

IRF3205PBF-VB Datasheet N-Channel 60 V (D-S) MOSFET

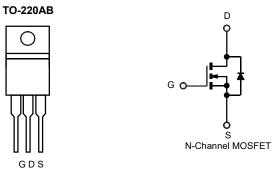
PRODUCT SUMMARY		
V _{DS}	60	V
R _{DS(on)} V _{GS} = 10 V	5	mΩ
ID	120	А
Configuration	Sin	gle

FEATURES

D

- 175 °C Junction Temperature
- Trench Power MOSFET
- Material categorization:





ABSOLUTE MAXIMUM RATINGS (T _C = 25	°C, unless other	vise noted)		
Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V _{GS}	± 20	V
Continuous Drain Current (T = 175 °Ch	T _C = 25 °C	1-	120	
Continuous Drain Current (T _J = 175 °C) ^b	T _C = 100 °C		90	
Pulsed Drain Current		I _{DM}	350	A
Continuous Source Current (Diode Conduction)		I _S	70ª	
Avalanche Current		I _{AS}	50	
Single Avalanche Energy (Duty Cycle \leq 1 %)	L = 0.1 mH	E _{AS}	125	mJ
Maximum Bower Dissinction	T _C = 25 °C	P _D	136	w
Maximum Power Dissipation	T _A = 25 °C		3 ^b , 8.3 ^{b, c}	V
Operating Junction and Storage Temperature Range		T _J , T _{stq}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
	$t \le 10 \text{ sec}$	P	15	18	
Maximum Junction-to-Ambient ^a	Steady State	R _{thJA}	40	50	°C/W
Maximum Junction-to-Case		R _{thJC}	0.85	1.1	

Notes:

a. Package limited. b. Surface mounted on 1" x 1" FR4 board.

c. t ≤ 10 s.

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Parameter	Symbol	Test Conditions	Min.	Typ.ª	Max.	Unit	
Static			1				
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	60			V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \ \mu A$	2		4	v	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		V _{DS} = 60 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I _{DSS}	V_{DS} = 60 V, V_{GS} = 0 V, T_{J} = 125 °C			50	μA	
		V_{DS} = 60 V, V_{GS} = 0 V, T_{J} = 175 °C			250		
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	60			А	
		V _{GS} = 10 V, I _D = 20 A		5			
	Б	V_{GS} = 10 V, I _D = 20 A, T _J = 125 °C		10		1	
Drain-Source On-State Resistance ^b	R _{DS(on)}	V_{GS} = 10 V, I _D = 20 A, T _J = 175 °C		15		mΩ	
		V _{GS} = 7.5 V, I _D = 15 A		8			
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic				1			
Input Capacitance	C _{iss}			6800			
Output Capacitance	C _{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		570		pF	
Reverse Transfer Capacitance	C _{rss}			325			
Total Gate Charge ^c	Qg			47	70		
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 30 V, V_{GS} = 10 V, I_{D} = 50 A		10		μA A mΩ S PF nC ns	
Gate-Drain Charge ^c	Q _{gd}			12			
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R_L = 0.6 Ω		15	25	20	
Turn-Off Delay Time ^c	t _{d(off)}	$I_D{\cong}50$ A, V_{GEN} = 10 V, R_g = 2.5 Ω		35	50	115	
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)					
Pulsed Current	I _{SM}			350		A	
Diode Forward Voltage	V _{SD}	I_{F} = 20 A, V_{GS} = 0 V		1	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/µs		45	100	ns	

Notes:

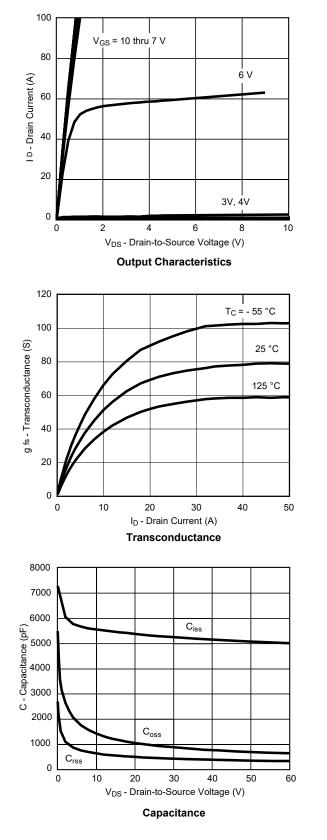
a. For design aid only; not subject to production testing. b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

