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IRF 530/FI-531/FI
IRF 532/FI-533/FI

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTORS

PRELIMINARY DATA

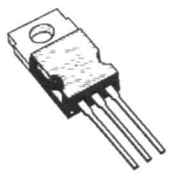
TYPE	V_{DSS}	$R_{DS(on)}$	I_D ■
IRF530	100 V	0.16 Ω	14 A
IRF530FI	100 V	0.16 Ω	9 A
IRF531	80 V	0.16 Ω	14 A
IRF531FI	80 V	0.16 Ω	9 A
IRF532	100 V	0.23 Ω	12 A
IRF532FI	100 V	0.23 Ω	8 A
IRF533	80 V	0.23 Ω	12 A
IRF533FI	80 V	0.23 Ω	8 A

- 80-100 VOLTS - FOR DC/DC CONVERTERS
- HIGH CURRENT
- ULTRA FAST SWITCHING
- EASY DRIVE- FOR REDUCED COST AND SIZE

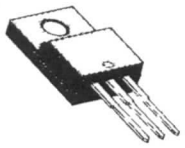
INDUSTRIAL APPLICATIONS:

- UNINTERRUPTIBLE POWER SUPPLIES
- MOTOR CONTROLS

N - channel enhancement mode POWER MOS field effect transistors. Easy drive and very fast switching times make these POWER MOS transistors ideal for high speed switching applications. Applications include DC/DC converters, UPS, battery chargers, secondary regulators, servo control, power-audio amplifiers and robotics.

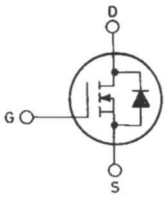


TO-220



ISOWATT220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

		TO-220 / ISOWATT220	IRF 530 / 530FI	IRF 531 / 531FI	IRF 532 / 532FI	IRF 533 / 533FI	
V_{DS} *	Drain-source voltage ($V_{GS}=0$)		100	80	100	80	V
V_{DGR} *	Drain-gate voltage ($R_{GS}=20$ KΩ)		100	80	100	80	V
V_{GS}	Gate-source voltage		±20				V
I_{DM} (•)	Drain current (pulsed)		56	56	48	48	A
I_{DLM}	Drain inductive current, clamped (L = 100 μH)		56	56	48	48	A
			530	**531**	**532**	**533**	
I_D	Drain current (cont.) at T_c = 25°C		14	14	12	12	A
I_D	Drain current (cont.) at T_c = 100°C		9	9	8	8	A
			530FI	**531FI**	**532FI**	**533FI**	
I_D ■	Drain current (cont.) at T_c = 25°C		9	9	8	8	A
I_D ■	Drain current (cont.) at T_c = 100°C		5.5	5.5	5	5	A
			TO-220		**ISOWATT220**		
P_{tot} ■	Total dissipation at T_c < 25°C		79		35		W
■	Derating factor		0.63		0.28		W/°C
T_{stg}	Storage temperature		−55 to 150				°C
T_j	Max. operating junction temperature		150				°C

* T_j = 25°C to 125°C
(•) Repetitive Rating: Pulse width limited by max junction temperature.
■ See note on ISOWATT220 on this datasheet.

THERMAL DATA ▪

			TO-220	ISOWATT220	
$R_{thj-case}$	Thermal resistance junction-case	max	1.58	3.57	°C/W
R_{thc-s}	Thermal resistance case-sink	typ	0.5		°C/W
$R_{thj-amb}$	Thermal resistance junction-ambient	max	80		°C/W
T_l	Maximum lead temperature for soldering purpose		300		°C

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Parameters		Test Conditions	Min.	Typ.	Max.	Unit
OFF						
$V_{(BR)\,DSS}$	Drain-source breakdown voltage	I_D = 250 μA V_{GS} = 0 for **IRF530/532/530FI/532FI** for **IRF531/533/531FI/533FI**	 100 80			 V V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = Max Rating V_{DS} = Max Rating x 0.8 T_c = 125°C			250 1000	μA μA
I_{GSS}	Gate-body leakage current (V_{DS} = 0)	V_{GS} = ±20 V			±100	nA
ON **						
$V_{GS\,(th)}$	Gate threshold voltage	V_{DS} = V_{GS} I_D = 250 μA	2		4	V
$I_{D(on)}$	On-state drain current	V_{DS} > $I_{D\,(on)}$ × $R_{DS(on)\,max}$ V_{GS} = 10 V for **IRF530/531/530FI/531FI** for **IRF532/533/532FI/533FI**	 14 12			 A A
$R_{DS\,(on)}$	Static drain-source on resistance	V_{GS} = 10 V I_D = 8.3 A for **IRF530/531/530FI/531FI** for **IRF532/533/532FI/533FI**			 0.16 0.23	 Ω Ω
DYNAMIC						
g_{fs} **	Forward transconductance	V_{DS} > $I_{D\,(on)}$ × $R_{DS\,(on)\,max}$ I_D = 8.3 A	5.1			mho
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} = 25 V f = 1 MHz V_{GS} = 0			850 260 50	pF pF pF
SWITCHING						
$t_{d\,(on)}$ t_r $t_{d\,(off)}$ t_f	Turn-on time Rise time Turn-off delay time Fall time	V_{DD} = 36 V I_D = 8.0 A R_i = 15 Ω (see test circuit)			30 75 40 45	ns ns ns ns
Q_g	Total Gate Charge	V_{GS} = 10 V I_D = 14 A V_{DS} = Max Rating × 0.8 (see test circuit)			30	nC