STN4438

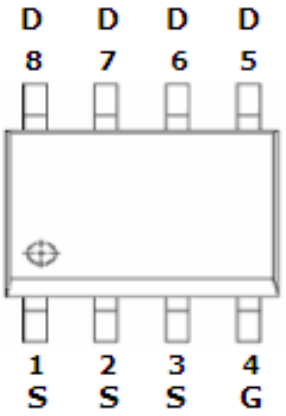
N Channel Enhancement Mode MOSFET

8.2A

DESCRIPTION

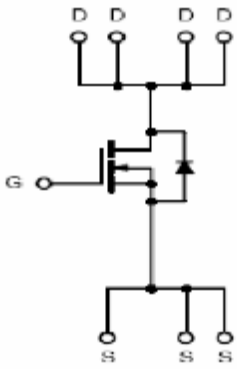
STN4438 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as power management and other battery powered circuits where high-side switching.

PIN CONFIGURATION
SOP-8



FEATURE

- **60V/8.2A, $R_{DS(ON)}$ = 25mΩ (Typ.) @V_{GS} = 10V**
- **60V/7.6A, $R_{DS(ON)}$ = 30mΩ @V_{GS} = 4.5V**
- **Super high density cell design for extremely low $R_{DS(ON)}$**
- **Exceptional on-resistance and maximum DC current capability**
- **SOP-8 package design**



PART MARKING

Y: Year Code A: Process Code

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ABSOULTE MAXIMUM RATINGS (Ta = 25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		VDSS	60	V
Gate-Source Voltage		VGSS	±20	V
Continuous Drain Current (TJ=150℃)	TA=25℃ TA=70℃	ID	8.2 6.6	A
Pulsed Drain Current		IDM	40	A
Continuous Source Current (Diode Conduction)		IS	3.0	A
Power Dissipation	TA=25℃ TA=70℃	PD	3.1 2.0	W
Operation Junction Temperature		TJ	150	℃
Storgae Temperature Range		TSTG	-55/150	℃
Thermal Resistance-Junction to Ambient		RθJA	70	℃/W

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ELECTRICAL CHARACTERISTICS (Ta = 25℃ Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,ID=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},ID=250uA	1.0		3.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=5℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	40			A
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=10A V_{GS}=4.5V,I_D=8A		25 30	30 35	mΩ
Forward Transconductance	gfs	V_{DS}=5V,I_D=6.2AV		24		S
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V		0.8	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V I_D≡8.2A		48	58	nC
Gate-Source Charge	Q_{gs}			24.2	30	
Gate-Drain Charge	Q_{gd}			14.5		
Input Capacitance	C_{iss}	V_{DS} ==30V,VGS=0V F=1MHz		1920		pF
Output Capacitance	C_{oss}			155		
Reverse TransferCapacitance	C_{rss}			116		
Turn-On Time	$t_{d(on)}$	V_{DS}=30V,R_L=3.6Ω V_{GEN}=3V		8.5		nS
	tr			6		
Turn-Off Time	$t_{d(off)}$			29		
	tf			6		

