Onsemi

MOSFET - Power, Single N-Channel, SO-8 FL 30 V, 69 A NTMFS4C06NC

Features

- Low R_{DS(on)} to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- CPU Power Delivery
- DC-DC Converters

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

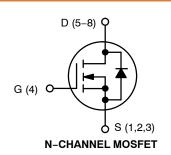
Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V _{DSS}	30	V
Gate-to-Source Voltage			V _{GS}	±20	V
Continuous Drain Current R _{θJA} (Note 1)		$T_A = 25^{\circ}C$ $T_A = 80^{\circ}C$	Ι _D	20.0 14.9	A
Power Dissipation $R_{\theta JA}$ (Note 1)		T _A = 25°C	P _D	2.55	W
Continuous Drain Current $R_{\theta JA} \le 10$ s		T _A = 25°C	Ι _D	31.6	A
(Note 1)		$T_A = 80^{\circ}C$		23.7	
Power Dissipation $R_{\theta JA} \leq 10 \text{ s} \text{ (Note 1)}$	Steady	T _A = 25°C	PD	6.4	W
Continuous Drain	State	$T_A = 25^{\circ}C$	۱ _D	11	А
Current R _{θJA} (Note 2)		$T_A = 80^{\circ}C$		8.2	
Power Dissipation $R_{\theta JA}$ (Note 2)		$T_A = 25^{\circ}C$	P _D	0.77	W
Continuous Drain Current R _{0.IC}		T _C = 25°C	Ι _D	69	A
(Note 1)		$T_{\rm C} = 80^{\circ}{\rm C}$		52	
Power Dissipation $R_{\theta JC}$ (Note 1)		T _C = 25°C	PD	30.5	W
Pulsed Drain Current	T _A = 25°	°C, t _p = 10 μs	I _{DM}	200	А
Current Limited by Pac	ckage	T _A = 25°C	I _{Dmax}	80	Α
Operating Junction and Storage Temperature Range			T _J , T _{STG}	–55 to +150	°C
Source Current (Body Diode)			ا _S	28	А
Drain to Source DV/DT			dV/d _t	7.0	V/ns
Single Pulse Drain-to-Source Avalanche Energy (T _J = 25°C, V _{GS} = 10 V, I _L =37 A _{pk} , L = 0.1 mH, R _{GS} = 25 Ω) (Note 3)			E _{AS}	68	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			ΤL	260	°C

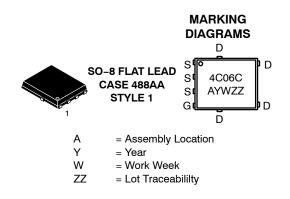
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Surface-mounted on FR4 board using 1 sq-in pad, 1 oz Cu.
Surface-mounted on FR4 board using the minimum recommended pad size.

3. Parts are 100% tested at $T_J = 25^{\circ}C$, $V_{GS} = 10$ V, $I_L = 27$ A_{pk}, EAS = 36 mJ.

V _{(BR)DSS}	R _{DS(ON)} MAX	I _D MAX
20.1/	4.0 m Ω @ 10 V	69 A
30 V	6.0 mΩ @ 4.5 V	09 A





ORDERING INFORMATION

Device	Package	Shipping [†]
NTMFS4C06NCT1G	SO-8FL (Pb-Free)	1500 / Tape & Reel
NTMFS4C06NCT3G	SO-8FL (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.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case (Drain)	$R_{\theta JC}$	4.1	
Junction-to-Ambient - Steady State (Note 4)	$R_{\theta JA}$	49	°C/W
Junction-to-Ambient - Steady State (Note 5)	$R_{\theta JA}$	162.3	°C/W
Junction-to-Ambient – (t \leq 10 s) (Note 4)	R_{\thetaJA}	19.5	

Surface-mounted on FR4 board using 1 sq-in pad, 1 oz Cu.
Surface-mounted on FR4 board using the minimum recommended pad size.

