MOSFET – Single, N-Channel, Small Signal, SOT-883 (XDFN3), 1.0 x 0.6 x 0.4 mm
30 V, 1000 mA

NTNS4C69N

ON Semiconductor®

www.onsemi.com

Features

- Single N−Channel MOSFET
- Ultra Low Profile SOT−883 (XDFN3) 1.0 x 0.6 x 0.4 mm for Extremely Thin Environments such as Portable Electronics
- Low $R_{DS(on)}$ Solution in Ultra Small 1.0 x 0.6 mm Package
- 1.8 V Gate Drive
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

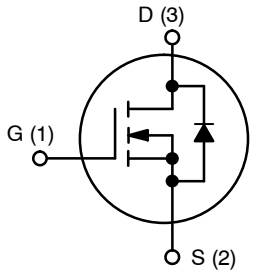
Applications

- High Side Switch
- High Speed Interfacing
- Level Shift and Translate
- Optimized for DC−DC Converter Power Management in Ultra Portable Solutions

MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
30 V	0.155 Ω @ 4.5 V	1000 mA
	0.168 Ω @ 3.7 V	
	0.180 Ω @ 3.3 V	
	0.220 Ω @ 2.5 V	
	0.450 Ω @ 1.8 V	

N−Channel MOSFET



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

Parameter			Symbol	Value	Units
Drain-to-Source Voltage			V_{DSS}	30	V
Gate-to-Source Voltage			V_{GS}	±12	V
Continuous Drain Current (Note 1)	Steady State	T_A = 25°C	I_D	1000	mA
		T_A = 85°C		721	
	t ≤ 5 s	T_A = 25°C		1050	
Power Dissipation (Note 1)	Steady State	T_A = 25°C	P_D	178	mW
	t ≤ 5 s	T_A = 25°C		187	
Pulsed Drain Current		t_p = 10 μs	I_{DM}	2.6	A
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	°C
Source Current (Body Diode) (Note 2)			I_S	187	mA
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)			T_L	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.

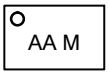
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Units
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	703	°C/W
Junction-to-Ambient – t ≤ 5 s (Note 1)	$R_{\theta JA}$	670	

1. Surface Mounted on FR4 Board using the minimum recommended pad size, (or 2 mm^2), 1 oz Cu.
2. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

SOT−883 (XDFN3) CASE 506CB

MARKING DIAGRAM



AA = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NTNS4C69NTCG	SOT−883 (Pb−Free)	8000 / 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.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
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	$V_{(BR)DSS}/T_J$	I_D = 250 μA, ref to 25°C		17		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 24 V; T_J = 25°C			1.0	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = 12 V			100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 10 μA	0.65		1.1	V
Negative Gate Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			–3.0		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 300 mA		0.127	0.155	Ω
		V_{GS} = 3.7 V, I_D = 250 mA		0.135	0.168	
		V_{GS} = 3.3 V, I_D = 200 mA		0.140	0.180	
		V_{GS} = 2.5 V, I_D = 150 mA		0.170	0.220	
		V_{GS} = 1.8 V, I_D = 100 mA		0.300	0.450	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 200 mA		2.0		S
Source–Drain Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = 100 mA		0.7	1.0	V
CHARGES & CAPACITANCES						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 15 V		75		pF
Output Capacitance	C_{OSS}			34		
Reverse Transfer Capacitance	C_{RSS}			3.0		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DS} = 15 V, I_D = 200 mA		0.9		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.1		
Gate–to–Source Charge	Q_{GS}			0.2		
Gate–to–Drain Charge	Q_{GD}			0.1		
SWITCHING CHARACTERISTICS, VGS = 4.5 V (Note 3)						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = 4.5 V, V_{DD} = 15 V, I_D = 200 mA, R_G = 2 Ω		4.5		ns
Rise Time	t_r			3.5		
Turn-Off Delay Time	$t_{d(OFF)}$			9.0		
Fall Time	t_f			7.0		

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.

3. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

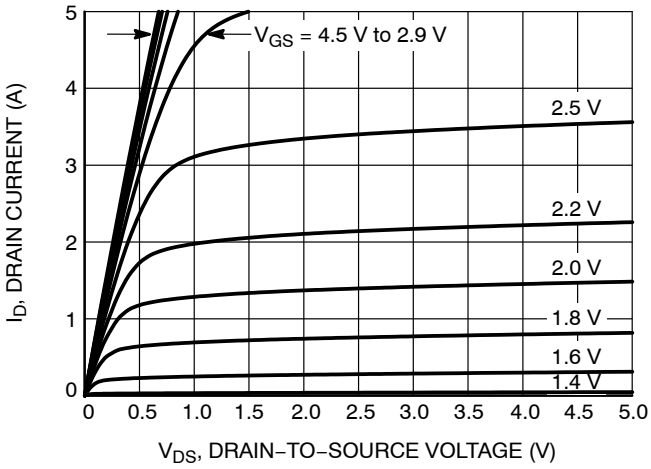


Figure 1. On−Region Characteristics

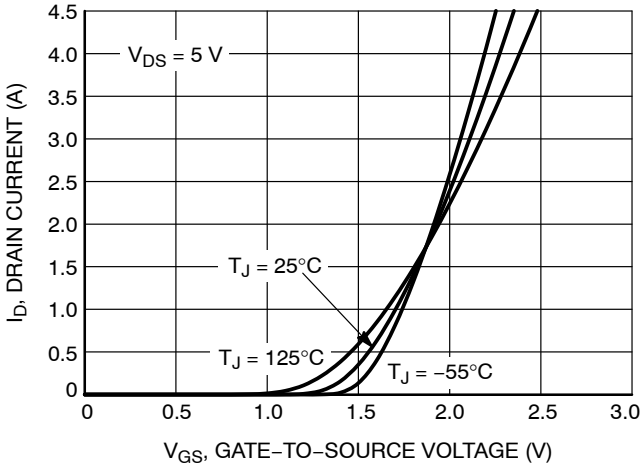


Figure 2. Transfer Characteristics

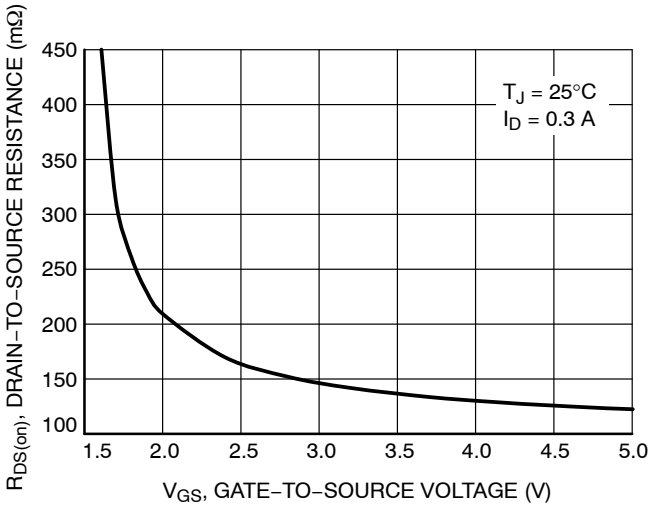


Figure 3. On−Resistance vs. Gate−to−Source Voltage

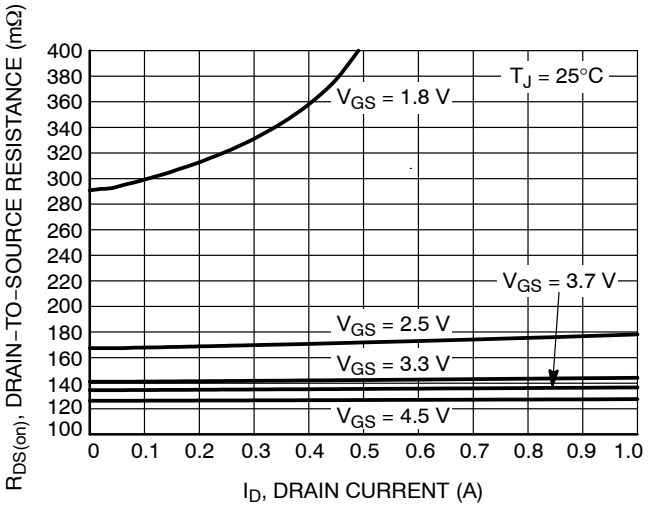


Figure 4. On−Resistance vs. Drain Current and Gate Voltage

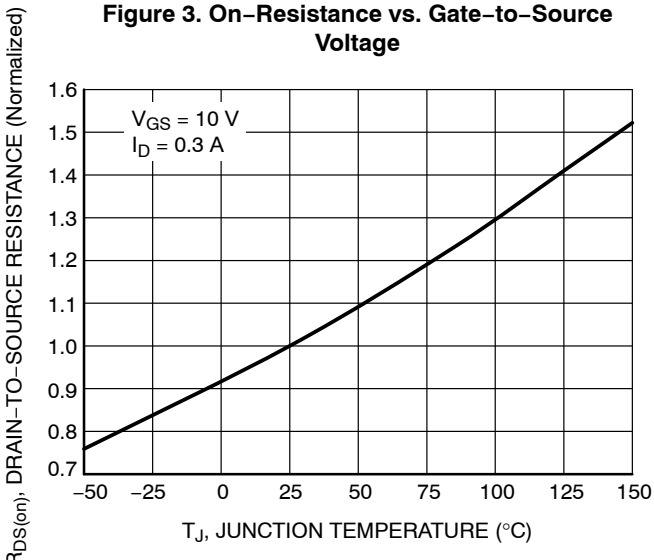


Figure 5. On−Resistance Variation with Temperature

