

SDM3401AV

-30V P-Channel MOSFETs

Rev A.0

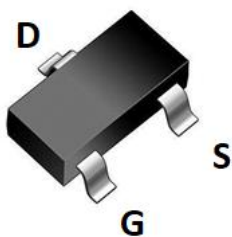
Feature

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

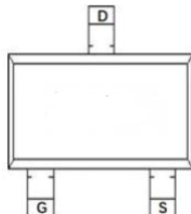
Product Summary

V_{DS}	-30	V
$V_{GS(th)}_{Typ}$	-0.9	V
$R_{DS(ON)}_{Typ}$ (at $V_{GS} = -10V$)	36	mΩ
I_D (at $V_{GS} = -10V$)	-4.2	A

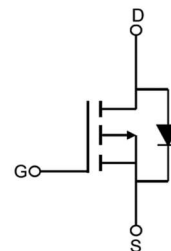
Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM3401AV	SOT-23-3L	3401	Tape	7" Reel	3000



SOT-23 top view



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}	± 12	V
Continuous Drain Current	$T_A = 25^\circ C$	I_D	-4.2	A
	$T_A = 100^\circ C$		-3	
Pulsed Drain Current ⁽¹⁾		I_{DM}	-17	A
Maximum Body-Diode Continuous Current		I_S	-4.2	A
Power Dissipation	$T_A = 25^\circ C$	P_D	1.1	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} =±12V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =-250μA	-0.6	-0.9	-1.3	V
R _{DS(ON)}	Static Drain-Source On-Resistance ⁽³⁾	V _{GS} =-10V, I _D =-4A	-	36	47	mΩ
		V _{GS} =-4.5V, I _D =-3A	-	41	53	
		V _{GS} =-2.5V, I _D =-1A	-	52	68	
V _{SD}	Diode Forward Voltage	I _S =-4.2A, V _{GS} =0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz	-	763	-	pF
C _{oss}	Output Capacitance		-	75	-	pF
C _{rss}	Reverse Transfer Capacitance		-	63	-	pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5~0V, V _{DS} =-15V, I _D =-3A	-	8.1	-	nC
Q _{gs}	Gate Source Charge		-	2.3	-	nC
Q _{gd}	Gate Drain Charge		-	2.3	-	nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =-4.5V,V _{DD} =-15V,R _G =3.0Ω, I _D =-3A	-	8.1	-	ns
t _r	Turn-On Rise Time		-	17	-	ns
t _{D(off)}	Turn-Off Delay Time		-	47	-	ns
t _f	Turn-Off Fall Time		-	35	-	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-3A, di/dt=100A/μs	-	8.1	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-3A, di/dt=100A/μs	-	3.1	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient ⁽²⁾	-	119	°C /W

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width $\leq$ 300 μ s, Duty Cycle $\leq$ 0.5%.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

