

FH4804TL

N-Channel Trench Power MOSFET

◆ General Description

The FH4804TL is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

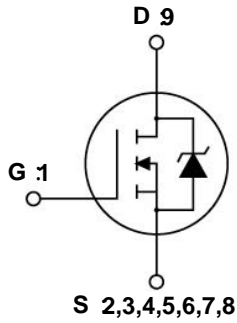
◆ Applications

- High power inverter system
- LCD TV appliances
- Load Switch

◆ Features

Parameter	Typ.	Unit
V_{DS}	40	V
I_D (@ $V_{GS} = 10V$)	280	A
$R_{DS(ON)}$ (@ $V_{GS} = 10V$) (Typ)	0.8	$m\Omega$
$R_{DS(ON)}$ (@ $V_{GS} = 4.5V$) (Typ)	1.25	$m\Omega$

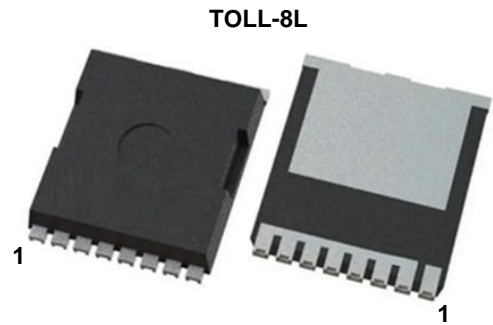
- Surface-mounted package
- Advanced trench cell design
- Super Trench



Schematic diagram



Marking and pin assignment



Top view

Bottom View

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	40	-	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	± 20	V
I_D^{***}	Drain Current (DC)	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	280	A
I_{DM}^{****}	Drain Current (Pulsed)	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	1000	A
P_{tot}	Drain power dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	300	W
T_{stg}	Storage Temperature		-55	150	$^\circ\text{C}$
T_J	Junction Temperature		-	150	$^\circ\text{C}$
I_S	Continuous-Source Current	$T_C = 25\text{ }^\circ\text{C}$	-	280	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=25V, L=0.5mH$	-	1156	mJ
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	39.4	$^\circ\text{C}/\text{W}$
$R_{\theta JC}^{**}$	Thermal Resistance- Junction to Case		-	0.47	

Notes :

* Surface Mounted on minimum footprint pad area.

** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

*** Maximum current rating is package limited.

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

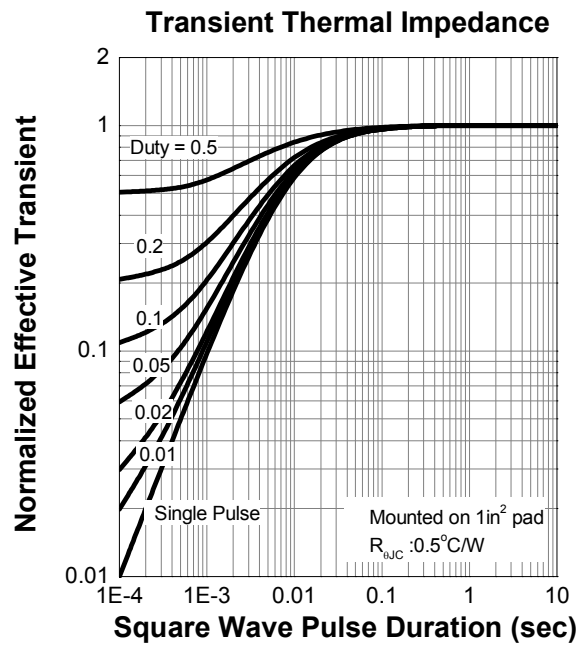
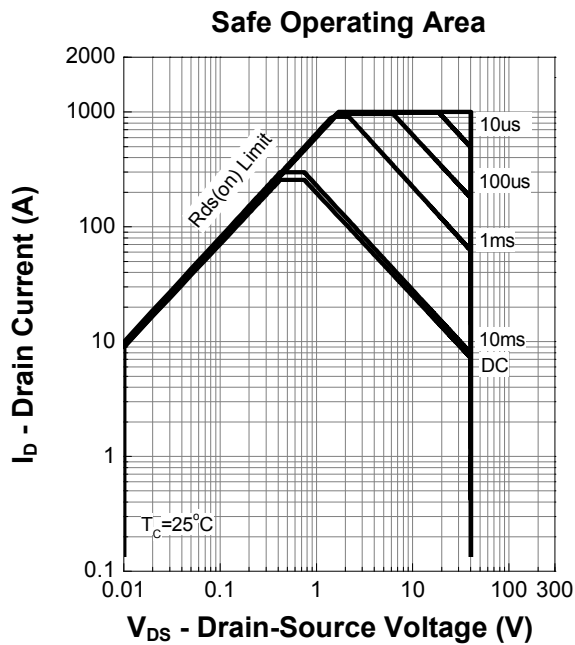
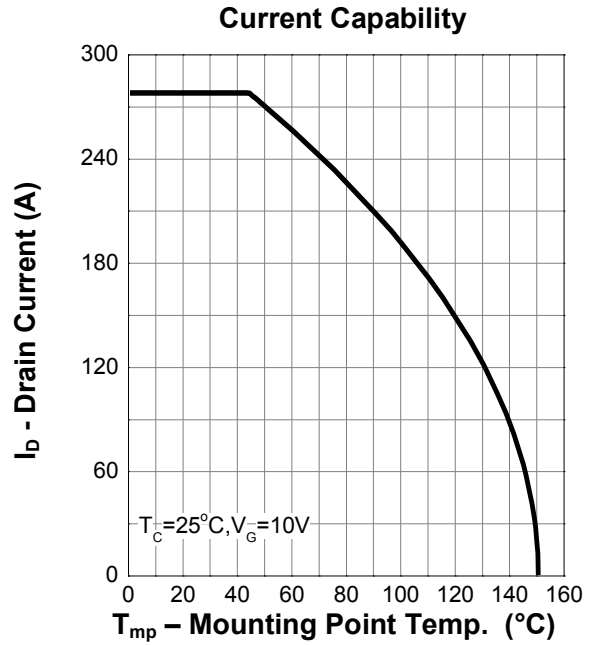
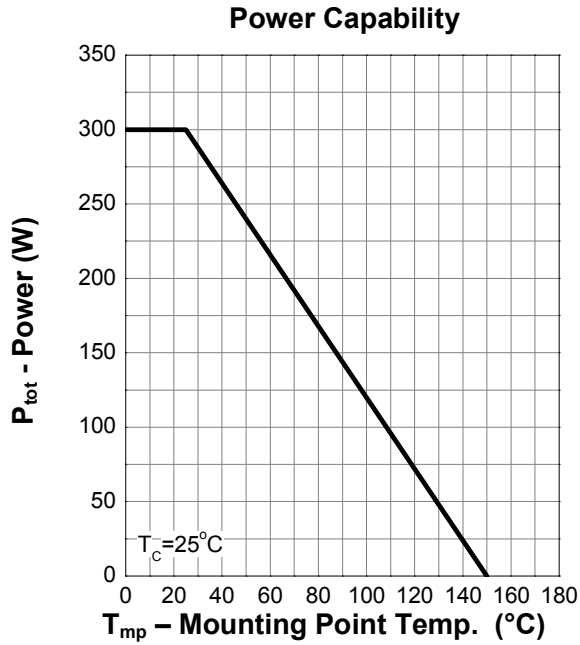
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	40	44	-	V	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_{DS} = 250\text{ }\mu\text{A}$	1.0	1.6	2.5	V	
I_{DSS}	Zero Gate Voltage Source Current	$V_{DS} = 32\text{ V}$ $V_{GS} = 0\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$	-	-	1	μA
			$T_J = 85\text{ }^\circ\text{C}$	-	-	40	μA
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$	-	-	± 100	nA	
$R_{DS(on)}^a$	Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$	-	0.8	1.0	m Ω	
		$V_{GS} = 4.5\text{ V}$, $I_D = 10\text{ A}$	-	1.25	1.8		
Diode Characteristics							
V_{SD}^a	Diode Forward Voltage	$I_{SD} = 40\text{ A}$, $V_{GS} = 0\text{ V}$	-	0.7	1.3	V	
t_{rr}	Reverse Recovery Time	$I_{SD} = 40\text{ A}$, $di_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	40	-	ns	
Q_{rr}	Reverse Recovery Charge		-	130	-	nC	
Dynamic Characteristics^b							
C_{iss}	Input Capacitance	$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$ Frequency = 1 MHz	-	5072	-	pF	
C_{oss}	Output Capacitance		-	2274	-		
C_{rss}	Reverse Transfer Capacitance		-	68	-		
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 20\text{ V}$, $V_{GEN} = 10\text{ V}$, $R_G = 1.6\text{ }\Omega$, $I_{DS} = 40\text{ A}$	-	14	-	ns	
t_r	Turn-on Rise Time		-	7.0	-		
$t_d(off)$	Turn-off Delay Time		-	48	-		
t_f	Turn-off Fall Time		-	10	-		
Gate Charge Characteristics^b							
Q_g	Total Gate Charge	$V_{DS} = 20\text{ V}$, $V_{GS} = 10\text{ V}$, $I_{DS} = 40\text{ A}$	-	88	-	nC	
Q_{gs}	Gate-Source Charge		-	28	-		
Q_{gd}	Gate-Drain Charge		-	17	-		

