



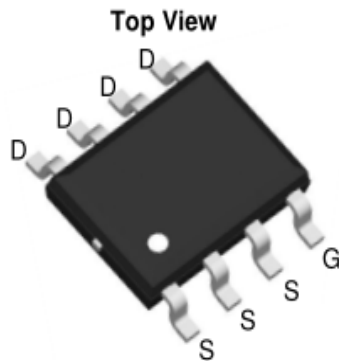
GeneralDescription

The ZLM0307BA combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

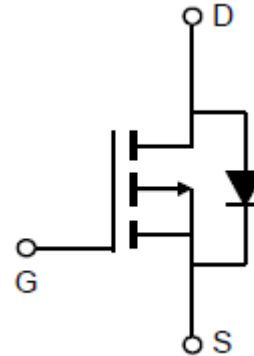
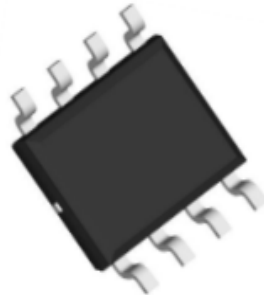
◆ RoHS and Halogen-Free Compliant

Product Summary

V_{DS}	-30V
I_D (at $V_{GS}=-4.5V$)	-12A
$R_{DS(ON)}$ (at $V_{GS}=-20V$)	< 13m Ω
$R_{DS(ON)}$ (at $V_{GS}=-10V$)	<14m Ω
$R_{DS(ON)}$ (at $V_{GS}=-5V$)	<30m Ω



Bottom View



Absolute Maximum Ratings (T_A=25°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	-12	A
		-10	
Pulsed Drain Current ^C	I_{DM}	-60	A
Power Dissipation ^B	P_D	3.1	W
		2	
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient ^A	$R_{\theta JA}$	62	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
B _V DSS	Drain-Source Breakdown Voltage	I _D =-250uA, V _{GS} =0V	-30			V
I _D DSS	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V			-1	uA
I _G SS	Gate-Bodyleakagecurrent	V _{DS} =0V, V _{GS} =±25V			±100	nA
V _{GS} (th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1		-3	V
I _D (ON)	Onstate draincurrent	V _{GS} =-10V, V _{DS} =-5V	-60			A
R _{DS} (ON)	StaticDrain-Source On-Resistance	V _{GS} =-20V, I _D =-12A		8.5	13	mΩ
		V _{GS} =-10V, I _D =-12A		11	14	mΩ
		V _{GS} =-4.5V, I _D =-7A		21	30	mΩ
g _{FS}	ForwardTransconductance	V _{DS} =-5V, I _D =-10.5A		27		S
V _{SD}	Diode Forward Voltage	I _{DS} =-1A, V _{GS} =0V			-1.2	V
I _S	Maximum Body-Diode ContinuousCurrent				-4	A
DYNAMIC PARAMETERS						
C _{iss}	InputCapacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz		2000		pF
C _{oss}	OutputCapacitance			360		pF
C _{rss}	Reverse TransferCapacitance			285		pF
SWITCHING PARAMETERS						
Q _g	TotalGate Charge	V _{GS} =-10V, V _{DS} =-15V, ID=-12A		33		nC
Q _{gs}	Gate Source Charge			5		nC
Q _{gd}	Gate Drain Charge			12		nC
t _D (on)	Turn-OnDelayTime	V _{GS} =-10V, V _{DS} =-15V, R _L =1.25Ω, R _{GEN} =3Ω		11		ns
t _r	Turn-On Rise Time			9.4		ns
t _D (off)	Turn-OffDelayTime			24		ns
t _f	Turn-OffFallTime			12		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =-12A, dI/dt=500A/μs		30	40	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =-12A, dI/dt=500A/μs		22		nC

Notes:

A. is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air.

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 <300 μs 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

