

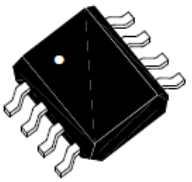
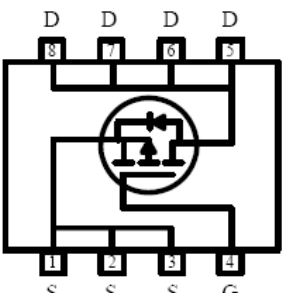
## P-Channel Enhancement-Mode MOSFET (-30V, -9.1A)

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(on)</sub> (m-ohm) Max
-30V	-9.1A	20 @ V <sub>GS</sub> = -10V, I <sub>D</sub> = -9.1A
		35 @ V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6.9A

### ◆ Features




- 1、 Advanced Trench Process Technology.
- 2、 High Density Cell Design for Ultra Low On-Resistance.
- 3、 Lead free product is acquired.
- 4、 Surface mount Package.
- 5、 RoHS Compliant.

**Pin 1 / 2 / 3: Source**  
**Pin 4: Gate**  
**Pin 5 / 6 / 7 / 8: Drain**

**SOP-8**

### ◆ Ordering Information

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		4	1/2/3	5/6/7/8	
SM4435PRL	SM4435PRG	SOP-8	G	S	D	Tape Reel
<p style="font-size: 1.2em; margin: 0;">SM4435X X X</p> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="text-align: center;"> <p>(1) Package Type</p>  </div> <div style="text-align: center;"> <p>(2) Packing Type</p>  </div> <div style="text-align: center;"> <p>(3) Lead Free</p>  </div> </div>			<p>(1) P: SOP-8</p> <p>(2) R: Tape Reel</p> <p>(3) G: Halogen Free; L: Lead Free</p>			



## ◆ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current (Continuous)	-9.1	A
$I_{DM}$	Drain Current (Pulsed) <sup>a</sup>	-36	A
$P_D$	Total Power Dissipation @ $T_A=25^\circ\text{C}$	2.5	W
$I_S$	Maximum Diode Forward Current	-2.1	A
$T_j, T_{stg}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{qJA}$	Thermal Resistance Junction to Ambient (PCB mounted) <sup>b</sup>	50	$^\circ\text{C/W}$

