

General Description

The ZLM0380BA uses advanced trench technology MOSFETs to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- wireless charging
- LCD Display inverter

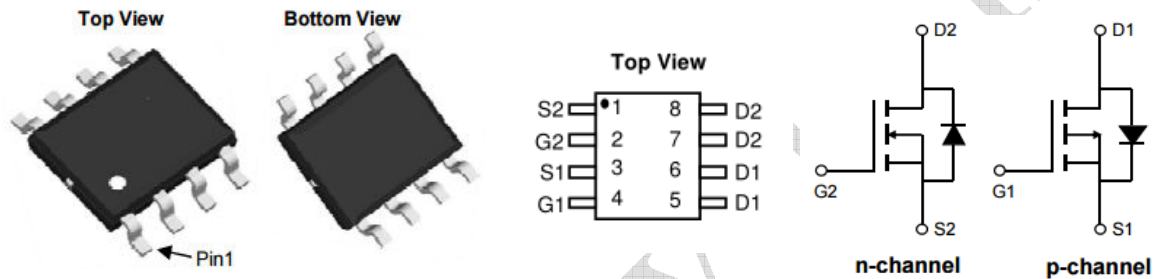
Product Summary

N-Channel

- V_{DS} 30V
- I_D (at $V_{GS} = 10V$) 6A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) $< 30m\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) $< 42m\Omega$

P-Channel

- V_{DS} -30V
- I_D (at $V_{GS} = -10V$) -6A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) $< 35m\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) $< 45m\Omega$



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Max N-Channel	Max P-Channel	Units
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current	I_D	6	-6	A
		5	-5	
Pulsed Drain Current ^C	I_{DM}	30	-30	A
Power Dissipation ^B	PD	2	-1.8	W
		1.3	-1.2	
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	$R_{\theta JA}$	62.5		°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		2.4	V
I _{D(ON)}	Onstate draincurrent	V _{GS} =10V,V _{DS} =5V	30			A
R _{DS(ON)}	StaticDrain-Source On-Resistance	V _{GS} =10V,I _D =5A		25	30	mΩ
		V _{GS} =4.5V,I _D =3A		33	42	mΩ
g _{FS}	ForwardTransconductance	V _{DS} =5V,I _D =6A		15		S
V _{SD}	Diode Forward Voltage	I _{DS} =1A,V _{GS} =0V		0.75	1	V
I _S	Maximum Body-Diode ContinuousCurrent				2.5	A
DYNAMIC PARAMETERS						
C _{iss}	InputCapacitance	V _{GS} =0V,V _{DS} =15V, f=1MHz		255		pF
C _{oss}	OutputCapacitance			40		pF
C _{rss}	Reverse TransferCapacitance			32		pF
SWITCHING PARAMETERS						
Q _g	TotalGate Charge	V _{GS} =10V,V _{DS} =15V, I _D =6A		5.1		nC
Q _{gs}	Gate Source Charge			0.8		nC
Q _{gd}	Gate Drain Charge			1.3		nC
t _{D(on)}	Turn-OnDelayTime	V _{GS} =10V,V _{DS} =15V, R _L =2.5Ω,R _{GEN} =3Ω		4.5		ns
t _r	Turn-On Rise Time			2.5		ns
t _{D(off)}	Turn-OffDelayTime			14		ns
t _f	Turn-OffFallTime			3.5		ns
t _{rr}	Body Diode Reverse Recovery Time		I _F =6A,dl/dt=100A/μs		9	
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =6A,dl/dt=100A/μs		2.5		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.

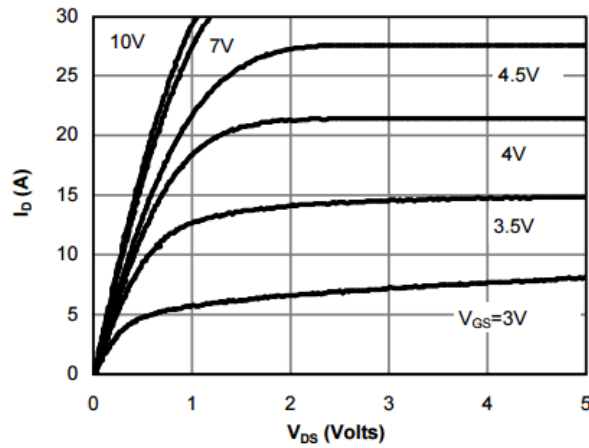
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


