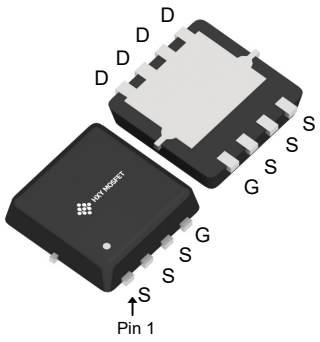
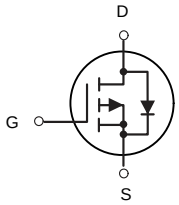
Description

The IRFHM9331PBF uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge .This device is well suited for high current load applications.



DFN3X3-8L



P-Channel MOSFET

Features

V_{DS} =-30V,I_D=-35A

$R_{DS(ON)}$ <15mΩ @V_{GS}=-10V

$R_{DS(ON)}$ <26mΩ @ V_{GS}=-4.5V

Application

High side switch for full bridge converter

DC/DC converter for LCD display

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRFHM9331PBF	DFN3X3-8L	HXY MOSFET	5000

Absolute Maximum Ratings@T_J=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 10V	-35	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 10V	-25	A
IDM	Pulsed Drain Current[1]	-120	A
P_D@T_A=25℃	Total Power Dissipation	15	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
Rthj-c	Maximum Thermal Resistance, Junction-case	6	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	66	℃/W

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-1.0	-1.6	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance Note3	V_{GS}= -10V, I_D= -10A	-	12	15	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	18	26	
C_{iss}	Input Capacitance	V_{DS}= -15V, V_{GS}=0V, f=1.0MHz	-	1330	-	pF
C_{oss}	Output Capacitance		-	183	-	pF
C_{rss}	Reverse Transfer Capacitance		-	156	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D= -5A, V_{GS}= -10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	1.0	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	1.8	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}= -15V, I_D= -10A, V_{GS}=-10V, R_{GEN}=2.5Ω	-	9	-	ns
t_r	Turn-on Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	48	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-35	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-90	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -15A	-	-0.8	-1.2	V
trr	Reverse Recovery Time	T_J=25℃, V_{DD}= -24V,I_F=-2.8A, dI/dt=-100A/μs	-	64	-	ns
Qrr	Reverse Recovery Charge		-	25	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25℃, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=-12.7A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure1: Output Characteristics

