N-Channel Enhancement Mode Power MOSFET

Description

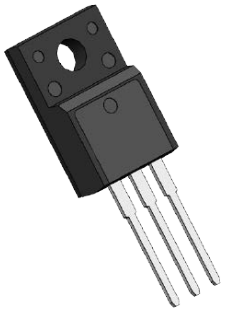
The HLDF10N80 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

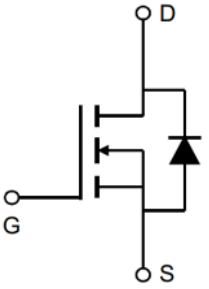
- ☐ Power switchingapplication
- ☐ Hard switched and high frequencycircuits
- ☐ Uninterruptible powersupply

Features

- ☐ VDS =800V,ID =10A
- ☐ RDS(ON)：1.1Ω@VGS=10V
- ☐ Low gatecharge.
- ☐ Green deviceavailable.
- ☐ AdvancedhighcelldenitytrenchtechnologyforultraRDS(ON).
- ☐ Excellentpackageforgoodheatdissipation.



Marking and pin assignment



N-Channel MOSFET

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	800	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current-	10	A
	Continuous Drain Current-T C=100℃	6.32	
E_{AS}	Single Pulse Avalanche Energy[1]	920	mJ
P_D	Power Dissipation	113	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\Theta JC}$	Thermal Resistance,Junction to Case	0.52	℃/W
$R_{\Theta JA}$	Thermal Resistance,Junction to Ambient	40	

*Drain current limited by maximum junction temperature.

Package Marking and Ordering Information

Part NO.	Marking	Package
HLDF10N80	HLDF10N80	TO-220F

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	800	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=800V	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V, V_{DS}=0V	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	3	---	5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=5A	---	---	1.1	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	2150	2800	pF
C_{oss}	Output Capacitance		---	180	230	
C_{rss}	Reverse Transfer Capacitance		---	15	20	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=400V, I_D=10A R_G=25Ω (Note 3,4)	---	50	110	ns
t_r	Rise Time		---	130	270	ns
$t_{d(off)}$	Turn-Off Delay Time		---	90	190	ns
t_f	Fall Time		---	80	170	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=560 I_D=9A (Note 3,4)	---	45	58	nC
Q_{gs}	Gate-Source Charge		---	13.5	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	17	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	Ld=10A	---	---	1.4	V
t_{rr}	Reverse Recovery Time	I_S=10A,V_{GS}=0V Di_F/dt=100A/μs	---	730	---	ns
Q_{rr}	Reverse Recovery Charge		---	10.9	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10s ec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤2%.
4. Guaranteed by design, not subject to production