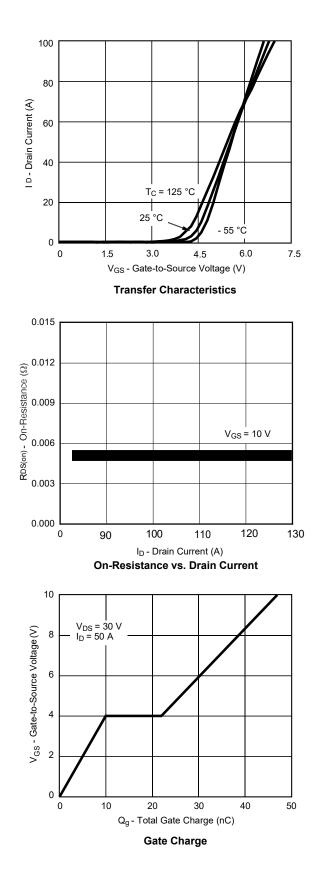
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



TYPICAL CHARACTERISTICS (25 °C unless noted)



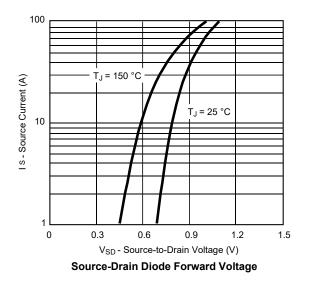




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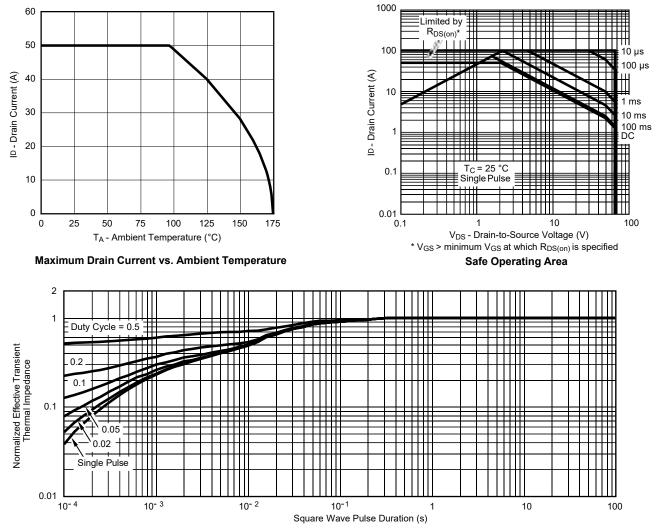


On-Resistance vs. Junction Temperature





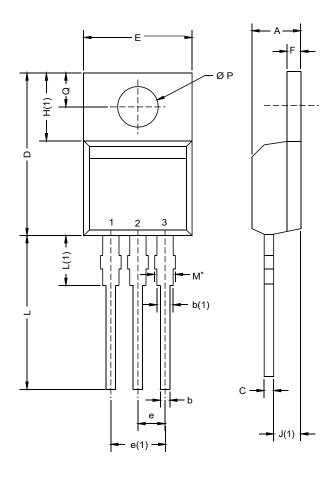
THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Case



TO-220AB



	MILLIM	IETERS	INCHES		
DIM.	MIN.	MAX.	MIN.	MAX.	
А	4.25	4.65	0.167	0.183	
b	0.69	1.01	0.027	0.040	
b(1)	1.20	1.73	0.047	0.068	
С	0.36	0.61	0.014	0.024	
D	14.85	15.49	0.585	0.610	
Е	10.04	10.51	0.395	0.414	
е	2.41	2.67	0.095	0.105	
e(1)	4.88	5.28	0.192	0.208	
F	1.14	1.40	0.045	0.055	
H(1)	6.09	6.48	0.240	0.255	
J(1)	2.41	2.92	0.095	0.115	
L	13.35	14.02	0.526	0.552	
L(1)	3.32	3.82	0.131	0.150	
ØР	3.54	3.94	0.139	0.155	
Q	2.60	3.00	0.102	0.118	
ECN: X12- DWG: 547	0208-Rev. N, 1	08-Oct-12			

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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