SDM4407AQ

-30V P-Channel MOSFETs

Rev A.0

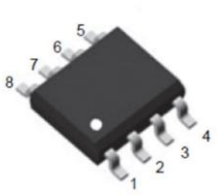
Feature

- ✧ Excellent $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ High current Capability
- ✧ Green product (RoHS compliant), lead free
- ✧ 100% UIS Tested

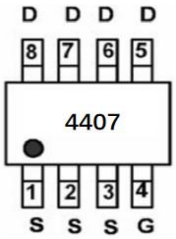
Product Summary

V_{DS}	-30	V
$V_{GS(th)\_Typ}$	-1.7	V
$R_{DS(ON)\_Typ}$ (at V_{GS} =-10V)	9.3	mΩ
I_D	-12	A

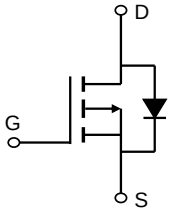
Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM4407AQ	SOP-8	4407	Tape	13" Reel	4000



SOP-8 Top View



Marking and Pin Assignment



Schematic Diagram

Absolute Maximum Ratings (Rating at T_A=25°C unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-12	A
	T_A=100°C		-7.6	
Pulsed Drain Current (1)		I_{DM}	-48	A
Maximum Body-Diode Continuous Current		I_S	-12	A
Avalanche Energy (2)		E_{AS}	64	mJ
Power Dissipation	T_A=25°C	P_D	1.5	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (Rating at T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS} =0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS} =0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V, V_{GS} =±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250μA	-1.0	-1.7	-2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance (4)	V_{GS}=-10V, I_D=-12A	-	9.3	14	mΩ
		V_{GS}=-4.5V, I_D=-8A	-	14	20	
V_{SD}	Diode Forward Voltage	I_S=-30A, V_{GS}=0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz	-	2251	-	pF
C_{oss}	Output Capacitance		-	305	-	pF
C_{rss}	Reverse Transfer Capacitance		-	221	-	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-10 to 0 V, V_{DD}=-15V I_D=-10A	-	39	-	nC
Q_{gs}	Gate Source Charge		-	6.9	-	nC
Q_{gd}	Gate Drain Charge		-	9	-	nC
$t_{D(on)}$	Turn-On Delay Time	V_{GS}=-10V,V_{DS}=-15V,I_D=-10A, R_{GEN}=3Ω	-	5.9	-	ns
t_r	Turn-On Rise Time		-	1.9	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	89	-	ns
t_f	Turn-Off Fall Time		-	51	-	ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-10A, di/dt=100A/μs	-	13	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-10A, di/dt=100A/μs	-	5.9	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient (3)	-	82	°C /W

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting T_J=25C, V_{DD}=-15V, V_G=-10V, R_G=25ohm, L=0.5mH, I_{AS}=-16A
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

