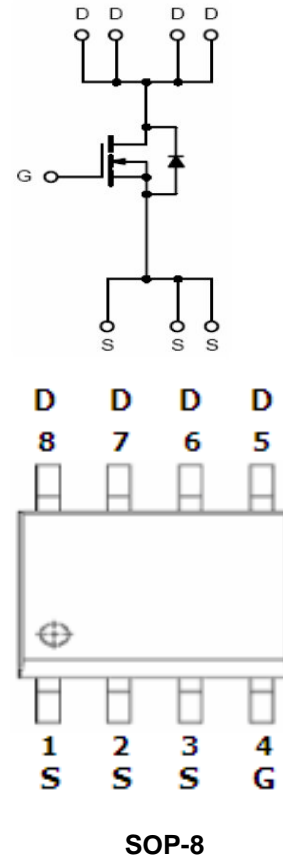


Features

- $V_{DS} (V) = 60V$
- $R_{DS(ON)} < 32m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 37m\Omega$ ($V_{GS} = 4.5V$)

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.



Absolute maximum ratings($T_a = 25^{\circ}C$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	VDSS	60	V
Gate-Source Voltage	VGSS	±20	V
Continuous Drain Current ($T_J=150^{\circ}C$)	ID	$T_A=25^{\circ}C$ 8.2	A
		$T_A=70^{\circ}C$ 6.6	
Pulsed Drain Current	IDM	40	A
Continuous Source Current (Diode Conduction)	IS	3.0	A
Power Dissipation	PD	$T_A=25^{\circ}C$ 3.1	W
		$T_A=70^{\circ}C$ 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	
Static							
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}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 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	32	mΩ	
		$V_{GS}=4.5V, I_D=8A$		30	37		
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	
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}	$V_{DS} = 30V, V_{GS}=0V$ $F=1MHz$		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

