

## 15V P-Channel MOSFET

- Features**

-15V/±8V. 11A ,

$R_{DS(ON)} = 15m\Omega @V_{GS} = -4.5V$

$R_{DS(ON)} = 20m\Omega @V_{GS} = -2.5V$

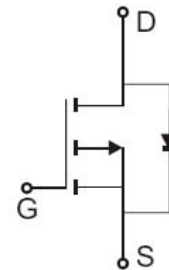
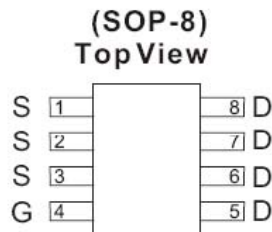
$R_{DS(ON)} = 27m\Omega @V_{GS} = -1.8V$

Lead Free Available (RoHS Compliant)

- General Description**

The FS2235 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . this device is well suited for high current load applications.

- Pin Configuration**



- Absolute Maximum Ratings  $T_A=25^{\circ}C$  unless otherwise noted**

Absolute Maximum Ratings ( $T_A=25$ Unless Otherwise Noted)			
Parameter	Symbol	Limits	Units
Drain-Source Voltage	$V_{DS}$	-15	V
Gate-Source Voltage	$V_{GS}$	±8	V
MAX Continuous Drain Current	$I_D$	-11	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-20	A
Maximum Power Dissipation	$P_D$	$T_A=25$	3
		$T_A=70$	2.1
Operating Junction Temperature	$T_J$	-55 to 150	$^{\circ}C$
Junction-to-Case Thermal Resistance	$R_{JC}$	30	/W
Junction-to-Ambient Thermal Resistance (PCB mounted) <sup>2)</sup>	$R_{JA}$	50	/W

Notes: 1.Maximum DC current limited by the package 2.1-in2 2oz Cu PCB board

## ● Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC</b>						
B <sub>VDS</sub>	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\text{ A}$	-15			V
R <sub>DS(on)</sub>	Drain-Source On-Resistance	$V_{GS} = -4.5V, I_D = -11A$		12	15	mΩ
		$V_{GS} = -2.5V, I_D = -10A$		17	20	
		$V_{GS} = -1.8V, I_D = -6A$		20	27	
V <sub>GS(th)</sub>	Gate-Threshold Voltage	$V_{GS}=V_{GS}, I_D=-250\text{ A}$	-0.5	-0.7	-0.9	V
I <sub>GSS</sub>	Gate-Body Leakage	$V_{GS} = +8V, V_{DS} = 0V$			+100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	$V_{DS} = -15V, V_{GS} = 0V$			-1	A
g <sub>FS</sub>	Forward Transconductance	$V_{DS} = -5V, I_D = -11A$		30		S
<b>DYNAMIC</b>						
Q <sub>g</sub>	Total Gate Charge	$V_{DS}=-15V, I_D=-5A, V_{GS}=-8V$		45		nC
Q <sub>gs</sub>	Gate-Source Charge			10		
Q <sub>gd</sub>	Gate-Drain Charge			8		
t <sub>D(on)</sub>	Turn-On Delay Time	$V_{DD} = -15V, R_L = 15\ \Omega, I_D = -1A,$ $V_{GEN} = -8V, R_G = 6\ \Omega$		30		ns
t <sub>r</sub>	Turn-On Rise Time			22		
t <sub>D(off)</sub>	Turn-Off Delay Time			80		
t <sub>f</sub>	Turn-Off Fall Time			34		

A: 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  $T_A = 25^\circ\text{C}$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA}$  and the maximum allowed junction temperature of  $150^\circ\text{C}$ . The value in any given application depends on the user's specific board design, and the maximum temperature of  $175^\circ\text{C}$  may be used if the PCB allows it.

B: The power dissipation  $P_D$  is based on  $T_{J(MAX)}=175^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=175^\circ\text{C}$ .

D: The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to case  $R_{\theta JC}$  and case to ambient.

E: The static characteristics in Figures 1 to 6 are obtained using  $<300\ \mu\text{s}$  pulses, duty cycle 0.5% max.

F: These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)}=175^\circ\text{C}$ .

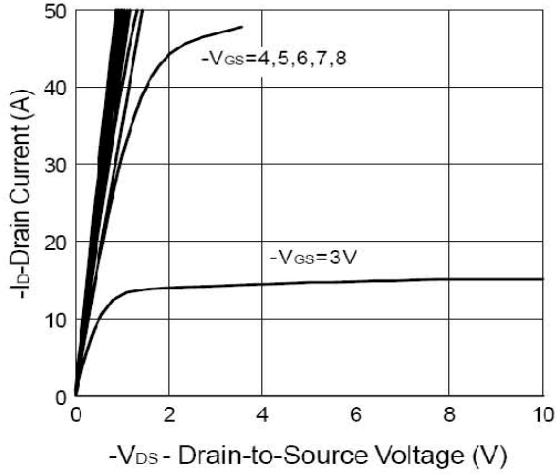
G: The maximum current rating is limited by bond-wires.