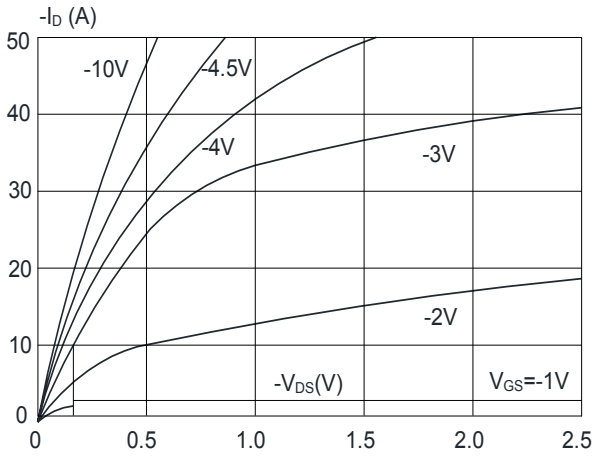


Figure 2: Typical Transfer Characteristics

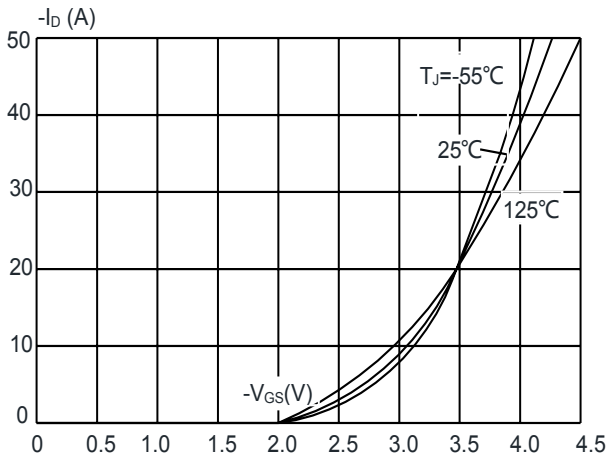


Figure 3: On-resistance vs. Drain Current

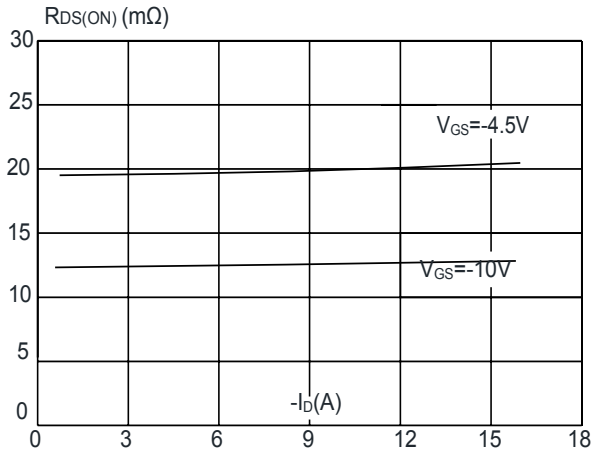


Figure 4: Body Diode Characteristics

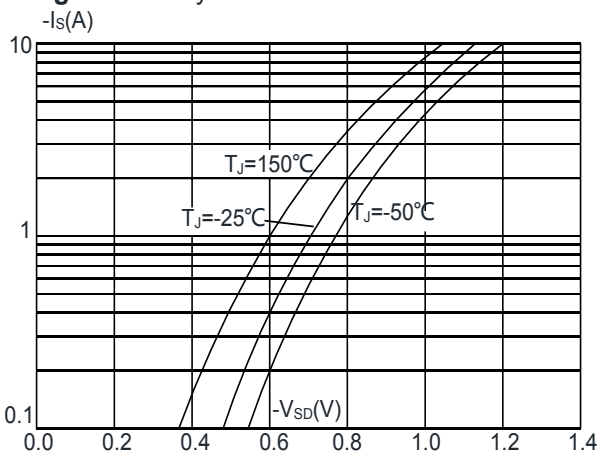


Figure 5: Gate Charge Characteristics

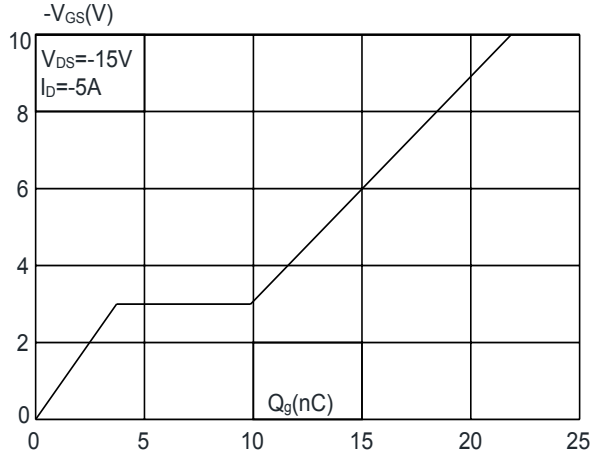


Figure 6: Capacitance Characteristics

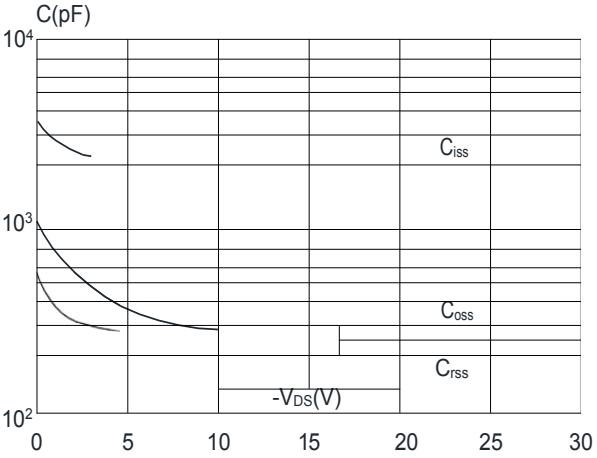


