

## N-Channel Enhancement Mode MOSFET

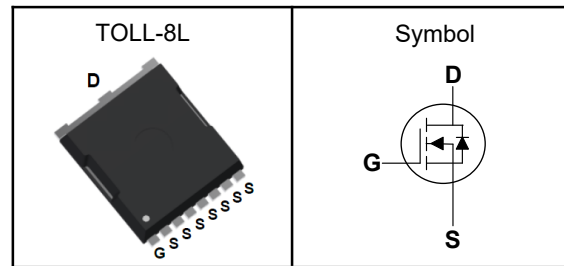
### Features

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

### Applications

- Power Management in Desktop Computer
- DC/DC Converters

### Pin Description



$V_{DSS}$	40	V
$R_{DS(ON)-Typ}$	0.84	m $\Omega$
$I_D$	400	A

### Absolute Maximum Ratings ( $T_C=25^{\circ}C$ , Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
$V_{DSS}$	Drain-Source Voltage	40	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	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	1600	A
$I_D$	Continuous Drain Current	400	A
$P_D$	Maximum Power Dissipation	600	W
$E_{AS}$	Avalanche Energy, Single pulse	1352	mJ

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	33	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.4	$^{\circ}C/W$

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 1in<sup>2</sup> FR-4 board with 1oz.