Typical Characteristics T_J=25℃ unless otherwise noted

Figure 1. On-Region Characteristics

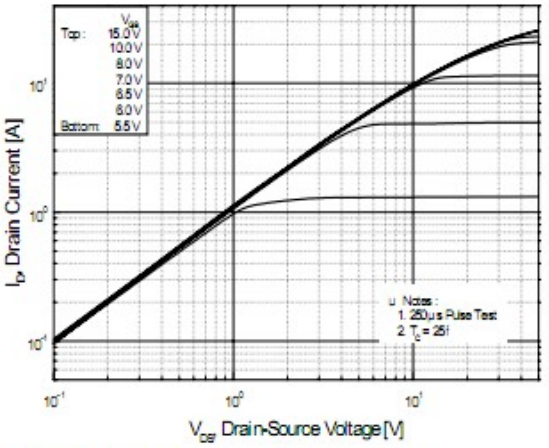


Figure 2. Transfer Characteristics

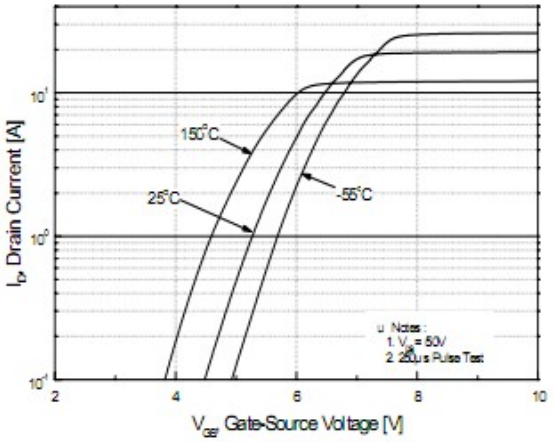


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

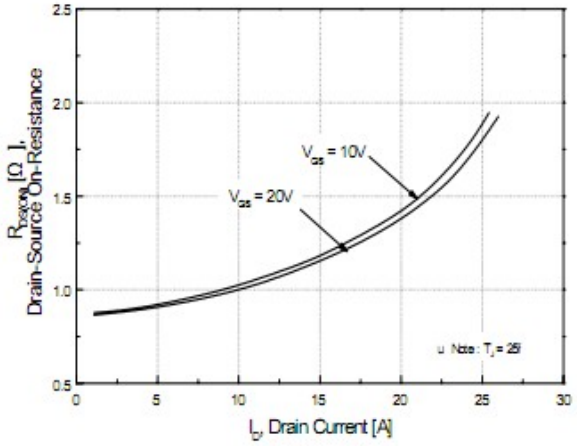


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperatue

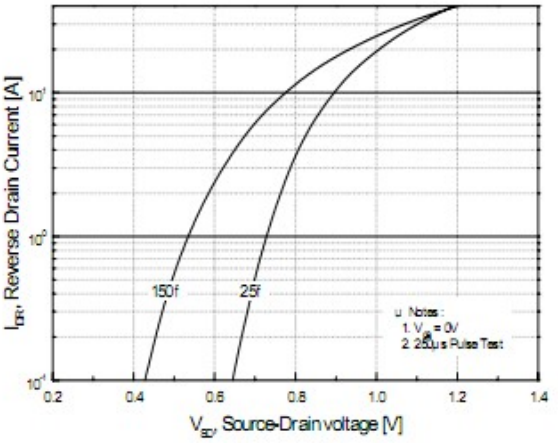


Figure 5. Capacitance Characteristics

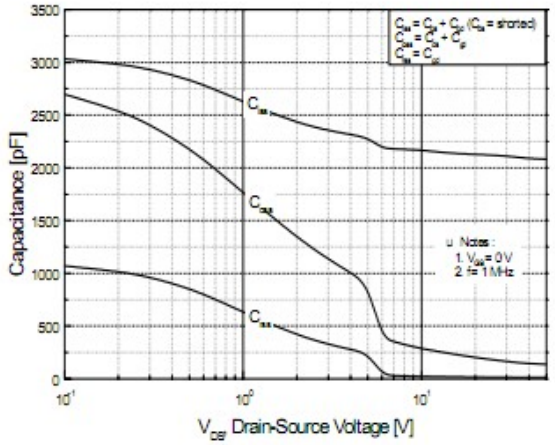


Figure 6. Gate Charge Characteristics

