

N-channel Enhancement Mode Power MOSFET

Features

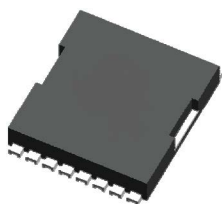
- Halogen-free and RoHS-compliant
- Ultra-low RDS(ON)
- Lead free product is acquired
- 100% UIS TESTED
- 100% Rg TESTED

Product Summary

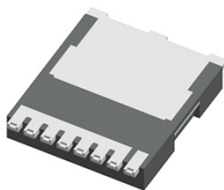
Parameters	Value	Unit
V_{DSS}	150	V
$V_{GS(th_Typ)}$	3.2	V
$I_D(@V_{GS}=10V)$	200	A
$R_{DS(ON)_Typ}(@V_{GS}=10V)$	3.5	mΩ

Applications

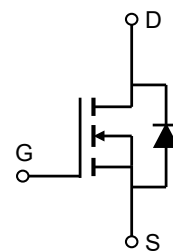
- Load Switch
- PWM Application
- Power Management



TOLL-8L Top View



TOLL-8L Bottom View



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK150G002TL	150G002	TOLL	Reel	N/A	N/A	2000

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	200	A
	$T_C = 100^{\circ}\text{C}$		80	
Pulsed Drain Current		I_{DM}	630	A
Single Pulsed Avalanche Energy		E_{AS}	889	mJ
Power Dissipation		P_D	417	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	48	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = 250uA	150			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 120V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.5	3.2	4.5	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.5	4.0	mΩ
Dynamic characteristics ④ ⑤						
Input capacitance	C _{iss}	V _{DS} =75V,V _{GS} =0V f =1MHz		6540		pF
Output capacitance	C _{oss}			772		
Reverse transfer capacitance	C _{rss}			6.7		
Gate Poly Resistance	R _g	f =1MHz		2.4		Ω
Switching characteristics ④ ⑤						
Total gate charge	Q _g	V _{GS} =0 to 10V V _{DS} =75V, I _D =20A		88		nC
Gate-source charge	Q _{gs}			32		
Gate-drain charge	Q _{gd}			16		
Turn-on delay time	t _{d(on)}	V _{DS} =75V,R _L =3.75Ω V _{GS} =10V,R _{GEN} =6Ω		48		ns
Turn-on rise time	t _r			90		
Turn-off delay time	t _{d(off)}			94		
Turn-off fall time	t _f			60		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _S =1A			1.0	V
Continuous drain-source diode forward current	I _S ①				600	A
Pulsed drain-source diode forward current	I _{SM} ②				720	A
Reverse recovery time	t _{rr}	di/dt = 100A/μs, I _F = 15A		122		ns
Reverse recovery charge	Q _{rr}			279		nC

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Continuous current rating is limited by the package used.
3. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ\text{C}$.
4. This single-pulse measurement was taken under the following condition [$L = 1mH, V_{GS} = 10V, V_{DS} = 75V$] while its value is limited by $T_{J_Max} = 150^\circ\text{C}$.
5. The power dissipation PD is based on $T_{J_Max} = 150^\circ\text{C}$.
6. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