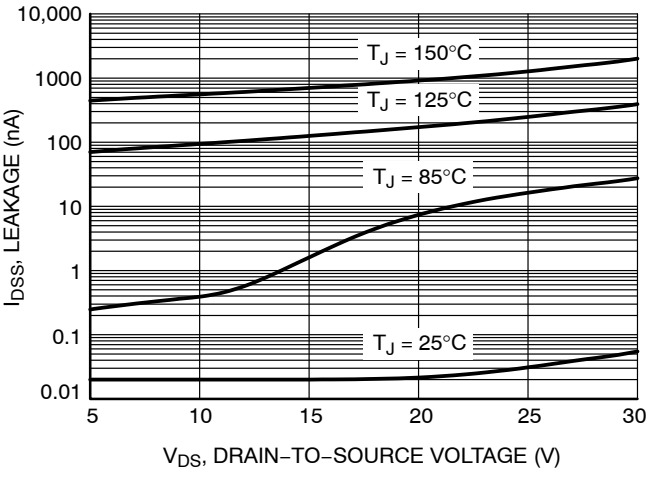


Figure 6. Drain−to−Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS

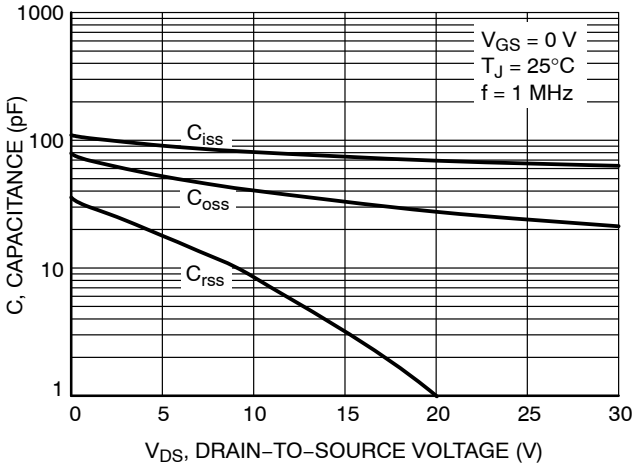


Figure 7. Capacitance Variation

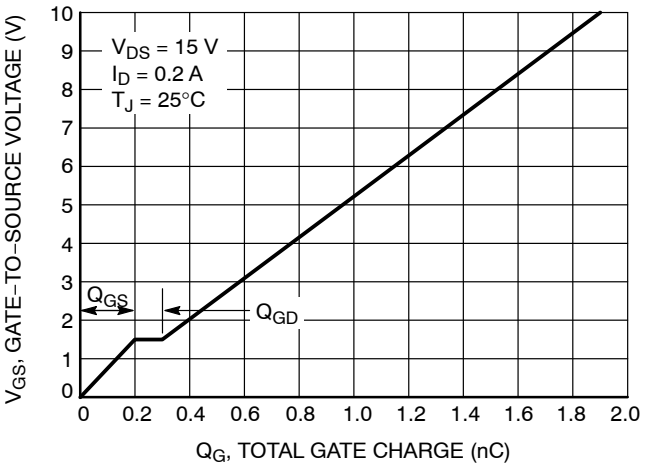


Figure 8. Gate−to−Source vs. Total Charge

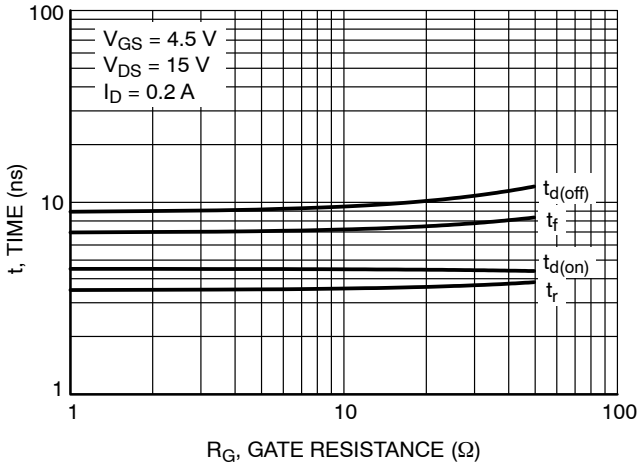


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

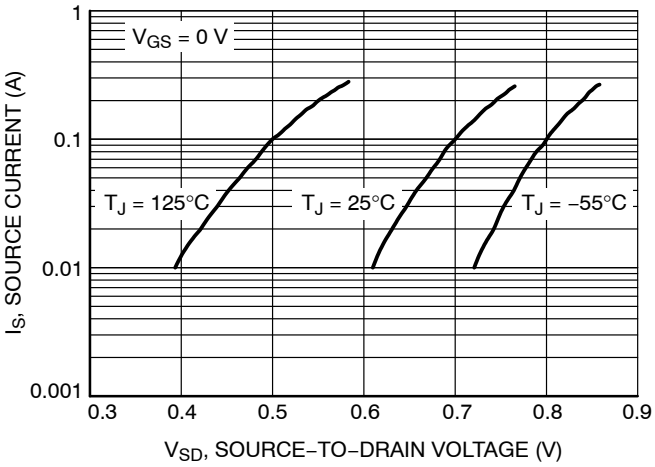


Figure 10. Diode Forward Voltage vs. Current

