

HRLF72N06

65V N-Channel Trench MOSFET

Features

- High Speed Power Switching, Logic Level
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead free, Halogen Free

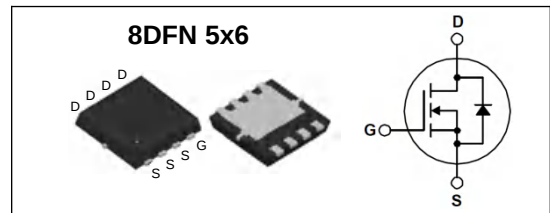
Application

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- DC/DC in Telecoms and Industrial

Key Parameters

Parameter	Value	Unit
BV_{DSS}	65	V
I_D	73	A
$R_{DS(on), \max @10V}$	7.2	m Ω
$R_{DS(on), \max @4.5V}$	12.5	m Ω

Package & Internal Circuit



Absolute Maximum Ratings $T_J=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter		Value	Units
V_{DSS}	Drain-Source Voltage		65	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	$T_C = 25^{\circ}\text{C}$	73	A
		$T_C = 100^{\circ}\text{C}$	46	A
I_{DM}	Pulsed Drain Current		292	A
E_{AS}	Single Pulsed Avalanche Energy		12.5	mJ
P_D	Power Dissipation	$T_C = 25^{\circ}\text{C}$	56	W
		$T_A = 25^{\circ}\text{C}$	2.5	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^{\circ}\text{C}$

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	2.2	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Junction-to-Ambient (steady state)	--	50	$^{\circ}\text{C/W}$

Electrical Characteristics $T_J=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V _{GS}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	1.0	--	2.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 20 A	--	6.0	7.2	mΩ
		V _{GS} = 4.5 V, I _D = 15 A	--	9.6	12.5	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 10 V, I _D = 3 A	--	10	--	S
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	65	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60 V, V _{GS} = 0 V	--	--	1	μA
		V _{DS} = 48 V, T _J = 85°C	--	--	10	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V	--	--	±1	μA
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 30 V, V _{GS} = 0 V, f = 1.0 MHz	--	1575	--	pF
C _{oss}	Output Capacitance		--	785	--	pF
C _{rss}	Reverse Transfer Capacitance		--	30	--	pF
R _g	Gate Resistance	V _{GS} = 0 V, V _{DS} = 0 V, f = 1MHz	--	1.25	--	Ω
Switching Characteristics						
t _{d(on)}	Turn-On Time	V _{DS} = 30 V, I _D = 10 A, R _G = 10 Ω	--	15	--	ns
t _r	Turn-On Rise Time		--	21	--	ns
t _{d(off)}	Turn-Off Delay Time		--	136	--	ns
t _f	Turn-Off Fall Time		--	27	--	ns
Q _g	Total Gate Charge	V _{DS} = 30 V, I _D = 10 A, V _{GS} = 10 V	--	38.5	--	nC
Q _{gs}	Gate-Source Charge		--	7.5	--	nC
Q _{gd}	Gate-Drain Charge		--	4.5	--	nC
Source-Drain Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	I _S = 1 A, V _{GS} = 0 V	--	0.9	1.2	V
trr	Reverse Recovery Time	I _S = 10 A, V _{GS} = 10 V di _F /dt = 100 A/μs	--	48.4	--	ns
Qrr	Reverse Recovery Charge		--	54.2	--	nC

Notes :

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=5\text{A}, V_{DD}=30\text{V}, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

Typical Characteristics

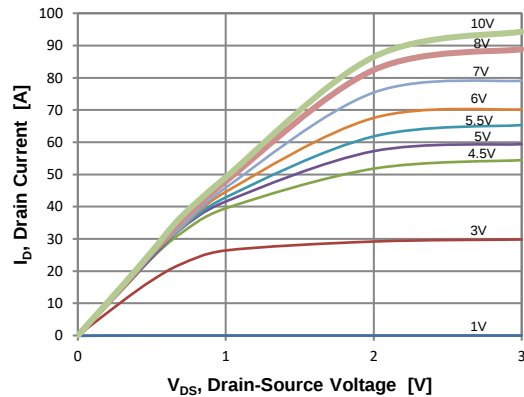


Figure 1. On Region Characteristics

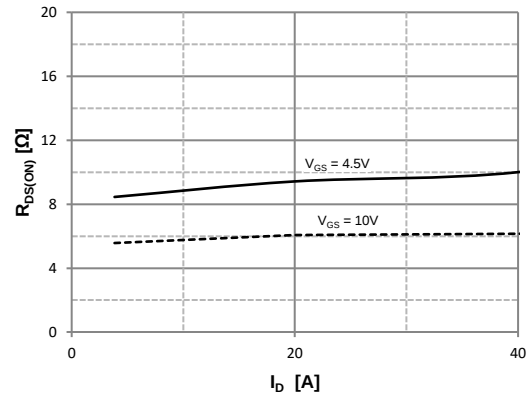


Figure 2. On Resistance Variation vs Drain Current and Gate Voltage

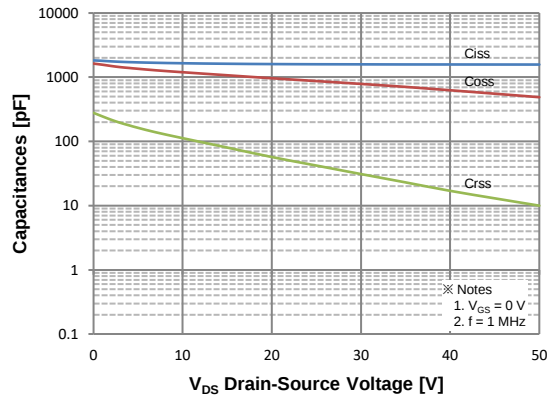


Figure 3. Capacitance Characteristics

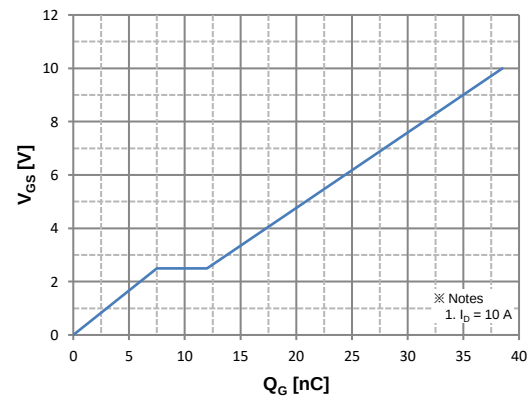


Figure 4. Gate Charge Characteristics

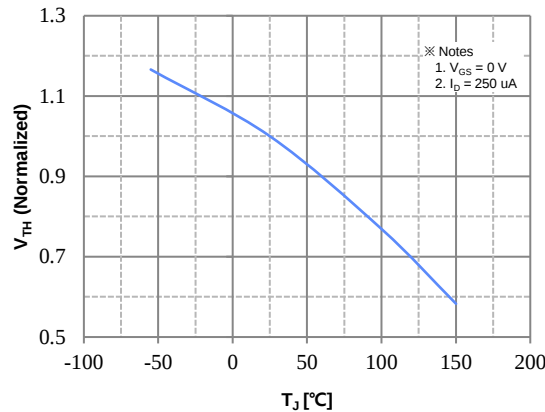


Figure 4. Gate Threshold Voltage vs Temperature

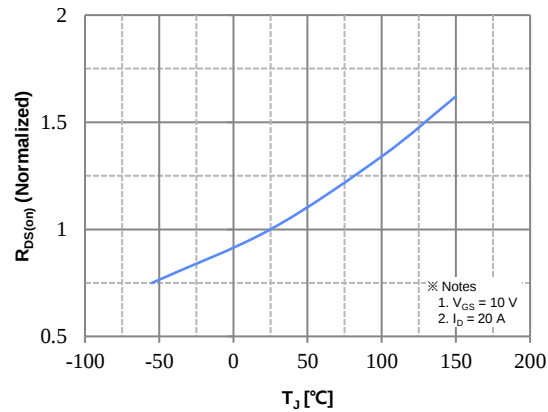


Figure 6. On-Resistance Variation vs Temperature

Typical Characteristics (continued)

