

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
150V	4.7mΩ@10V	255A

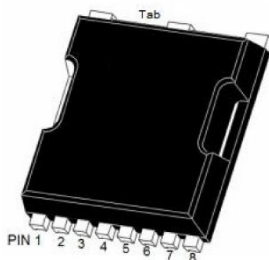
### Feature

- Excellent gate charge x  $R_{DS(on)}$  product(FOM)
- Very low on-resistance  $R_{DS(on)}$
- 175 °C operating temperature

### Application

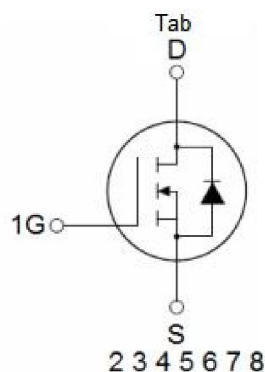
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Package

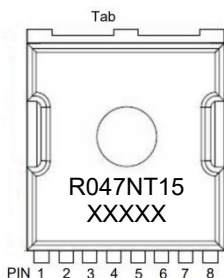


TOLL-8L

### Circuit diagram



### Marking



### Absolute maximum ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	255	A
Continuous Drain Current (T <sub>c</sub> =100°C)	$I_D$	180	A
Pulsed Drain Current	$I_{DM}$	1020	A
Power Dissipation	$P_D$	690	W
Thermal Resistance, Junction-to-Ambient <sup>2)</sup>	$R_{\theta JA}$	40	°C/W
Single pulse avalanche energy <sup>1)</sup>	$E_{AS}$	1797	mJ
Junction Temperature	$T_J$	175	°C
Storage Temperature	$T_{STG}$	-55 ~ +175	°C

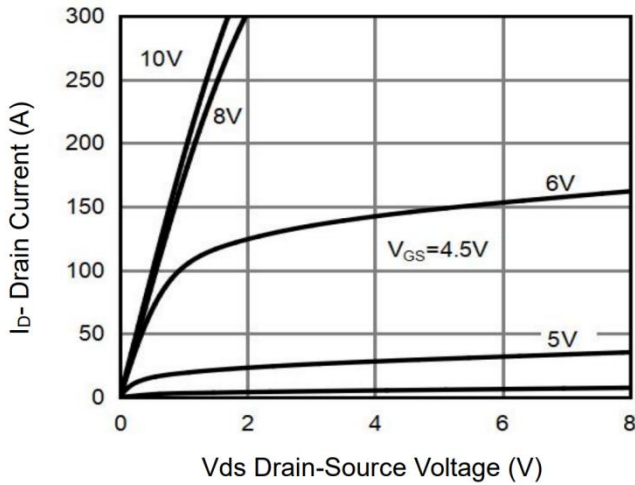
### Electrical characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	150			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 150V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		4.2	4.7	m $\Omega$
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 75V, V_{GS} = 0V, f = 1MHz$		7100		pF
Output Capacitance	$C_{oss}$			890		
Reverse Transfer Capacitance	$C_{riss}$			30		
Total Gate Charge	$Q_g$	$V_{DS} = 75V, V_{GS} = 10V, I_D = 20A$		97		nC
Gate-Source Charge	$Q_{gs}$			32.5		
Gate-Drain Charge	$Q_{gd}$			22.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 75V, V_{GS} = 10V, I_D = 20A, R_G = 4.7\Omega$		36		nS
Turn-on rise time	$t_r$			40		
Turn-off delay time	$t_{d(off)}$			60		
Turn-off fall time	$t_f$			30		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				255	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0V, I_F = 20A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ C, I_F = I_S$		160		nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100A/\mu s$		720		nC

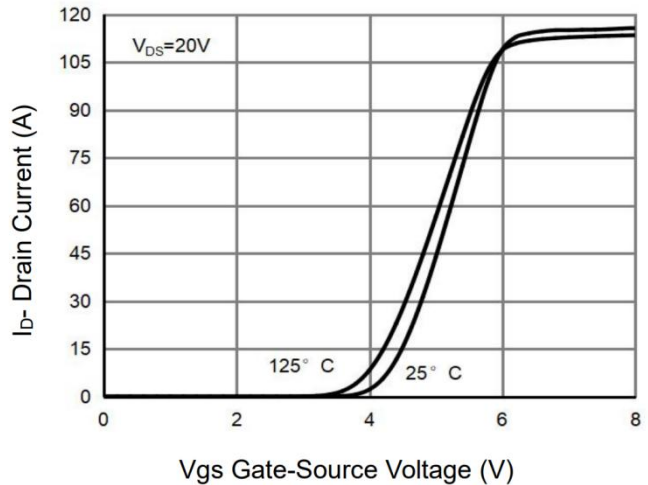
Notes:

- 1) EAS condition :  $T_J = 25^\circ C, V_{DD} = 40V, V_G = 10V, L = 0.5mH, R_G = 25\Omega$ .
- 2) These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)} = 175^\circ C$ . The SOA curve provides a single pulse rating.
- 3) Guaranteed by design, not subject to production testing.