ELECTRICAL CHARACTERISTICS (T_J = 25° 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 (transient)	V _{(BR)DSSt}	V_{GS} = 0 V, $I_{D(aval)}$ = 12.6 A, T_{case} = 25°C, $t_{transient}$ = 100 ns		34			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} / T _J				14.4		mV/∘C
Zero Gate Voltage Drain Current	I _{DSS}	$V_{GS} = 0 V,$	$T_J = 25^{\circ}C$			1.0	Ι.
		$V_{DS} = 24 \text{ V}$ $T_J = 125$				10	μΑ
Gate-to-Source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS}	= ±20 V			±100	nA
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	V _{GS(TH)}	V_{GS} = V_{DS} , I_D = 250 μ A		1.3		2.1	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		3.2	4.0	mΩ
		V _{GS} = 4.5 V	I _D = 25 A		4.8	6.0	
Forward Transconductance	9 _{FS}	V _{DS} = 1.5 V, I _D = 15 A			58		S
Gate Resistance	R _G	T _A = 25°C		0.3	1.0	2.0	Ω
CHARGES AND CAPACITANCES							
Input Capacitance	C _{ISS}				1683		
Output Capacitance	C _{OSS}	V _{GS} = 0 V, f = 1 MH	z, V _{DS} = 15 V		841		pF
Reverse Transfer Capacitance	C _{RSS}				40		
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		
Threshold Gate Charge	Q _{G(TH)}	V _{GS} = 4.5 V, V _{DS} = 15 V; I _D = 30 A			2.6]
Gate-to-Source Charge	Q _{GS}				4.7		nC
Gate-to-Drain Charge	Q _{GD}				4.0]
Gate Plateau Voltage	V _{GP}				3.1		V
Total Gate Charge	Q _{G(TOT)}	V_{GS} = 10 V, V_{DS} = 15 V; I_{D} = 30 A			26		nC

Turn–On Delay Time	t _{d(ON)}		10	
Rise Time	t _r	V _{GS} = 4.5 V, V _{DS} = 15 V,	32	
Turn-Off Delay Time	t _{d(OFF)}	$I_{\rm D}$ = 15 A, $R_{\rm G}$ = 3.0 Ω	18	ns
Fall Time	t _f		5.0	

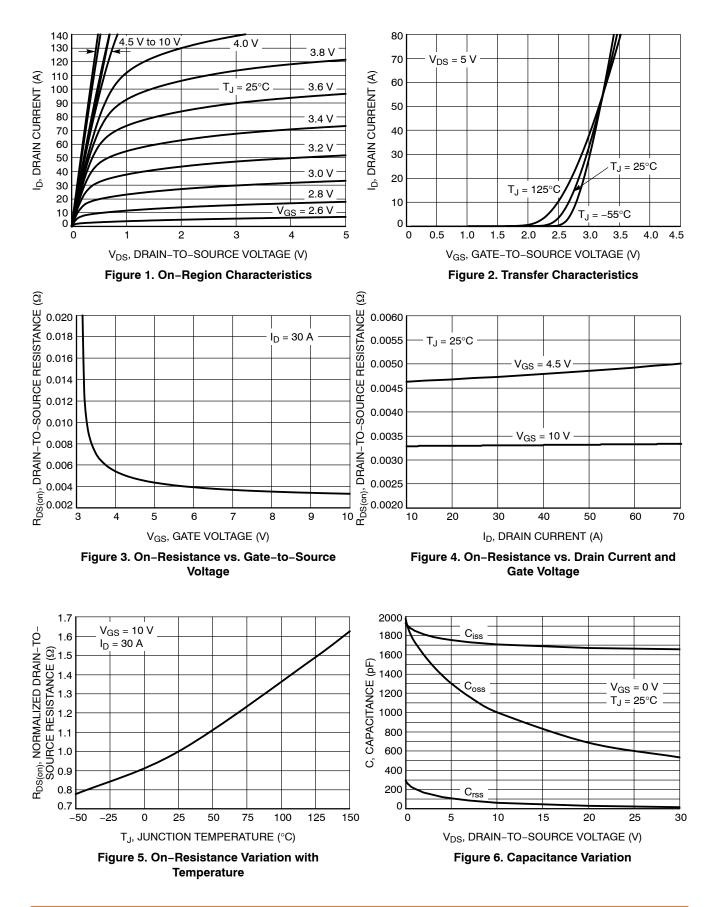
 $\begin{array}{ll} \mbox{6. Pulse Test: pulse width } \le 300 \ \mu \mbox{s, duty cycle } \le 2\%. \\ \mbox{7. Switching characteristics are independent of operating junction temperatures.} \end{array}$

ELECTRICAL CHARACTERISTICS (T_J = 25° C unless otherwise specified)

