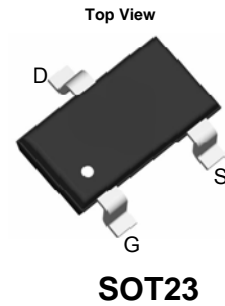


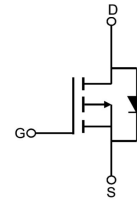
Features

- $V_{DS}=-20V$, $I_D=-2.5A$
 $R_{DS(ON)} < 104m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 154m\Omega @ V_{GS} = -2.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired



Application

- PWM Applications
- Load Switch
- Power Management



Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	-2.5
		$T_A = 100^\circ C$	-1.6
I_{DM}	Pulsed Drain Current ^{note1}	-10	A
P_D	Power Dissipation	1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS} = -4.5V, I_D = -2.5A$	-	80	104	m Ω
		$V_{GS} = -2.5V, I_D = -1.5A$	-	110	154	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0MHz$	-	248	-	pF
C_{oss}	Output Capacitance		-	42	-	pF
C_{riss}	Reverse Transfer Capacitance		-	31	-	pF
Q_g	Total Gate Charge	$V_{DS} = -10V, I_D = -2.5A,$ $V_{GS} = -4.5V$	-	2.9	-	nC
Q_{gs}	Gate-Source Charge		-	0.45	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	0.75	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10V, R_L = 5\Omega,$ $R_{GEN} = 3\Omega, V_{GS} = -4.5V,$	-	9.8	-	ns
t_r	Turn-on Rise Time		-	4.9	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	20.5	-	ns
t_f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-2.5	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-10	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -2.5A$	-	-	-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