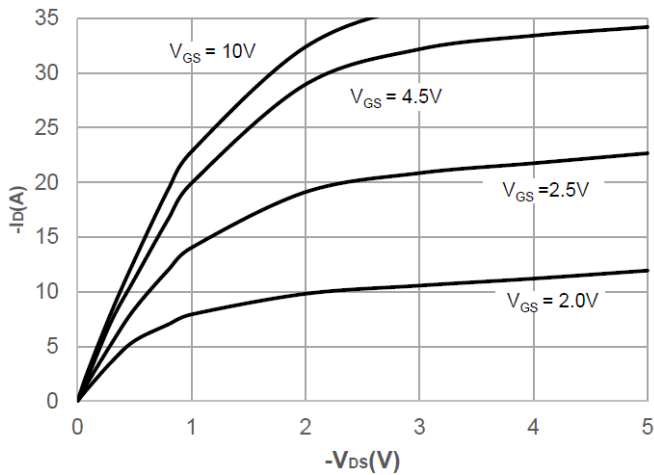


Figure 2: Transfer Characteristics

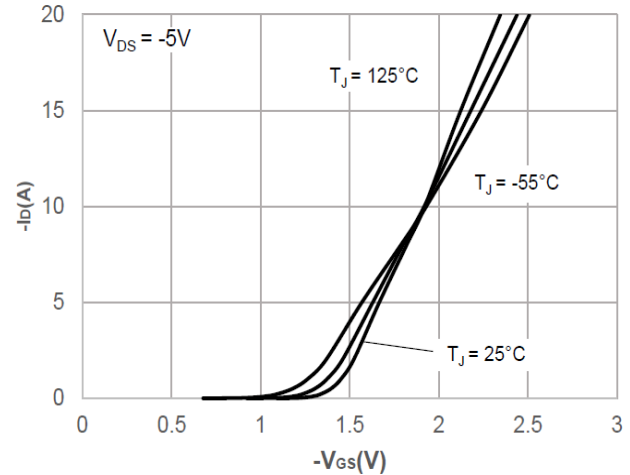
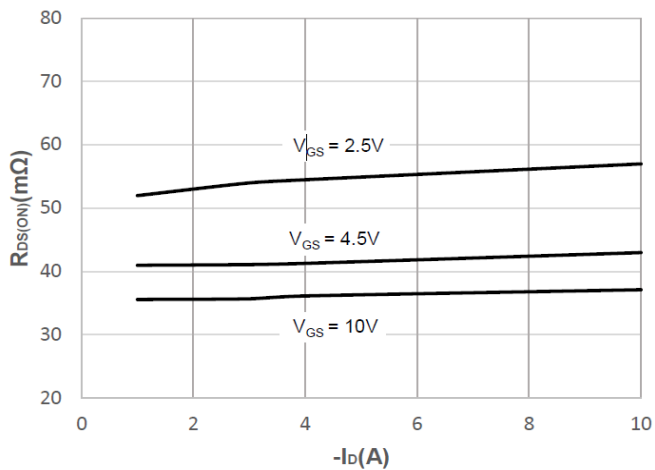
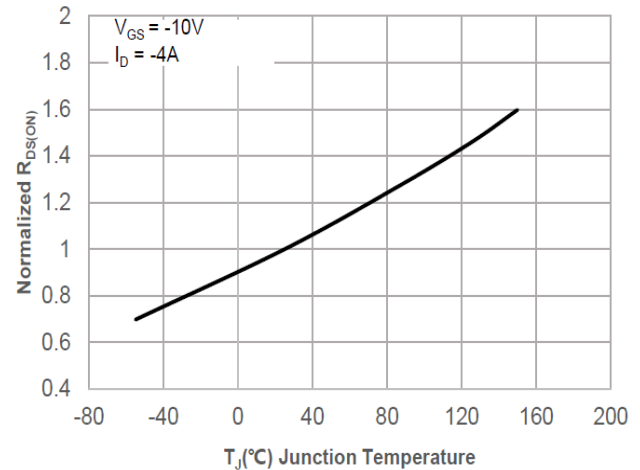
Figure 3: $R_{DS(ON)}$ vs. Drain CurrentFigure 4: $R_{DS(ON)}$ vs. Junction Temperature

Figure 5: Normalized Breakdown voltage vs. Junction Temperature

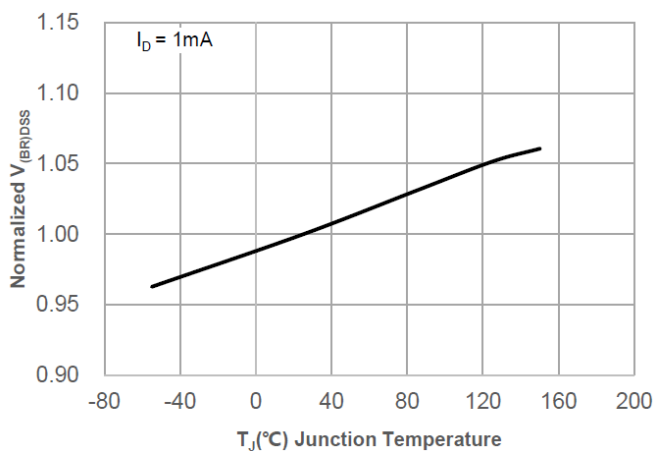
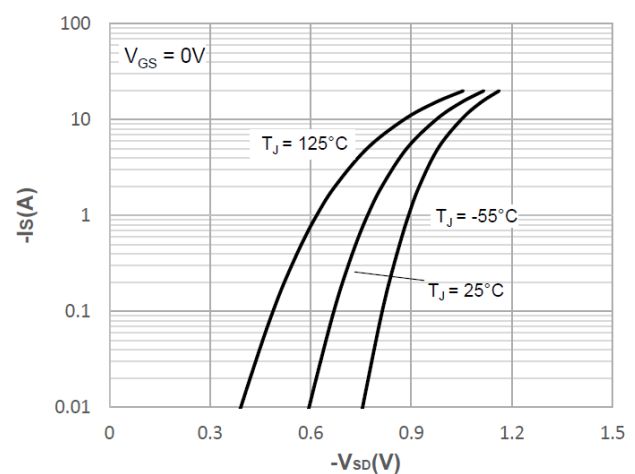


