

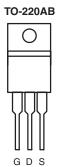
# HMS4030A-VB Datasheet N-Channel 100-V (D-S) 175 °C MOSFET

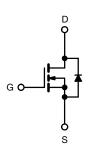
PRODUCT SUMMARY					
V <sub>DS</sub> (V)	100				
$R_{DS(on)}(\Omega)$ at $V_{GS} = 10 \text{ V}$	0. 009				
$R_{DS(on)}(\Omega)$ at $V_{GS} = 4.5 \text{ V}$	0. 020				
I <sub>D</sub> (A)	100				
Configuration	Single				

#### **FEATURES**

- TrenchFET® Power MOSFET
- 175 °C Maximum Junction Temperature
- Compliant to RoHS Directive 2002/95/EC







N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted					
Parameter			Limit	Unit	
Drain-Source Voltage			100	V	
Gate-Source Voltage			± 20	V	
Continuous Drain Current (T <sub>J</sub> = 150 °C)	T <sub>C</sub> = 25 °C	I <sub>D</sub>	100		
	T <sub>C</sub> = 125 °C		75 <sup>a</sup>	^	
Pulsed Drain Current	$I_{DM}$	300	Α		
Avalanche Current	L = 0.1 mH	I <sub>AS</sub>	75		
Single Pulse Avalanche Energy <sup>b</sup>	L = 0.1 IIII1	E <sub>AS</sub>	280	mJ	
Maximum Power Dissipation <sup>b</sup>	$T_C = 25$ °C (TO-220AB and TO-263)	P <sub>D</sub>	250 <sup>c</sup>	W	
	T <sub>A</sub> = 25 °C (TO-263) <sup>d</sup>	ט י	3.75	] **	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Limit	Unit	
Junction-to-Ambient	PCB Mount (TO-263) <sup>d</sup>	- R <sub>thJA</sub>	40		
Junction-to-Ambient	Free Air (TO-220AB)	□ □thJA	62.5	°C/W	
Junction-to-Case		R <sub>thJC</sub>	0.6		

#### Notes

- a. Pulse test; pulse width  $\leq$  300  $\mu$ s, duty cycle  $\leq$  2 %.
- b. Guaranteed by design, not subject to production testing.
- 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.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{DS}$ $V_{GS} = 0 \text{ V, } I_{D} = 250  \mu\text{A}$				v	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \mu A$	2		4	V	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$		± 100	nA	
Zero Gate Voltage Drain Current		V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V			1		
	I <sub>DSS</sub>	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	μΑ	
		V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} = \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	120			Α	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A		0.009			
D	D.	$V_{GS} = 4.5 \text{ V}, I_{D} = 20 \text{ A}$		0.020		_	
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 125 °C		0.023		Ω	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 175 °C		0.030			
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 30 A	25			S	
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			4700		pF	
Output Capacitance	C <sub>oss</sub>	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		665			
Reverse Transfer Capacitance	C <sub>rss</sub>	7		265			
Total Gate Charge <sup>c</sup>	$Q_g$			105	160		
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{DS} = 50 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 85 \text{ A}$		17		nC	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>	7		23			
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			12	25		
Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD} = 50 \text{ V}, R_{L} = 0.6 \Omega$		90	135		
Turn-Off DelayTime <sup>c</sup>	t <sub>d(off)</sub>	$I_D\cong 85$ A, $V_{GEN}=10$ V, $R_g=2.5~\Omega$		55	85	ns	
Fall Time <sup>c</sup>	t <sub>f</sub>	7		130	195	7	
Source-Drain Diode Ratings and Char	racteristics T <sub>C</sub>	= 25 °C <sup>b</sup>					
Continuous Current	Is				85	^	
Pulsed Current	I <sub>SM</sub>				240	Α	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 85 A, V <sub>GS</sub> = 0 V		1.0	1.5	V	
Reverse Recovery Time	t <sub>rr</sub>			85	140	ns	
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>	I <sub>F</sub> = 50 A, dI/dt = 100 A/μs		4.5	7	Α	
Reverse Recovery Charge	Q <sub>rr</sub>	1		0.17	0.35	μС	