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

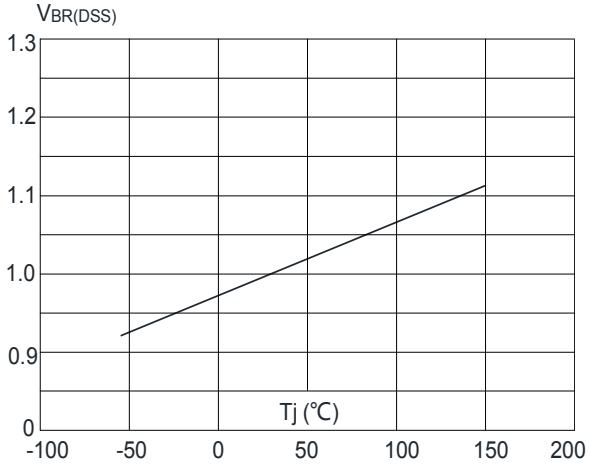


Figure 8: Normalized on Resistance vs. Junction Temperature

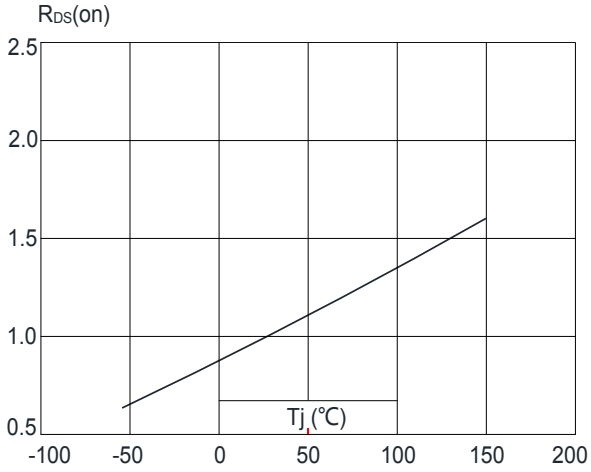


Figure 9: Maximum Safe Operating Area

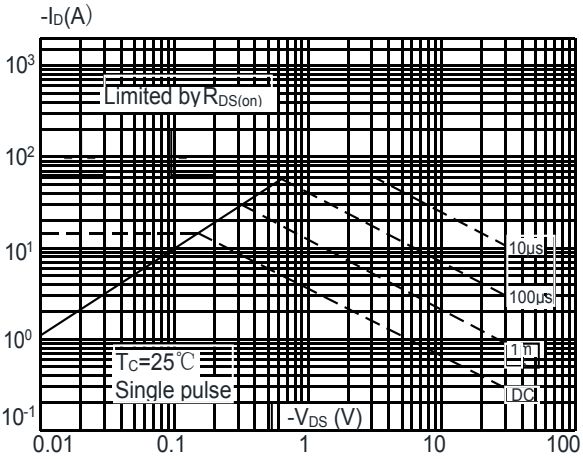


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

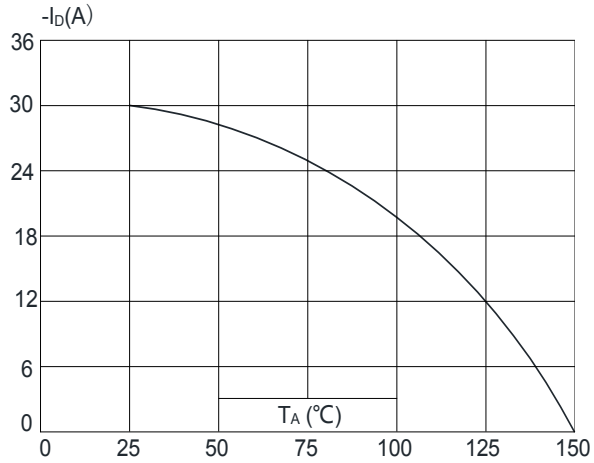
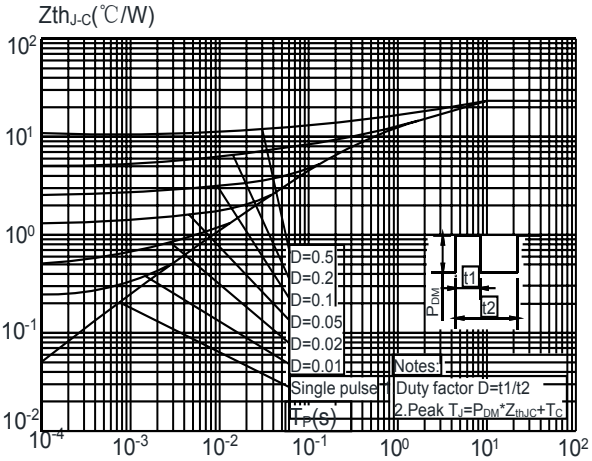
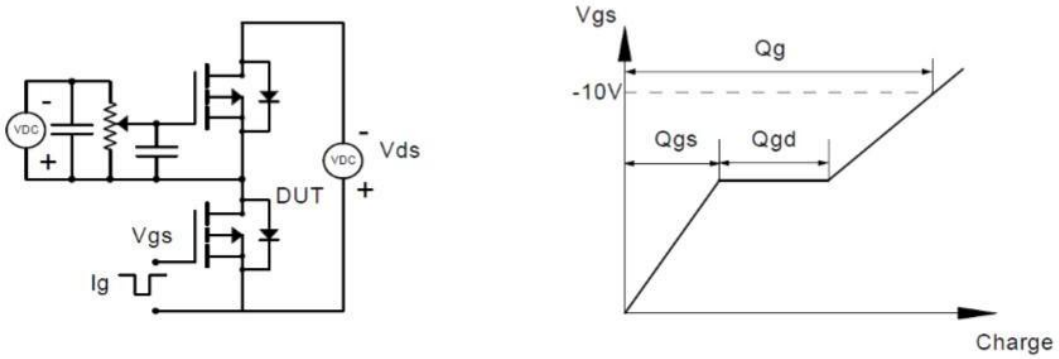


