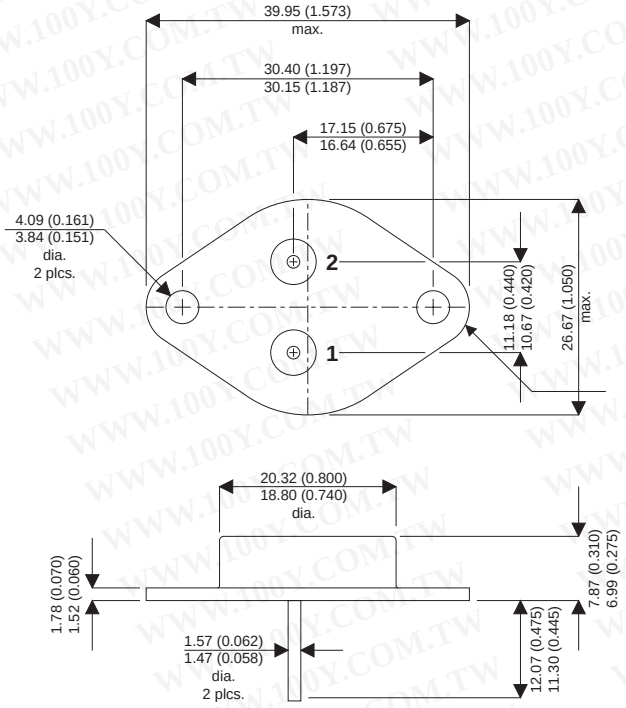
IRF250

MECHANICAL DATA

Dimensions in mm (inches)



TO–3 Metal Package

Pin 1 – Gate Pin 2 – Source Case – Drain

N–CHANNEL POWER MOSFET

V_{DSS}	200V
$I_{D(cont)}$	30A
$R_{DS(on)}$	0.085Ω

FEATURES

- HERMETICALLY SEALED TO–3 METAL PACKAGE
- SIMPLE DRIVE REQUIREMENTS
- SCREENING OPTIONS AVAILABLE

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_{GS}	Gate – Source Voltage		±20V
I_D	Continuous Drain Current	(V_{GS} = 0 , T_{case} = 25°C)	30A
I_D	Continuous Drain Current	(V_{GS} = 0 , T_{case} = 100°C)	19A
I_{DM}	Pulsed Drain Current [1]		120A
P_D	Power Dissipation @ T_{case} = 25°C		150W
	Linear Derating Factor		1.2W/°C
E_{AS}	Single Pulse Avalanche Energy [2]		200mJ
I_{AR}	Avalanche Current [2]		30A
E_{AR}	Repetitive Avalanche Energy [2]		15mJ
dv/dt	Peak Diode Recovery [3]		5V/ns
T_J , T_{stg}	Operating and Storage Temperature Range		–55 to +150°C
T_L	Lead Temperature 1.6mm (0.63”) from case for 10 sec.		300°C

Notes

1) Pulse Test: Pulse Width ≤ 300µs, δ ≤ 2%.
2) @ V_{DD} = 50V , L ≥ 330mH , R_G = 25Ω , Peak I_L = 30A , Starting T_J = 25°C.
3) @ I_{SD} ≤ 30A , di/dt ≤ 190A/µs , V_{DD} ≤ BV_{DSS} , T_J ≤ 150°C , Suggested R_G = 2.35Ω

IRF250

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

	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	STATIC ELECTRICAL RATINGS					
BV_{DSS}	Drain – Source Breakdown Voltage	V_{GS} = 0 I_D = 1mA	200			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C I_D = 1mA		0.029		V/°C
$R_{DS(on)}$	Static Drain – Source On–State Resistance [1]	V_{GS} = 10V I_D = 19A V_{GS} = 10V I_D = 30A			0.085 0.090	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 250mA	2		4	V
g_{fs}	Forward Transconductance [1]	V_{DS} > 15V I_D = 19A	9			S (℧)
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0 V_{DS} = 0.8BV_{DSS} T_J = 125°C			25 250	µA
I_{GSS}	Forward Gate – Source Leakage	V_{GS} = 20V			100	nA
I_{GSS}	Reverse Gate – Source Leakage	V_{GS} = –20V			–100	
	DYNAMIC CHARACTERISTICS					
C_{iss}	Input Capacitance	V_{GS} = 0		3500		pF
C_{oss}	Output Capacitance	V_{DS} = 25V		700		
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		110		
Q_g	Total Gate Charge	V_{GS} = 10V	55		115	nC
Q_{gs}	Gate – Source Charge	I_D = 30A	8		22	
Q_{gd}	Gate – Drain (“Miller”) Charge	V_{DS} = 0.5BV_{DSS}	30		60	
$t_{d(on)}$	Turn–On Delay Time	V_{DD} = 100V			35	ns
t_r	Rise Time	I_D = 30A			190	
$t_{d(off)}$	Turn–Off Delay Time	R_G = 2.35Ω			170	
t_f	Fall Time				130	
	SOURCE – DRAIN DIODE CHARACTERISTICS					
I_S	Continuous Source Current				30	A
I_{SM}	Pulse Source Current [2]				120	
V_{SD}	Diode Forward Voltage [1]	I_S = 30A T_J = 25°C V_{GS} = 0			1.9	V
t_{rr}	Reverse Recovery Time	I_F = 30A T_J = 25°C			950	ns
Q_{rr}	Reverse Recovery Charge [1]	$d_i / d_t \leq$ 100A/µs $V_{DD} \leq$ 50V			9.0	µC
t_{on}	Forward Turn–On Time			Negligible		
	PACKAGE CHARACTERISTICS					
L_D	Internal Drain Inductance (measured from 6mm down drain lead to centre of die)			5.0		nH
L_S	Internal Source Inductance (from 6mm down source lead to source bond pad)			13		
	THERMAL CHARACTERISTICS					
$R_{\theta JC}$	Thermal Resistance Junction – Case				0.83	°C/W
$R_{\theta CS}$	Thermal Resistance Case – Sink			0.12		
$R_{\theta JA}$	Thermal Resistance Junction – Ambient				30	

Notes

1) Pulse Test: Pulse Width ≤ 300ms, δ ≤ 2%
2) Repetitive Rating – Pulse width limited by maximum junction temperature.