



## ST12N10D



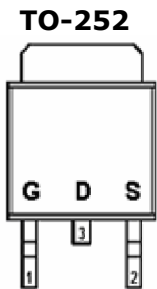
N Channel Enhancement Mode MOSFET

12.0A

### DESCRIPTION

ST12N10D is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. The ST12N10D 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)



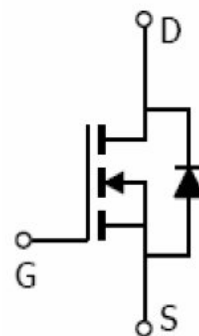
### FEATURE

- 100V/12.0A,  $R_{DS(ON)} = 170m\Omega$ (Typ.) @ $V_{GS} = 10V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-252 Package design

### PART MARKING



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





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

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	VDSS	100	V
Gate-Source Voltage	VGSS	±20	V
Continuous Drain Current (TJ=150°C)	ID	TA=25°C 12.0	A
		TA=100°C 6.0	
Pulsed Drain Current	IDM	50	A
Continuous Source Current (Diode Conduction)	IS	15	A
Power Dissipation	PD	TA=25°C 79	W
Operation Junction Temperature	TJ	150	°C
Storage Temperature Range	TSTG	-55/150	°C
Thermal Resistance-Junction to Ambient	RθJA	110	°C/W



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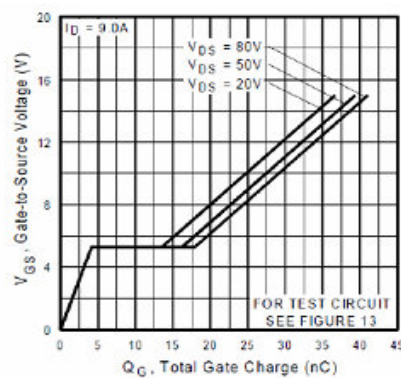
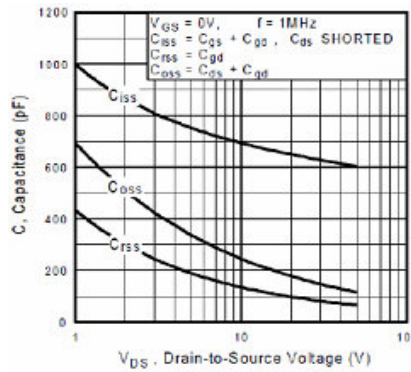
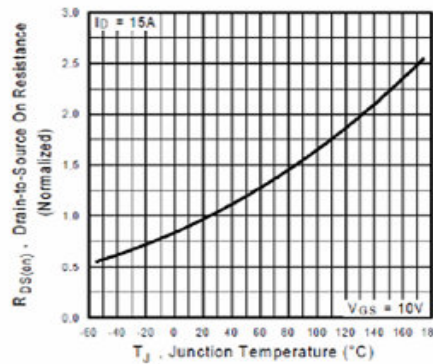
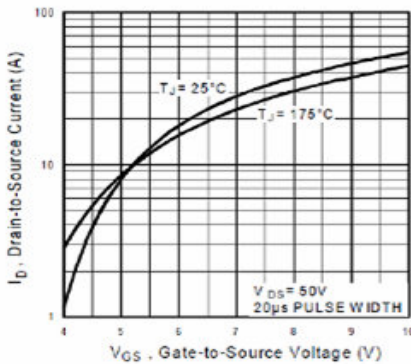
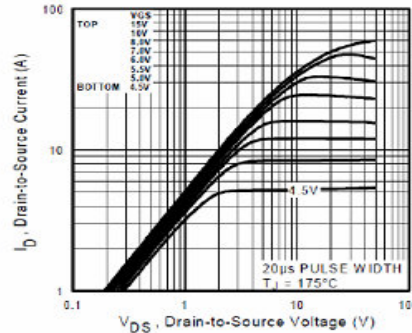
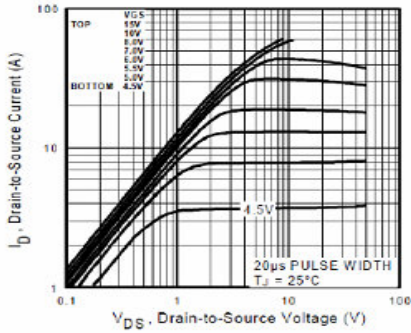
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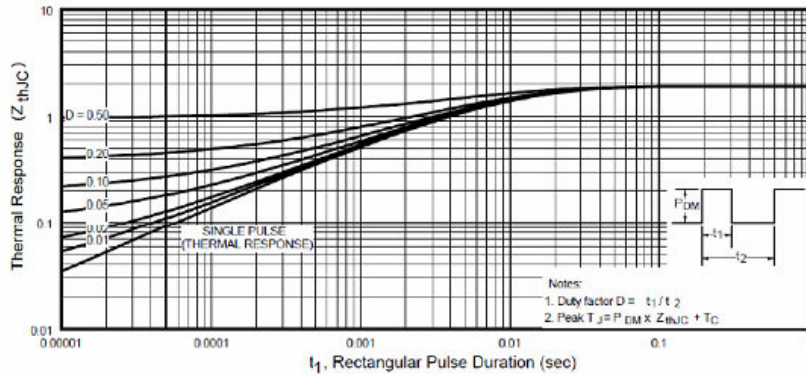
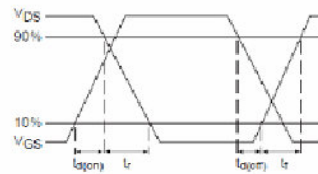
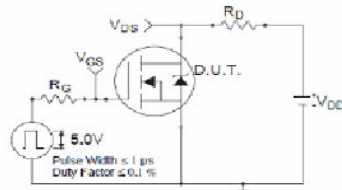
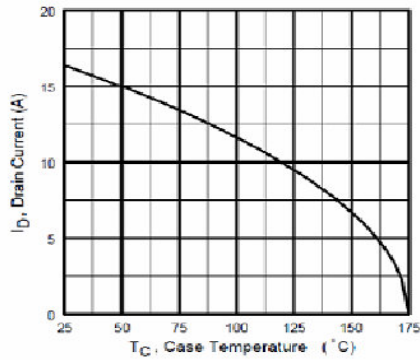
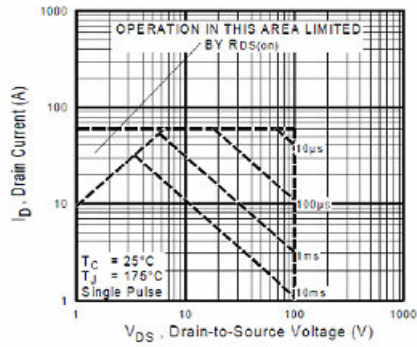
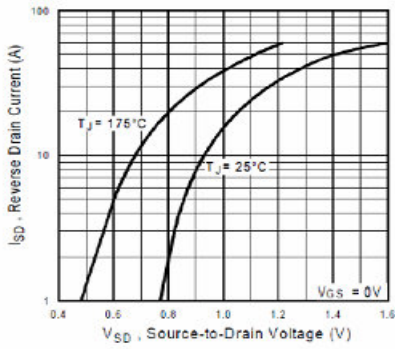
**ELECTRICAL CHARACTERISTICS** ( Ta = 25°C Unless otherwise noted )

