

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

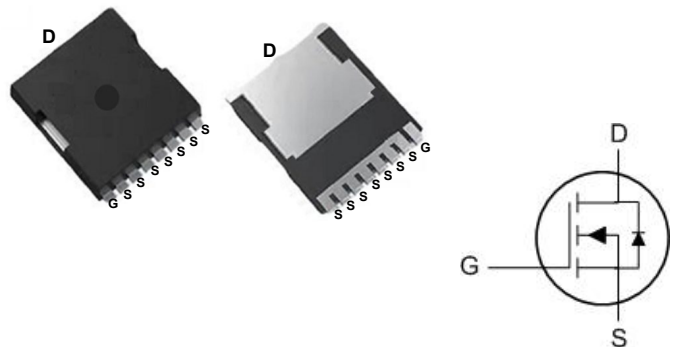
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

Product Summary



BVDSS	RDSON	ID
100V	1.2mΩ	350A

TOLL-8L Pin Configuration



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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	350	A
	$T_C=100^\circ\text{C}$		200	
Pulsed Drain Current ¹		I_{DM}	1248	A
Single Pulse Avalanche Energy ²		EAS	1250	mJ
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	390.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	39	$^\circ\text{C/W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.32	$^\circ\text{C/W}$

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

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	1.2	1.6	mΩ
Forward Transconductance ⁴		g _{fs}	V _{DS} = 10V, I _D =20A	-	84	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 50V, V _{GS} =0V, f =1MHz	-	14300	-	pF
Output Capacitance		C _{oss}		-	2120	-	
Reverse Transfer Capacitance		C _{rss}		-	50	-	
Gate Resistance		R _g	f=1MHz	-	2.8	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D = 20A	-	250	-	nC
Gate-Source Charge		Q _{gs}		-	53	-	
Gate-Drain Charge		Q _{gd}		-	77	-	
Turn-on Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} = 50V, R _G = 3Ω, I _D = 20A	-	41	-	ns
Rise Time		t _r		-	88	-	
Turn-off Delay Time		t _{d(off)}		-	163	-	
Fall Time		t _f		-	98	-	
Body Diode Reverse Recovery Time		t _{rr}	I _F =20A, di/dt = 100A/μs	-	106	-	ns
Body Diode Reverse Recovery Charge		Q _{rr}		-	245	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	350	A

Note:

- The maximum current rating is package limited.
- Repetitive rating; pulse width limited by max. junction temperature.
- V_{DD}=32 V, R_G=25 Ω, L=0.5mH, starting T_J=25 °C.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