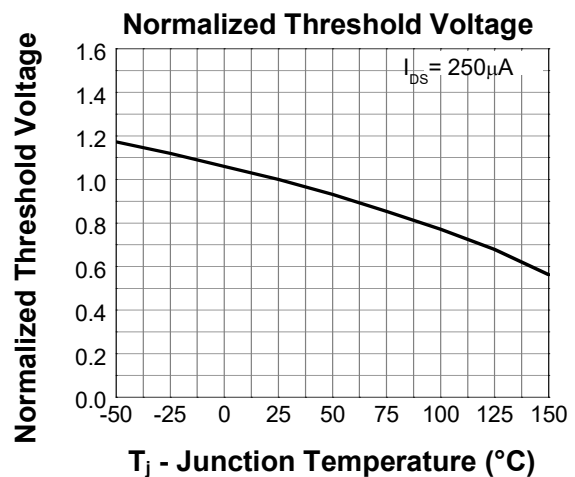
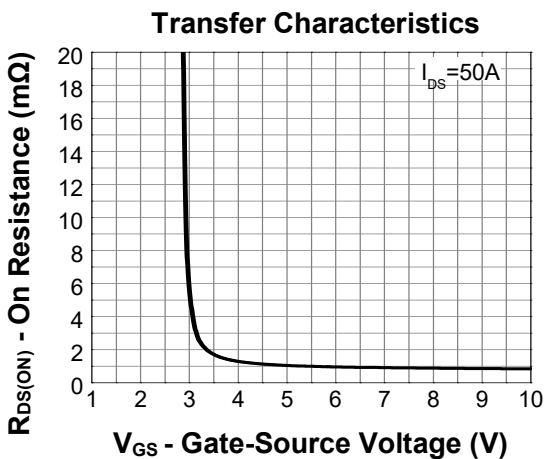
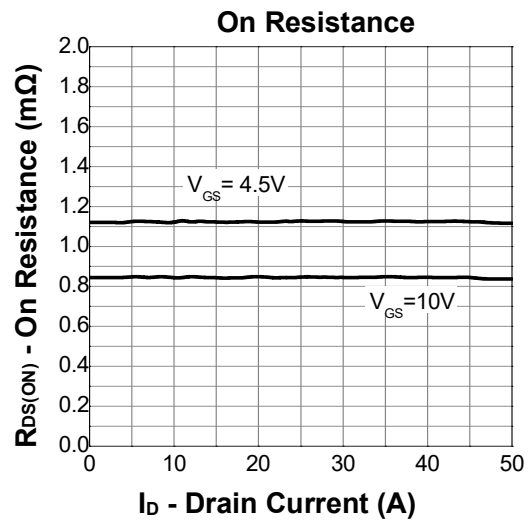
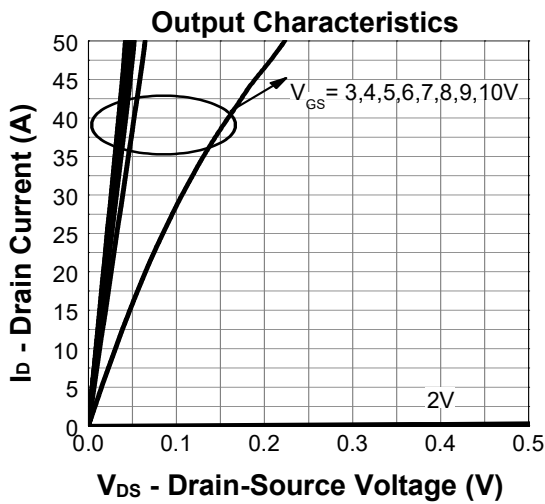
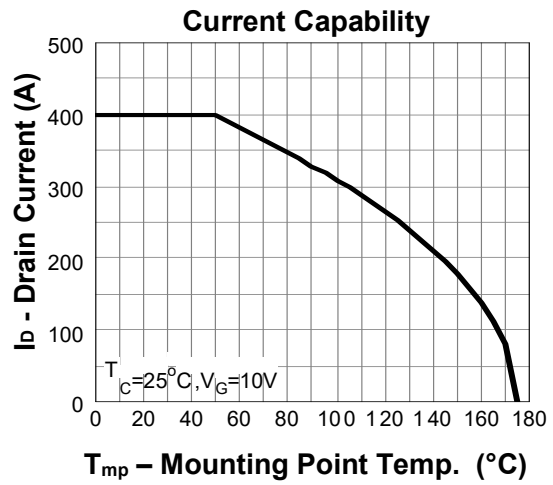
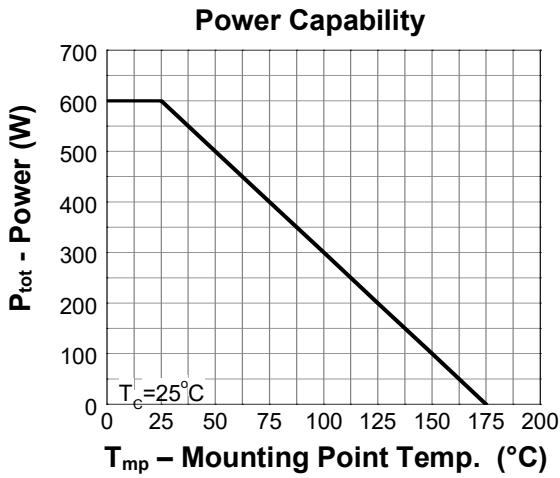
**N-Channel Enhancement Mode MOSFET**

