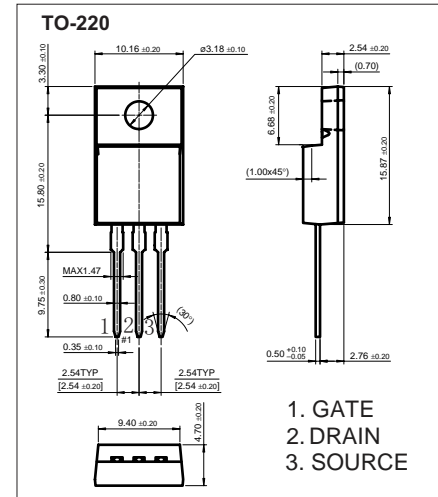


## HEXFET Power MOSFET

### IRF3205

#### Features

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- Fast Switching
- Fully Avalanche Rated



#### Absolute Maximum Ratings Ta = 25

Parameter	Symbol	Rating	Unit
Continuous Drain Current, V <sub>GS</sub> @ 10V, T <sub>C</sub> = 25	I <sub>D</sub>	110	A
Continuous Drain Current, V <sub>GS</sub> @ 10V, T <sub>C</sub> = 100	I <sub>D</sub>	80	
Pulsed Drain Current*1	I <sub>DM</sub>	390	
Power Dissipation	P <sub>D</sub>	200	W
Linear Derating Factor		1.3	W/
Linear Derating Factor	V <sub>GS</sub>	± 20	V
Avalanche Current *1	I <sub>AR</sub>	62	A
Repetitive Avalanche Energy *1	E <sub>AR</sub>	20	mJ
Peak Diode Recovery dv/dt *2	dv/dt	5	V/ns
Junction-to-Case	R <sub>JC</sub>	0.75 (Max)	/W
Case-to-Sink, Flat, Greased Surface	R <sub>CS</sub>	0.5	
Junction-to-Ambient	R <sub>JA</sub>	62 (Max)	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to + 175	

\*1 Repetitive rating; pulse width limited by max. junction temperature.

\*2 I<sub>SD</sub> 62A, di/dt 207A/μs, V<sub>DD</sub> V<sub>(BR)DSS</sub>, T<sub>J</sub> 175

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Electrical Characteristics Ta = 25

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	V <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	55			V
Static Drain-to-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 62A*1			8.0	m
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.0		4.0	V
Drain-to-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 55V, V <sub>GS</sub> = 0V			25	μA
		V <sub>DS</sub> = 44V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 150			250	
Gate-to-Source Forward Leakage	I <sub>GSS</sub>	V <sub>GS</sub> = 20V			100	nA
Gate-to-Source Reverse Leakage		V <sub>GS</sub> = -20V			-100	
Total Gate Charge	Q <sub>g</sub>	I <sub>D</sub> = 62A			146	nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> = 44V			35	
Gate-to-Drain ("Miller") Charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V,*1			54	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 28V		14		ns
Rise Time	t <sub>r</sub>	I <sub>D</sub> = 62A		101		
Turn-Off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 4.5		50		
Fall Time	t <sub>f</sub>	V <sub>GS</sub> = 10V *1		65		
Internal Drain Inductance	L <sub>D</sub>	Between lead, 6mm (0.25in.) from package and center of die contact		4.5		nH
Internal Source Inductance	L <sub>S</sub>			7.5		
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V		3247		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 25V		781		
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1.0MHz		211		
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25 , I <sub>F</sub> = 62A		69	104	ns
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 100A/μs*1		143	215	nC
Forward Turn-On Time	t <sub>on</sub>	Intrinsic turn-on time is negligible (turn-on is dominated by L <sub>S</sub> +L <sub>D</sub> )				
Continuous Source Current ( Body Diode)	I <sub>S</sub>	MOSFET symbol showing the integral reverse p-n junction diode.			110	A
Pulsed Source Current ( Body Diode) *2	I <sub>SM</sub>				390	
Diode Forward Voltage	V <sub>SD</sub>	T <sub>J</sub> = 25 , I <sub>S</sub> = 62A, V <sub>GS</sub> = 0V*1			1.3	V

\*1 Pulse width 400μs; duty cycle 2%.