Typical Characteristics

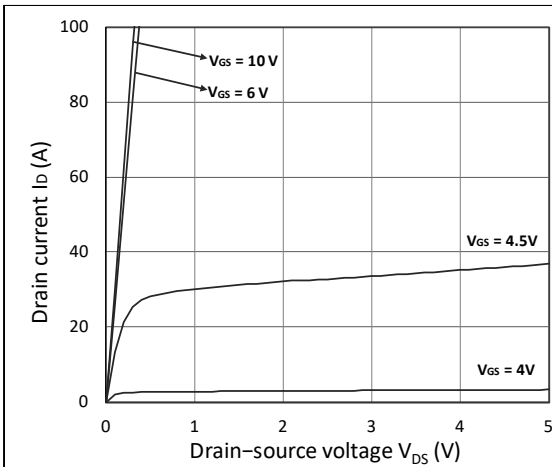


Figure 1. Output Characteristics

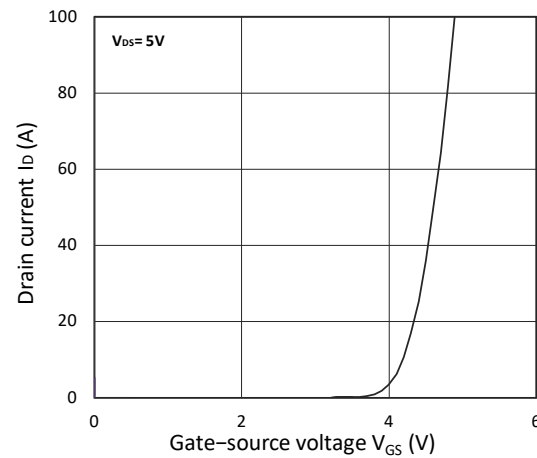


Figure 2. Transfer Characteristics

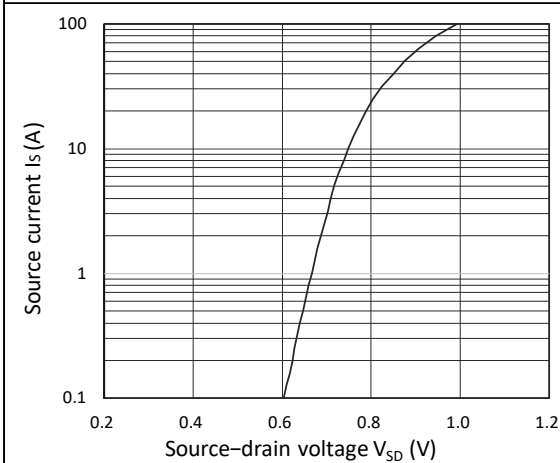


Figure 3. Forward Characteristics of Reverse

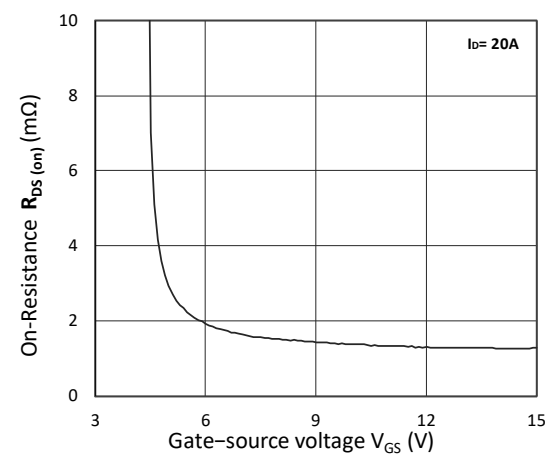


Figure 4. $R_{DS(on)}$ vs. V_{GS}

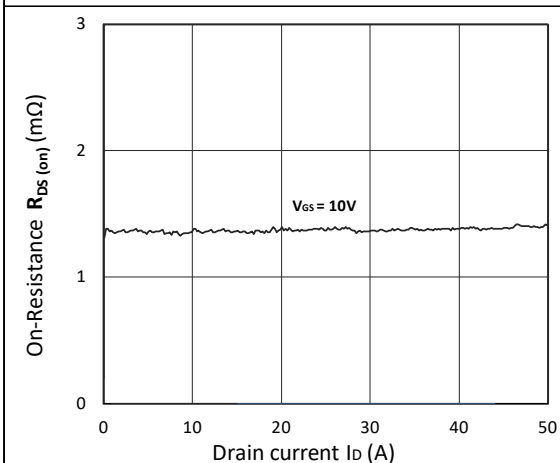


Figure 5. $R_{DS(on)}$ vs. I_D

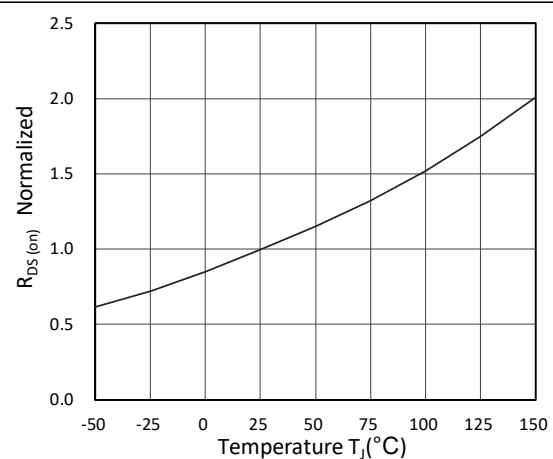


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

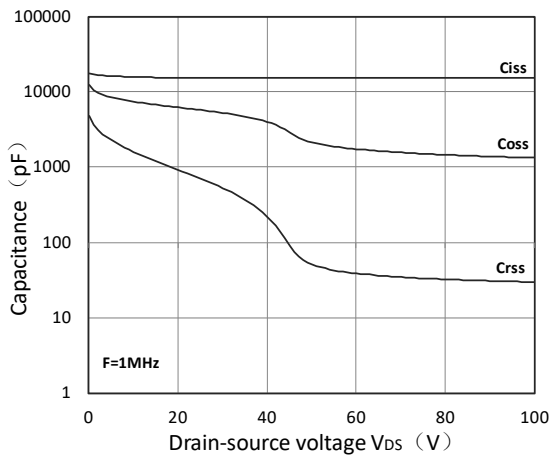


Figure 7. Capacitance Characteristics

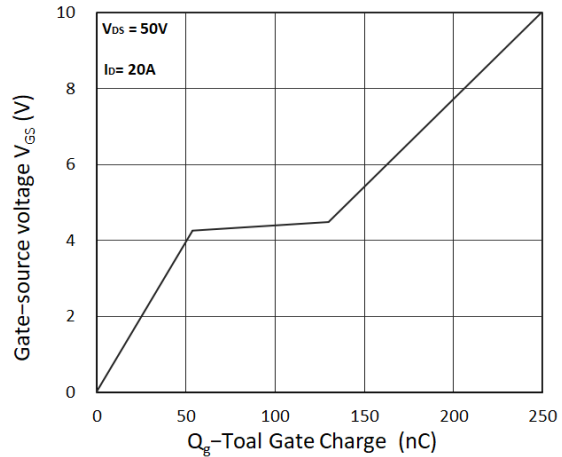


Figure 8. Gate Charge Characteristics

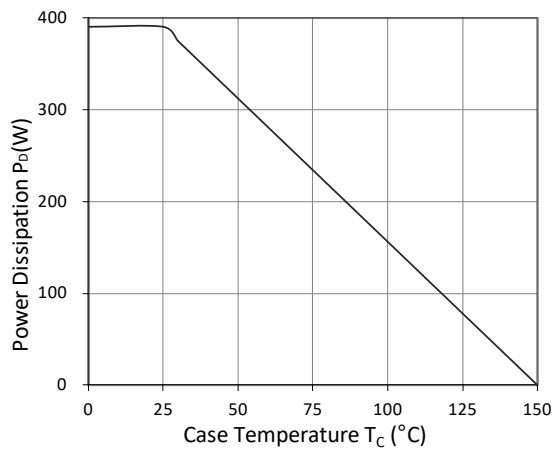


Figure 9. Power Dissipation

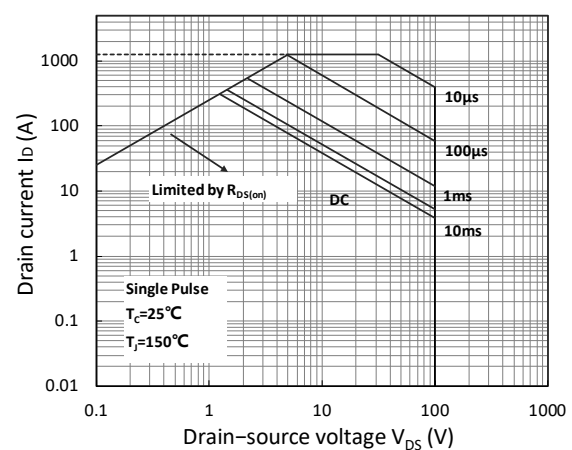