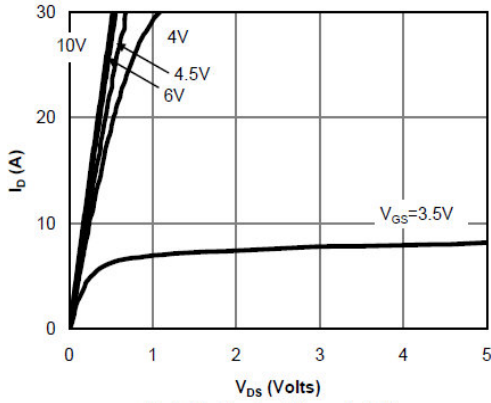


Fig 1: On-Region Characteristics

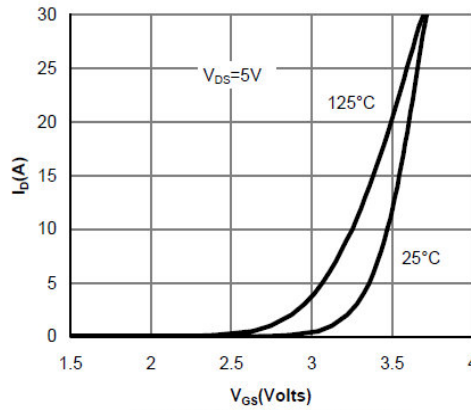


Figure 2: Transfer Characteristics

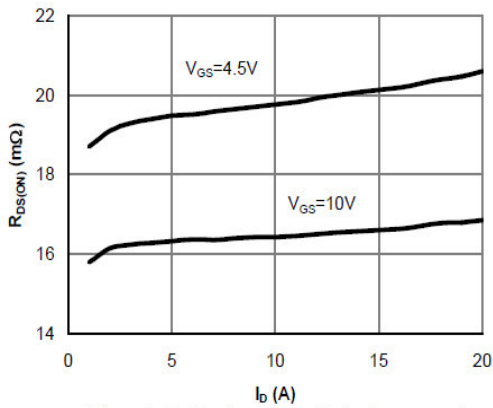


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

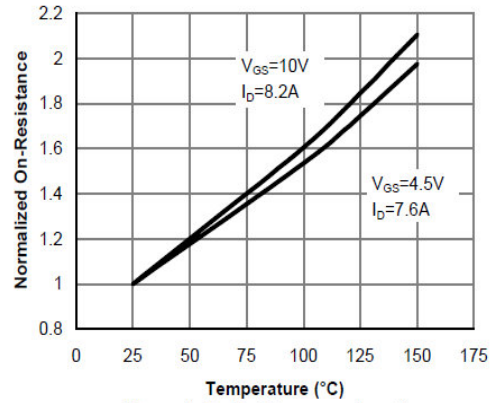


Figure 4: On-Resistance vs. Junction Temperature

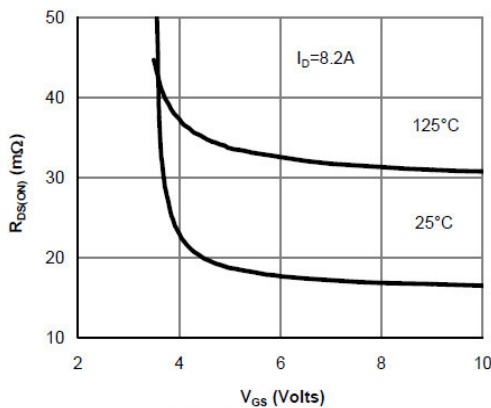


Figure 5: On-Resistance vs. Gate-Source Voltage

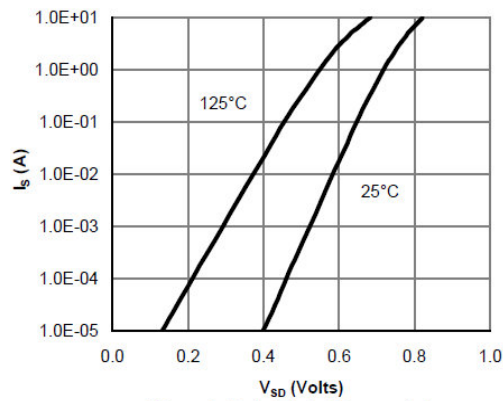


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

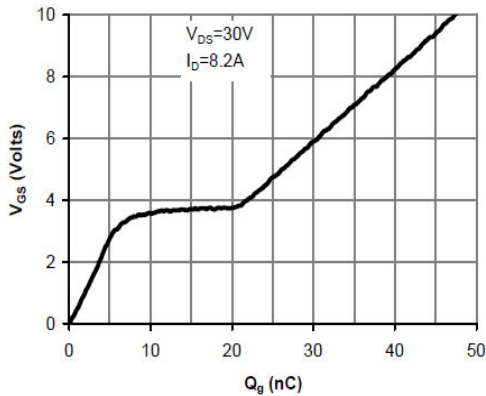


