

N-Channel Enhancement Mode MOSFET

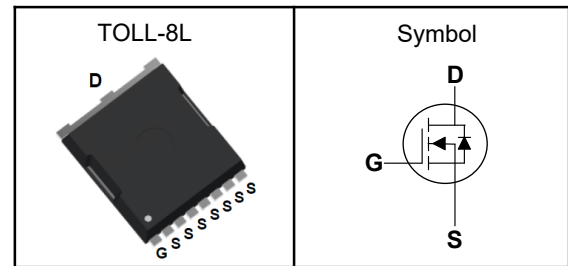
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	60	V
$R_{DS(ON)-Typ}$	0.9	m Ω
I_D	390	A

Absolute Maximum Ratings ($T_C=25^{\circ}C$, 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	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
$I_{DM}^{①}$	Pulse Drain Current Tested	1560	A
I_D	Continuous Drain Current	390	A
P_D	Maximum Power Dissipation	350	W
E_{AS}	Avalanche Energy, Single pulse	1218	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	40	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.43	$^{\circ}C/W$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^{\circ}C$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	---	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	0.9	1.2	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{DS}=30V,$ $V_{GS}=0V,$ Freq.=1MHz	---	9240	---	pF
C_{oss}	Output Capacitance		---	2230	---	
C_{rSS}	Reverse Transfer Capacitance		---	85	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, V_{GS}=10V,$ $I_D=20A, R_G=3\Omega$	---	23	---	nS
T_r	Turn-on Rise Time		---	30	---	
$T_{d(off)}$	Turn-off Delay Time		---	106	---	
T_f	Turn-off Fall Time		---	54	---	
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_D=20A$	---	148	---	nC
Q_{gs}	Gate-Source Charge		---	38	---	
Q_{gd}	Gate-Drain Charge		---	40	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=20A, V_{GS}=0V,$ $di/dt=100A/\mu s$	---	78	---	nS
Q_{rr}	Reverse Recovery Charge		---	168	---	nC

Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

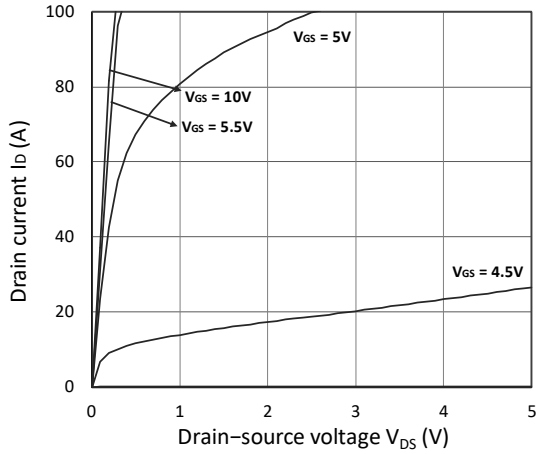
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Typical Characteristics