Figure 6: Body-Diode Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

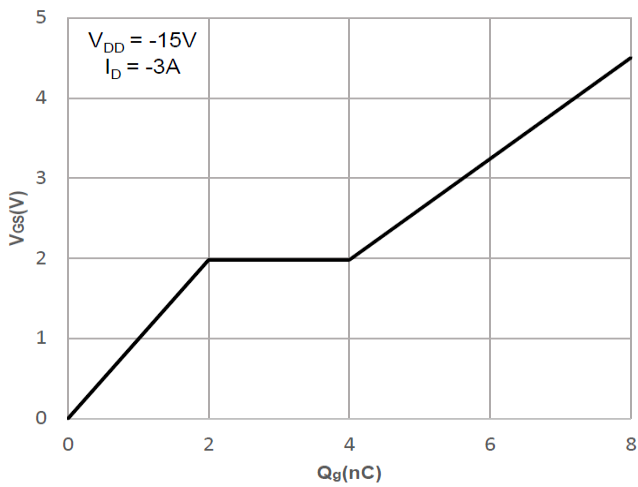


Figure 8: Capacitance characteristics

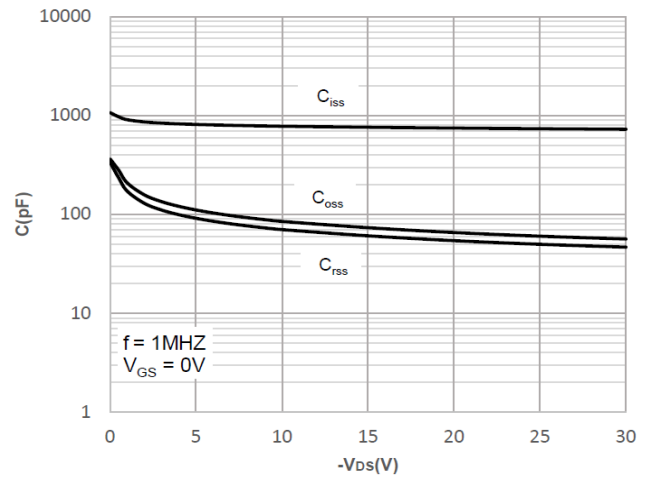


Figure 9: Current De-rating

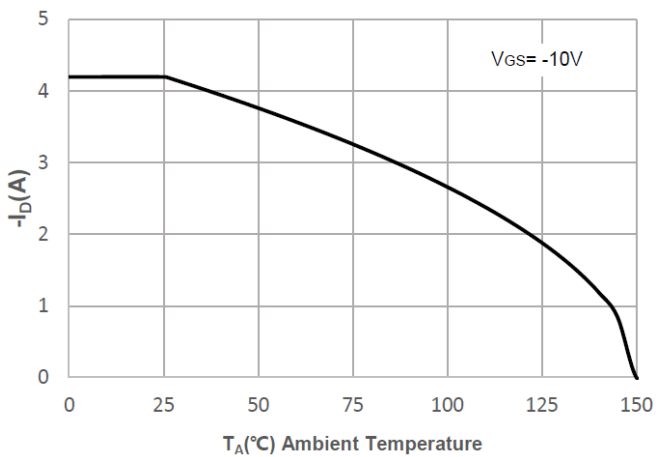


Figure 10: Peak Current Capacity

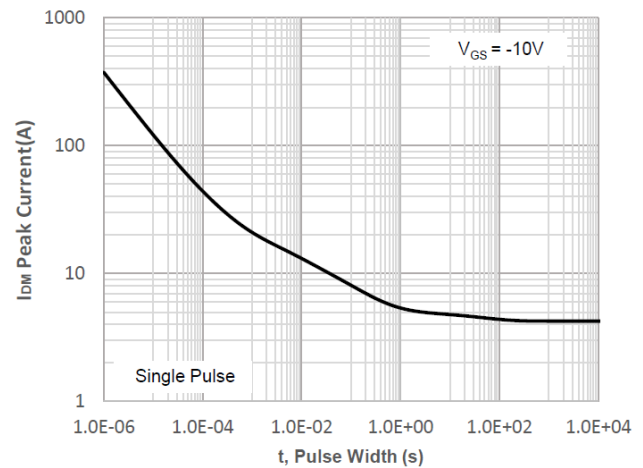


Figure 11: Maximum Safe Operating Area

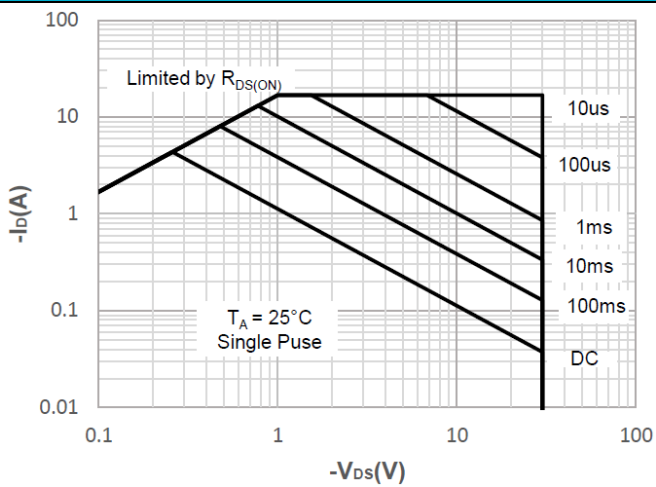
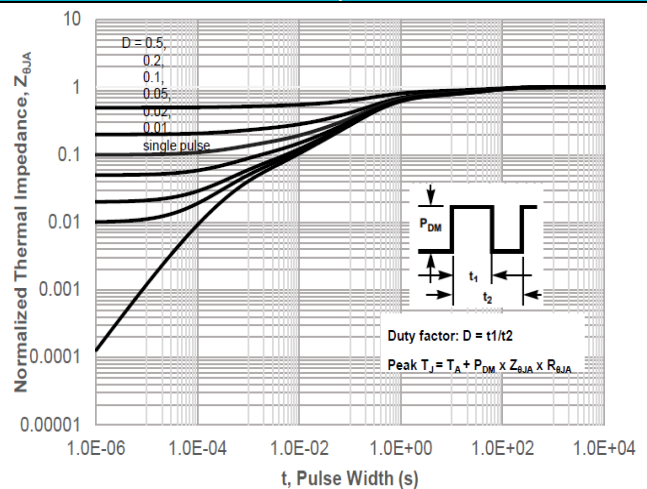