\*2 Repetitive rating; pulse width limited by max. junction temperature.

# IRF3205

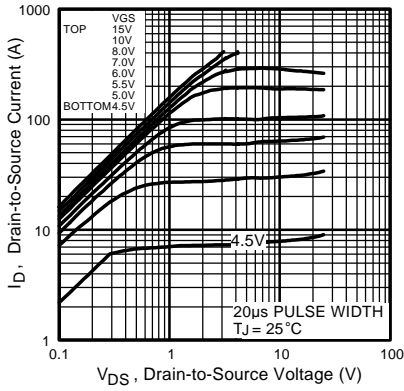


Fig 1. Typical Output Characteristics

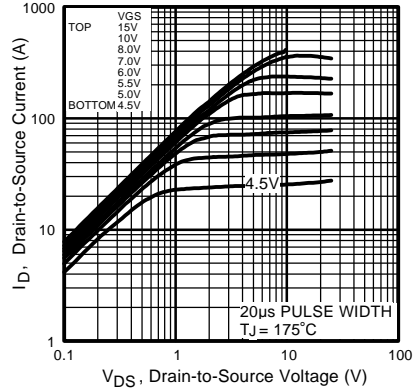


Fig 2. Typical Output Characteristics

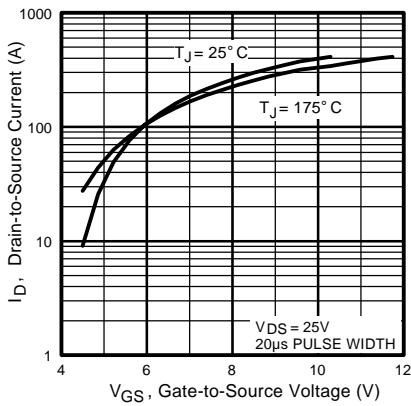


Fig 3. Typical Transfer Characteristics

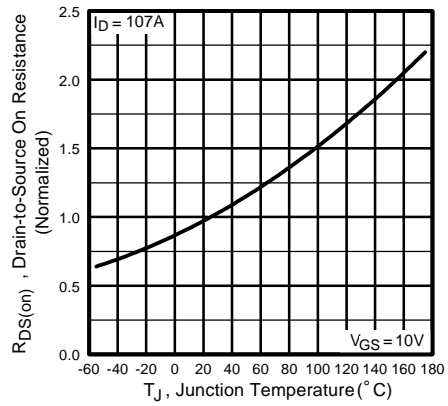


Fig 4. Normalized On-Resistance Vs. Temperature

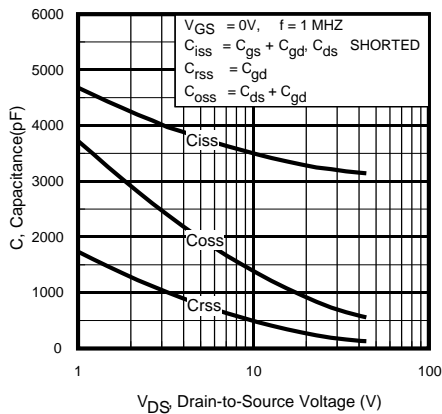


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

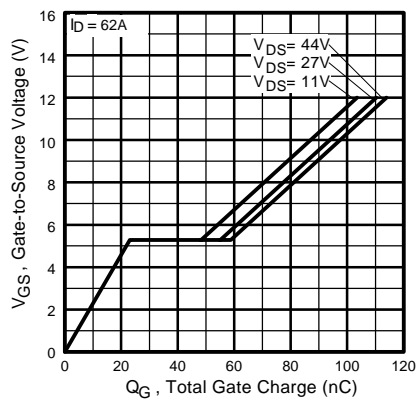