Figure 1. Output Characteristics

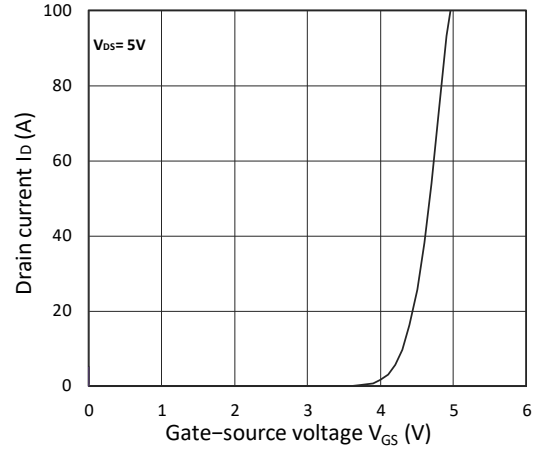


Figure 2. Transfer Characteristics

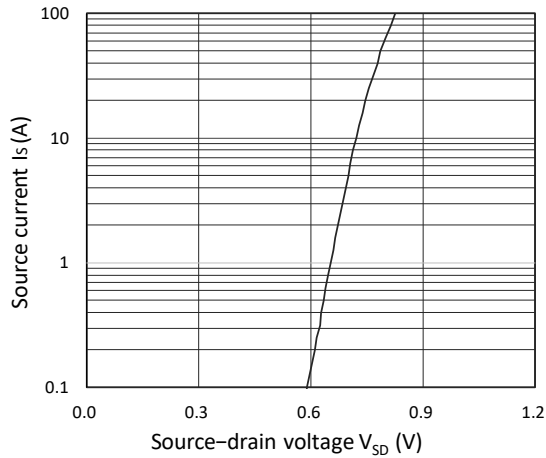
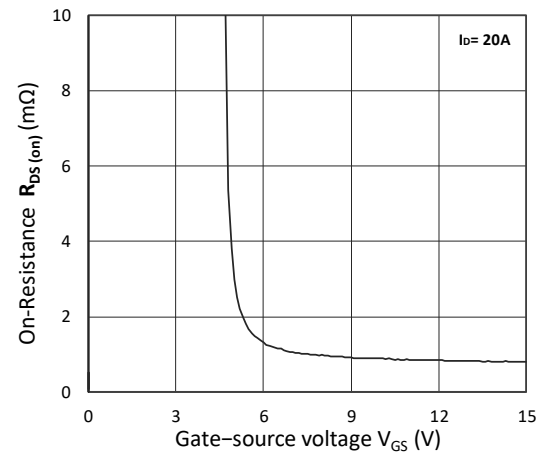
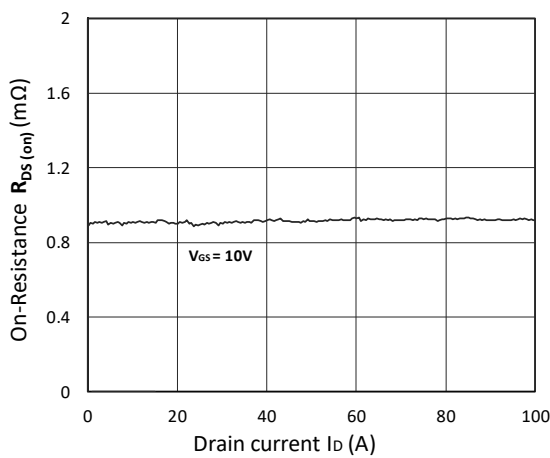
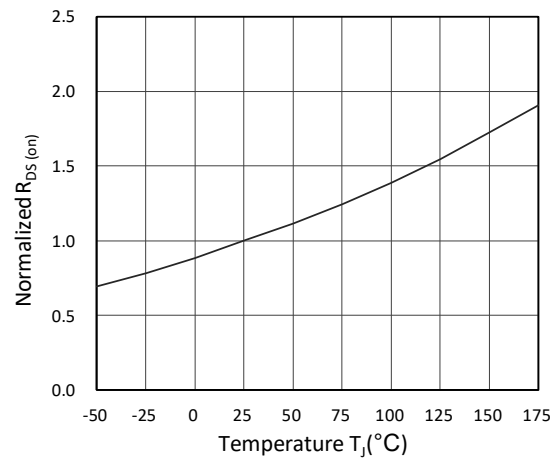


Figure 3. Forward Characteristics of Reverse


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

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

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

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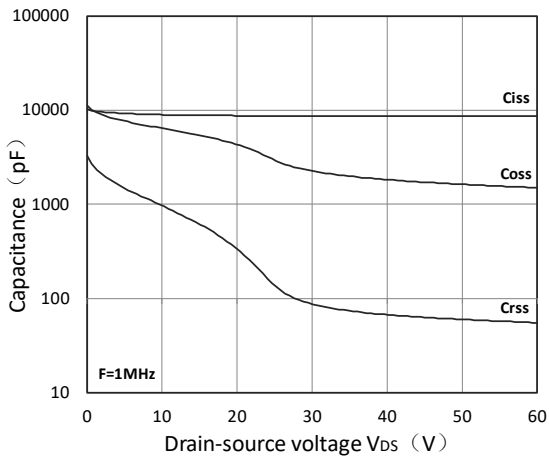


