



General Description

The ZLM0302AB uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device may be used as a load switch or in PWM applications.

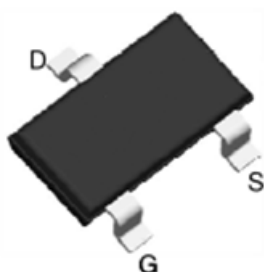
Applications

- load switch
- portable power source
- Switching Power Supply
- wireless charging

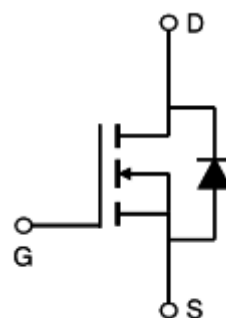
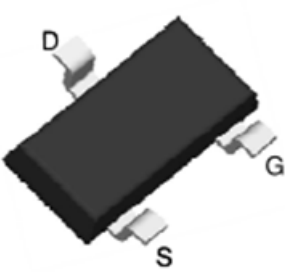
Product Summary

- V_{DS} 30V
- I_D (at $V_{GS} = 10V$) 5A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) $< 31m\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) $< 43m\Omega$

Top View



Bottom View



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	5	A
$T_A=25^\circ\text{C}$			
$T_A=70^\circ\text{C}$		4	
Pulsed Drain Current ^C	I_{DM}	20	A
Power Dissipation ^B	P_D	1.4	W
$T_A=25^\circ\text{C}$			
$T_A=70^\circ\text{C}$		0.9	
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient ^A	$R_{\theta JA}$	80	$^\circ\text{C/W}$

**Electrical Characteristics (T_J=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250uA, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V			1	uA
I _{GSS}	Gate-Bodyleakagecurrent	V _{DS} =0V, V _{GS} =±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.8	2.4	V
I _{D(ON)}	Onstate draincurrent	V _{GS} =10V, V _{DS} =5V	20			A
R _{DS(ON)}	StaticDrain-Source On-Resistance	V _{GS} =10V, I _D =1A		26	31	mΩ
		V _{GS} =4.5V, I _D =1A		34	43	mΩ
g _{FS}	ForwardTransconductance	V _{DS} =5V, I _D =5A		15		S
V _{SD}	Diode Forward Voltage	I _{DS} =1A, V _{GS} =0V		0.7	1	V
I _S	Maximum Body-Diode ContinuousCurrent				1.5	A
DYNAMIC PARAMETERS						
C _{iss}	InputCapacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		255		pF
C _{oss}	OutputCapacitance			45		pF
C _{rss}	Reverse TransferCapacitance			35		pF
SWITCHING PARAMETERS						
Q _g	TotalGate Charge	V _{GS} =10V, V _{DS} =15V, I _D =5A		5.2		nC
Q _{gs}	Gate Source Charge			0.85		nC
Q _{gd}	Gate Drain Charge			1.3		nC
t _{D(on)}	Turn-OnDelayTime	V _{GS} =10V, V _{DS} =15V, R _L =3Ω, R _{GEN} =3Ω		4.5		ns
t _r	Turn-On Rise Time			2.5		ns
t _{D(off)}	Turn-OffDelayTime			14.5		ns
t _f	Turn-OffFallTime			3.5		ns
t _{rr}	Body Diode Reverse Recovery Time		I _F =5A, dI/dt=100A/μs		8.5	
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =5A, dI/dt=100A/μs		2.2		nC

Notes:

- A. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.
- B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using ≤ 10s junction-to-ambient thermal resistance
- C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
- D. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max
- E. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T_{J(MAX)}=150°C. The SOA curve provides a single pulse rating.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

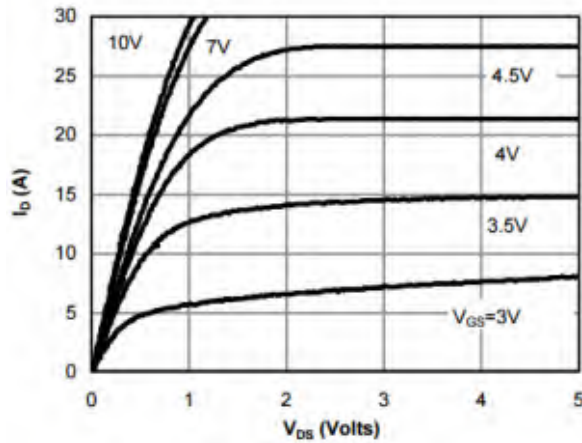


Fig 1: On-Region Characteristics (Note D)

