

N-Channel Enhancement Mode MOSFET

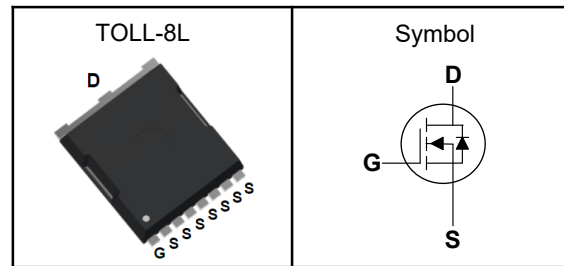
Features

- 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}	100	V
$R_{DS(ON)-Typ}$	1.1	m Ω
I_D	435	A

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
$I_{DM}^{①}$	Pulse Drain Current Tested	1320	A
I_D	Continuous Drain Current	435	A
P_D	Maximum Power Dissipation	431	W
E_{AS}	Avalanche Energy, Single pulse	1750	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	0.27	$^{\circ}C/W$

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.



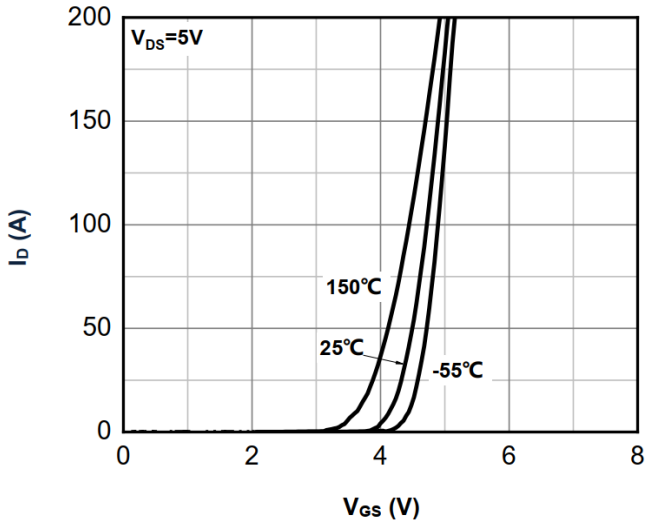
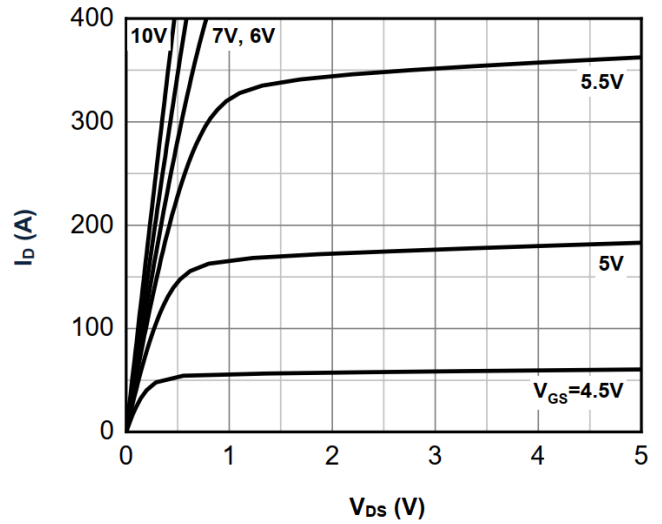
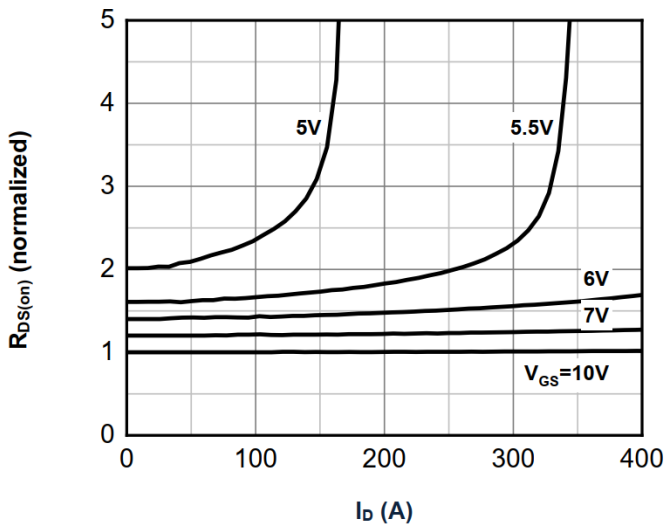
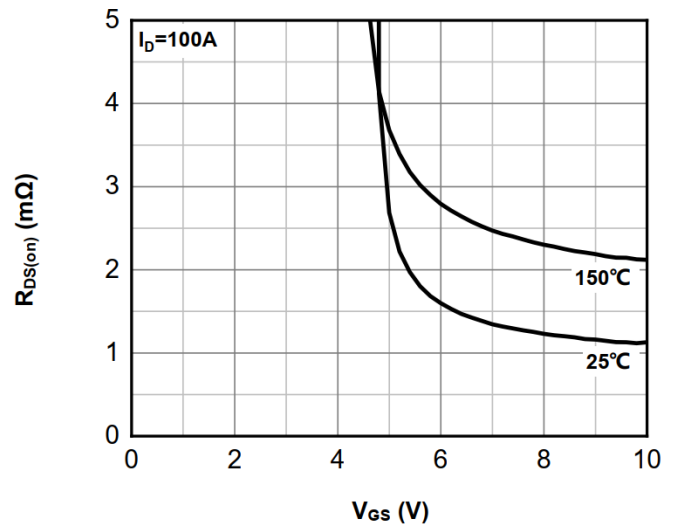
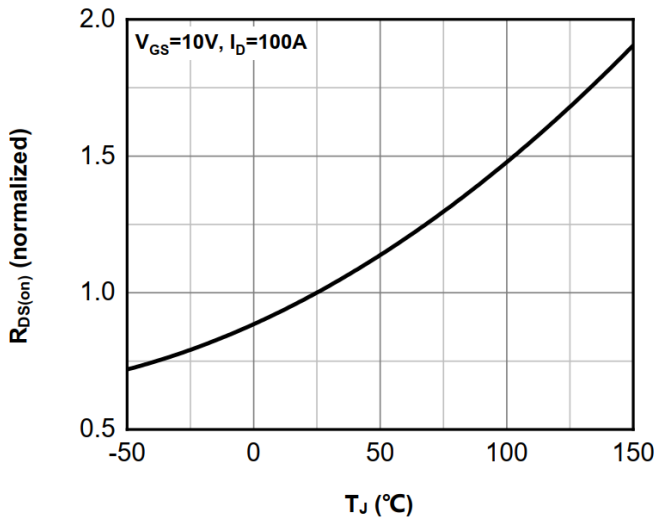
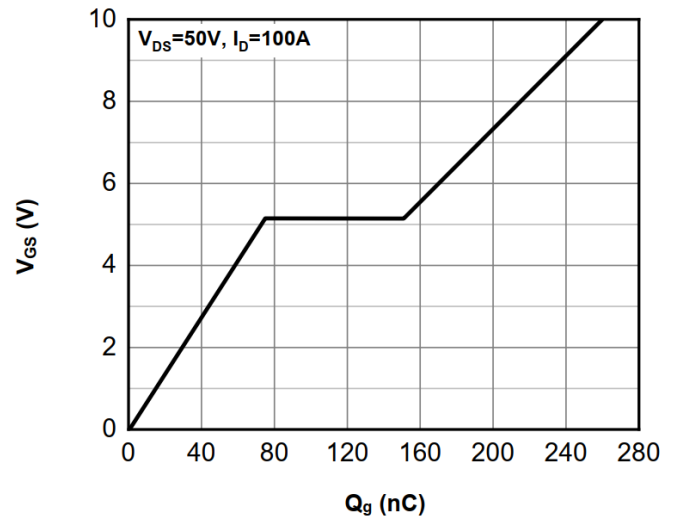
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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	---	---	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	$V_{GS}=10V, I_D=50A$	---	1.1	1.35	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, \text{Freq.}=1\text{MHz}$	---	15880	---	pF
C_{oss}	Output Capacitance		---	1930	---	
C_{riss}	Reverse Transfer Capacitance		---	75	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=50V, V_{GS}=10V, I_D=100A, R_G=6\Omega$	---	81	---	nS
T_r	Turn-on Rise Time		---	178	---	
$T_{d(off)}$	Turn-off Delay Time		---	167	---	
T_f	Turn-off Fall Time		---	68	---	
Q_g	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=100A$	---	265	---	nC
Q_{gs}	Gate-Source Charge		---	75	---	
Q_{gd}	Gate-Drain Charge		---	76	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_S=100A, V_{GS}=0V$	---	---	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=100A, V_{GS}=0V, di_F/dt=100A/\mu s$	---	92	---	nS
Q_{rr}	Reverse Recovery Charge		---	200	---	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
Fig.1 Typ. transfer characteristics