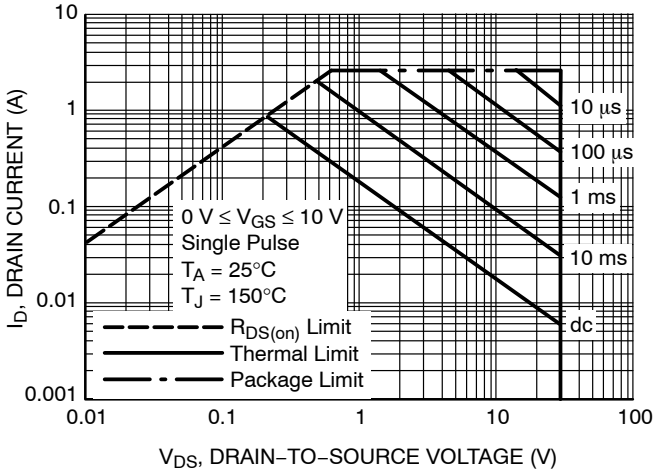


Figure 11. Safe Operating Area

TYPICAL CHARACTERISTICS

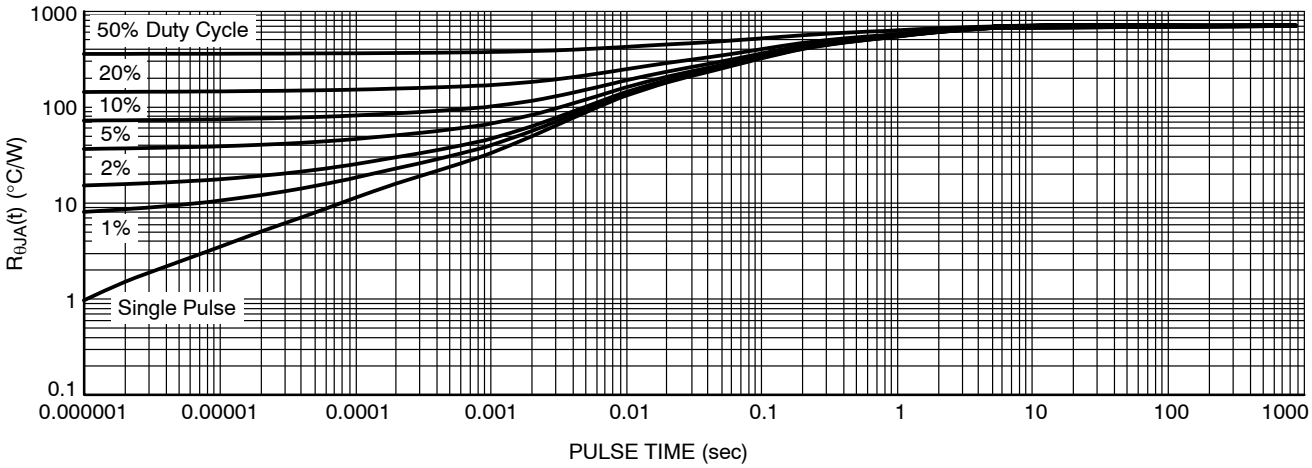
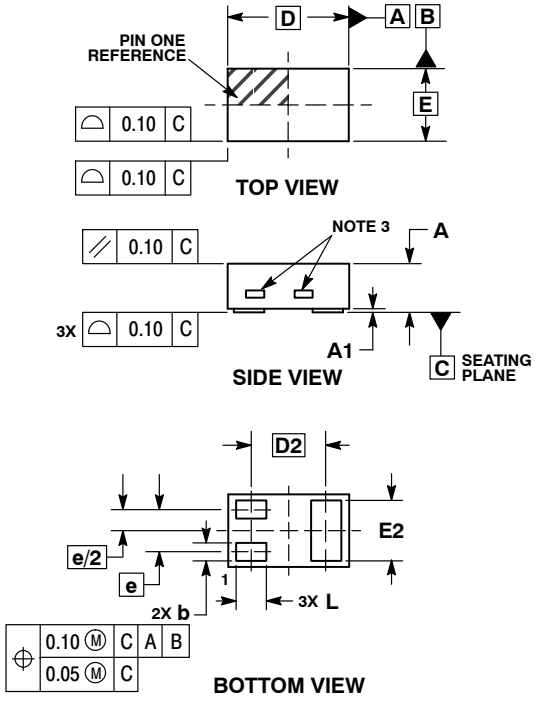


Figure 12. Thermal Characteristics

SOT−883 (XDFN3), 1.0x0.6, 0.35P
CASE 506CB
ISSUE A

DATE 30 MAR 2012

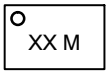
SCALE 8:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. EXPOSED COPPER ALLOWED AS SHOWN.

	MILLIMETERS	
DIM	MIN	MAX
A	0.340	0.440
A1	0.000	0.030
b	0.075	0.200
D	0.950	1.075
D2	0.620 BSC	
e	0.350 BSC	
E	0.550	0.675
E2	0.425	0.550
L	0.170	0.300

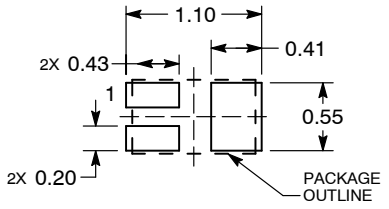
GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G”, may or not be present.

RECOMMENDED SOLDER FOOTPRINT*



DIMENSIONS: MILLIMETERS

*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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DESCRIPTION:	**SOT−883 (XDFN3), 1.0X0.6, 0.35P**	**PAGE 1 OF 1**

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