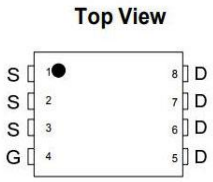
-60V P - Channel MOSFET

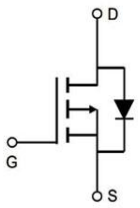
Description

-60V /-6.2A Power MOSFET

Very low on-resistance RDS(on) @ VGS=4.5 V

Pb-free lead plating; RoHS compliant





General Features

V_{DS}	-60	V
$R_{DS(on),TYP@VGS=10V}$	35.0	mΩ
$R_{DS(on),TYP@VGS=4.5}$	55.0	mΩ
I_D	-6.2	A

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

◆ Ordering Information

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
SM4421PRL	SM4421PRG	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

SM4421 X X X

(1)Package Type

(2)Packing Type

(3)Lead Free

(1) P：SOP-8

(2) R：Tape Reel

(3) G：Halogen Free；L：Lead Free

◆ Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	- 6.2	A
Drain Current-Pulsed (Note 1)	I_{DM}	- 9.9	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

a:Fused current that based on wire numbers and diameter

b:Repetitive Rating: Pulse width limited by the maximum junction temperature

c:1-in^2 2oz Cu PCB board

-1

◆ Electrical Characteristics (T_A=25°C, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	- 60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=-60V, VGS=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.5	-2.3	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=-10V, ID=-6.2A	-	35.0	50.0	mΩ
Forward Transconductance	g_{FS}	VDS=-5V, ID=-6.2A	45	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	VGS=0V, VDS=-15V, f=1MHz	-	2417	-	PF
Output Capacitance	C_{oss}		-	179	-	PF
Reverse Transfer Capacitance	C_{rss}		-	120	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	VGS=-10V, VDS=-15V,RL=0.75Ω, RGEN=3Ω	-	17	-	nS
Turn-on Rise Time	t_r		-	13.6	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	47.6	-	nS
Turn-Off Fall Time	t_f		-	15.3	-	nS
Total Gate Charge	Q_g	VGS=-10V, VDS=-15V, ID=-6.2A	-	22.7	-	nC
Gate-Source Charge	Q_{gs}		-	6.44	-	nC
Gate-Drain Charge	Q_{gd}		-	9.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	IS=-1A,VGS=0V	-	-	−1	V