Figure 7. Capacitance Characteristics

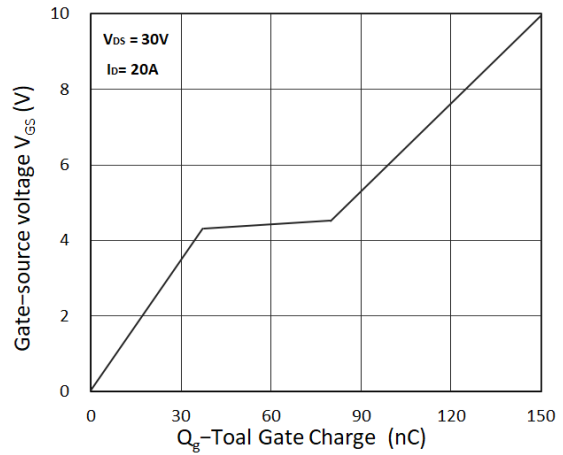


Figure 8. Gate Charge Characteristics

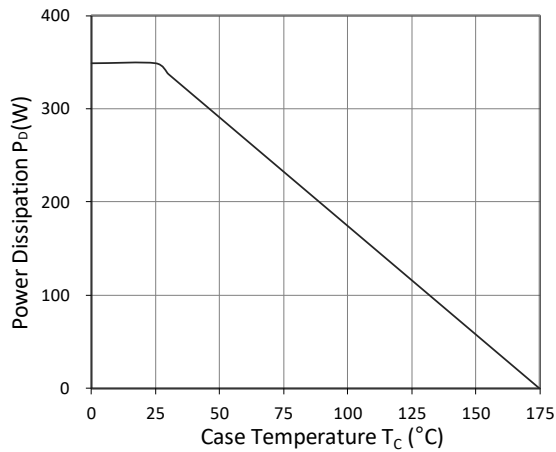


Figure 9. Power Dissipation

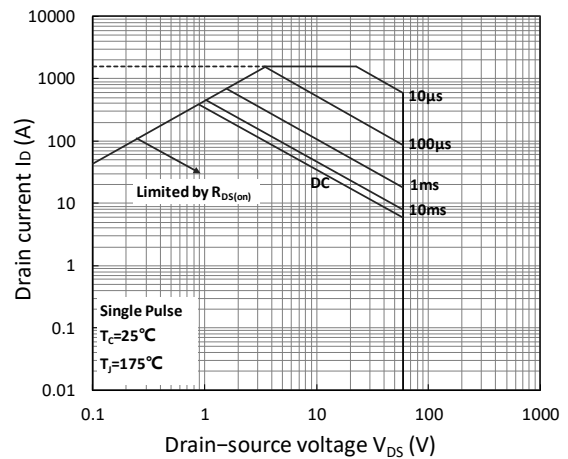


Figure 10. Safe Operating Area

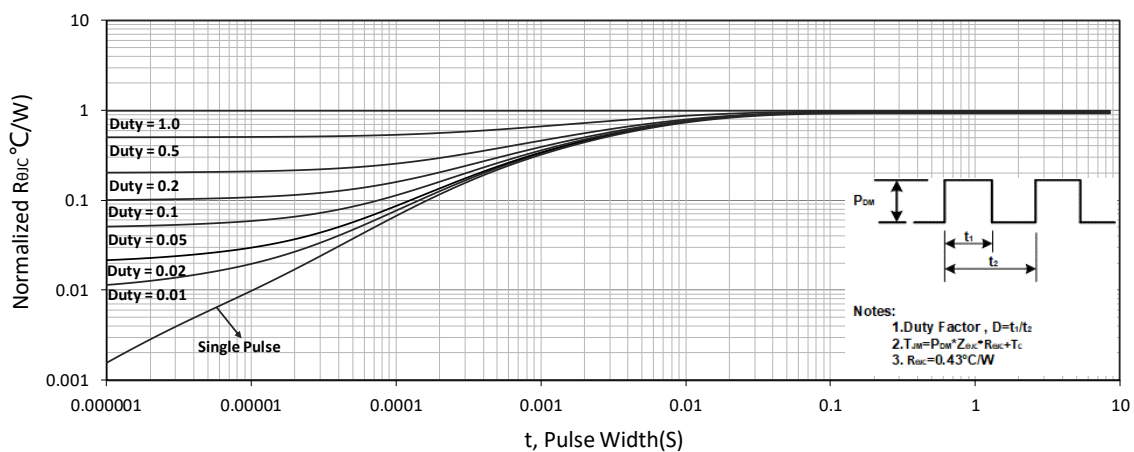
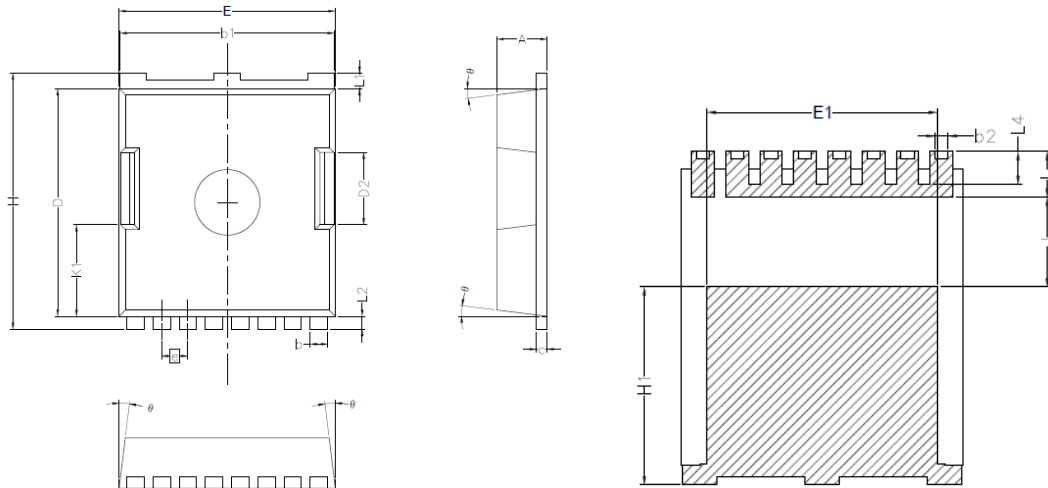


Figure 11. Normalized Maximum Transient Thermal Impedance

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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°