Fig 1: On-Region Characteristics (Note D)

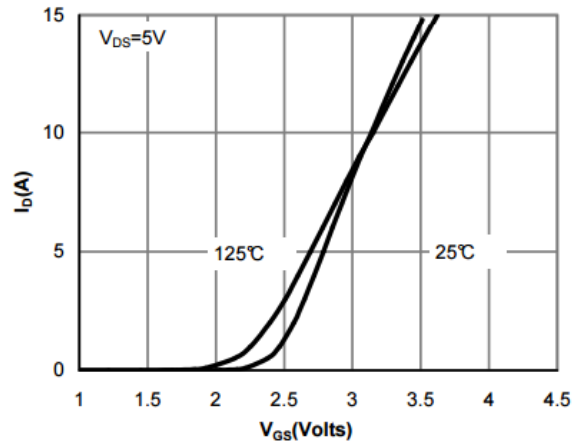


Figure 2: Transfer Characteristics (Note D)

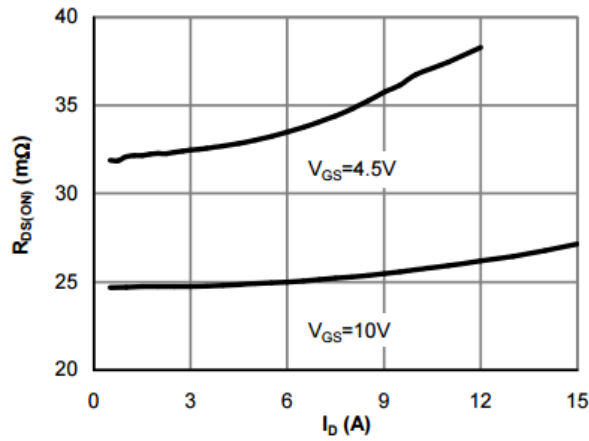


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

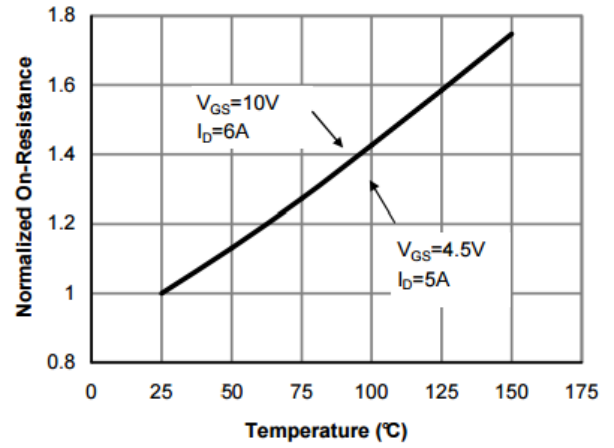


Figure 4: On-Resistance vs. Junction Temperature (Note D)

