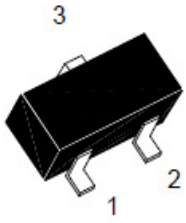
SM3407

P-Channel Enhancement-Mode MOSFET (-30V, -4.3A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-30V	-4.3A	60 @ VGS = -10 V,ID=-4.3A
		78 @ VGS = -4.5V,ID=-3.0A

◆ Features

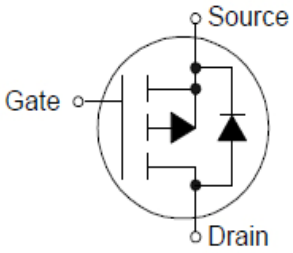
1. Super high dense cell trench design for low RDS(on).
2. Rugged and reliable.
3. SOT-23 package
4. RoHS Compliant.



SM3407 Pin Assignment & Symbol

3-Lead Plastic **SOT-23**

Pin 1: Gate 2: Source 3: Drain



◆ Ordering Information

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
SM3407SRL	SM3407SRG	SOT-23	G	S	D	Tape Reel
SM3407LRL	SM3407LRG	SOT-23-3L	G	S	D	Tape Reel

SM3407X X X

(1)Package Type

(2)Packing Type

(3)Lead Free

(1) S：SOT-23；L：SOT-23-3L

(2) R：Tape Reel

(3) G：Halogen Free；L：Lead Free

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

Symbol	Parameter		Ratings	Units
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current (Continuous) [a]		-4.3	A
I_{DM}	Drain Current (Pulsed) [b]		-20	A
P_D	Total Power Dissipation	@TA=25°C	1.4	W
		@TA=70°C	0.9	
T_j, T_{stg}	Operating Junction and Storage Temperature Range		-55 to +150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted) [c]		125	°C/W

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

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS}=0V	-	-	-1	uA
		V_{DS}=-30V, V_{GS}=0V, T_J=55°C	-	-	-5	
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1	-1.4	-3	V
$I_{DS(on)}$	On state drain current	V_{DS}=-5V, V_{GS}=-10V	-30	-	-	A
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-4.3A	-	-	60	mΩ
		V_{GS}=-4.5V, I_D=-3.0A	-	-	78	
• Dynamic Characteristics[d]						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	745	-	pF
C_{oss}	Output Capacitance		-	440	-	
C_{rss}	Reverse Transfer Capacitance		-	120	-	
R_g	Gate resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	-	6	9	Ω
• Switching Characteristics[d]						
Q_g	Total Gate Charge(4.5V)	V_{DS}=-15V, I_D=-4.3A, V_{GS}=-10V	-	28	36.4	nC
Q_{gs}	Gate-Source Charge		-	3	3.9	
Q_{gd}	Gate-Drain Charge		-	7	9.1	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-15V,R_L=15Ω, V_{GEN}=-10V, I_D=-1A,R_G=6Ω	-	9	18	nS
t_r	Turn-on Rise Time		-	15	30	
$t_{d(off)}$	Turn-off Delay Time		-	75	150	
t_f	Turn-off Fall Time		-	40	80	
t_{rr}	Body Diode Reverse Recovery Time	I_F=-4.3A, dI/dt=100A/us	-	22	30	nS
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-4.3A, dI/dt=100A/us	-	15	-	nC
• Drain-Source Diode Characteristics						
I_S	Maximum Diode Forward Current		-	-	-2.6	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=-2.6A	-	-	-1.3	V

