

N-Ch 100V Fast Switching MOSFETs
General Description

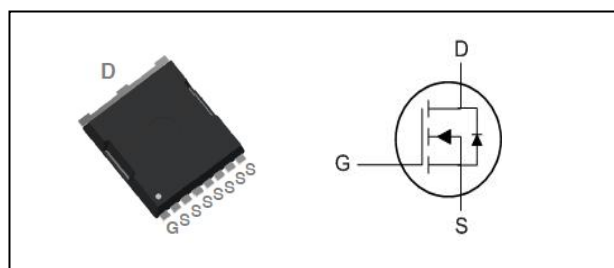
- 100% EAS Guaranteed
- Green Device Available
- Super Low $R_{DS(ON)}$
- Advanced high cell density Trench technology

Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	1	m Ω
I_D	455	A

Applications

- MOTOR Driver.
- UPS.
- Power Tools.
- Synchronous Rectification in SMPS.

TOLL Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	455	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	360	A
I_{DM}	Pulsed Drain Current ²	1820	A
EAS	Single Pulse Avalanche Energy ³	2800	mJ
I_{AS}	Avalanche Current	100	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	500	W
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	40	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.25	$^{\circ}C/W$

Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=20A$	---	1	1.2	$m\Omega$
		$V_{GS}=6V$, $I_D=20A$		1.4	1.8	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	0.45	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=50V$, $V_{GS}=10V$, $I_D=30A$	---	285	---	nC
Q_{gs}	Gate-Source Charge		---	74	---	
Q_{gd}	Gate-Drain Charge		---	87	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=50V$, $V_{GS}=10V$, $R_L=3.9\Omega$, $I_D=30A$	---	39	---	ns
T_r	Rise Time		---	86	---	
$T_{d(off)}$	Turn-Off Delay Time		---	181	---	
T_f	Fall Time		---	116	---	
C_{iss}	Input Capacitance	$V_{DS}=50V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	15770	---	pF
C_{oss}	Output Capacitance		---	2100	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	

Diode Characteristics

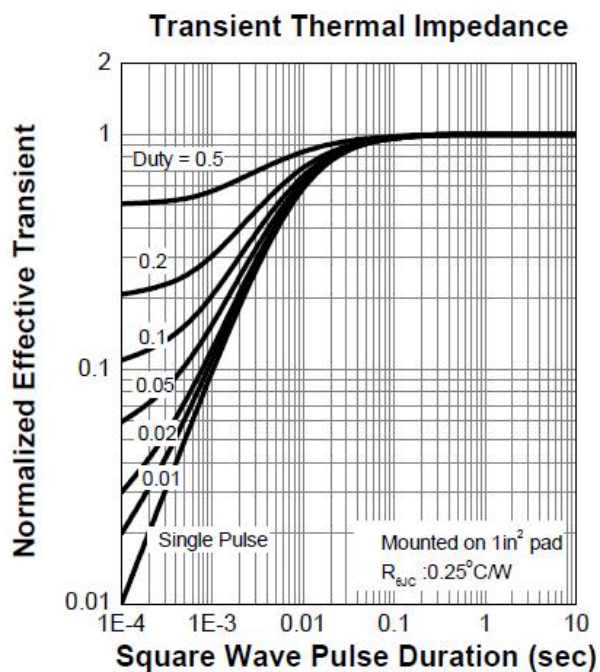
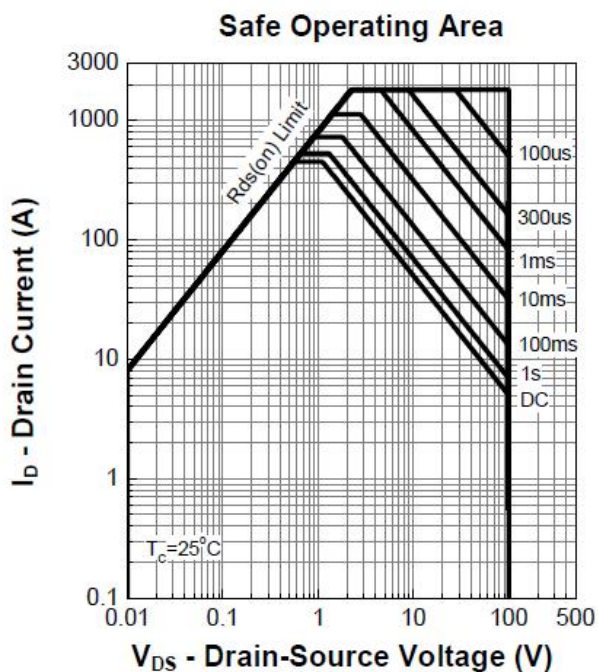
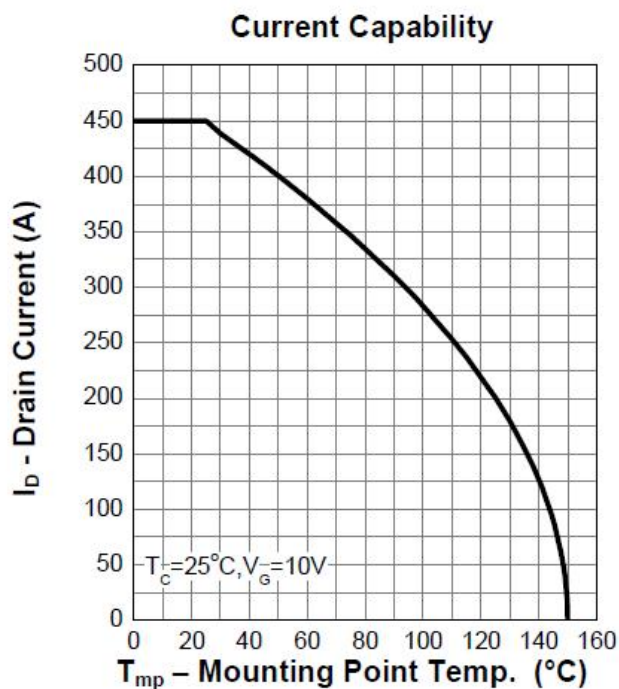
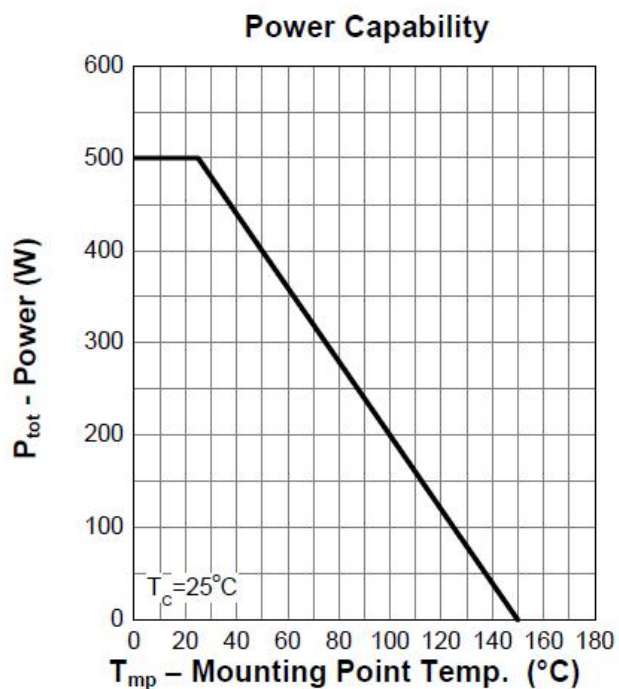
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=50A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_f=30A$, $DI/dt=500A/\mu s$	---	119	---	ns
Q_{rr}	Body Diode Reverse Recovery charge	$I_f=30A$, $DI/dt=100A/\mu s$	---	415	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=60V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=100A$
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 5.The maximum current rating is package limited.