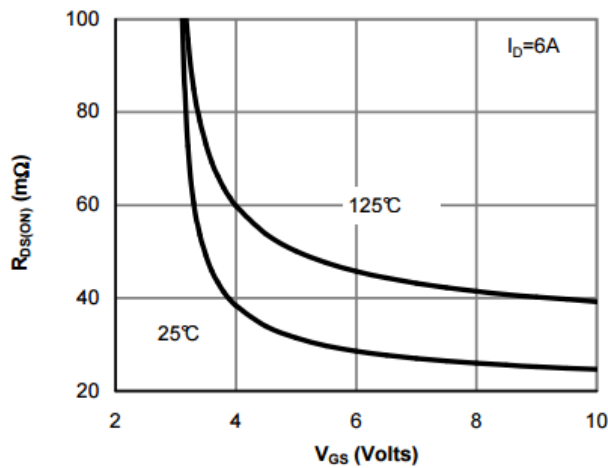


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

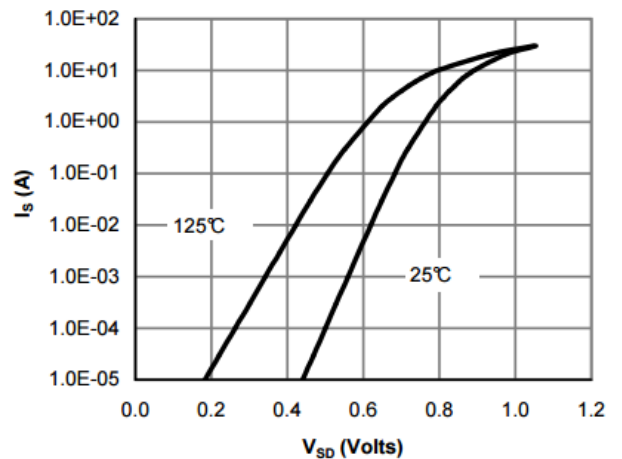


Figure 6: Body-Diode Characteristics (Note D)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