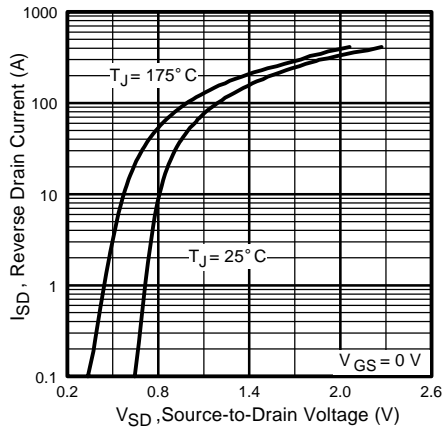
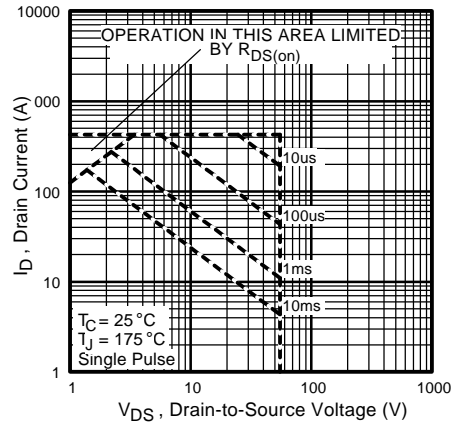


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

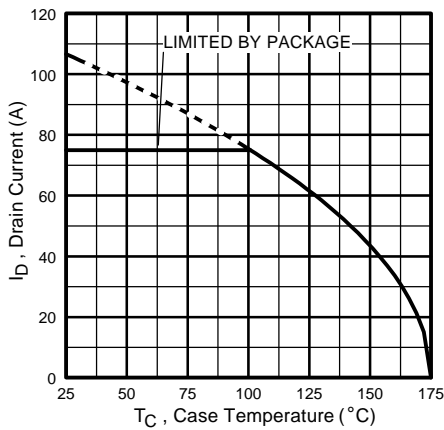
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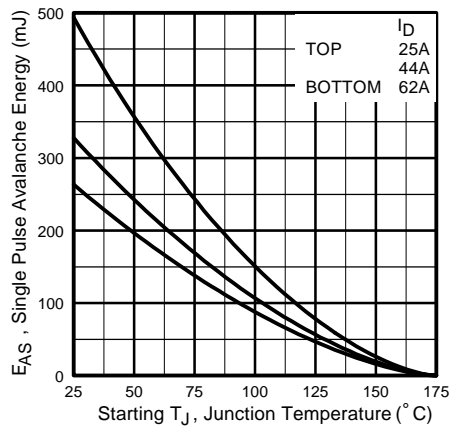
**Fig 7.** Typical Source-Drain Diode Forward Voltage



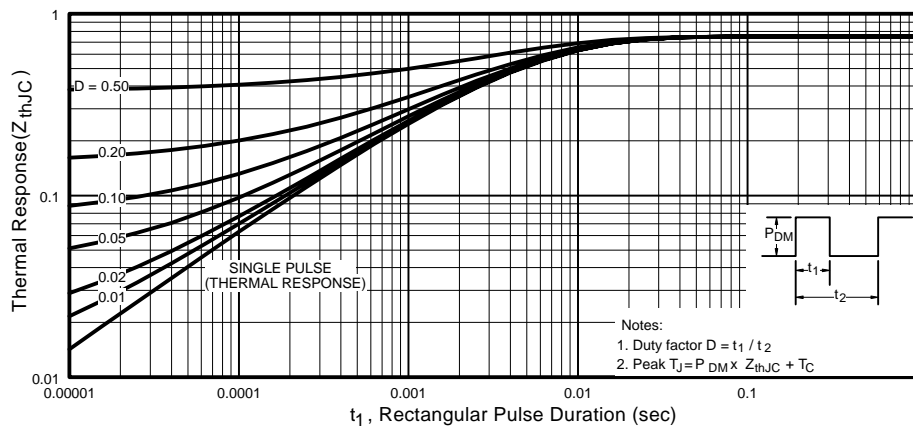
**Fig 8.** Maximum Safe Operating Area



**Fig 9.** Maximum Drain Current Vs. Case Temperature



**Fig 12c.** Maximum Avalanche Energy Vs. Drain Current



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case