

30V N-Channel Enhancement Mode MOSFET

DESCRIPTION

The STN4420 is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density, advanced trench technology to provide excellent $R_{DS(ON)}$.

This device is suitable for use as a load switch or in PWM and gate charge for most of the synchronous buck converter applications.

100% EAS guaranteed with full function reliability approval.

STN4420M-TRG ROHS Compliant This is Halogen Free

FEATURE

- ◆ 30V/14A, $R_{DS(ON)} = 10m\Omega(\text{typ.})@V_{GS} = 10V$
- ◆ 30V/12A, $R_{DS(ON)} = 12m\Omega(\text{typ.})@V_{GS} = 4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability

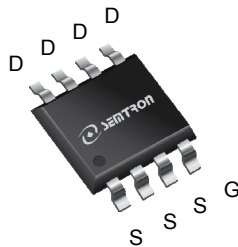
APPLICATIONS

- ◆ Power Management in Note book
- ◆ Portable Equipment
- ◆ High Frequency Point-Load Synchronous Buck Converter for MB/NB/VGA
- ◆ Battery Powered System
- ◆ Load Switch

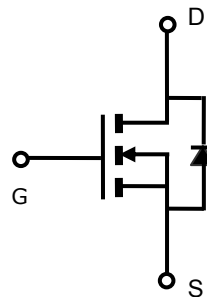


N-Channel Enhancement Mode MOSFET

PIN CONFIGURATION



SOP-8
Top View



PART NUMBER INFORMATION

<u>ST</u> <u>N</u> <u>4420</u> <u>M</u> - <u>TR</u> <u>G</u> a b c d e f	a : Company name. b : Channel type. c : Product Serial number. d : Package code e : Handling code f : Green product code
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ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
STN4420M-TRG	M : SOP-8	TR : Tape&Reel	2.5K/Reel

※ Year Code : 00 ~ 90, 2010 : 00

※ Week Code : 01 ~ 54

※ SOP-8 : Only available in tape and reel packaging.

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

Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	30	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current, V _{GS} =10V ^A	T _A =25°C	14
		T _A =70°C	12
I _{DM}	Pulsed Drain Current ^B	40	A
E _{AS}	Single Pulse Avalanche energy L=0.1mH ^C	138	mJ
P _D	Power Dissipation	T _A =25°C	2.0
		T _A =70°C	1.4
T _J	Operation Junction Temperature	-55/150	°C
T _{STG}	Storage Temperature Range	-55/150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

THERMAL DATA

Symbol	Parameter	Min	Typ	Max	Unit
R _{θJA}	Thermal Resistance-Junction to Ambient			85	°C/W
R _{θJC}	Thermal Resistance-Junction to Case			38	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0		2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} = 0V			1	μA
		V _{DS} = 24V, V _{GS} = 0V T _J = 55°C			5	
R _{DS(ON)}	Drain-source On-Resistance ^B	V _{GS} = -10V, I _D = 14A V _{GS} = -4.5V, I _D = 12A		10 12	14 18	mΩ
G _{fs}	Forward Transconductance	V _{DS} = -10V, I _D = -5.8A		6		S
Source-Drain Diode						
V _{SD}	Diode Forward Voltage	I _S = 1.7A, V _{GS} = 0V		0.7	1.2	V
I _S	Continuous Source Current ^{AD}				10	A
Dynamic Parameters						
Q _g	Total Gate Charge	V _{DS} = 15V, V _{GS} = 4.5V I _D = 10A		12.5		nC
Q _{gs}	Gate-Source Charge			4.4		
Q _{gd}	Gate-Drain Charge			5		
C _{iss}	Input Capacitance	V _{DS} = 15V, V _{GS} = 0V f = 1MHz		1310		pF
C _{oss}	Output Capacitance			160		
C _{rss}	Reverse Transfer Capacitance			132		
t _{d(on)}	Turn-On Time	V _{DD} = 15V, V _{GS} = 10V, I _D = -10A, R _G = 3.3Ω		6.2		nS
t _r				59		
t _{d(off)}	Turn-Off Time			28		
t _f				8.4		

Note:

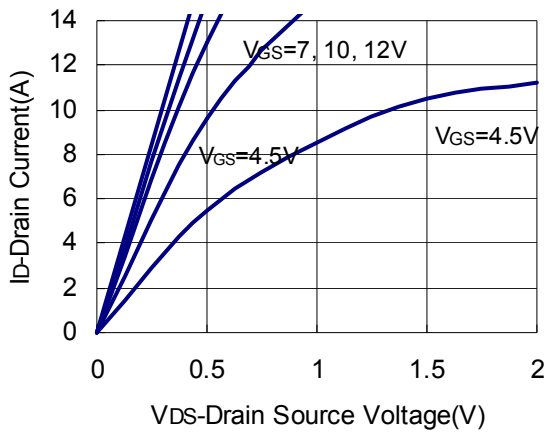
- The value of R_{θJA} is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.
- The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH.
- The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date

