

H7N0308CF-VB Datasheet

N-Channel 30-V (D-S) MOSFET

PRODU	CT SUMMARY		
V _{DS} (V)	$R_{DS(on)}$ (Ω)	I _D (A) ^{a, e}	Q _g (Typ)
30	$0.004 \text{ at V}_{GS} = 10 \text{ V}$	140	82 nC
30	0.005 at $V_{GS} = 4.5 \text{ V}$	120	02 IIC

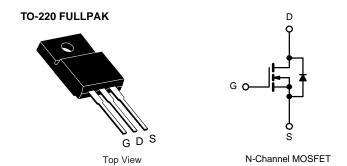
FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2011/65/EU



APPLICATIONS

- OR-ing
- Server
- DC/DC



Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	± 20	V
	T _C = 25 °C		140 ^{a, e}	
Continuous Drain Current (T _{.I} = 175 °C)	T _C = 70 °C		120 ^e	
Continuous Diam Current (1) = 173 C)	T _A = 25 °C	I _D	28.8 ^{b, c}	A
	T _A = 70 °C		27 ^{b, c}	^
Pulsed Drain Current		I _{DM}	168	
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	36	
Single Pulse Avalanche Energy	L=0.1 mn	E _{AS}	64.8	V
	T _C = 25 °C	I-	90 ^{a, e}	A
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	3.13 ^{b, c}	A
	T _C = 25 °C		250 ^a	
	T _C = 70 °C	P _D	175	w
Maximum Power Dissipation	T _A = 25 °C	' D	3.75 ^{b, c}	VV
	T _A = 70 °C		2.63 ^{b, c}	
Operating Junction and Storage Temperature R	ange	T _J , T _{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Тур.	Max.	Unit		
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 sec	R_{thJA}	32	40	°C/W		
Maximum Junction-to-Case	Steady State	R_{thJC}	0.5	0.6			

Notes:

- a. Based on T_C = 25 °C.
 b. Surface mounted on 1" x 1" FR4 board.

- b. Striate informed on 1 X 1 114 board.
 c. t = 10 sec.
 d. Maximum under steady state conditions is 90 °C/W.
 e. Calculated based on maximum junction temperature. Package limitation current is 90 A.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_{D} = 250 \mu\text{A}$	30			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = 250 μA		35		~~\//°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	1 _D = 230 μΑ		- 7.5		mV/°0
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0		2.5	V
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1	
	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C			10	μA
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α
Drain-Source On-State Resistance ^a	D	V _{GS} = 10 V, I _D = 28.8 A		0.004		
	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 27 \text{ A}$	0.005			Ω
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 28.8 A		160		S
Dynamic ^b						
Input Capacitance	C _{iss}			2765		
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		725		pF
Reverse Transfer Capacitance	C _{rss}			270		1
Total Gate Charge	0	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 28.8 \text{ A}$		171		nC
	Q_g			81.5		
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 28.8 \text{ A}$		34		
Gate-Drain Charge	Q _{gd}			29		
Gate Resistance	R _g	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	t _{d(on)}			18	27	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.625 Ω		11	17	ns
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 24$ A, V_{GEN} = 10 V, R_g = 1 Ω		70	105	
Fall Time	t _f			10	15	
Turn-On Delay Time	t _{d(on)}			55	83	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.67 Ω		180	270	
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 22.5$ A, V_{GEN} = 4.5 V, R_g = 1 Ω		55	83	
Fall Time	t _f			12	18	
Drain-Source Body Diode Characteristic	s					
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		168		Λ
Pulse Diode Forward Current ^a	I _{SM}			168		A
Body Diode Voltage	V_{SD}	I _S = 22 A		0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}			52	78	ns
Body Diode Reverse Recovery Charge	Q _{rr}	-		70.2	105	nC
Reverse Recovery Fall Time	t _a	$I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		27		
Reverse Recovery Rise Time	t _b					ns

Notes:

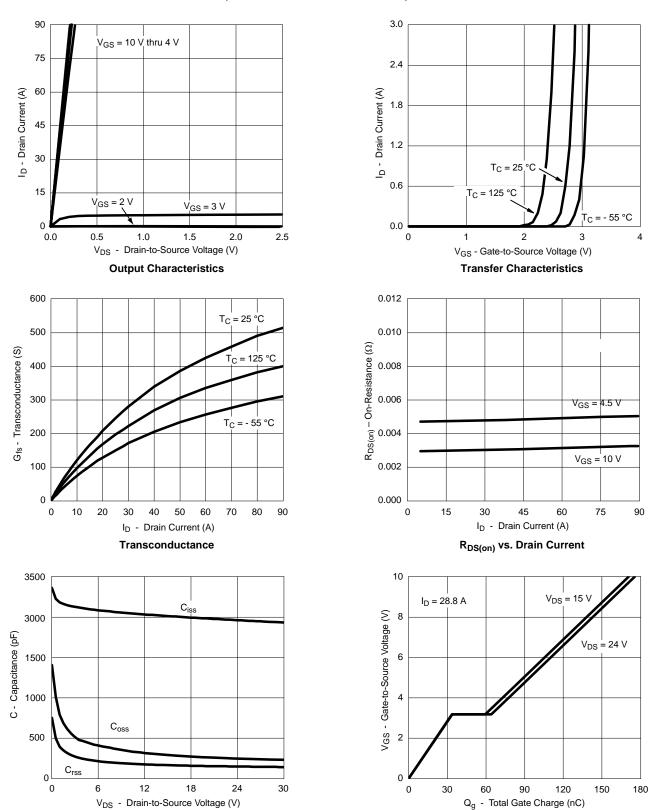
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.

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.

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



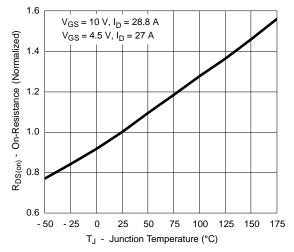
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Capacitance

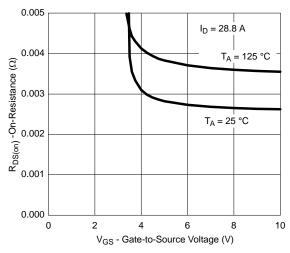
Gate Charge



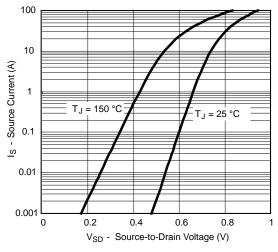
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



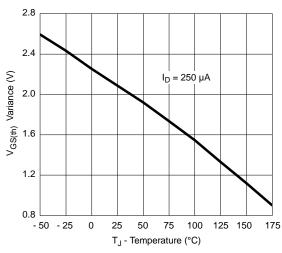
On-Resistance vs. Junction Temperature



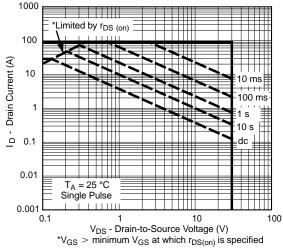
 $R_{DS(on)}$ vs. V_{GS} vs. Temperature



Forward Diode Voltage vs. Temperature



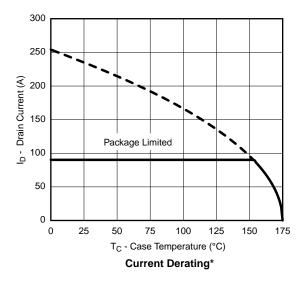
Threshold Voltage

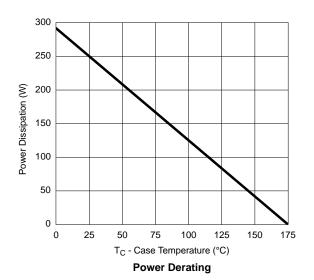


Safe Operating Area, Junction-to-Ambient

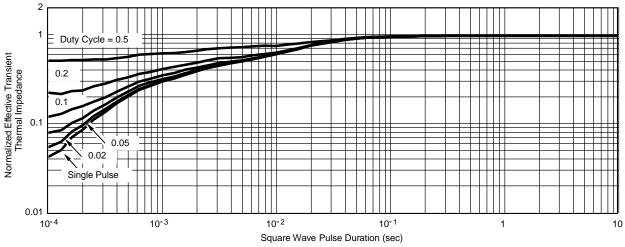


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

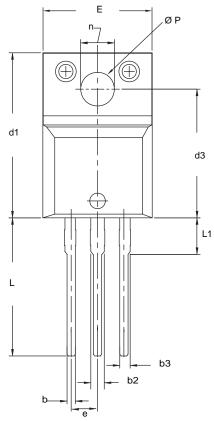


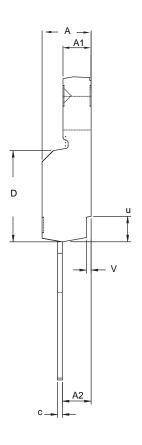
Normalized Thermal Transient Impedance, Junction-to-Case

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TO-220 FULLPAK (HIGH VOLTAGE)





DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.570	4.830	0.180	0.190
A1	2.570	2.830	0.101	0.111
A2	2.510	2.850	0.099	0.112
b	0.622	0.890	0.024	0.035
b2	1.229	1.400	0.048	0.055
b3	1.229	1.400	0.048	0.055
С	0.440	0.629	0.017	0.025
D	8.650	9.800	0.341	0.386
d1	15.88	16.120	0.622	0.635
d3	12.300	12.920	0.484	0.509
E	10.360	10.630	0.408	0.419
е	2.54	BSC	0.100 BSC	
L	13.200	13.730	0.520	0.541
L1	3.100	3.500	0.122	0.138
n	6.050	6.150	0.238	0.242
ØΡ	3.050	3.450	0.120	0.136
u	2.400	2.500	0.094	0.098
V	0.400	0.500	0.016	0.020

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- To be used only for process drawing.
 These dimensions apply to all TO-220, FULLPAK leadframe versions 3 leads.
 All critical dimensions should C meet C_{pk} > 1.33.
 All dimensions include burrs and plating thickness.
 No chipping or package damage.

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