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

d: Guaranteed by design: not subject to production testing

◆ Characteristics Curve

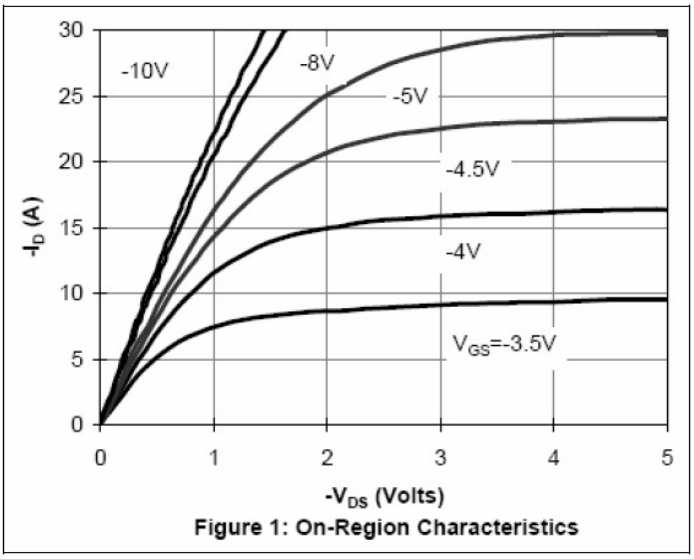


Figure 1: On-Region Characteristics

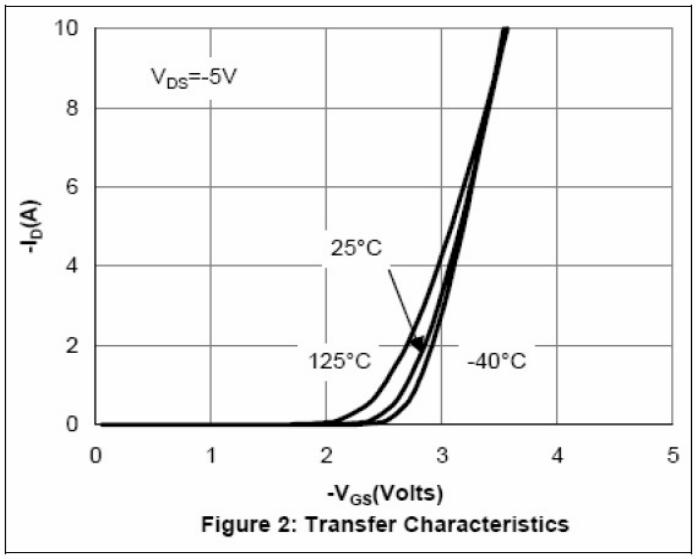


Figure 2: Transfer Characteristics

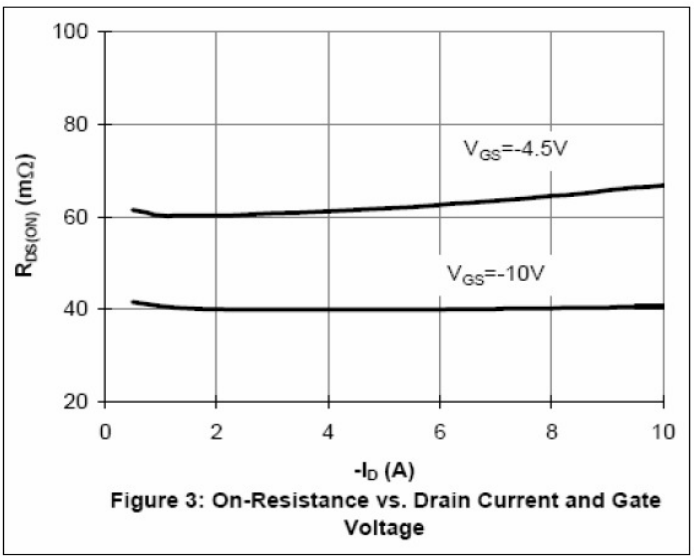


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