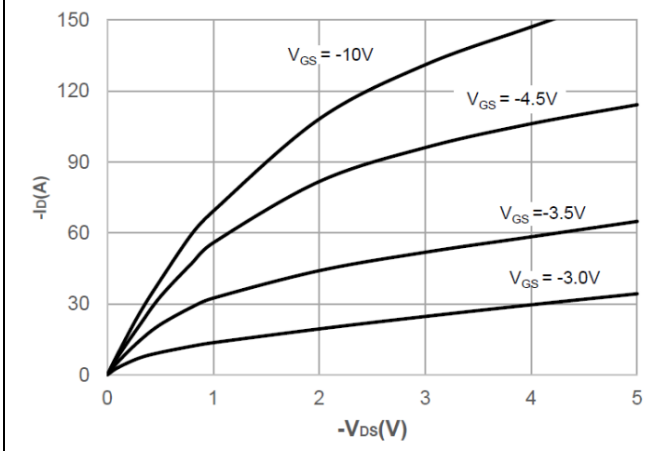


Figure 2: Transfer Characteristics

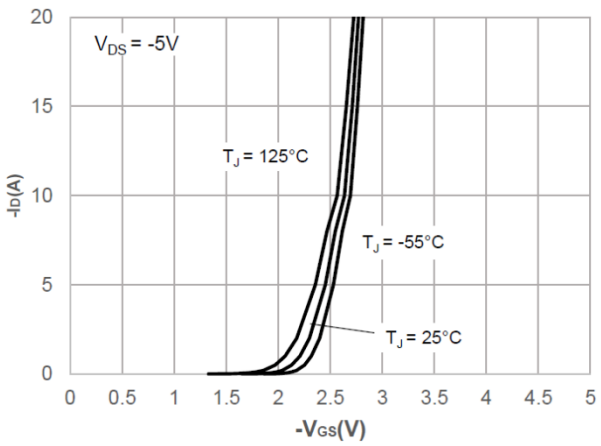


Figure 3: $R_{DS(ON)}$ vs. Drain Current

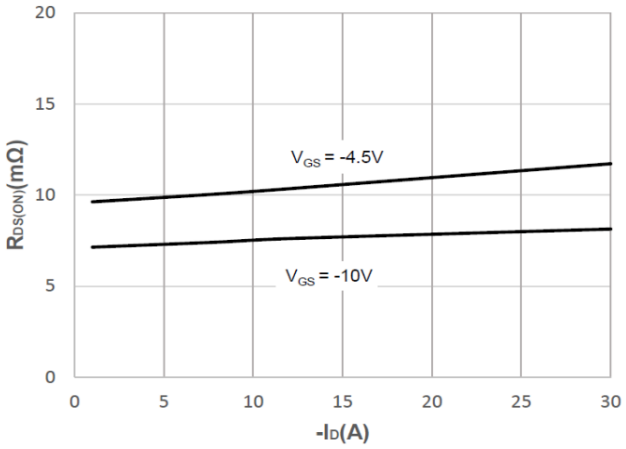


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

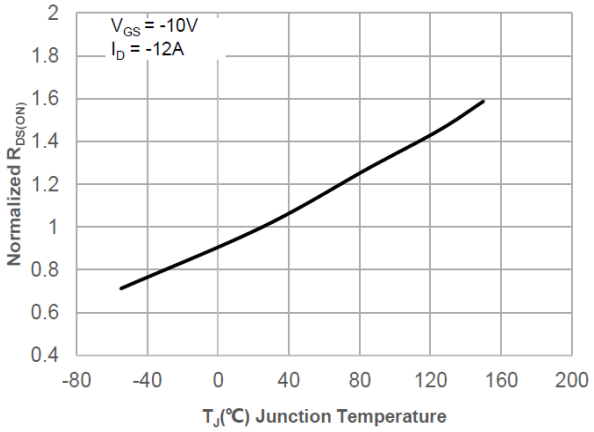


Figure 5: Normalized Breakdown voltage vs. Junction Temperature

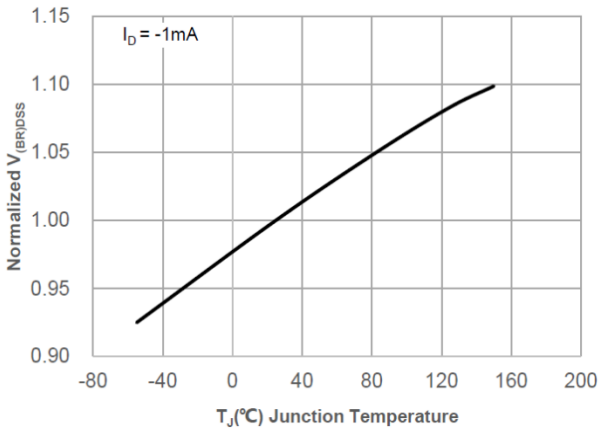
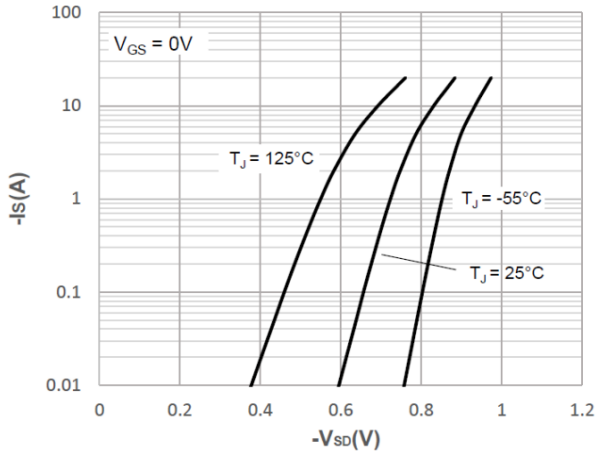


