-20V/29mΩ@-4.5V P-Channel MOSFET

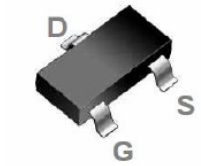
Features

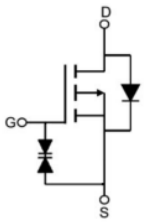
- V_{DS} = -20V, I_D = -4.1A
  $R_{DS(ON)}$ <38mΩ @ V_{GS} = -4.5V
  $R_{DS(ON)}$ <53mΩ @ V_{GS} = -2.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- ESD Rating: HBM 2.0KV

Applications

- PWM Applications
- Load Switch
- Power Management

SOT23 Pin Configuration





Maximum Ratings (Tc = 25℃, Unless Otherwise Noted)

Parameters	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current - Continuous(TC=25℃)	I_D	-4.1	A
Drain Current - Continuous(TC=100℃)		-2.7	A
Drain Current - Pulsed	I_{DM}[1]	-16.4	A
Power Dissipation(TC=25℃)	P_D	1.0	W
Power Dissipation - Derate above 25℃		0.008	W/℃
Storage Temperature Range	T_{STG}	-55~ 150	℃
Operating Junction Temperature Range	Tj	-55~ 150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Typ.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	125	℃/W

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Electrical Characteristics(Tj = 25℃, Unless Otherwise Noted)

Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain to Source Breakdown Volage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	---	---	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V, T_J=25℃	---	---	-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±10V	---	---	±10	μA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A	---	29	38	mΩ
		V_{GS}=-2.5V, I_D=-3A	---	38	53	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.7	-1.0	V

Dynamic And Switching Characteristics

Total Gate Charge[2,3]	Q_g	V_{DS}=-10V, V_{GS}= -4.5V, I_D=-4.1A	---	9	---	nC
Gate-Source Charge[2,3]	Q_{gs}		---	1	---	
Gate-Drain Charge[2,3]	Q_{gd}		---	2.6	---	
Turn-on Delay Time[2,3]	$T_{d(on)}$	V_{DD}=-10V, R_G = 1Ω V_{GEN}=-4.5V, R_L=1.2Ω	---	12	---	nS
Turn-on Rise Time[2,3]	T_r		---	35	---	
Turn-off Delay Time[2,3]	$T_{d(off)}$		---	30	---	
Turn-off Fall Time[2,3]	T_f		---	10	---	
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V, F=1.0MHz	---	289	---	pF
Output Capacitance	C_{oss}		---	98	---	
Reverse Transfer Capacitance	C_{rss}		---	22	---	

Drain-Source Diode Characteristics And Maximum Ratings

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	-4.1	A
Pulsed Source Current	I_{SM}		---	---	-16.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-4.1A, T_J=25℃	---	---	-1.2	V