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

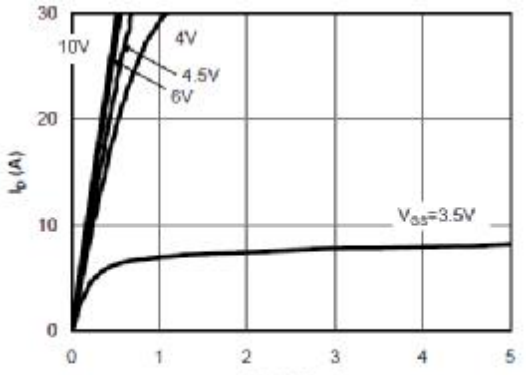

Fig 1: On-Region Characteristics

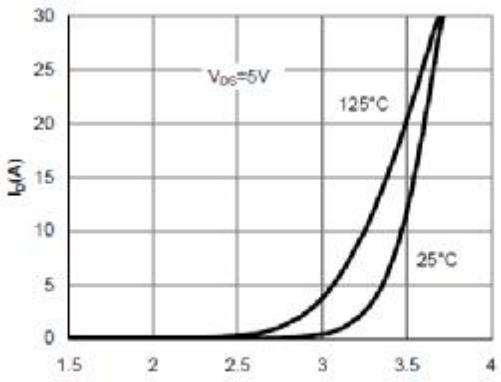

Figure 2: Transfer Characteristics

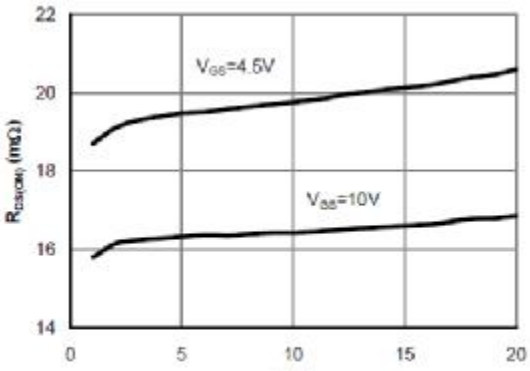

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

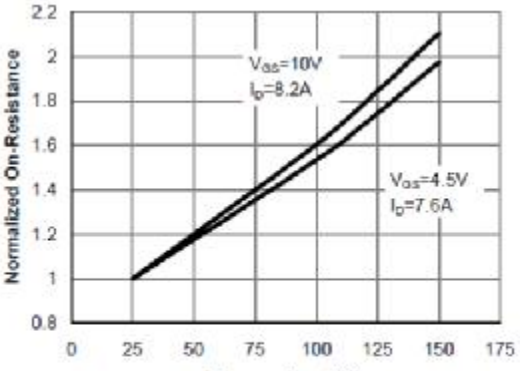

Figure 4: On-Resistance vs. Junction Temperature

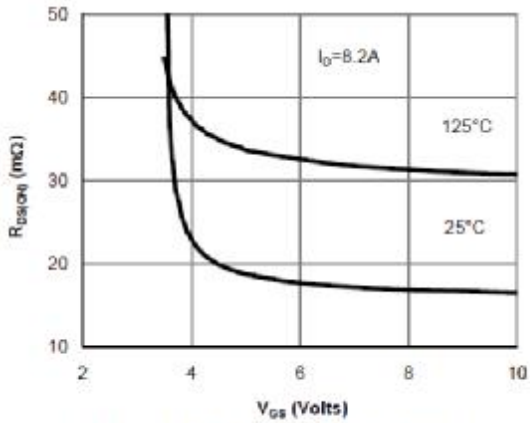

Figure 5: On-Resistance vs. Gate-Source Voltage

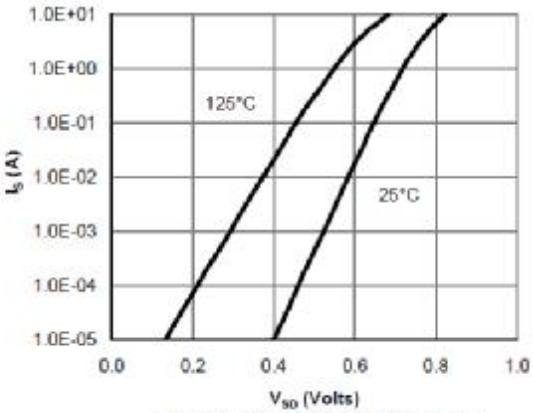

Figure 6: Body-Diode Characteristics

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

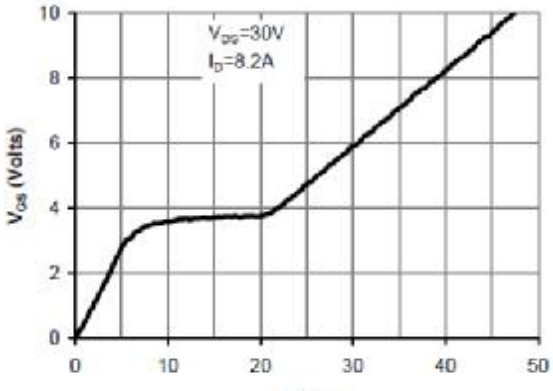

Figure 7: Gate-Charge Characteristics

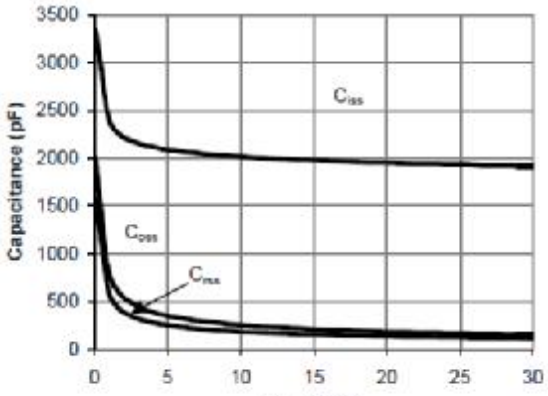

Figure 8: Capacitance Characteristics

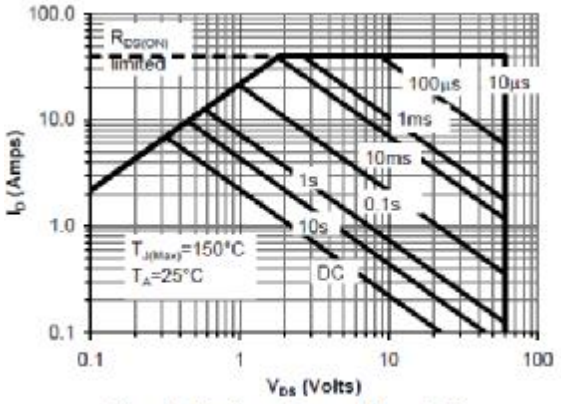