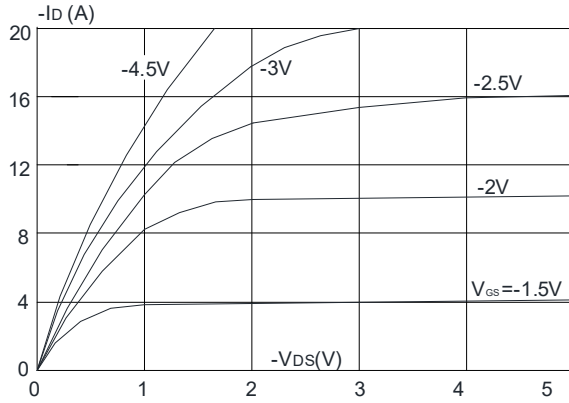


Figure 2: Typical Transfer Characteristics

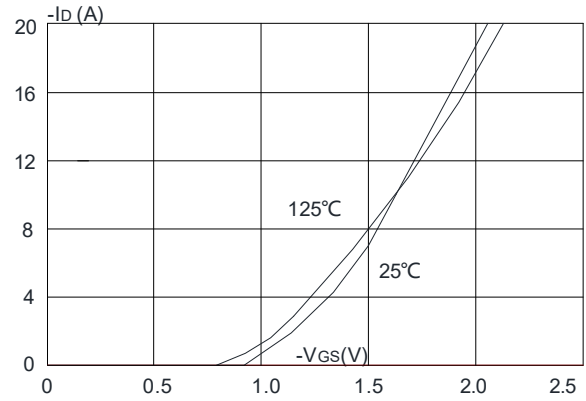


Figure 3: On-resistance vs. Drain Current

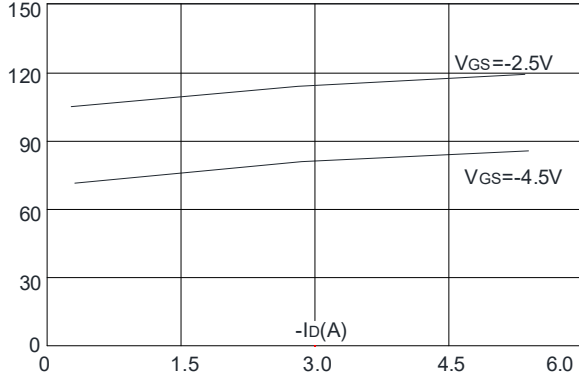


Figure 4: Body Diode Characteristics

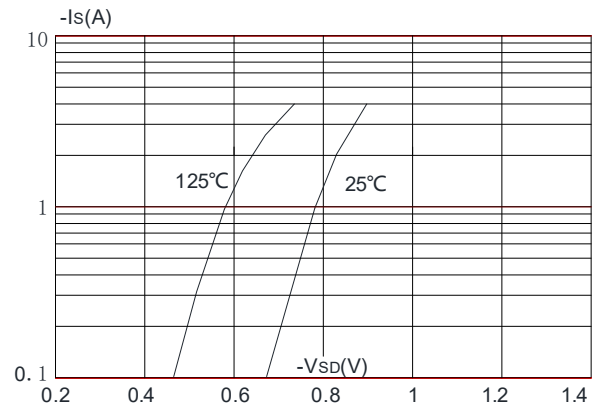


Figure 5: Gate Charge Characteristics

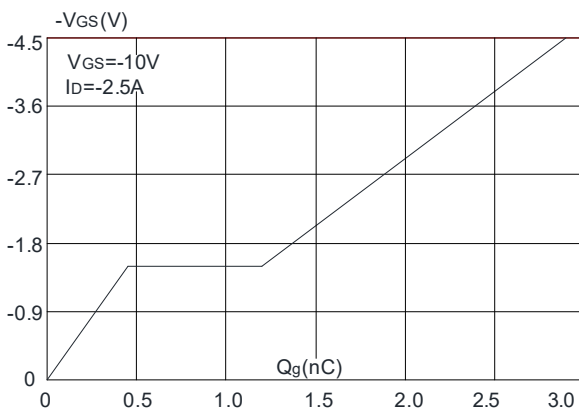


Figure 6: Capacitance Characteristics

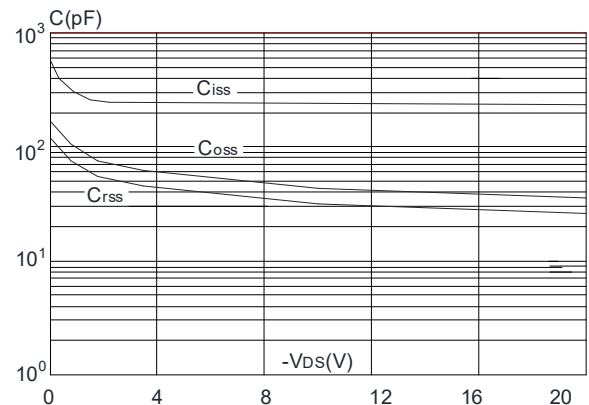


