Power MOSFET 30 V, 74 A, Single N-Channel, SO-8 FL

Features

- Low R_{DS(on)} to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Optimized Gate Charge to Minimize Switching Losses
- These are Pb-Free Devices

Applications

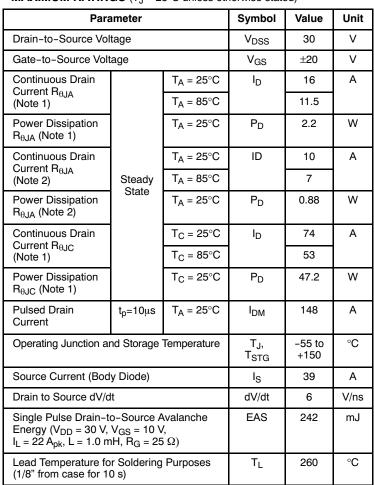
- CPU Power Delivery
- DC-DC Converters
- Low Side Switching



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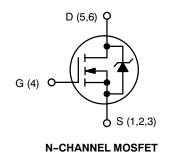
V _{(BR)DSS}	BR)DSS R _{DS(ON)} MAX	
20 V (5.0 mΩ @ 10 V	
30 V	7.5 mΩ @ 4.5 V	74 A

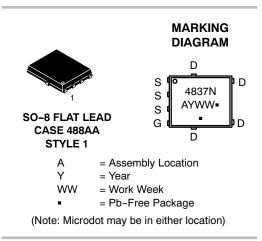


MAXIMUM RATINGS (T_J = 25° C unless otherwise stated)

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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





ORDERING INFORMATION

Device	Package	Shipping [†]
NTMFS4837NT1G	SO-8 FL (Pb-Free)	1500 / Tape & Reel
NTMFS4837NT3G	SO-8 FL (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)	$R_{ ext{ heta}JC}$	2.65	
Junction-to-Ambient – Steady State (Note 1)	R_{\thetaJA}	56.75	°C/W
Junction-to-Ambient - Steady State (Note 2)	R_{\thetaJA}	142.2	

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 = 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 µA		30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} / T _J				25		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	I_{DSS} $V_{GS} = 0 V$, $T_J = 25 \degree C$				1	
		$V_{DS} = 24 V$	T _J = 125°C			10	μA
Gate-to-Source Leakage Current	I _{GSS}	$V_{DS} = 0 V, V_{GS}$	₆ = ±20 V			±100	nA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	V _{GS(TH)}	$V_{GS} = V_{DS}, I_{D}$	= 250 μA	1.5		2.5	V
Negative Threshold Temperature Coefficient	V _{GS(TH)} /T _J				5.7		mV/°C
Drain-to-Source On Resistance	R _{DS(on)}	V _{GS} = 10 V to 11.5 V	I _D = 30 A		3.5	5.0	- mΩ
			I _D = 15 A		3.5		
		V _{GS} = 4.5 V	I _D = 30 A		5.9	7.5	
			I _D = 15 A		5.9		
Forward Transconductance	9 FS	V _{DS} = 15 V, I	_D = 15 A		15		S
CHARGES AND CAPACITANCES				-		-	
Input Capacitance	C _{ISS}				2048		
Output Capacitance	C _{OSS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 12 V			444		pF
Reverse Transfer Capacitance	C _{RSS}				239		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 15 V; I _D = 30 A			14.2	22	_
Threshold Gate Charge	Q _{G(TH)}				2.98		
Gate-to-Source Charge	Q _{GS}				5.7		nC
Gate-to-Drain Charge	Q _{GD}				6.7		
Total Gate Charge	Q _{G(TOT)}	V_{GS} = 11.5 V, V_{DS} = 15 V; I_D = 15 A			34.2		nC
SWITCHING CHARACTERISTICS (Note 4)	-			-	-	-	-
Turn-On Delay Time	t _{d(ON)}				14.2		
Rise Time	t _r	V_{GS} = 4.5 V, V_{DS} = 15 V, I_D = 15 A, R_G = 3.0 Ω			55		1
Turn-Off Delay Time					19		ns

