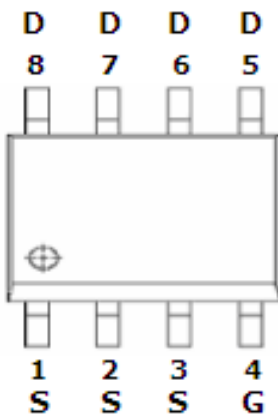
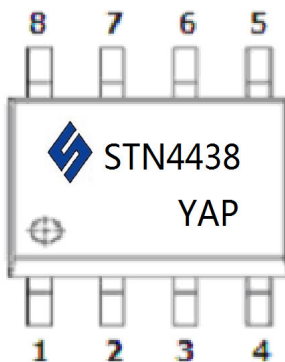


**DESCRIPTION**

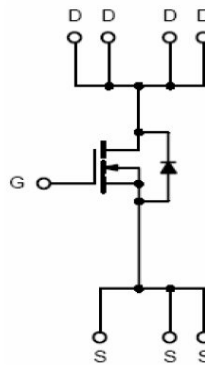
STN4438 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as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

**PIN CONFIGURATION  
SOP-8**

**PART MARKING**


**Y: Year Code**  
**A: Produce Code**  
**P: Process Code**

**FEATURE**

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



**STN4438**

N Channel Enhancement Mode MOSFET

8.2A

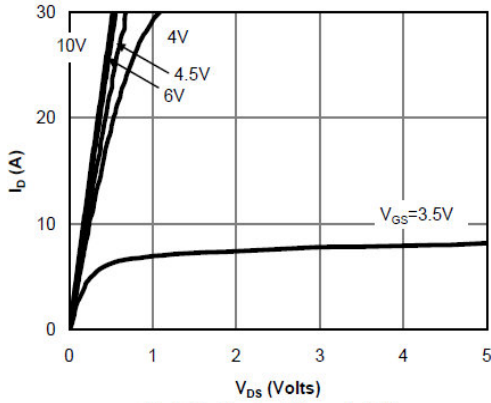
**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C Unless otherwise noted )

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

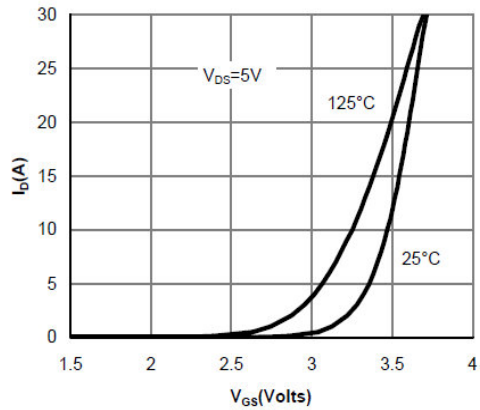
**ELECTRICAL CHARACTERISTICS** ( Ta = 25°C Unless otherwise noted )

Parameter	Symbol	Condition	Min	Typ	Max	Unit	
<b>Static</b>							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$			1	uA	
		$V_{DS}=48V, V_{GS}=0V$ $T_J=5^\circ C$			5		
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	40			A	
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$		25	30	mΩ	
		$V_{GS}=4.5V, I_D=8A$		30	35		
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=6.2AV$		24		S	
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$		0.8	1.2	V	
<b>Dynamic</b>							
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	$C_{iss}$	$V_{DS} = 30V, V_{GS}=0V$ $F=1MHz$		1600		pF	
Output Capacitance	$C_{oss}$			155			
Reverse Transfer Capacitance	$C_{rss}$			116			
Turn-On Time	$t_{d(on)}$	$V_{DS}=30V, R_L=3.6\Omega$ $V_{GEN}=3V$		8.5		nS	
	$t_r$			6			
Turn-Off Time	$t_{d(off)}$				29		
	$t_f$				6		

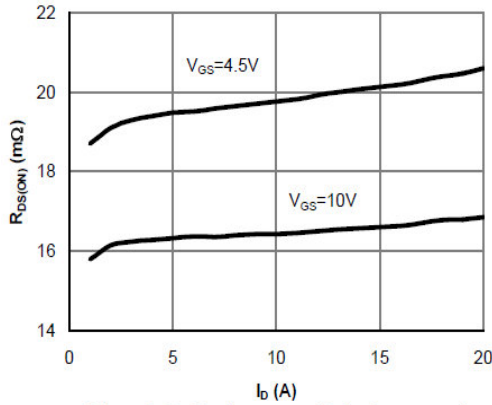
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