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

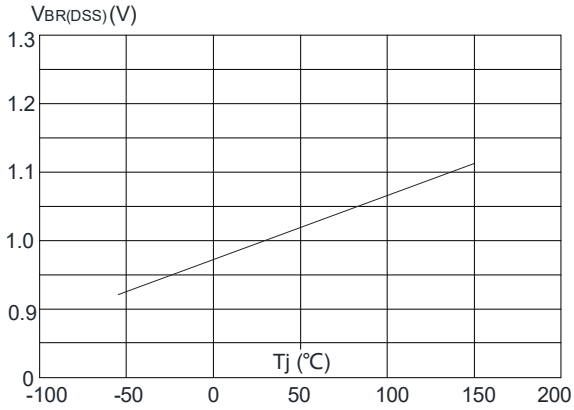


Figure 8: Normalized on Resistance vs. Junction Temperature

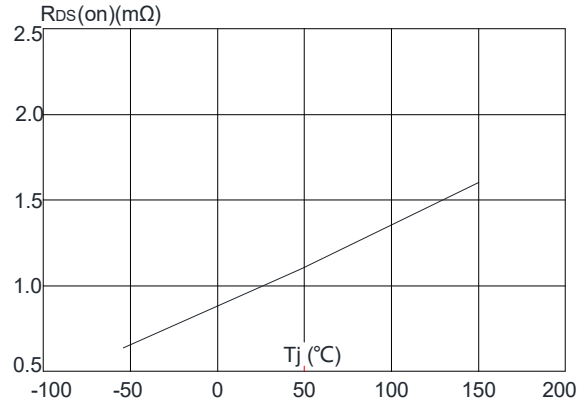


Figure 9: Maximum Safe Operating Area

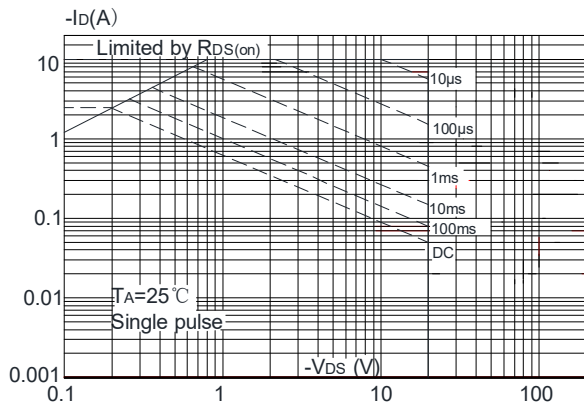


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

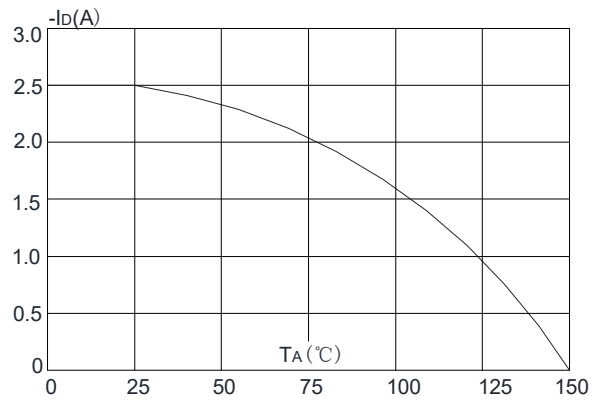
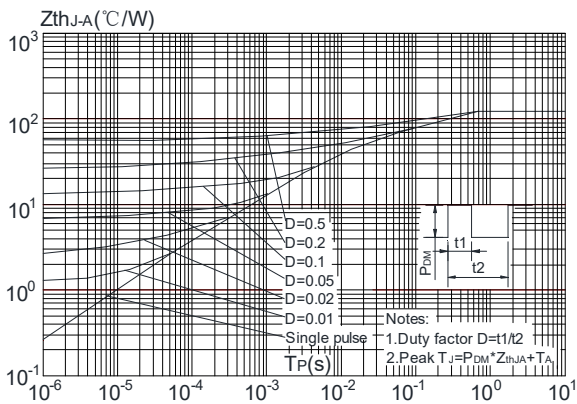
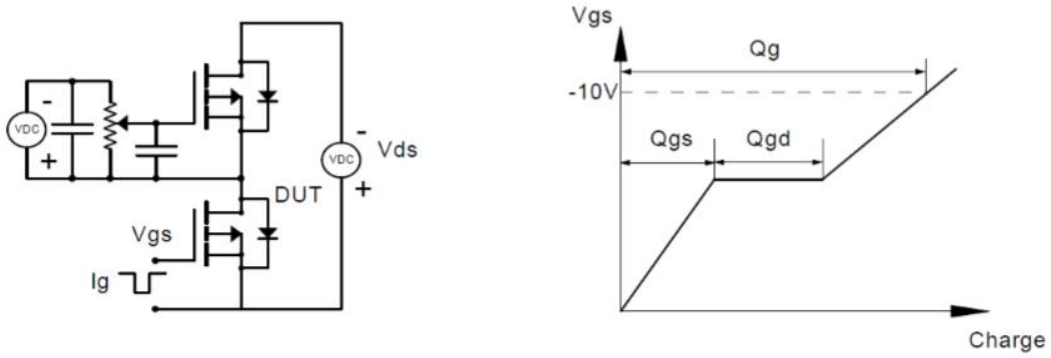