Figure1: Output Characteristics

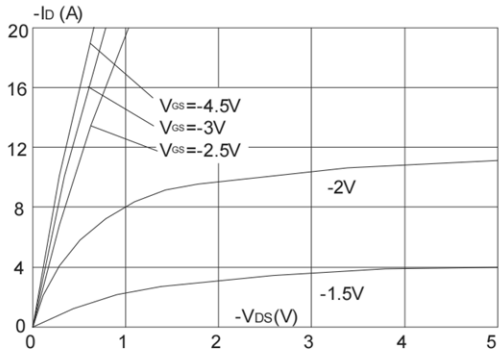


Figure 2: Typical Transfer Characteristics

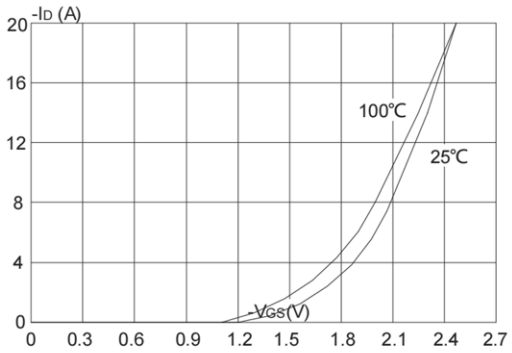


Figure 3: On-resistance vs. Drain Current

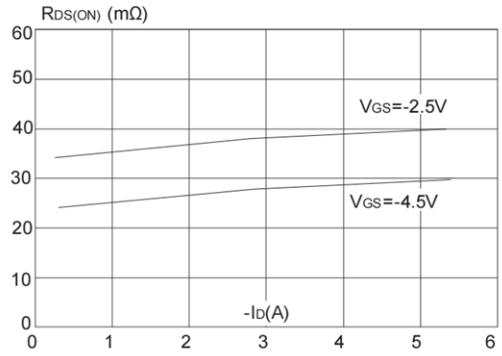


Figure 4: Body Diode Characteristics

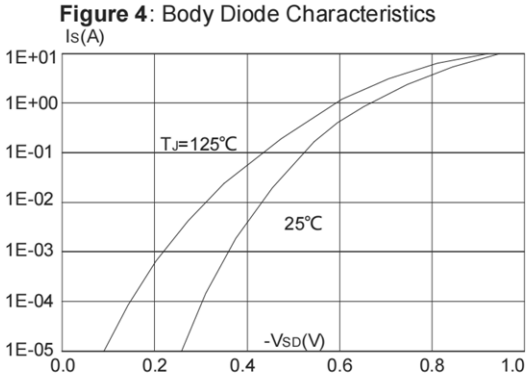


Figure 5: Gate Charge Characteristics

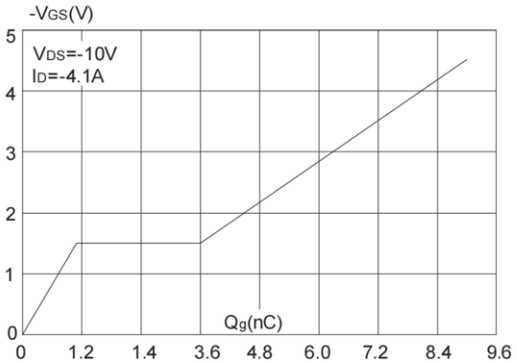


Figure 6: Capacitance Characteristics

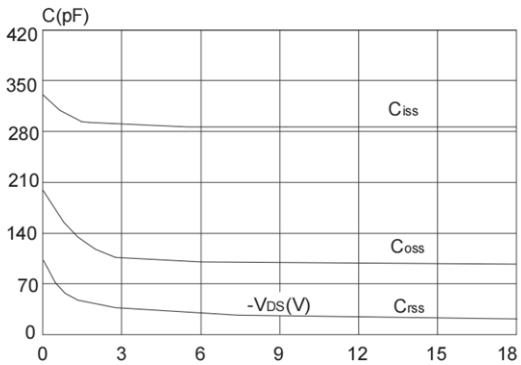


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