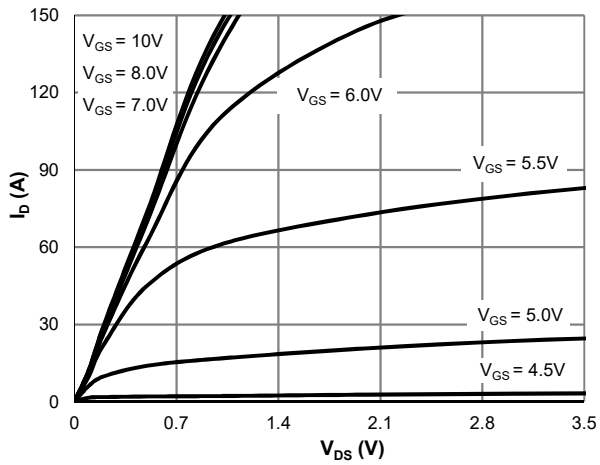


Figure 1: Saturation Characteristics

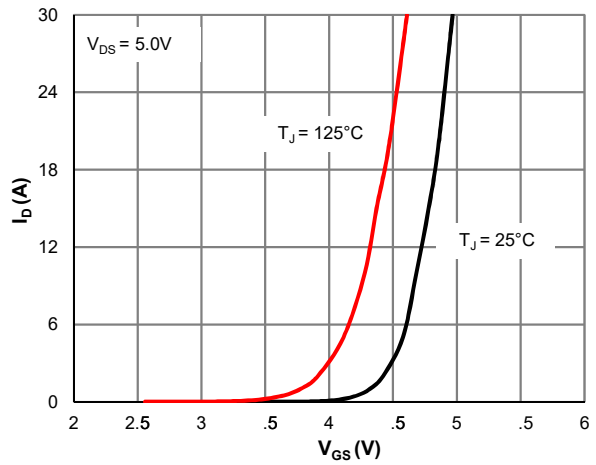


Figure 2: Transfer Characteristics

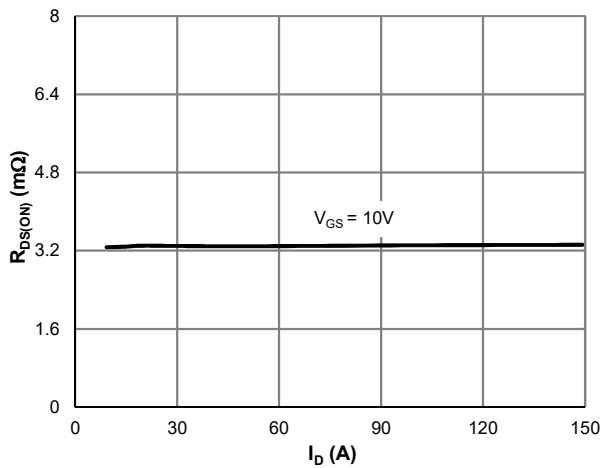


Figure 3: $R_{DS(ON)}$ vs. Drain Current

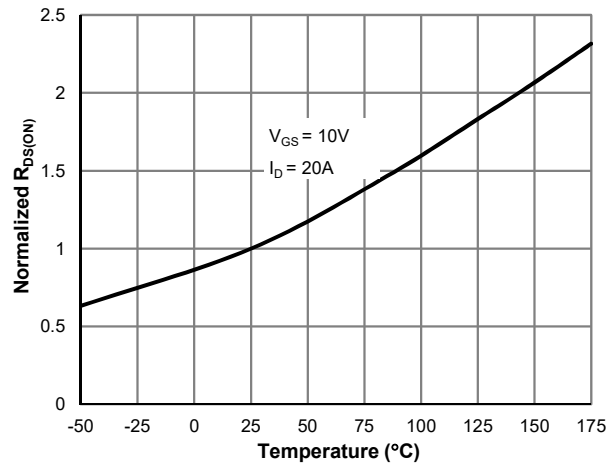


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

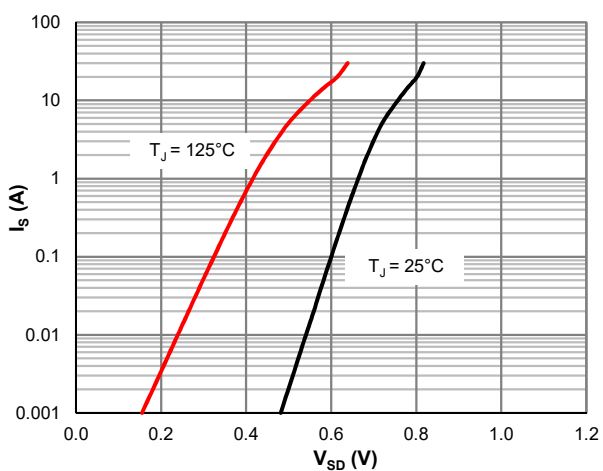


Figure 5: Body-Diode Characteristics

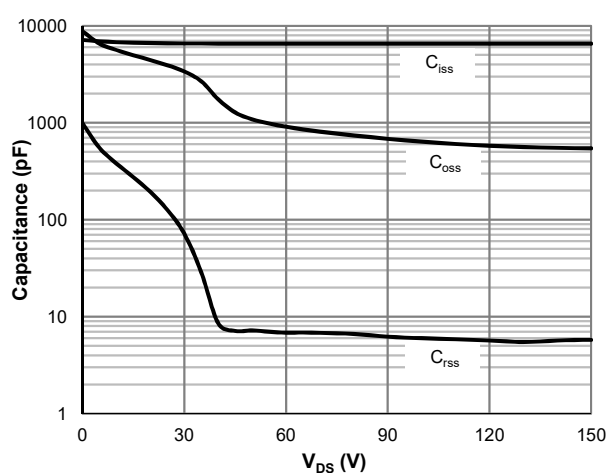


Figure 6: Capacitance Characteristics