Figure 7: Gate-Charge Characteristics

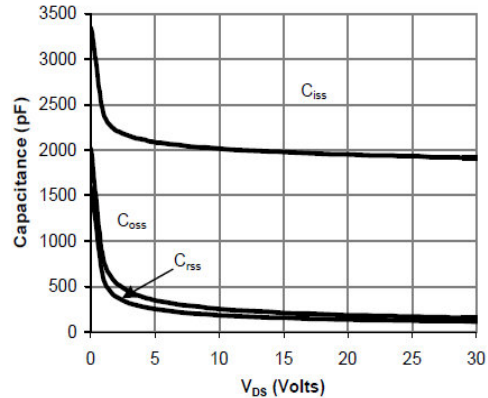


Figure 8: Capacitance Characteristics

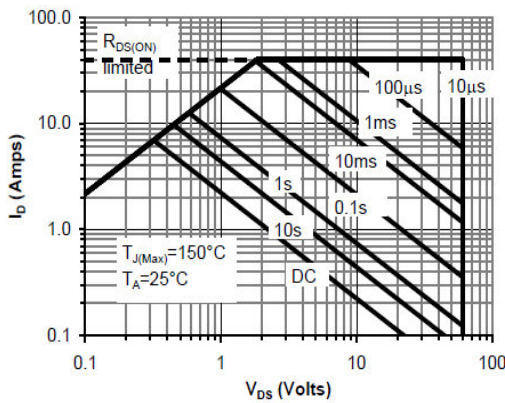


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

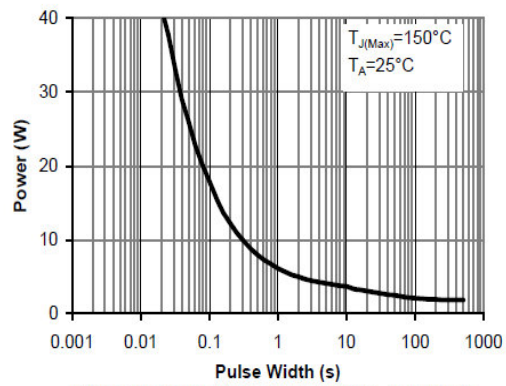


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

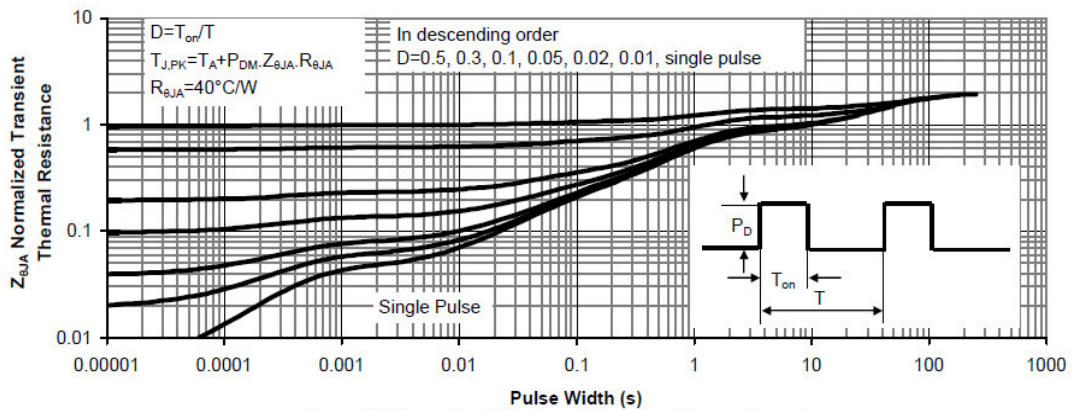
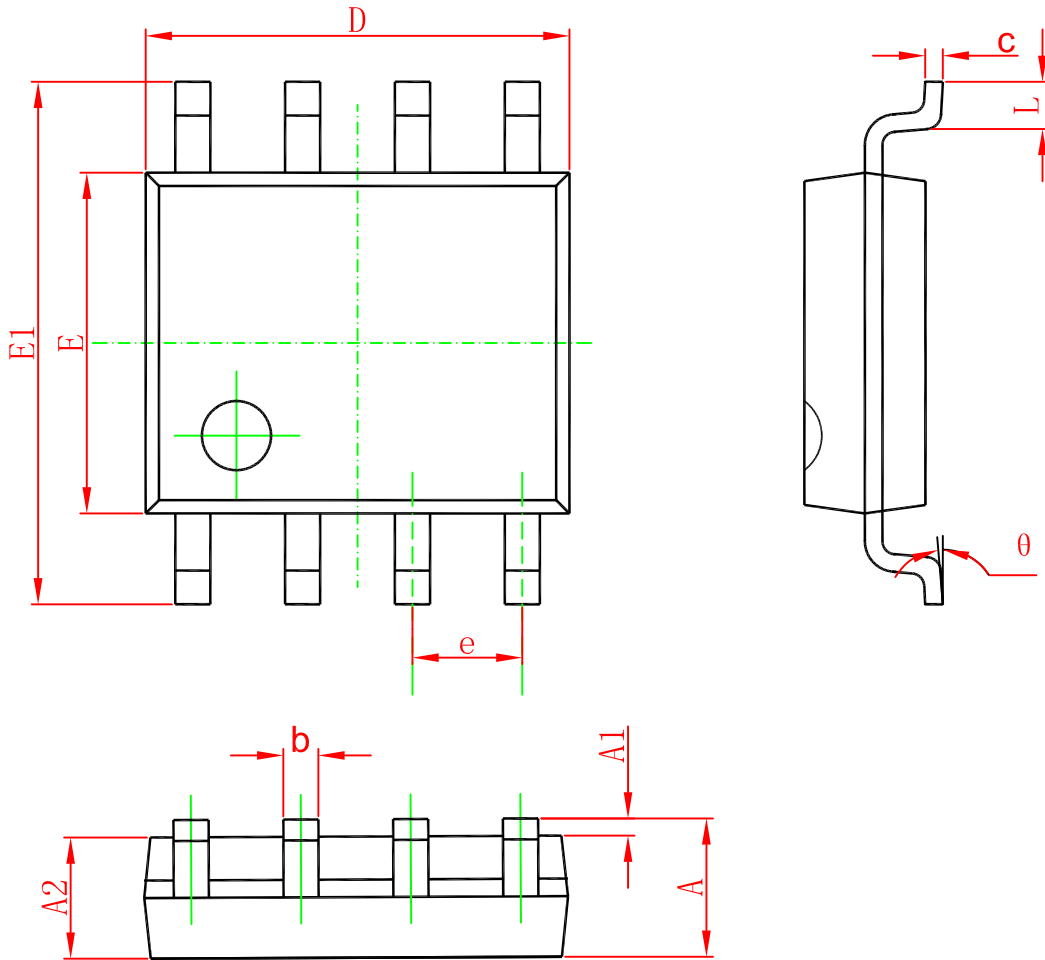


Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Ordering information

Order code	Package	Baseqty	Deliverymode
UMW STN4438	SOP-8	3000	Tape and reel