		$v_{GS} = 4.5 v, v_{DS} = 15 v, I_D = 15 A,$		ns
Turn-Off Delay Time	t _{d(OFF)}	R _G = 3.0 Ω	19	115
Fall Time	t _f		10	
Turn-On Delay Time	t _{d(ON)}		8.5	
Rise Time	t _r	V _{GS} = 11.5 V, V _{DS} = 15 V, I _D = 15 A, R _G = 3.0 Ω	25.6	20
Turn-Off Delay Time	t _{d(OFF)}	$I_{\rm D} = 15 {\rm A}, {\rm R}_{\rm G} = 3.0 {\Omega}$	25.2	ns
Fall Time	t _f		9.2	

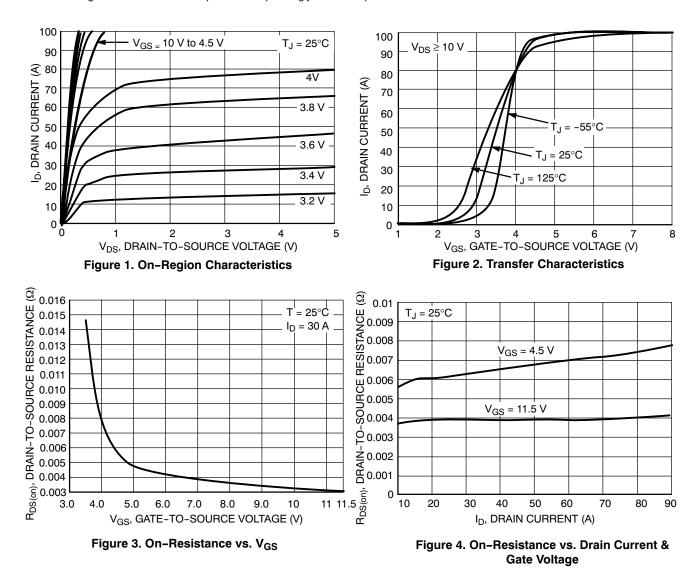
Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
Switching characteristics are independent of operating junction temperatures.

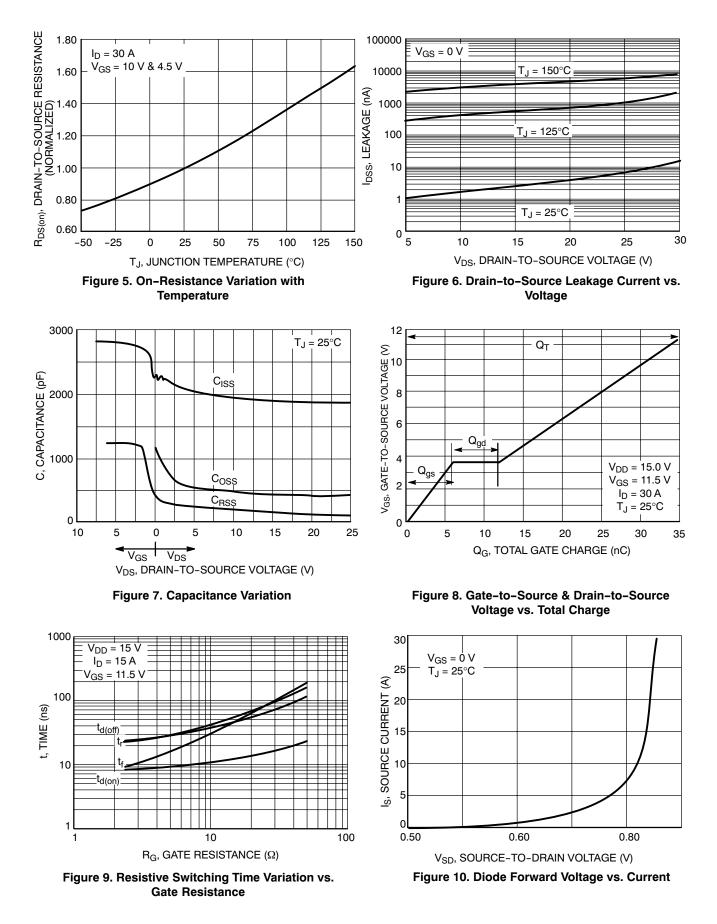
ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}C$ unless otherwise specified)

