

ZL8205B Specification V1.0

N-Channel Trench Power MOSFET

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N-Channel Trench Power MOSFET

General Description

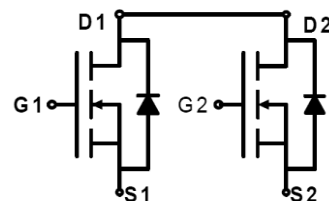
The ZL8205B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching applications.

Features

- $V_{DS} = 20V, I_D = 5A$
 $R_{DS(ON)} < 21m\Omega @ V_{GS} = 4.5V$
 $R_{DS(ON)} < 28m\Omega @ V_{GS} = 2.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management



Schematic Diagram



Marking and pin Assignment



TSSOP-8 top view

Table 1. Absolute Maximum Ratings ($T_A = 25^\circ C$)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage ($V_{GS} = 0V$)	20	V
V_{GS}	Gate-Source Voltage ($V_{DS} = 0V$)	± 10	V
I_D	Drain Current-Continuous	5	A
$I_{DM} (pulse)$	Drain Current-Continuous@ Current-Pulsed (Note 1)	25	A
P_D	Maximum Power Dissipation	1.25	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Table 2. Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	$^\circ C/W$

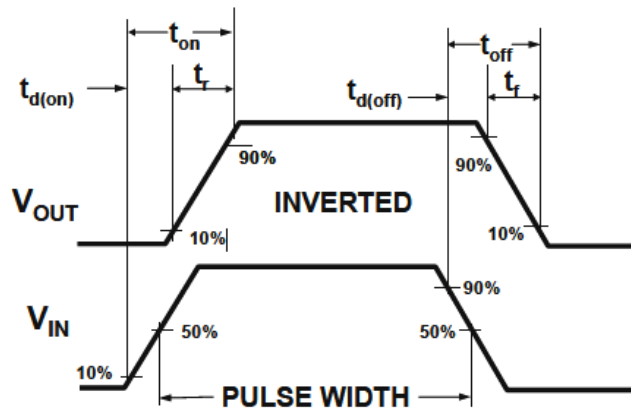
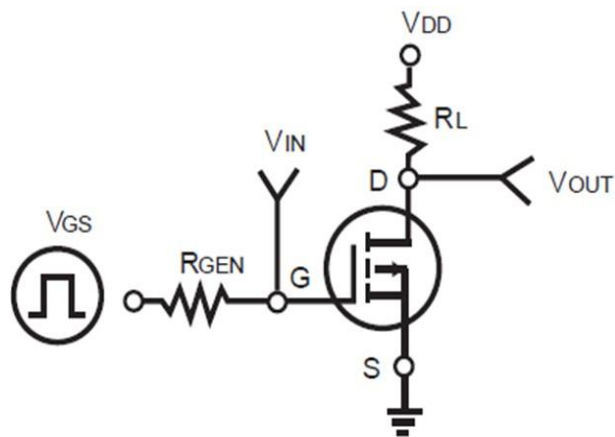
ZL8205B

Table 3. Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±10V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.1	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =5A	4			S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =5A		15.5	21	mΩ
		V _{GS} =2.5V, I _D =3A		20	28	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =8V, V _{GS} =0V, f=1.0MHz		605		pF
C _{oss}	Output Capacitance			315		pF
C _{rss}	Reverse Transfer Capacitance			132		pF
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =1A, V _{GS} =4.5V, R _G =6Ω		11		nS
t _r	Turn-on Rise Time			12		nS
t _{d(off)}	Turn-Off Delay Time			36		nS
t _f	Turn-Off Fall Time			32		nS
Q _g	Total Gate Charge	V _{DS} =10V, I _D =4A, V _{GS} =4.5V		10		nC
Q _{gs}	Gate-Source Charge			2.8		nC
Q _{gd}	Gate-Drain Charge			1.8		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)				5	A
V _{SD}	Forward on Voltage ^(Note 1)	V _{GS} =0V, I _S =5A			1.2	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Switch Time Test Circuit and Switching Waveforms:



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

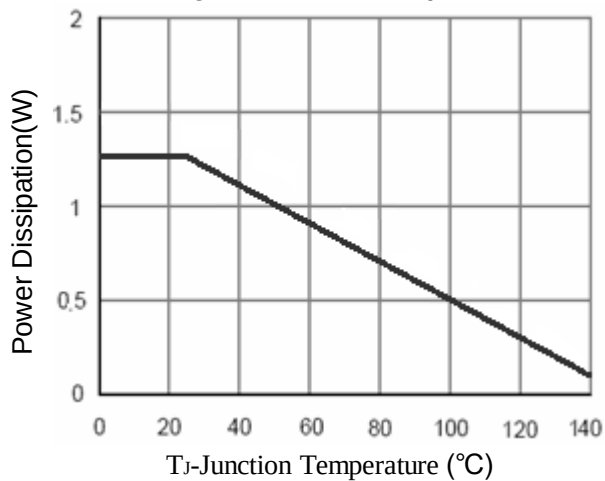


Figure2. Drain Current

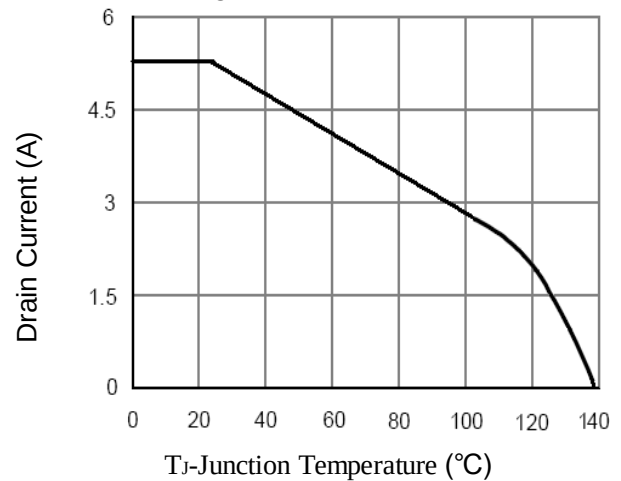


Figure3. Output Characteristics

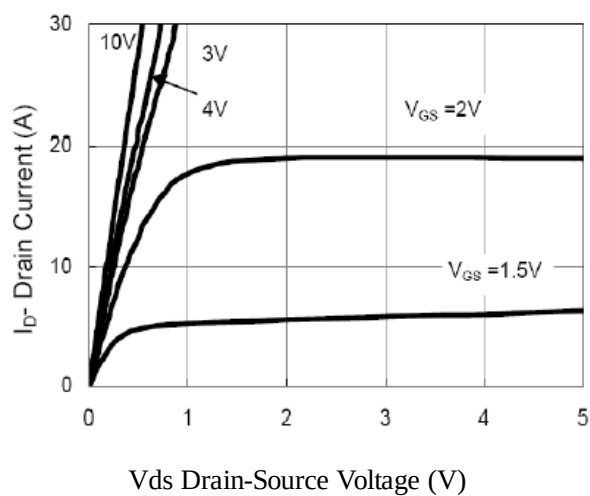


Figure4. Transfer Characteristics

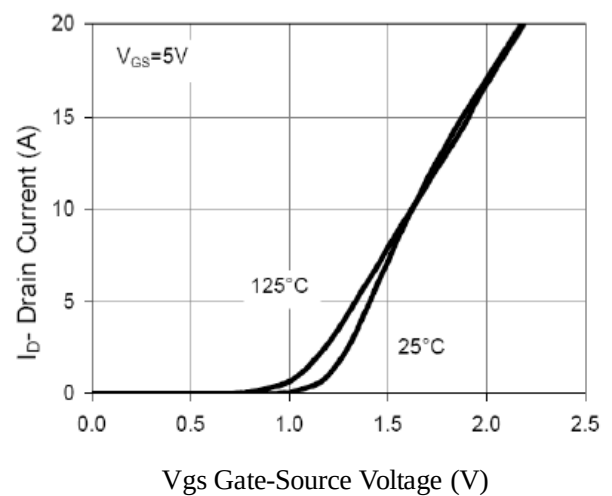


