

SDM9435AQ

-30V P-Channel MOSFETs

Rev A.0

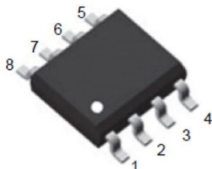
Feature

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

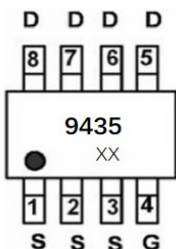
Product Summary

V_{DS}	-30	V
$V_{GS(th_Typ)}$	-1.8	V
$R_{DS(ON_Typ)}$ (at $V_{GS} = -10V$)	31	mΩ
I_D (at $V_{GS} = -10V$)	-5.1	A

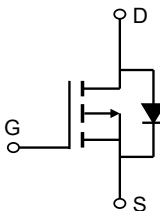
Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM9435AQ	SOP-8	9435	Tape	13" Reel	4000



SOP-8 Top View



Marking and Pin Assignment



Schematic Diagram

Absolute Maximum Ratings (Rating at $T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A = 25^\circ C$	I_D	-5.1	A
	$T_A = 100^\circ C$		-3.2	
Pulsed Drain Current ⁽¹⁾		I_{DM}	-20	A
Maximum Body-Diode Continuous Current		I_S	-5.1	A
Avalanche Energy ⁽²⁾		E_{AS}	12	mJ
Power Dissipation	$T_A = 25^\circ C$	P_D	1.4	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ C$

Electrical Characteristics (Rating at $T_J=25^{\circ}\text{C}$ 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	-1.8	-2.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance ⁽³⁾	V _{GS} =-10V, I _D =-5A	-	31	40	mΩ
		V _{GS} =-4.5V, I _D =-4A	-	46	60	
V _{SD}	Diode Forward Voltage	I _S =-5.1A, V _{GS} =0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz	-	537	-	pF
C _{oss}	Output Capacitance		-	73	-	pF
C _{rss}	Reverse Transfer Capacitance		-	55	-	pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DD} =-15V, I _D =-2A	-	10.9	-	nC
Q _{gs}	Gate Source Charge		-	2.1	-	nC
Q _{gd}	Gate Drain Charge		-	2.1	-	nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =-10V, V _{DD} =-15V, I _D =-2A, R _{GEN} =3Ω	-	2.9	-	ns
t _r	Turn-On Rise Time		-	2.1	-	ns
t _{D(off)}	Turn-Off Delay Time		-	25	-	ns
t _f	Turn-Off Fall Time		-	13	-	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-2A, di/dt=100A/μs	-	8.7	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-2A, di/dt=100A/μs	-	2.9	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient ⁽⁴⁾	-	89	$^{\circ}\text{C}/\text{W}$

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting $T_J=25^{\circ}\text{C}$, $V_{DD}=-15\text{V}$, $V_G=-10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=-7\text{A}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$
4. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