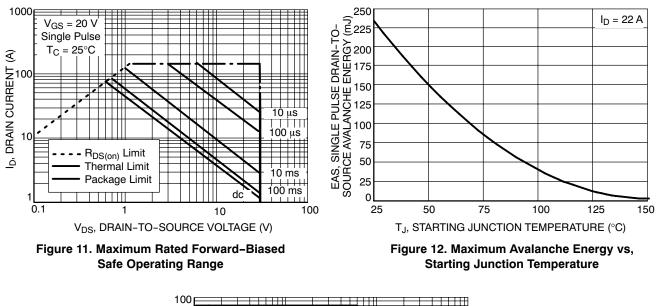
Parameter	Symbol	Test Condition		Min	Тур	Max	Unit
DRAIN-SOURCE DIODE CHARACTE	RISTICS						
Forward Diode Voltage	V _{SD}	$V_{GS} = 0 V, \\ I_{S} = 30 A \\ T_{J} = 125^{\circ}C \\ T_{J} = 125^{\circ}C$			0.85	1.2	V ns
					0.72		
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dI _S /dt = 100 A/µs, I _S = 30 A			24		
Charge Time	t _a				13		
Discharge Time	t _b				11		
Reverse Recovery Charge	Q _{RR}				14		nC
PACKAGE PARASITIC VALUES							
Source Inductance	L _S	T _A = 25°C			0.93		nH
Drain Inductance	L _D				0.005		
Gate Inductance	L _G				1.84		
Gate Resistance	R _G				2.8		Ω

3. Pulse Test: pulse width \leq 300 µs, duty cycle \leq 2%.

4. Switching characteristics are independent of operating junction temperatures.







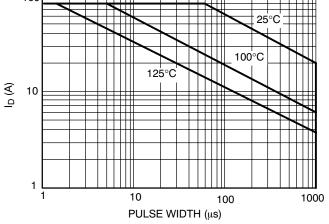
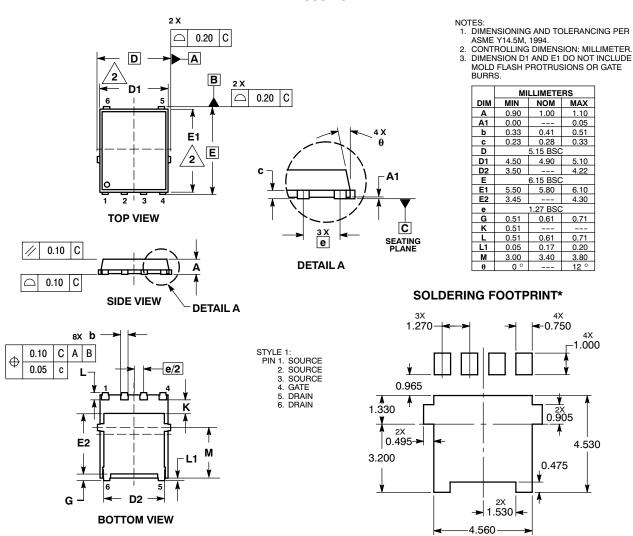


Figure 13. EAS vs. Pulse Width

PACKAGE DIMENSIONS

DFN6 5x6, 1.27P (SO8 FL) CASE 488AA-01 ISSUE C



*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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