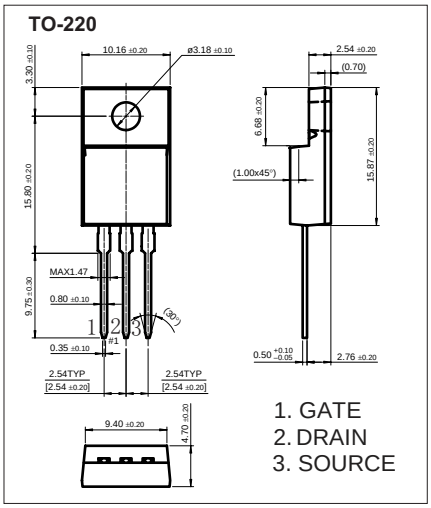
HEXFET Power MOSFET

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_{GS} @ 10V,T_C = 25℃	I_D	110	A
Continuous Drain Current, V_{GS} @ 10V,T_C = 100℃	I_D	80	
Pulsed Drain Current*1	I_{DM}	390	
Power Dissipation	P_D	200	W
Linear Derating Factor		1.3	W/℃
Linear Derating Factor	V_{GS}	± 20	V
Avalanche Current *1	I_{AR}	62	A
Repetitive Avalanche Energy *1	E_{AR}	20	mJ
Peak Diode Recovery dv/dt *2	dv/dt	5	V/ns
Junction-to-Case	$R_{\theta JC}$	0.75 (Max)	℃/W
Case-to-Sink, Flat, Greased Surface	$R_{\theta CS}$	0.5	
Junction-to-Ambient	$R_{\theta JA}$	62 (Max)	
Operating Junction and Storage Temperature Range	T_J.T_{STG}	-55 to + 175	℃

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

*2 I_{SD} ≤ 62A, di/dt ≤ 207A/μs, V_{DD} ≤ $V_{(BR)DSS}$,T_J ≤ 175℃

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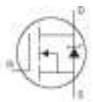
■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	V_{DSS}	V_{GS} = 0V, I_D = 250μA	55			V
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 62A*1			8.0	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS} = 55V, V_{GS} = 0V			25	μA
		V_{DS} = 44V, V_{GS} = 0V, T_J = 150℃			250	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS} = 20V			100	nA
Gate-to-Source Reverse Leakage		V_{GS} = -20V			-100	
Total Gate Charge	Q_g	I_D = 62A			146	nC
Gate-to-Source Charge	Q_{gs}	V_{DS} = 44V			35	
Gate-to-Drain ("Miller") Charge	Q_{gd}	V_{GS} = 10V,*1			54	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 28V		14		ns
Rise Time	t_r	I_D = 62A		101		
Turn-Off Delay Time	$t_{d(off)}$	R_G = 4.5Ω		50		
Fall Time	t_f	V_{GS}=10V *1		65		
Internal Drain Inductance	L_D	Between lead, 6mm (0.25in.) from package and center of die contact 		4.5		nH
Internal Source Inductance	L_S			7.5		
Input Capacitance	C_{iss}	V_{GS} = 0V		3247		pF
Output Capacitance	C_{oss}	V_{DS} = 25V		781		
Reverse Transfer Capacitance	C_{rss}	f = 1.0MHz		211		
Reverse Recovery Time	t_{rr}	T_J = 25℃, I_F = 62A		69	104	ns
Reverse RecoveryCharge	Q_{rr}	di/dt = 100A/μs*1		143	215	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				
Continuous Source Current（Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode. 			110	A
Pulsed Source Current （Body Diode) *2	I_{SM}				390	
Diode Forward Voltage	V_{SD}	T_J = 25℃, I_S = 62A, V_{GS} = 0V*1			1.3	V

*1 Pulse width ≤ 400μs; duty cycle ≤ 2%.

