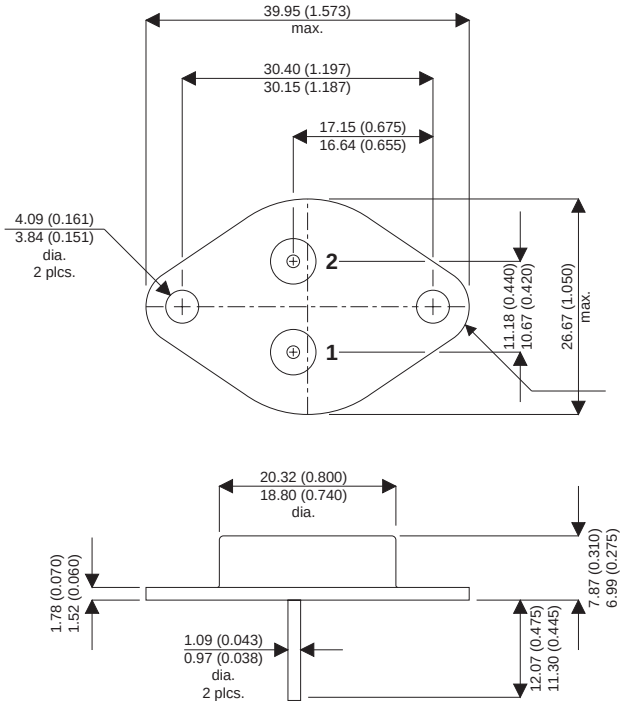
IRF140

MECHANICAL DATA

Dimensions in mm (inches)



TO–3 Metal Package

Pin 1 – Gate Pin 2 – Source Case – Drain

N–CHANNEL POWER MOSFET

V_{DSS}	100V
$I_{D(cont)}$	28A
$R_{DS(on)}$	0.077Ω

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)	28A
		(V_{GS} = 0 , T_{case} = 100°C)	20A
I_{DM}	Pulsed Drain Current [1]		112A
P_D	Power Dissipation @ T_{case} = 25°C		125W
	Linear Derating Factor		1.0W/°C
E_{AS}	Single Pulse Avalanche Energy [2]		250mJ
I_{AR}	Avalanche Current [2]		28A
E_{AR}	Repetitive Avalanche Energy [2]		12.5mJ
dv/dt	Peak Diode Recovery [3]		5.5V/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} = 25V , L ≥ 480µH , R_G = 25Ω , Peak I_L = 28A , Starting T_J = 25°C
3) @ I_{SD} ≤ 28A , di/dt ≤ 170A/µs , V_{DD} ≤ BV_{DSS} , T_J ≤ 150°C , Suggested R_G = 9.1Ω

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SEME LAB

IRF140

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	100			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	Reference to 25°C I_D = 1mA			0.13		V/°C
$R_{DS(on)}$	Static Drain – Source On–State Resistance [1]	V_{GS} = 10V	I_D = 20A			0.077	Ω
		V_{GS} = 10V	I_D = 28A			0.089	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}	I_D = 250µA	2		4	V
g_{fs}	Forward Transconductance [1]	V_{DS} ≥ 15V	I_{DS} = 20A	9.1			S (℧)
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0	V_{DS} = 0.8BV_{DSS}			25	µA
			T_J = 125°C			250	
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			1660		pF
C_{oss}	Output Capacitance	V_{DS} = 25V			550		
C_{rss}	Reverse Transfer Capacitance	f = 1MHz			120		
Q_g	Total Gate Charge	V_{GS} = 10V		30		59	nC
Q_{gs}	Gate – Source Charge	I_D = 28A		2.4		12	
Q_{gd}	Gate – Drain (“Miller”) Charge	V_{DS} = 0.5BV_{DSS}		12		30.7	
$t_{d(on)}$	Turn–On Delay Time	V_{DD} = 50V I_D = 28A R_G = 9.1Ω				21	ns
t_r	Rise Time					145	
$t_{d(off)}$	Turn–Off Delay Time					21	
t_f	Fall Time					105	
	SOURCE – DRAIN DIODE CHARACTERISTICS						
I_S	Continuous Source Current					28	A
I_{SM}	Pulse Source Current [2]					112	
V_{SD}	Diode Forward Voltage [1]	I_S = 28A V_{GS} = 0	T_J = 25°C			1.5	V
t_{rr}	Reverse Recovery Time	I_F = 28A	T_J = 25°C			400	ns
Q_{rr}	Reverse Recovery Charge [1]	d_i / d_t ≤ 100A/µs	V_{DD} ≤ 50V			2.9	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					1.67	°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.

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