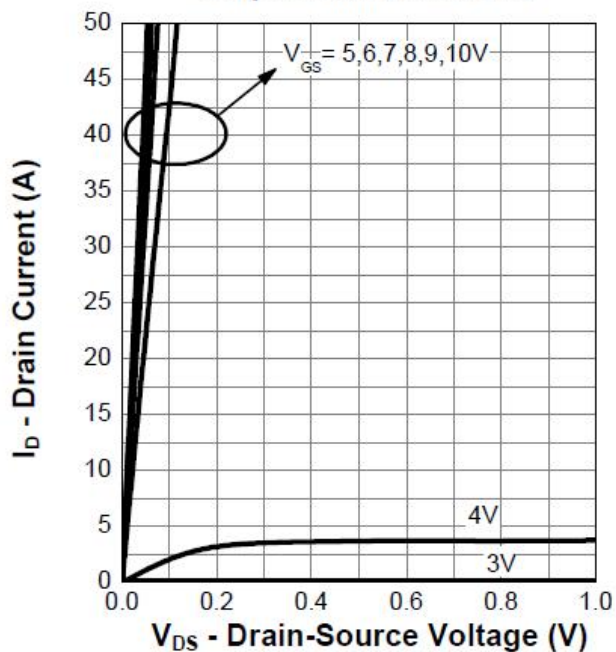


Typical Characteristics

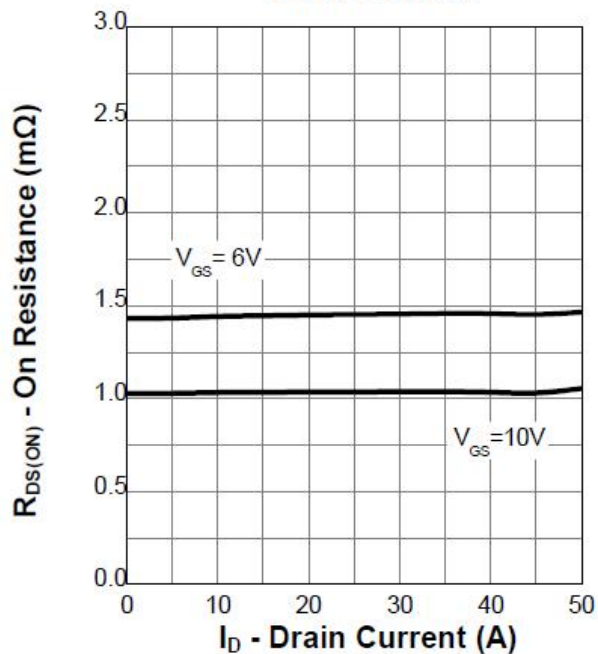




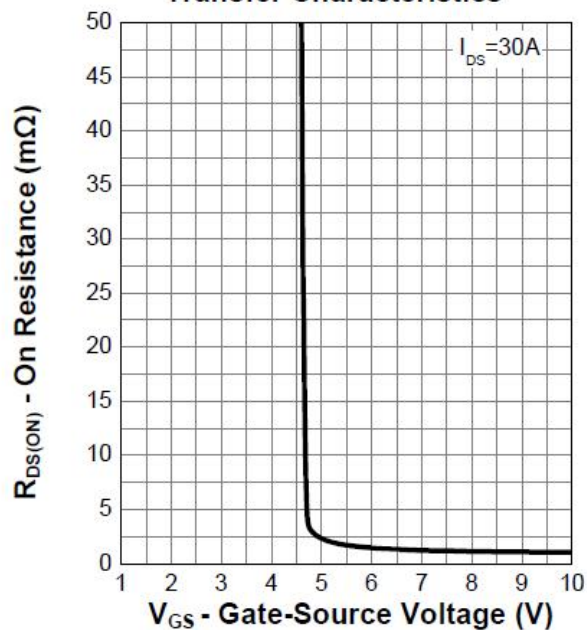
Output Characteristics



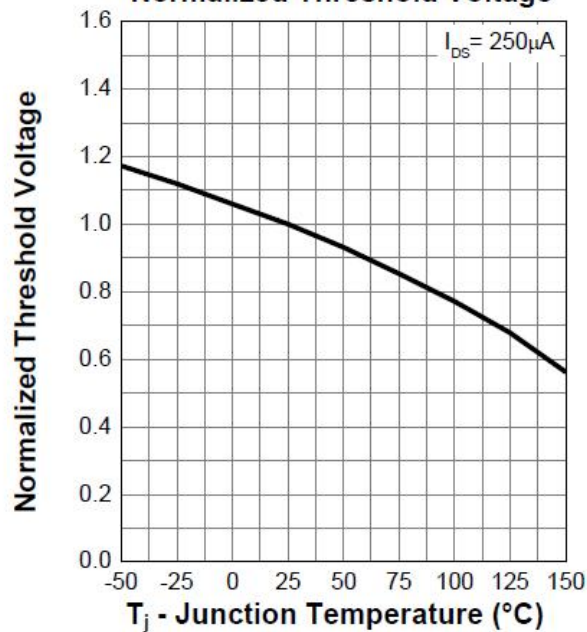
