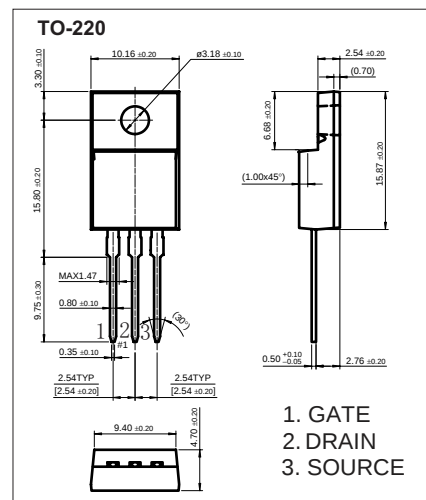


HEXFET Power MOSFET

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 _{θJC}	0.75 (Max)	/W
Case-to-Sink, Flat, Greased Surface	R _{θCS}	0.5	
Junction-to-Ambient	R _{θJA}	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	Testconditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0V, I_D = 250\mu A$	55			V
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 62A^{*1}$			8.0	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	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	$t_{d(off)}$	$R_G = 4.5\Omega$		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 Recovery Charge	Q_{rr}	$di/dt = 100A/\mu s^{*1}$		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}				1.3	V

*1 Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.

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

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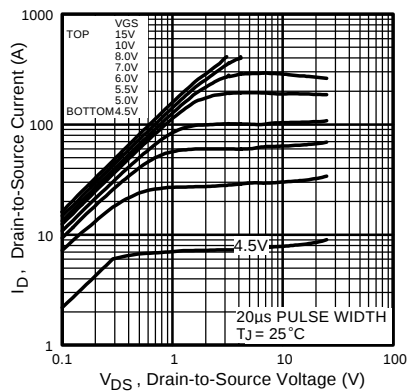


