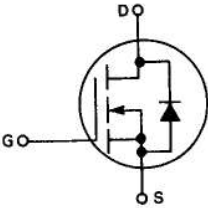


IRF530
IRF531
IRF532
IRF533

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

These TMOS Power FETs are designed for low voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

- Silicon Gate for Fast Switching Speeds
- Rugged — SOA is Power Dissipation Limited
- Source-to-Drain Diode Characterized for Use With Inductive Loads



Part Number	V _{DS}	r _{DS(on)}	I _D
IRF530	100 V	0.18 Ω	14 A
IRF531	60 V	0.18 Ω	14 A
IRF532	100 V	0.25 Ω	12 A
IRF533	60 V	0.25 Ω	12 A



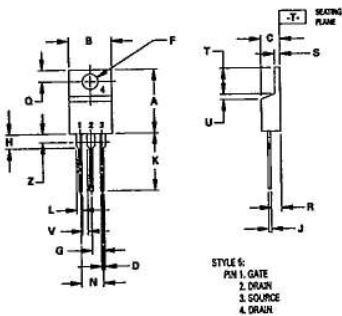
MAXIMUM RATINGS

Rating	Symbol	IRF				Unit
		530	531	532	533	
Drain-Source Voltage	V _{DSS}	100	60	100	60	V _{dc}
Drain-Gate Voltage (R _{GS} = 1.0 MΩ)	V _{DGR}	100	60	100	60	V _{dc}
Gate-Source Voltage	V _{GS}	± 20				V _{dc}
Continuous Drain Current T _C = 25°C	I _D	14	14	12	12	A _{dc}
Continuous Drain Current T _C = 100°C	I _D	9.0	9.0	8.0	8.0	A _{dc}
Drain Current — Pulsed	I _{DM}	56	56	48	48	A _{dc}
Total Power Dissipation @ T _C = 25°C Derate above 25°C	P _D	75 0.6				Watts W/°C
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to 150				°C

THERMAL CHARACTERISTICS

Thermal Resistance Junction to Case	R _{θJC}	1.67	°C/W
Junction to Ambient	R _{θJA}	62.5	°C/W
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T _L	300	°C

See the MTM12N10 Designer's Data Sheet for a complete set of design curves for this product.



- 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.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	14.48	15.75	0.570	0.620
B	3.65	12.75	0.280	0.665
C	4.07	4.82	0.160	0.190
D	0.54	0.88	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.42	2.65	0.096	0.104
H	2.80	3.93	0.110	0.154
J	0.38	0.55	0.014	0.022
K	12.72	14.27	0.500	0.562
L	1.15	1.25	0.045	0.049
M	4.83	5.20	0.190	0.205
Q	2.54	3.04	0.100	0.120
R	2.04	2.25	0.080	0.110
S	1.15	1.25	0.045	0.049
T	5.97	6.47	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.15	—	0.045	—
Z	—	2.54	—	0.100

CASE 221A-04
TO-220AB

MOTOROLA SC XSTRS/R F

IRF530-533/130-133

T-39-11

14E D 6367254 0089686 6

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage ($V_{GS} = 0$, $I_D = 250 \mu\text{A}$)	$V_{(BR)DSS}$	100 60	—	—	Vdc
Zero Gate Voltage Drain Current ($V_{GS} = 0$ V, $V_{DS} = \text{Rated } V_{DSS}$) ($V_{GS} = 0$ V, $V_{DS} = 0.8 \text{ Rated } V_{DSS}$, $T_C = 125^\circ\text{C}$)	I_{DSS}	—	—	0.25 1.0	mA _{dc}
Forward Gate-Body Leakage Current ($V_{GS} = 20$ V, $V_{DS} = 0$)	I_{GSSF}	—	—	100	nA _{dc}
Reverse Gate-Body Leakage Current ($V_{GS} = -20$ V, $V_{DS} = 0$)	I_{GSSR}	—	—	-100	nA _{dc}
ON CHARACTERISTICS*					
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$)	$V_{GS(th)}$	2.0	—	4.0	Vdc
On-State Drain Current ($V_{DS} = 25$ V, $V_{GS} = 10$ V)	$I_{D(on)}$	14 12	—	—	A _{dc}
Static Drain-Source On-Resistance ($V_{GS} = 10$ V, $I_D = 8.0$ A)	$r_{DS(on)}$	—	—	0.18 0.25	Ohm
Forward Transconductance ($V_{DS} = 15$ V, $I_D = 8.0$ A)	g_{FS}	4.0	—	—	mhos
DYNAMIC CHARACTERISTICS					
Input Capacitance	C_{iss}	—	—	800	pF
Output Capacitance	C_{oss}	—	—	500	pF
Reverse Transfer Capacitance	C_{rss}	—	—	150	pF
SWITCHING CHARACTERISTICS* ($T_J = 100^\circ\text{C}$)					
Turn-On Delay Time	$t_{d(on)}$	—	—	30	ns
Rise Time	t_r	—	—	75	ns
Turn-Off Delay Time	$t_{d(off)}$	—	—	40	ns
Fall Time	t_f	—	—	45	ns
SOURCE DRAIN DIODE CHARACTERISTICS*					
Forward On-Voltage	V_{SD}	—	2.3	—	Vdc
Forward Turn-On Time	t_{on}	—	Limited by stray inductance	—	—
Reverse Recovery Time	t_{rr}	—	360	—	ns
INTERNAL PACKAGE INDUCTANCE (TO-220)					
Internal Drain Inductance (Measured from the contact screw on tab to center of die) (Measured from the drain lead 0.25" from package to center of die)	L_d	—	3.5 4.5	—	nH
Internal Source Inductance (Measured from the source lead 0.25" from package to source bond pad.)	L_s	—	7.5	—	nH

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

FIGURE 1 — SWITCHING TEST CIRCUIT

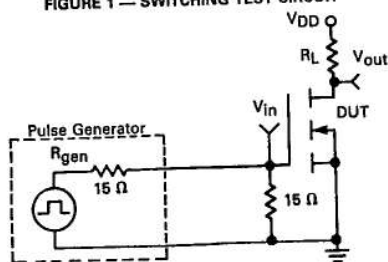
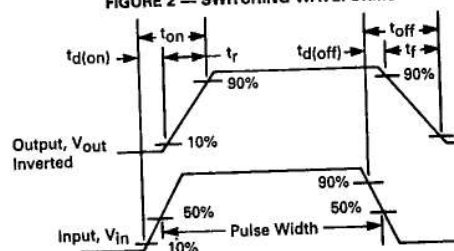


FIGURE 2 — SWITCHING WAVEFORMS



MOTOROLA TMOS POWER MOSFET DATA