H: These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The SOA curve provides a single pulse rating.

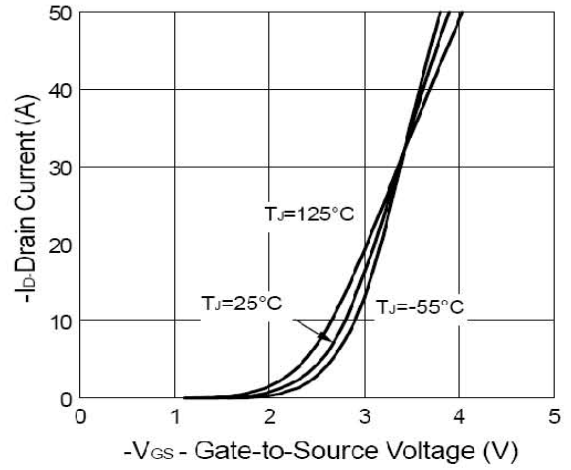
\*This device is guaranteed green after data code 8X11 (Sep 1<sup>ST</sup> 2008).

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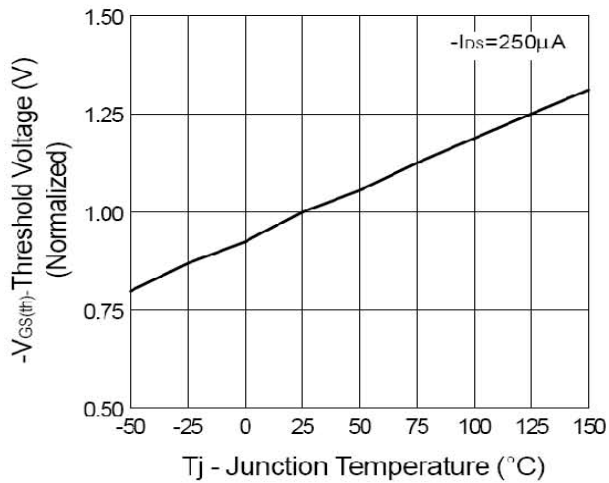
Output Characteristics



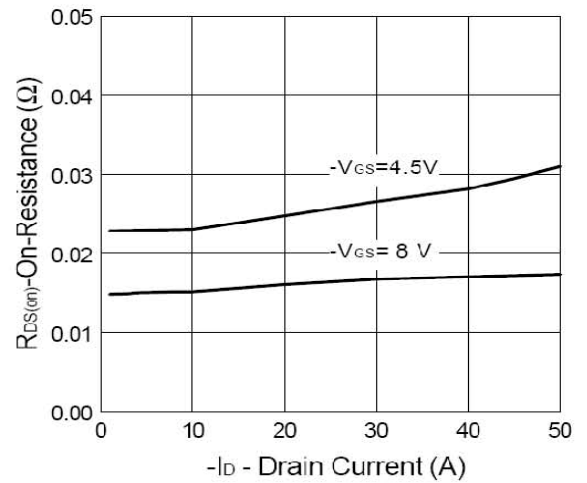
Transfer Characteristics



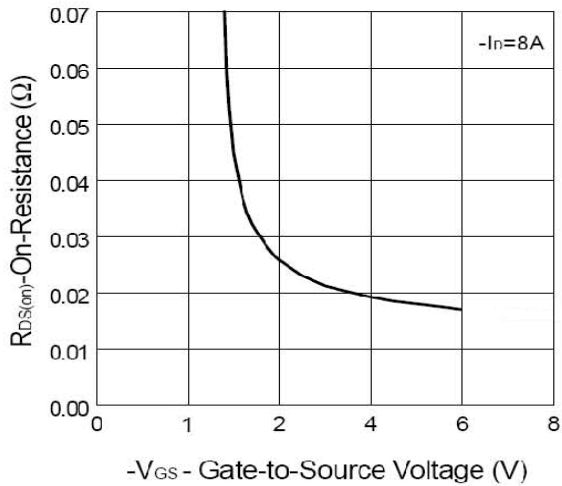
Threshold Voltage vs. Junction Temperature



