SDM130PU02S

-20V P-Channel MOSFETs

Rev A.0

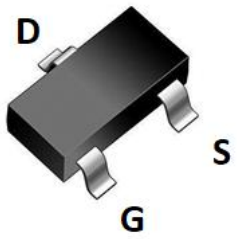
Feature

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

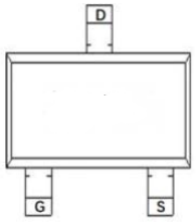
Product Summary

V_{DS}	-20	V
$V_{GS(th)\_Typ}$	-0.7	V
$R_{DS(ON)\_Typ}$ (at V_{GS} =-4.5V)	95	mΩ
I_D	-2	A

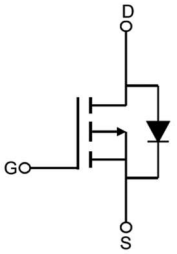
Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM130PU02S	SOT-23	2301	Tape	7" Reel	3000



SOT-23 top view



Pin Assignment



Schematic Diagram

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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A=25°C	I_D	-2	A
	T_A=100°C		-1.3	
Pulsed Drain Current (1)		I_{DM}	-8	A
Maximum Body-Diode Continuous Current		I_S	-2	A
Power Dissipation	T_A=25°C	P_D	0.8	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	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V, 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	-0.4	-0.7	-1	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance(3)	V_{GS}=-4.5V, I_D=-2A	-	95	125	mΩ
		V_{GS}=-2.5V, I_D=-1A	-	125	165	
V_{SD}	Diode Forward Voltage	I_S=-2A, V_{GS}=0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-10V, f=1MHz	-	187	-	pF
C_{oss}	Output Capacitance		-	37	-	pF
C_{rss}	Reverse Transfer Capacitance		-	27	-	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=-4.5 to 0V, V_{DS}=-10V, I_D=-2A	-	2.3	-	nC
Q_{gs}	Gate Source Charge		-	0.7	-	nC
Q_{gd}	Gate Drain Charge		-	0.7	-	nC
$t_{D(on)}$	Turn-On Delay Time	V_{GS}=-4.5V,V_{DD}=-10V,R_G=3.0Ω, R_L=5Ω	-	11	-	ns
t_r	Turn-On Rise Time		-	31	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	65	-	ns
t_f	Turn-Off Fall Time		-	51	-	ns

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient(2)	-	156	°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 $1inch^2$ pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

