

IRF540 IRF540FI

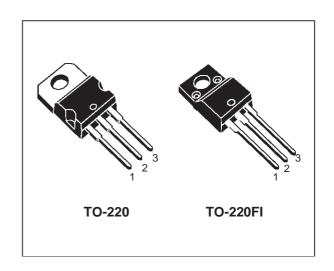
N - CHANNEL100V - 00.50Ω - 30A - TO-220/TO-220FI POWER MOSFET

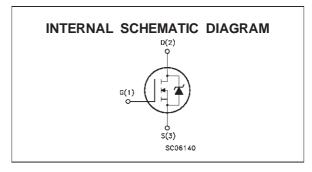
TYPE	V _{DSS}	R _{DS(on)}	I _D
IRF540	100 V	< 0.077 Ω	30 A
IRF540FI	100 V	< 0.077 Ω	16 A

- TYPICAL $R_{DS(on)} = 0.050 \Omega$
- AVALANCHE RUGGED TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- 175°C OPERATING TEMPERATURE
- APPLICATION ORIENTED CHARACTERIZATION

APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- DC-DC & DC-AC CONVERTER
- AUTOMOTIVE ENVIRONMENT (INJECTION, ABS, AIR-BAG, LAMP DRIVERS Etc.)





ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Va	lue	Unit
		IRF530	IRF530FI	
V_{DS}	Drain-source Voltage (V _{GS} = 0)	10	00	V
V_{DGR}	Drain- gate Voltage (RGS = 20 k Ω)	10	00	V
V_{GS}	Gate-source Voltage	±	20	V
I _D	Drain Current (continuous) at T _c = 25 °C	30	17	А
I _D	Drain Current (continuous) at T _c = 100 °C	21	12	А
I _{DM} (•)	Drain Current (pulsed)	120	120	А
P_{tot}	Total Dissipation at T _c = 25 °C	150	45	W
	Derating Factor	1	0.3	W/°C
Viso	Insulation Withstand Voltage (DC)	- 2000		V
T _{stg}	Storage Temperature	-65 to 175		°C
Tj	Max. Operating Junction Temperature	17	75	°C

^(•) Pulse width limited by safe operating area

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⁽¹⁾ $I_{SD} \le 30 \text{ A}$, $di/dt \le 200 \text{ A/}\mu\text{s}$, $V_{DD} \le V_{(BR)DSS}$, $Tj \le T_{JMAX}$

THERMAL DATA

			TO-220	TO220-FI	
R _{thj-case}	Thermal Resistance Junction-case	Max	1	3.33	°C/W
R _{thc-sink}	Thermal Resistance Junction-ambient Thermal Resistance Case-sink Maximum Lead Temperature For Soldering P	Max Typ urpose	62 0. 30	.5	°C/W °C/W °C

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I _{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T _j max	30	А
E _{AS}	Single Pulse Avalanche Energy (starting $T_i = 25$ °C, $I_D = I_{AR}$, $V_{DD} = 25$ V)	200	mJ

ELECTRICAL CHARACTERISTICS ($T_{case} = 25$ $^{\circ}C$ unless otherwise specified) OFF

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	$I_D = 250 \ \mu A$ $V_{GS} = 0$	100			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	$V_{DS} = Max Rating$ $V_{DS} = Max Rating$ $T_c = 125 ^{\circ}C$			1 10	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 20 V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250 \mu A$	2	3	4	V
R _{DS(on)}	Static Drain-source On Resistance	VGS = 10V ID = 15 A		0.05	0.077	Ω
I _{D(on)}	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10 \text{ V}$	30			А

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
gfs (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_{D} = 15 \text{ A}$	10	20		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0		2600 350 85	3600 500 120	pF pF pF

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ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
t _{d(on)} t _r	Turn-on Time Rise Time	$V_{DD} = 50 \text{ V}$ $I_{D} = 15 \text{ A}$ $R_{G} = 4.7 \Omega$ $V_{GS} = 10 \text{ V}$		20 60	28 85	ns ns
Q _g Q _{gs} Q _{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V _{DD} =80 V I _D =30 A V _{GS} = 10 V		80 13 28	110	nC nC nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
t _{r(Voff)}	Off-voltage Rise Time	$V_{DD} = 80 \text{ V}$ $I_{D} = 30 \text{ A}$		22	30	ns
t _f	Fall Time	$R_G = 4.7 \Omega$ $V_{GS} = 10 V$		25	35	ns
t _c	Cross-over Time			55	75	ns

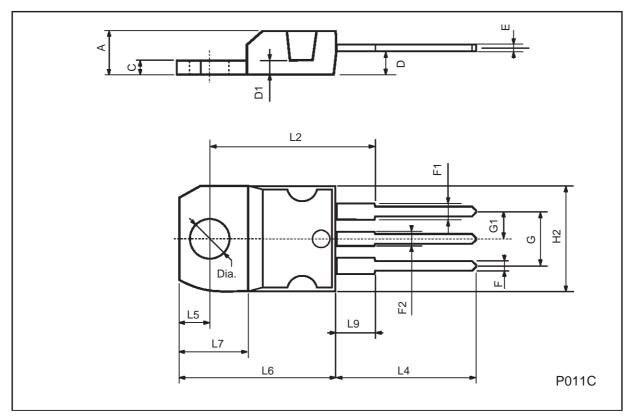
SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
I _{SD} I _{SDM} (•)	Source-drain Current Source-drain Current (pulsed)				30 120	A A
V _{SD} (*)	Forward On Voltage	I _{SD} = 50 A V _{GS} = 0			1.5	V
t _{rr}	Reverse Recovery Time	$I_{SD} = 30 \text{ A}$		175		ns
Qrr	Reverse Recovery	,		1.1		μC
I _{RRM}	Charge Reverse Recovery Current			12.5		А

^(*) Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %
(•) Pulse width limited by safe operating area

TO-220 MECHANICAL DATA

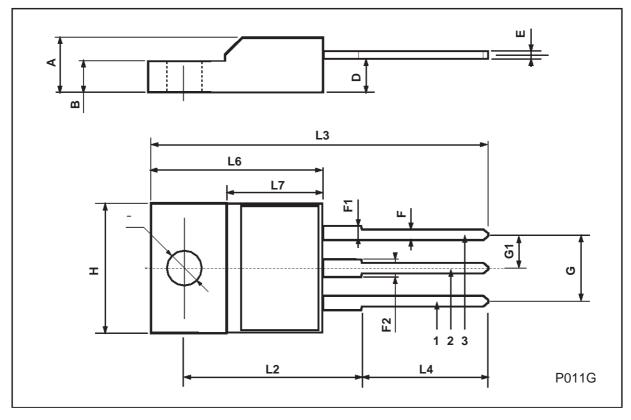
DIM.		mm			inch	
DIM.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α	4.40		4.60	0.173		0.181
С	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



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ISOWATT220 MECHANICAL DATA

DIM.		mm			inch	
DIIVI.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А	4.4		4.6	0.173		0.181
В	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
Е	0.4		0.7	0.015		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
Н	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
Ø	3		3.2	0.118		0.126



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