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

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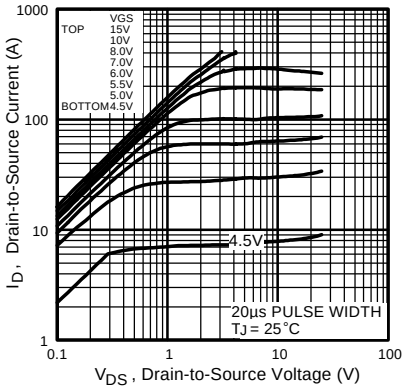

Fig 1. Typical Output Characteristics

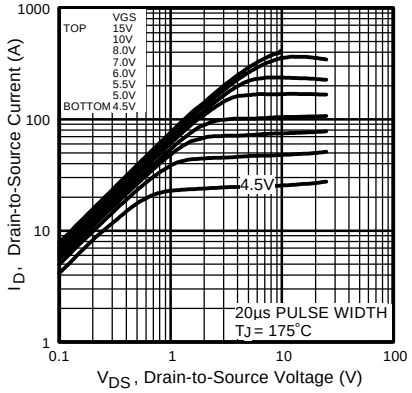

Fig 2. Typical Output Characteristics

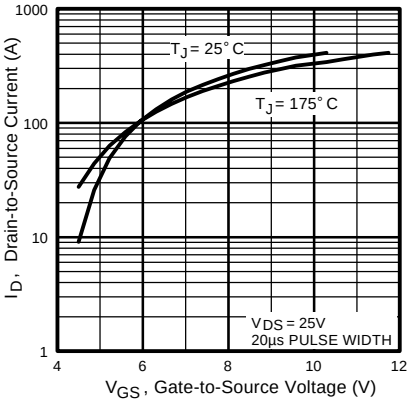

Fig 3. Typical Transfer Characteristics

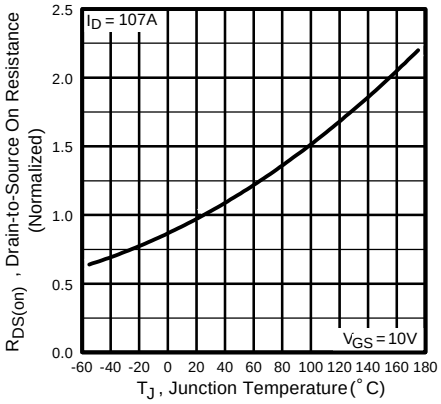

Fig 4. Normalized On-Resistance Vs. Temperature

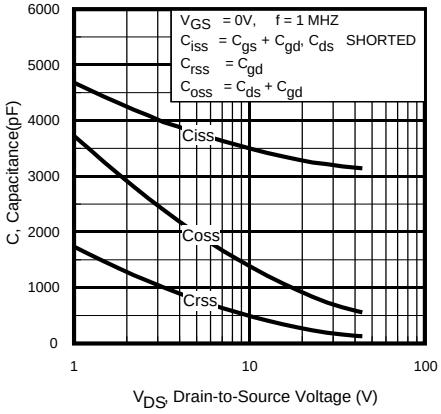

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

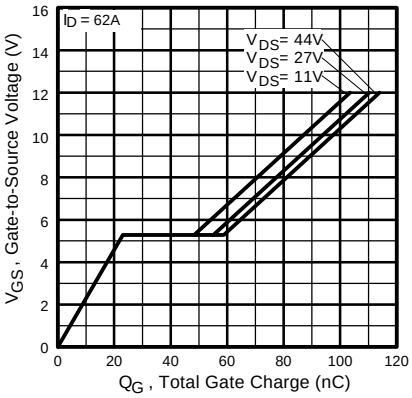

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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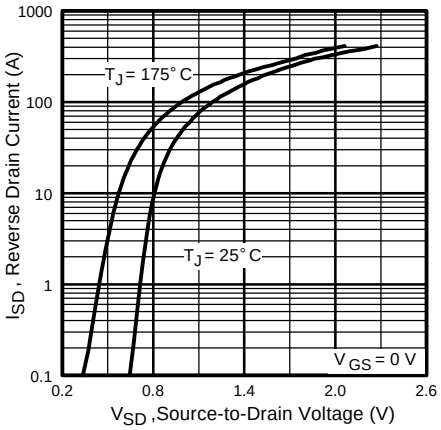