Fig 1. Typical Output Characteristics

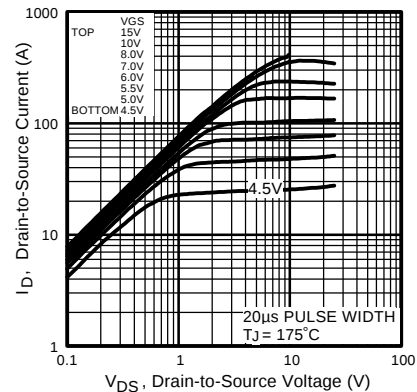


Fig 2. Typical Output Characteristics

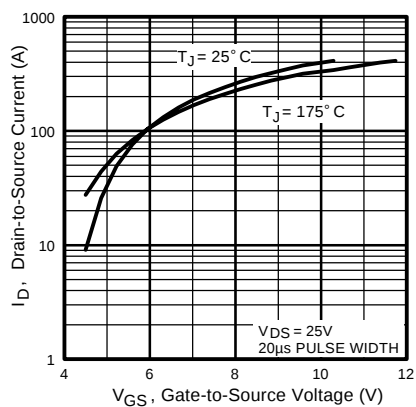


Fig 3. Typical Transfer Characteristics

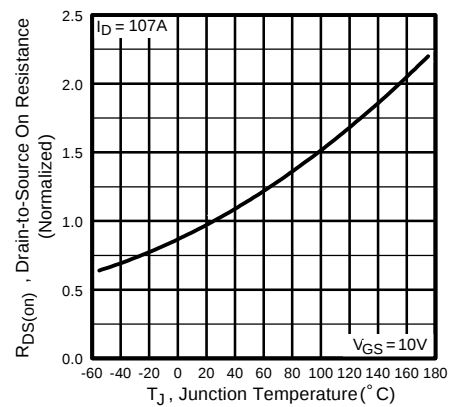


Fig 4. Normalized On-Resistance Vs. Temperature

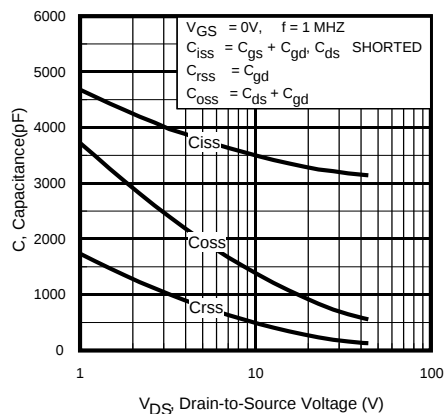


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

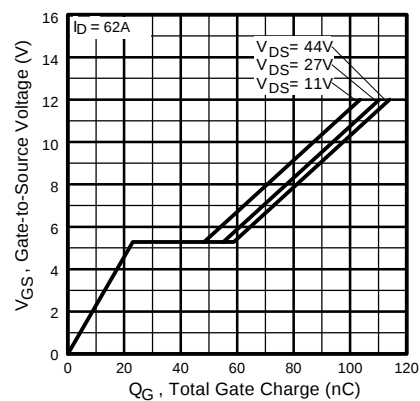


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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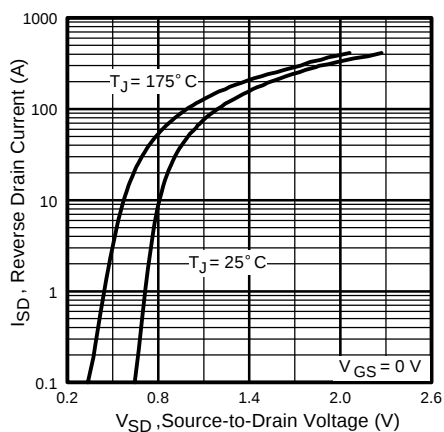


Fig 7. Typical Source-Drain Diode Forward Voltage

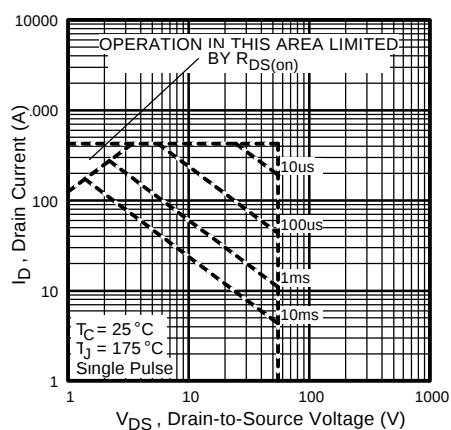


Fig 8. Maximum Safe Operating Area

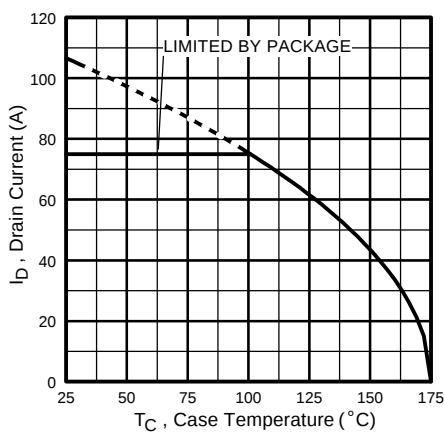


Fig 9. Maximum Drain Current Vs. Case Temperature

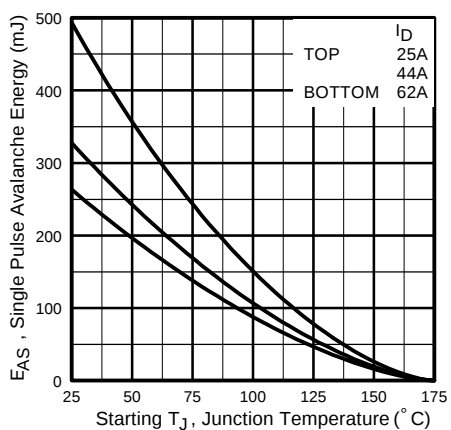


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

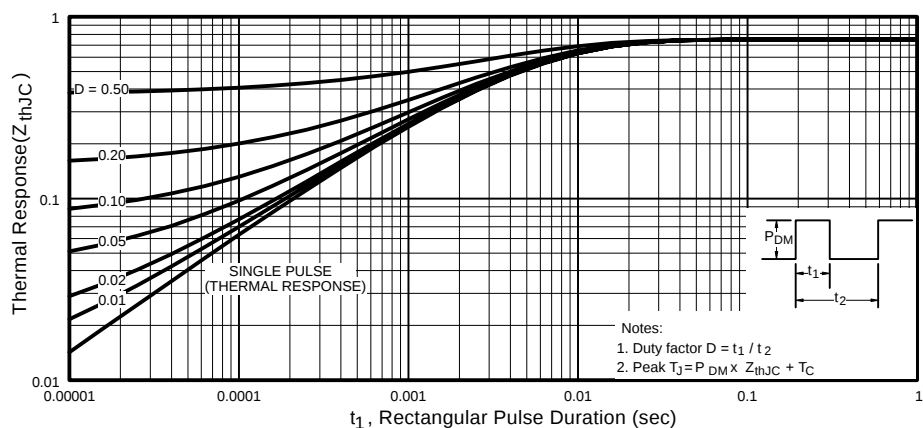


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case