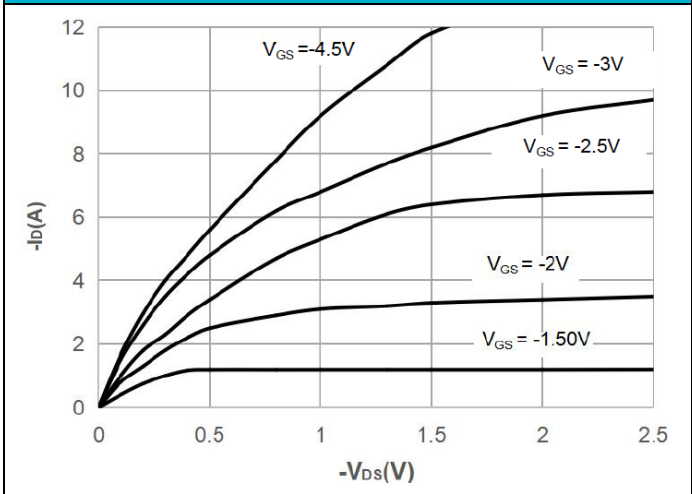


Figure 2: Transfer Characteristics

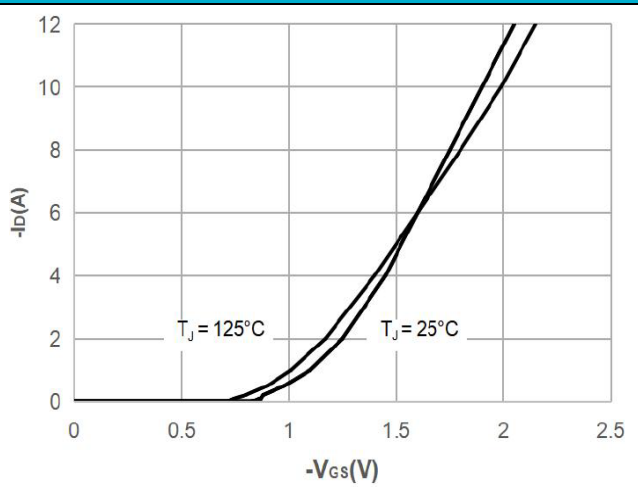


Figure 3: $R_{DS(ON)}$ vs. Drain Current

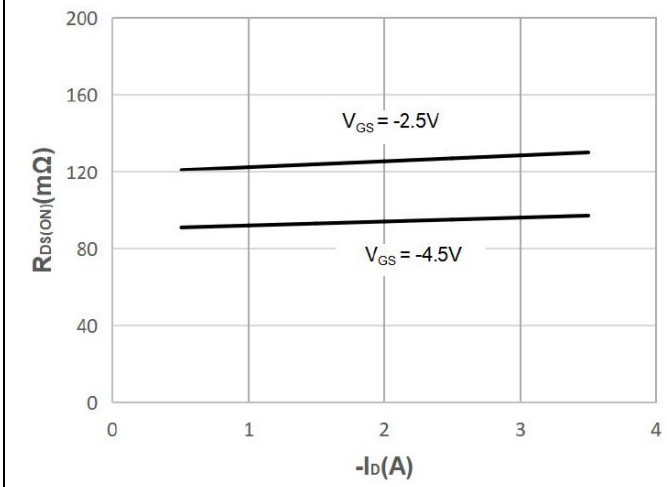