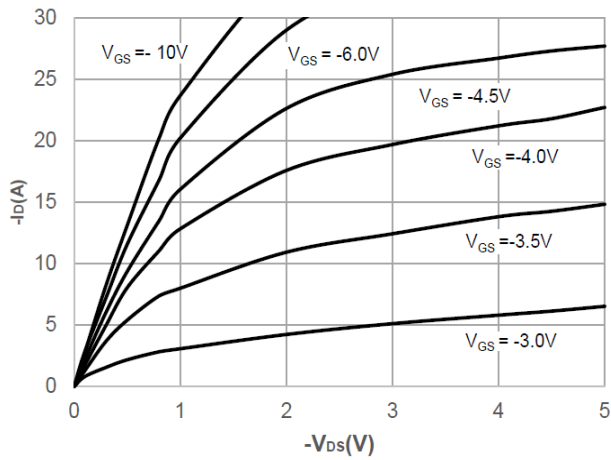


Figure 2: Transfer Characteristics

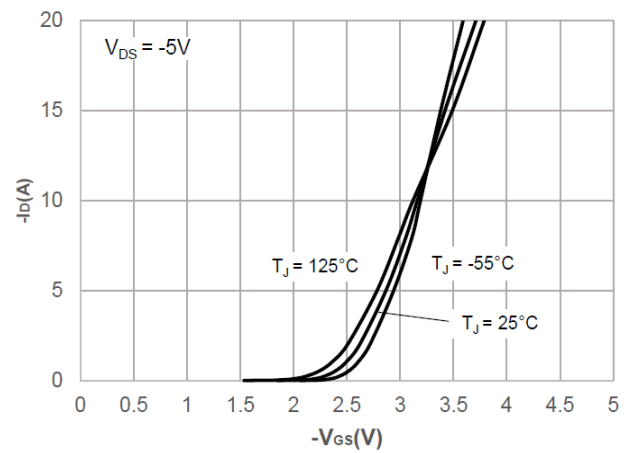
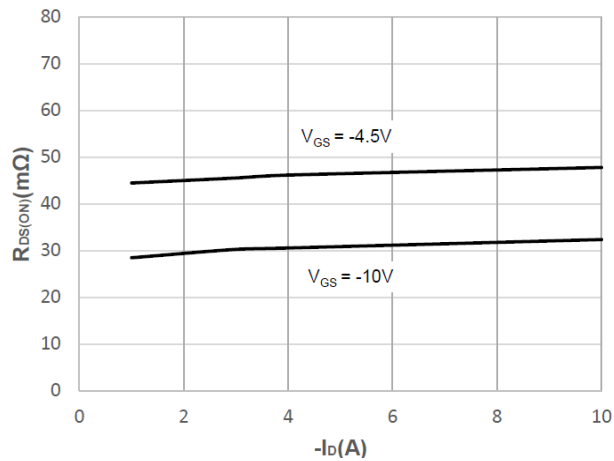
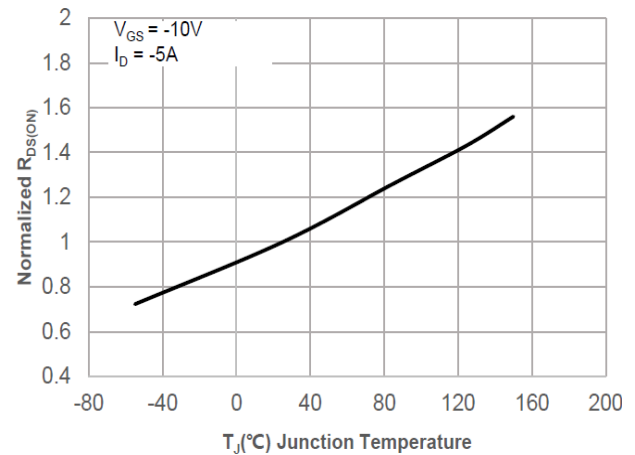
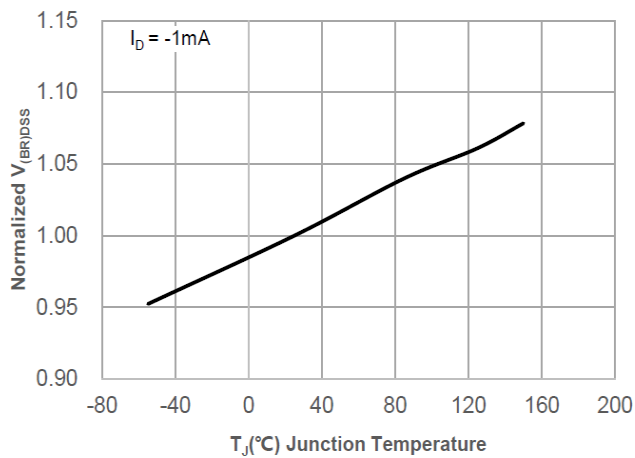
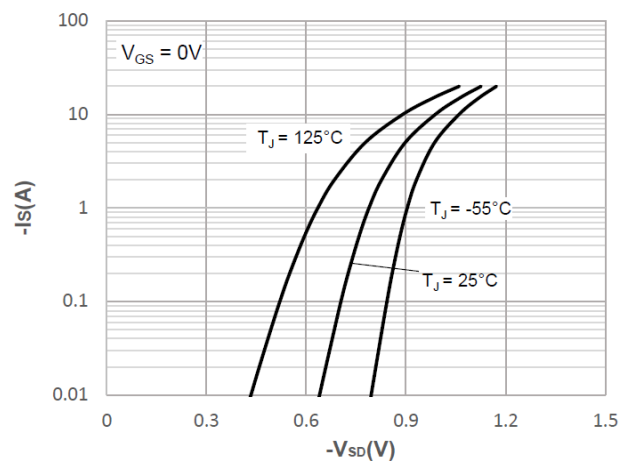
Figure 3: $R_{DS(ON)}$ vs. Drain CurrentFigure 4: $R_{DS(ON)}$ vs. Junction TemperatureFigure 5: V_{BRDSS} vs. Junction Temperature