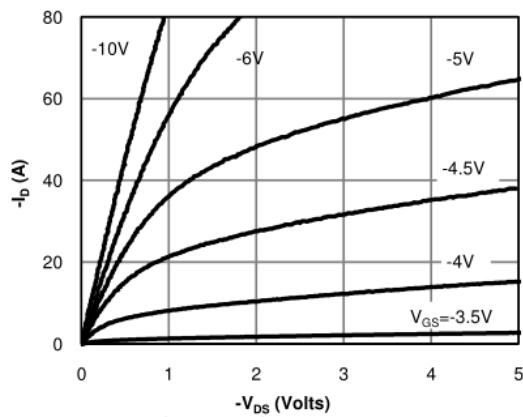


Fig 1: On-Region Characteristics (Note D)

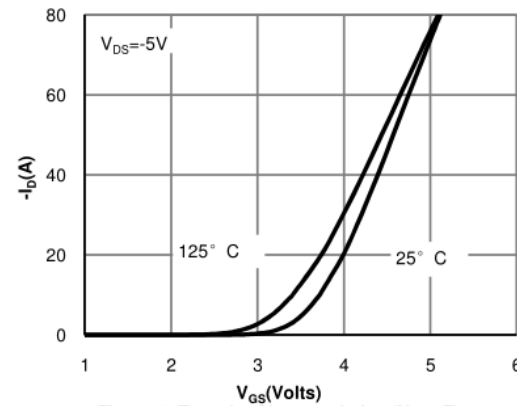


Figure 2: Transfer Characteristics (Note D)

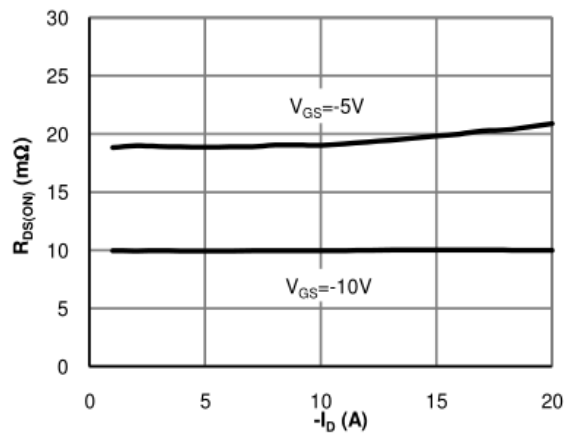


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

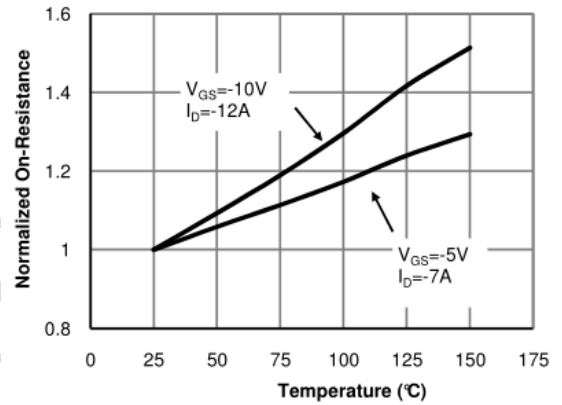


Figure 4: On-Resistance vs. Junction Temperature (Note D)