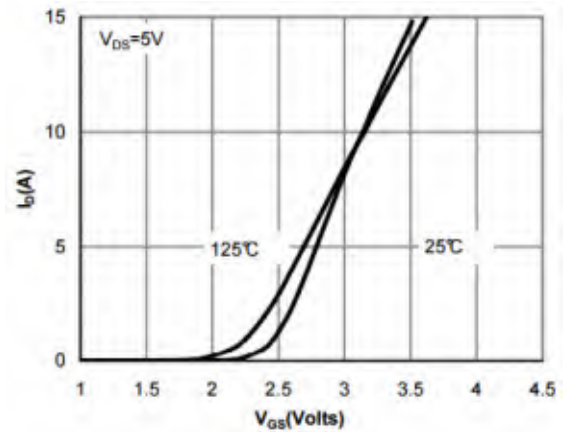


Figure 2: Transfer Characteristics (Note D)

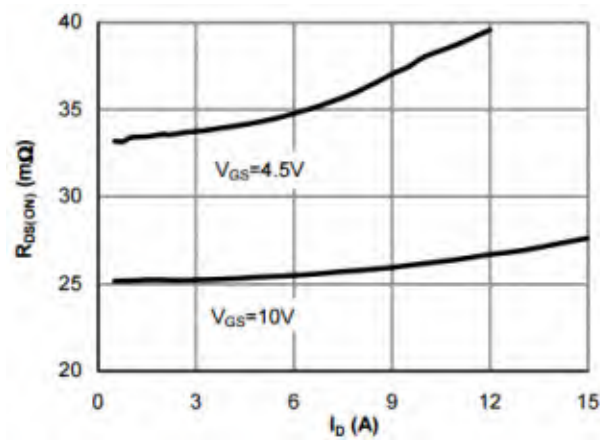


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

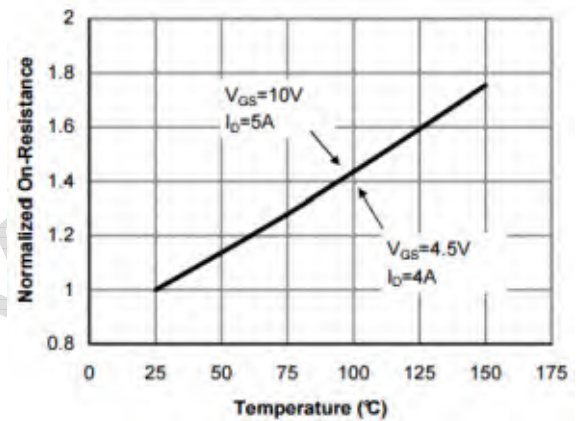


Figure 4: On-Resistance vs. Junction Temperature (Note D)

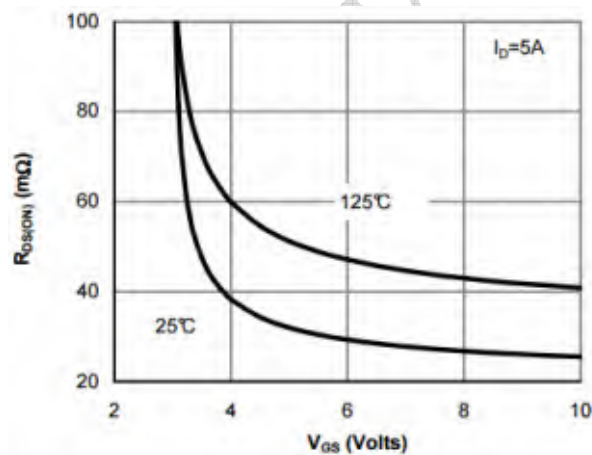


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

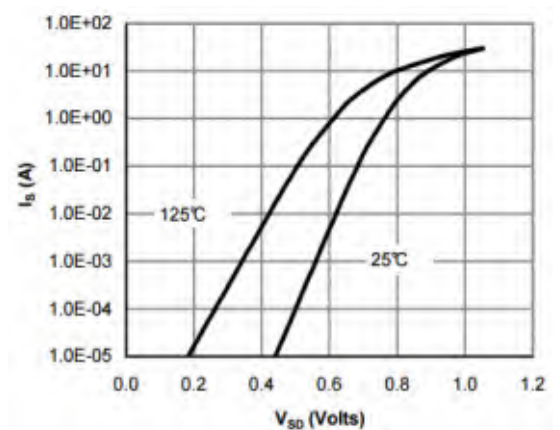


Figure 6: Body-Diode Characteristics (Note D)



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

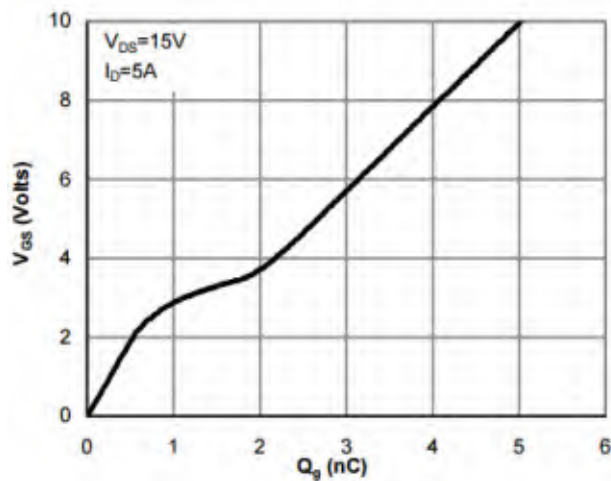


Figure 7: Gate-Charge Characteristics

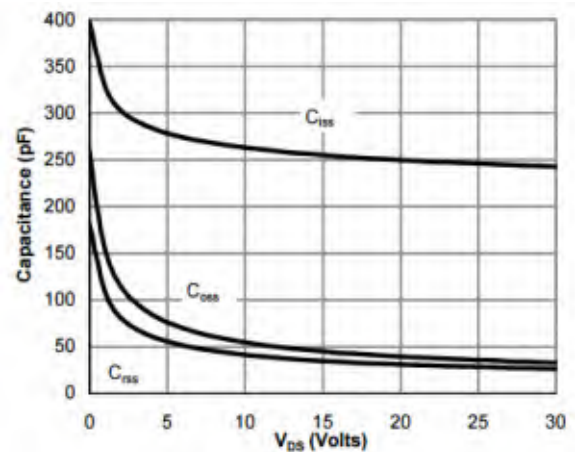


Figure 8: Capacitance Characteristics

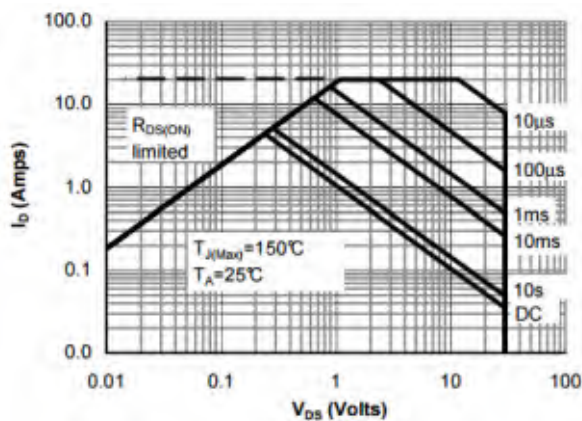


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

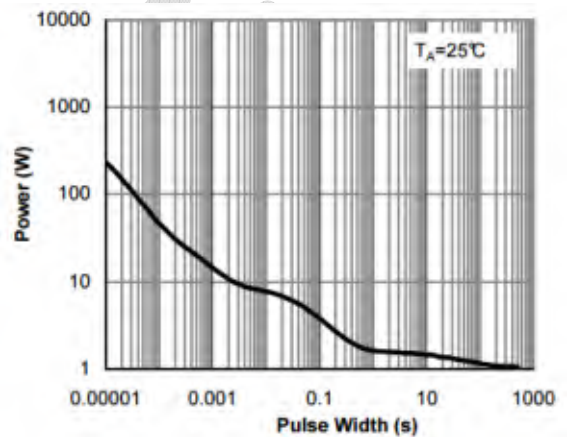


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