Figure 6: Body-Diode Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

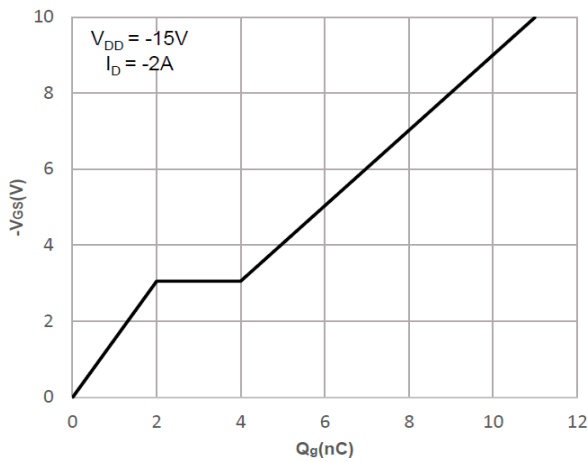


Figure 8: Capacitance characteristics

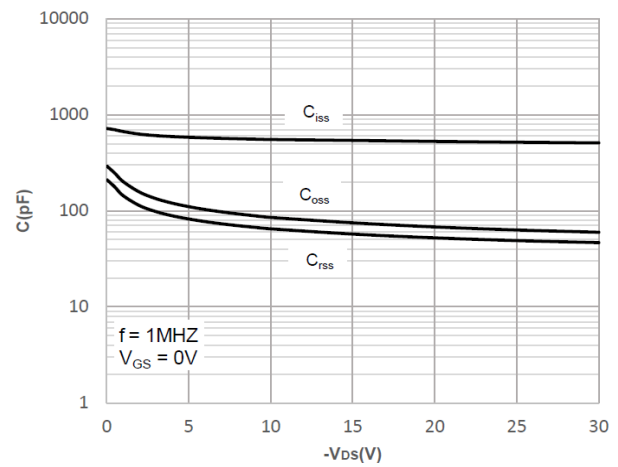


Figure 9: Current De-rating

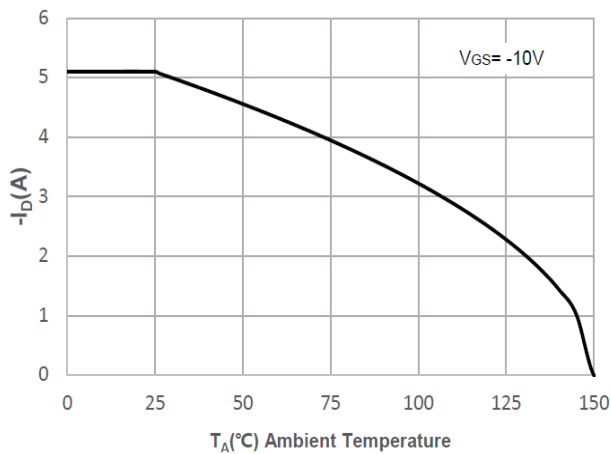


Figure 10: Maximum Safe Operating Area

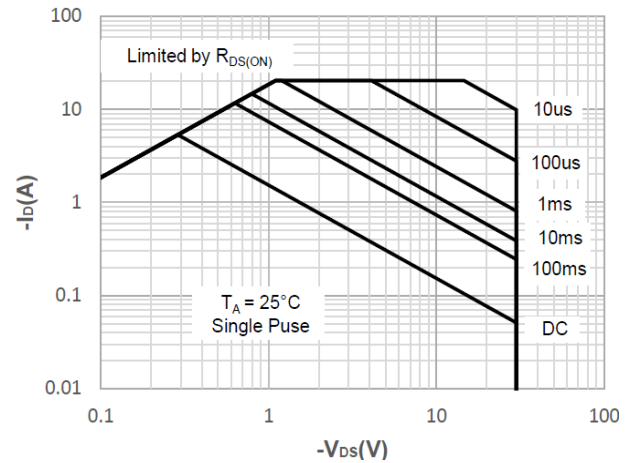


Figure 11: Normalized Maximum Transient Thermal Impedance

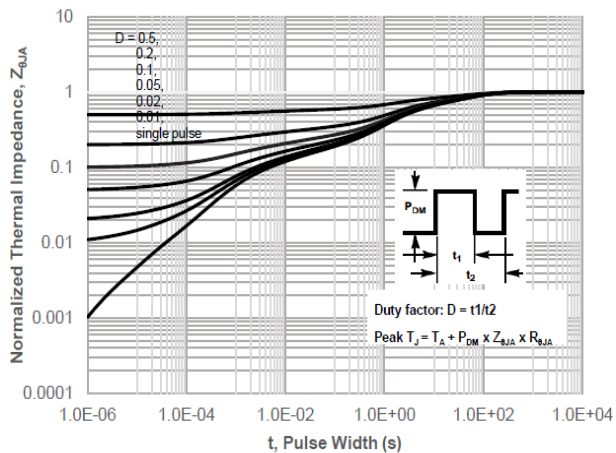
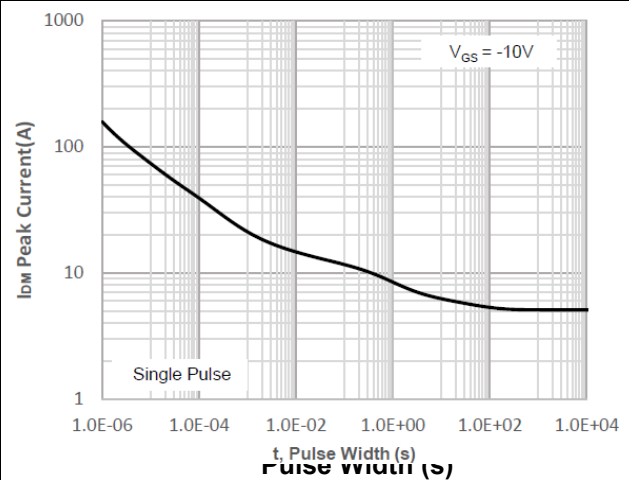