Figure 6: Body-Diode Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

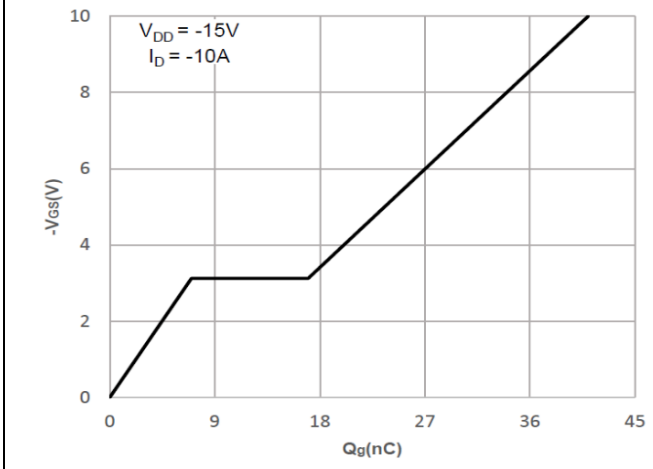


Figure 8: Capacitance characteristics

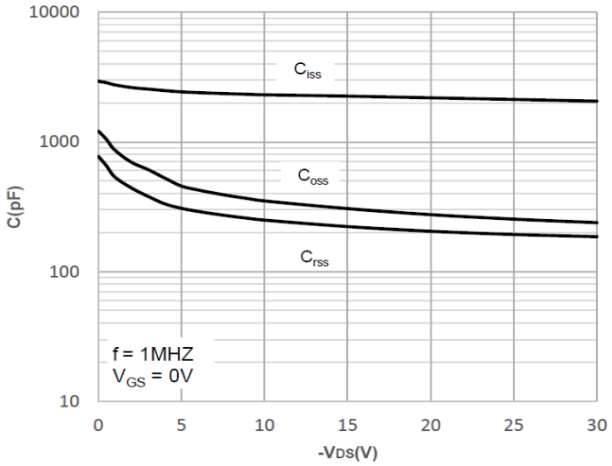


Figure 9: Current De-rating

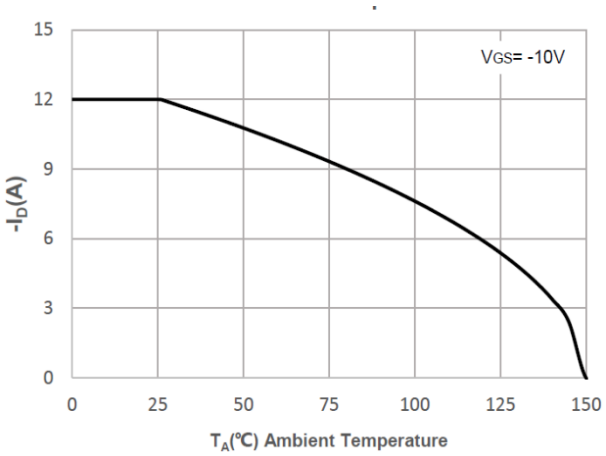


Figure 10: Peak Current Capacity

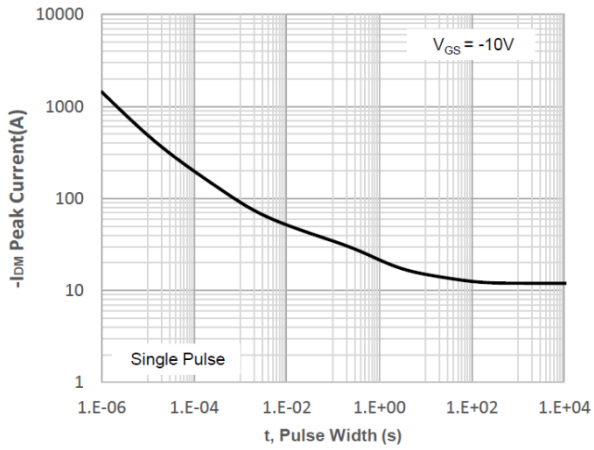


Figure 11: Maximum Safe Operating Area

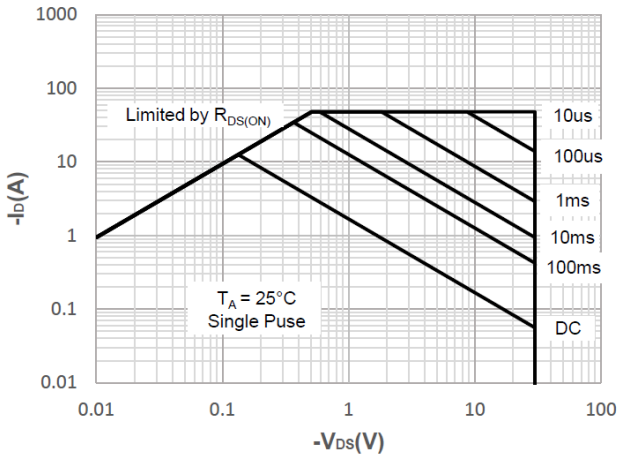
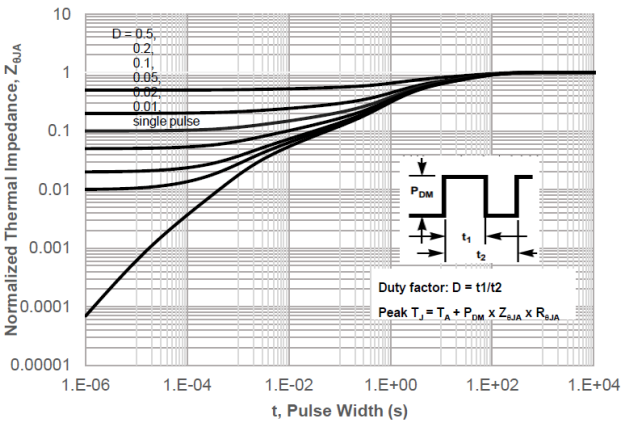