Figure5. Capacitance

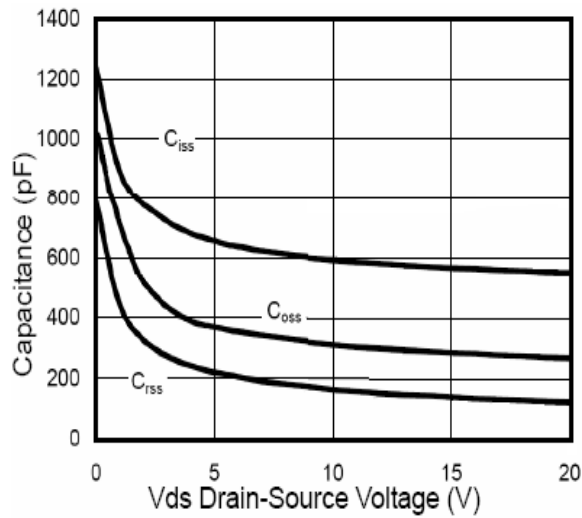


Figure6. $R_{DS(ON)}$ vs Junction Temperature

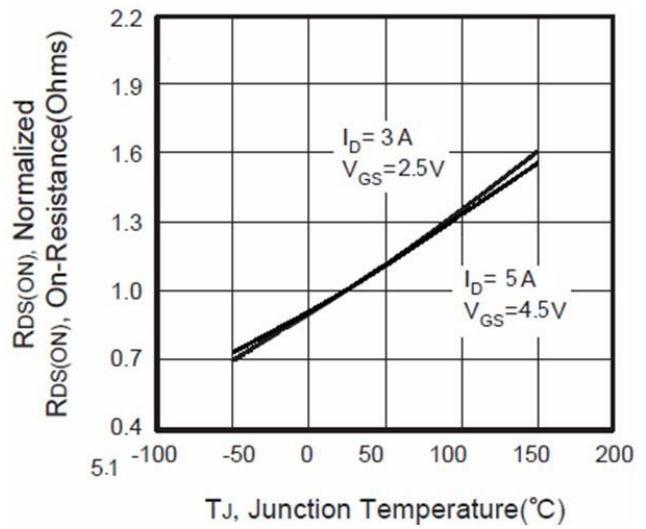


Figure7. Max BV_{DSS} vs Junction Temperature

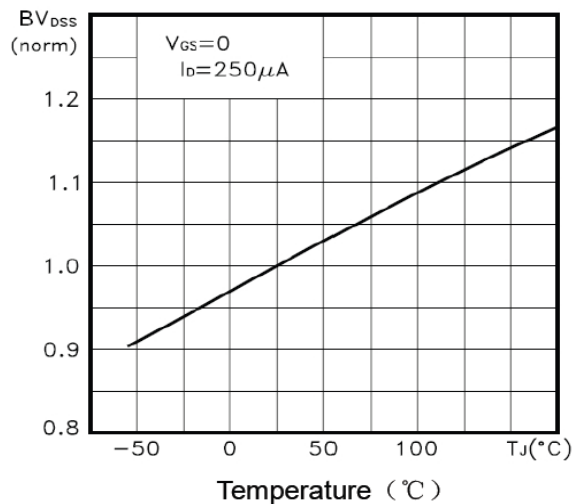


Figure8. $V_{GS(th)}$ vs Junction Temperature