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

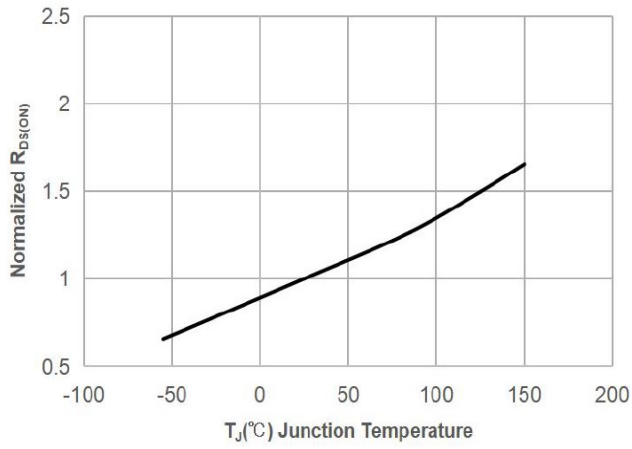


Figure 5: Normalized Breakdown voltage vs. Junction Temperature

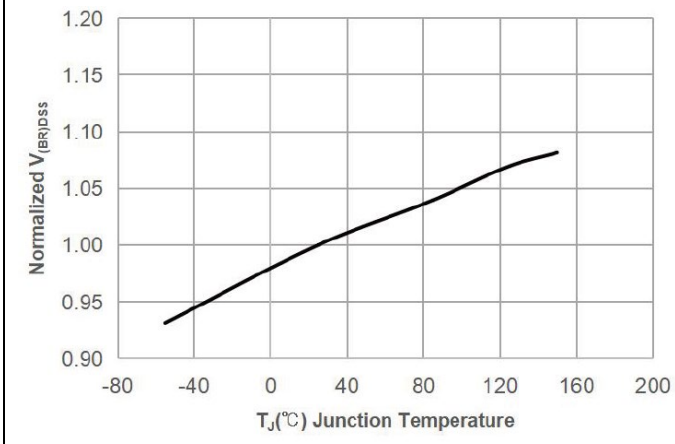
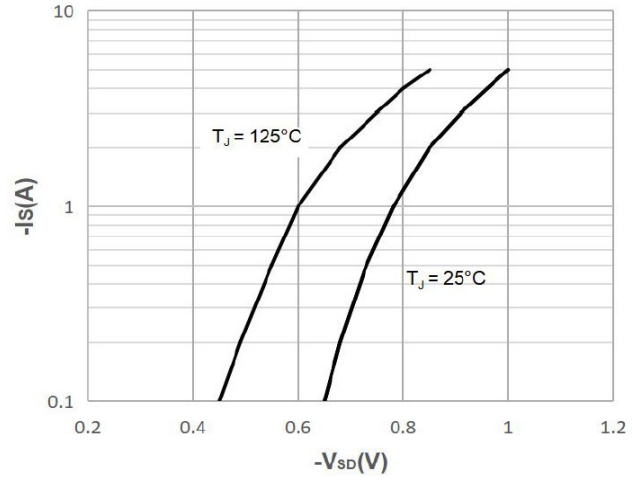