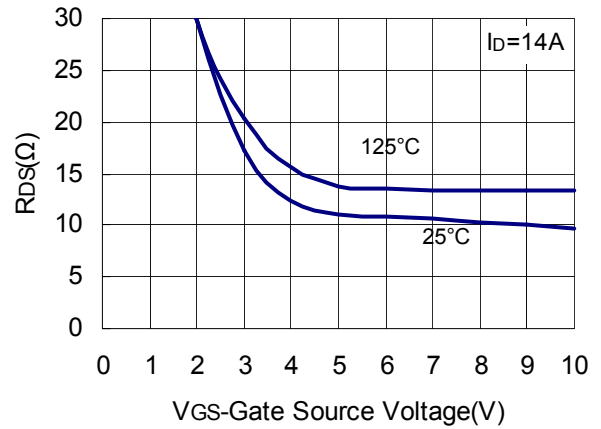
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TYPICAL CHARACTERISTICS

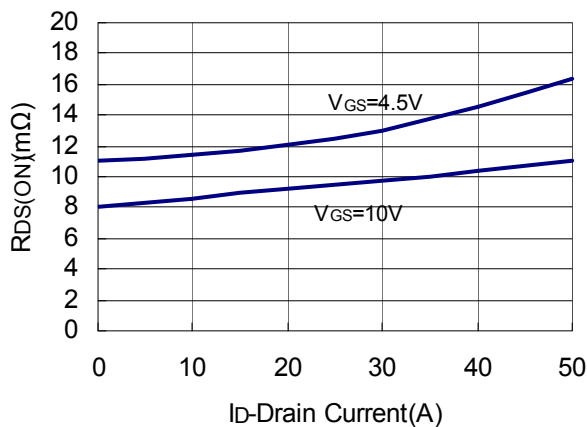
Output Characteristics



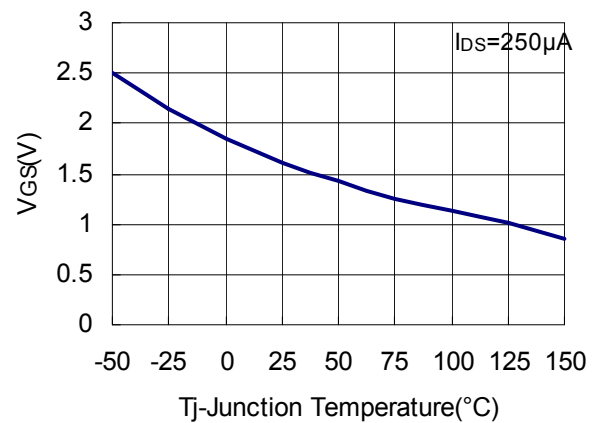
On Resistance VS Gate Source Voltage



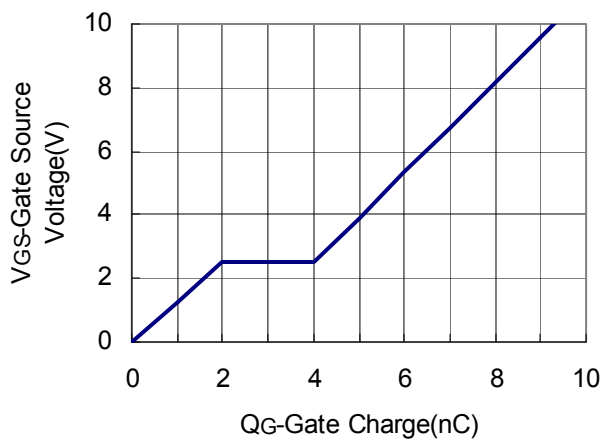
Drain Source On Resistance



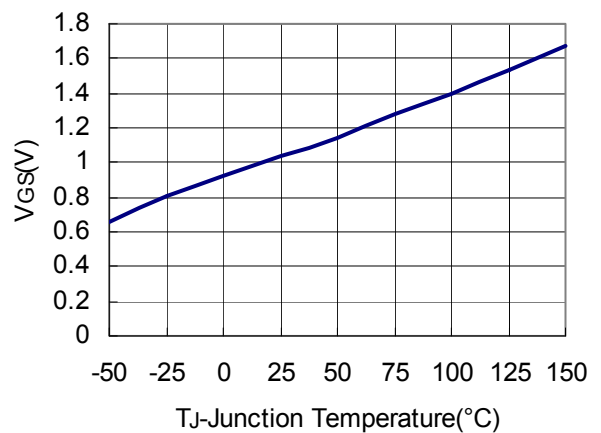
Gate Threshold Voltage



Gate Charge

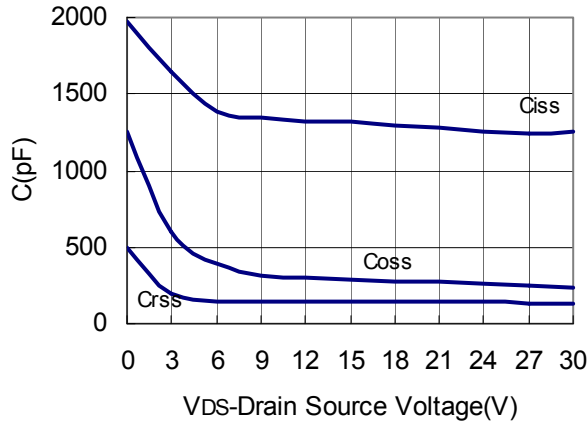


Drain Source On Resistance