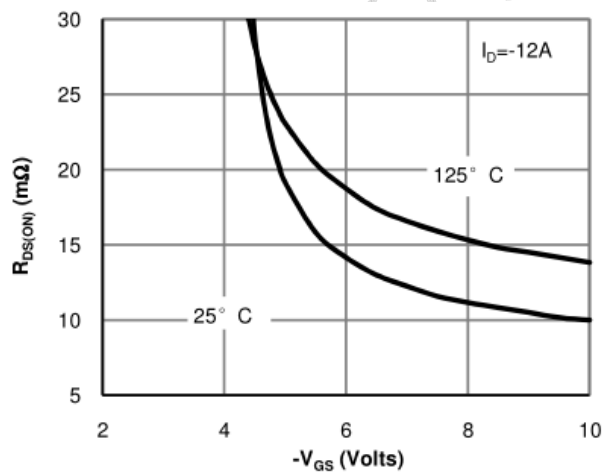


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

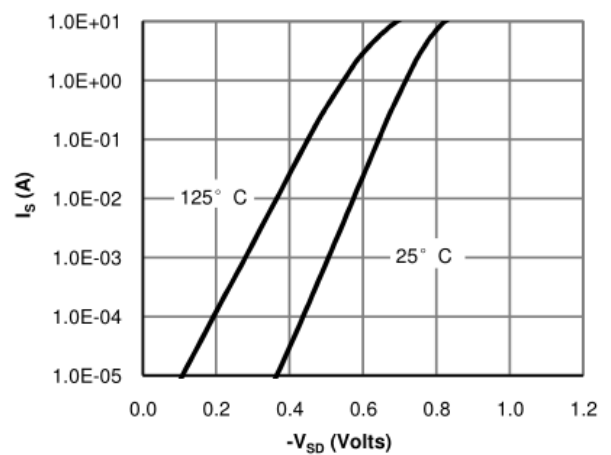


Figure 6: Body-Diode Characteristics (Note D)