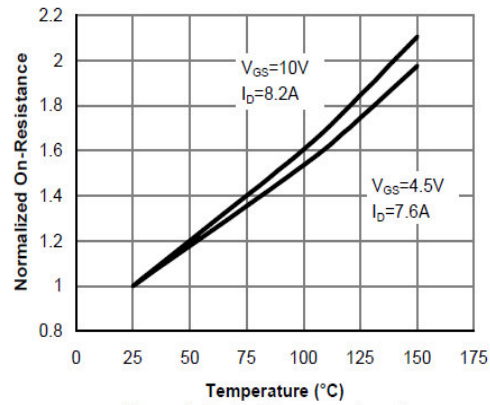
**Fig 1: On-Region Characteristics**



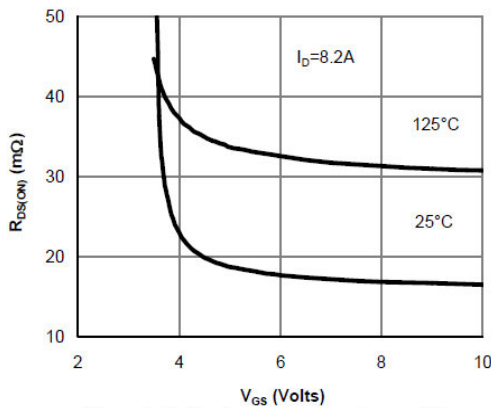
**Figure 2: Transfer Characteristics**



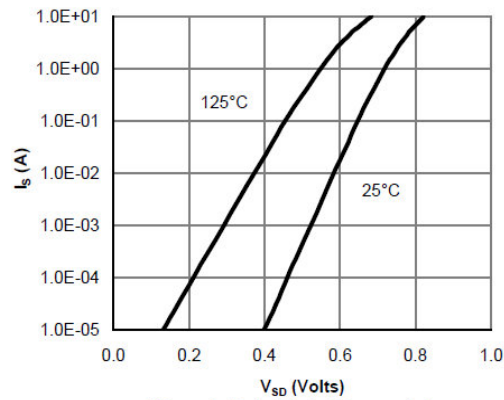
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**