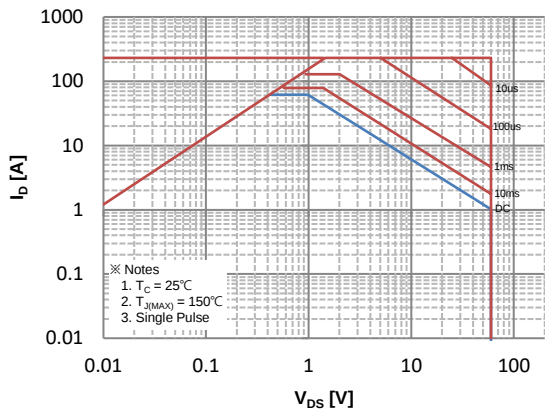


Figure 7. Maximum Safe Operating Area

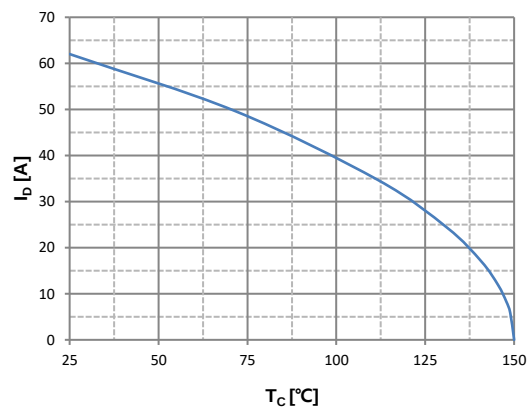


Figure 8. Maximum Drain Current vs Case Temperature

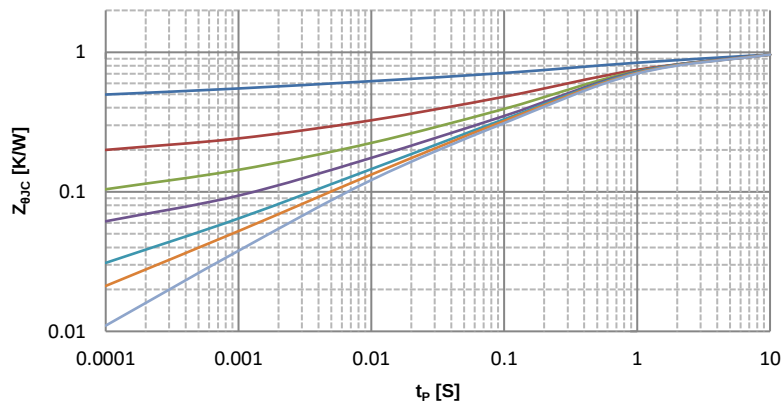


Figure 9. Transient Thermal Response Curve