Figure 12: Normalized Maximum Transient Thermal Impedance



Test Circuit

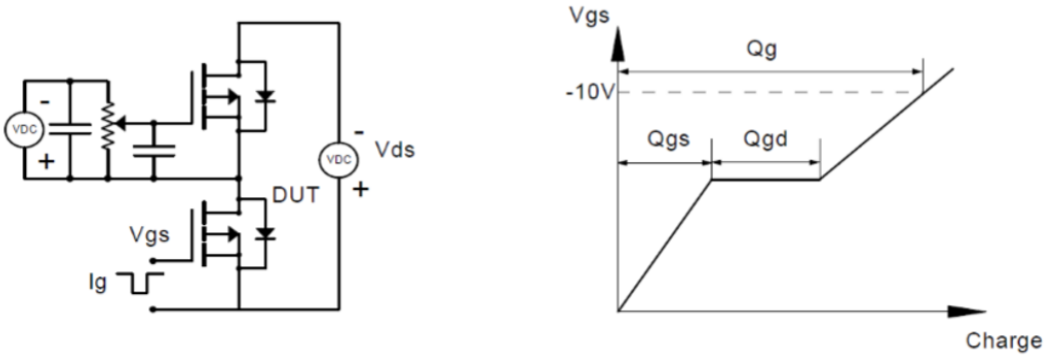


Figure1: Gate Charge Test Circuit & Waveforms

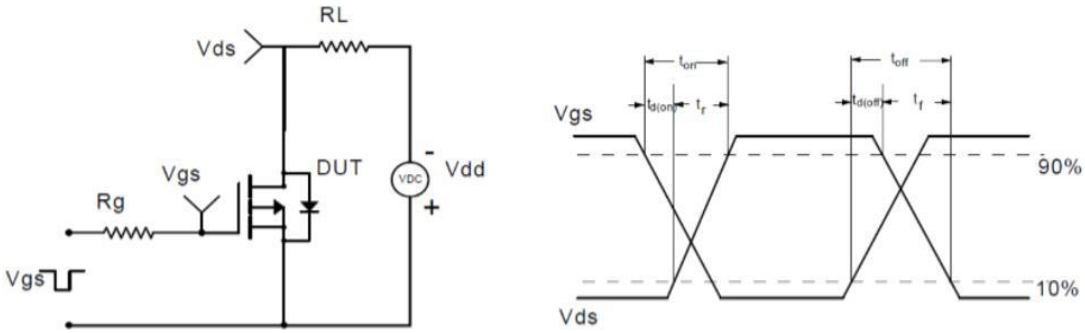


Figure2: Resistive Switching Test Circuit & Waveforms

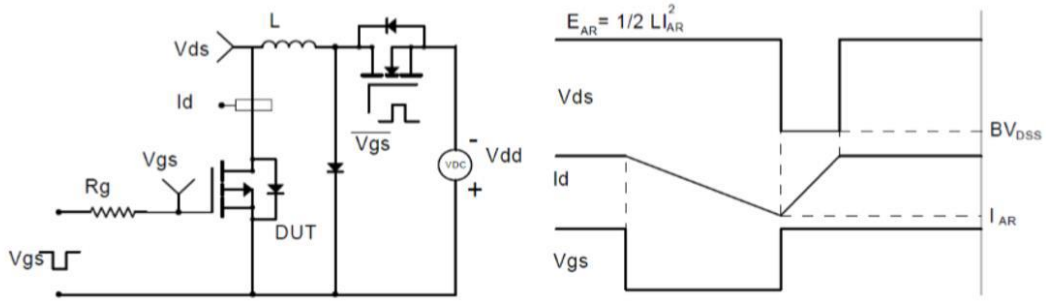


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