Fig.2 Typ. output characteristics

Fig.3 Normalized on resistance vs drain current

Fig.4 Typ. on-resistance vs gate-source voltage

Fig.5 Normalized on-resistance vs junction temperature

Fig.6 Typ. gate charge


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Fig.7 Typ. forward characteristics of body diode

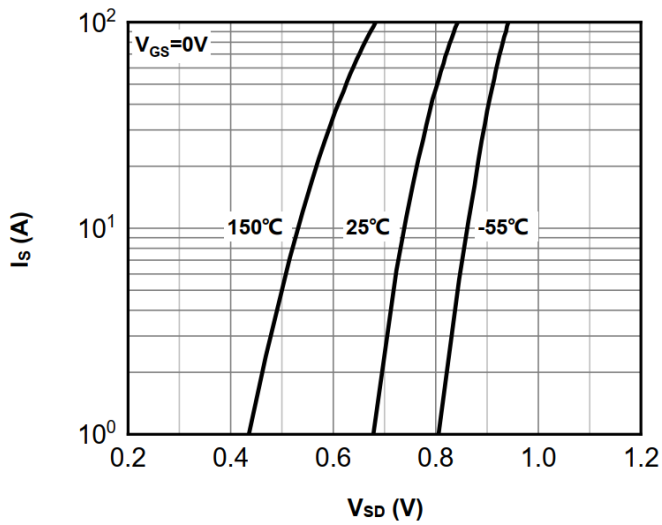


Fig.8 Safe operating area

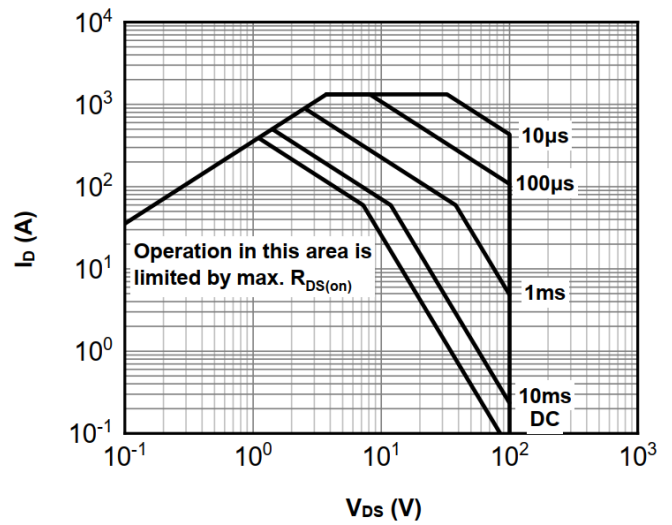


Fig.9 Typ. Capacitance

