General Description

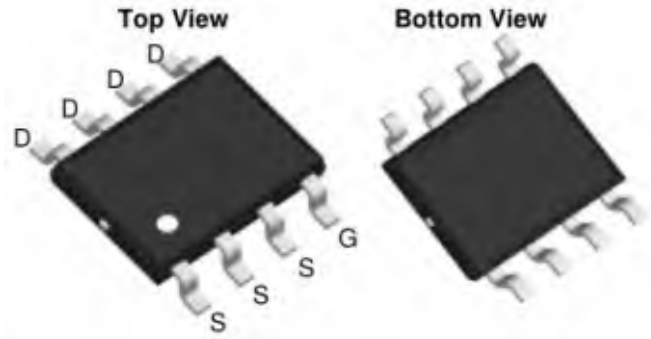
The ZLM0303BA uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use as a load switch or in PWM applications.

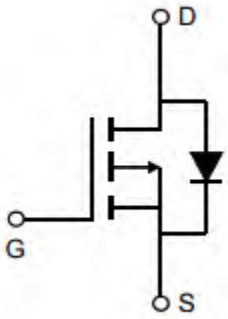
Applications

- GPS
- Portable Equipment
- Bluetooth
- DC/DC Converter
- USB cable
- Security and protection monitoring

Product Summary

- V_{DS} -30V
- I_D (at V_{GS} =10V) -4.1A
- $R_{DS(ON)}$ (at V_{GS} =-10V) < 53mΩ
- $R_{DS(ON)}$ (at V_{GS} =-4.5V) < 87mΩ





Absolute MaximumRatings（T_A=25℃unless otherwisenoted）

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
ContinuousDrain Current	T_A=25℃	I_D	-4.1	A
	T_A=70℃		-3.5	
PulsedDrainCurrent[C]		I_{DM}	-18	A
Power Dissipation[B]	T_A=25℃	P_D	1.4	W
	T_A=70℃		0.9	
Storage Temperature Range		T_{STG}	-55 to +150	℃
Operating Junction Temperature Range		T_J	-55 to +150	℃
Thermal Resistance, Junction-to-Ambient [A]		$R_{\theta JA}$	65	℃/W

Electrical Characteristics (TJ=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	-1.4	-1.9	-2.4	V
$I_{D(ON)}$	Onstate draincurrent	V_{GS}=10V,V_{DS}=5V	-18			A
$R_{DS(ON)}$	StaticDrain-Source On-Resistance	V_{GS}=-10V,I_D=-1A		48	53	mΩ
		V_{GS}=-4.5V,I_D=-1A		61	80	mΩ
g_{FS}	ForwardTransconductance	V_{DS}=-5V,I_D=-4.1A		10		S
V_{SD}	Diode Forward Voltage	I_{DS}=-1A,V_{GS}=0V		-0.7	-1	V
I_S	Maximum Body-Diode ContinuousCurrent				-2	A
DYNAMIC PARAMETERS						
C_{iss}	InputCapacitance	V_{GS}=0V,V_{DS}=-15V, f=1MHz		520		pF
C_{oss}	OutputCapacitance			100		pF
C_{rss}	Reverse TransferCapacitance			65		pF
SWITCHING PARAMETERS						
Q_g	TotalGate Charge	V_{GS}=-10V,V_{DS}=-15V, I_D=-4.1A		9.2	11	nC
Q_{gs}	Gate Source Charge			1.6		nC
Q_{gd}	Gate Drain Charge			2.2		nC
$t_{D(on)}$	Turn-OnDelayTime	V_{GS}=-10V,V_{DS}=-15V, R_L=3.65Ω,R_{GEN}=3Ω		7.5		ns
t_r	Turn-On Rise Time			5.5		ns
$t_{D(off)}$	Turn-OffDelayTime			19		ns
t_f	Turn-OffFallTime			7		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-4.1A,dI/dt=100A/μs		11		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-4.1A,dI/dt=100A/μs		5.3		nC

Notes:

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 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 initialT_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 impedence which is measured with the device mounted on 1in^2 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