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

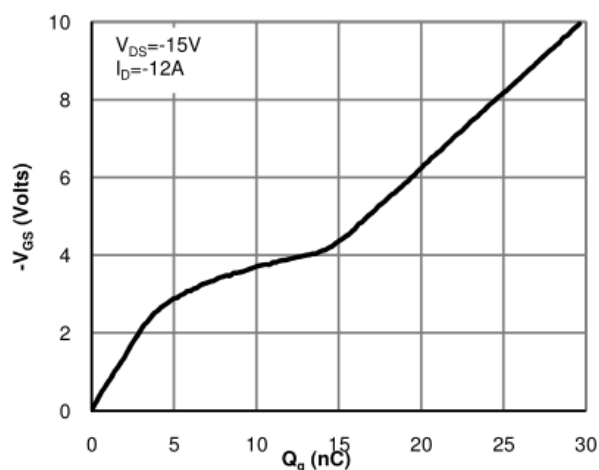


Figure 7: Gate-Charge Characteristics

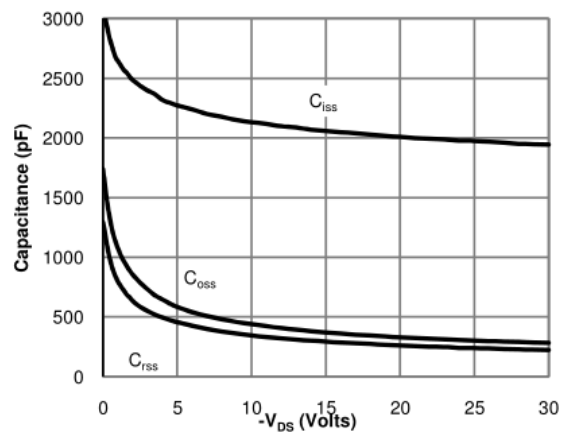


Figure 8: Capacitance Characteristics

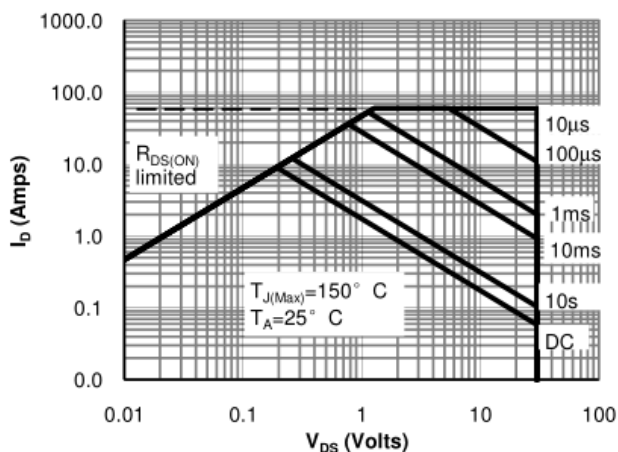


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

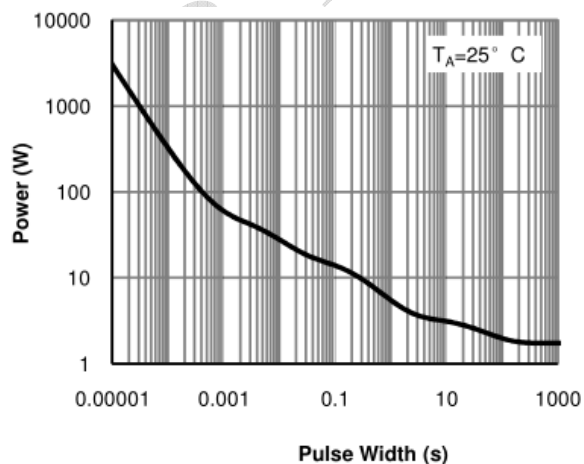


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

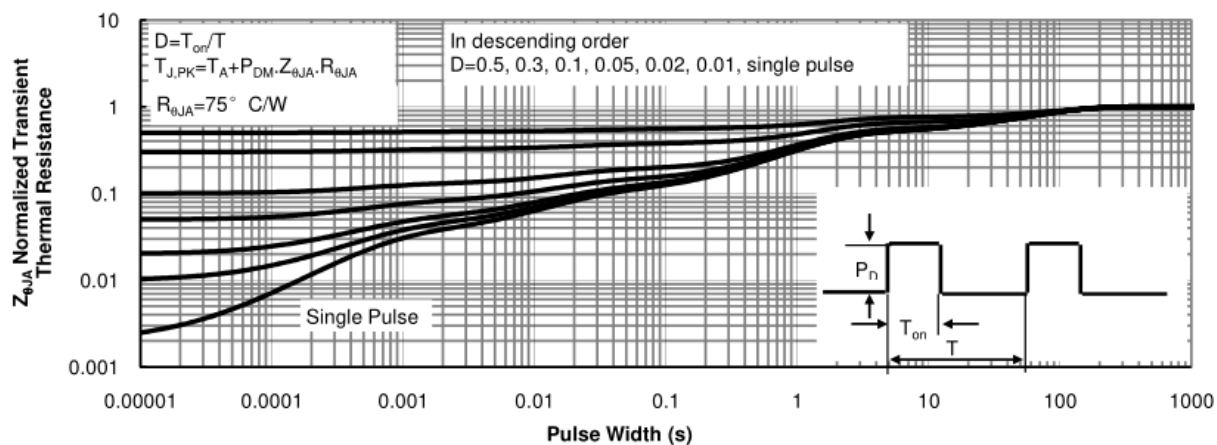
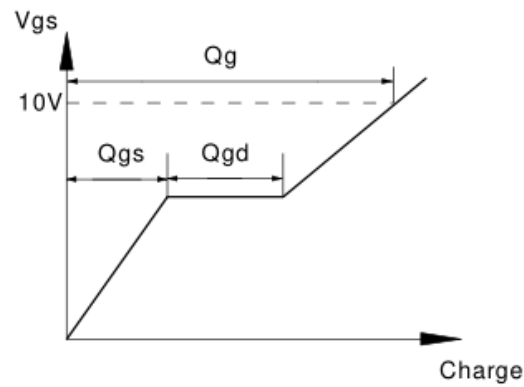
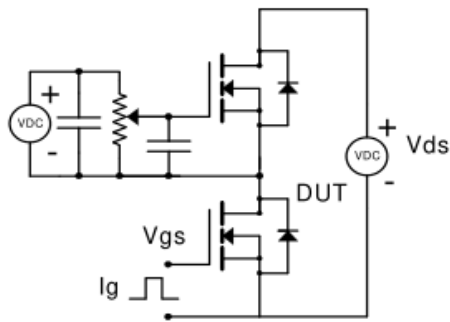


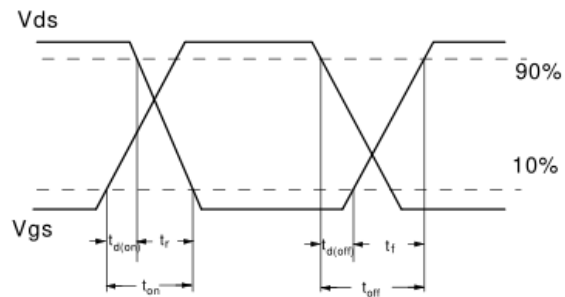
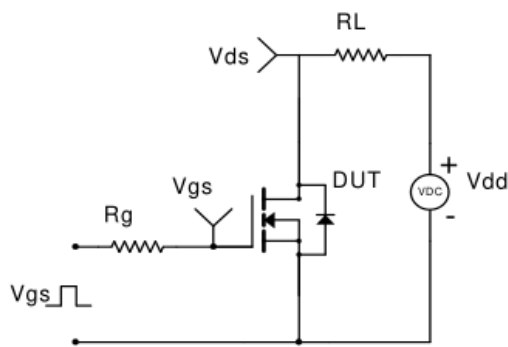
Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)