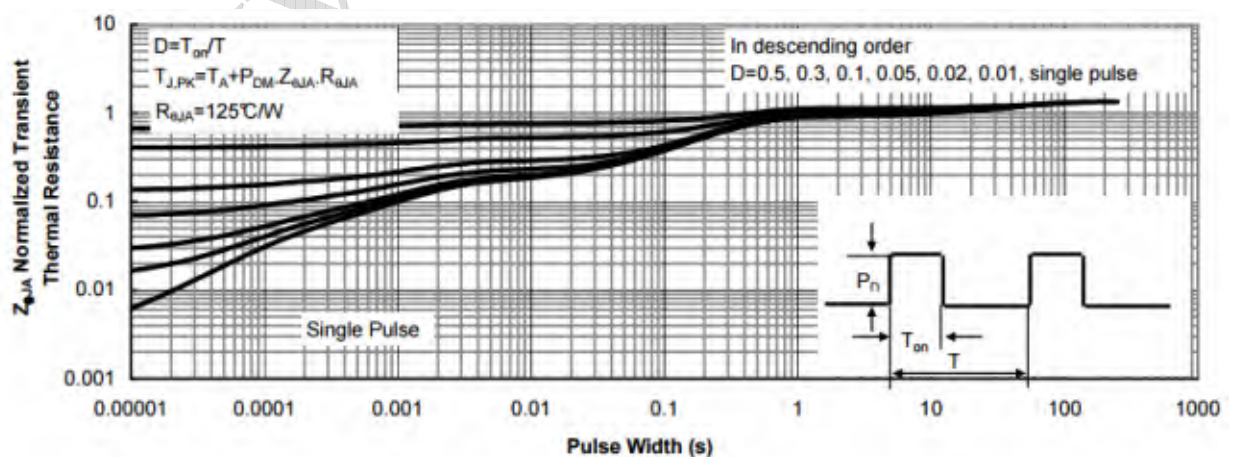
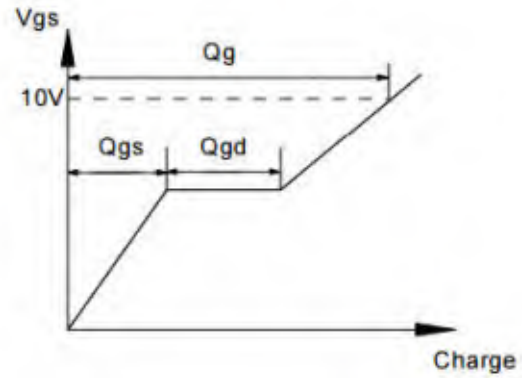
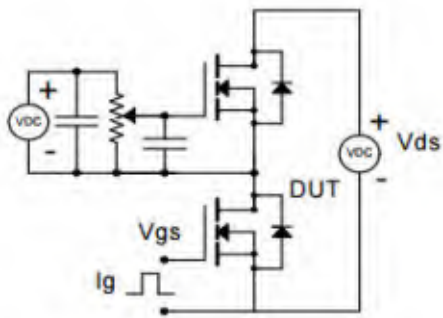


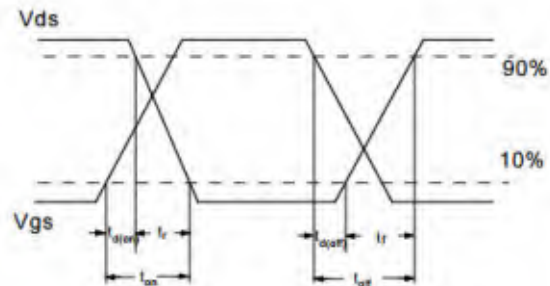
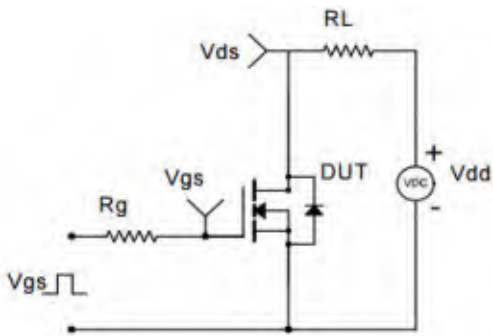
Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)



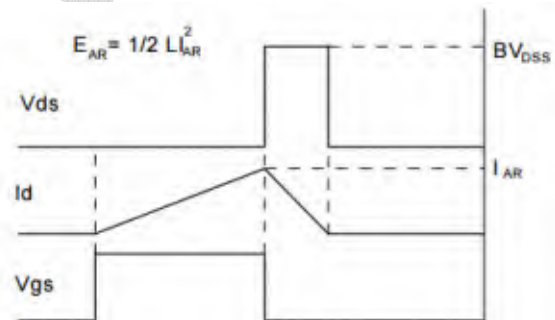
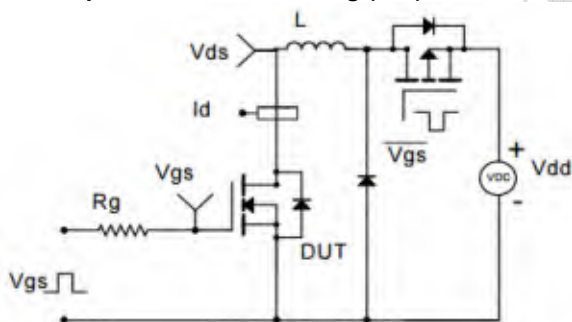
Gate Charge Test Circuit & Waveform