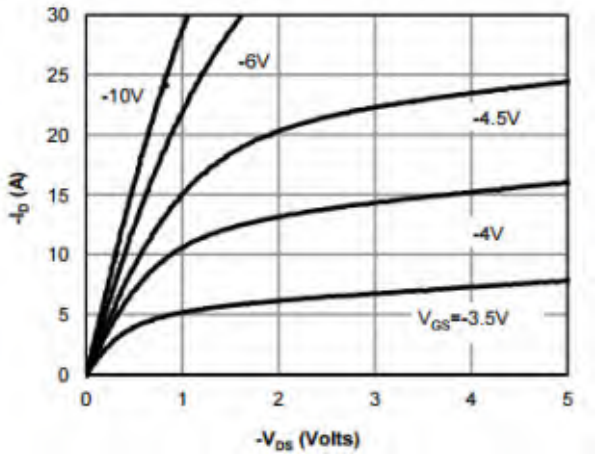


Fig 1: On-Region Characteristics (Note D)

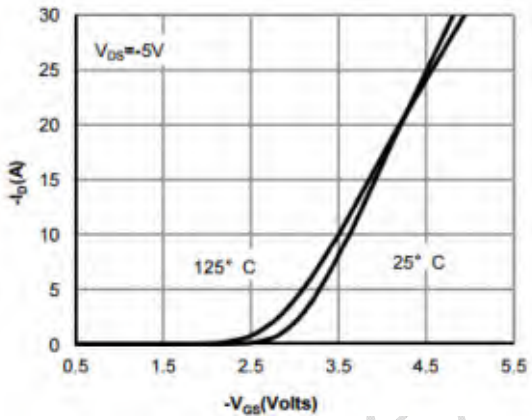


Figure 2: Transfer Characteristics (Note D)

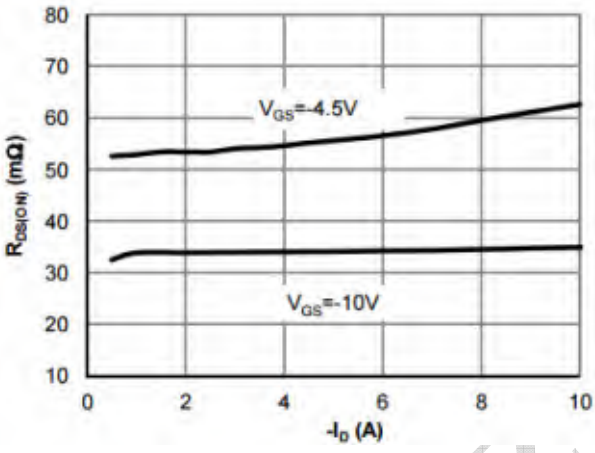


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note D)

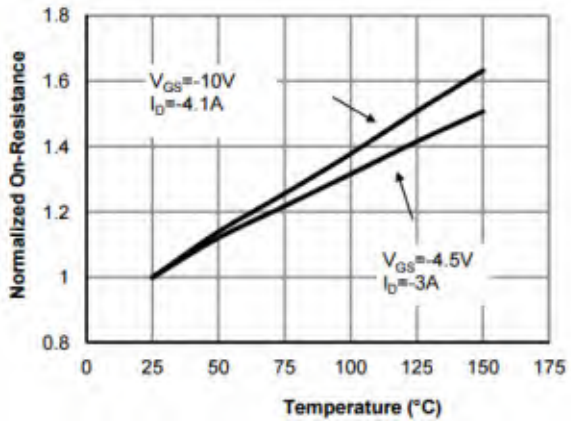


Figure 4: On-Resistance vs. Junction Temperature (Note D)

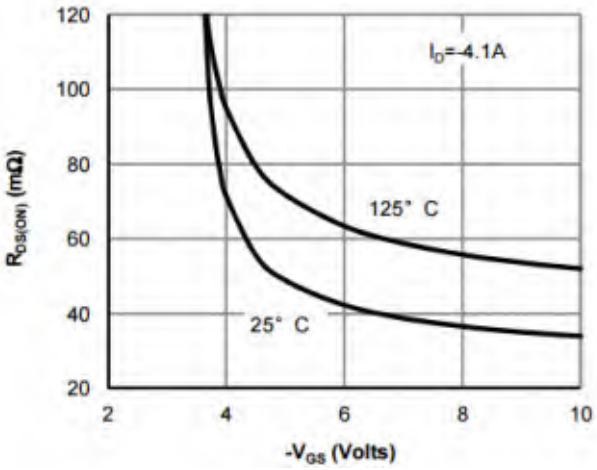


Figure 5: On-Resistance vs. Gate-Source Voltage (Note D)