Fig 12. Gate Charge Test Circuit & Waveform

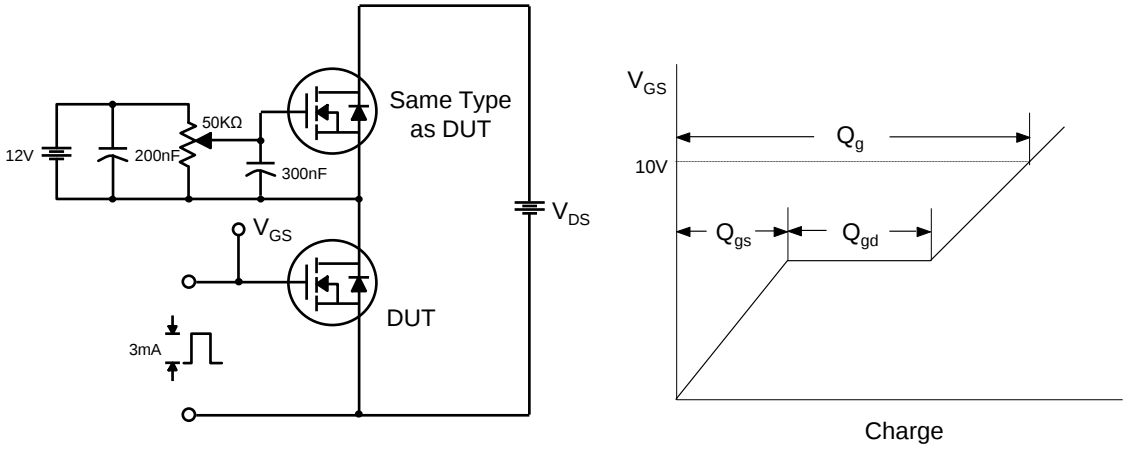


Fig 13. Resistive Switching Test Circuit & Waveforms

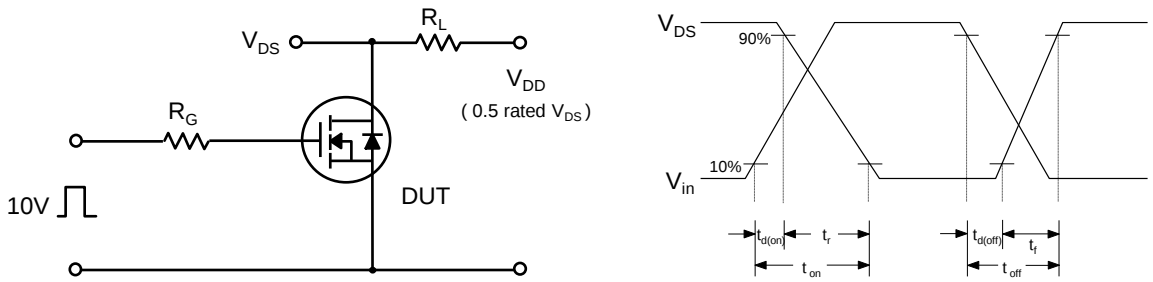


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