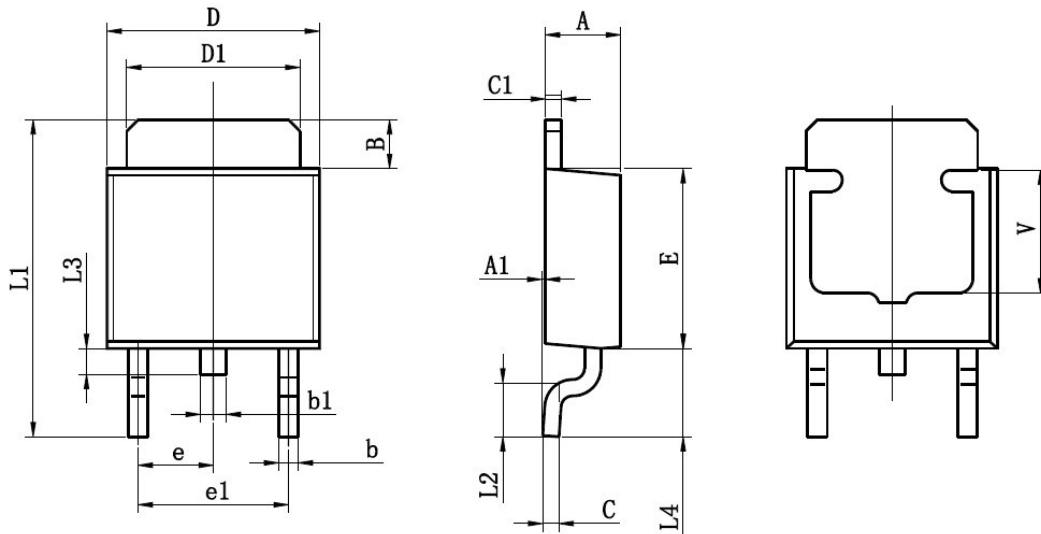
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250mA$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			12	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=150^\circ C$			5.0	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	50			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=16A$		170	180	mΩ
Forward Transconductance	$g_{fs}$	$V_{DS}=50V, I_D=9.0A$	6.4			S
Diode Forward Voltage	$V_{SD}$	$I_S=9.0A, V_{GS}=0V$			1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=80V, V_{GS}=10V$ $I_D=9.0A$			45	nC
Gate-Source Charge	$Q_{gs}$				7.2	
Gate-Drain Charge	$Q_{gd}$				22	
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS}=0V$ $F=1MHz$		640		pF
Output Capacitance	$C_{oss}$			160		
Reverse Transfer Capacitance	$C_{rss}$			88		
Turn-On Time	$t_{d(on)}$ $t_r$	$V_{DD}=50V, R_D= 5.5\Omega$ $I_D=9.0A, V_{GEN}=10V$ $R_G=12\Omega$		7.4		nS
Turn-Off Time	$t_{d(off)}$ $t_f$			29		
				40		
				25		

**TYPICAL CHARACTERISTICS**



**TYPICAL CHARACTERISTICS**



**TO-252-2L PACKAGE OUTLINE SOP-8P**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300TYP		0.091TYP	
e1	4.500	4.700	0.177	0.185
L1	9.500	9.900	0.374	0.390
L2	1.400	1.780	0.055	0.070
L3	0.650	0.950	0.026	0.037
L4	2.550	2.900	0.100	0.114
V	3.80REF		0.150REF	