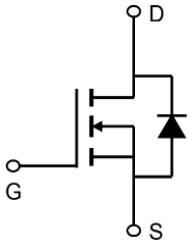
WLP066R150

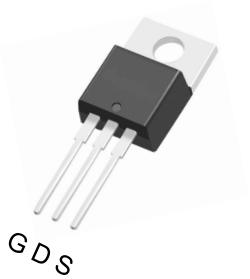
150V N-Channel Enhancement Mode MOSFET

Description

These N-Channel enhancement mode power field effect transistors are using shielded gate trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance,provide superior switching performance, and with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.



TO-220



General Features

V_{DS} = 150V I_D =190A

$R_{DS(ON)}$ < 7.5mΩ @ V_{GS}=10V **(Type：6.6mΩ)**

Application

DC/DC Converter

LED Backlighting

Power Management Switches

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	190	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	140	A
IDM	Pulsed Drain Current	550	A
EAS	Single Pulse Avalanche Energy	506	mJ
IAS	Avalanche Current	53.4	A
P_D@T_C=25℃	Total Power Dissipation[4]	210	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-Ambient	0.84	℃/W
RθJC	Thermal Resistance Junction-Case	62	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VDSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	150	-	-	V
IGSS	Gate-body Leakage current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T_J=25°C	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
IDSS	Zero Gate Voltage Drain Current T_J=100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	2.9	4.0	V
RDS(on)	Drain-Source on-Resistance[2]	V_{GS} = 10V, I_D = 20A	-	6.6	7.5	mΩ
Ciss	Input Capacitance	V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	5240	-	pF
Coss	Output Capacitance		-	412	-	
Crss	Reverse Transfer Capacitance		-	10	-	
R_g	Gate Resistance	V_{GS} = 0V, V_{DS} = 0V, f =1MHz	-	1.7	-	Ω
Q_g	Total Gate Charge	V_{GS} = 10V, V_{DS} = 50V, I_D=20A	-	18	-	nC
Qgs	Gate-Source Charge		-	10	-	
Qgd	Gate-Drain Charge		-	72	-	
td(on)	Turn-on Delay Time	V_{GS} =10V, V_{DS} =50V, R_G = 3Ω, I_D= 20A	-	22	-	ns
t_r	Rise Time		-	115	-	
td(off)	Turn-off Delay Time		-	44	-	
t_f	Fall Time		-	105	-	
VSD	Diode Forward Voltage[2]	I_F = 20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	-	-	190	A
trr	Body Diode Reverse Recovery Time	I_F = 20A, dI/dt=100A/μs	-	45	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	12	-	nC

Notes:

