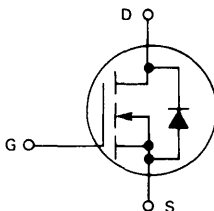


IRF710

N-CHANNEL ENHANCEMENT-MODE SILICON GATE TMOS POWER FIELD EFFECT TRANSISTOR

This TMOS Power FET is designed for high voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

- Silicon Gate for Fast Switching Speeds
- Low $r_{DS(on)}$ to Minimize On-Losses. Specified at Elevated Temperature
- Rugged — SOA is Power Dissipation Limited
- Source-to-Drain Diode Characterized for Use With Inductive Loads



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	400	Vdc
Drain-Gate Voltage ($R_{GS} = 1.0 \text{ M}\Omega$)	V_{DGR}	400	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
Drain Current Continuous	I_D	1.5	A
Pulsed	I_{DM}	6.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	20 0.16	Watts W/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

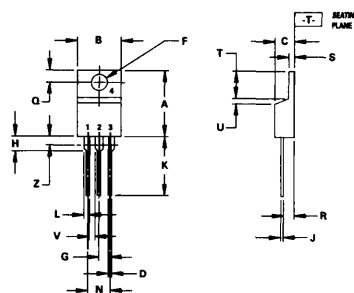
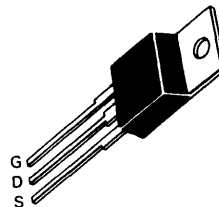
THERMAL CHARACTERISTICS

Thermal Resistance Junction to Case	$R_{\theta JC}$	6.4	$^\circ\text{C/W}$
Junction to Ambient	$R_{\theta JA}$	62.5	
Maximum Lead Temp. for Soldering Purposes, 1/8" from Case for 5 Seconds	T_L	300	$^\circ\text{C}$

Design curves of the MTP2N35 are applicable for this series of products.

The Designer's Data Sheet permits the design of most circuits entirely from the information presented. Limit curves — representing boundaries on device characteristics — are given to facilitate "worst case" design.

Part Number	V_{DS}	$r_{DS(on)}$	I_D
IRF710	400 V	3.6 Ω	1.5 A



STYLE 5:
 PIN 1, GATE
 2, DRAIN
 3, SOURCE
 4, DRAIN

- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	14.48	15.75	0.570	0.620
B	9.86	10.28	0.380	0.405
C	4.07	4.82	0.160	0.190
D	0.94	0.96	0.026	0.028
F	2.61	3.73	0.142	0.147
G	2.42	2.66	0.095	0.105
H	2.80	3.83	0.110	0.150
J	0.36	0.55	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.15	1.39	0.045	0.055
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.15	1.39	0.045	0.055
T	5.97	6.47	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.15	—	0.045	—
Z	—	2.04	—	0.080

CASE 221A-04
 TO-220AB

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA)		V _{I(BR)DSS}	400	—	V _{dc}
Zero Gate Voltage Drain Current (V _{DS} = Rated V _{DSS} , V _{GS} = 0) (V _{DS} = 0.8 Rated V _{DSS} , V _{GS} = 0, T _J = 125°C)		I _{DSS}	— —	0.25 1.00	mAdc
Gate-Body Leakage Current, Forward (V _{GSSF} = 20 Vdc, V _{DS} = 0)		I _{GSSF}	—	500	nAdc
Gate-Body Leakage Current, Reverse (V _{GSR} = 20 Vdc, V _{DS} = 0)		I _{GSSR}	—	500	nAdc
ON CHARACTERISTICS*					
Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 0.25 mA)		V _{GS(th)}	2.0	4.0	Vdc
Static Drain-Source On-Resistance (V _{GS} = 10 Vdc, I _D = 0.8 Adc)		r _{DS(on)}	—	3.6	Ohm
On-State Drain Current (V _{GS} = 10 V) (V _{DS} ≥ 5.4 Vdc)		I _{D(on)}	1.5	—	Adc
Forward Transconductance (V _{DS} ≥ 5.4 V, I _D = 0.8 A)		g _{FS}	0.5	—	mhos
DYNAMIC CHARACTERISTICS					
Input Capacitance	(V _{DS} = 25 V, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	—	150	pF
Output Capacitance		C _{oss}	—	50	
Reverse Transfer Capacitance		C _{rss}	—	15	
SWITCHING CHARACTERISTICS*					
Turn-On Delay Time	(V _{DD} = 0.5 V _{DSS} , I _D = 0.8 Apk, R _{gen} = 50 Ohms)	t _{d(on)}	—	10	ns
Rise Time		t _r	—	20	
Turn-Off Delay Time		t _{d(off)}	—	10	
Fall Time		t _f	—	15	
Total Gate Charge	(V _{DS} = 0.8 Rated V _{DSS} , V _{GS} = 10 Vdc, I _D = 2.0 A)	Q _g	6.0 (Typ)	7.5	nC
Gate-Source Charge		Q _{gs}	3.0 (Typ)	—	
Gate-Drain Charge		Q _{gd}	3.0 (Typ)	—	
SOURCE DRAIN DIODE CHARACTERISTICS*					
Forward On-Voltage	(I _S = 2.0 A, V _{GS} = 0)	V _{SD}	1.1 (Typ)	1.6	Vdc
Forward Turn-On Time		t _{on}	Limited by stray inductance		
Reverse Recovery Time		t _{rr}	600 (Typ)	—	ns
INTERNAL PACKAGE INDUCTANCE					
Internal Drain Inductance (Measured from the contact screw on the tab to center of die) (Measured from the drain lead 0.25" from package to center of die)		L _d	3.5 (Typ) 4.5 (Typ)	— —	nH
Internal Source Inductance (Measured from the source lead, 0.25" from package to source bond pad)		L _s	7.5 (Typ)	—	

*Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$