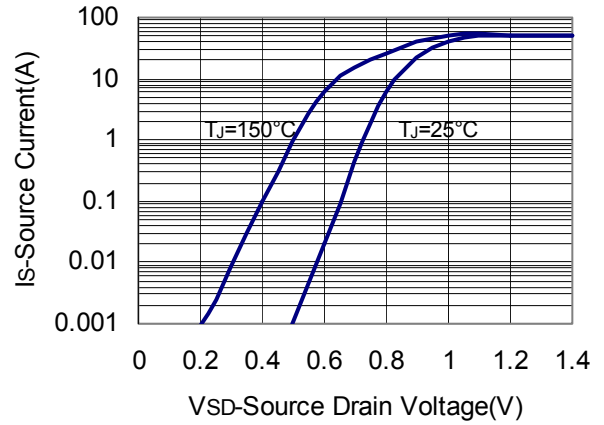


TYPICAL CHARACTERISTICS

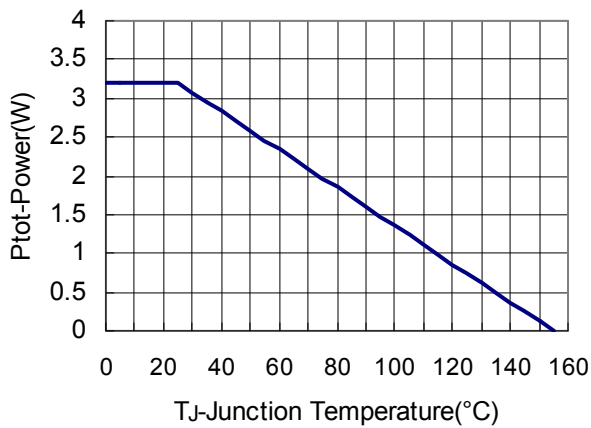
Capacitance



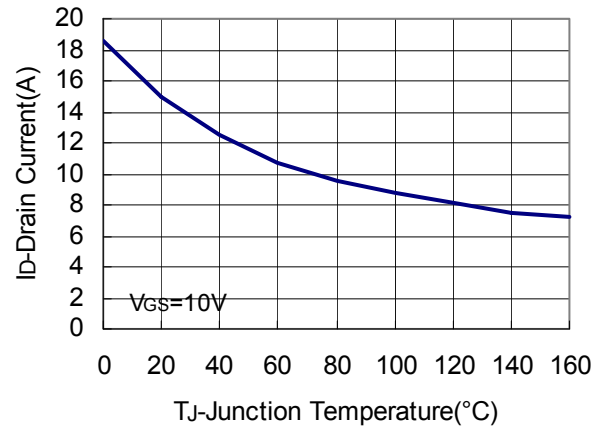
Source Drain Diode Forward



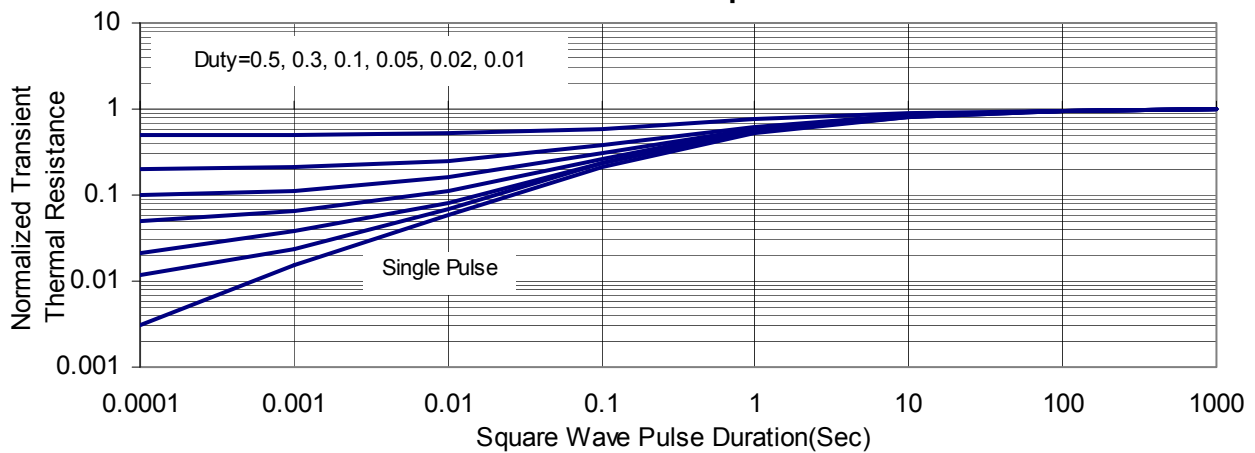
Power Dissipation



Drain Current



Thermal Transient Impedance



SOP-8 PACKAGE DIMENSIONS

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	0.040	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°

SOP-8 PACKAGE OUTLINE DIMENSIONS