Notes :

a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

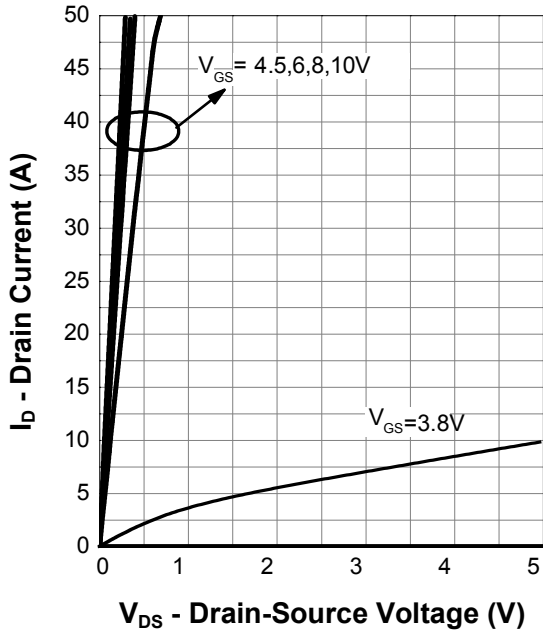
b : Guaranteed by design, not subject to production testing

Typical Characteristics

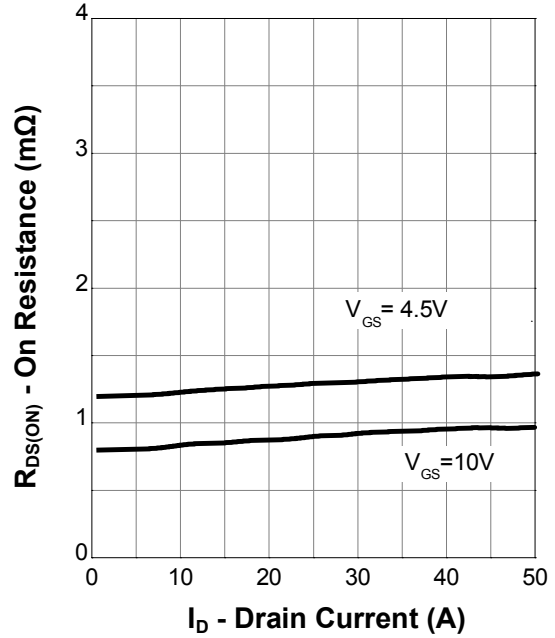


Typical Characteristics (Cont.)