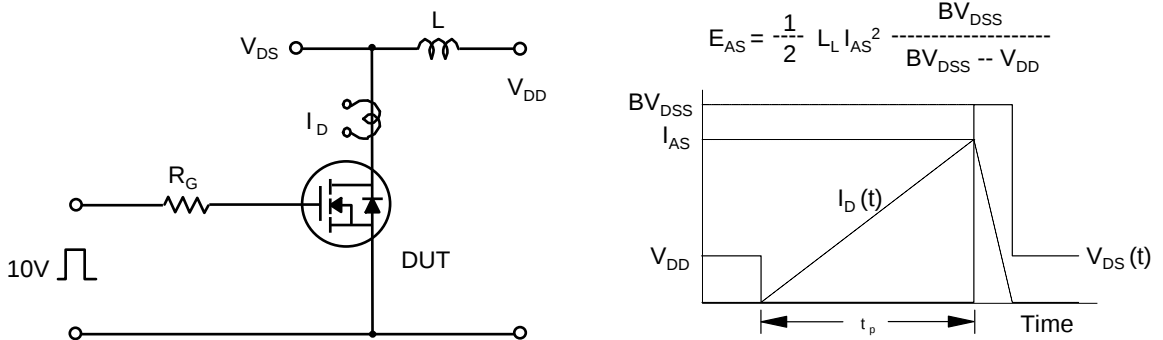
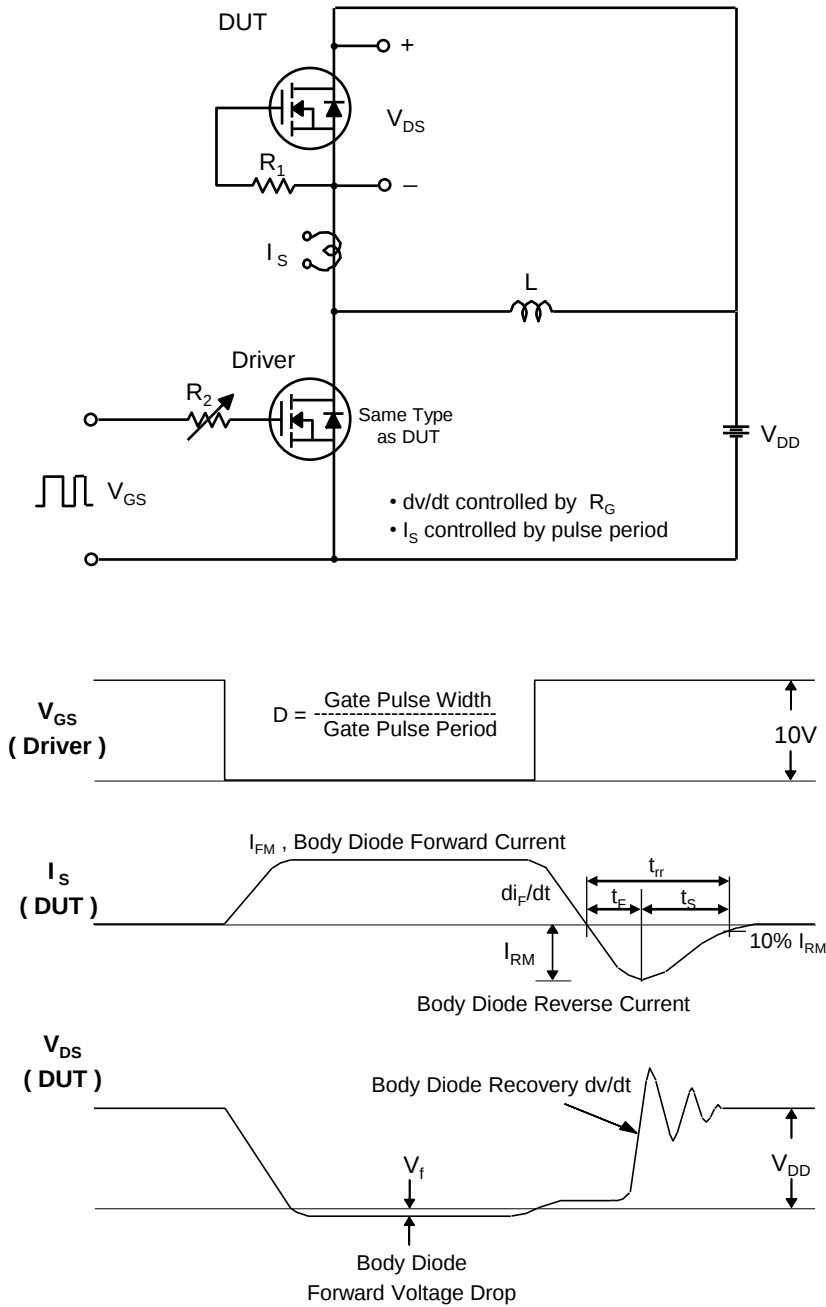
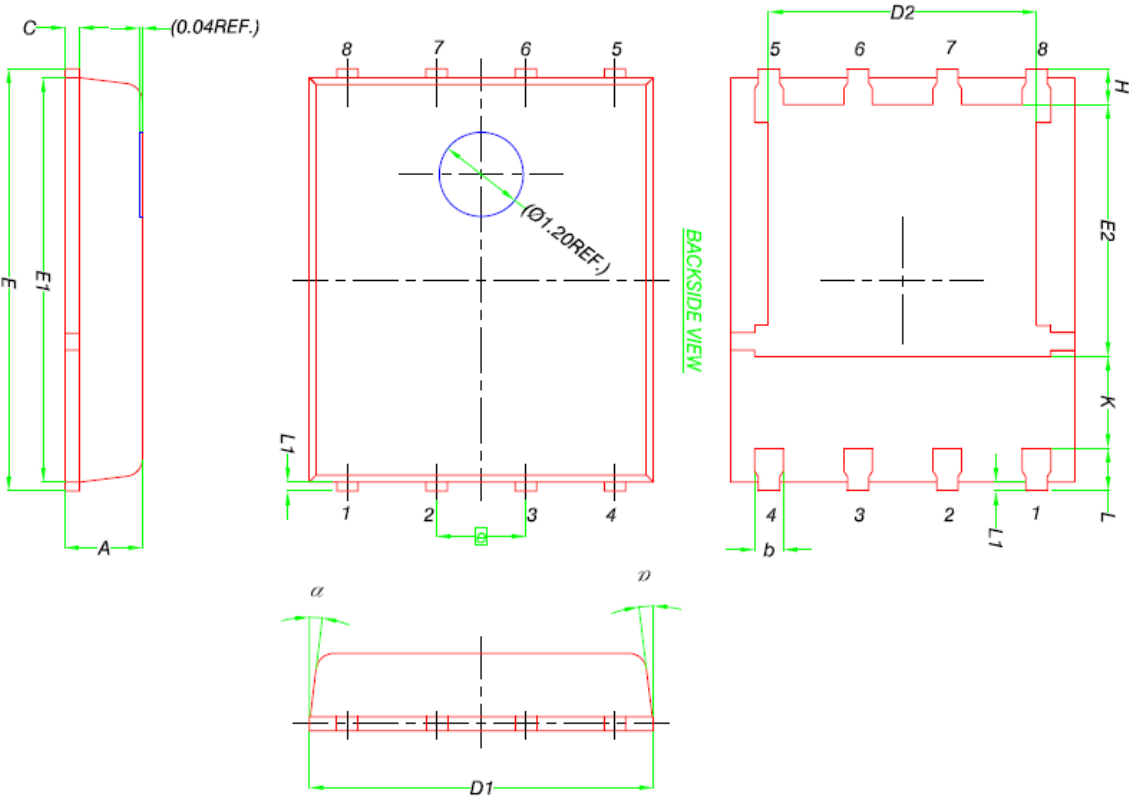


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Dimension

8DFN 5x6



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°