Figure 12: Peak Current Capacity



Test Circuit

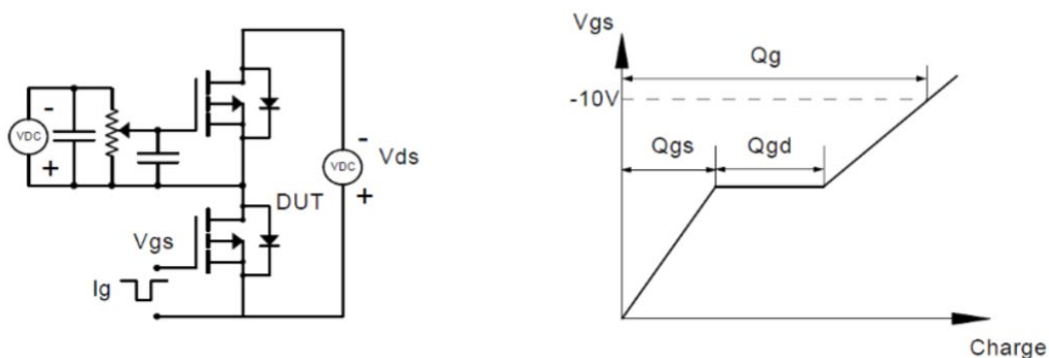


Figure1: Gate Charge Test Circuit & Waveforms

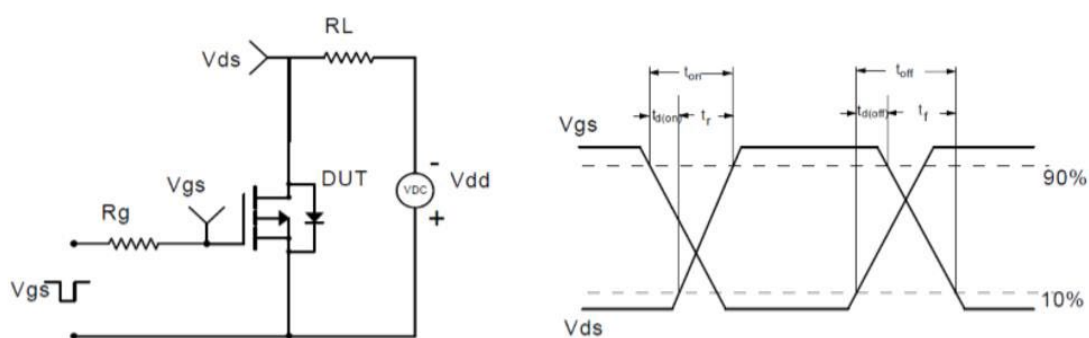


Figure2: Resistive Switching Test Circuit & Waveforms

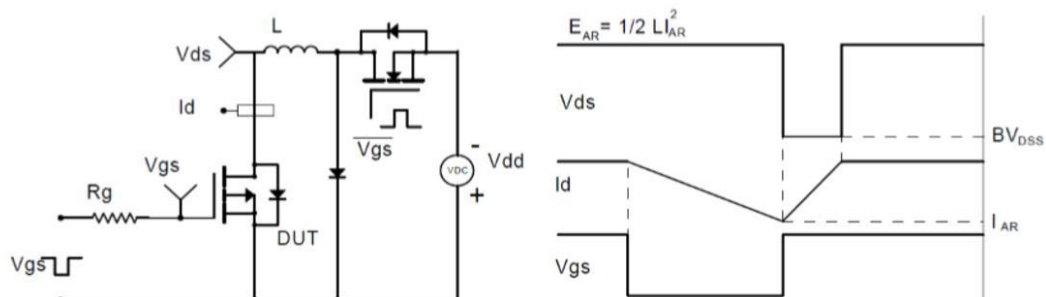


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

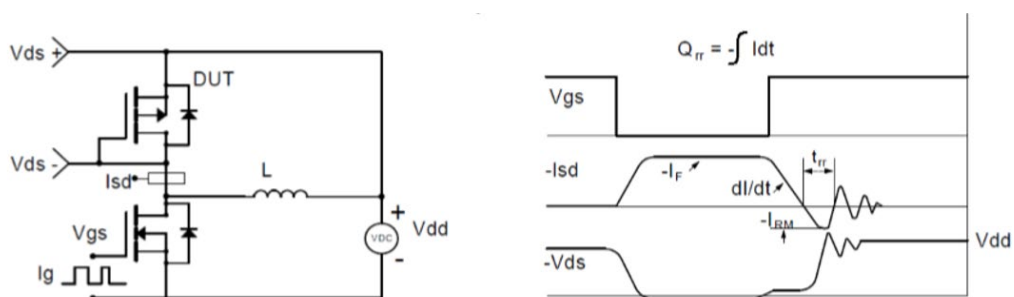
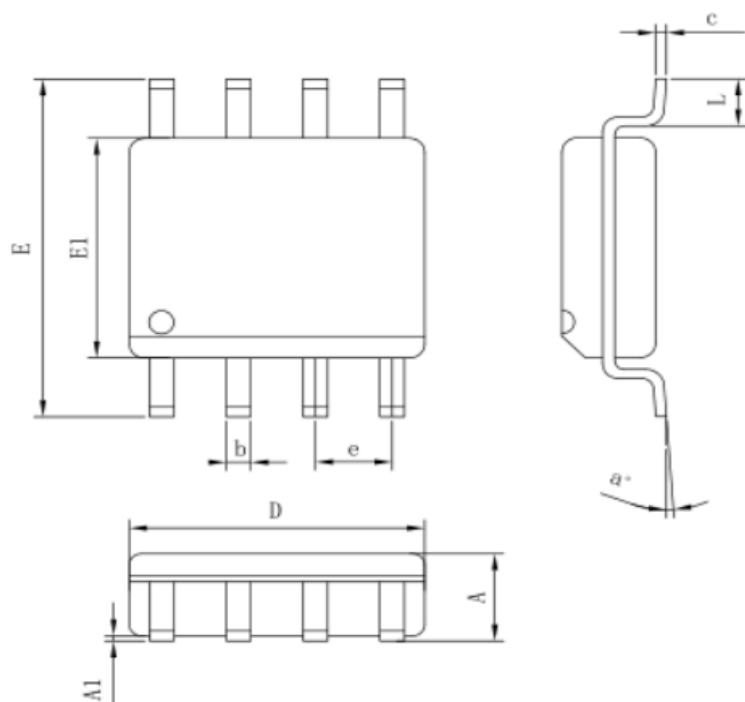


Figure4: Diode Recovery Test Circuit & Waveforms

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	1.27 BSC		
L	0.50	--	0.80
a*	0°	--	8°