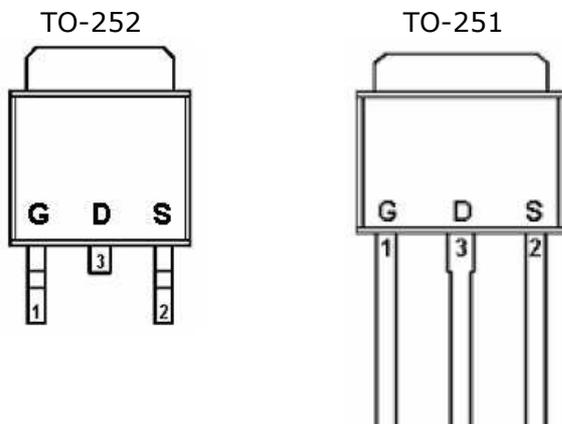


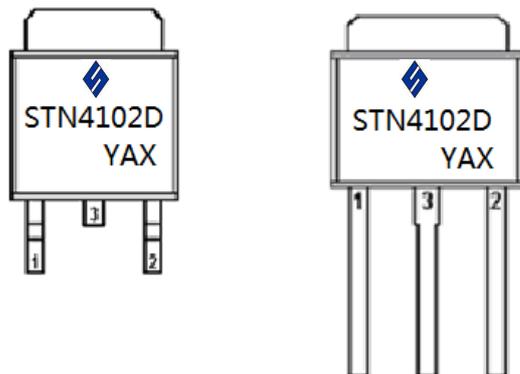
## DESCRIPTION

STN4102 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. The STN410D has been designed specially to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low  $R_{DS(ON)}$  and fast switching speed.

## PIN CONFIGURATION (D-PAK)



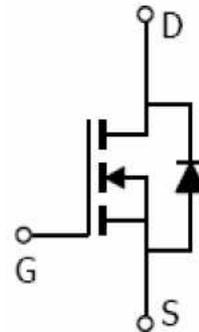
## PART MARKING



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

## FEATURE

- 30V/ 15.0A,  $R_{DS(ON)} = 32m\Omega$  @ $V_{GS} = 10V$
- 30V/8.0A,  $R_{DS(ON)} = 40m\Omega$  @ $V_{GS} = 4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-252,TO-251 package design



# STN4102

N Channel Enhancement Mode MOSFET

15.0A

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

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	VDSS	30	V
Gate-Source Voltage	VGSS	±20	V
Continuous Drain Current (TJ=150°C)	ID	15.0 10.0	A
Pulsed Drain Current	IDM	30	A
Continuous Source Current (Diode Conduction)	IS	12	A
Power Dissipation	PD	25 12.5	W
Operation Junction Temperature	TJ	150	°C
Storage Temperature Range	TSTG	-55/150	°C
Thermal Resistance-Junction to Ambient	RθJA	60	°C/W

# STN4102

N Channel Enhancement Mode MOSFET

15.0A

## 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		3.0	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$V_{DS}=24V, V_{GS}=0V$ $T_J=85^\circ C$			5	
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15.0A$ $V_{GS}=4.5V, I_D=8.0A$		22 32	32 40	mΩ
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=12A$		20		S
Diode Forward Voltage	$V_{SD}$	$I_S=1.0A, V_{GS}=0V$			1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{DS}=15V$ $I_D=8A$		7		nC
Gate-Source Charge	$Q_{gs}$			3.4		
Gate-Drain Charge	$Q_{gd}$			1.78		
Input Capacitance	$C_{iss}$	$V_{DS} = 15, V_{DS}=15V$ $F=1MHz$		290		pF
Output Capacitance	$C_{oss}$			60		
Reverse Transfer Capacitance	$C_{rss}$			75		
Turn-On Time	$t_{d(on)}$ $t_r$	$V_{DD}=10V, R_L= 1.8\Omega$ $V_{GEN}=3\Omega$		4		nS
				3.7		
Turn-Off Time	$t_{d(off)}$ $t_f$			15.9		
				2.6		