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

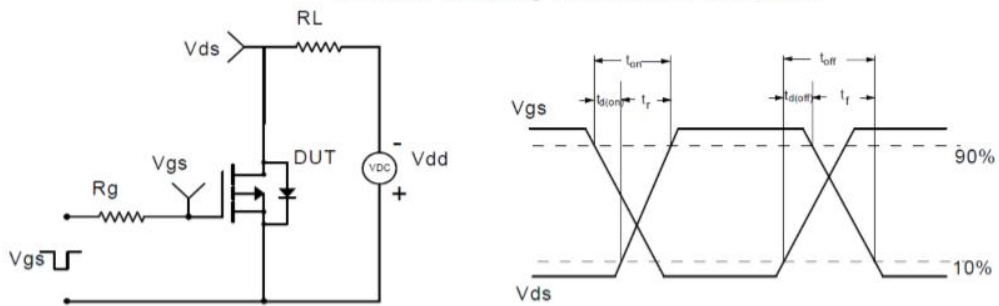


Test Circuit

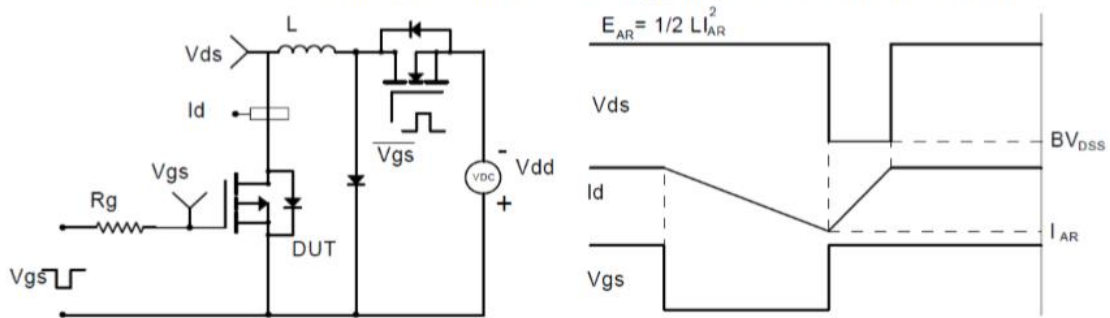
Gate Charge Test Circuit & Waveform



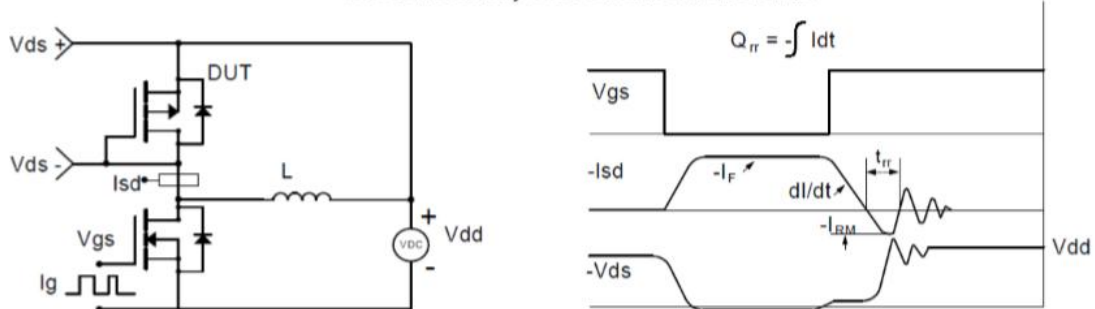
Resistive Switching Test Circuit & Waveforms



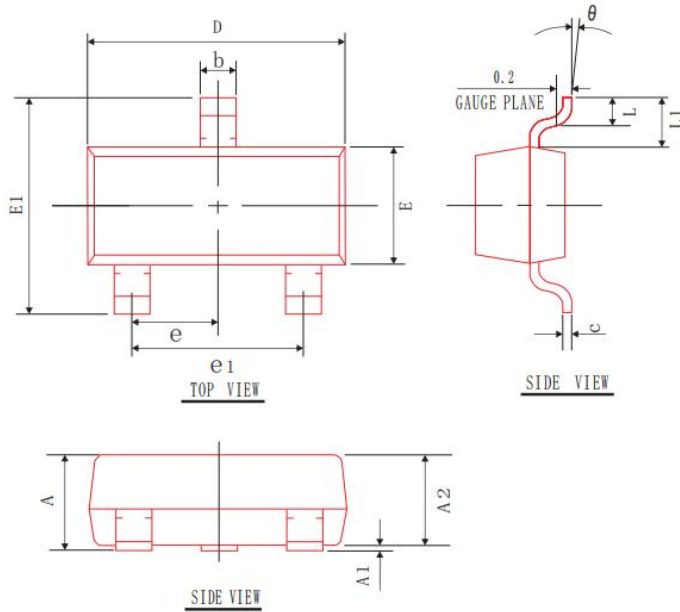
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



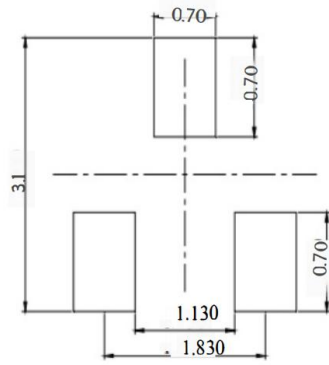
Package Mechanical Data-SOT-23



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

Recommended Footprint



DIMENSIONS:MILLIMETERS