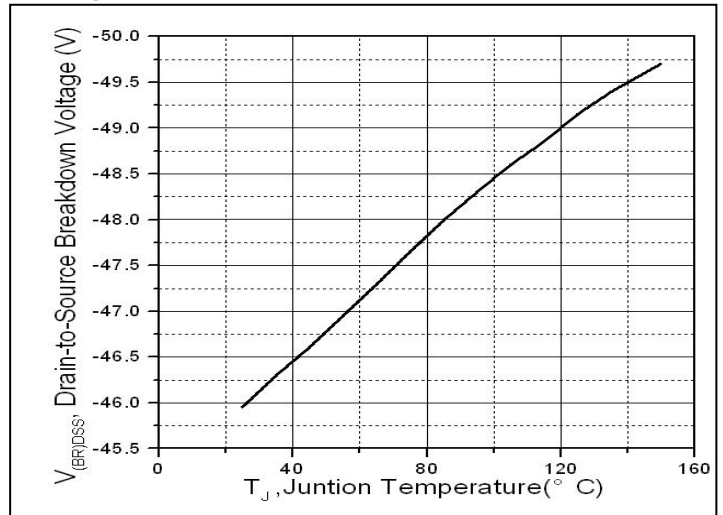


Figure 4. Drain-to-Source Breakdown Voltage vs. Junction Temperature

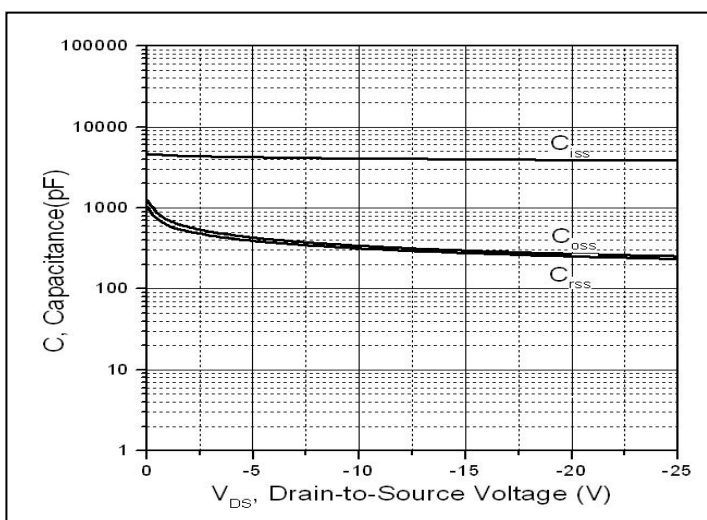


Figure 5. Capacitance Characteristics

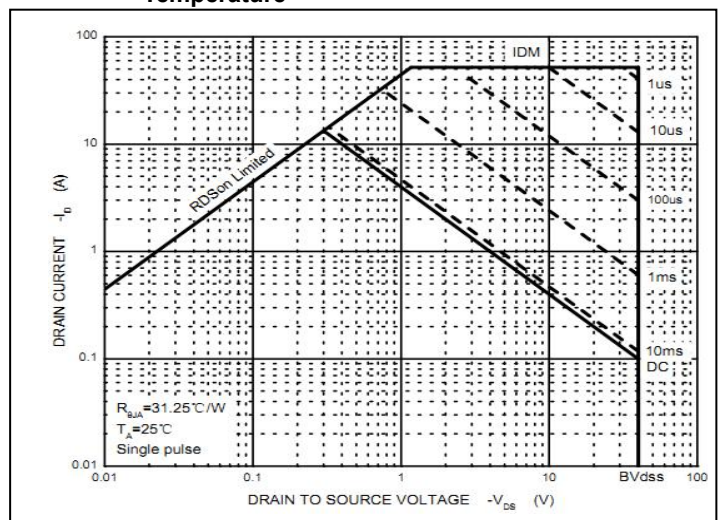
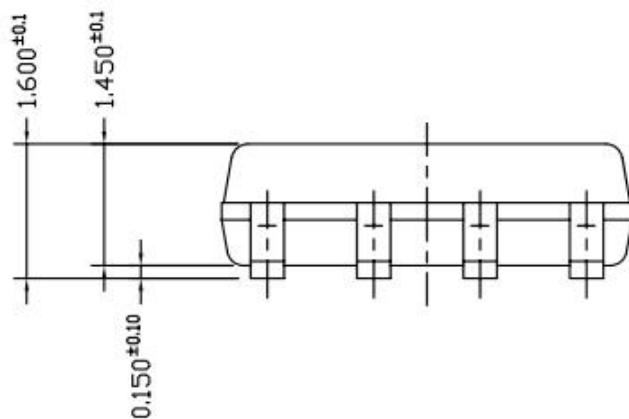
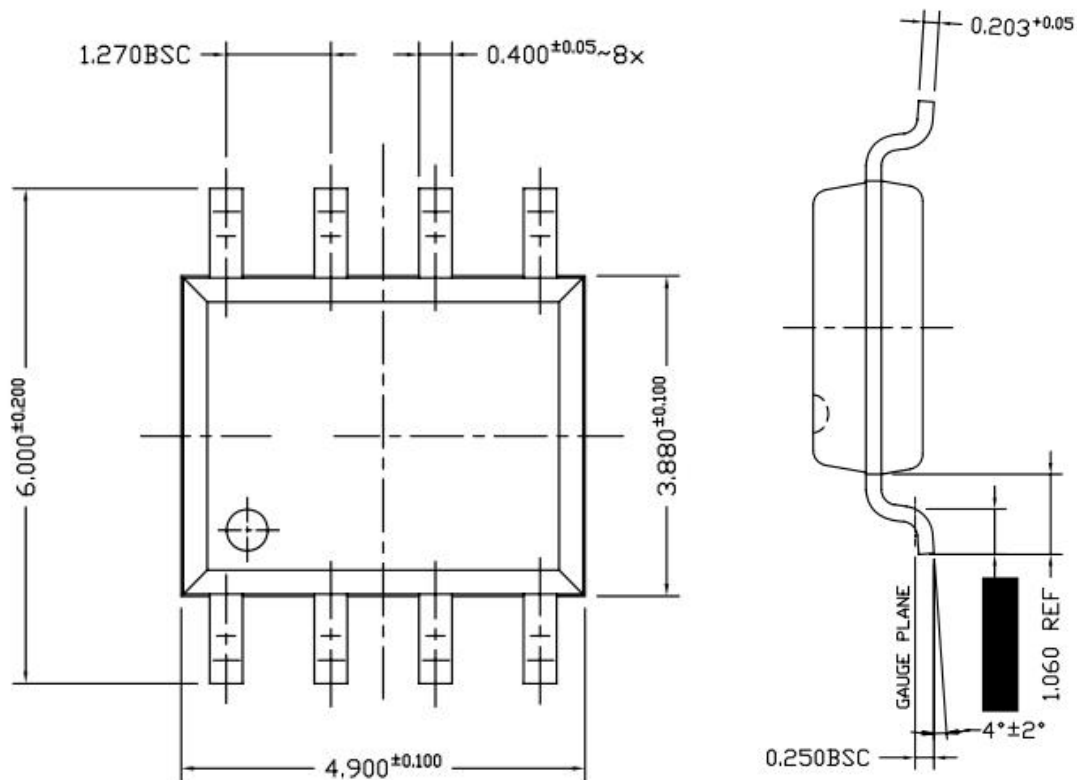


Figure 6. Safe Operation Area

**Mechanical Data:**

SOP-8 Package Outline (Unit:mm)



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