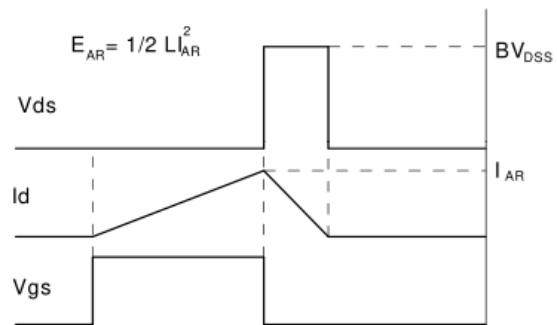
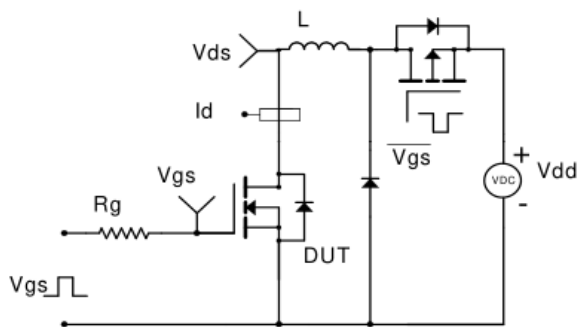
Gate Charge Test Circuit & Waveform



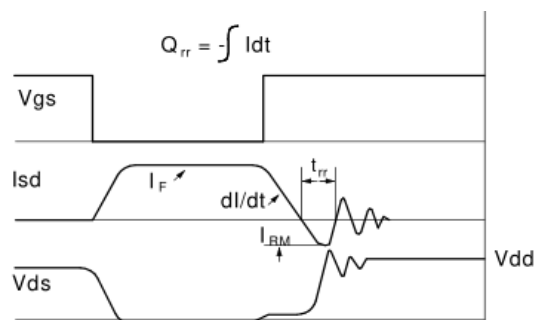
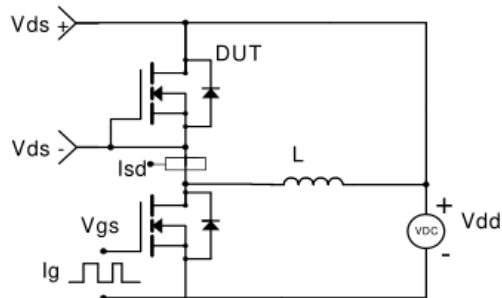
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



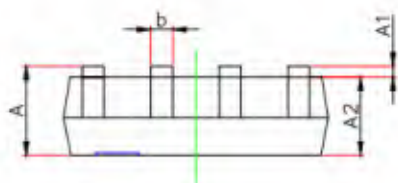
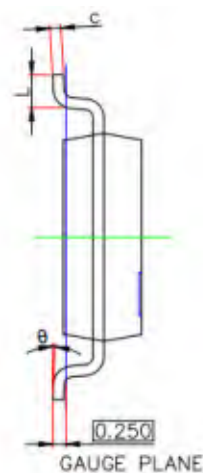
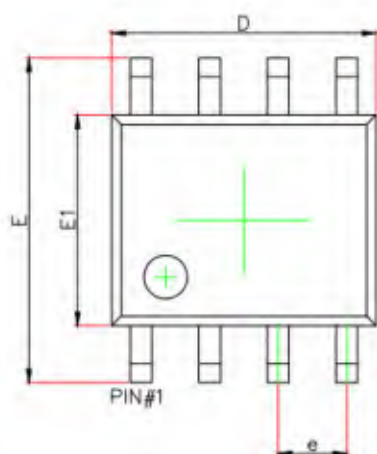
Diode Recovery Test Circuit & Waveforms





Package Information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°