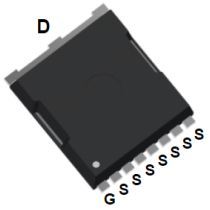
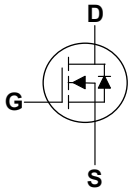
N-Channel Enhancement Mode MOSFET

Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Pin Description

TOLL-8L	Symbol
	

Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	60	V
$R_{DS(ON)-Typ}$	0.8	mΩ
I_D	429	A

Absolute Maximum Ratings (T_C=25℃, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	-55 to 175	℃
T_{STG}	Storage Temperature Range	-55 to 175	℃
I_{DM} ①	Pulse Drain Current Tested	1073	A
I_D	Continuous Drain Current	429	A
P_D	Maximum Power Dissipation	375	W
E_{AS}	Avalanche Energy, Single pulse	756	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	40	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.4	℃/W

Note ①: Max. current is limited by bonding wire.

Note ②: UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③: Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	---	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_D=30A	---	0.8	1.1	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, Freq.=1MHz	---	12250	---	pF
C_{oss}	Output Capacitance		---	3452	---	
C_{rss}	Reverse Transfer Capacitance		---	78	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DS}=30V,V_{GS}=10V , I_D=1A,R_G=1Ω	---	46	---	nS
T_r	Turn-on Rise Time		---	28	---	
$T_{d(off)}$	Turn-off Delay Time		---	74	---	
T_f	Turn-off Fall Time		---	108	---	
Q_g	Total Gate Charge	V_{DS}=30V,V_{GS}=10V , I_D=30A	---	203	---	nC
Q_{gs}	Gate-Source Charge		---	62	---	
Q_{gd}	Gate-Drain Charge		---	50	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	I_S=30A, V_{GS}=0V	---	---	1.1	V
t_{rr}	Reverse Recovery Time	I_F=15A,V_{GS}=0V, dI_F/dt=100A/us	---	74	---	nS
Q_{rr}	Reverse Recovery Charge		---	119	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