a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

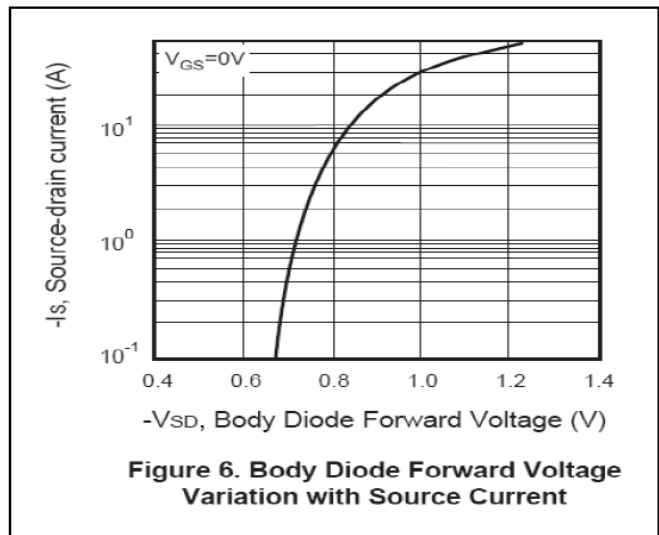
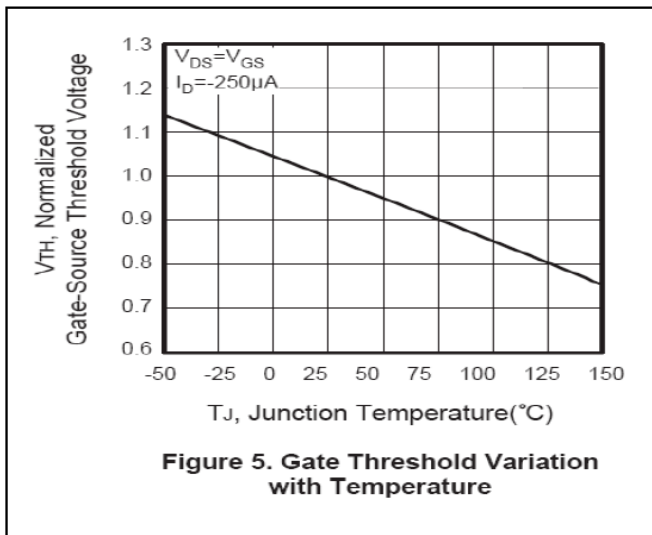
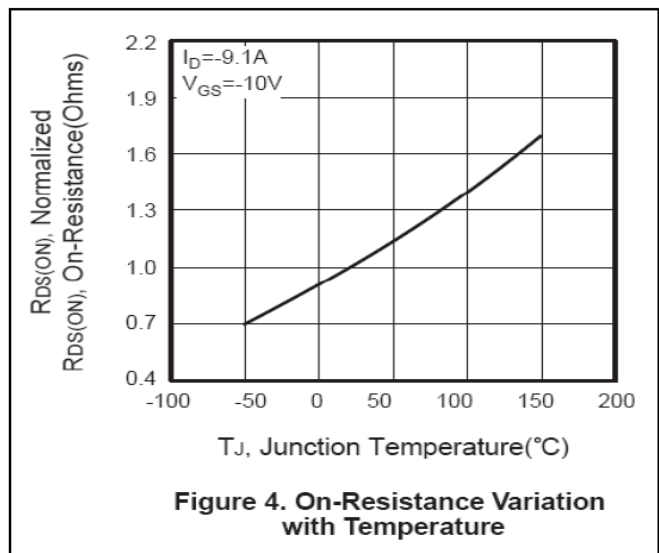
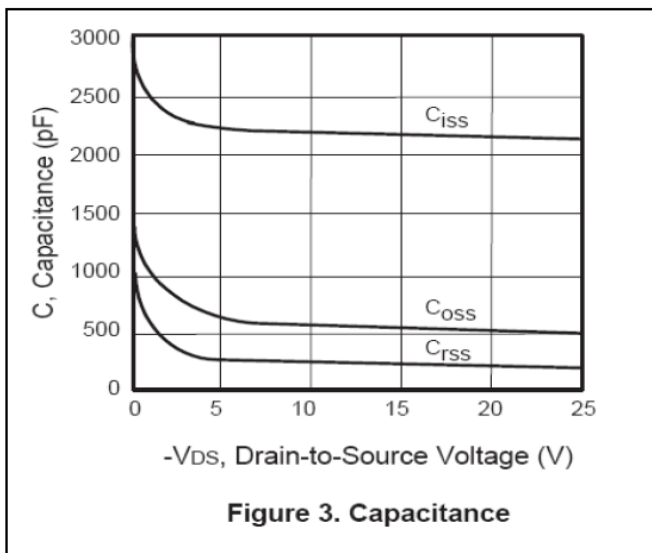
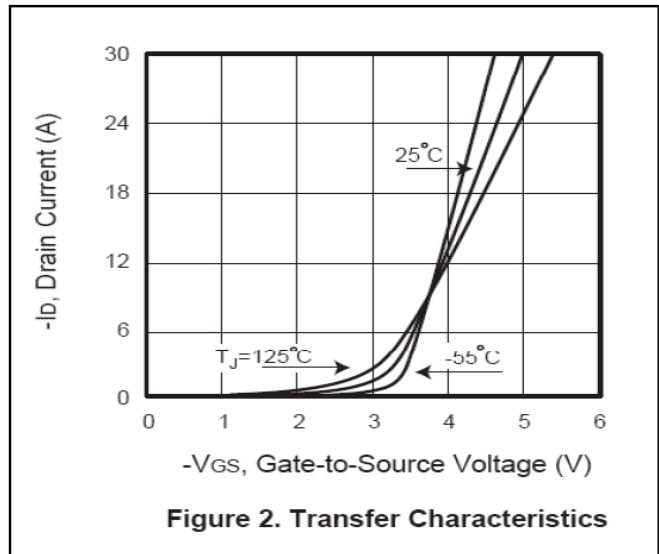
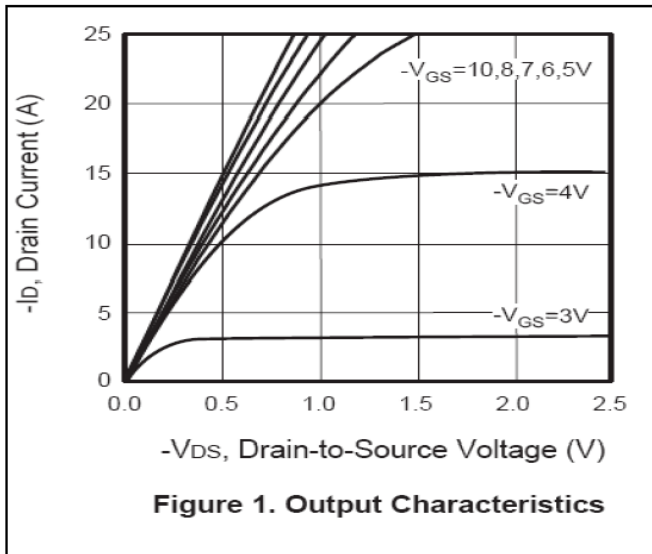
b: 1-in<sup>2</sup> 2oz Cu PCB board.

