



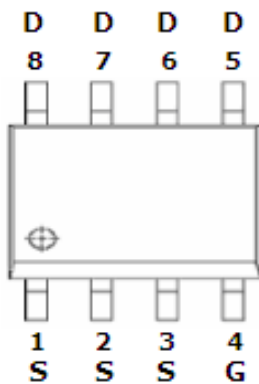
**STN4488L** 

N Channel Enhancement Mode MOSFET  
20.0A

## DESCRIPTION

STN4488L is the N-Channel logic enhancement mode power field effect transistors which are produced using high cell density DMOS trench technology. It is suitable for the power management applications in the portable or battery powered system.

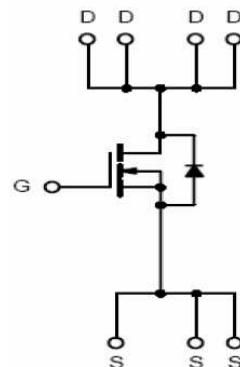
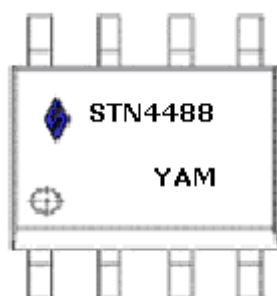
## PIN CONFIGURATION SOP-8



## FEATURE

- 30V/20A,  $R_{DS(ON)} = 3.8m\Omega$  (Typ.) @VGS = 10V
- 30V/18A,  $R_{DS(ON)} = 5.2m\Omega$  @VGS = 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 SOP-8




**Y: Year Code**  
**A: Week Code**  
**M: Process Code**

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

Parameter		Symbol	10 Sec	Steady state	Unit
Drain-Source Voltage		V <sub>DSS</sub>	30		V
Gate-Source Voltage		V <sub>GSS</sub>	±20		V
Continuous Drain Current (T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	I <sub>D</sub>	20	15	A
	T <sub>A</sub> =70°C		17	12	
Pulsed Drain Current		I <sub>DM</sub>	80		A
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	3.0		A
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	3.1	1.7	W
	T <sub>A</sub> =70°C		20	1.1	
Operation Junction Temperature		T <sub>J</sub>	-55/150		°C
Storage Temperature Range		T <sub>STG</sub>	-55/150		°C
Thermal Resistance-Junction to Ambient		R <sub>θJA</sub>	<b>Typ</b>	<b>Max</b>	°C/W
			59	75	



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$ $T_J=55^\circ C$			1	uA
					5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=5V, V_{GS}=10V$	80			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$ $T_J=125^\circ C$		3.8	4.6	mΩ
			$V_{GS}=4.5V, I_D=18A$		5.2	
Forward Tran Conductance	$g_{fs}$	$V_{DS}=10V, I_D=20A$		72		S
Diode Forward Voltage	$V_{SD}$	$I_S=8.0A, V_{GS}=0V$			1.0	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=10V$ $I_D=20A$		84	112	nC
Gate-Source Charge	$Q_{gs}$			12		
Gate-Drain Charge	$Q_{gd}$			21		
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V$ $f=1MHz$		5450	6800	pF
Output Capacitance	$C_{oss}$			760		
Reverse TransferCapacitance	$C_{rss}$			540		
Turn-On Time	$t_{d(on)}$	$V_{DS}=15V, R_L=0.75\Omega$ $I_D=1A, V_G=10V$ $R_G=3.0\Omega$		13		nS
	$t_r$			9.8		
Turn-Off Time	$t_{d(off)}$			49		
	$t_f$			16		