# STN4102

N Channel Enhancement Mode MOSFET

15.0A

## TYPICAL CHARACTERISTICS

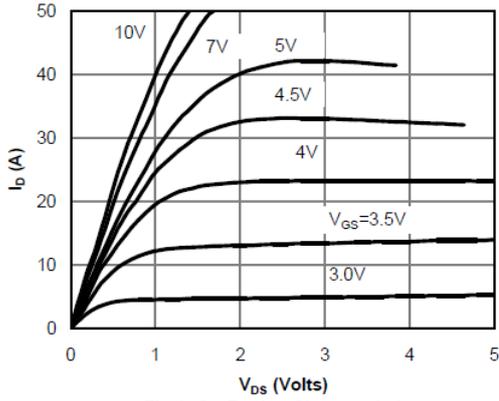


Fig 1: On-Region Characteristics

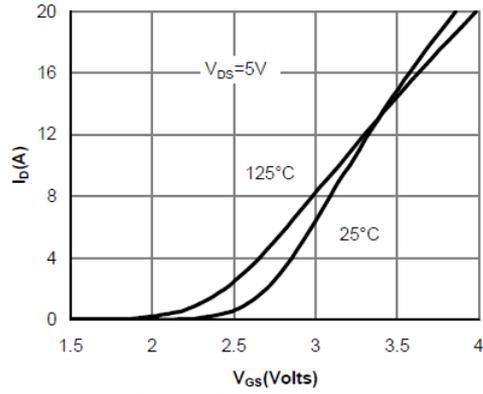


Figure 2: Transfer Characteristics

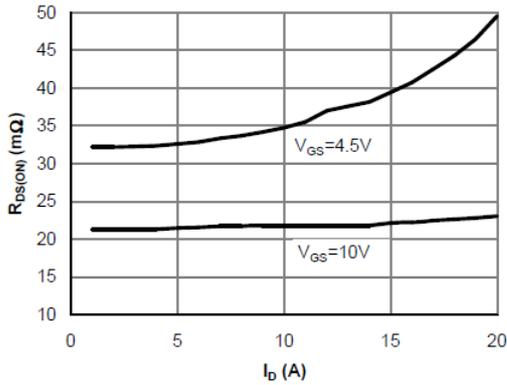


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

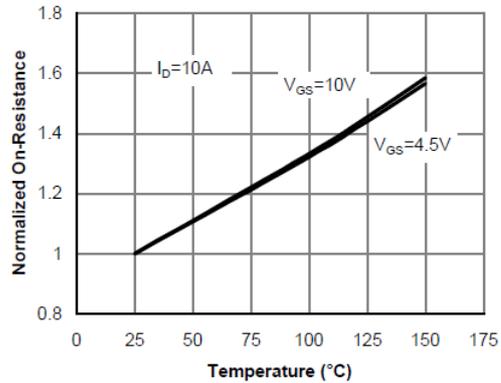


Figure 4: On-Resistance vs. Junction Temperature

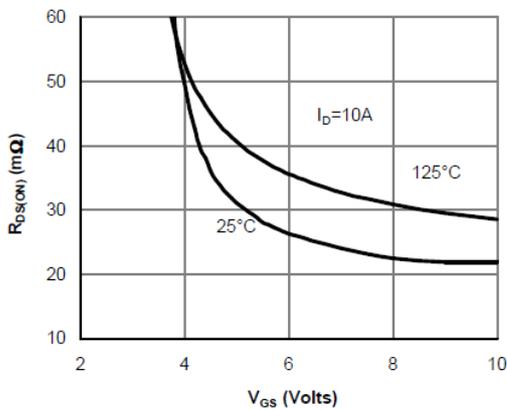


Figure 5: On-Resistance vs. Gate-Source Voltage

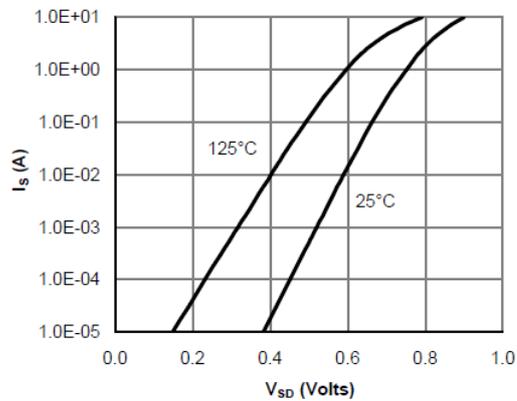


Figure 6: Body-Diode Characteristics