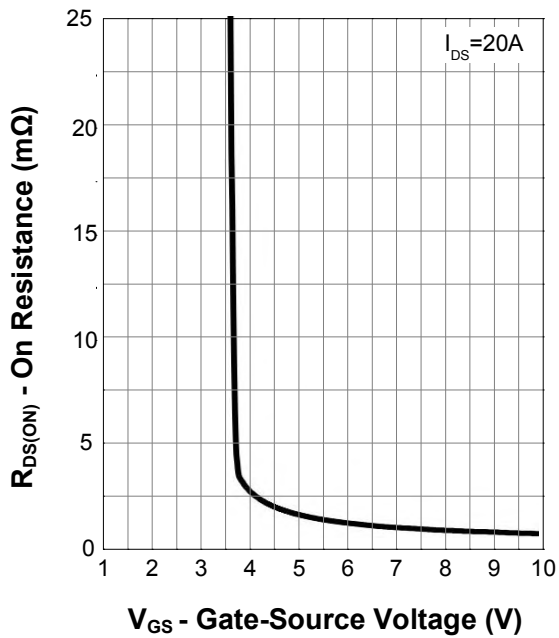
Output Characteristics



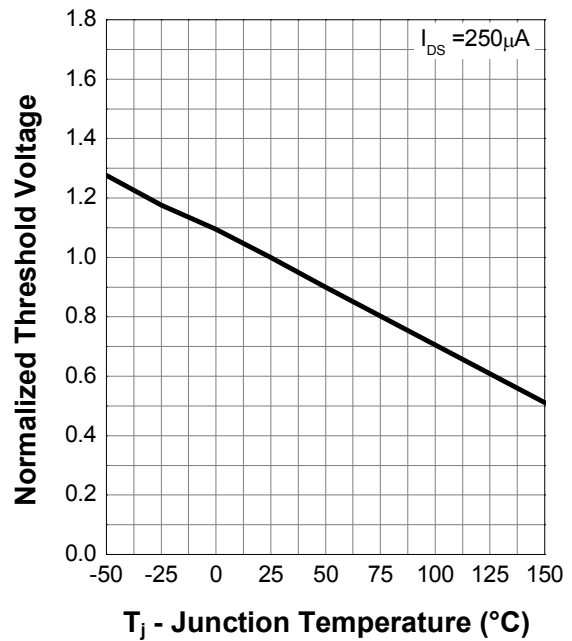
On Resistance



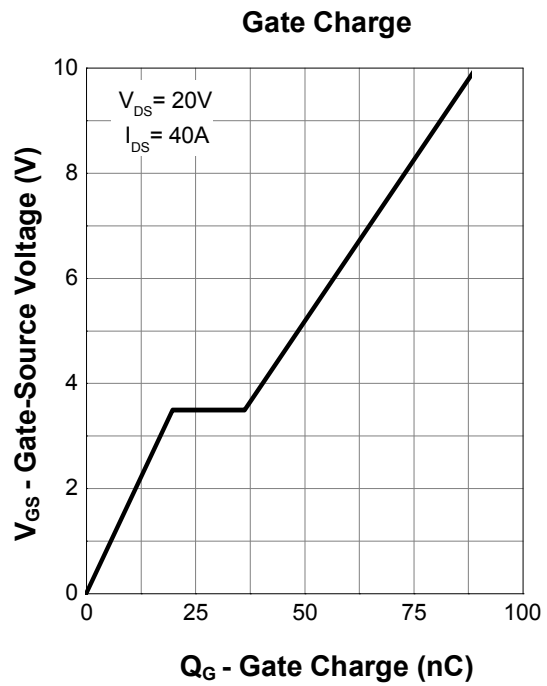
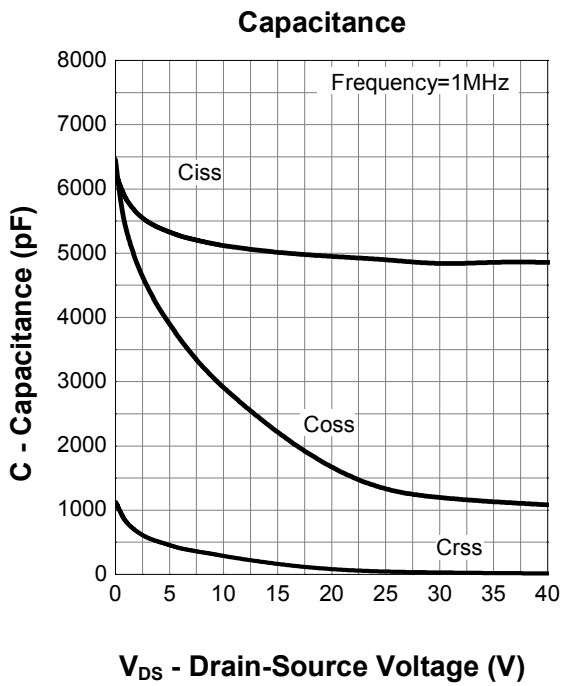
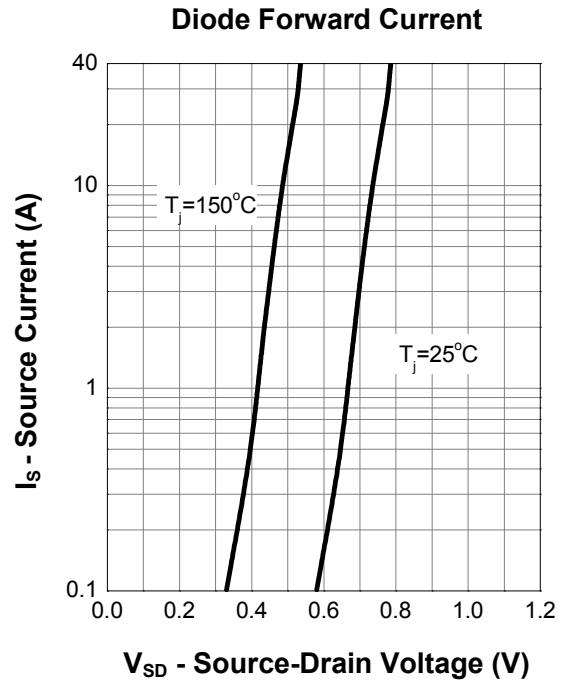
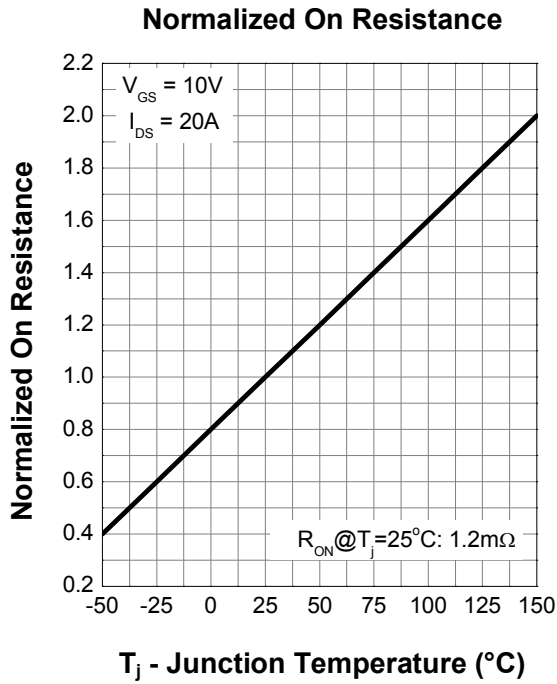
Transfer Characteristics