On Resistance

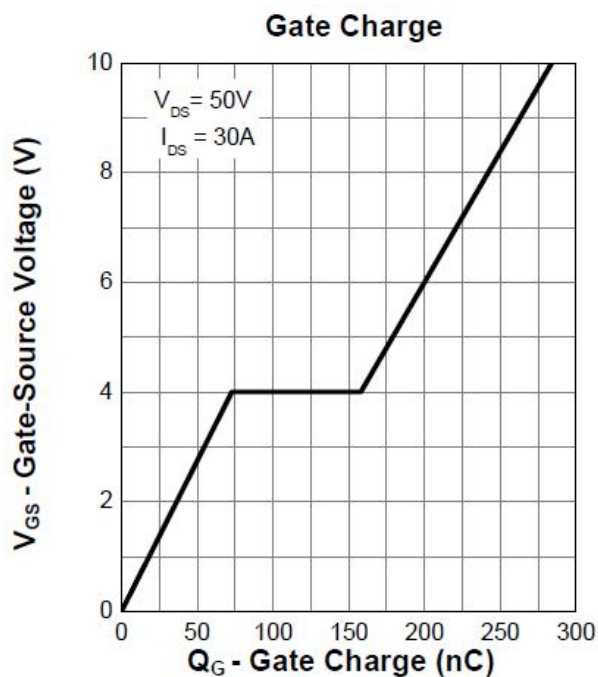
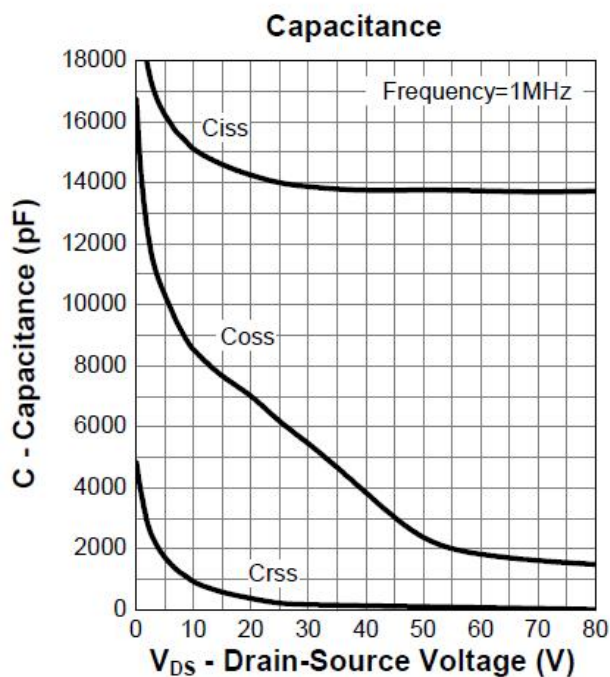
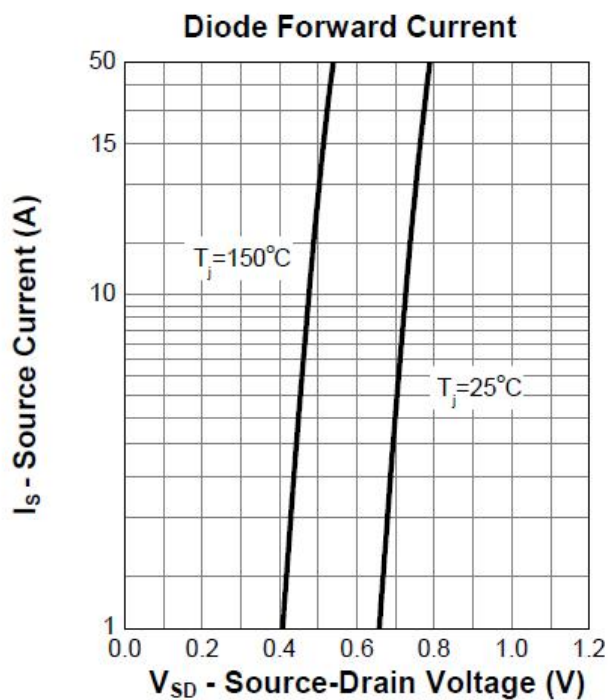
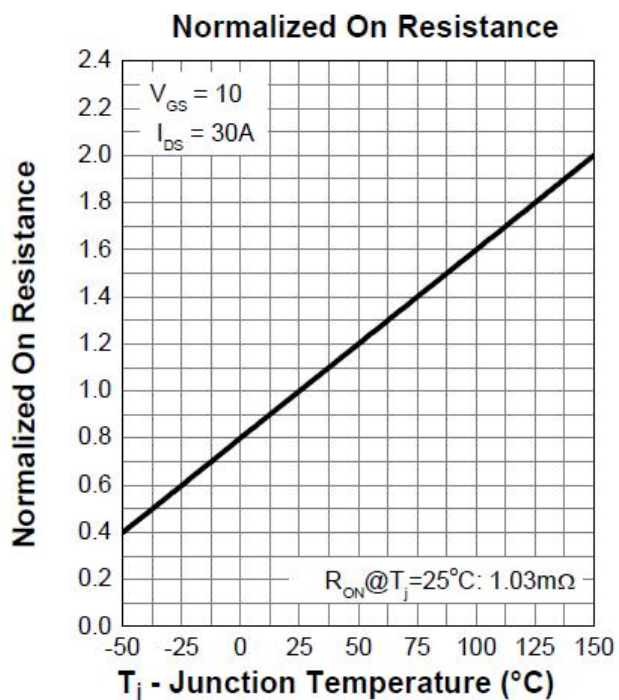


