



ST13P10D

P Channel Enhancement Mode MOSFET

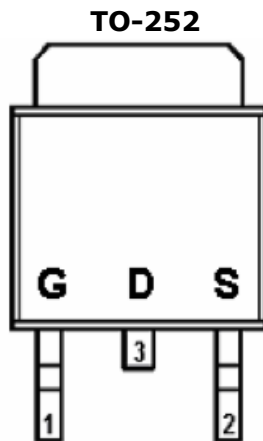


-13.0A

DESCRIPTION

ST13P10D is the P-Channel logic enhancement mode power field effect transistor which is produced using high cell density, DMOS trench technology. The ST13P10D has been designed specially to improve the overall efficiency of DC/DC converters using either synchronous or onventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

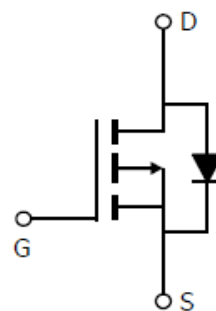
PIN CONFIGURATION (D-PAK)



FEATURE

- -100V/-13.0A, $R_{DS(ON)} = 130m\Omega$
@ $V_{GS} = -10V$
- 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: Process Code
B : Wafer Code

STANSON TECHNOLOGY
120 Bentley Square, Mountain View, Ca 94040 USA
www.stansontech.com

**ST13P10D**

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-13.0A**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)	TA=25°C TA=100°C	ID	-13.0 -8.2	A
Pulsed Drain Current		IDM	-52	A
Continuous Source Current (Diode Conduction)		IS	-13	A
Power Dissipation	TA=25°C	PD	66	W
Operation Junction Temperature		TJ	150	°C
Storage Temperature Range		TSTG	-55/150	°C
Thermal Resistance-Junction to Ambient		RθJA	110	°C/W

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

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100			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}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$			-25	uA
		$V_{DS}=-80V, V_{GS}=0V$ $T_J=150^{\circ}C$			-250	
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-13A$		115	130	mΩ
Forward Transconductance	gfs	$V_{DS}=-50V, I_D=-7.8A$	3.2			S
Diode Forward Voltage	V_{SD}	$I_S=-7.8A, V_{GS}=0V$			-1.6	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-80V, V_{GS}=-10V$ $I_D=-8.4A$			58	nC
Gate-Source Charge	Q_{gs}				8.3	
Gate-Drain Charge	Q_{gd}				32	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V$ $F=1MHz$		760		pF
Output Capacitance	C_{oss}			260		
Reverse Transfer Capacitance	C_{rss}			170		
Turn-On Time	$t_{d(on)}$ t_r	$V_{GS}=-10V, V_{DD}=-50V$ $R_D=6.2\Omega, R_G=9.1\Omega$		15		nS
Turn-Off Time	$t_{d(off)}$ t_f			58		
				45		
				46		