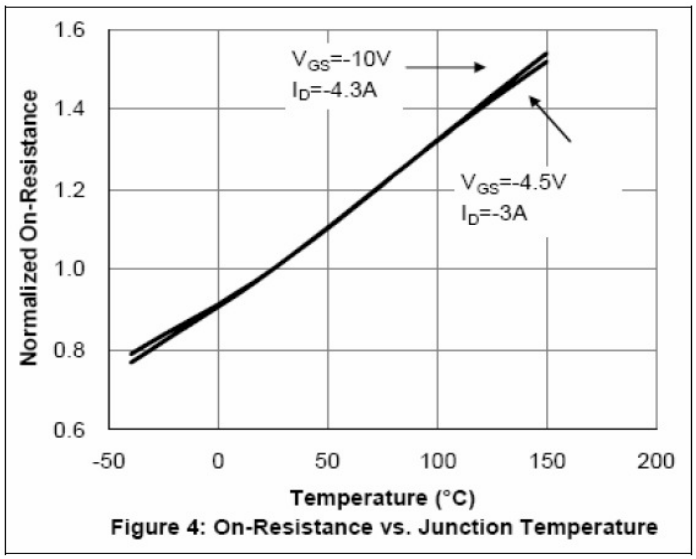


Figure 4: On-Resistance vs. Junction Temperature

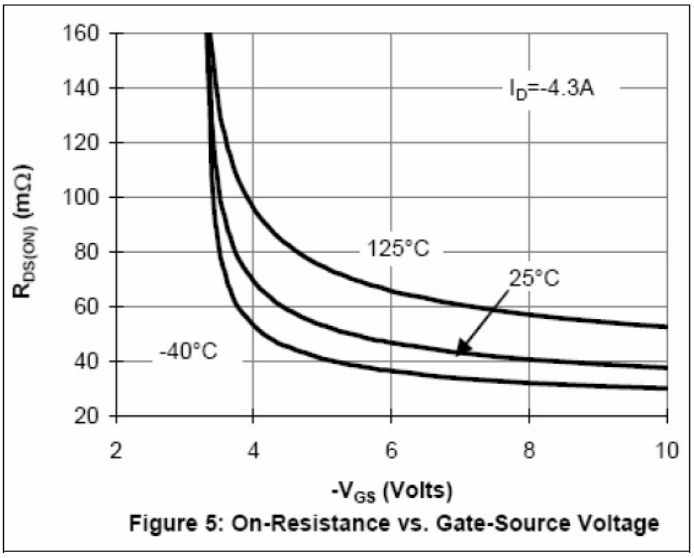


Figure 5: On-Resistance vs. Gate-Source Voltage

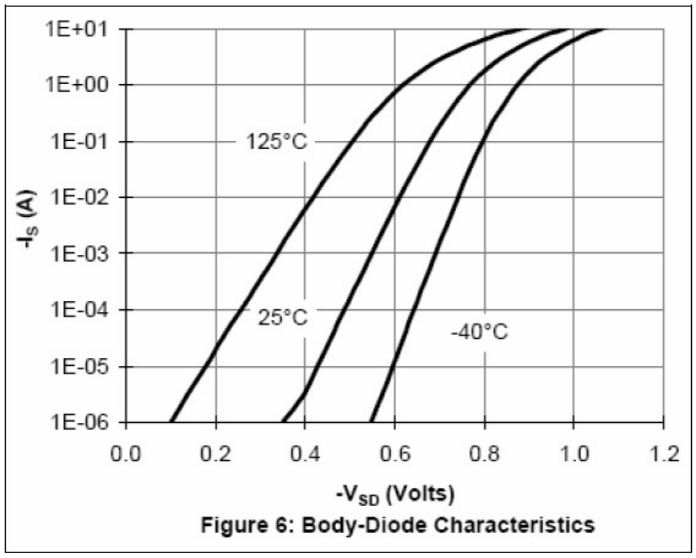


Figure 6: Body-Diode Characteristics

◆ Characteristics Curve

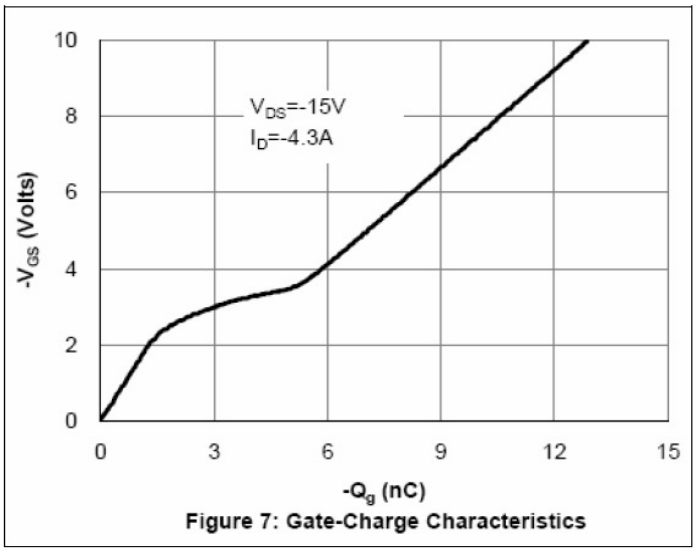


Figure 7: Gate-Charge Characteristics