**TYPICAL CHARACTERISTICS**

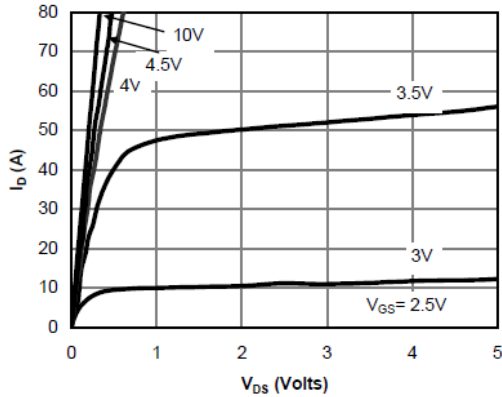


Figure 1: On-Region Characteristics

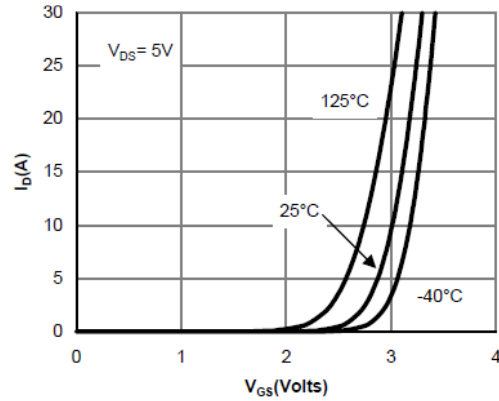


Figure 2: Transfer Characteristics

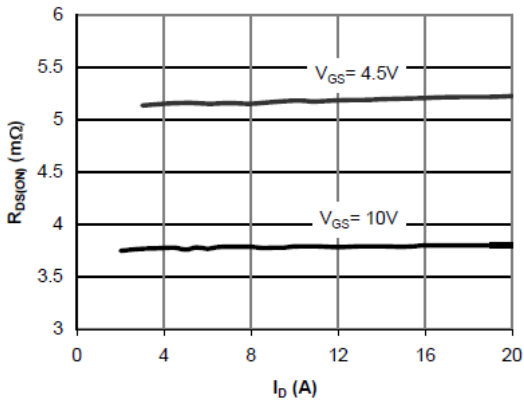


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

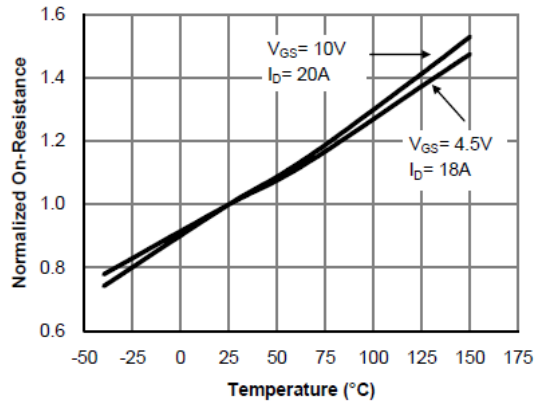


Figure 4: On-Resistance vs. Junction Temperature

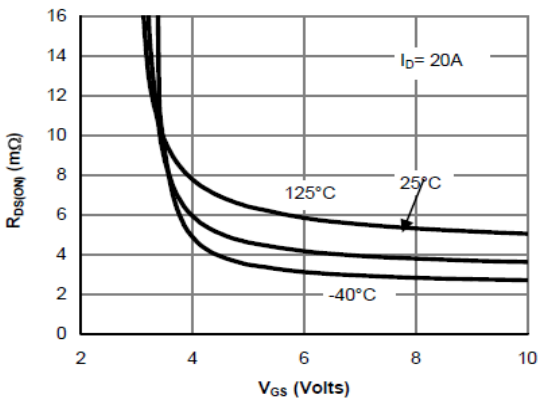


Figure 5: On-Resistance vs. Gate-Source Voltage

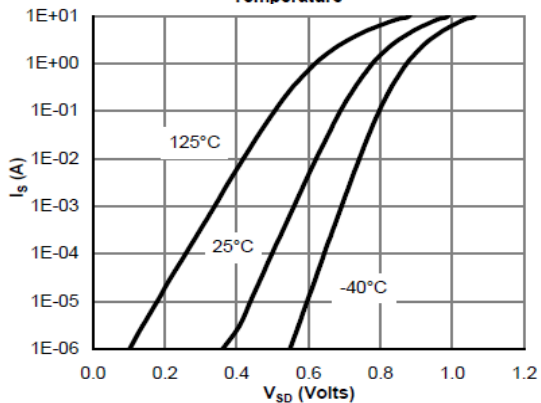