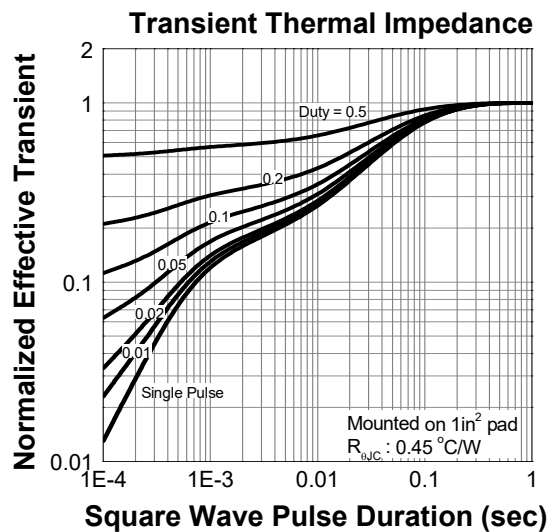
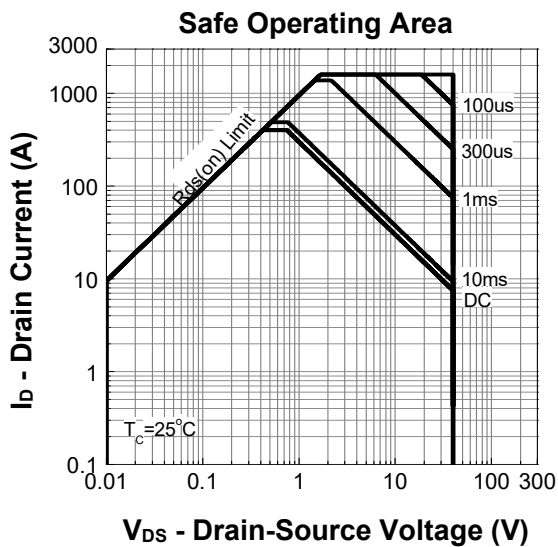
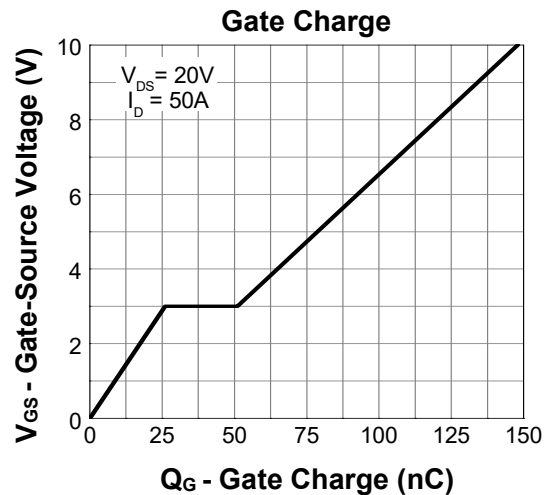
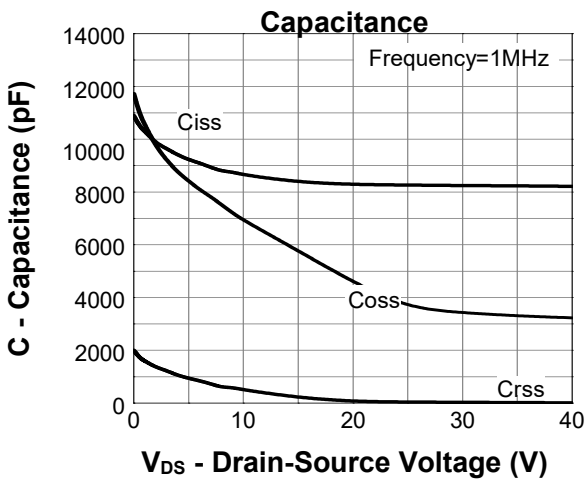
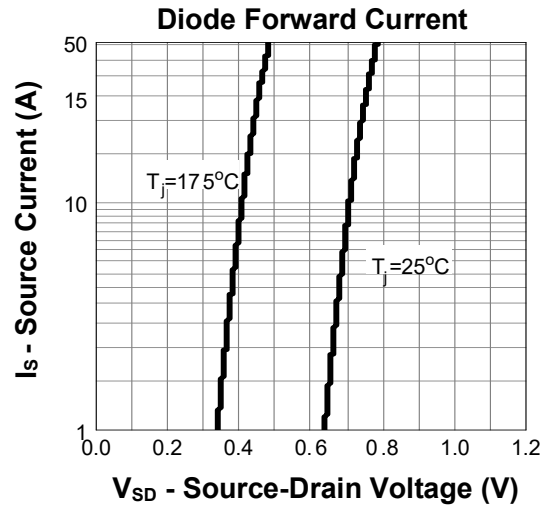
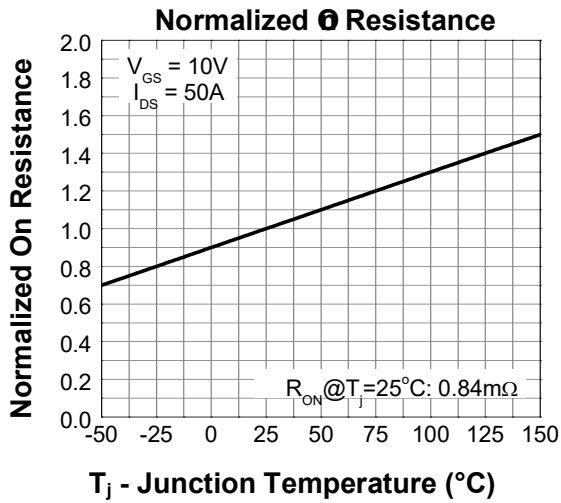
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