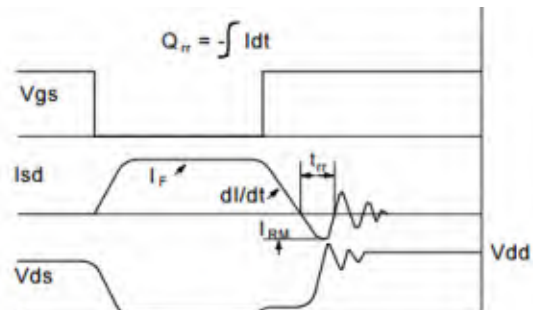
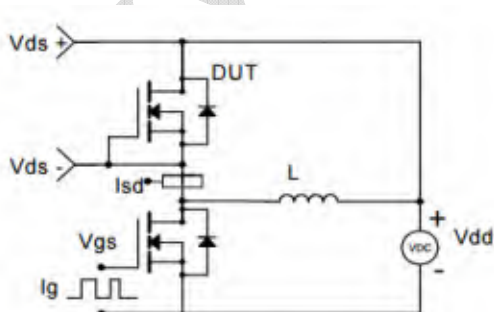
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



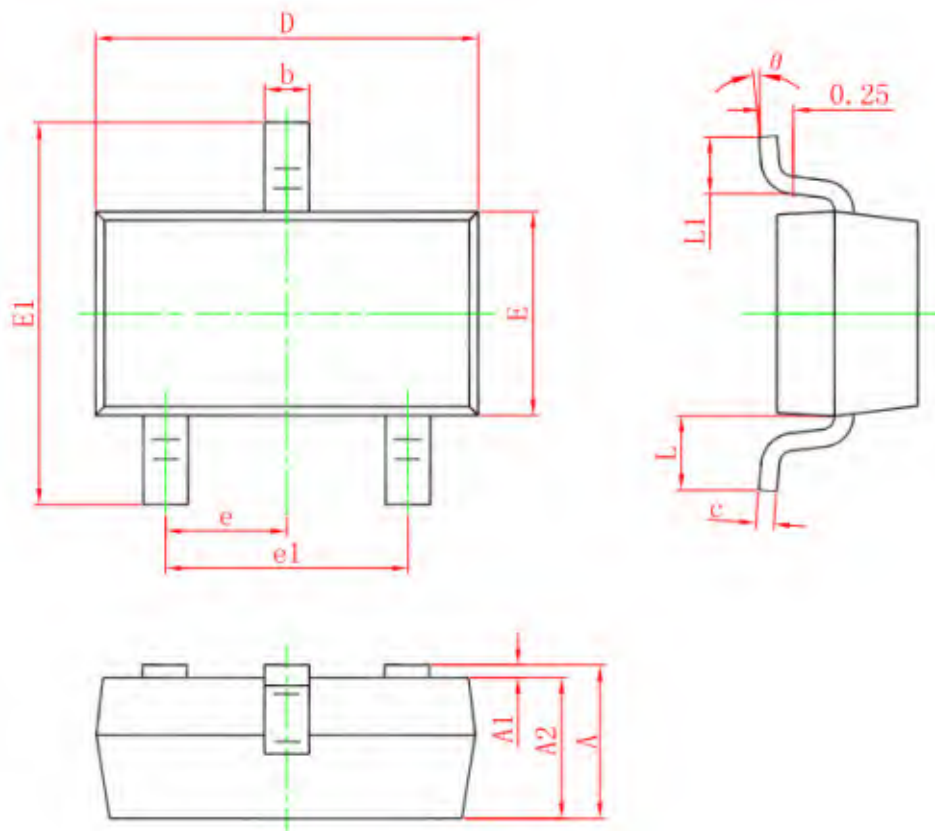
Diode Recovery Test Circuit & Waveforms





Package Information

SOT23



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°