TYPICAL CHARACTERISTICS

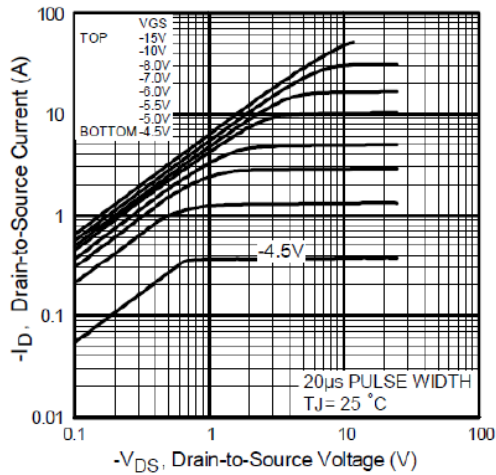


Fig 1. Typical Output Characteristics

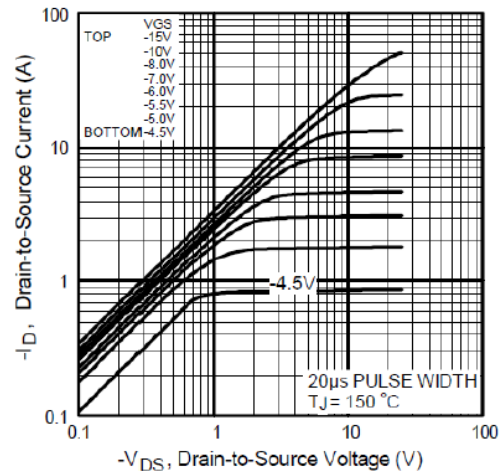


Fig 2. Typical Output Characteristics

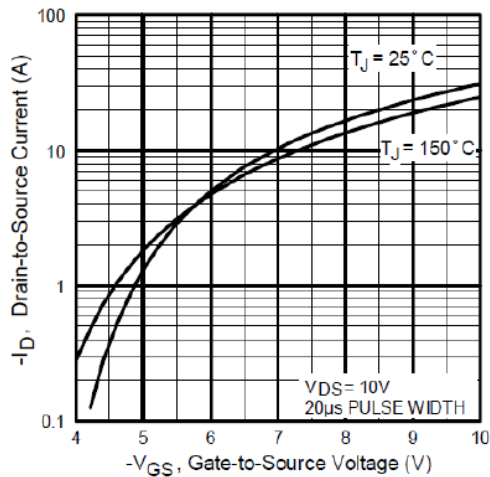


Fig 3. Typical Transfer Characteristics

