Small Signal MOSFET

-20 V, -281 mA, Single P-Channel, SOT-883 (XDFN3) 1.0 x 0.6 x 0.4 mm Package

Features

- Single P-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 the Ultra Small 1.0 x 0.6 mm Package
- 1.5 V Gate Drive
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- High Side Switch
- High Speed Interfacing
- Optimized for Power Management in Ultra Portable Solutions

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

Parameter			Symbol	Value	Unit			
Drain-to-Source Voltage			V _{DSS}	-20	V			
Gate-to-Source Volta	Gate-to-Source Voltage			±8	V			
Continuous Drain	Steady State	$T_A = 25^{\circ}C$	Ι _D	-281	mA			
Current (Note 1)	Sidle	$T_A = 85^{\circ}C$		-202				
	t ≤ 5 s	$T_A = 25^{\circ}C$		-332				
Power Dissipation (Note 1)	Steady State	$T_A = 25^{\circ}C$	PD	155	mW			
	t ≤ 5 s			218				
Pulsed Drain Current	t _p = 10 μs		I _{DM}	-842	mA			
Operating Junction and Storage Temperature			T _J , T _{STG}	–55 to 150	°C			
Source Current (Body Diode) (Note 2)			۱ _S	-130	mA			
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			ΤL	260	°C			

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.

- Surface-mounted on FR4 board using the minimum recommended pad size, or 2 mm², 1 oz Cu.
- 2. Pulse Test: pulse width \leq 300 μ s, duty cycle \leq 2%

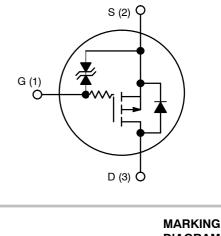


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V _{(BR)DSS}	R _{DS(on)} MAX	I _D Max
–20 V	1.3 Ω @ –4.5 V	
	2.0 Ω @ –2.5 V	001
	3.4 Ω @ –1.8 V	–281 mA
	4.5 Ω @ –1.5 V	

P-CHANNEL MOSFET





ORDERING INFORMATION

Device	Package	Shipping [†]
NTNS3A65PZT5G	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 Specification Brochure, BRD8011/D.

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THERMAL RESISTANCE RATINGS

Parameter	Symbol	Мах	Unit	
Junction-to-Ambient - Steady State (Note 3)	R_{\thetaJA}	804	°C/W	
Junction-to-Ambient – t \leq 5 s (Note 3)	$R_{\theta JA}$	574	C/VV	

3. Surface-mounted on FR4 board using the minimum recommended pad size, or 2 mm², 1 oz Cu.

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

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		-20			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} / T _J	$I_D = -250 \ \mu A$, ref	$I_D = -250 \ \mu\text{A}$, ref to 25°C		11		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = -20 V	T _J = 25°C			-1	μA
Gate-to-Source Leakage Current	I _{GSS}	$V_{DS} = 0 V, V_{GS}$	= ±5 V			±10	μA
ON CHARACTERISTICS (Note 4)	•						
Gate Threshold Voltage	V _{GS(TH)}	$V_{GS}=V_{DS},\ I_{D}=-250\ \mu A$		-0.4		-1.0	V
Negative Threshold Temperature Coefficient	V _{GS(TH)} /T _J				2.2		mV/°C
Drain-to-Source On Resistance		V_{GS} = -4.5 V, I _D =	–200 mA		0.9	1.3	
		V_{GS} = -2.5 V, I _D =	–100 mA		1.3	2.0	Ω
	R _{DS(on)}	V_{GS} = -1.8 V, I _D = -50 mA			1.8	3.4	
		V _{GS} = -1.5 V, I _D =	–10 mA		2.3	4.5	Ω
Forward Transconductance	9 FS	$V_{DS} = -5 \text{ V}, \text{ I}_{D} = -200 \text{ mA}$			0.58		S
Source-Drain Diode Voltage	V _{SD}	V_{GS} = 0 V, I _S = -	100 mA		-0.8	-1.2	V
CHARGES & CAPACITANCES	•				•	•	•
Input Capacitance	Ciss				44		