Figure 12: Normalized Maximum Transient Thermal Impedance



Test Circuit

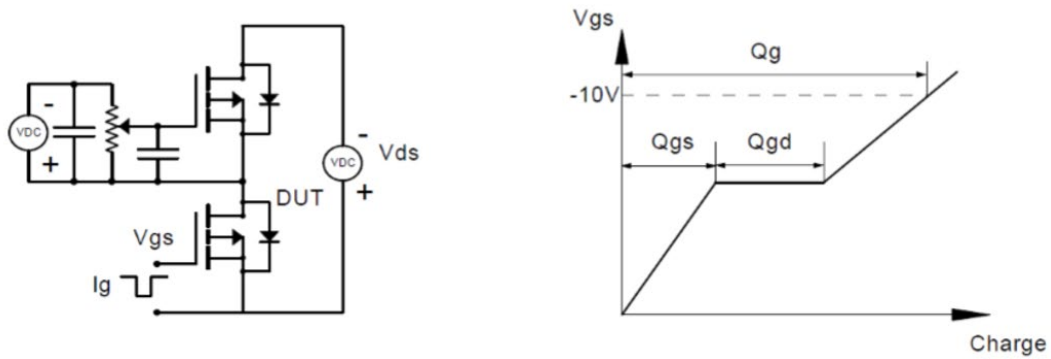


Figure1: Gate Charge Test Circuit & Waveforms

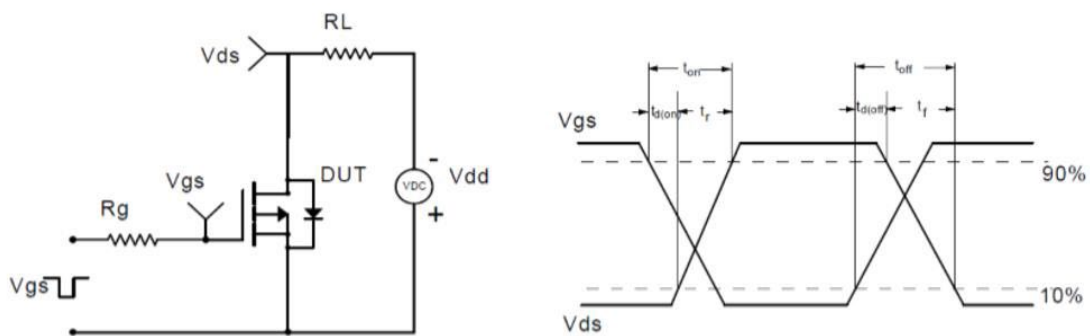


Figure2: Resistive Switching Test Circuit & Waveforms

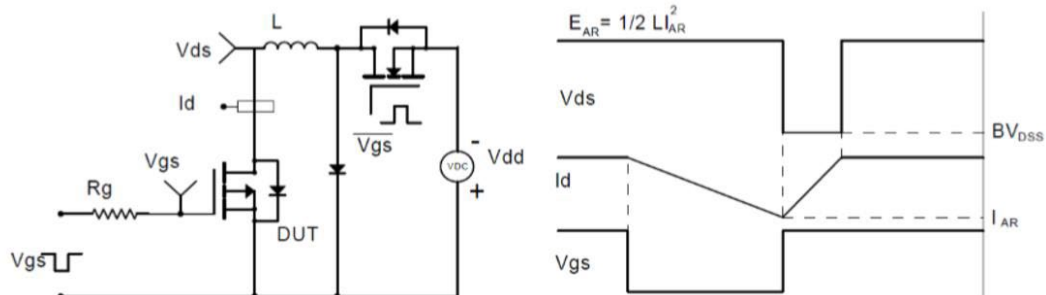


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

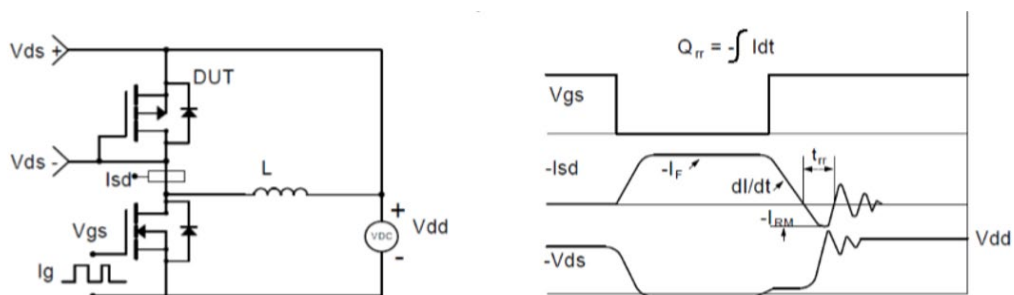