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

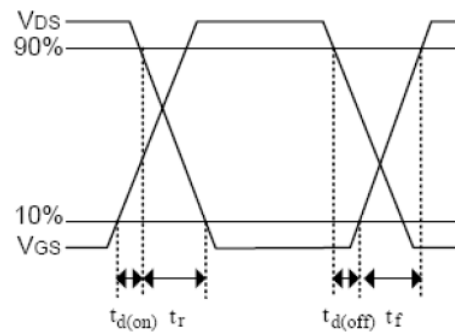
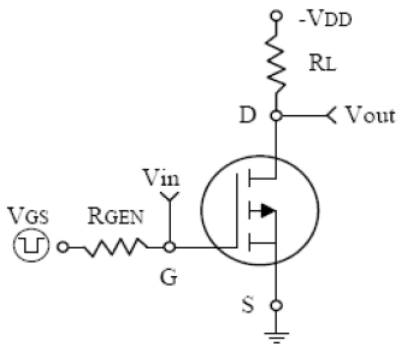
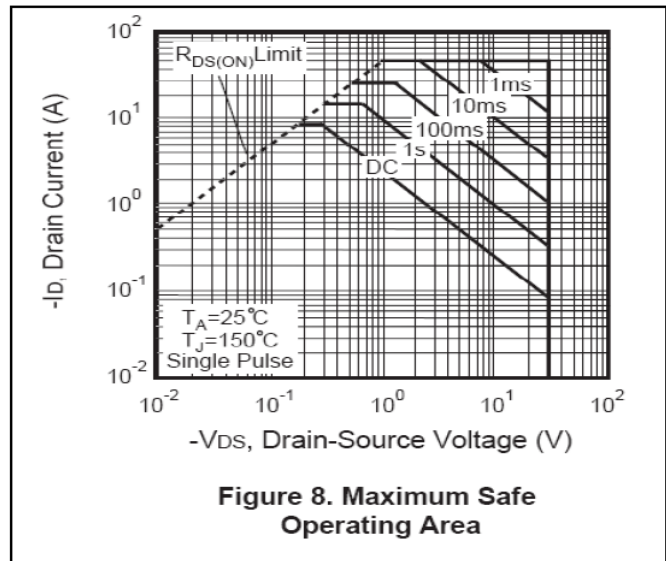
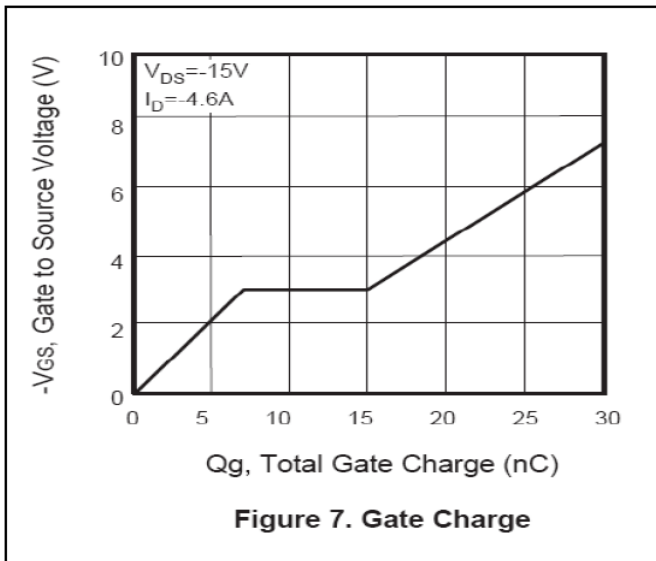
Symbol	Characteristi	Test Conditions	Min.	Typ.	Max.	Unit
<b>• Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu\text{A}$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>• On Characteristics<sup>c</sup></b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1	-1.4	-3	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-9.1A$	-	15	20	m $\Omega$
		$V_{GS}=-4.5V, I_D=-6.9A$	-	20	35	
$g_{FS}$	Forward Transconductance	$V_{DS}=-10V, I_D=-9.1A$	-	21	-	S
<b>• Dynamic Characteristics<sup>d</sup></b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	-	2253	-	pF
$C_{oss}$	Output Capacitance		-	555	-	
$C_{rss}$	Reverse Transfer Capacitance		-	253	-	
<b>• Switching Characteristics<sup>d</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=-15V, I_D=-9.1A, V_{GS}=-10V$	-	35	45.5	nC
$Q_{gs}$	Gate-Source Charge		-	5.5	7.15	
$Q_{gd}$	Gate-Drain Charge		-	8.2	10.66	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-15V, R_L=15\Omega, I_D=-1A, V_{GEN}=-10V, R_G=6\Omega$	-	10	20	nS
$t_r$	Turn-on Rise Time		-	15	30	
$t_{d(off)}$	Turn-off Delay Time		-	110	220	
$t_f$	Turn-off Fall Time		-	70	140	
<b>• Drain-Source Diode Characteristics</b>						
$V_{SD}$	Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=-2.1A$	-	-	-1.2	V

Note: Pulse Test : Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%.

## ◆ Characteristics Curve



## ◆ Characteristics Curve



Switching Test Circuit and Switching Waveforms

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