Note: Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%

d: Guaranteed by design: not subject to production testing

Typical Electrical and Thermal Characteristics

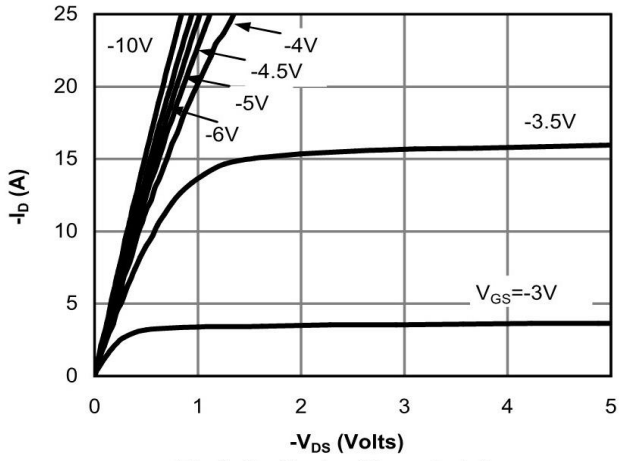


Fig 1: On-Region Characteristics

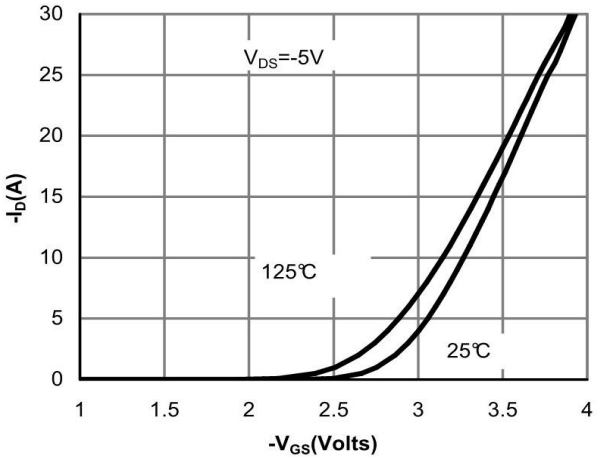


Figure 2: Transfer Characteristics

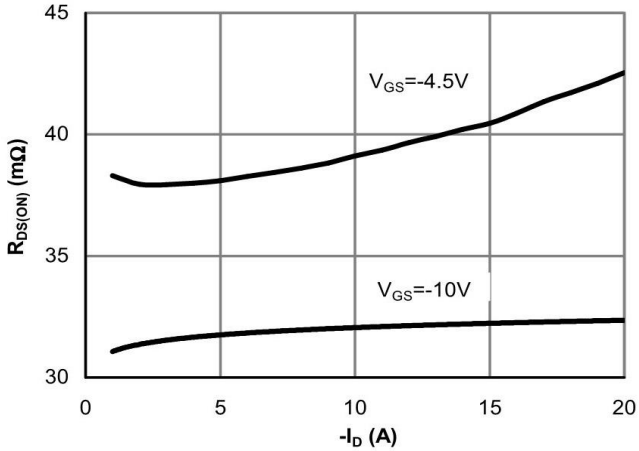


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