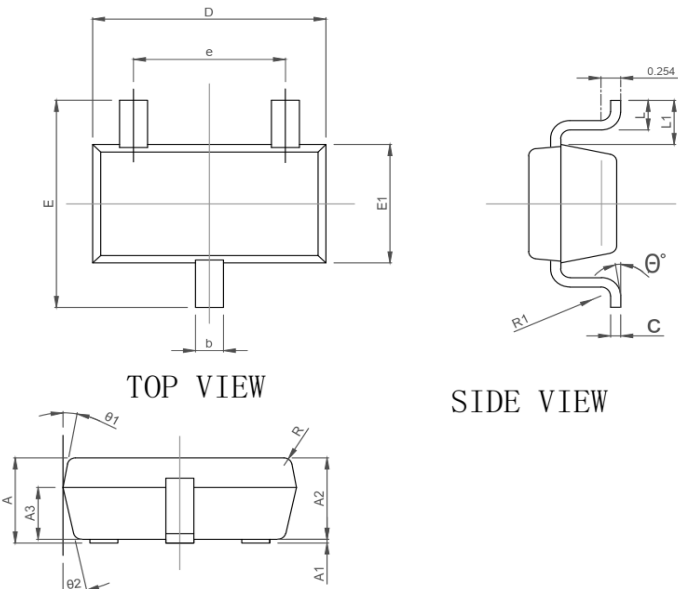


Figure4: Diode Recovery Test Circuit & Waveforms

SOT-23-3L Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	-	1.25
* A1	0.02	-	0.10
* A2	1.05	1.10	1.15
A3	0.65	0.70	0.75
* b	0.30	0.35	0.45
* c	0.127 BSC		
* D	2.87	2.92	2.97
* E	2.72	2.80	2.88
* E1	1.55	1.60	1.65
* e	1.85	1.90	1.95
* L	0.32	0.40	0.48
* L1	0.55	0.60	0.65
R	0.10 REF		
R1	0.12 REF		
* θ	0	--	8°
θ_1	8°	10°	12°
θ_2	10°	12°	14°