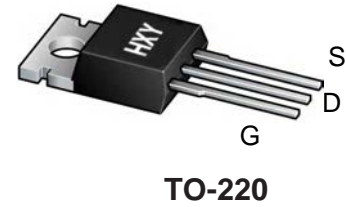




Description

The IRF740 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.



General Features

$V_{DS} = 420V, I_D = 11A$

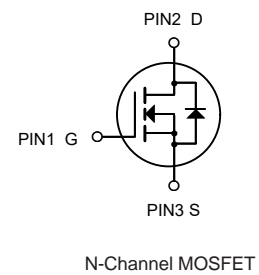
$R_{DS(ON)} < 0.5\Omega @ V_{GS} = 10V$

Application

High efficiency switch mode power supplies

Power factor correction

Electronic lamp ballast



Package Marking and Ordering Information

Product ID	Pack	Marking	Units Tube
IRF740	TO-220	IRF740 XXXX	50

Absolute Maximum Ratings@ $T_j=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	420	V
V _{GS}	Gate-Source Voltage	± 30	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 4.5V	11	A
IDM	Pulsed Drain Current ¹	44	A
P _D @T _C =25°C	Total Power Dissipation	87	W
TSTG	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C



Electrical Characteristics ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	420			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$			1	μA
Gate- Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$		0.36	0.5	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{ MHz}$		1368		pF
Output Capacitance	C_{OSS}			90.3		pF
Reverse Transfer Capacitance	C_{RSS}			3		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=250V, I_D=10A, R_G=25\Omega$ (Note 1, 2)		16		ns
Turn-On Rise Time	t_R			25		ns
Turn-Off Delay Time	$t_{D(OFF)}$			40		ns
Turn-Off Fall Time	t_F			29		ns
Total Gate Charge	Q_G	$V_{DS}=480V, I_D=12A, V_{GS}=10V$ (Note 1, 2)		8.1		nC
Gate-Source Charge	Q_{GS}			7.4		nC
Gate-Drain Charge	Q_{GD}			5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=11A$			1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				11	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				44	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=12A, dI_F/dt=100\text{ A}/\mu\text{s}$ (Note 1)		435		ns
Reverse Recovery Charge	Q_{RR}			4		μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.



Typical Characteristics:

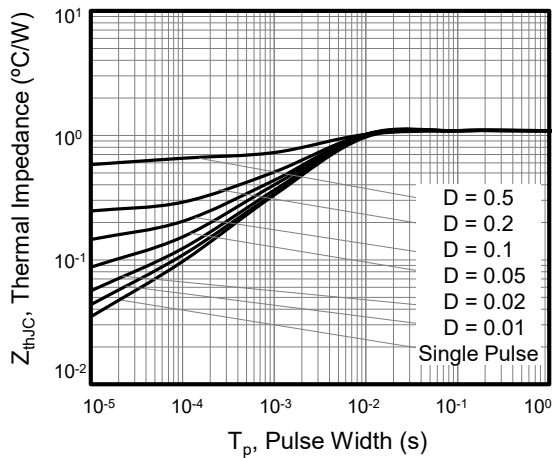


Figure 1. Transient Thermal Impedance

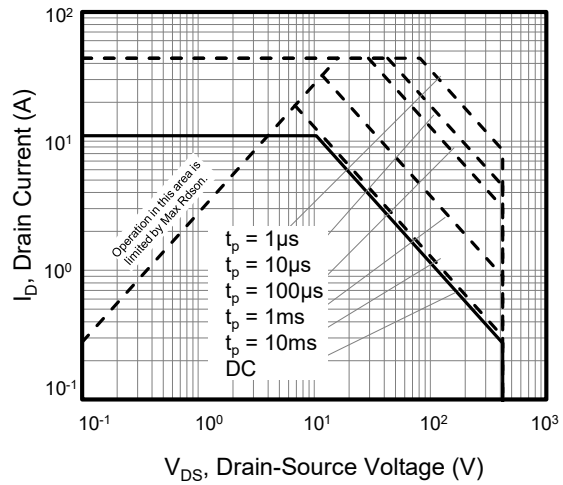


Figure 2. Safe Operation Area

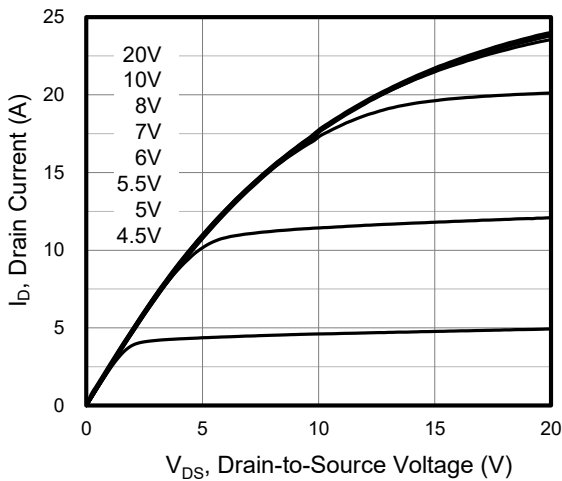


Figure 3. Output Characteristics

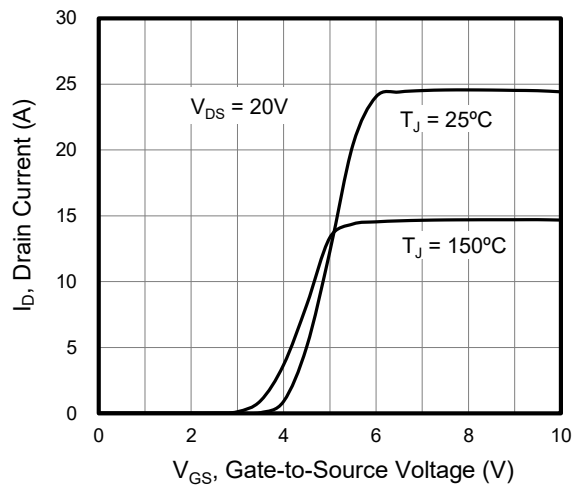


Figure 4. Transfer Characteristics

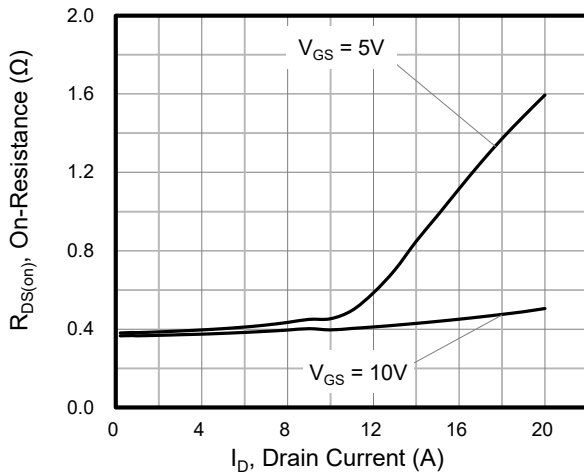


Figure 5. On-Resistance vs Drain Current

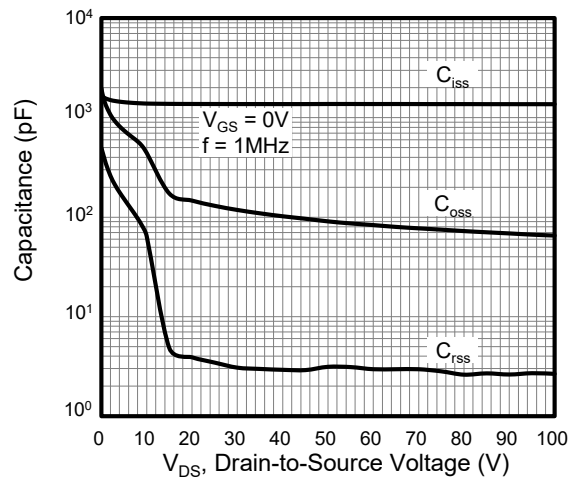


Figure 6. Capacitance

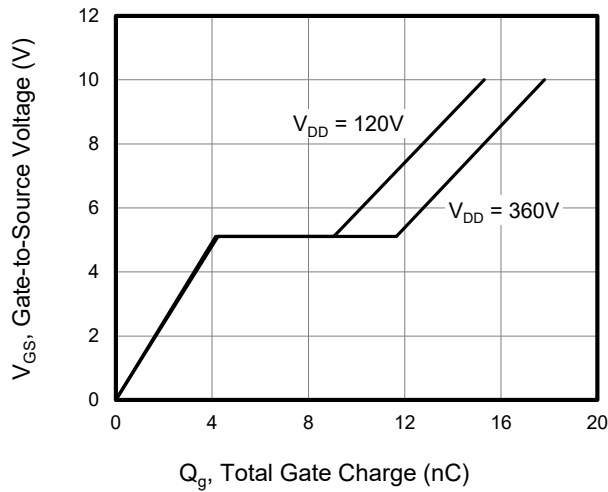


Figure 7. Gate Charge