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 ≤ 300us , duty cycle ≤ 2%

3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=45A

4、The power dissipation is limited by 150°C junction temperature

5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

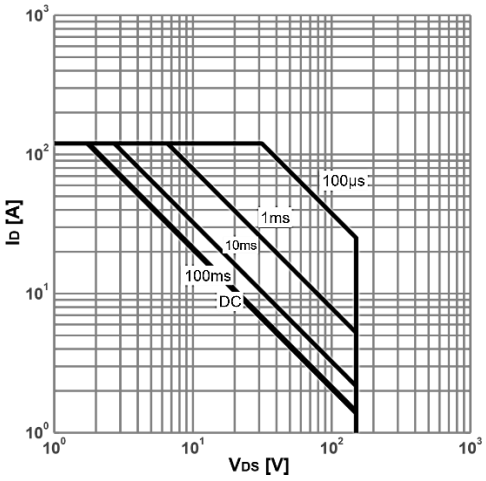


Figure 1. Power dissipation

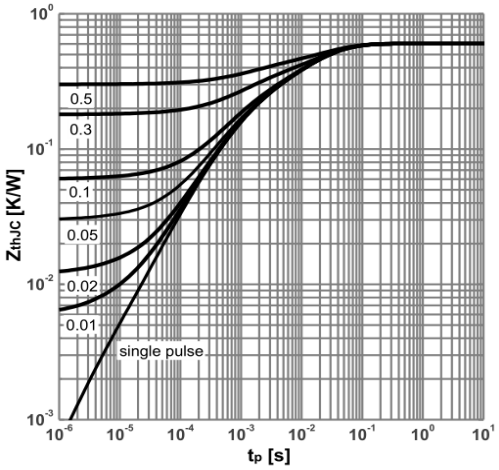


Figure 2. Max. transient thermal impedance

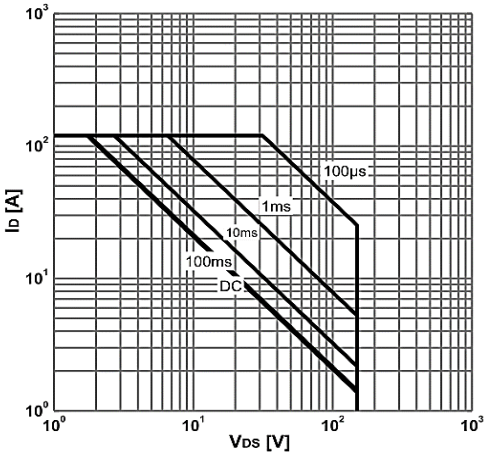


Figure 3. Safe operating area

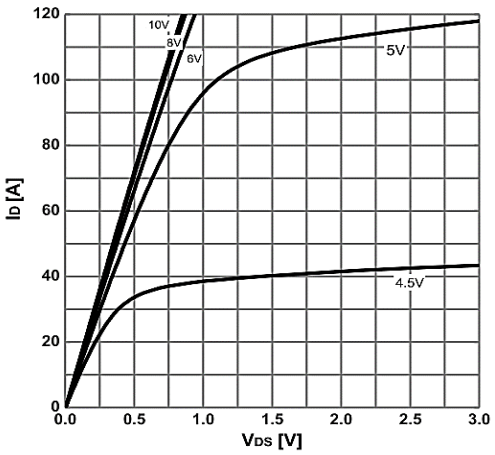


Figure 4. Typ. output characteristics

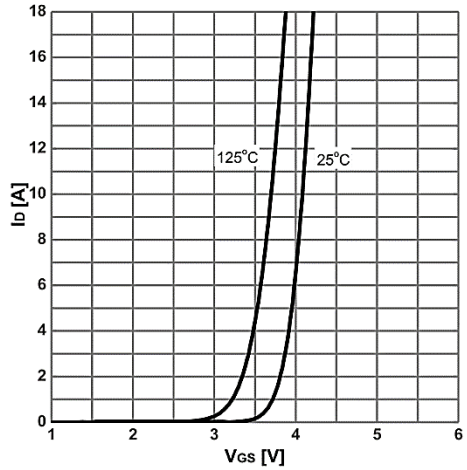


Figure 5. Typ. transfer characteristics

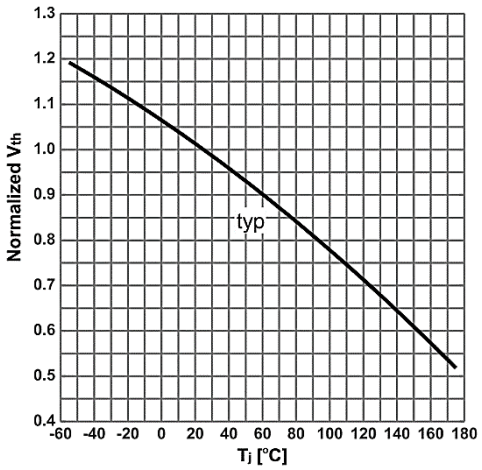


Figure 6. Gate threshold voltage vs. Junction Temperature

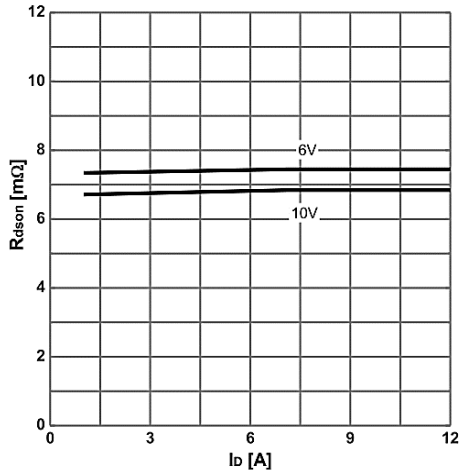


Figure 7. On-state resistance vs. Drain current

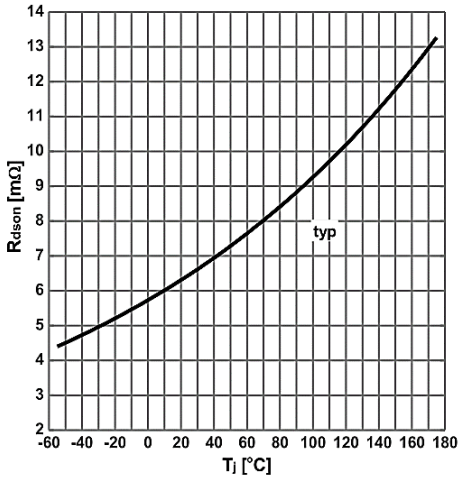


