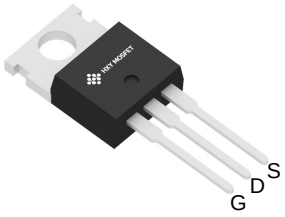
Description

The IRF640PBF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

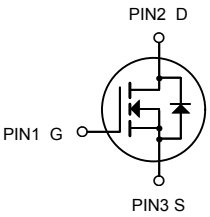


TO-220C

General Features

V_{DS} = 200V I_D =18A

$R_{DS(ON)}$ < 0.15mΩ @V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRF640PBF	TO-220C	HXY MOSFET	50

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain CurrentTC=25°C	18	A
I_D	Continuous Drain CurrentTC=100°C	11	A
IDM	Pulsed Drain Current note1	72	A
EAS	Single Pulse Avalanche Energy[3]	340	mJ
P_D@T_C=25°C	Total Power Dissipation[4]	63.7	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Ambient [1]	1.96	°C/W

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =200V, V_{GS} = 0V, T_J= 25℃	-	-	5	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	2	3	4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =9A	-	0.12	0.15	Ω
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	1318	-	pF
C_{oss}	Output Capacitance		-	180	-	pF
C_{rss}	Reverse Transfer Capacitance		-	75	-	pF
Q_g	Total Gate Charge	V_{DD} =160V, I_D = 18A, V_{GS} = 10V	-	41	-	nC
Q_{gs}	Gate-Source Charge		-	5.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	19.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 100V, I_D = 18A, R_G = 25Ω	-	24	-	ns
t_r	Turn-on Rise Time		-	45	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	101	-	ns
t_f	Turn-off Fall Time		-	95	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	18	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	72	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD} =18A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=18A, di/dt=100A/μs	-	230	-	ns
Q_{rr}	Reverse Recovery Charge		-	1.8	-	μC