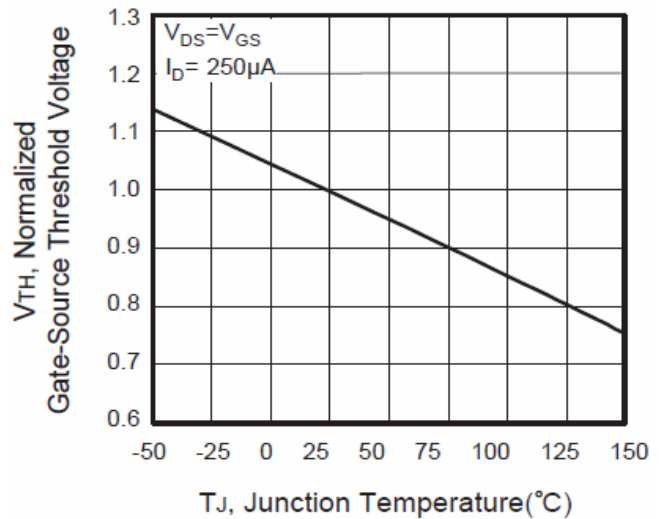


Figure9. Gate Charge Waveforms

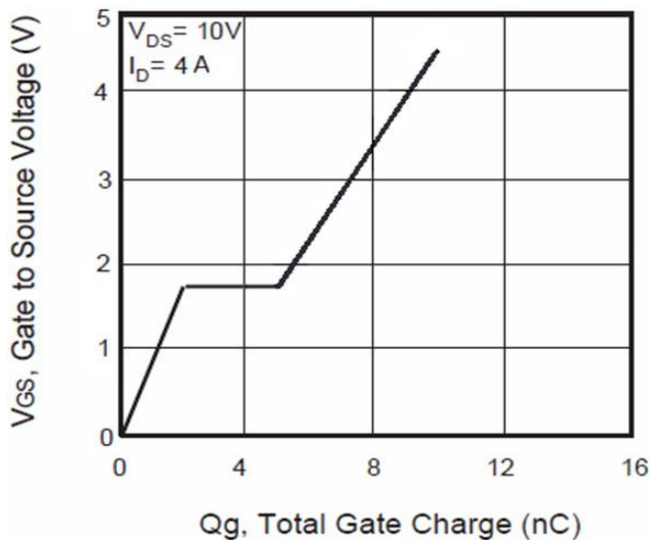


Figure10. Maximum Safe Operating Area

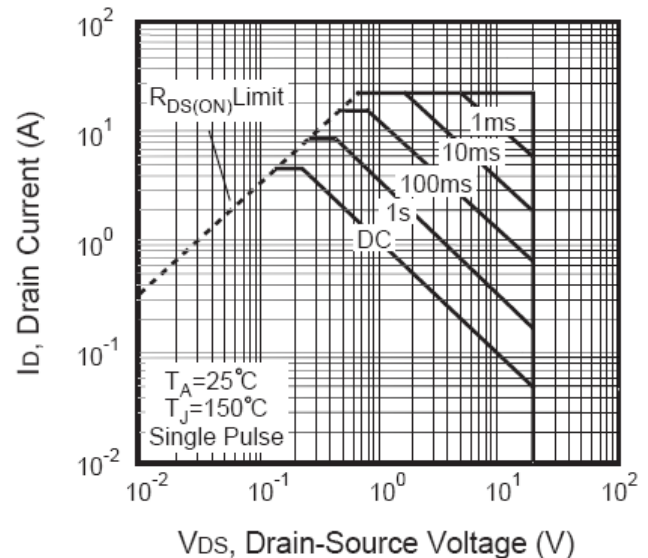
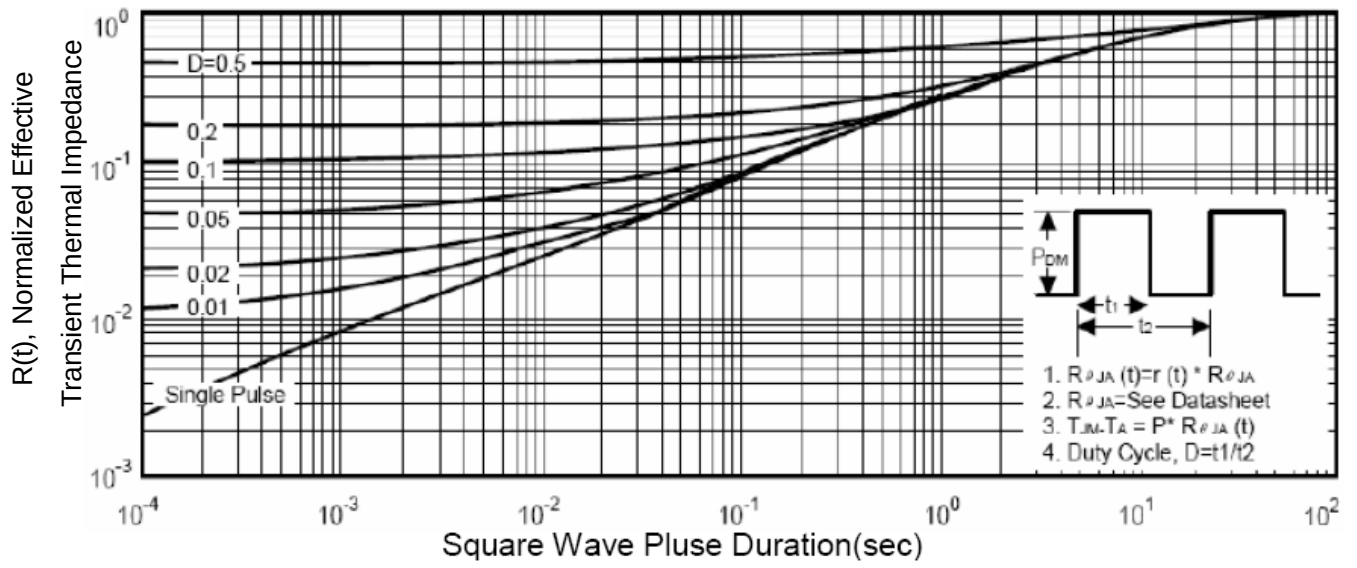
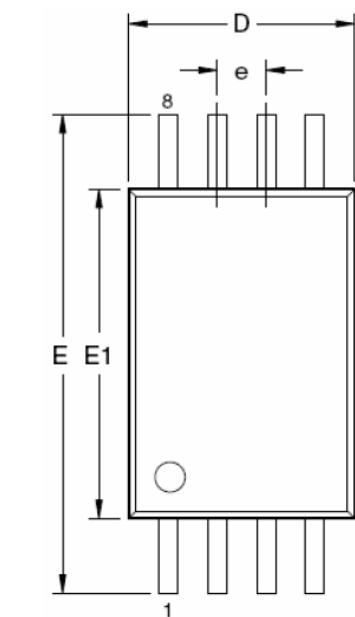