Figure 6: Body-Diode Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

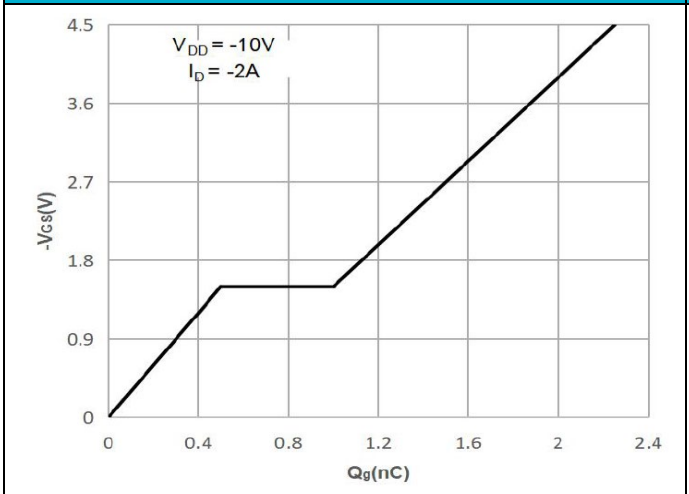


Figure 8: Capacitance characteristics

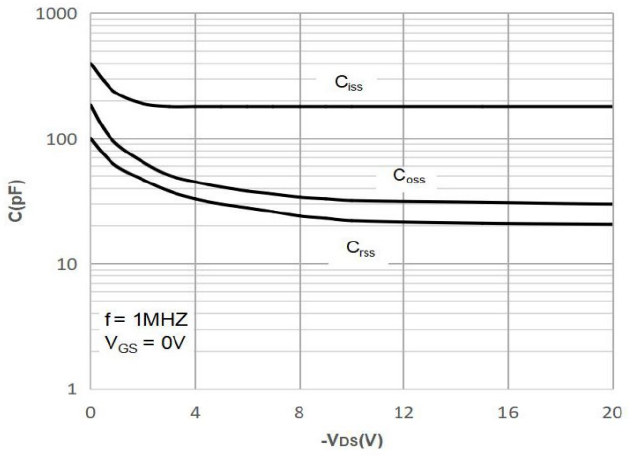


Figure 9: Current De-rating

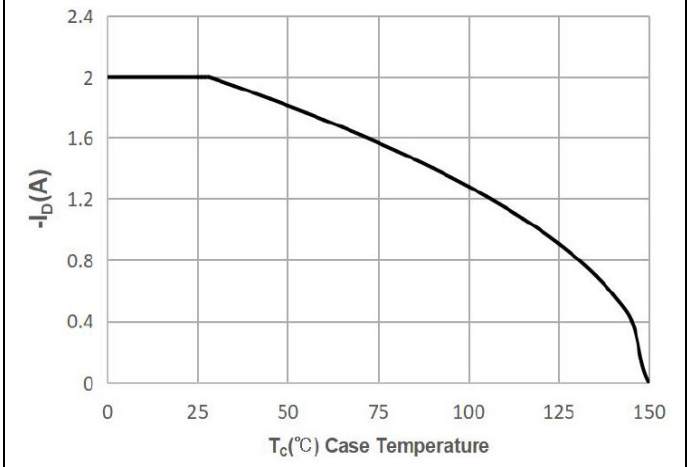


Figure 10: Maximum Safe Operating Area

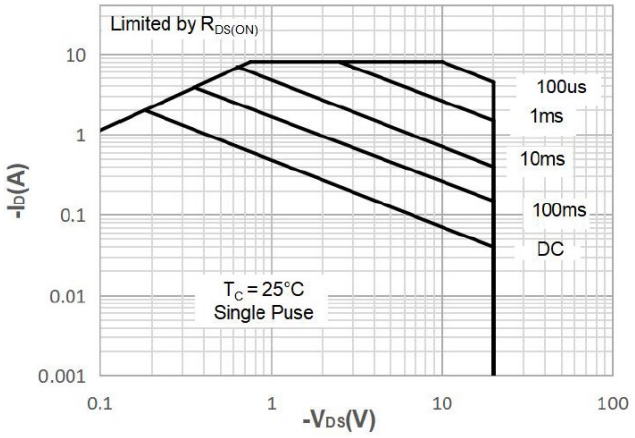


Figure 11: Normalized Maximum Transient Thermal Impedance

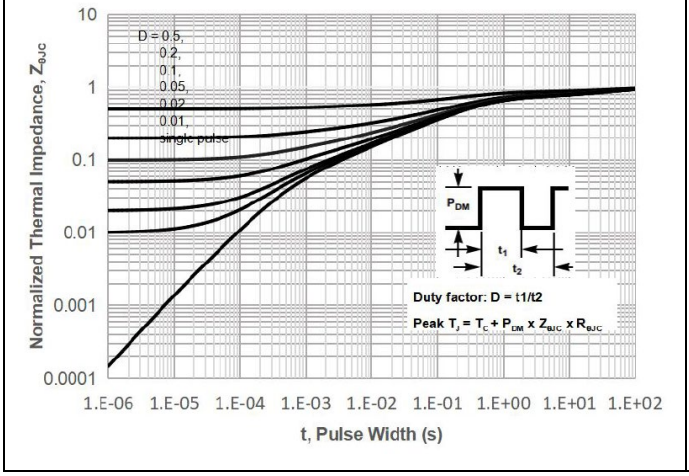
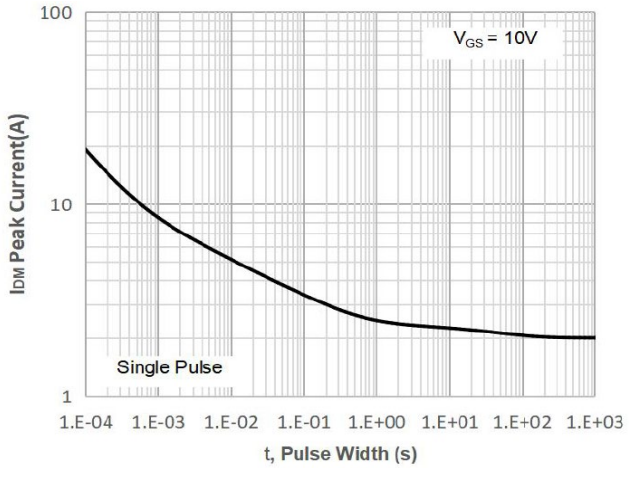