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

2. I_{AS}=15A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

3. Pulse Test: Pulse Width≤325μs, Duty Cycle≤1%

Typical Performance Characteristics

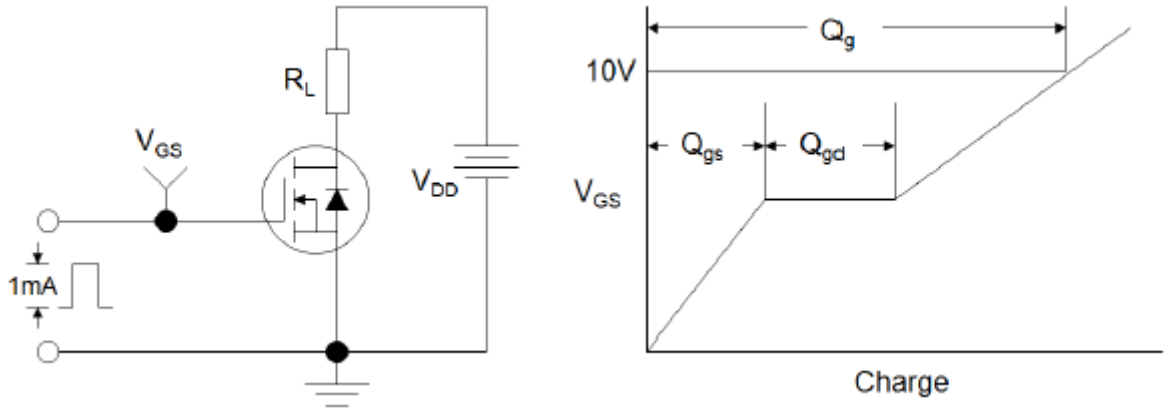


Figure1:Gate Charge Test Circuit & Waveform

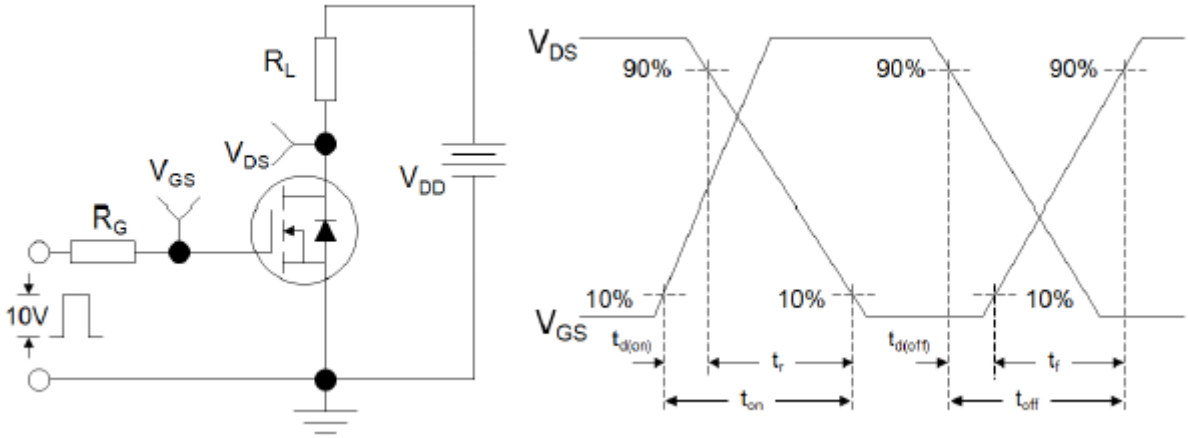


Figure 2: Resistive Switching Test Circuit & Waveforms

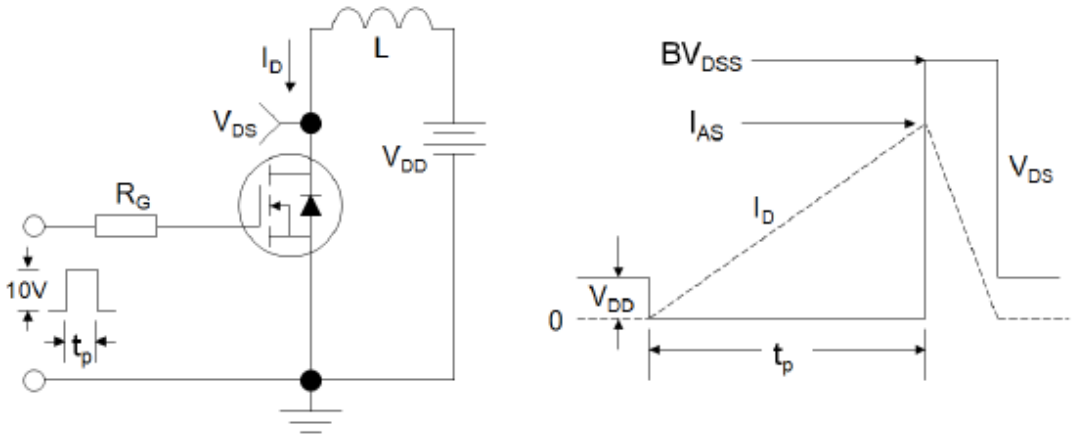


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

