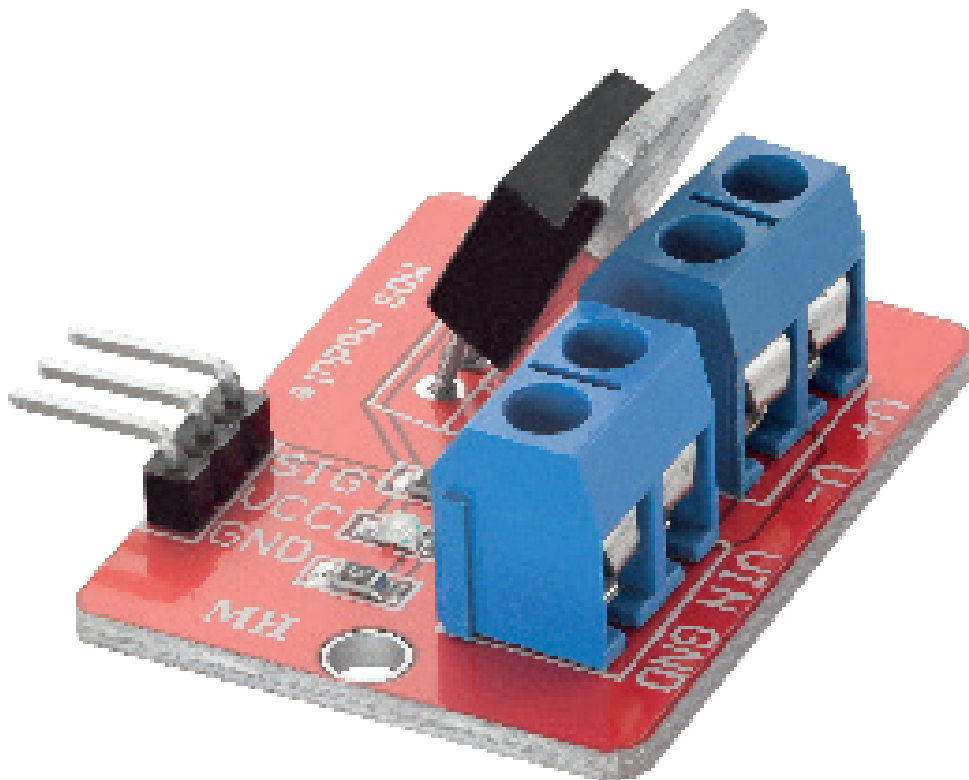


IRF520 MOS Driver Datenblatt



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1. Basic Specifications

This little module (HCMODU0083) is a breakout board for the IFR520 MOSFET transistor. The module is designed to switch heavy DC loads from a single digital pin of your microcontroller. Its main purpose is to provide a low cost way to drive a DC motor for robotics applications, but the module can be used to control most high current DC loads. Screw terminals are provided to interface to your load and external power source. An LED indicator provides a visual indication of when your load is being switched.

Weight: 10g

Size: 33.5mm x 25.5mm

Max load (drain) current: <5A

Input Voltage: 4V to 10V

Output load voltage: 0-24V

Applications: LED lights, DC motors, miniature pumps, solenoid valves.

V_{DS} (V)	100	
$R_{DS(ON)}$ (Ω)	$V_{GS}=10$ (V)	0.27
Q_g (Max.) (nC)	16	
Q_{gs} (nC)	4.4	
Q_{gs} (nC)	7.7	
Configuration	Single	

2. Absolute Maximum Ratings

T _C = 25 °C, unless otherwise noted					
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V _{DS}	100	V	
Gate-Source Voltage		V _{GS}	±20		
Continuous Drain Current	V _{GS} at 10V	I _D	T _C = 25 °C	9.2	A
			T _C = 100 °C	6.5	
Pulsed Drain Current (Note 1)		I _{DM}	37		
Linear Derating Factor			0.40	W/°C	
Single Pulse Avalanche Energy (Note 2)		E _{AS}	200	mJ	
Repetitive Avalanche Current (Note 1)		I _{AR}	9.2	A	
Repetitive Avalanche Energy (Note 1)		E _{AR}	6.0	mJ	
Maximum Power Dissipation	T _C = 25 °C		P _D	60	W
Peak Diode Recovery dV/dt (Note 3)		dV/dt	5.5	V/ns	
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to +175	°C	
Soldering Recommendations (Peak Temperature)	for 10s		300 (Note 4)		
Mounting Torque	6-32 or M3 screw		10	lbf · in	
			1.1	N · m	

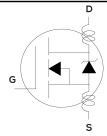
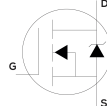
Notes:

1. Repetitive rating; pulse width limited by maximum junction temperature.
2. V_{DD} = 25 V, starting T_J = 25 °C, L = 3.5 mH, R_g = 25 Ω, I_{AS} = 9.2 A.
3. I_{SD} ≤ 9.A, dI/dt ≤ 110 A/μs, V_{DD} ≤ V_{DS}, T_J ≤ 175 °C.
4. 1.66 mm from case.

3. Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient	R_{thJA}	-	62	°C/W
Case-to-Sink, Flat, Greased Surface	R_{thCS}	0.50	-	
Maximum Junction-to-Case (Drain)	R_{thJC}	-	2.5	

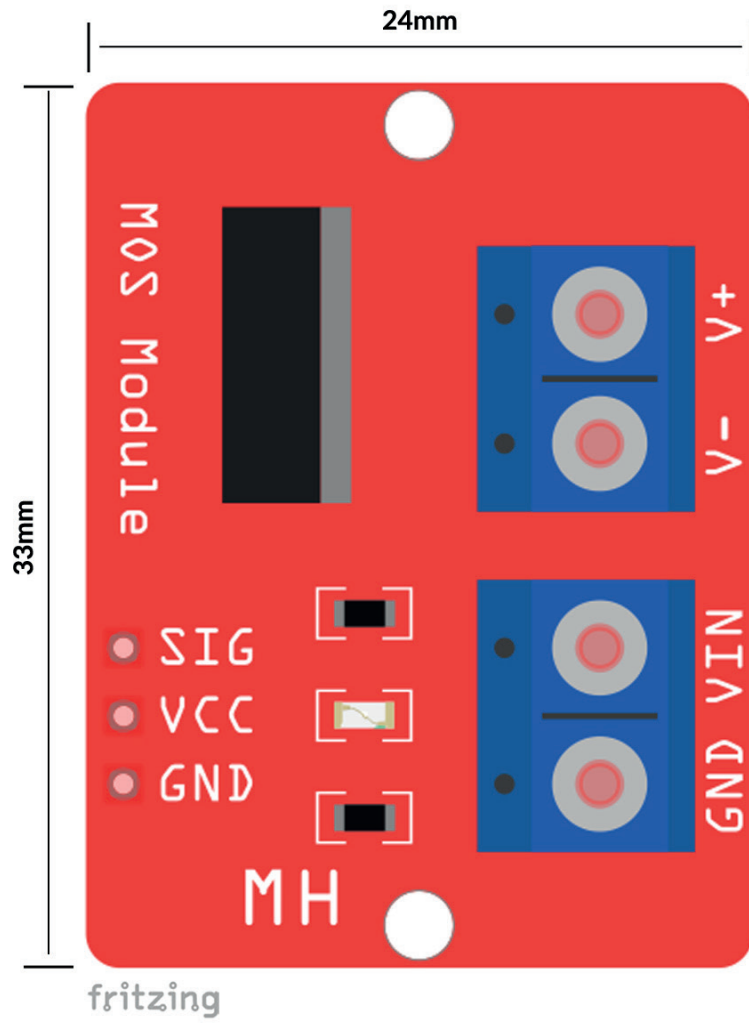
4. Specifications

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100	-	-	V
V _{DS} Temperature Coefficient	Δ V _{DS} /T _J	Reference to 25 °C, I _D = 1 mA	-	0.13	-	V / °C
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.0	-	4.0	V
Gate-Source Leakage	I _{GSS}	V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V	-	-	25	μA
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 150 °C	-	-	250	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 5.5 A (Note 1)	-	-	0.27	Ω
Forward Transconductance	g _{fs}	V _{DS} = 50 V, I _D = 5.5 A (Note 1)	0.27	-	-	S
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1.0 MHz	-	360	-	pF
Output Capacitance	C _{oss}		-	150	-	
Reverse Transfer Capacitance	C _{oss}		-	34	-	
Total Gate Charge	Q _g	V _{GS} = 10 V, I _D = 9.2 A, V _{DS} = 80 V	-	-	16	nC
Gate-Source Charge	Q _{gs}		-	-	4.4	
Gate-Drain Charge	Q _{gd}		-	-	7.7	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, I _D = 9.2 A R _g = 18 Ω, R _D = 5.2 Ω	-	8.8	-	ns
Rise Time	t _r		-	30	-	
Turn-Off Delay Time	t _{d(off)}		-	19	-	
Fall Time	t _f		-	20	-	
Internal Drain Inductance	L _D		Between lead, 6 mm (0.25") from package and center of die contact	-	4.5	
Internal Source Inductance	L _S		-	7.5	-	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode	-	-	9.2	A
Pulsed Diode Forward Current (Note 1)	I _{SM}		-	-	37	
Body Diode Voltage	V _S	T _J = 25 °C, I _S = 9.2 A, V _{GS} = 0 V (Note 2)	-	-	1.8	V
Body Diode Reverse Recovery Time	t _{rr}	T _J = 25 °C, I _F = 9.2 A, dI/dt = 100 A/μs (Note 2)	-	110	260	nS
Body Diode Reverse Recovery Charge	Q _{rr}		-	0.53	1.3	μC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S and L _D)				

Notes:

1. Repetitive rating; pulse width limited by maximum junction temperature.
2. Pulse width ≤ 300 μs; duty cycle ≤ 2 %.

5. Measurements



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