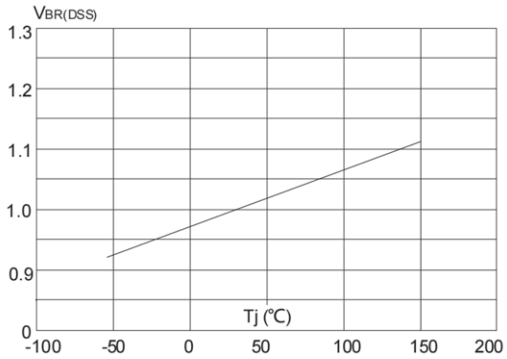


Figure 8: Normalized on Resistance vs. Junction Temperature

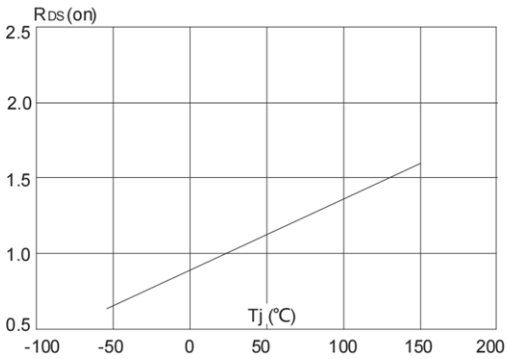


Figure 9: Maximum Safe Operating Area

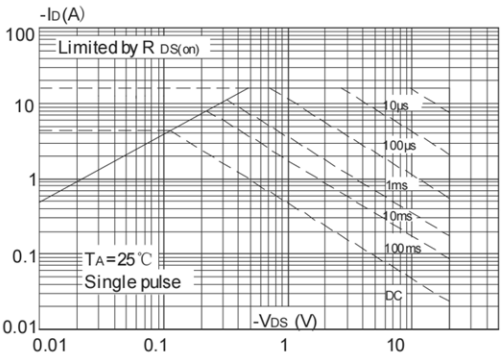


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

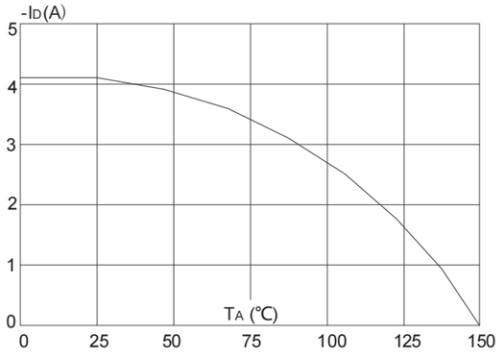
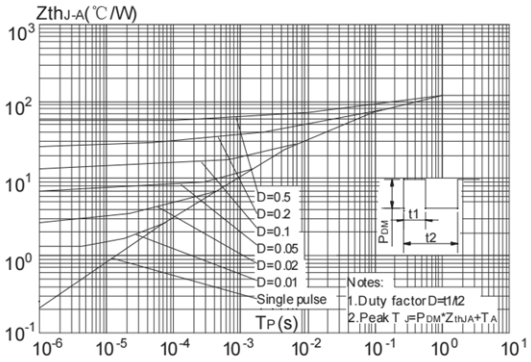
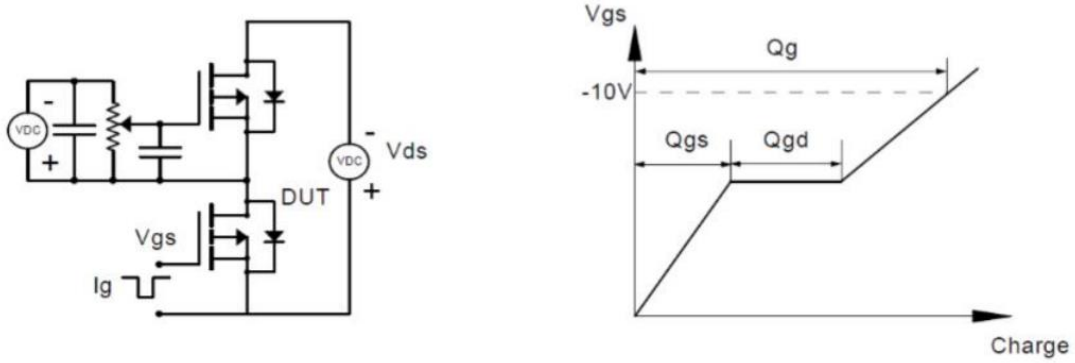


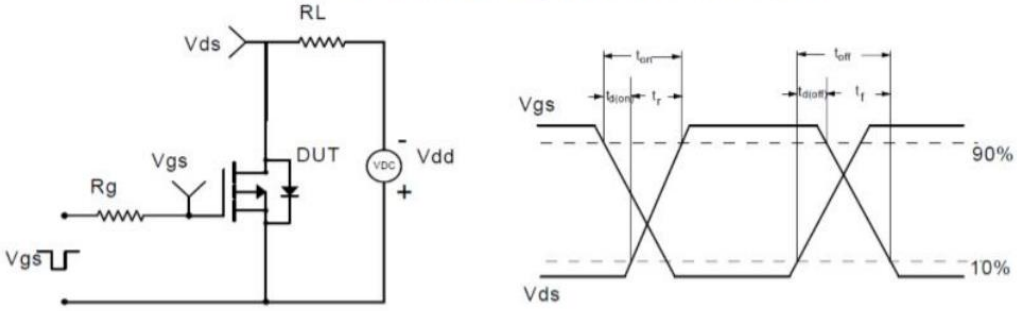
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



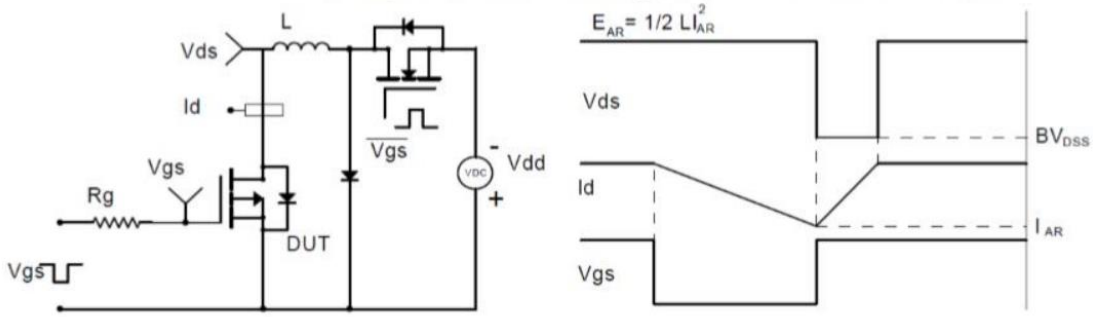
Gate Charge Test Circuit & Waveform



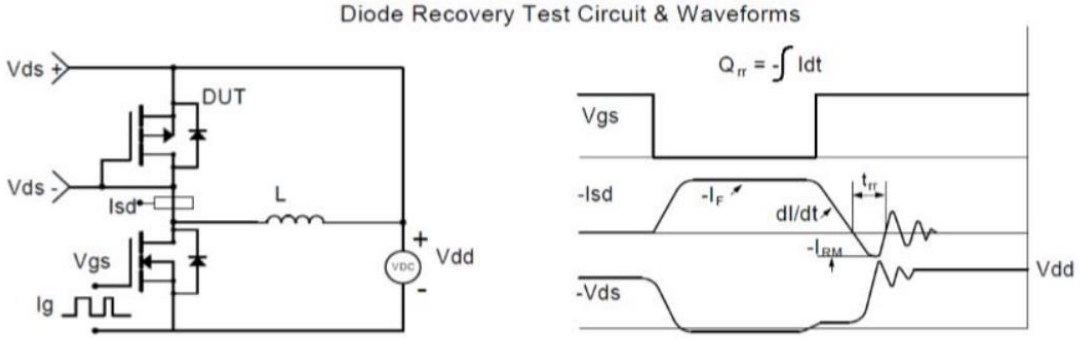
Resistive Switching Test Circuit & Waveforms



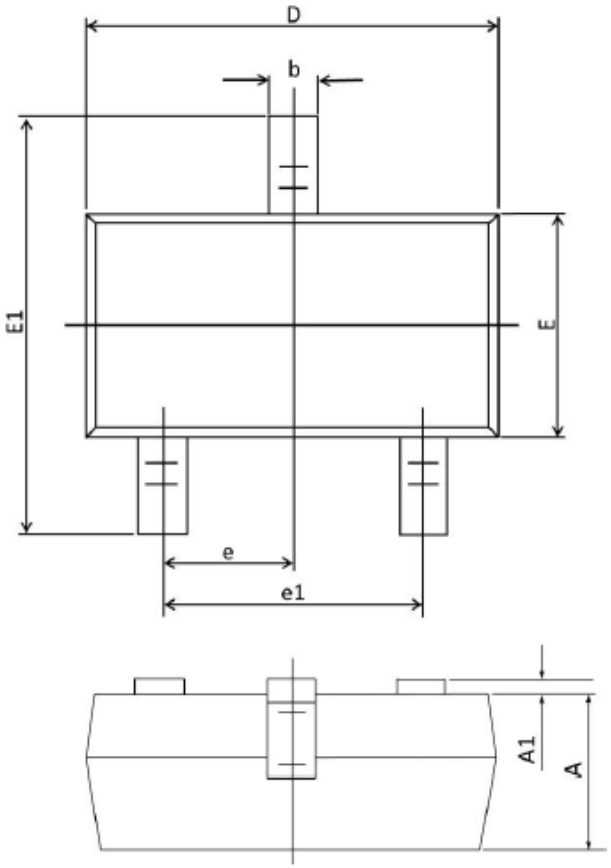
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
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	1°	7°	1°	7°