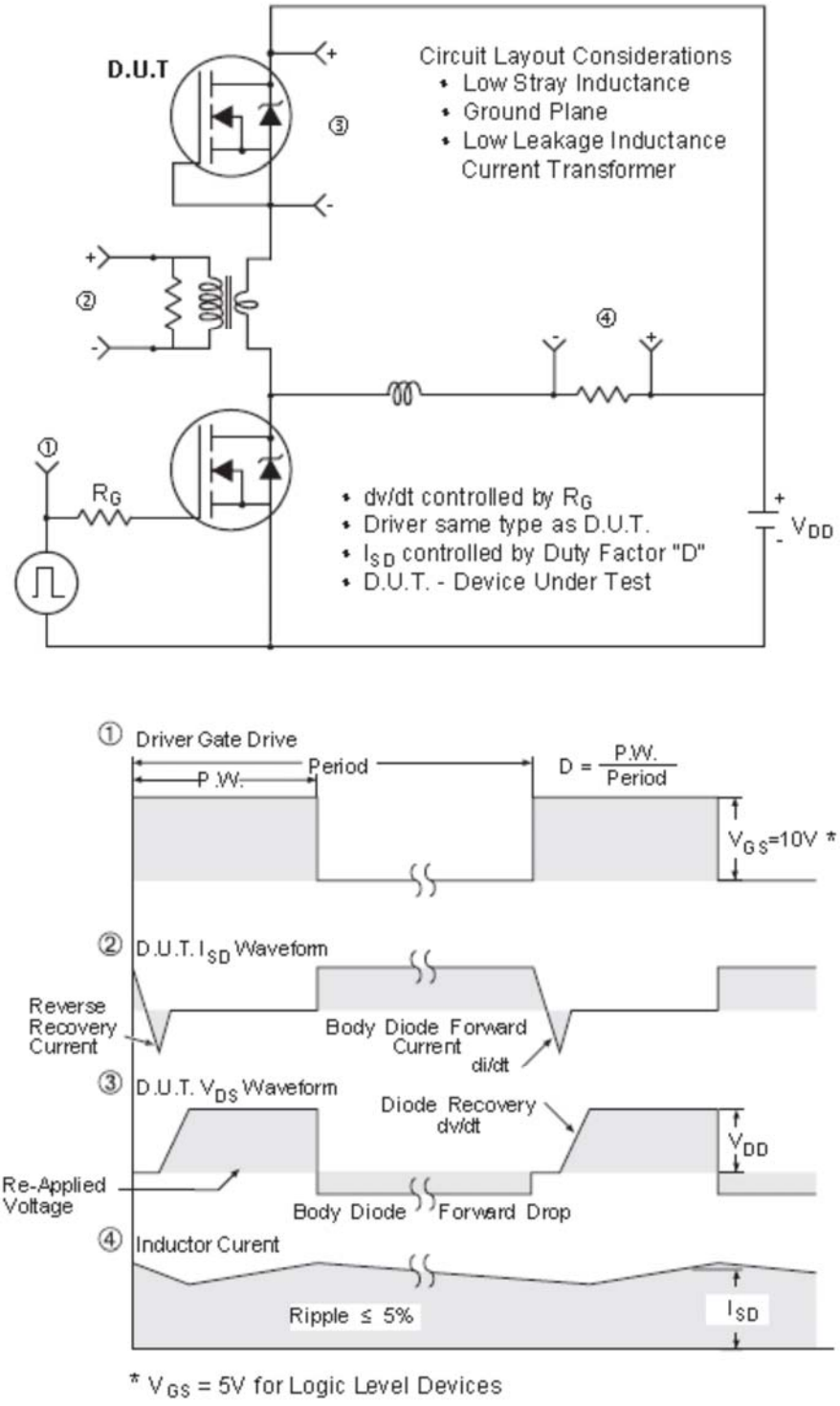
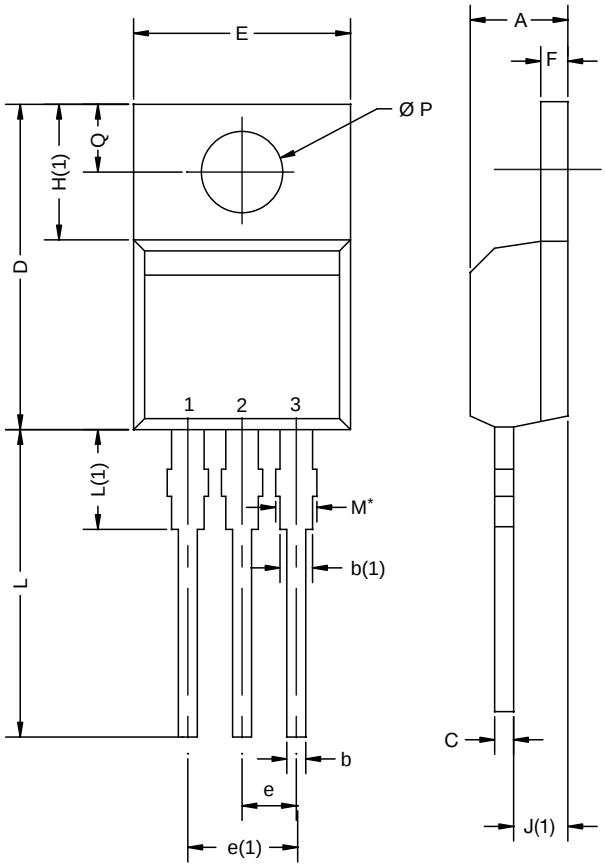


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

Package Information

TO-220C



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
Ø P	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118
ECN: X12-0208-Rev. N, 08-Oct-12 DWG: 5471				

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM

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