

## Silicon N-Channel Power MOSFET

### Description

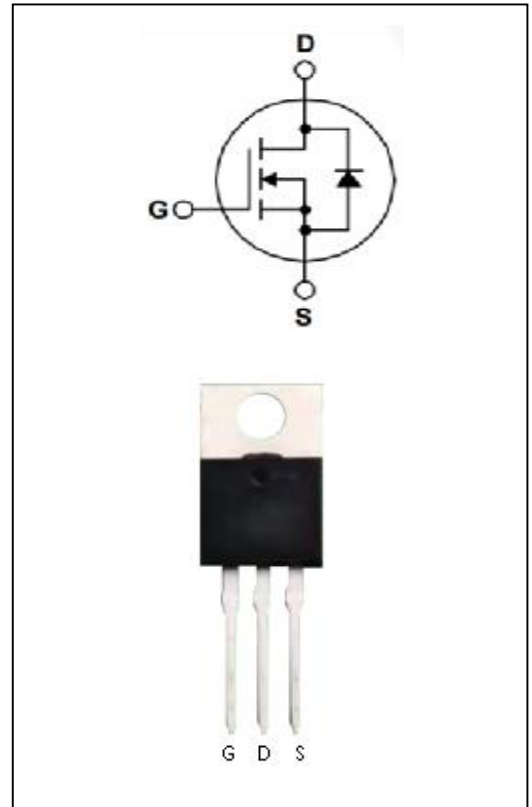
The IRF840 uses advanced technology and design to provide excellent  $R_{DS(ON)}$ . It can be used in a wide variety of applications.

### General Features

- I  $V_{DS}=500V, I_D=8A$
- I Low ON Resistance
- I Low Reverse transfer capacitances
- I 100% Single Pulse avalanche energy Test

### Application

- I Power switching application
- I Adapter and charger



### Electrical Characteristics @ $T_a=25^\circ\text{C}$ (unless otherwise specified)

#### a) Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Breakdown Voltage	500	V
$I_D$	Drain Current (continuous) at $T_c=25^\circ\text{C}$	8	A
$I_{DM}$	Drain Current (pulsed)	32	A
$V_{GS}$	Gate to Source Voltage	+/-30	V
$P_D$	Total Power Dissipation $T_c=25^\circ\text{C}$	134	W
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$
$E_{AS}$	Single Pulse Avalanche Energy	320	mJ

## b) Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{DS}$	Drain-source Voltage	$V_{GS}=0V, I_D=250\mu A$	500			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	$V_{GS}=10V, I_D=6.5A$		0.73	0.9	$\Omega$
$V_{GS(th)}$	Gated Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
$I_{DSS}$	Drain to Source leakage Current	$V_{DS}=500V, V_{GS}=0V$			10	$\mu A$
$I_{GSS(F)}$	Gated Body Forward Leakage	$V_{GS}=+30V$			0.1	nA
$I_{GSS(R)}$	Gated Body Reverse Leakage	$V_{GS}=-30V$			-0.1	nA
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1.0MHz$		1570	2040	pF
$C_{oss}$	Output Capacitance			150	195	pF
$C_{rss}$	Reverse Transfer Capacitance			15	20	pF

## c) Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V, I_D=8A,$ $R_G=10\Omega$		25	60	nS
$t_r$	Turn-on Rise Time			75	160	nS
$t_{d(off)}$	Turn-off Delay Time			125	260	nS
$t_f$	Turn-off Fall Time			75	160	nS
$Q_g$	Total Gate Charge	$V_{DS}=400V$ $I_D=8A$ $V_{GS}=10V$		25		nC
$Q_{gs}$	Gate-Source Charge			8		nC
$Q_{gd}$	Gate-Drain Charge			7		nC

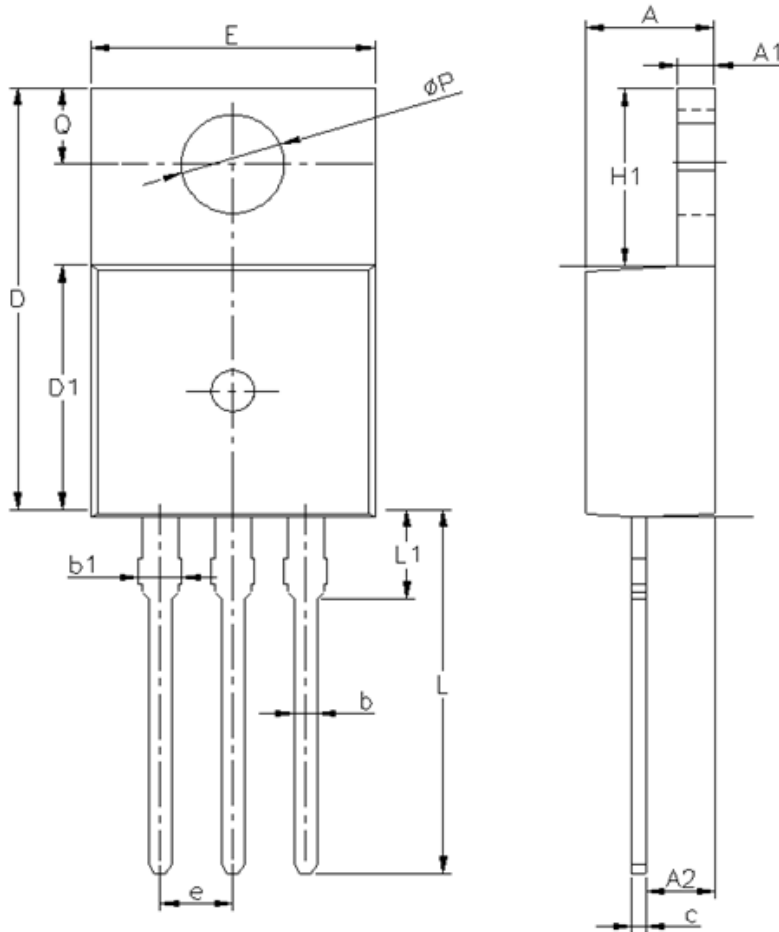
## d) Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$I_{SD}$	S-D Current(Body Diode)				8	A
$I_{SDM}$	Pulsed S-D Current(Body Diode)				32	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{DS}=8A$			1.5	V
$t_{rr}$	Reverse Recovery Time	$T_J=25^\circ C, I_F=8A$ $di/dt=100A/us$			325	nS
$Q_{rr}$	Reverse Recovery Charge				1836	$\mu C$
*Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$						

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	2.5	$^\circ C/W$

Package Information

TO-220EW PACKAGE



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.77
A1	1.25	1.27	1.42
A2	1.80	2.50	2.89
b	0.70	0.80	0.96
b1	1.22	1.33	1.50
c	0.33	0.38	0.48
D	15.10	15.70	16.10
D1	8.80	9.15	9.40
E	9.60	10.20	10.40
e	2.54 BSC		
H1	6.10	6.50	7.00
L	12.60	13.10	14.30
L1	—	—	3.50
Q	2.54	—	2.94
$\phi P$	3.66	3.86	4.06