Typical Characteristics

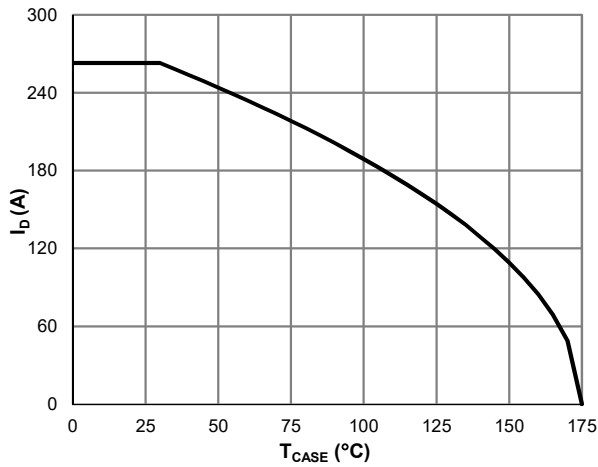


Figure 7: Current De-rating

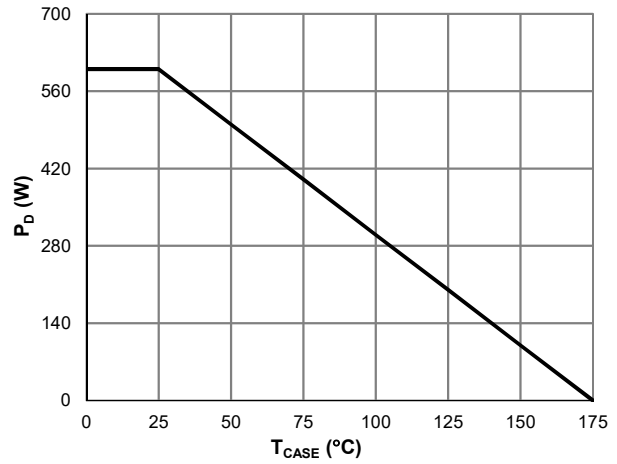


Figure 8: Power De-rating

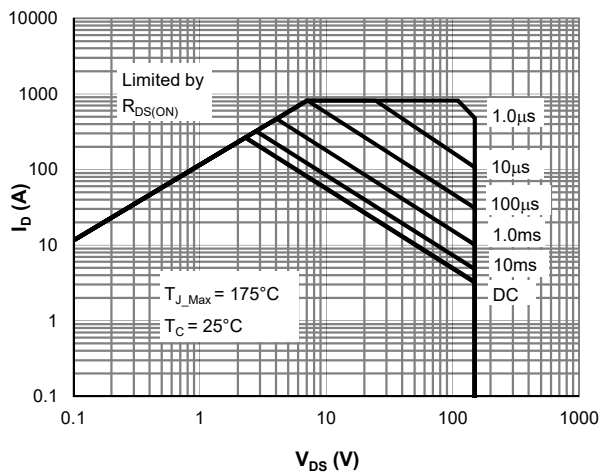


Figure 9: Maximum Safe Operating Area

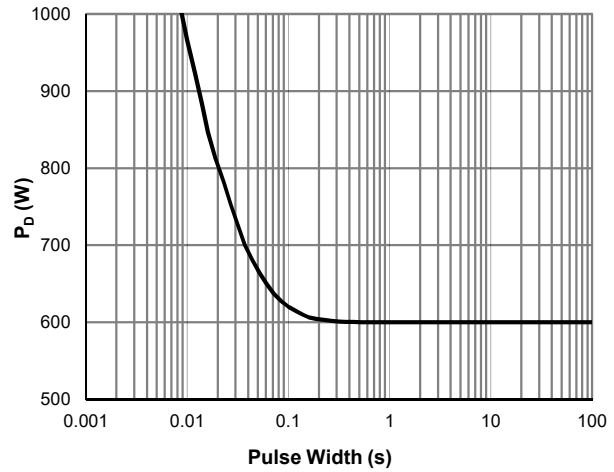


Figure 10: Single Pulse Power Rating, Junction-to-Case

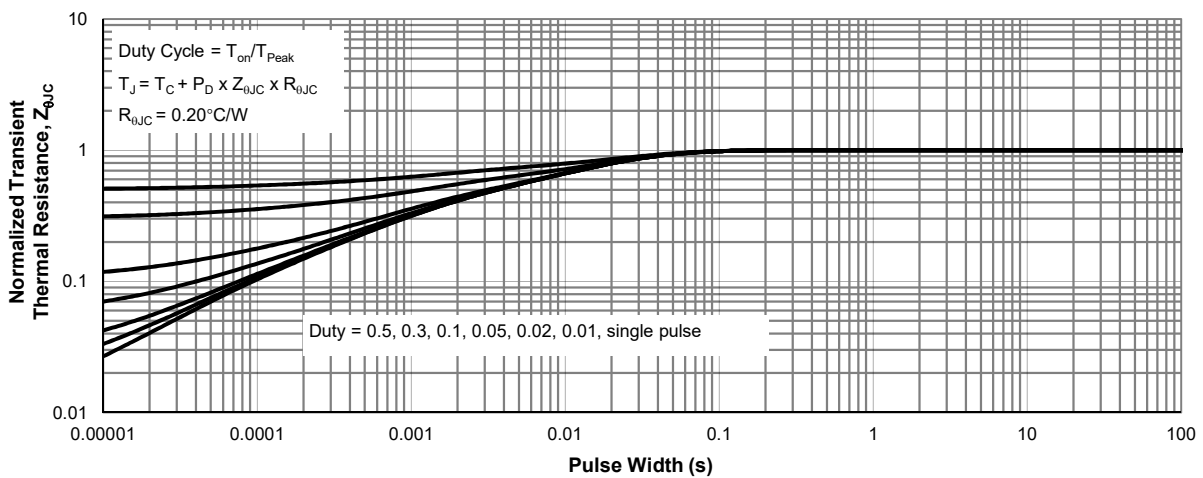
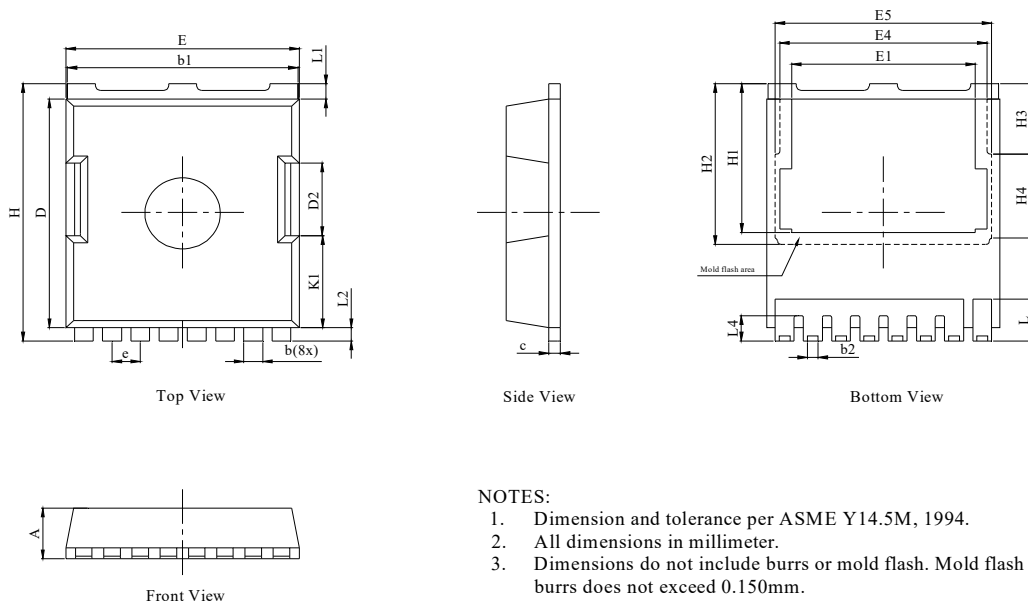


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data(TOLL-8L)

Package Outlines



NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter.
3. Dimensions do not include burrs or mold flash. Mold flash or burrs does not exceed 0.150mm.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.42	0.46	0.50
c	0.40	0.50	0.60
D	10.28	10.38	10.58
D2		3.30	
E	9.70	9.90	10.10
E1		7.80	
E4		8.80	
E5		9.20	
e	1.20 (BSC)		
H	11.48	11.68	11.88
H1	6.55	6.75	6.85
H2		7.30	
H3		3.20	
H4		3.80	
K1		4.18	
L	1.70	1.90	2.10
L1		0.70	
L2		0.60	
L4	1.00	1.15	1.30

Recommended Soldering Footprint