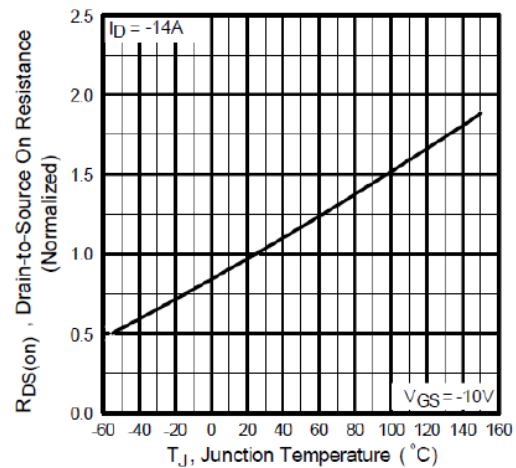


Fig 4. Normalized On-Resistance Vs. Temperature

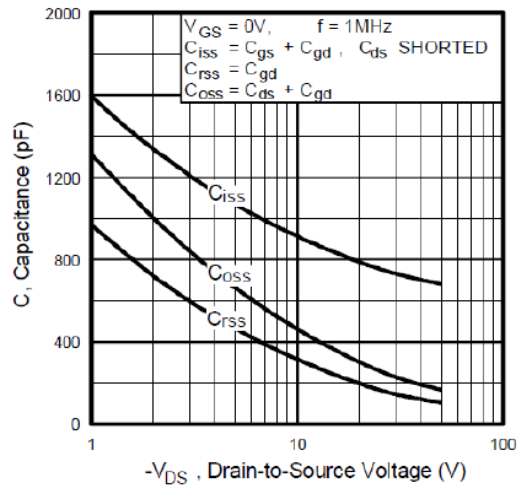


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

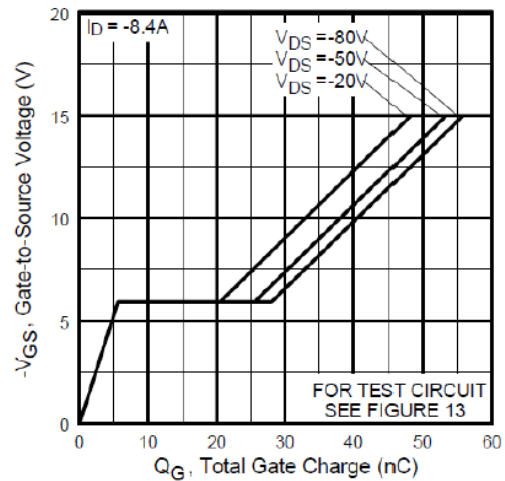
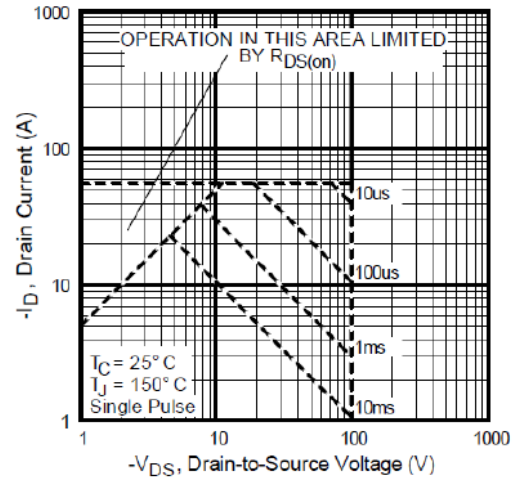
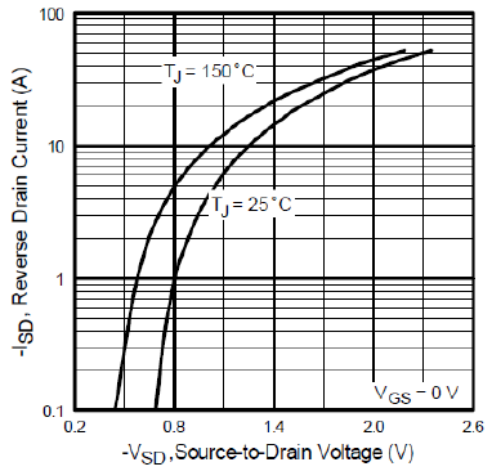