Figure 6: Body-Diode Characteristics

**TYPICAL CHARACTERISTICS**

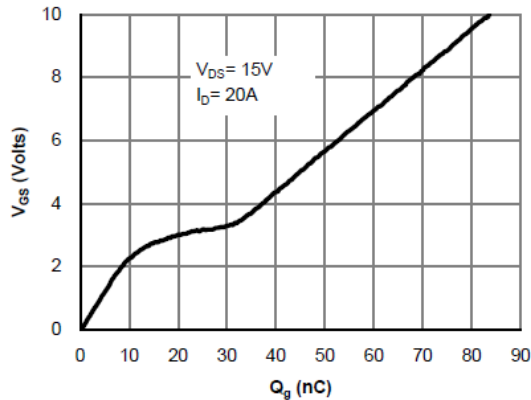


Figure 7: Gate-Charge Characteristics

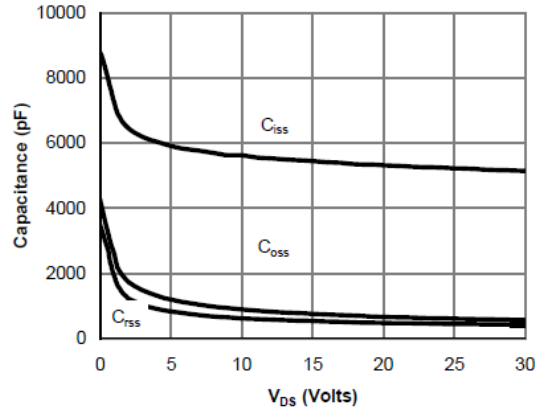


Figure 8: Capacitance Characteristics

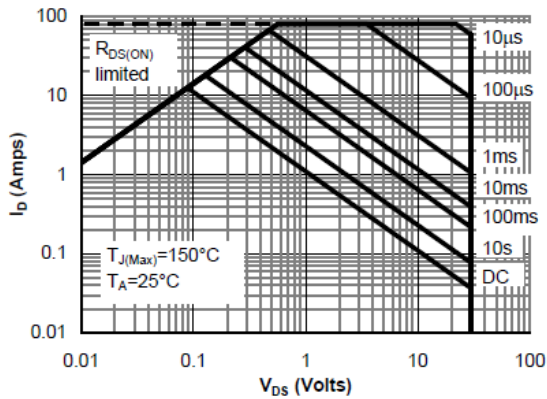


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

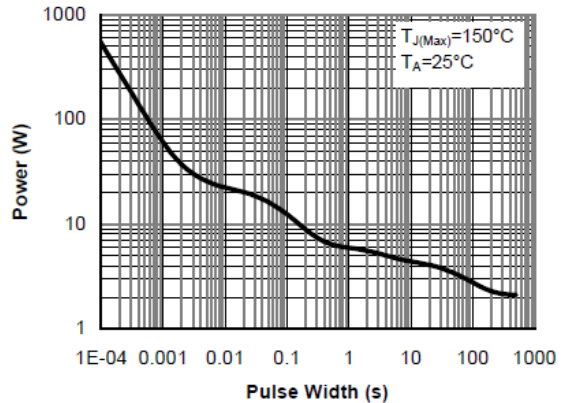


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

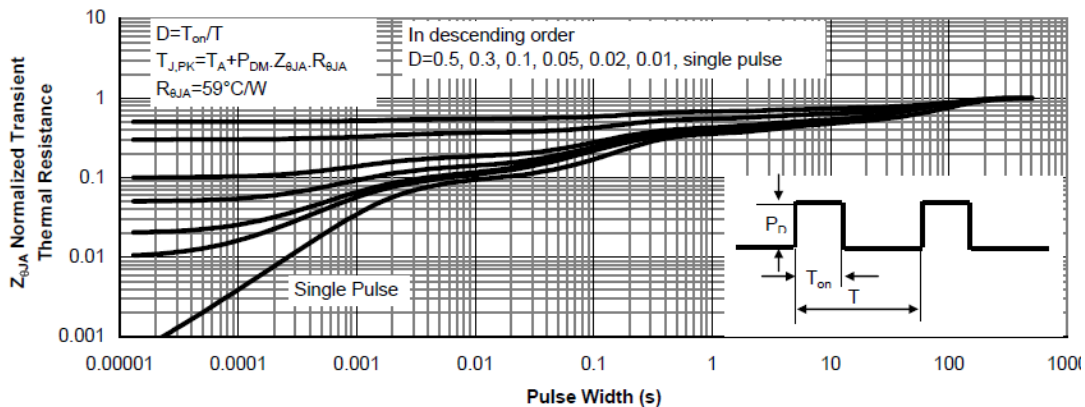
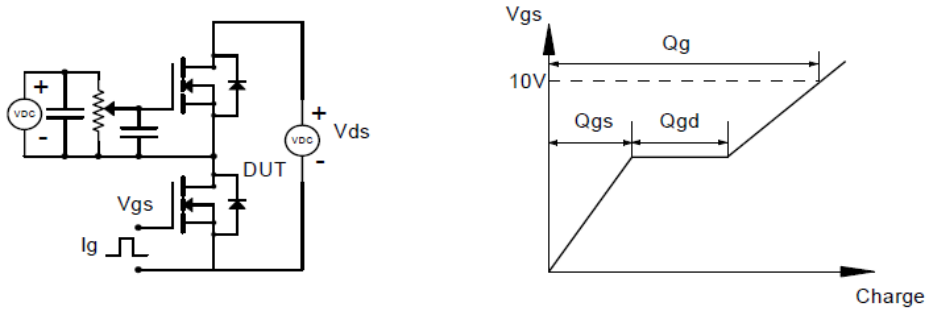
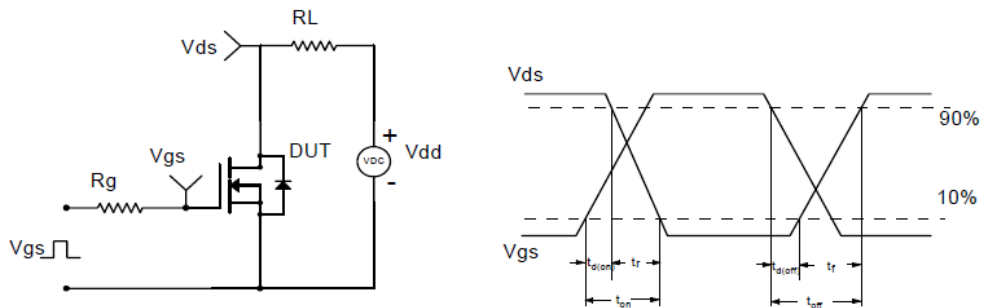