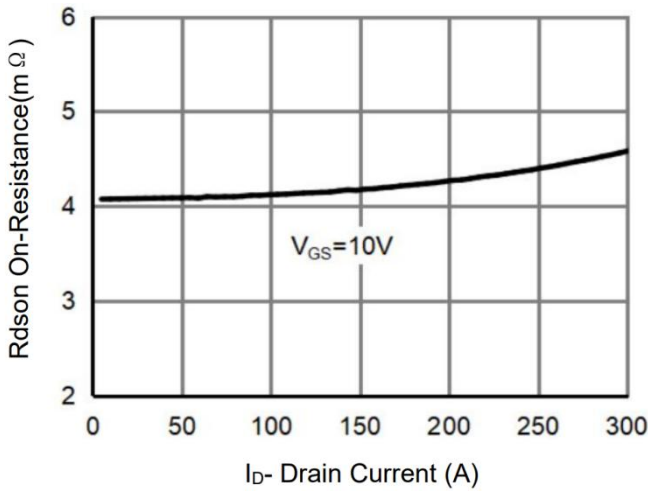
## Typical Characteristics



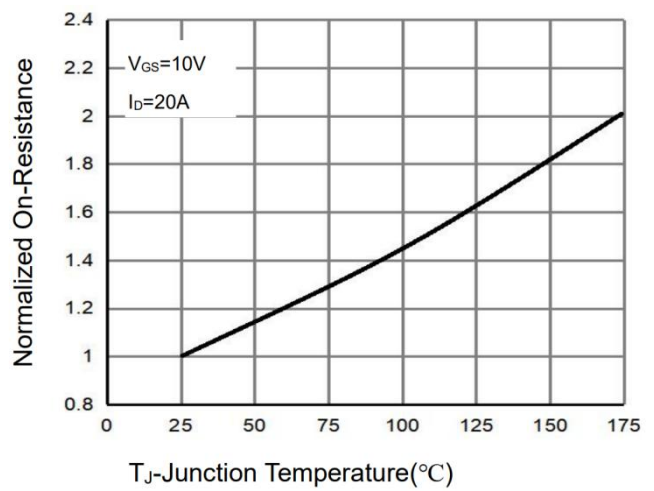
**Figure 1 Output Characteristics**



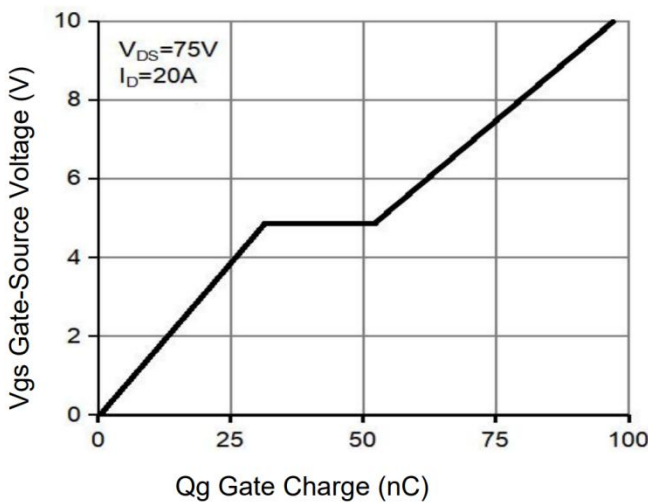
**Figure 2 Transfer Characteristics**



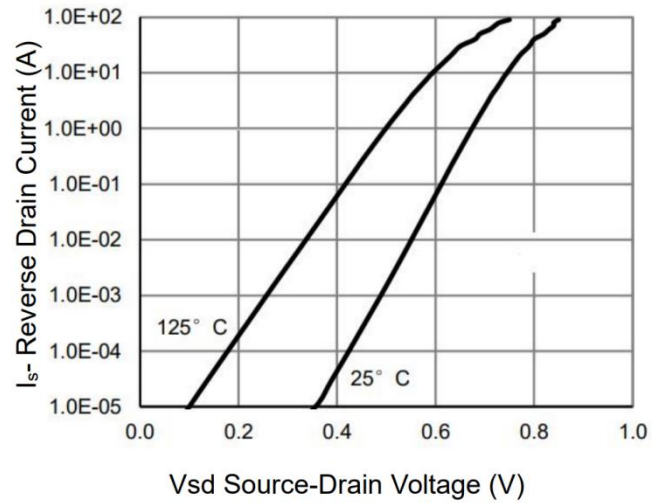
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**