Fig 7. Typical Source-Drain Diode Forward Voltage

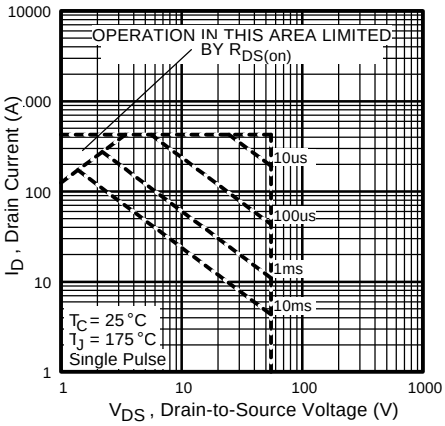

Fig 8. Maximum Safe Operating Area

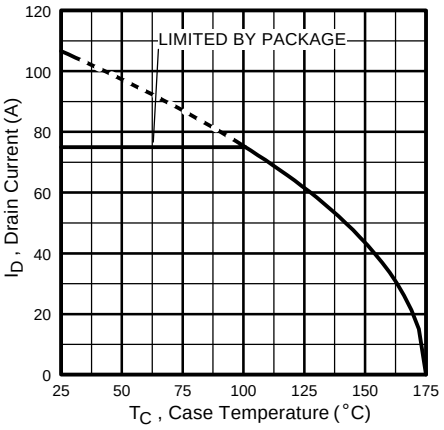

Fig 9. Maximum Drain Current Vs. Case Temperature

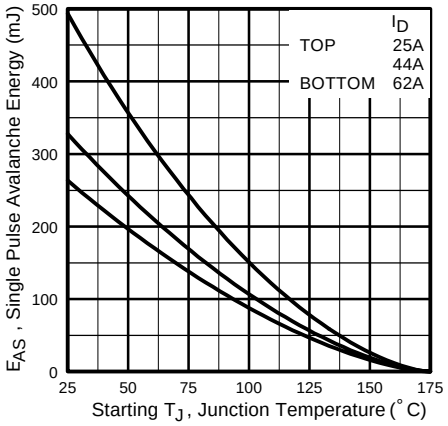

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

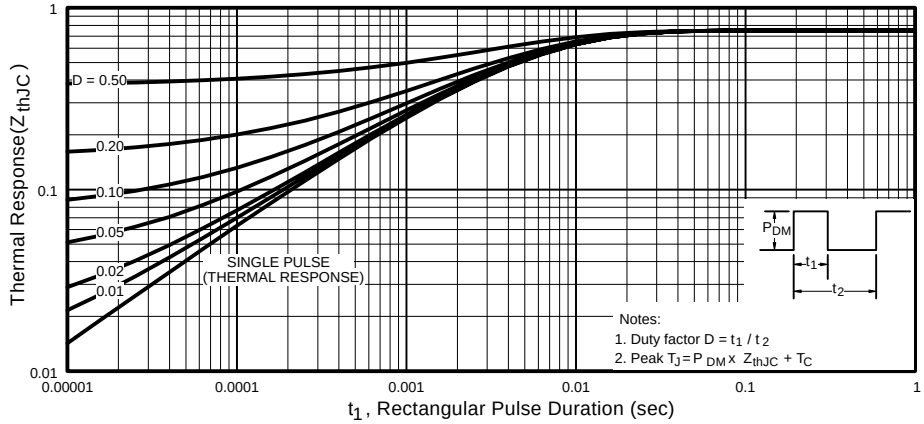

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case