Typical Characteristics

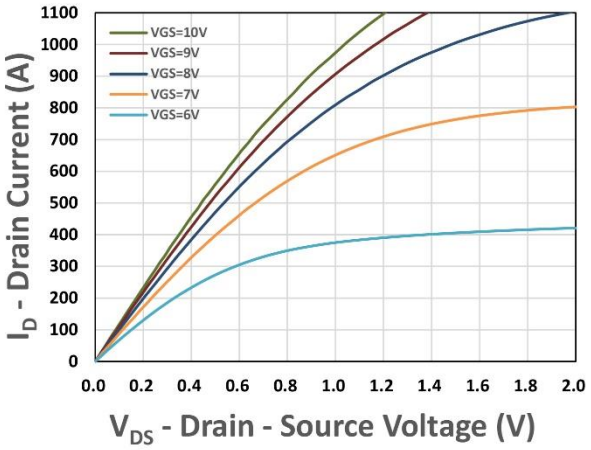

Figure 1. Output Characteristics

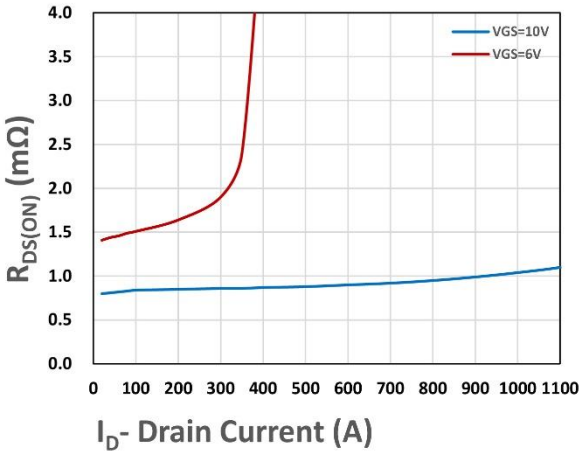

Figure 2. On-Resistance vs. ID

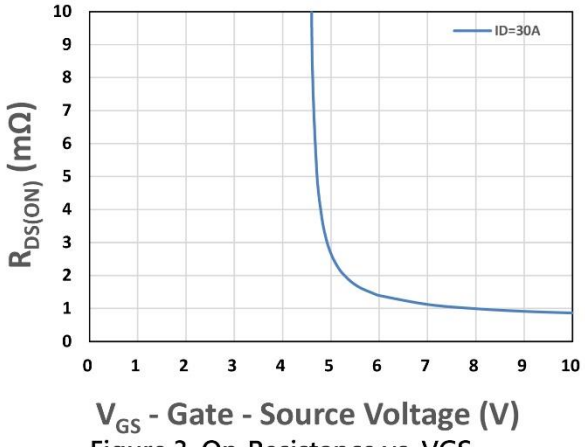

Figure 3. On-Resistance vs. VGS

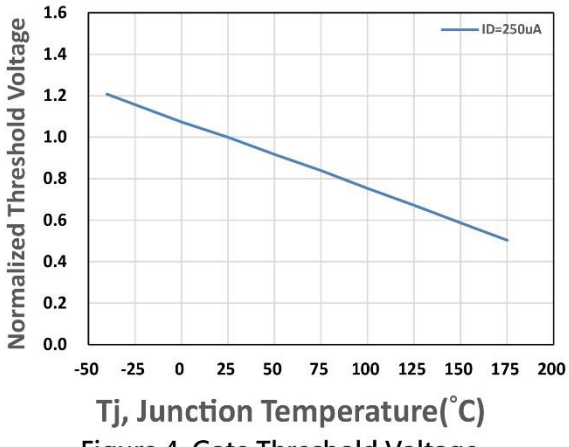

Figure 4. Gate Threshold Voltage

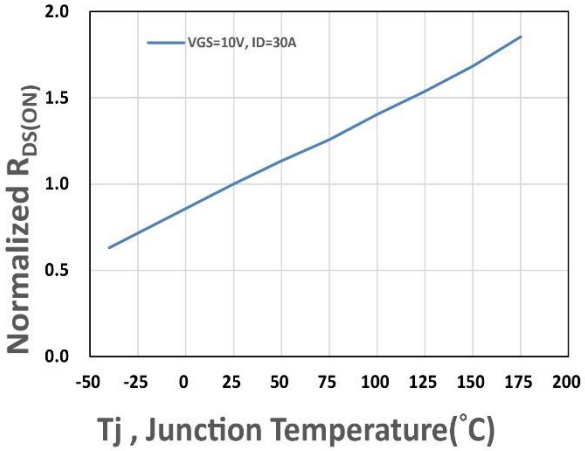

Figure 5. Drain-Source On Resistance

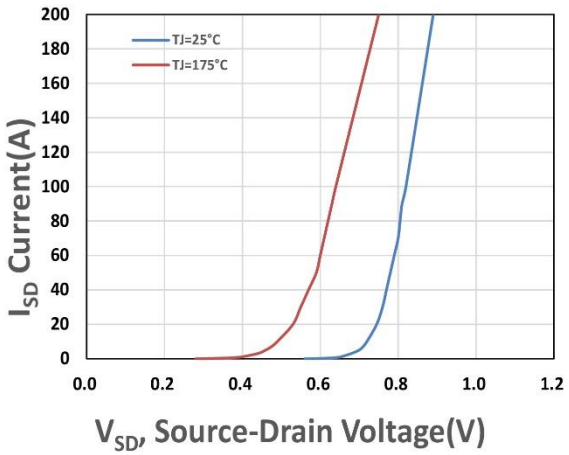

Figure 6. Source-Drain Diode Forward