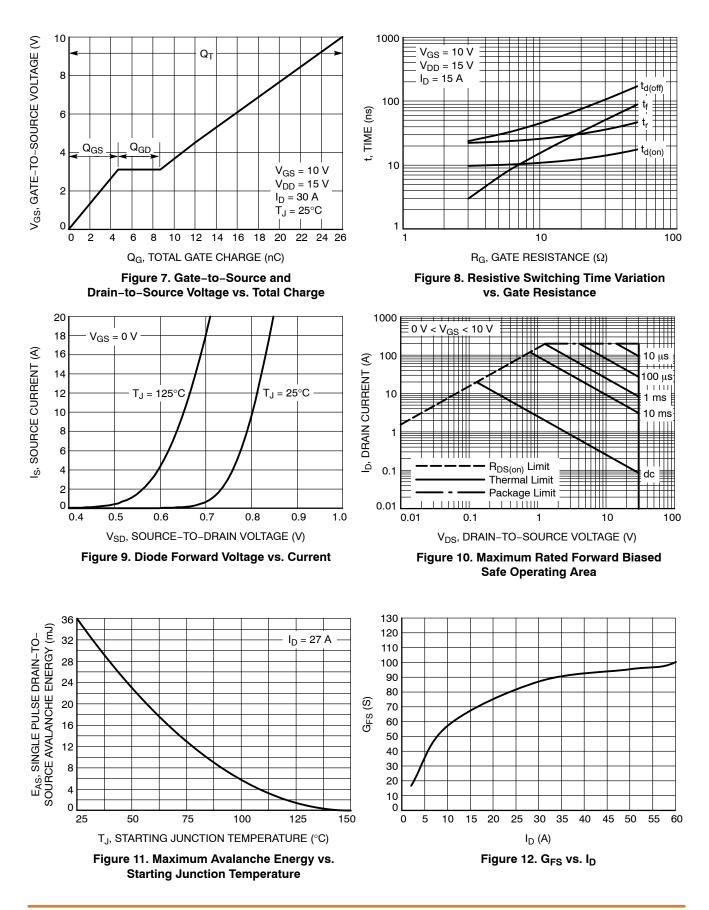
Parameter	Symbol	Test Condition		Min	Тур	Max	Unit
SWITCHING CHARACTERISTICS (N	ote 7)	•					
Turn-On Delay Time	t _{d(ON)}	V_{GS} = 10 V, V _{DS} = 15 V, I _D = 15 A, R _G = 3.0 Ω			8.0		ns
Rise Time	t _r				28		
Turn-Off Delay Time	t _{d(OFF)}				24		
Fall Time	t _f				3.0		
DRAIN-SOURCE DIODE CHARACTE	ERISTICS						
Forward Diode Voltage	V _{SD}	$V_{GS} = 0 V, \\ I_{S} = 10 A \\ T_{J} = 125^{\circ}C \\ T_{J} = 125^{\circ}C$		0.8	1.1	V	
			T _J = 125°C		0.63		v
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dIS/dt = 100 A/µs, I _S = 30 A			34		
Charge Time	t _a				17		ns
Discharge Time	t _b				17		
Reverse Recovery Charge	Q _{RR}				22		nC

 $\begin{array}{ll} \mbox{6. Pulse Test: pulse width } \le 300 \ \mu \mbox{s, duty cycle } \le 2\%. \\ \mbox{7. Switching characteristics are independent of operating junction temperatures.} \end{array}$

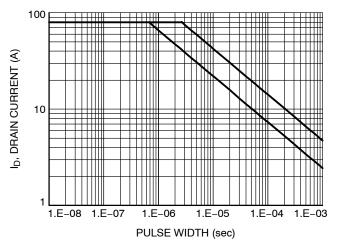
TYPICAL CHARACTERISTICS



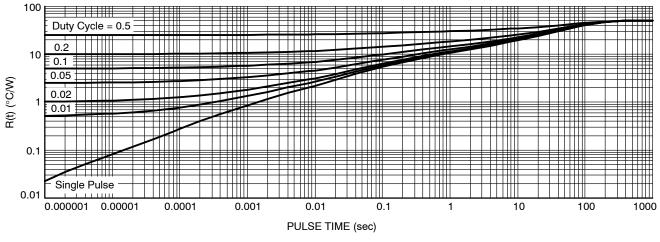
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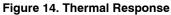


TYPICAL CHARACTERISTICS

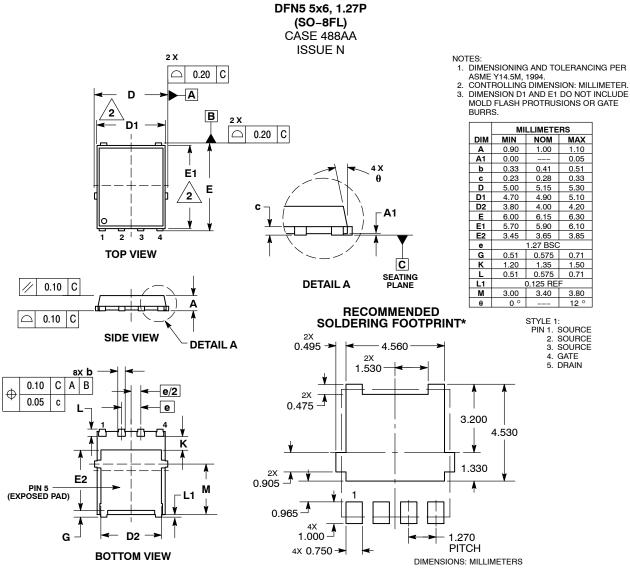








PACKAGE DIMENSIONS



*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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