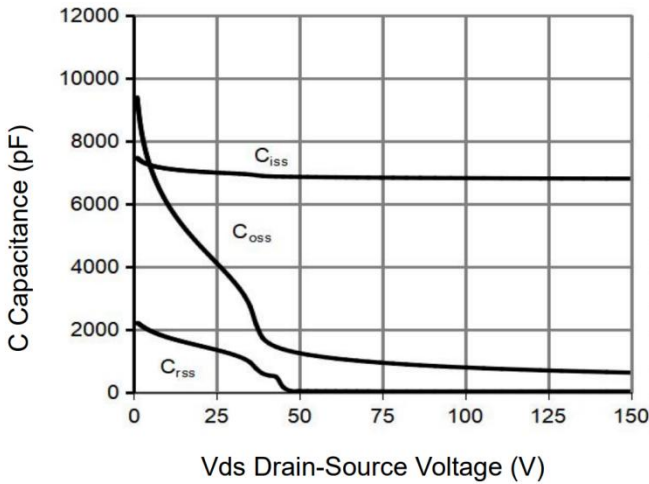


**Figure 5 Gate Charge**

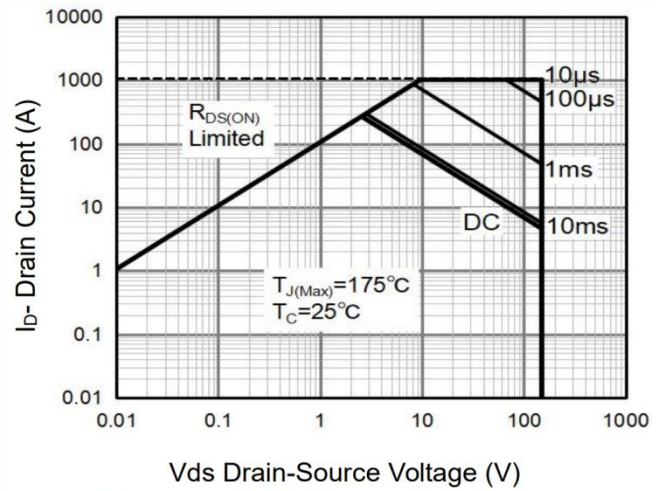


**Figure 6 Source- Drain Diode Forward**

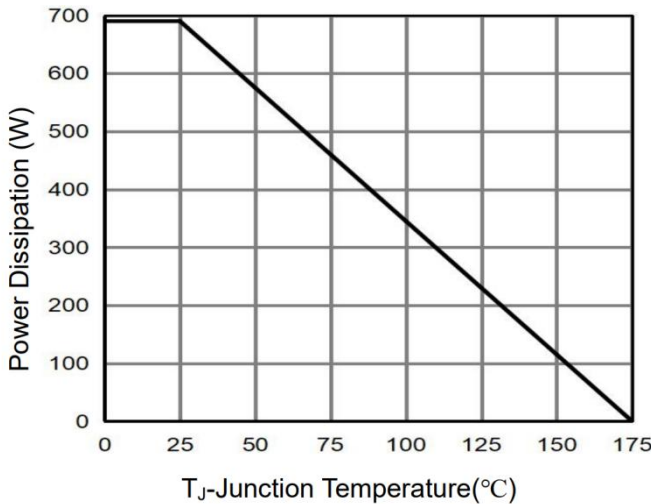
## Typical Characteristics



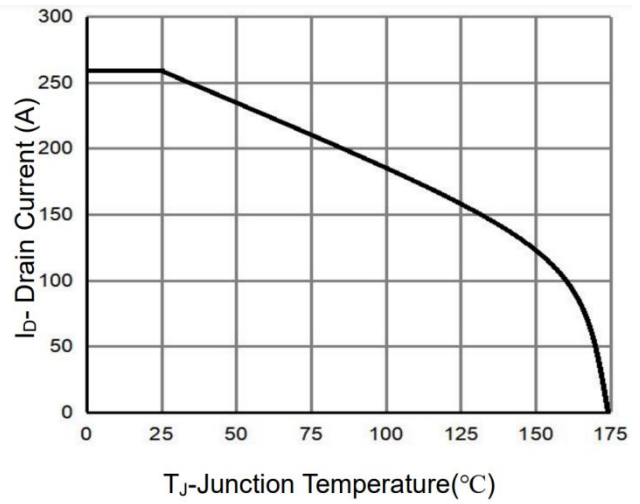
**Figure 7 Capacitance vs Vds**



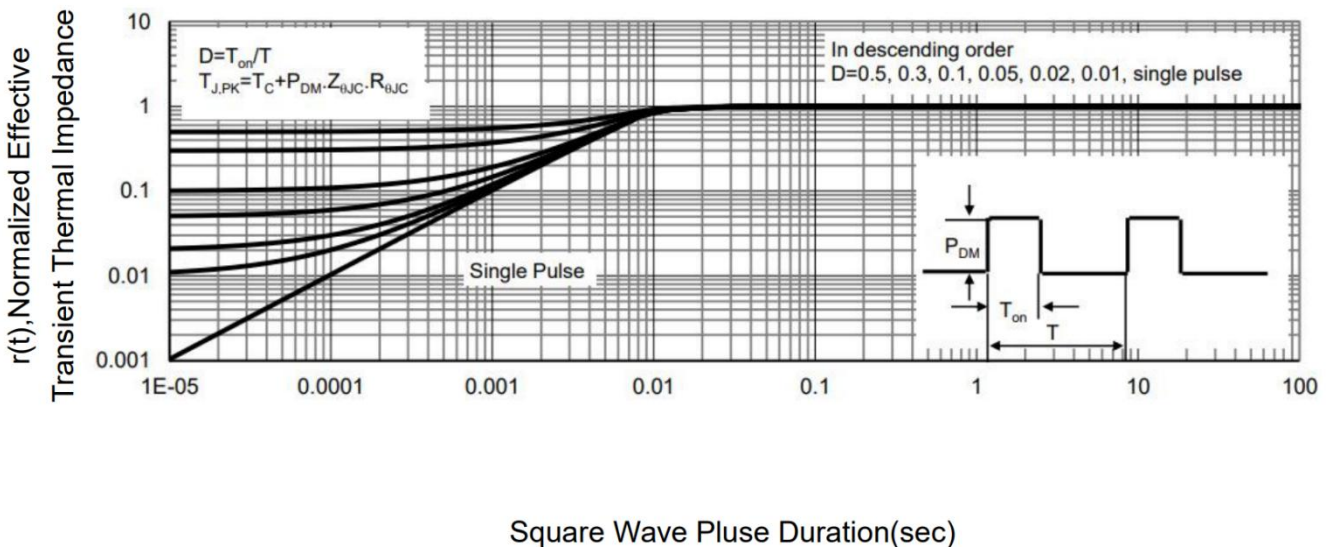
**Figure 8 Safe Operation Area**



**Figure 9 Power De-rating**

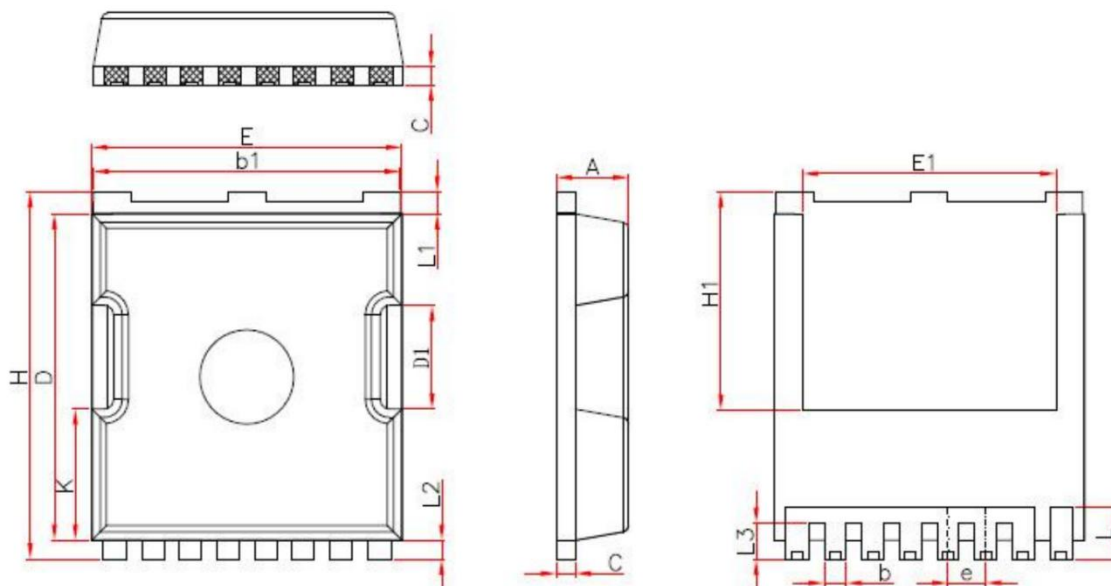


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### TOLL-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.650	0.850	0.026	0.033
b1	9.700	9.900	0.382	0.390
C	0.500	0.700	0.020	0.027
D	10.300	10.500	0.406	0.413
D1	3.150	3.450	0.124	0.136
E	9.700	10.100	0.382	0.398
E1	8.000	8.200	0.315	0.323
e	1.100	1.300	0.043	0.051
H	11.600	11.800	0.457	0.465
H1	6.850	7.050	0.270	0.278
K	4.080	4.280	0.161	0.169
L	1.600	2.100	0.063	0.083
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	1.050	1.300	0.041	0.051