Figure 12: Peak Current Capacity



Test Circuit

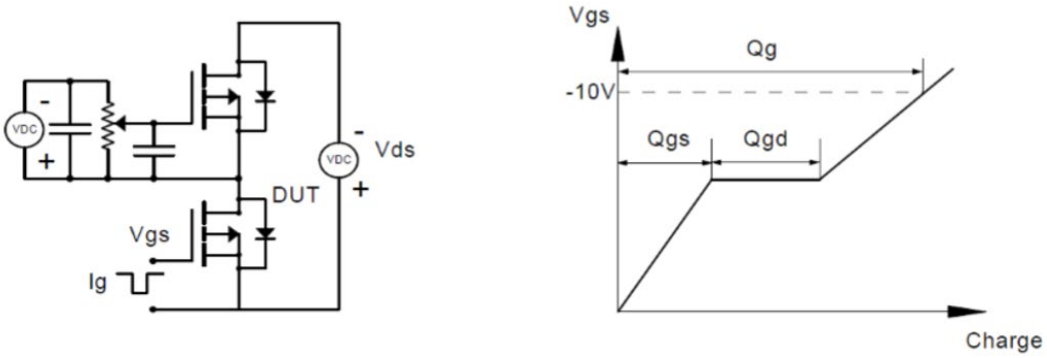


Figure1: Gate Charge Test Circuit & Waveforms

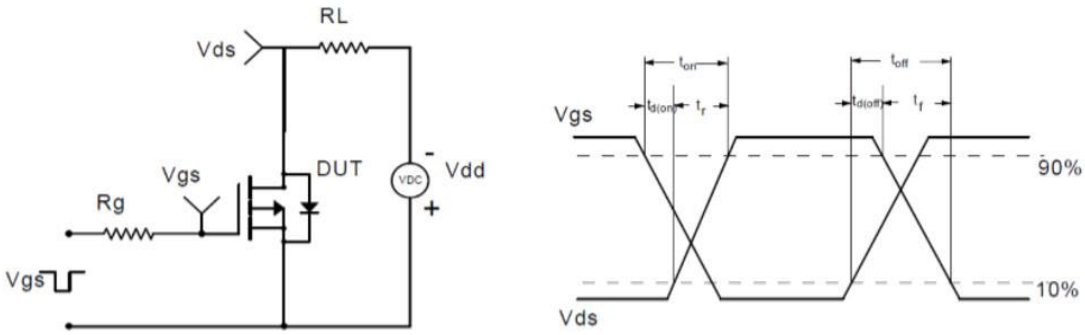


Figure2: Resistive Switching Test Circuit & Waveforms

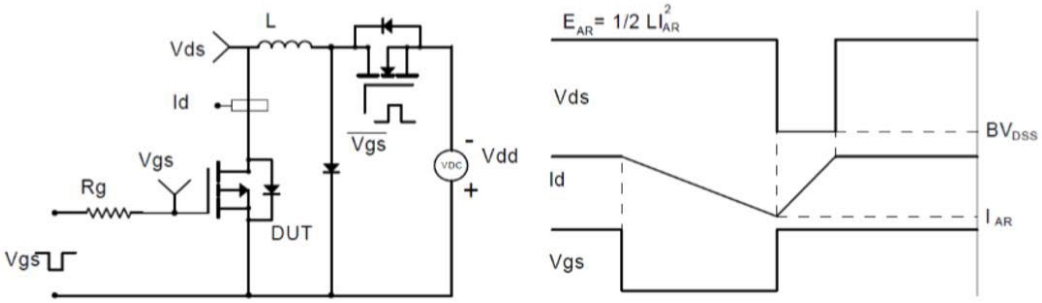


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

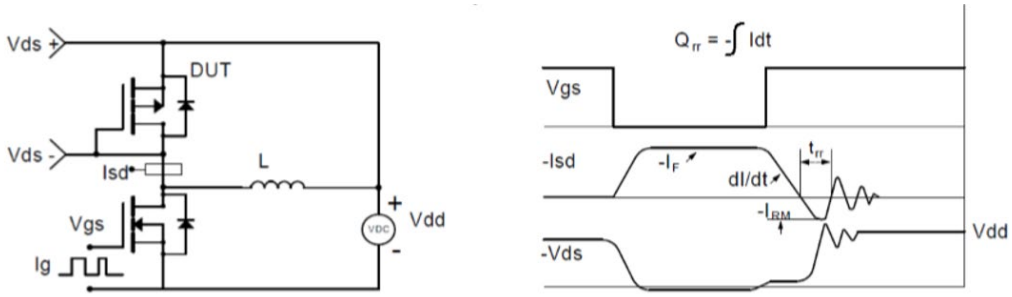
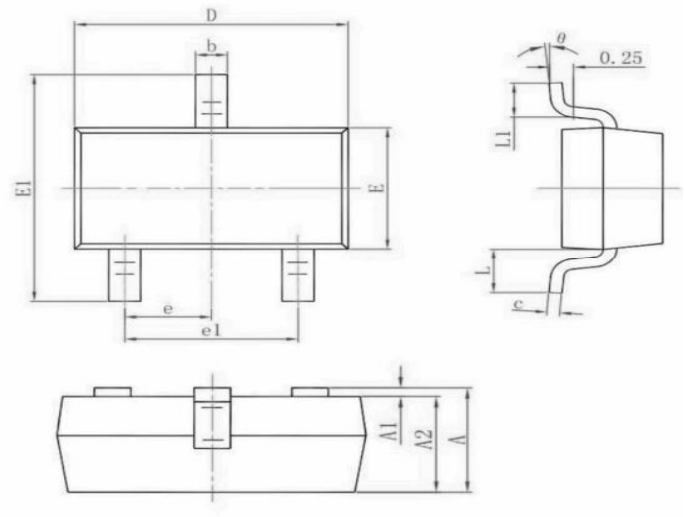


Figure4: Diode Recovery Test Circuit & Waveforms

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°