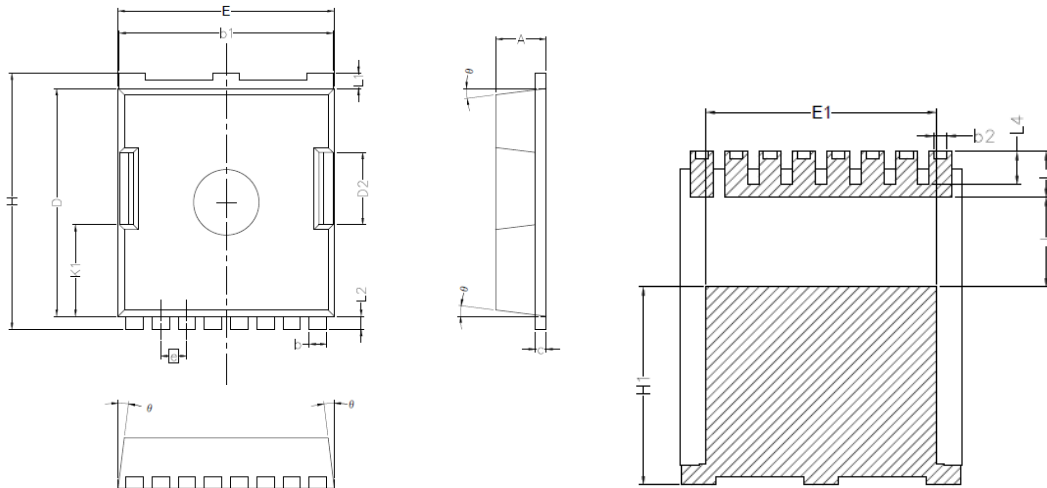
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=32V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	---	2	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=50A$	---	0.84	0.95	$m\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	1.1	1.25	$m\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, \text{Freq.}=1\text{MHz}$	---	8296	---	pF
$C_{oss}$	Output Capacitance		---	3294	---	
$C_{rSS}$	Reverse Transfer Capacitance		---	55	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=20V, V_{GS}=10V, I_D=50A, R_G=4.5\Omega$	---	19	---	nS
$T_r$	Turn-on Rise Time		---	84	---	
$T_{d(off)}$	Turn-off Delay Time		---	153	---	
$T_f$	Turn-off Fall Time		---	126	---	
$Q_g$	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=50A$	---	148	---	nC
$Q_{gs}$	Gate-Source Charge		---	26	---	
$Q_{gd}$	Gate-Drain Charge		---	25	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=50A, V_{GS}=0V$	---	---	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_F=50A, V_{GS}=0V, di_F/dt=100A/\mu s$	---	97	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	162	---	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.

**N-Channel Enhancement Mode MOSFET**
**Typical Characteristics**


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**TOLL-8L Package Outline Data**


Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.20	2.40
b	0.90	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	3.50
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
$\theta$	4°	10°