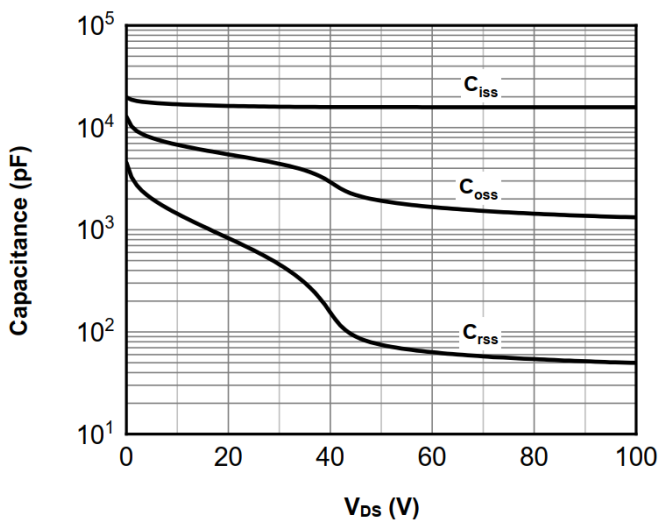


Fig.10 Single pulse maximum power dissipation

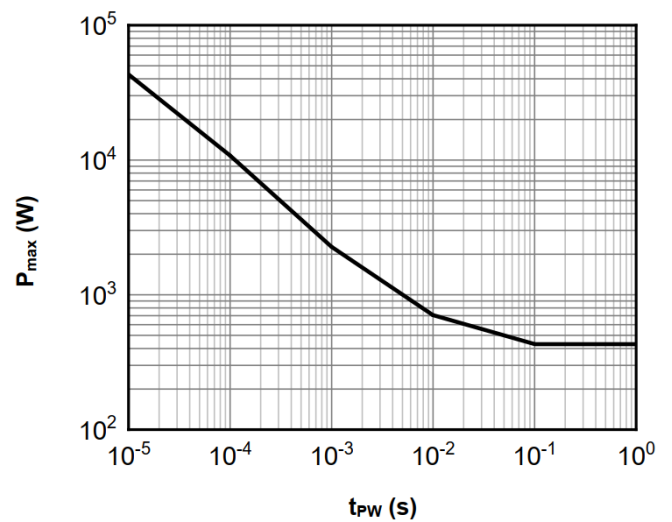


Fig.11 Max. power dissipation vs case temperature

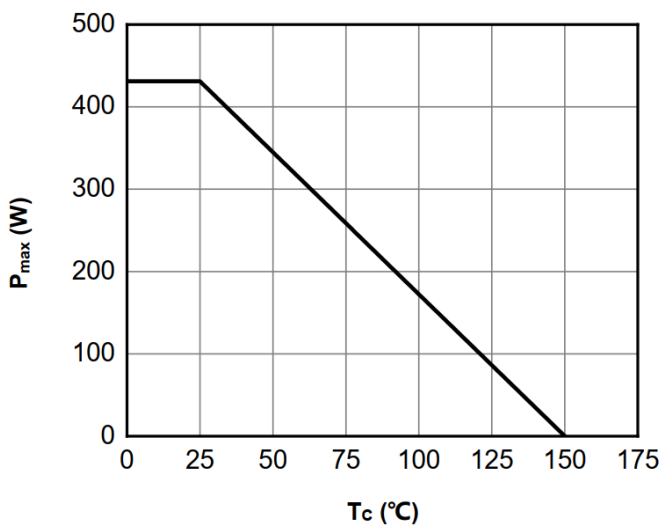
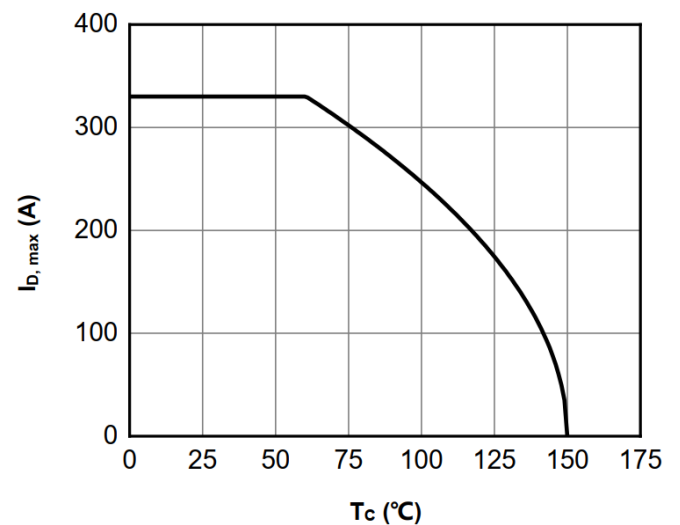
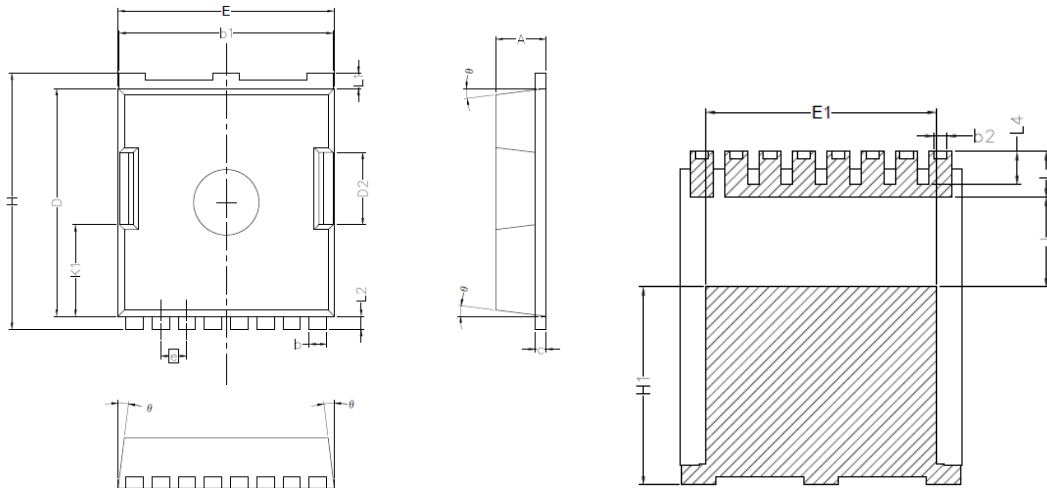


Fig.12 Max. continuous drain current vs case temperature



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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
θ	4°	10°