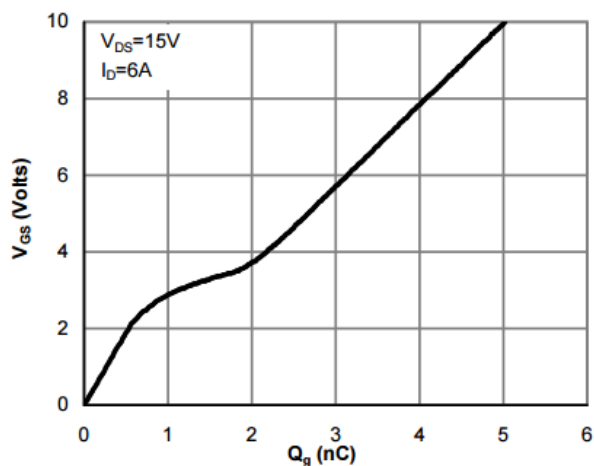


Figure 7: Gate-Charge Characteristics

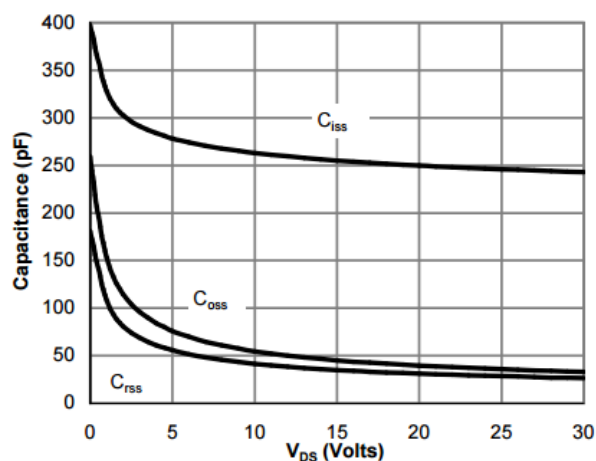


Figure 8: Capacitance Characteristics

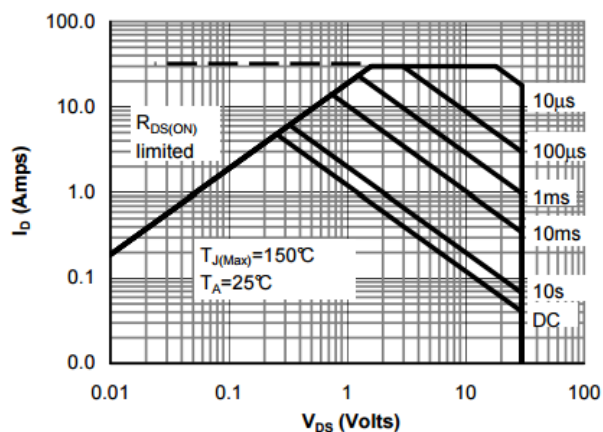


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

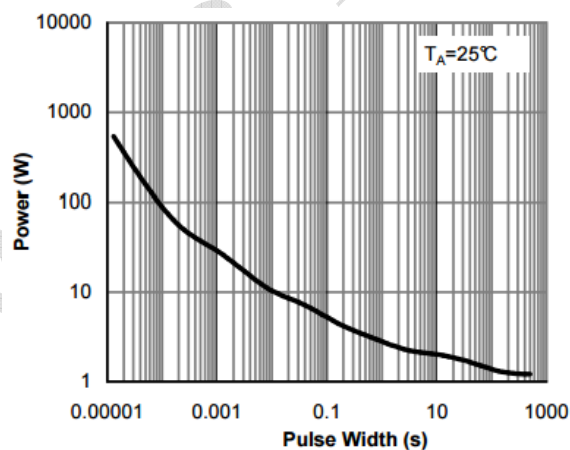


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

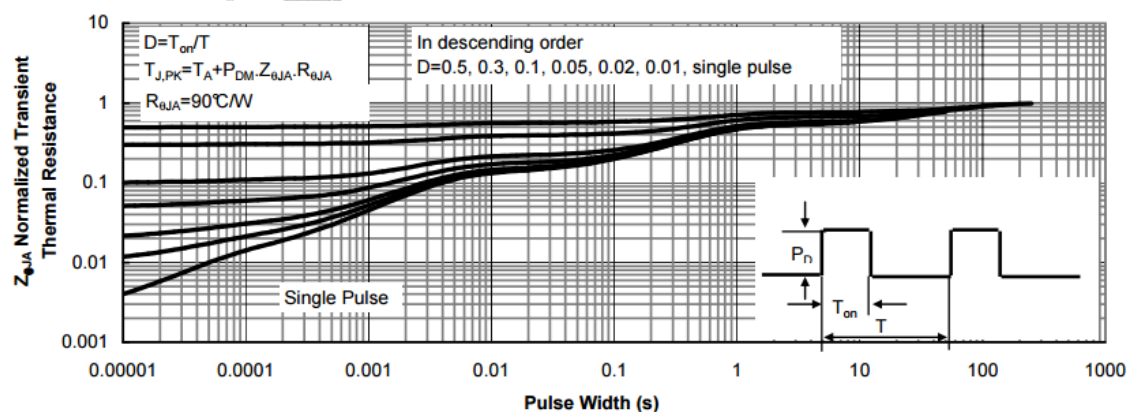
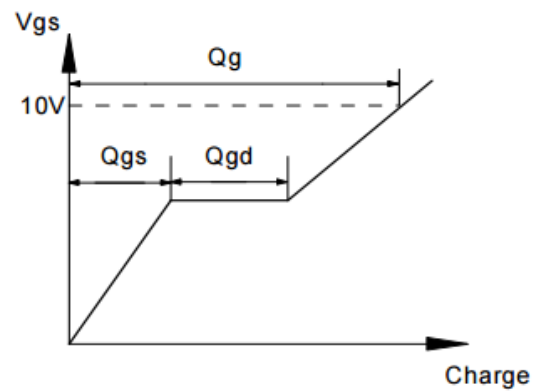
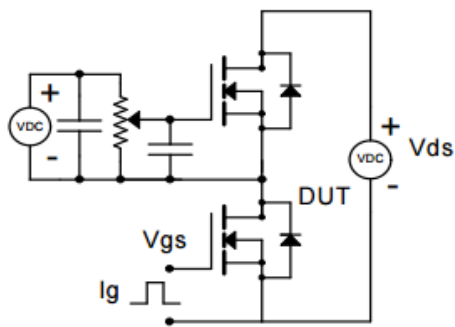
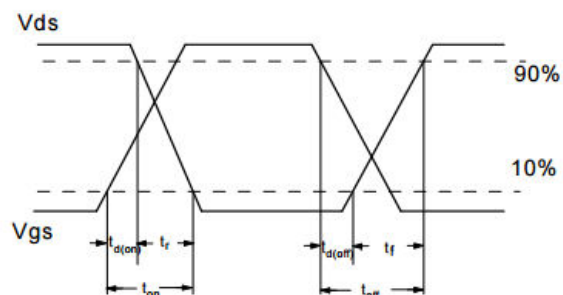
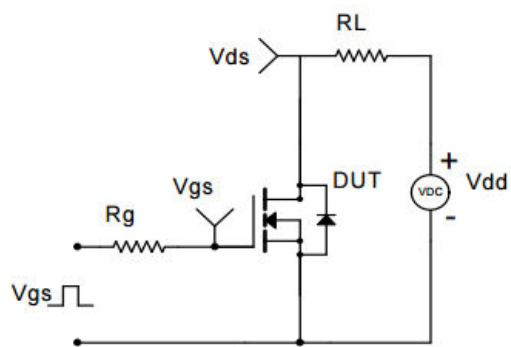