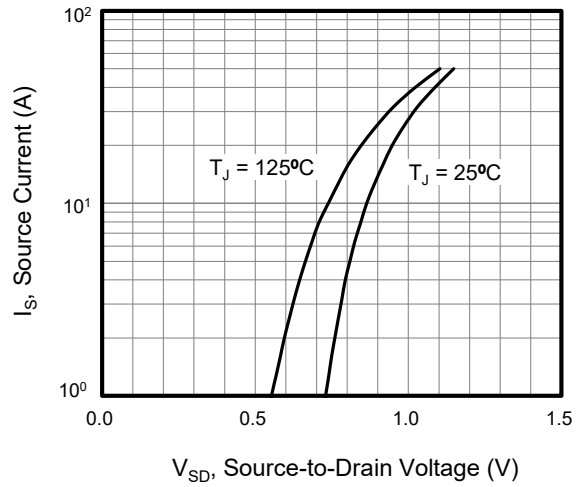


Figure 8. Body Diode Forward Voltage

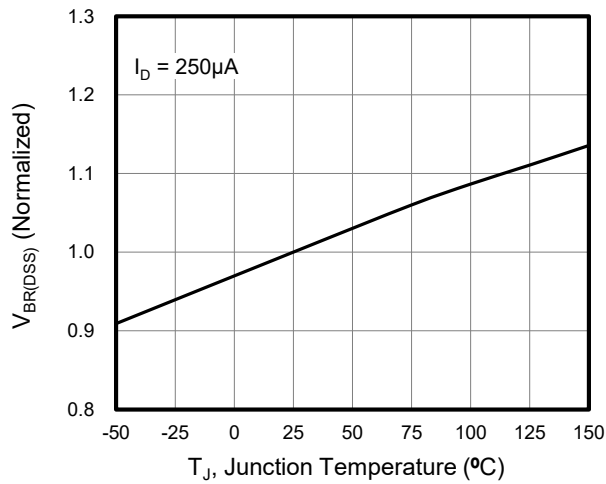


Figure 9. Breakdown Voltage vs Junction Temperature

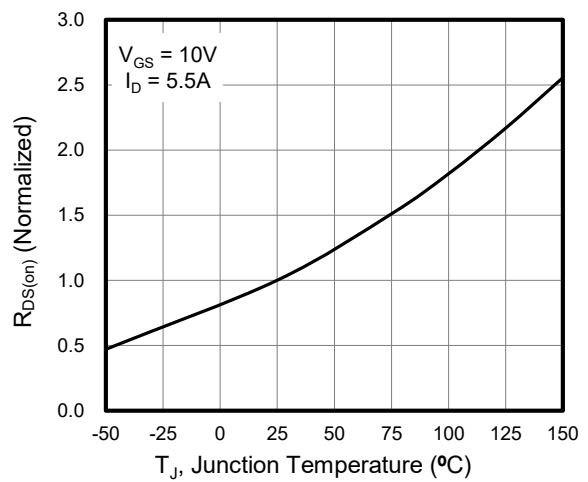
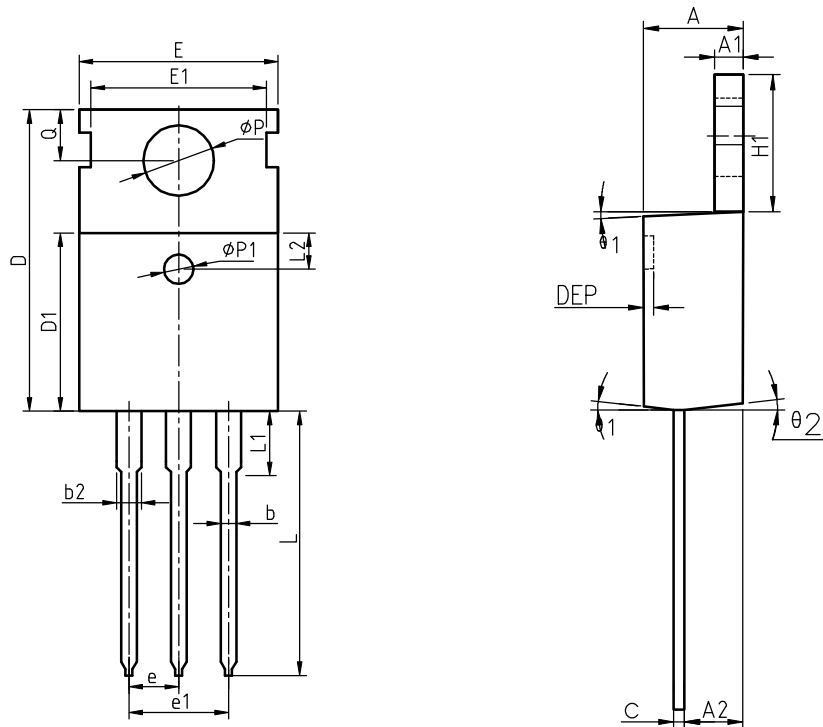


Figure 10. On-Resistance vs Temperature



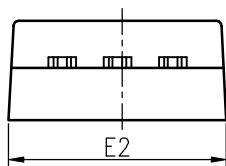
Package Information

TO-220



COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
theta 1	5°	7°	9°	5°	7°	9°
theta 2	1°	3°	5°	1°	3°	5°
theta 3	1°	3°	5°	1°	3°	5°





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