N-Channel Enhancement Mode MOSFET

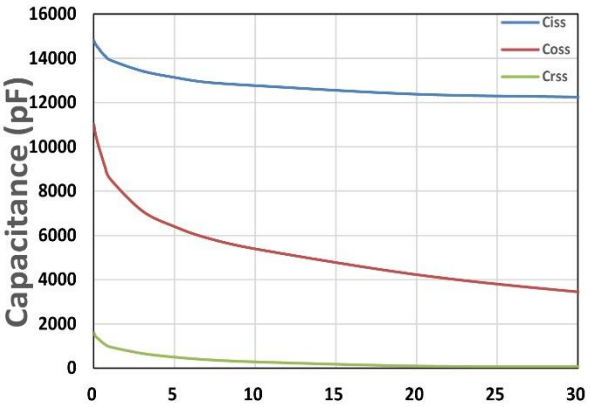

Figure 7. Capacitance

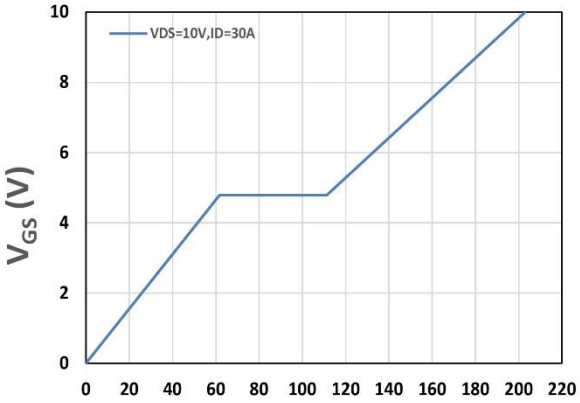

Figure 8. Gate Charge Characteristics

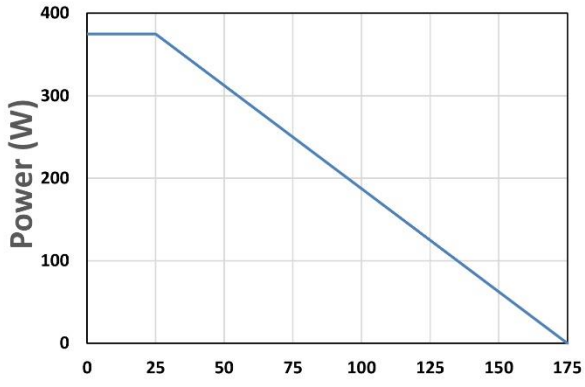

Figure 9. Power Dissipation

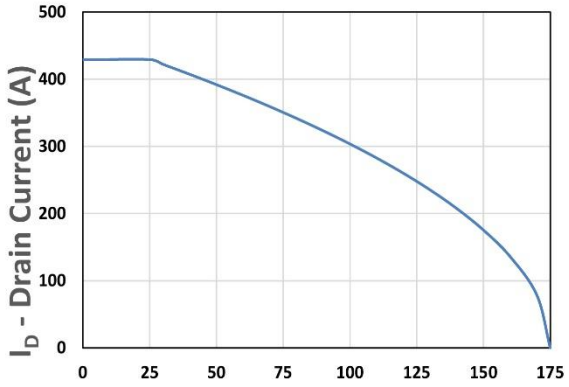

Figure 10. Drain Current

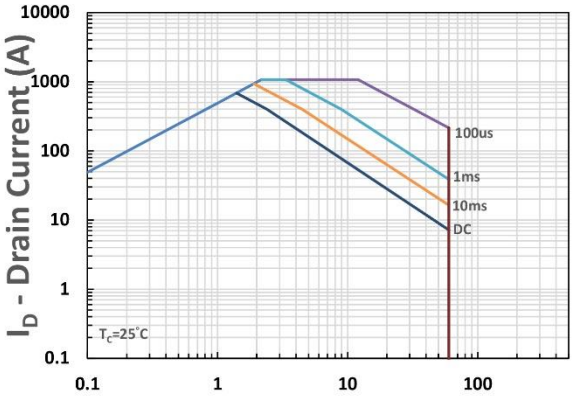

Figure 11. Safe Operating Area

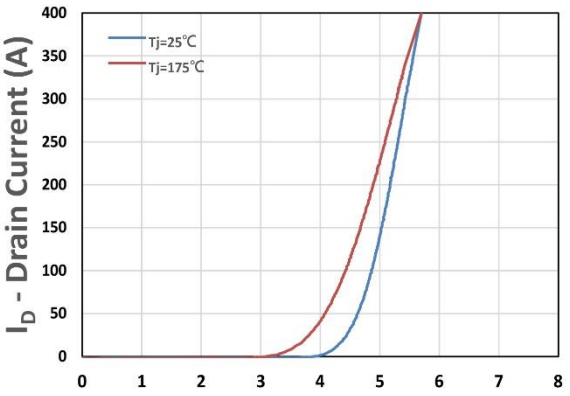

Figure 12. Transfer Characteristics