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

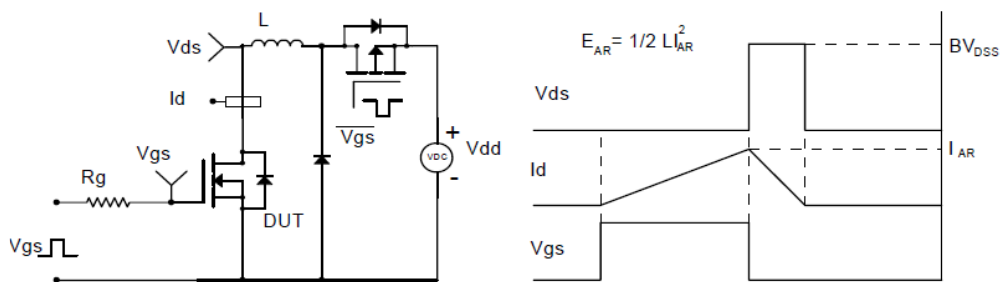
Gate Charge Test Circuit & Waveform



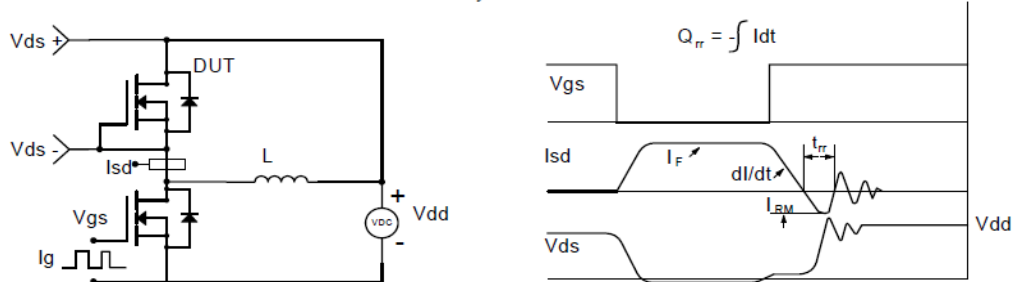
Resistive Switching Test Circuit & Waveforms

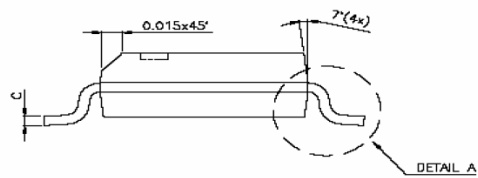
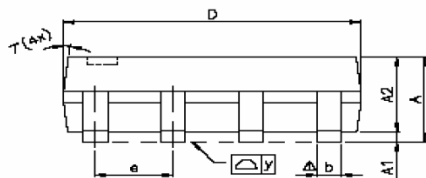
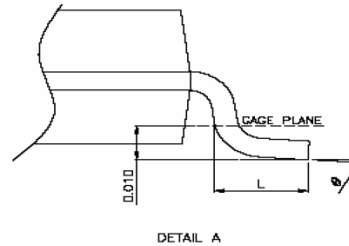
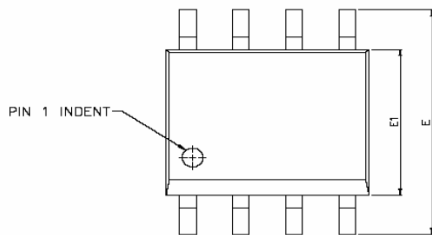


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



**SOP-8 PACKAGE OUTLINE**


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
$\triangle y$	—	—	0.076	—	—	0.003
$\varnothing$	0°	—	8°	0°	—	8°