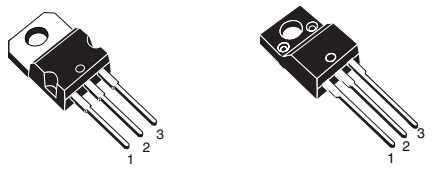
IRF630M
IRF630MFP

N-channel 200V - 0.35Ω - 9A - TO-220 /TO-220FP
Mesh Overlay™ Power MOSFET

General features

Type	V_{DSS} (@Tjmax)	$R_{DS(on)}$	I_D
IRF630M	200 V	< 0.40 Ω	9 A
IRF630MFP	200 V	< 0.40 Ω	9 A

- Extremely high dv/dt capability
- Very low intrinsic capacitances
- Gate charge minimized



TO-220 TO-220FP

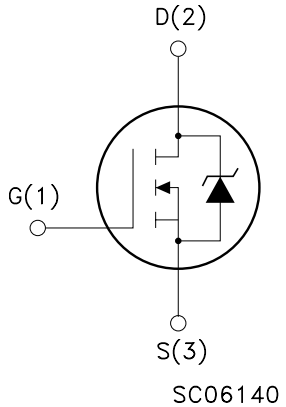
Description

This power MOSFET is designed using the company's consolidated strip layout-based MESH OVERLAY™ process. This technology matches and improves the performances compared with standard parts from various sources. Isolated TO-220 option simplifies assembly and cuts risk of accidental short circuit in crowded monitor PCB's.

Applications

- Switching application

Internal schematic diagram



Order codes

Part number	Marking	Package	Packaging
IRF630M	IRF630M	TO-220	Tube
IRF630MFP	IRF630MFP	TO-220FP	Tube

1 Electrical ratings

Table 1. Absolute maximum rating

Symbol	Parameter	Value		Unit
		IRF630M	IRF630MFP	
V_{DS}	Drain-source Voltage (V_{GS} = 0)	200		V
V_{DGR}	Drain-gate voltage (R_{GS} = 20 kW)	200		V
V_{GS}	Gate- source voltage	± 20		V
I_D	Drain current (continuos) at T_C = 25°C	9	9 (1)	A
I_D	Drain current (continuos) at T_C = 100°C	5.7	5.7 (1)	A
I_{DM} (2)	Drain current (pulsed)	36	36	A
P_{TOT}	Total dissipation at T_C = 25°C	75	30	W
	Derating factor	0.6	0.24	W/°C
dv/dt (3)	Peak diode recovery voltage slope	5	5	V/ns
V_{ISO}	Insulation winthstand voltage (DC)	--	2500	V
T_{stg}	Storage temperature	–65 to 150		°C
T_j	Max. operating junction temperature	150		°C

1. Limited only by maximum temperature allowed
2. Pulse width limited by safe operating area
3. I_{SD} £9A, di/dt £300A/µs, V_{DD} £ $V_{(BR)DSS}$, Tj ≤T_{JMAX}.

Table 2. Thermal data

		TO-220	TO-220FP	
Rthj-case	Thermal resistance junction-case max	1.67	4.17	°C/W
Rthj-amb	Thermal resistance junction-ambient max	62.5		°C/W
T_l	Maximum lead temperature for soldering purpose	300		°C

Table 3. Avalanche characteristics

Symbol	Parameter	Value	Unit
I_{AR}	Avalanche current, repetitive or not-repetitive (pulse width limited by Tj Max)	5	A
E_{AS}	Single pulse avalanche energy (starting Tj=25°C, Id=Iar, Vdd=50V)	350	mJ

2 Electrical characteristics

(T_{CASE}=25°C unless otherwise specified)

Table 4. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 250µA, V_{GS} = 0	200			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = max rating V_{DS} = max rating, T_C = 125 °C			1 50	µA µA
I_{GSS}	Gate-body leakage current (V_{DS} = 0)	V_{GS} = ± 20V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250µA	2	3	4	V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS} = 10V, I_D = 4.5A		0.35	0.40	Ω

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward transconductance	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$, I_D = 4.5A	3	4		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} = 25V, f = 1 MHz, V_{GS} = 0		540 90 35	700	pF pF pF
$t_{d(on}$ t_r $t_{r(Voff)}$ t_f	Turn-on delay time Rise time Off-voltage rise time Fall time	V_{DD} = 100V, I_D = 4.5A R_G = 4.7Ω V_{GS} = 10V		10 15 12 12	14 20 17 17	ns ns ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD} = 160V, I_D = 9A, V_{GS} = 10V		31 7.5 9	45	nC nC nC

1. Pulsed: pulse duration = 300µs, duty cycle 1.5%

Table 6. Sourse drain diode

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (1)	Source-drain current Source-drain current (pulsed)				9 36	A A
V_{SD} (2)	Forward on voltage	I_{SD} = 9A, V_{GS} = 0			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 9A, di/dt = 100A/µs V_{DD} = 50V, T_j = 150°C		170 0.95 11		ns nC A

1. Pulse width limited by safe operating area.
2. Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %