<u>MOSFET</u> – Power, Single N-Channel, μ**8FL** 30 V, 4.2 mΩ, 71 A

Features

- Low R_{DS(on)} to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- NVTFS4C06NWF Wettable Flanks Product
- NVT Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

	(0		,		
Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V _{DSS}	30	V
Gate-to-Source Voltage			V _{GS}	±20	V
Continuous Drain Current R _{R.IA}		T _A = 25°C	Ι _D	21	A
(Notes 1, 2, 4)		T _A = 100°C		15	
Power Dissipation $R_{\theta JA}$		T _A = 25°C	PD	3.1	W
(Note 1, 2, 4)	Steady	T _A = 100°C		1.6	
Continuous Drain	State	$T_A = 25^{\circ}C$	Ι _D	71	
Current R _{θJC} (Note 1, 3, 4)		T _A = 100°C		50	A
Power Dissipation		T _A = 25°C	PD	37	W
R _{θJC} (Note 1, 3, 4)		T _A = 100°C		18	
Pulsed Drain Current	$T_A = 25^{\circ}C, t_p = 10 \ \mu s$		I _{DM}	367	А
Operating Junction and Storage Temperature			T _J , T _{stg}	–55 to +175	°C
Source Current (Body Diode)			ا _S	33	А
Single Pulse Drain–to–Source Avalanche Energy (T _J = 25°C, I _L = 26 A _{pk} , L = 0.1 mH)			E _{AS}	34	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			ΤL	260	°C

MAXIMUM RATINGS (T_J = 25°C unless otherwise stated)

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case - Steady State (Drain) (Notes 1 and 4)	$R_{ extsf{ heta}JC}$	4.1	°C/W
Junction-to-Ambient – Steady State (Notes 1 and 2)	R_{\thetaJA}	48	0/11

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2. Surface-mounted on FR4 board using a 650 mm² 2 oz. Cu pad.
- 3. Assumes heat-sink sufficiently large to maintain constant case temperature independent of device power.
- 4. Continuous DC current rating. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle.

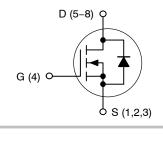


ON Semiconductor®

http://onsemi.com

V _{(BR)DSS}	R _{DS(on)} MAX	I _D MAX
30 V	4.2 mΩ @ 10 V	71 A
30 V	6.1 mΩ @ 4.5 V	

N-Channel MOSFET



MARKING DIAGRAM sб b D XXXX WDFN8 S Γ AYWW-(µ8FL) sd CASE 511AB G h D 4C06 = Specific Device Code for NVMTS4C06N 06WF = Specific Device Code of NVTFS4C06NWF

А	= Assembly Location

Y = Year WW = Work Week

= Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

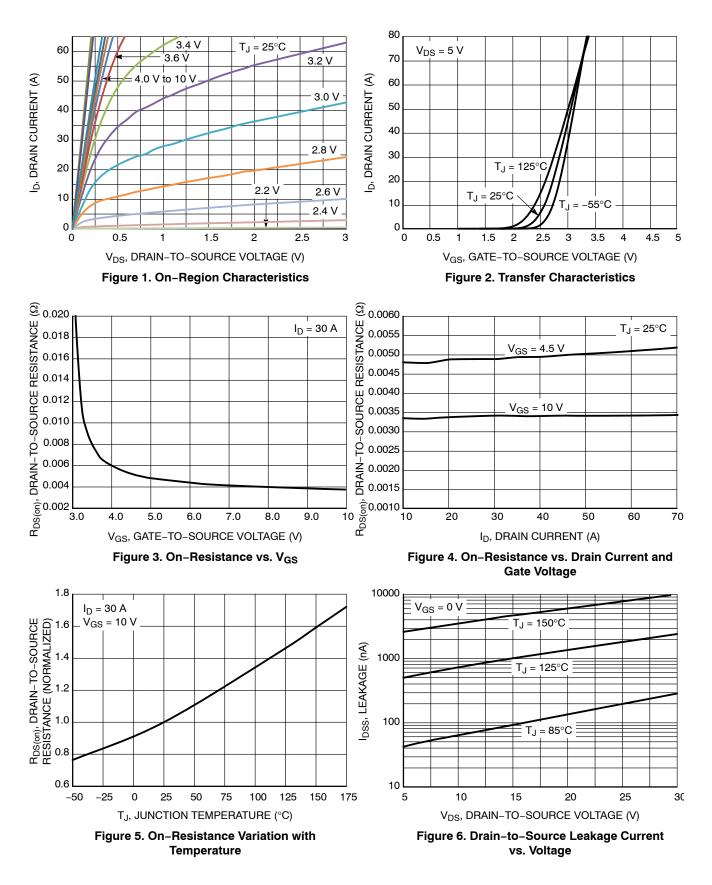
See detailed ordering and shipping information on page 5 of this data sheet.

ELECTRICAL CHARACTERISTICS (T_J = $25^{\circ}C$ unless otherwise specified)

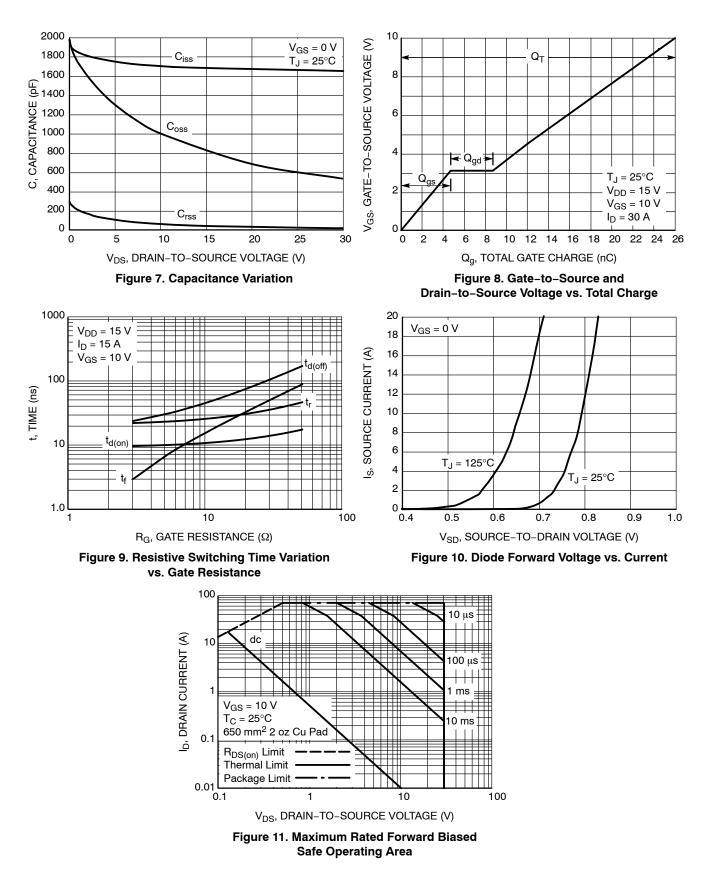
Parameter	Symbol	Test Condition		Min	Тур	Max	Unit	
OFF CHARACTERISTICS								
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V_{GS} = 0 V, I _D = 250 μ A		30			V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} / T _J				14.4		mV/°C	
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = 24 V	$T_J = 25^{\circ}C$			1.0		
		v _{DS} = 24 v	T _J = 125°C			10	Αμ C	
Gate-to-Source Leakage Current	I _{GSS}	V_{DS} = 0 V, V_{GS}	; = ±20 V			±100	nA	
ON CHARACTERISTICS (Note 5)								
Gate Threshold Voltage	V _{GS(TH)}	$V_{GS} = V_{DS}, I_D$	= 250 μA	1.3		2.2	V	
Negative Threshold Temperature Coefficient	V _{GS(TH)} /T _J				3.8		mV/∘C	
Drain-to-Source On Resistance	R _{DS(on)}	V _{GS} = 10 V	I _D = 30 A		3.4	4.2	mΩ	
		V _{GS} = 4.5 V	I _D = 30 A		4.9	6.1	11152	
Forward Transconductance	9fs	V _{DS} = 1.5 V, I	_D = 15 A		58		S	
Gate Resistance	R _G	T _A = 25°	C		1.0		Ω	
CHARGES AND CAPACITANCES								
Input Capacitance	C _{ISS}				1683		pF	
Output Capacitance	C _{OSS}	V _{GS} = 0 V, f = 1 MH	z, V _{DS} = 15 V		841			
Reverse Transfer Capacitance	C _{RSS}				40		1	
Capacitance Ratio	C _{RSS} /C _{ISS}	V _{GS} = 0 V, V _{DS} = 15 V, f = 1 MHz			0.023			
Total Gate Charge	Q _{G(TOT)}				11.6		1	
Threshold Gate Charge	Q _{G(TH)}				2.6		nC	
Gate-to-Source Charge	Q _{GS}	V _{GS} = 4.5 V, V _{DS} = 1	15 V; I _D = 30 A		4.7			
Gate-to-Drain Charge	Q _{GD}				4.0		1	
Gate Plateau Voltage	V _{GP}				3.1		V	
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 10 V, V _{DS} = 1	5 V; I _D = 30 A		26		nC	
SWITCHING CHARACTERISTICS (Note 6)							8	
Turn–On Delay Time	t _{d(ON)}				10			
Rise Time	t _r	$V_{CC} = 45 V V_{C}$	e = 15 V		32		- ns	
Turn–Off Delay Time	t _{d(OFF)}	V _{GS} = 4.5 V, V _D I _D = 15 A, R _G	= 3.0 Ω		18			
Fall Time	t _f				5.0			
Turn-On Delay Time	t _{d(ON)}				8.0			
Rise Time	t _r		e = 15 V		28		1	
Turn-Off Delay Time	t _{d(OFF)}	V_{GS} = 10 V, V_{DS} = 15 V, I_{D} = 15 A, R_{G} = 3.0 Ω			24		ns	
Fall Time	t _f				3.0			
DRAIN-SOURCE DIODE CHARACTERISTIC						1	1	
Forward Diode Voltage	V _{SD}	V _{GS} = 0 V,	T _J = 25°C		0.8	1.1	V	
		V _{GS} = 0 V, I _S = 10 A	T _J = 125°C		0.63			
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dlS/dt = 100 A/µs, I _S = 30 A			34			
Charge Time	ta				17		ns	
Discharge Time	t _b				17		•	
Reverse Recovery Charge	Q _{RR}				22		nC	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions. 5. Pulse Test: pulse width \leq 300 µs, duty cycle \leq 2%. 6. Switching characteristics are independent of operating junction temperatures.

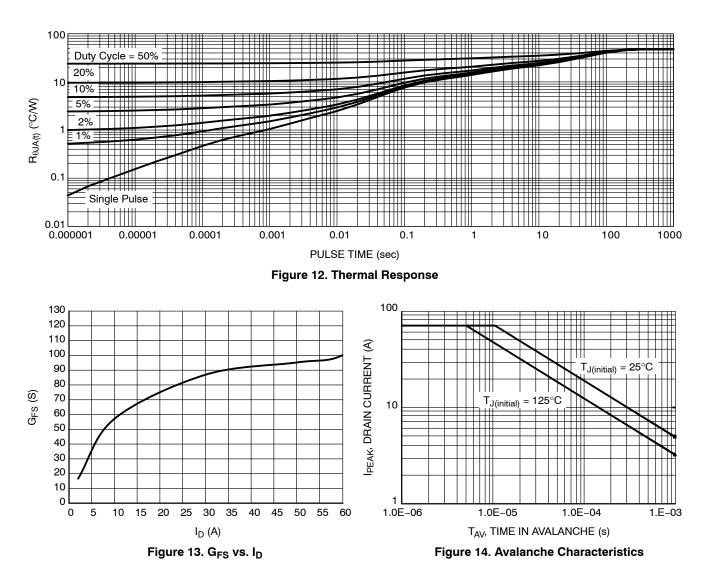
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



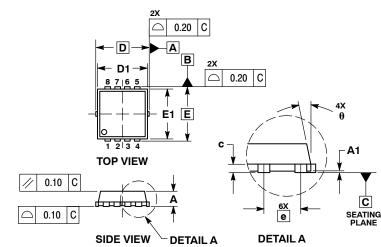
ORDERING INFORMATION

Device	Package	Shipping [†]
NVTFS4C06NTAG	WDFN8 (Pb-Free)	1500 / Tape & Reel
NVTFS4C06NWFTAG	WDFN8 (Pb-Free)	1500 / Tape & Reel
NVTFS4C06NTWG	WDFN8 (Pb-Free)	5000 / Tape & Reel
NVTFS4C06NWFTWG	WDFN8 (Pb-Free)	5000 / Tape & Reel

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

WDFN8 3.3x3.3, 0.65P CASE 511AB ISSUE D



3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS. MILLIMETERS INCHES

NOTES:

	MILLIMETERS			INCHES			
DIM	MIN	NOM	MAX	MIN	NOM	MAX	
Α	0.70	0.75	0.80	0.028	0.030	0.031	
A1	0.00		0.05	0.000		0.002	
b	0.23	0.30	0.40	0.009	0.012	0.016	
с	0.15	0.20	0.25	0.006	0.008	0.010	
D		3.30 BSC		0	.130 BSC	;	
D1	2.95	3.05	3.15	0.116	0.120	0.124	
D2	1.98	2.11	2.24	0.078	0.083	0.088	
Е		3.30 BSC		0.130 BSC			
E1	2.95	3.05	3.15	0.116	0.120	0.124	
E2	1.47	1.60	1.73	0.058	0.063	0.068	
E3	0.23	0.30	0.40	0.009	0.012	0.016	
е	0.65 BSC			0.026 BSC			
G	0.30	0.41	0.51	0.012	0.016	0.020	
к	0.65	0.80	0.95	0.026	0.032	0.037	
L	0.30	0.43	0.56	0.012	0.017	0.022	
L1	0.06	0.13	0.20	0.002	0.005	0.008	
М	1.40	1.50	1.60	0.055	0.059	0.063	
θ	0 °		12 °	0 °		12 °	

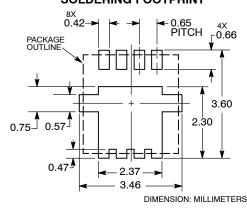
DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
CONTROLLING DIMENSION: MILLIMETERS.

С В 0.10 А 0.05 С e/2 4X Ā É2 E3 м ¥ D2 G **BOTTOM VIEW**

8X

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SOLDERING FOOTPRINT*



*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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