Transfer Characteristics



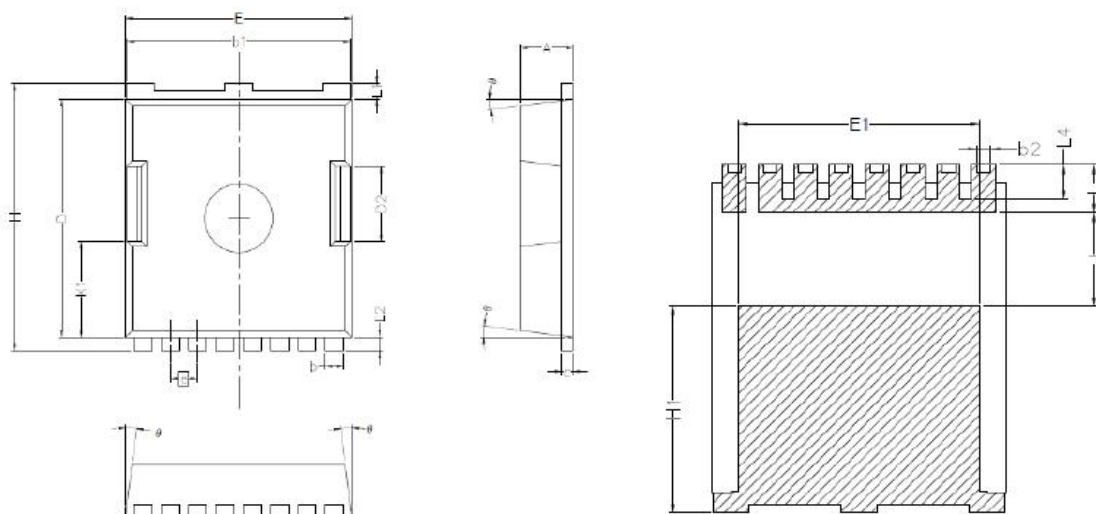
Normalized Threshold Voltage







■ TOLL-8L Package information



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°