Figure 10. Safe Operating Area

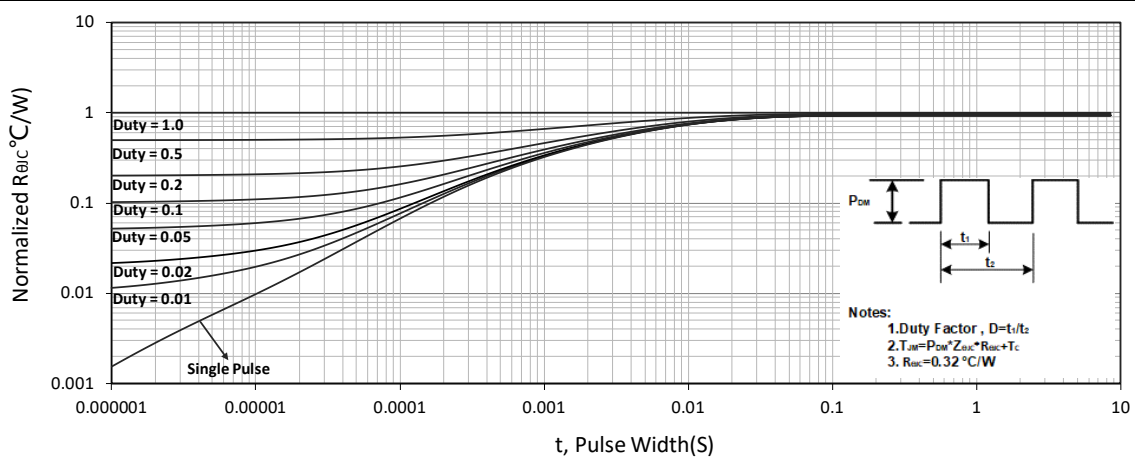


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

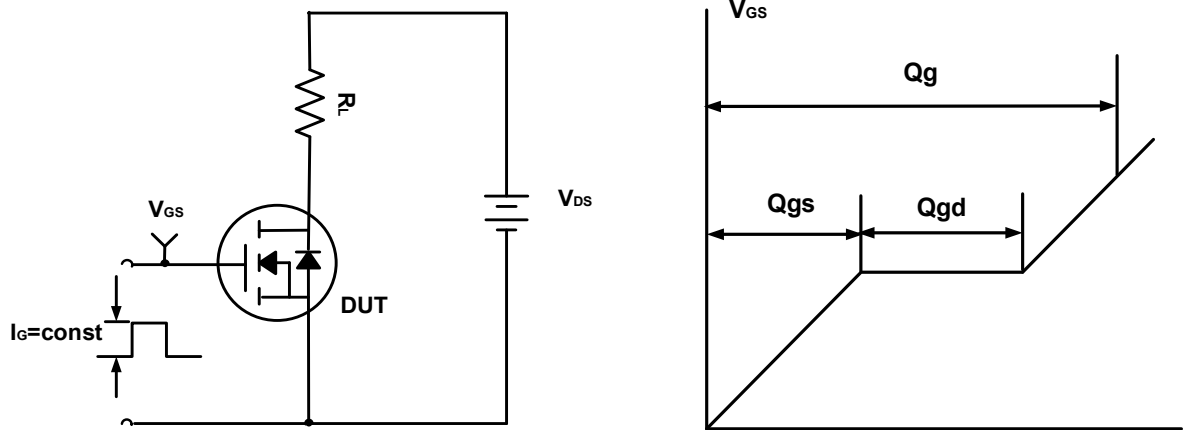


Figure A. Gate Charge Test Circuit & Waveforms

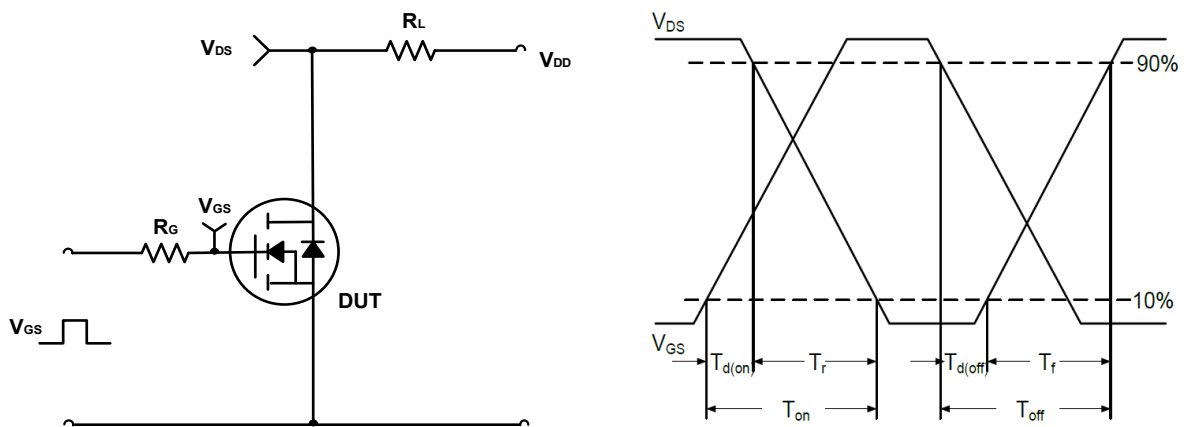


Figure B. Switching Test Circuit & Waveforms

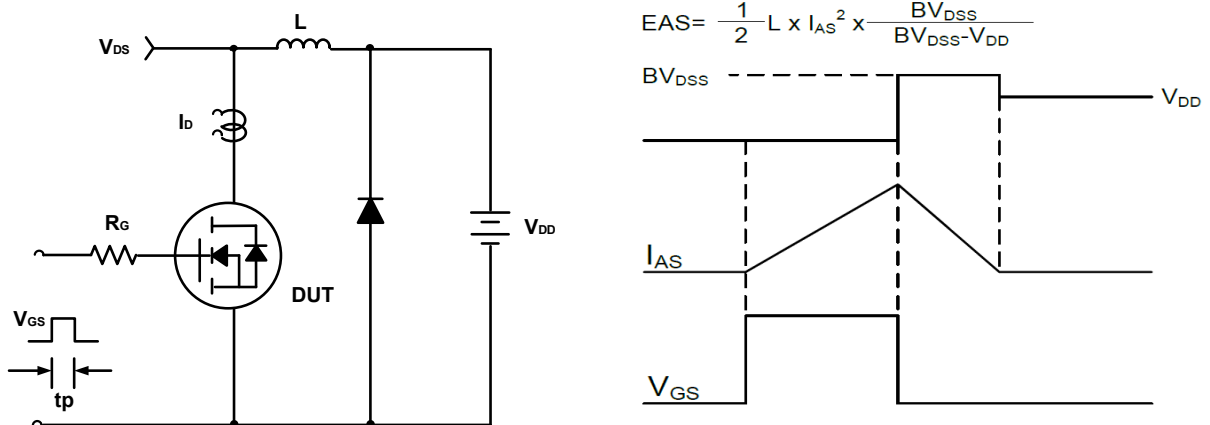
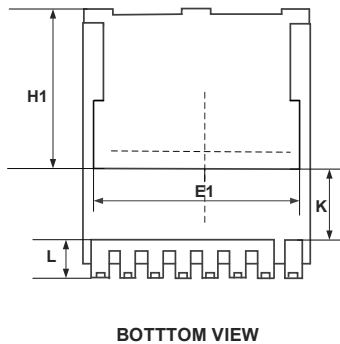
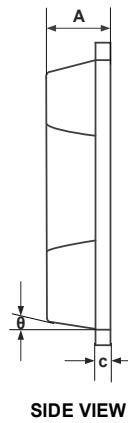
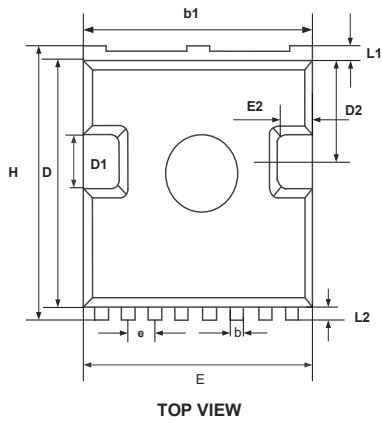


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TOLL-8L



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	2.20	2.40
b	0.60	0.90
b1	9.70	9.90
c	0.40	0.60
D	10.20	10.60
D1	3.10	3.50
D2	4.45	4.75
E	9.70	10.10
E1	7.80BSC	
E2	0.50	0.70
e	1.200 BSC	
H	11.45	11.90
H1	6.75 BSC	
K	3.10 REF	
L	1.70	2.10
L1	0.60	0.80
L2	0.50	0.70
θ	10° REF	