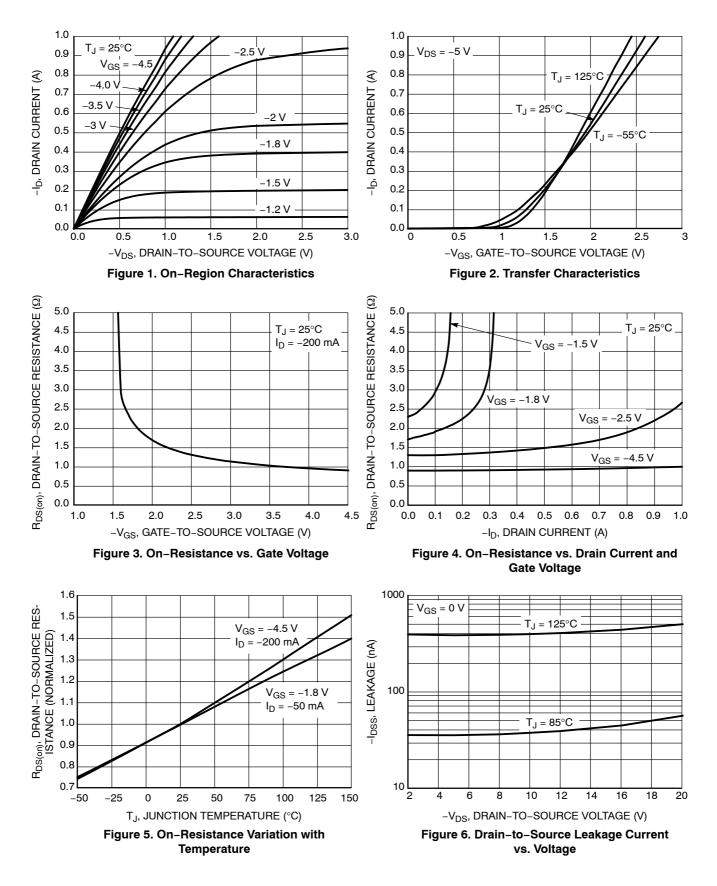
C _{ISS}			44		
C _{OSS}	V_{GS} = 0 V, freq = 1 MHz, V_{DS} = –10 V		6.7		pF
C _{RSS}			5.5		
Q _{G(TOT)}	V_{GS} = -4.5 V, V_{DS} = -10 V; I _D = -200 mA		1.1		nC
Q _{G(TH)}			0.1		
Q _{GS}			0.2		ne
Q _{GD}			0.2		
	C _{OSS} C _{RSS} Q _{G(TOT)} Q _{G(TH)} Q _{GS}	$\begin{tabular}{ c c c c c } \hline C_{OSS} & $V_{GS} = 0 $ V, $freq = 1 $ MHz, $V_{DS} = -10 $ V$ \\ \hline C_{RSS} & $Q_{G(TOT)}$ \\ \hline $Q_{G(TOT)}$ & $V_{GS} = -4.5 $ V, $V_{DS} = -10 $ V;$ \\ \hline Q_{GS} & $I_D = -200 $ mA$ & $I_D $	$\begin{tabular}{ c c c c c c } \hline C_{OSS} & $V_{GS} = 0 $ V, $freq = 1 $ MHz, $V_{DS} = -10 $ V$ \\ \hline C_{RSS} & $Q_{G(TOT)}$ \\ \hline $Q_{G(TOT)}$ & $V_{GS} = -4.5 $ V, $V_{DS} = -10 $ V;$ \\ \hline Q_{GS} & $I_D = -200 $ mA$ & \Box &$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$

SWITCHING CHARACTERISTICS, V_{GS} = 4.5 V (Note 4)

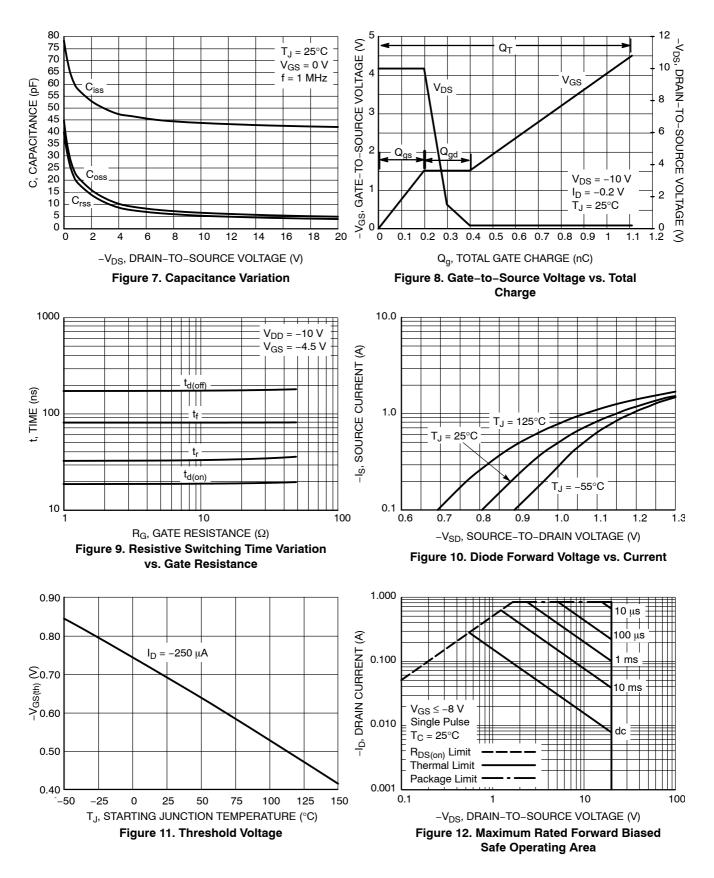
Turn-On Delay Time	t _{d(ON)}		18	
Rise Time	tr	$V_{GS} = -4.5 \text{ V}, V_{DD} = -10 \text{ V},$	32	20
Turn-Off Delay Time	t _{d(OFF)}	$I_D = -200 \text{ mA}, R_G = 2 \Omega$	178	ns
Fall Time	t _f		84	

4. Switching characteristics are independent of operating junction temperatures

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS

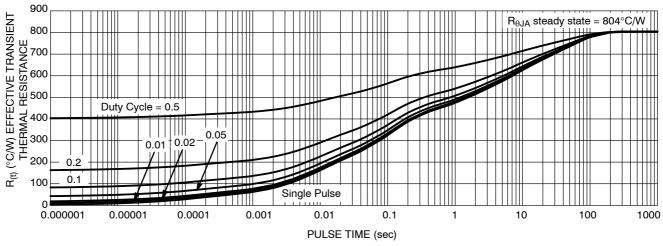
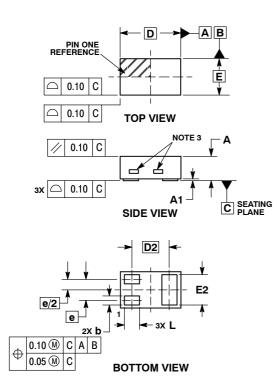


Figure 13. Thermal Response

PACKAGE DIMENSIONS

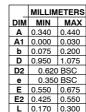
SOT-883 (XDFN3), 1.0x0.6, 0.35P CASE 506CB

ISSUE A

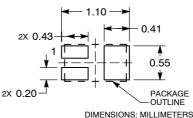


NOTES:

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