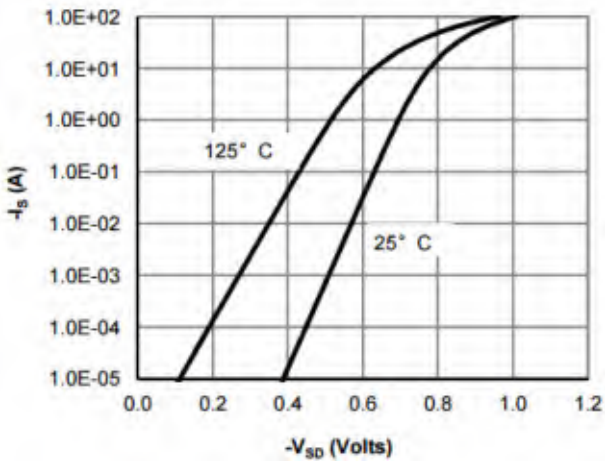


Figure 6: Body-Diode Characteristics (Note D)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

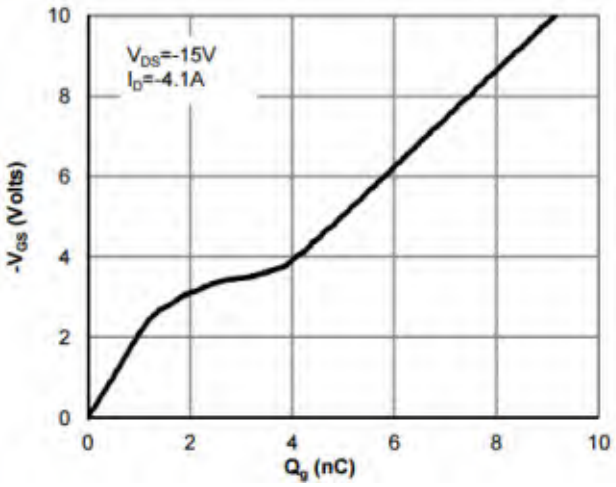


Figure 7: Gate-Charge Characteristics

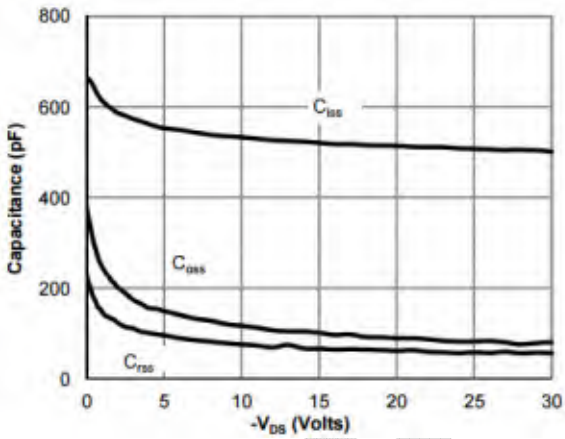


Figure 8: Capacitance Characteristics

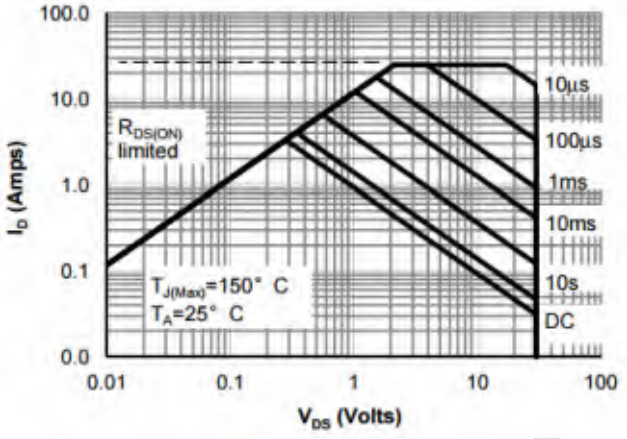