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

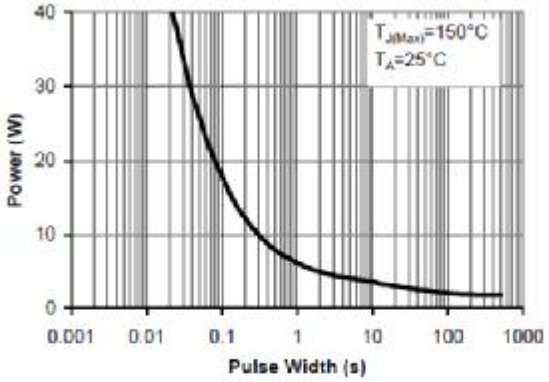

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

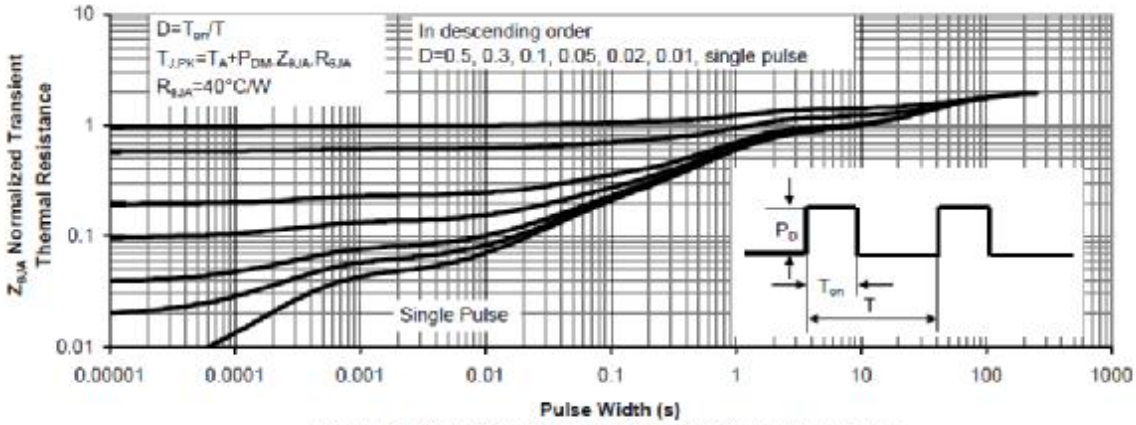

Figure 11: Normalized Maximum Transient Thermal Impedance

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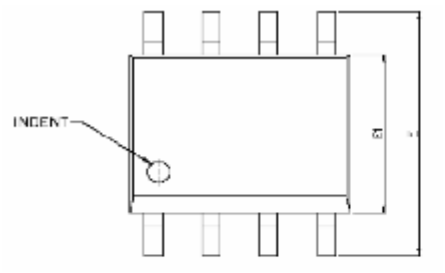
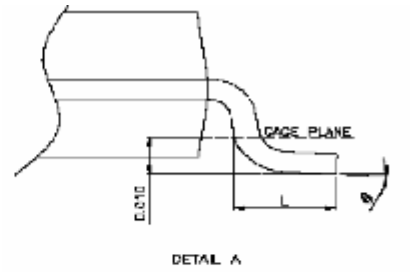
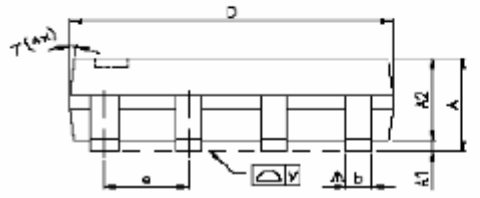
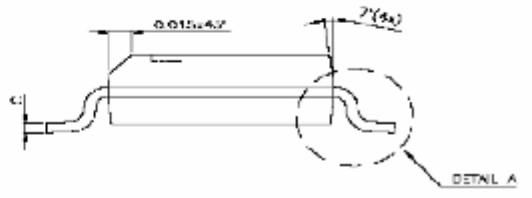
PACKAGE OUTLINE SOP-8P









SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	——	0.25	0.004	——	0.010
A2	——	1.45	——	——	0.057	——
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	——	1.27	——	——	0.050	——
L	0.38	0.71	1.27	0.015	0.028	0.050
② y	——	——	0.076	——	——	0.003
θ	0°	——	8°	0°	——	8°

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