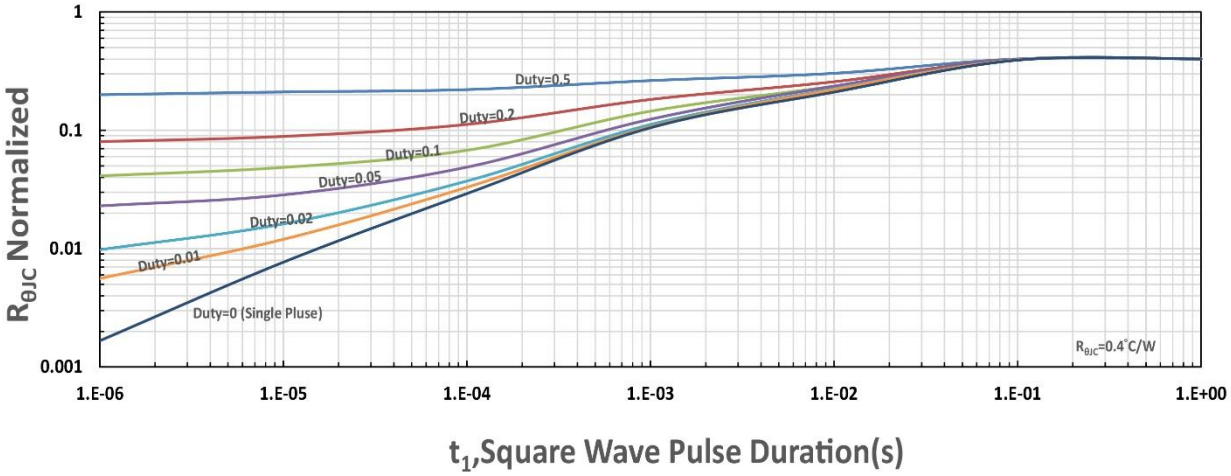

Figure 13. RθJC Transient Thermal Impedance

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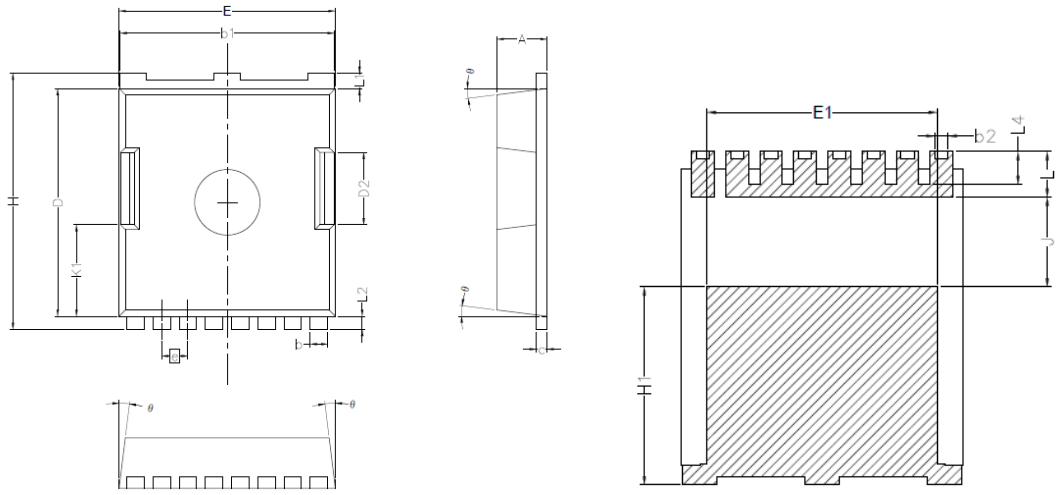
TOLL-8L Package Outline Data



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.20	2.40
b	0.70	0.90
b1	9.70	9.90
b2	0.42	0.50
c	0.40	0.60
D	10.28	10.58
D2	3.10	3.60
E	9.70	10.10
E1	7.90	8.30
e	1.20BSC	
H	11.48	11.88
H1	6.75	7.15
N	8	
J	3.00	3.30
K1	3.98	4.38
L	1.40	1.80
L1	0.60	0.80
L2	0.50	0.70
L4	1.00	1.30
θ	4°	10°