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

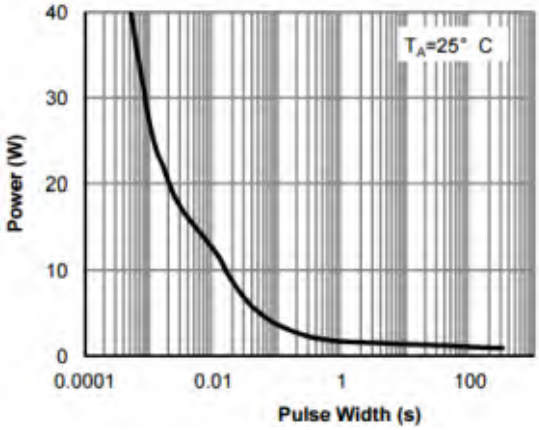


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

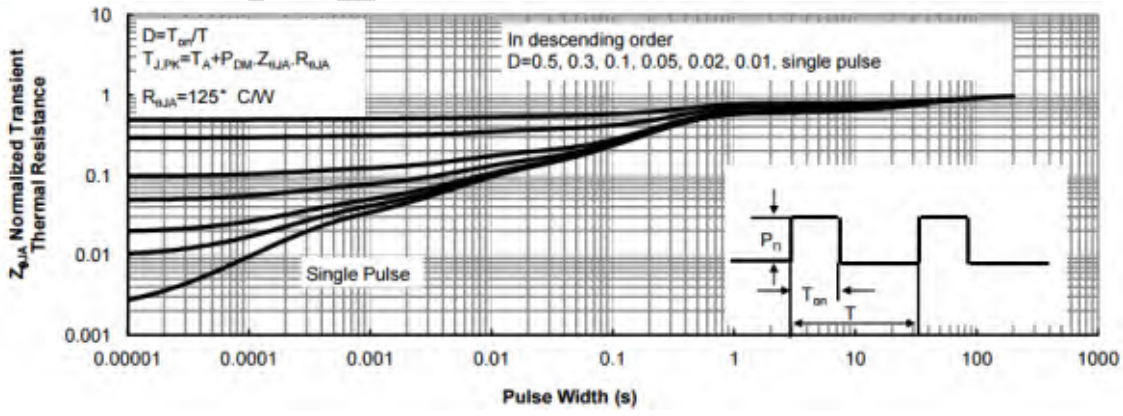
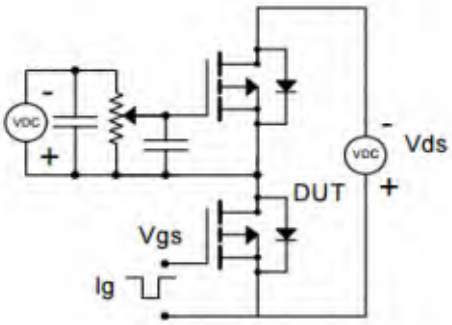
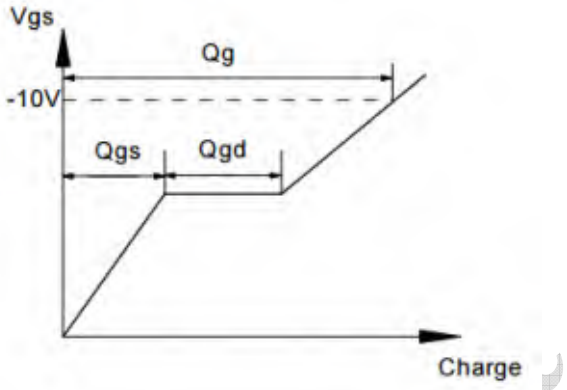


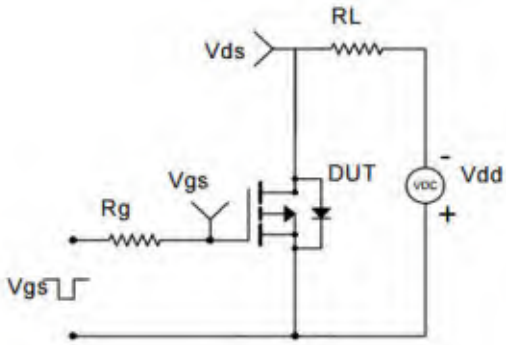
Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