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

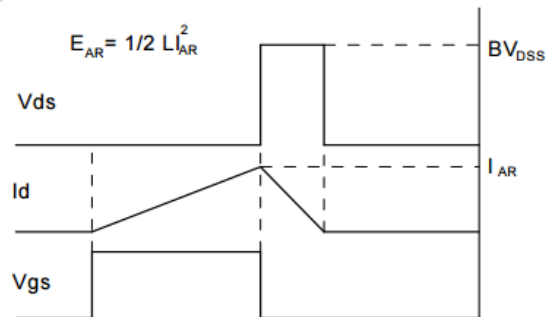
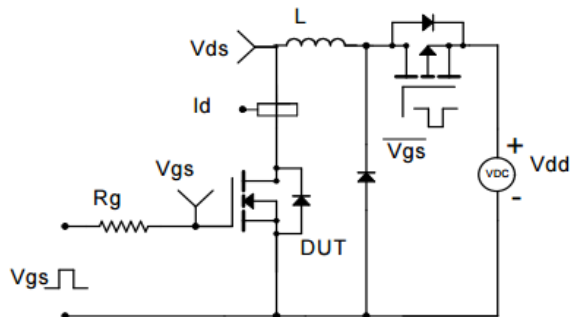
Gate Charge Test Circuit & Waveform



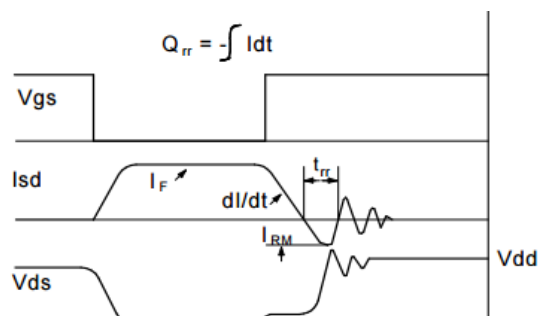
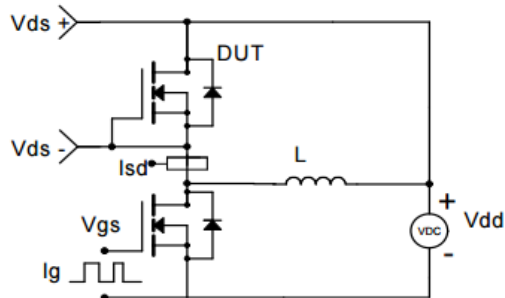
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

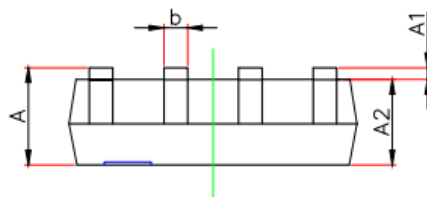
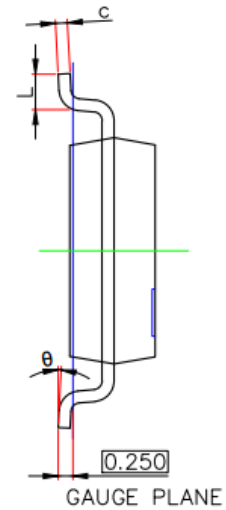
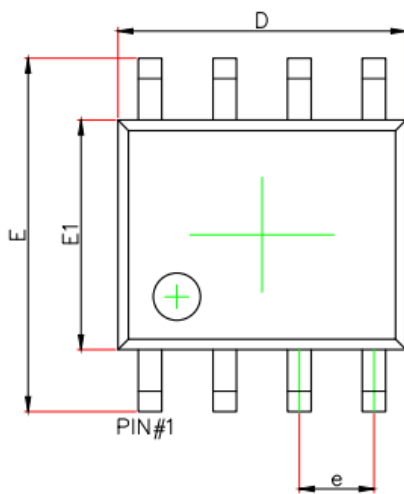


Diode Recovery Test Circuit & Waveforms



Package Information

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°