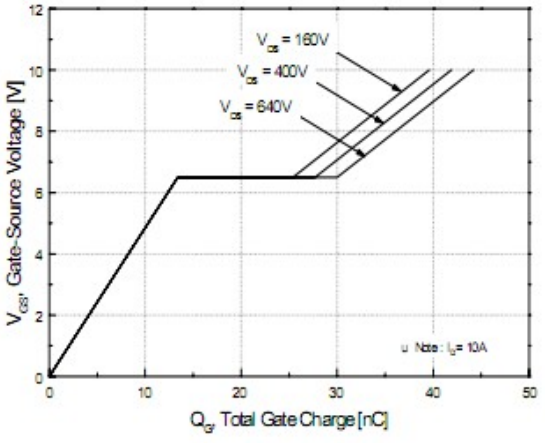


Figure 7. Breakdown Voltage Variation vs. Temperature

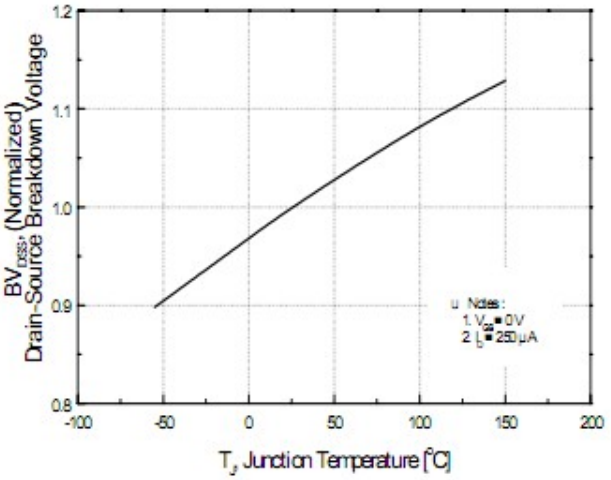


Figure 8. On-Resistance Variation vs. Temperature

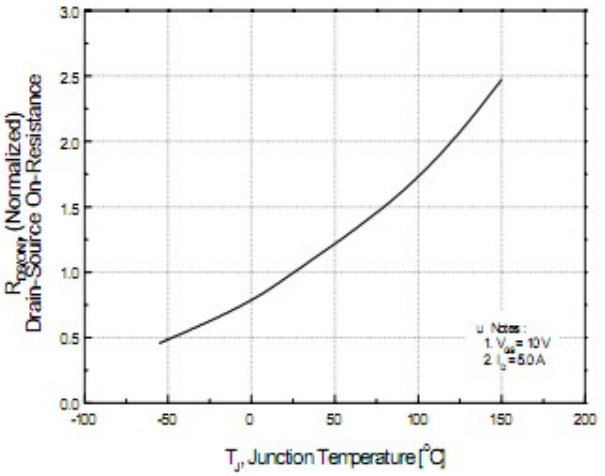


Figure 9. Maximum Safe Operating Area

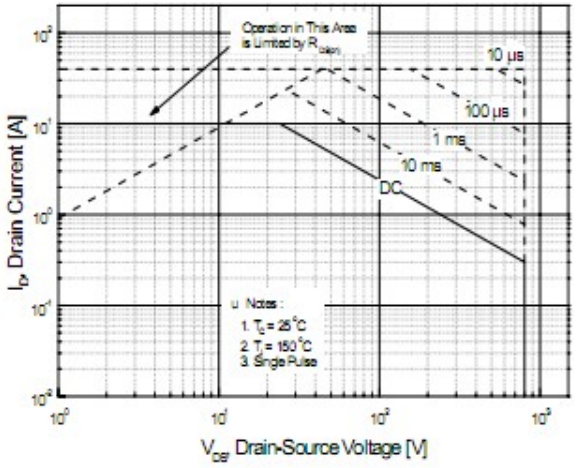


Figure 10. Maximum Drain Current vs. Case Temperature

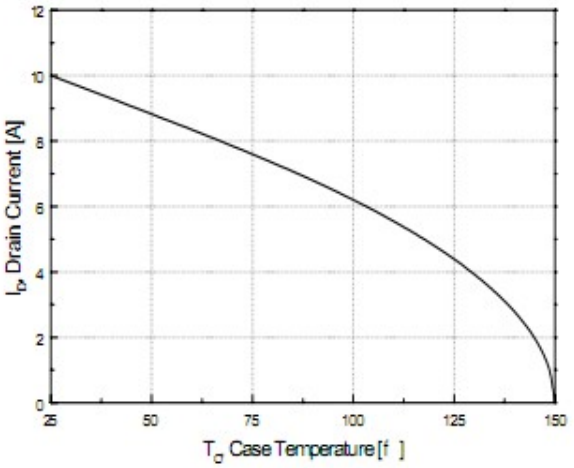
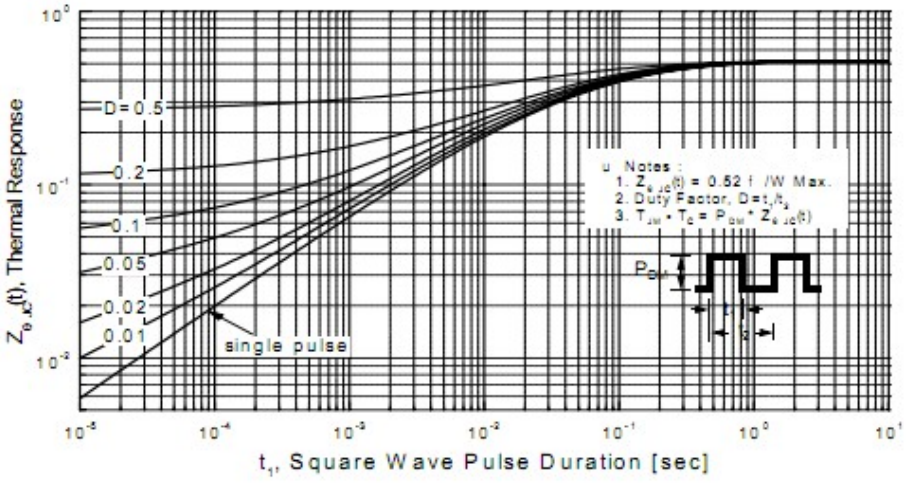


Figure 11. Transient Thermal Response Curve



TO-220F Package Information