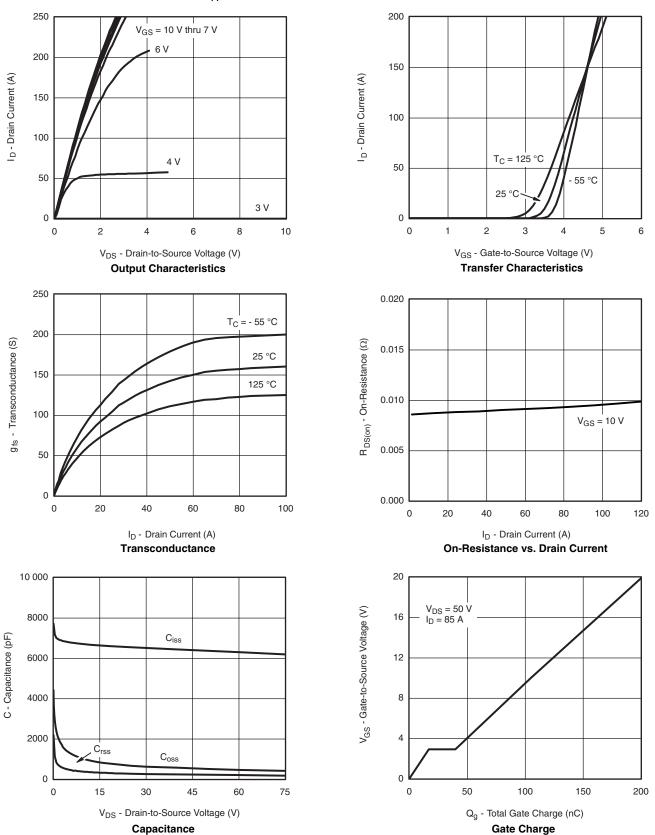
#### Notes:

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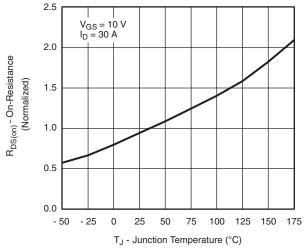
### **TYPICAL CHARACTERISTICS** $T_A = 25$ °C, unless otherwise noted



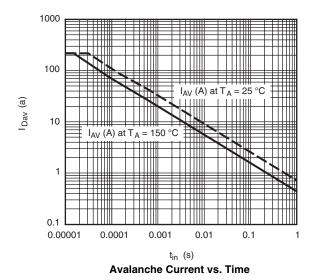
服务热线:400-655-8788 3



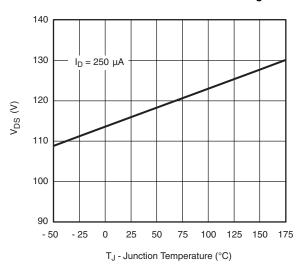
## **TYPICAL CHARACTERISTICS** $T_A = 25 \, ^{\circ}C$ , unless otherwise noted



#### On-Resistance vs. Junction Temperature



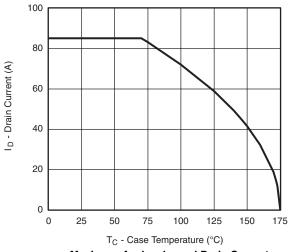
Source-Drain Diode Forward Voltage



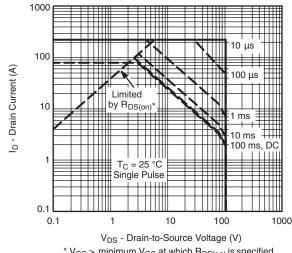
T<sub>J</sub> - Drain-Source Breakdown vs. Junction-Temperature



#### **THERMAL RATINGS**

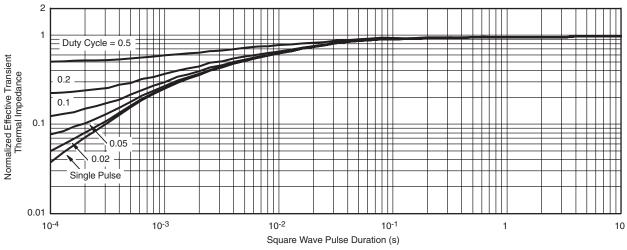






\*  $V_{GS}$  > minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

Safe Operating Area



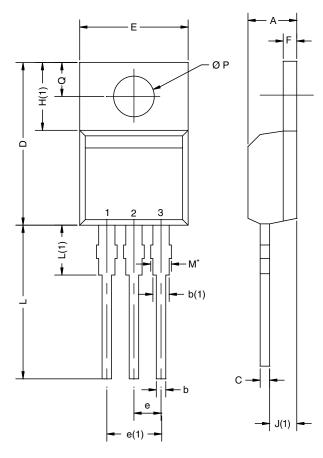
Normalized Thermal Transient Impedance, Junction-to-Case

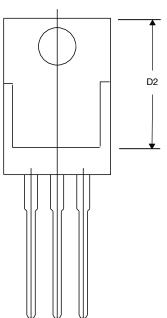
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# **TO-220AB**





	MILLIM	IETERS	INC	HES	
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	
D2	12.19	12.70	0.480	0.500	
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	
ØΡ	3.54	3.94	0.139	0.155	
Q	2.60	3.00	0.102	0.118	
ECN: T14-0413-Rev. P, 16-Jun-14 DWG: 5471					

#### Note

 $^{\star}$  M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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