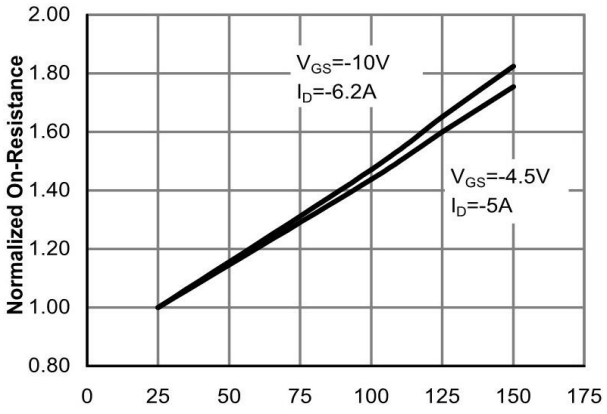


Figure 4: On-Resistance vs. Junction Temperature

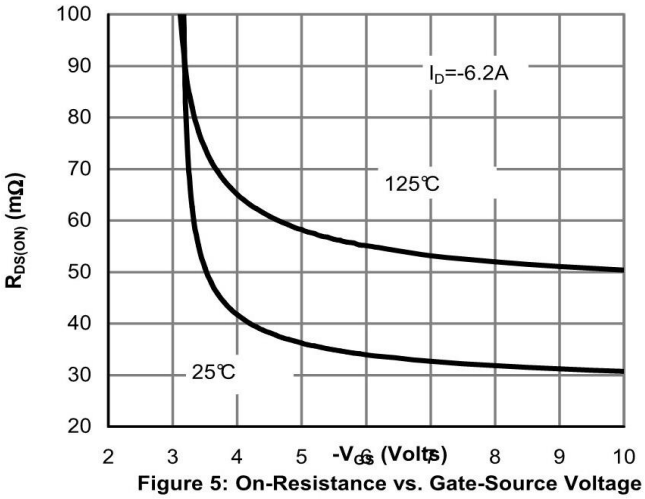


Figure 5: On-Resistance vs. Gate-Source Voltage

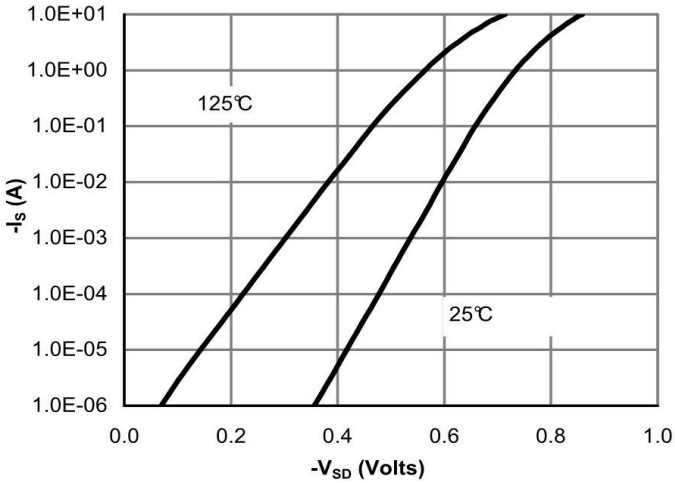


Figure 6: Body-Diode Characteristics

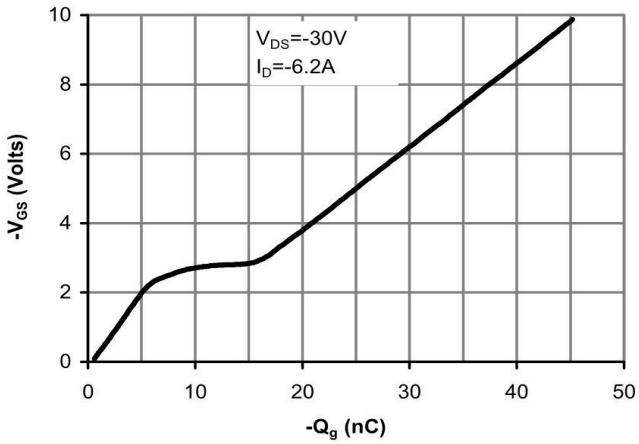


Figure 7: Gate-Charge Characteristics

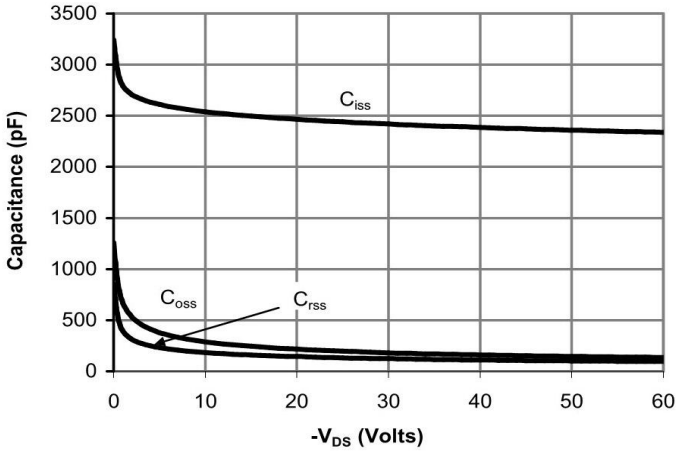