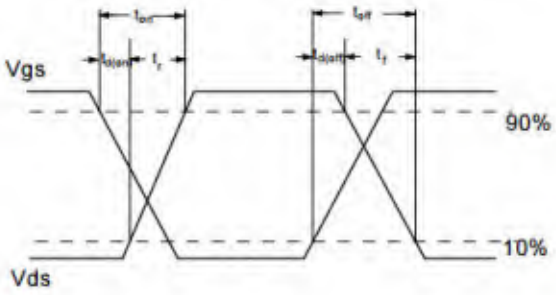
Gate Charge Test Circuit & Waveform



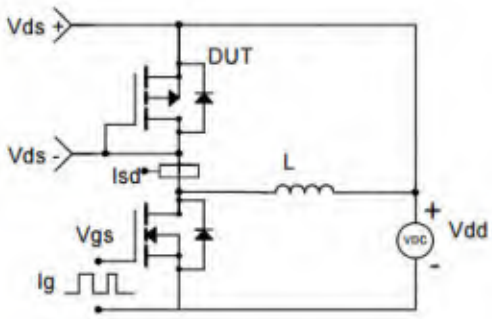


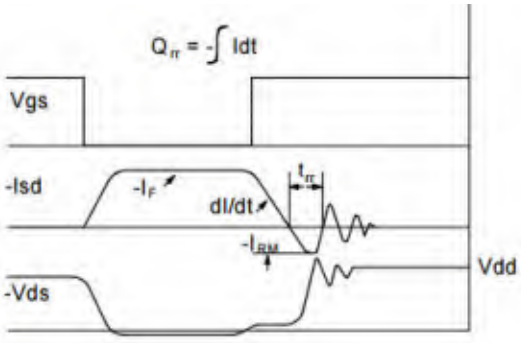
Resistive Switching Test Circuit & Waveforms





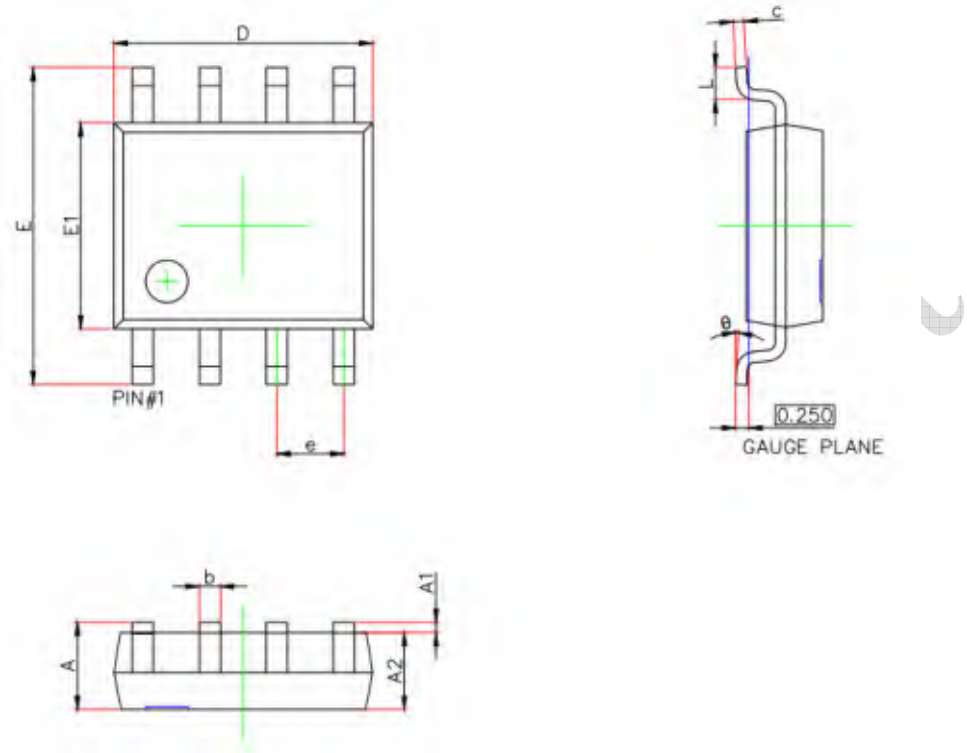
Diode Recovery Test Circuit & Waveforms





Package Information

SOP8



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°