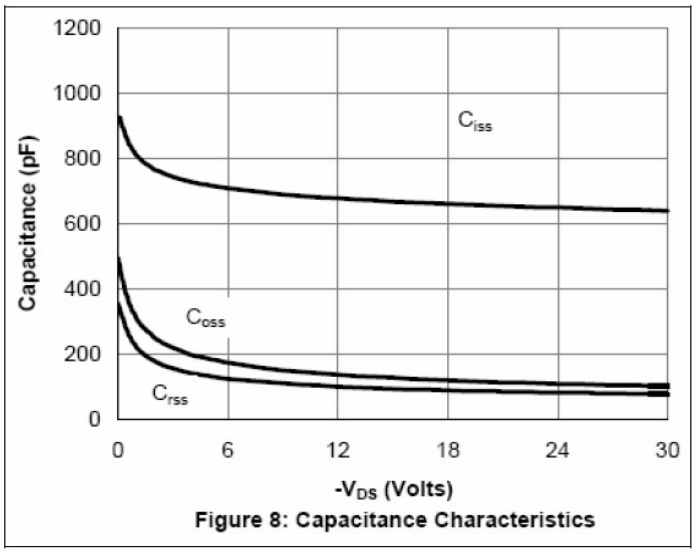


Figure 8: Capacitance Characteristics

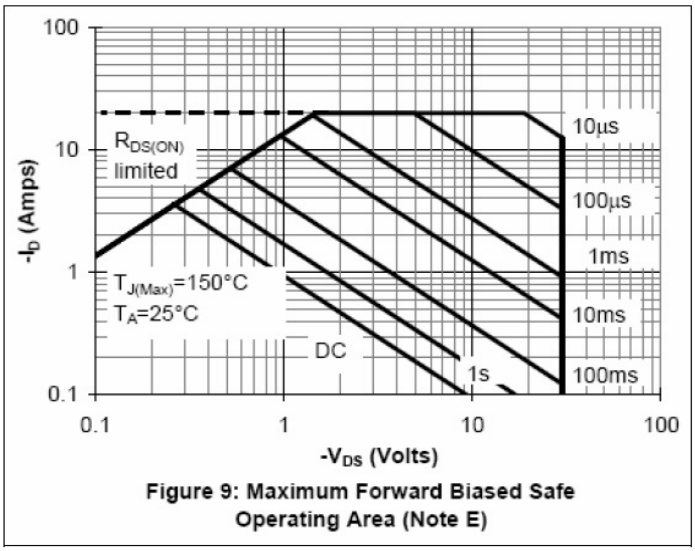


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

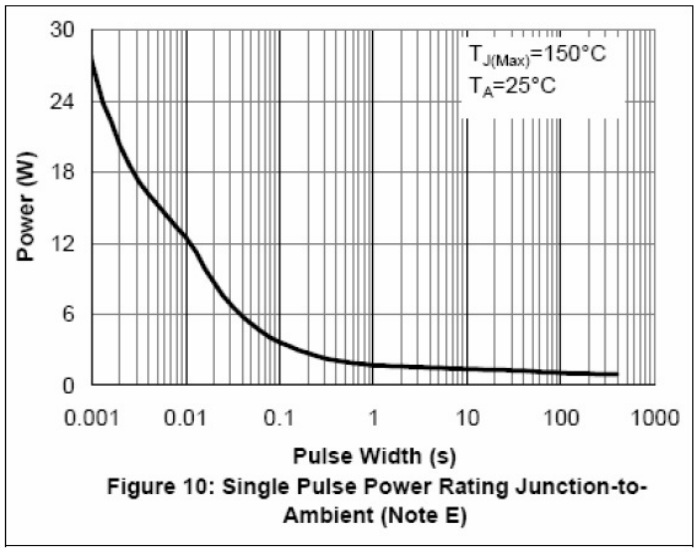


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

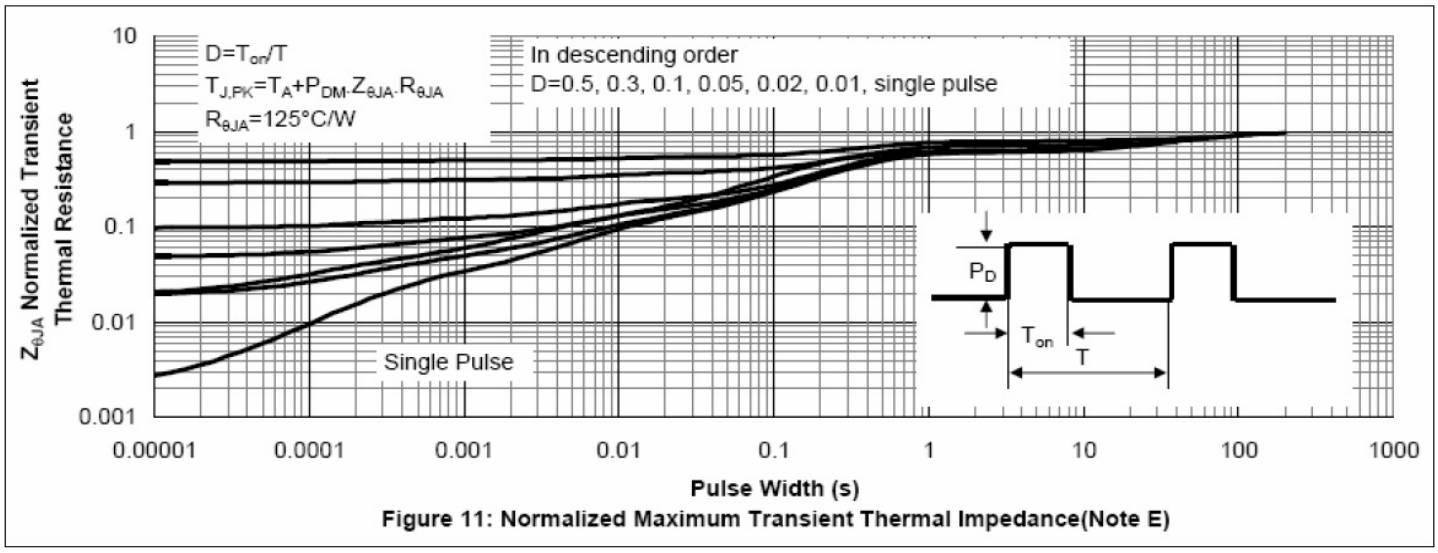


Figure 11: Normalized Maximum Transient Thermal Impedance(Note E)

◆ Characteristics Curve