Figure 8: Capacitance Characteristics

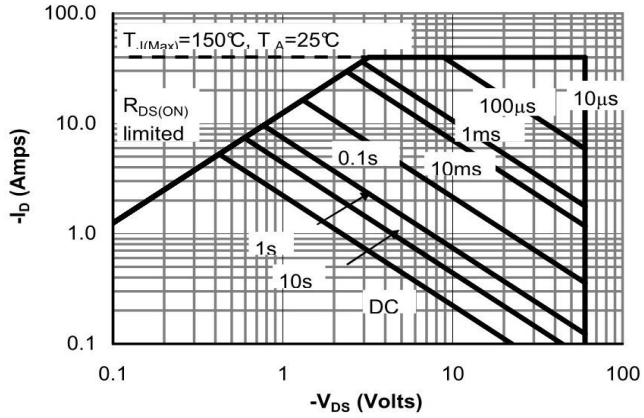


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

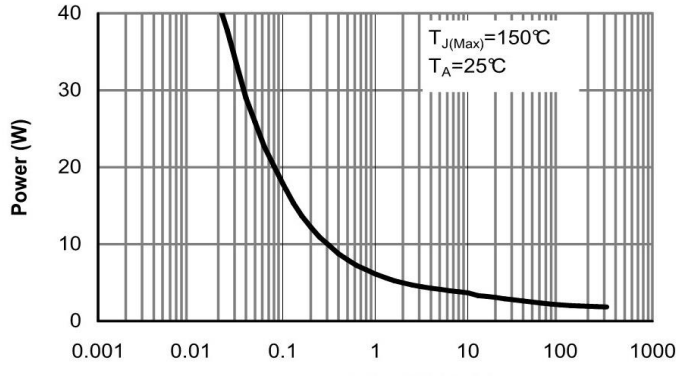


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

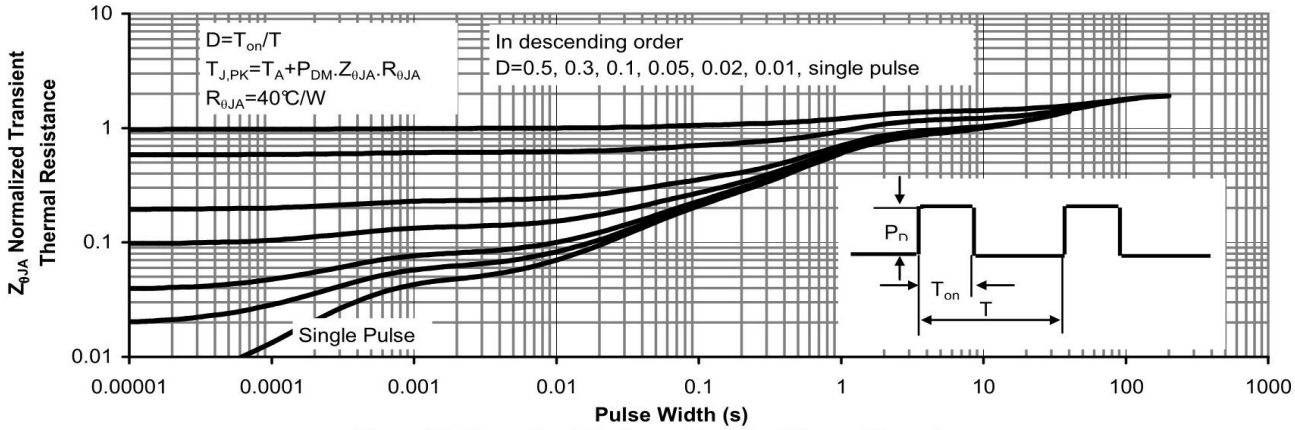
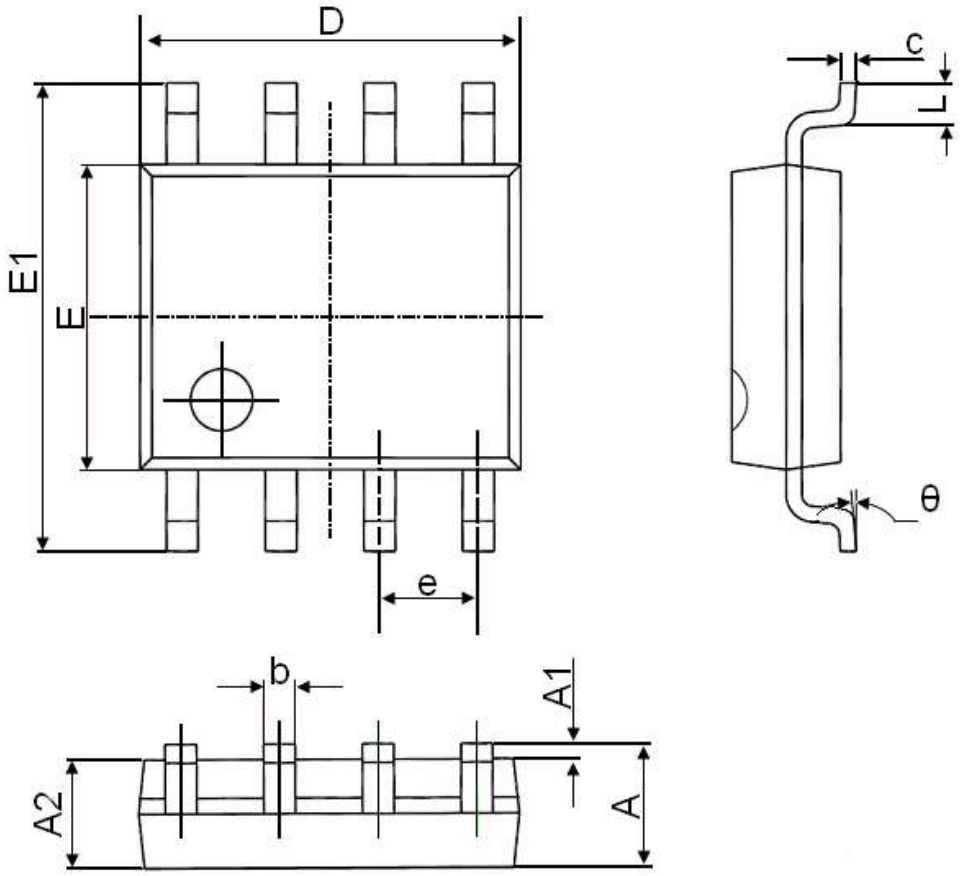


Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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