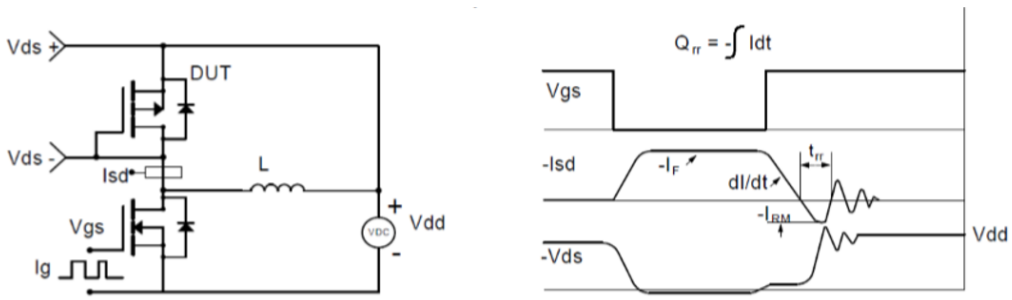
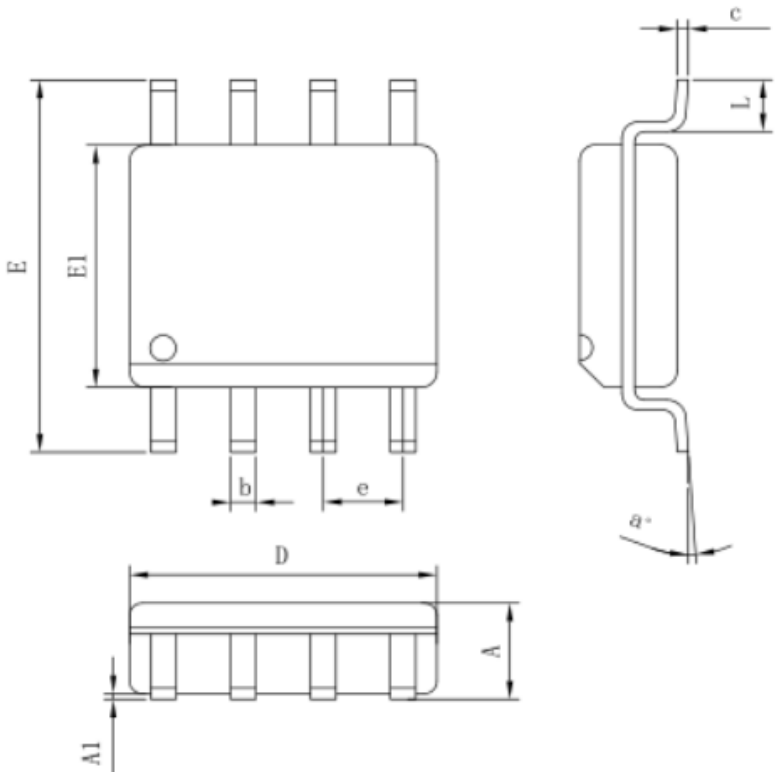


Figure4: Diode Recovery Test Circuit & Waveforms

SOP-8 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.75
A1	0.10	--	0.23
b	0.35	--	0.48
c	0.19	--	0.25
D	4.70	4.90	5.00
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	--	0.80
a°	0°	--	8°