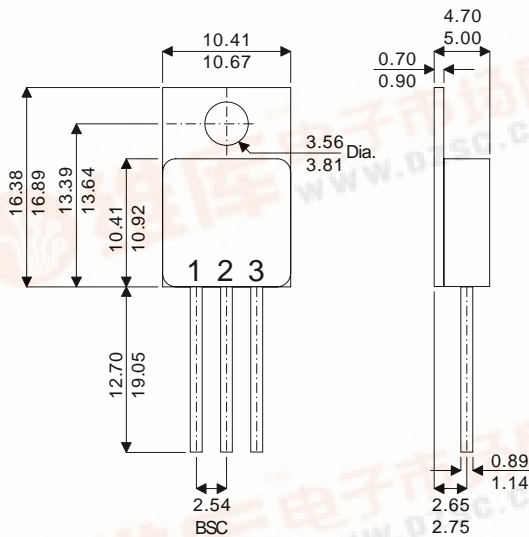


IRFY440

MECHANICAL DATA

Dimensions in mm (inches)



TO-220M – Metal Package

Pad 1 – Gate Pad 2 – Drain Pad 3 – Source

**N-CHANNEL
POWER MOSFET
FOR HI-REL
APPLICATIONS**

V_{DSS} **500V**
 $I_{D(cont)}$ **5.5A**
 $R_{DS(on)}$ **0.85Ω**

FEATURES

- HERMETICALLY SEALED TO-220 METAL PACKAGE
- SIMPLE DRIVE REQUIREMENTS
- LIGHTWEIGHT
- SCREENING OPTIONS AVAILABLE
- ALL LEADS ISOLATED FROM CASE

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

V_{GS}	Gate – Source Voltage	±20V
I_D	Continuous Drain Current @ $T_{case} = 25^{\circ}C$	5.5A
I_D	Continuous Drain Current @ $T_{case} = 100^{\circ}C$	3.5A
I_{DM}	Pulsed Drain Current	22A
P_D	Power Dissipation @ $T_{case} = 25^{\circ}C$	60W
	Linear Derating Factor	0.48W/°C
T_J, T_{stg}	Operating and Storage Temperature Range	-55 to 150°C
$R_{\theta JC}$	Thermal Resistance Junction to Case	2.1°C/W max.
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	80°C/W max.



ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit		
STATIC ELECTRICAL RATINGS							
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0$	$I_D = 1\text{mA}$	500	V		
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C $I_D = 1\text{mA}$		0.78	$\text{V}/^\circ\text{C}$		
$R_{DS(on)}$	Static Drain – Source On–State Resistance	$V_{GS} = 10\text{V}$	$I_D = 3.5\text{A}$		0.85		
		$V_{GS} = 10\text{V}$	$I_D = 5.5\text{A}$		0.98		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$	$I_D = 250\mu\text{A}$	2	4	V	
g_{fs}	Forward Transconductance	$V_{DS} \geq 15\text{V}$	$I_{DS} = 3.5\text{A}$	4.7		$\text{S}(\bar{\omega})$	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0$	$V_{DS} = 0.8BV_{DSS}$ $T_J = 125^\circ\text{C}$		25	μA	
					250		
I_{GSS}	Forward Gate – Source Leakage	$V_{GS} = 20\text{V}$			100	nA	
I_{GSS}	Reverse Gate – Source Leakage	$V_{GS} = -20\text{V}$			-100		
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	$V_{GS} = 0$			1300	pF	
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$			310		
C_{riss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$			120		
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}$	$I_D = 5.5\text{A}$	27.3		68.5	nC
		$V_{DS} = 0.5BV_{DSS}$					
Q_{gs}	Gate – Source Charge	$I_D = 5.5\text{A}$		2		12.5	nC
Q_{gd}	Gate – Drain (“Miller”) Charge	$V_{DS} = 0.5BV_{DSS}$		11.1		42.4	
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 250\text{V}$ $I_D = 5.5\text{A}$ $R_G = 9.1\Omega$				21	ns
t_r	Rise Time					73	
$t_{d(off)}$	Turn–Off Delay Time					72	
t_f	Fall Time					51	
SOURCE – DRAIN DIODE CHARACTERISTICS							
I_S	Continuous Source Current				5.5	A	
I_{SM}	Pulse Source Current				22		
V_{SD}	Diode Forward Voltage	$I_S = 5.5\text{A}$	$T_J = 25^\circ\text{C}$			1.5	V
		$V_{GS} = 0$					
t_{rr}	Reverse Recovery Time	$I_S = 5.5\text{A}$	$T_J = 25^\circ\text{C}$			700	ns
Q_{rr}	Reverse Recovery Charge	$d_i / d_t \leq 100\text{A}/\mu\text{s}$		$V_{DD} \leq 50\text{V}$		8.9	μC
PACKAGE CHARACTERISTICS							
L_D	Internal Drain Inductance	(from 6mm down drain lead pad to centre of die)			8.7	nH	
L_S	Internal Source Inductance	(from 6mm down source lead to centre of source bond pad)			8.7		