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



**Figure 6: Body-Diode Characteristics**

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

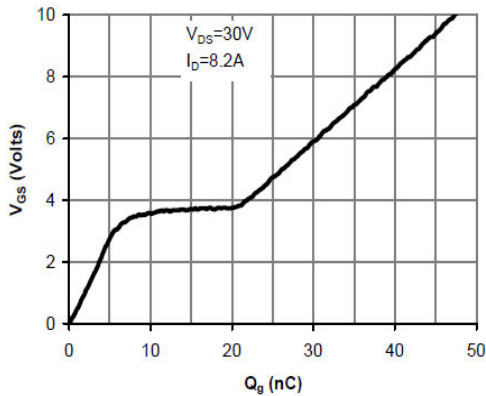


Figure 7: Gate-Charge Characteristics

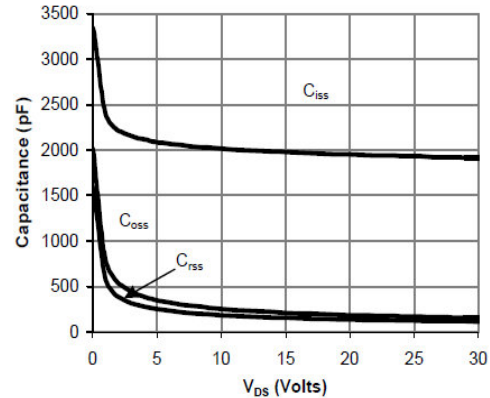


Figure 8: Capacitance Characteristics

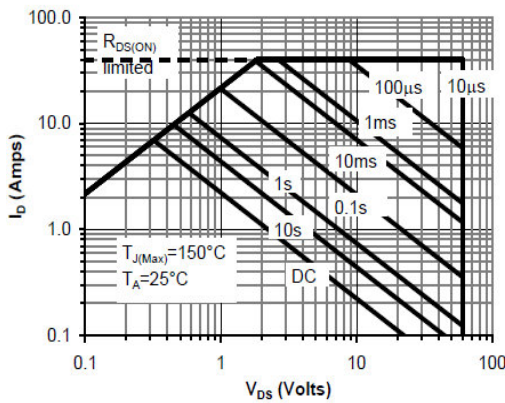


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

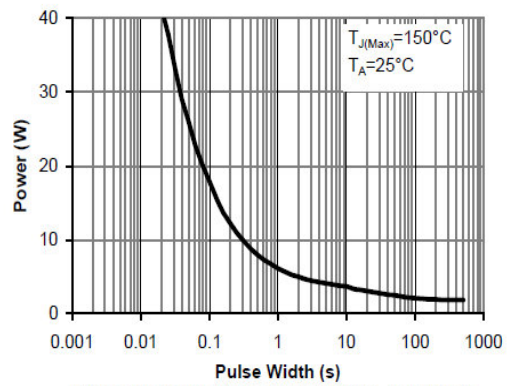


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

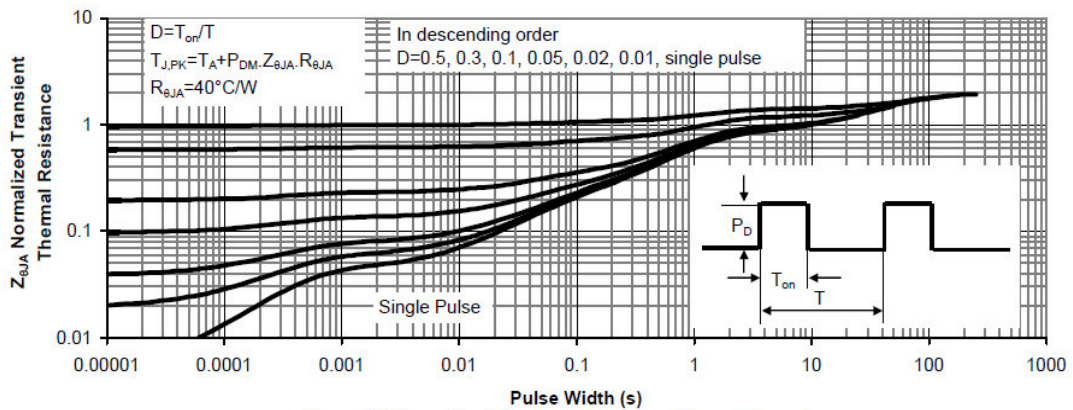
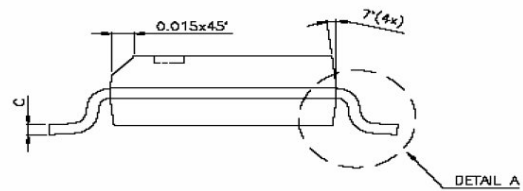
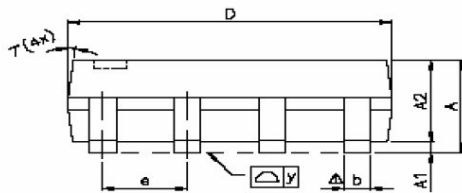
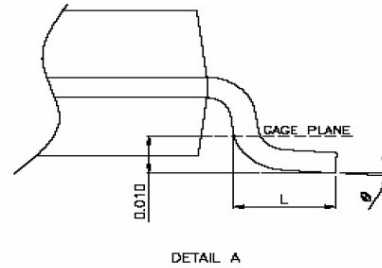
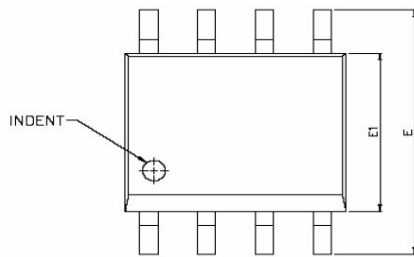


Figure 11: Normalized Maximum Transient Thermal Impedance

**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
$\Delta$ y	—	—	0.076	—	—	0.003
$\varnothing$	0°	—	8°	0°	—	8°

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