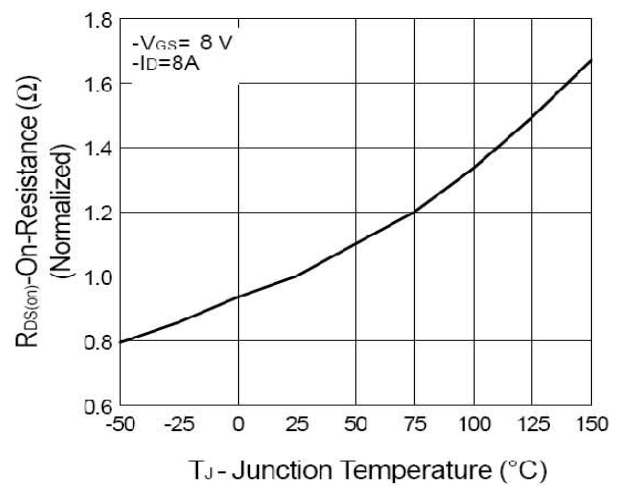
On-Resistance vs. Drain Current



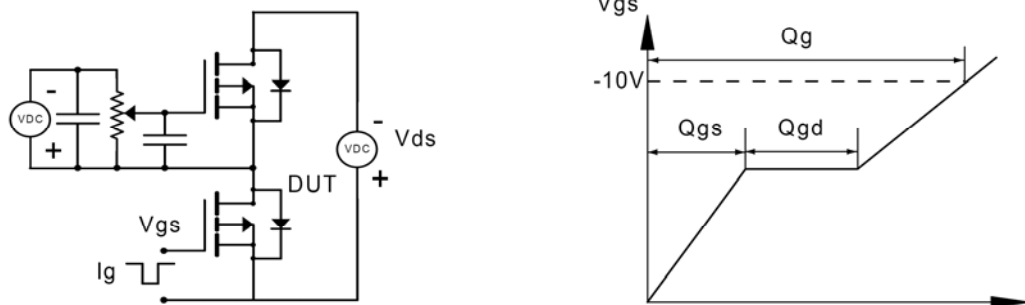
On-Resistance vs. Gate-to-Source Voltage



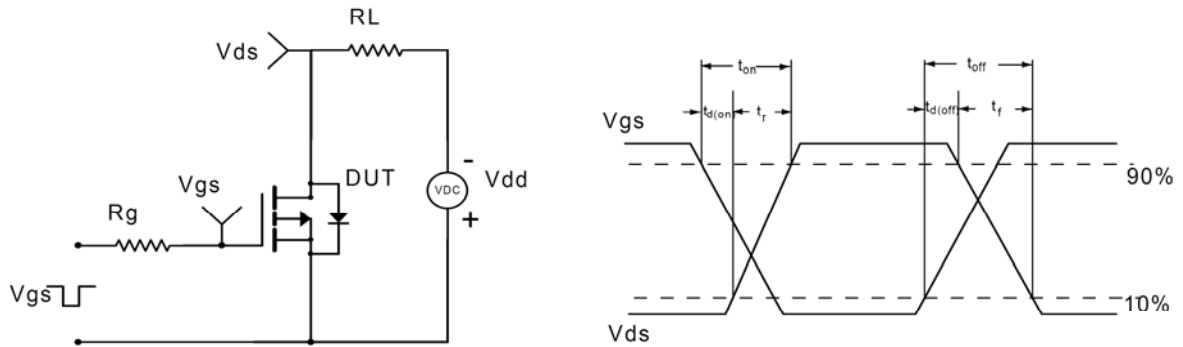
On-Resistance vs. Junction Temperature



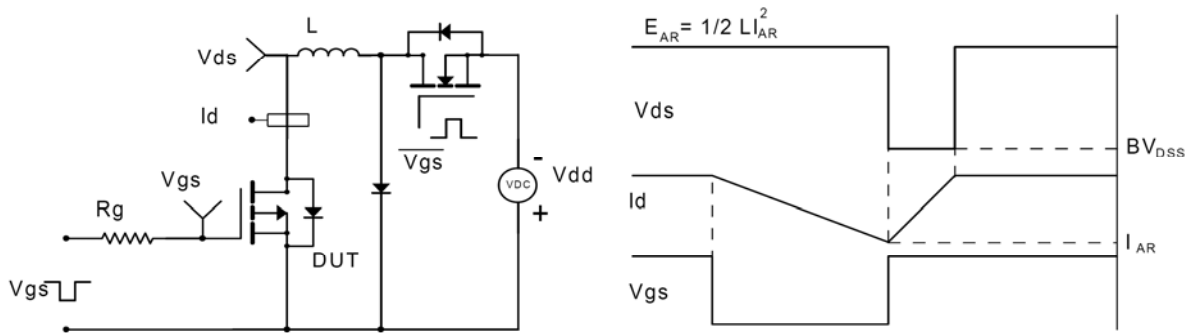
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