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

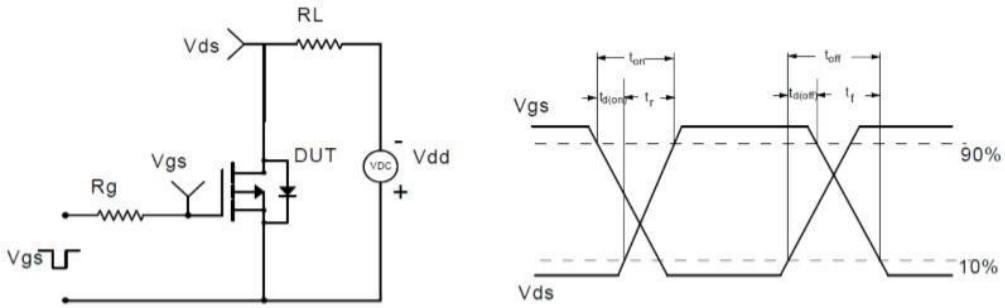


Test Circuit

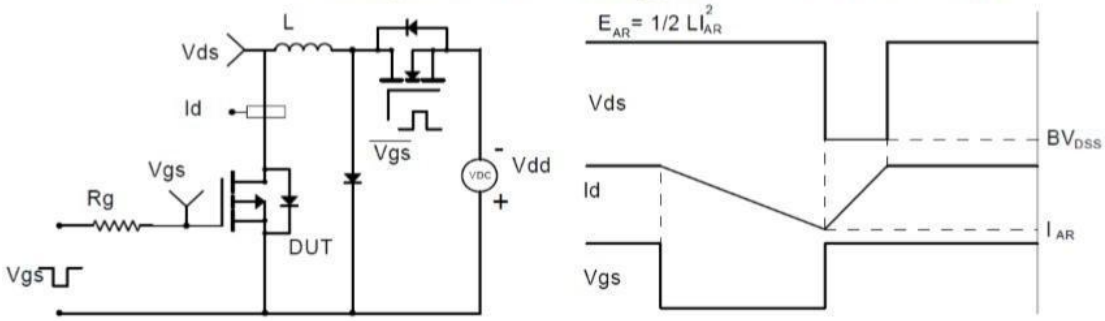
Gate Charge Test Circuit & Waveform



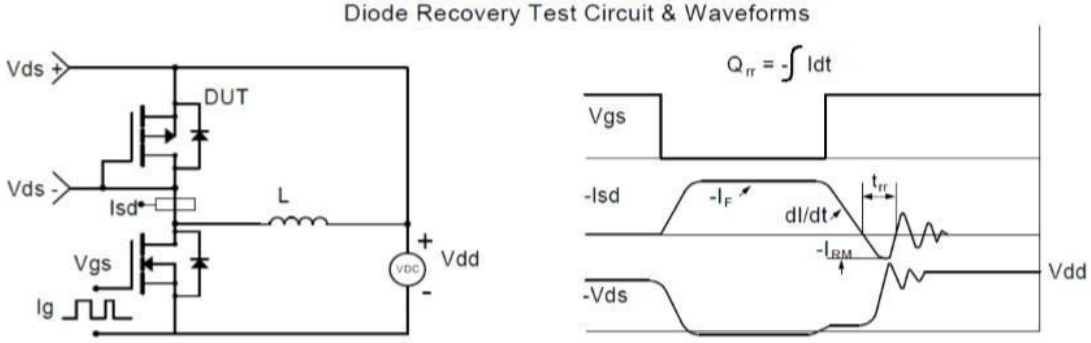
Resistive Switching Test Circuit & Waveforms



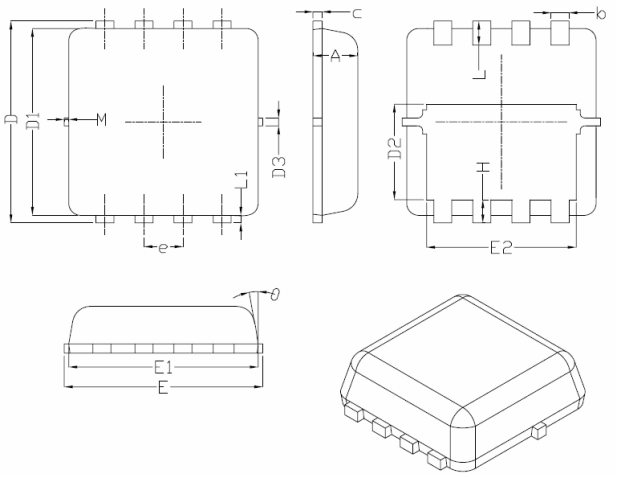
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



DFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°

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