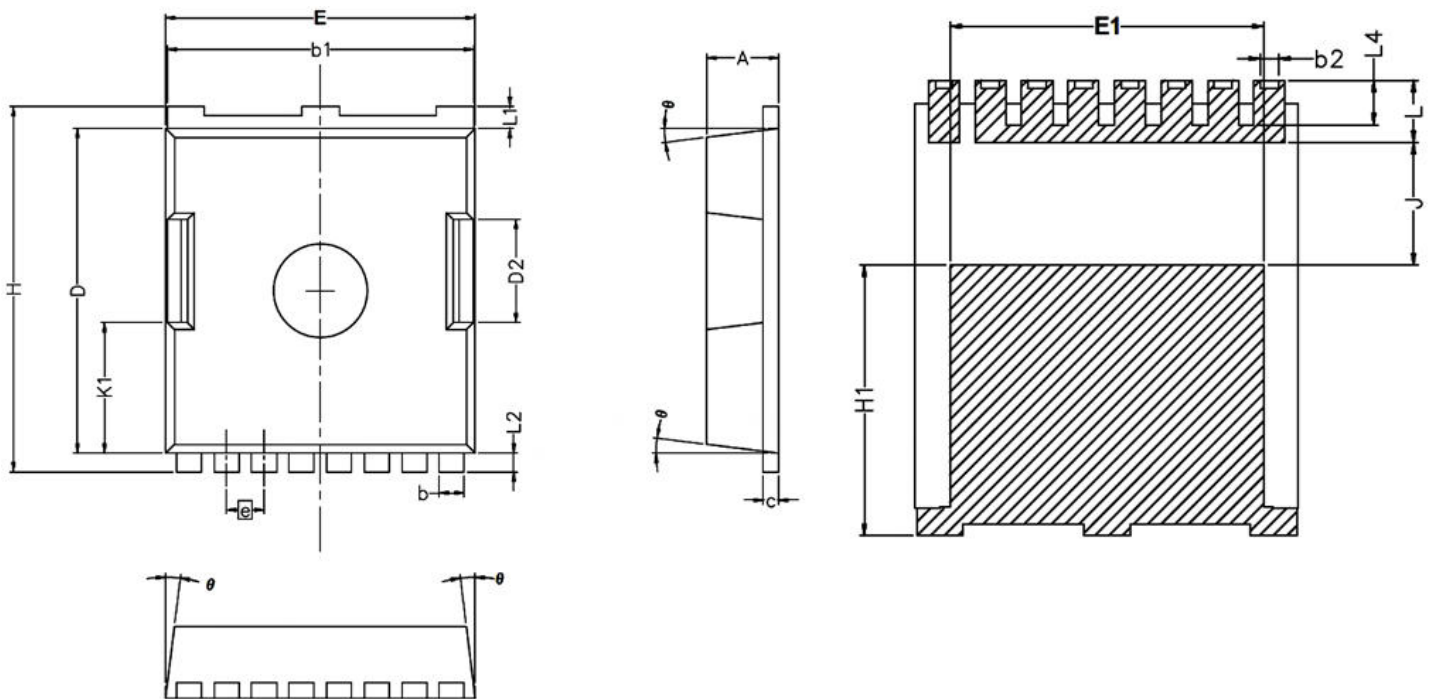
Normalized Threshold Voltage



Typical Characteristics (Cont.)



Package Information : TOLL-8L



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°