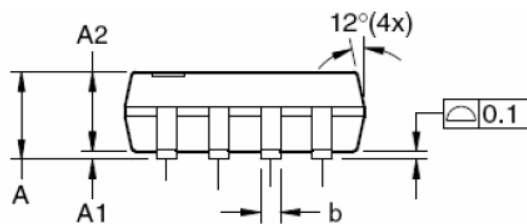
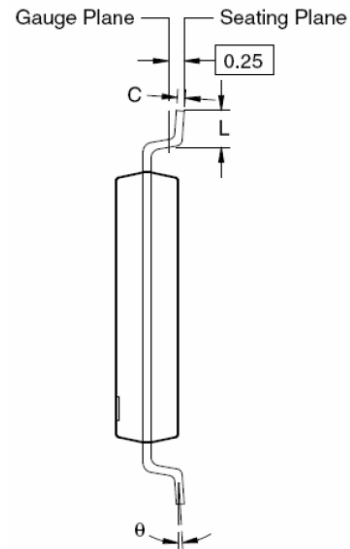
Figure11. Normalized Maximum Transient Thermal Impedance



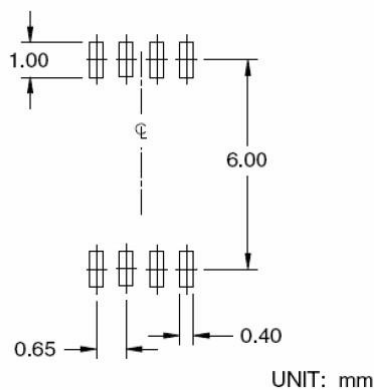
TSSOP-8 PACKAGE INFORMATION



Dimensions in Millimeters (UNIT:mm)



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.20
A1	0.05	—	0.15
A2	0.80	1.00	1.05
b	0.19	—	0.30
C	0.09	—	0.20
D	2.90	3.00	3.10
E	6.40 BSC		
E1	4.30	4.40	4.50
e	0.65 BSC		
L	0.45	0.60	0.75
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	—	—	0.047
A1	0.002	—	0.006
A2	0.031	0.039	0.041
b	0.007	—	0.012
C	0.004	—	0.008
D	0.114	0.118	0.122
E	0.252 BSC		
E1	0.169	0.173	0.177
e	0.026 BSC		
L	0.018	0.024	0.030
θ	0°	—	8°