Figure 8. On-state resistance vs. Junction temperature

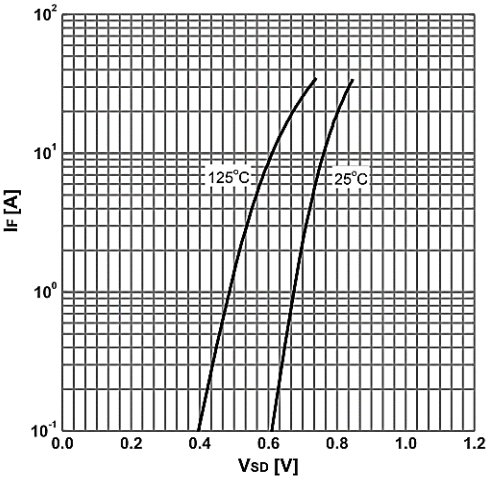


Figure 9. Forward characteristics of reverse diode

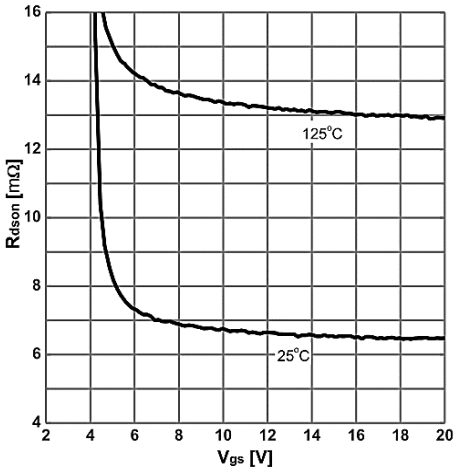


Figure10. On-state resistance vs. Vgs characteristics

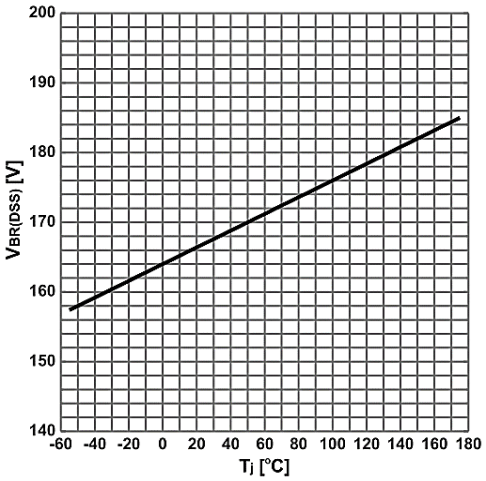


Figure 10：Breakdown Voltage Variation vs. Temperature

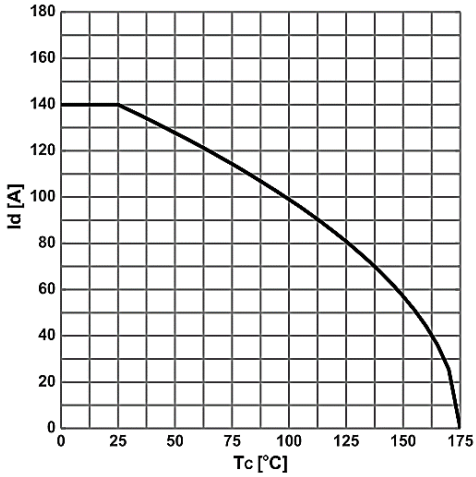
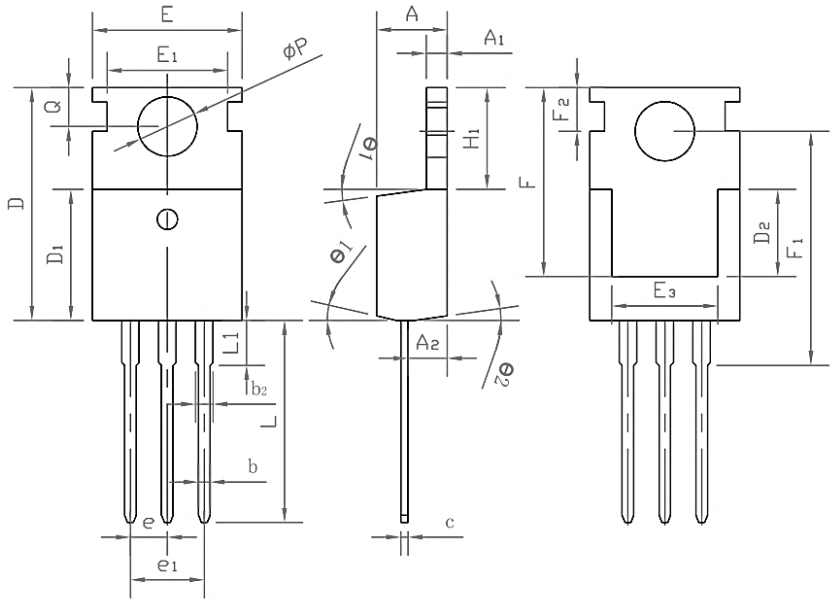


Figure 11：Maximum Drain Current

Package Mechanical Data-TO-220-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
D	0.40	0.50	0.65
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	-	8.70	-
E2	9.63	10.00	10.35
E3	7.00	8.00	8.40
e		0.37	
e1		0.10	
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	-	3.10	3.40
Φp	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°
F	13.30	13.50	13.70
F1	15.50	15.90	16.30
F2	2.80	3.00	3.20

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