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage



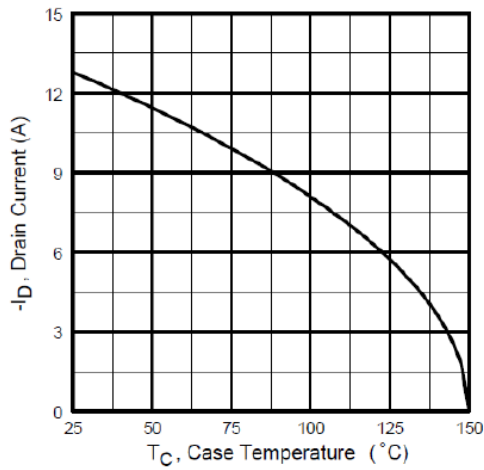


Fig 9. Maximum Drain Current Vs. Case Temperature

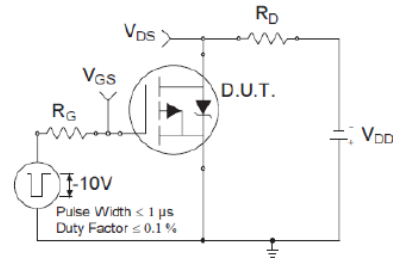


Fig 10a. Switching Time Test Circuit

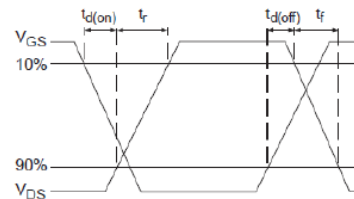


Fig 10b. Switching Time Waveforms

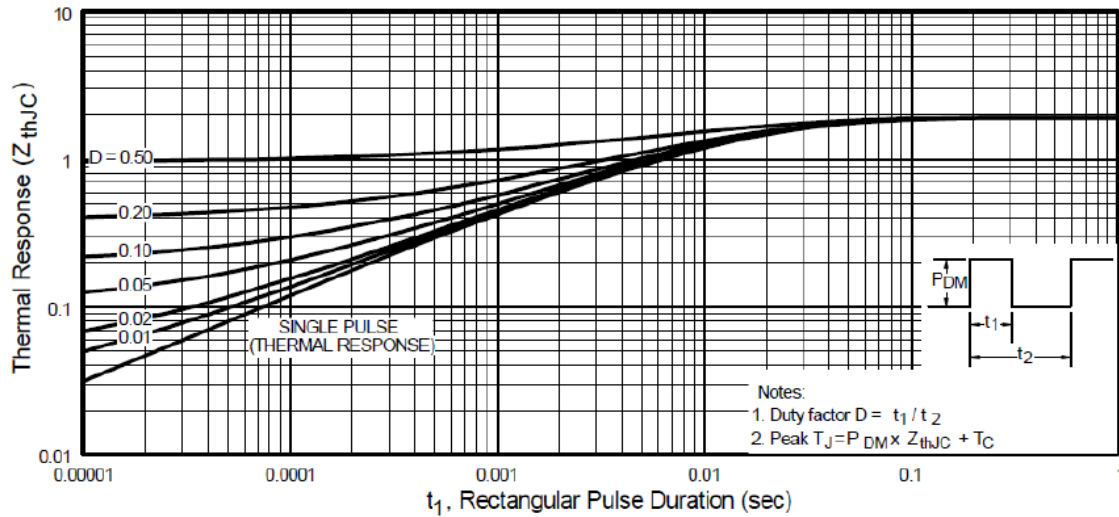
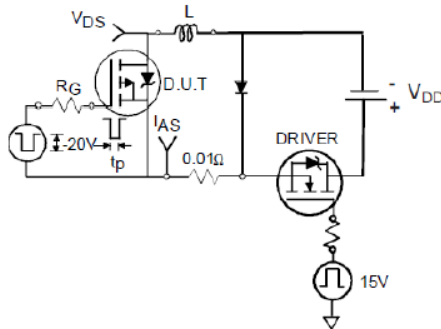
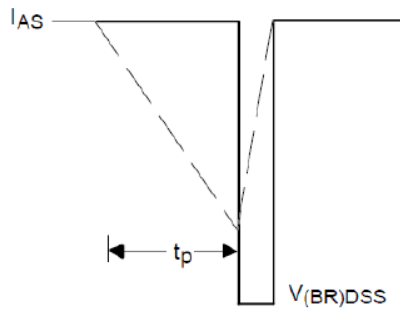
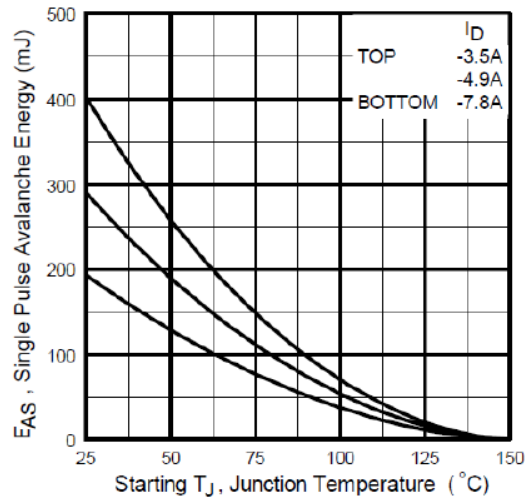
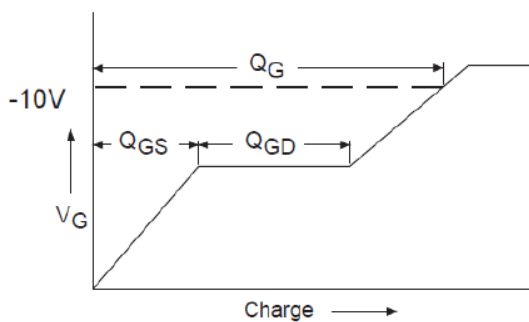
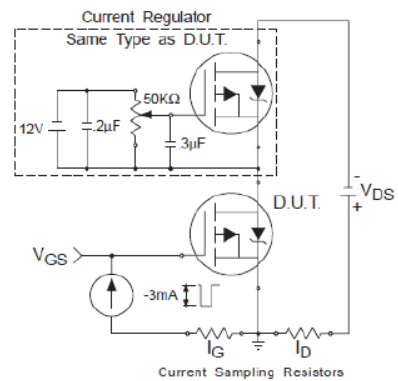
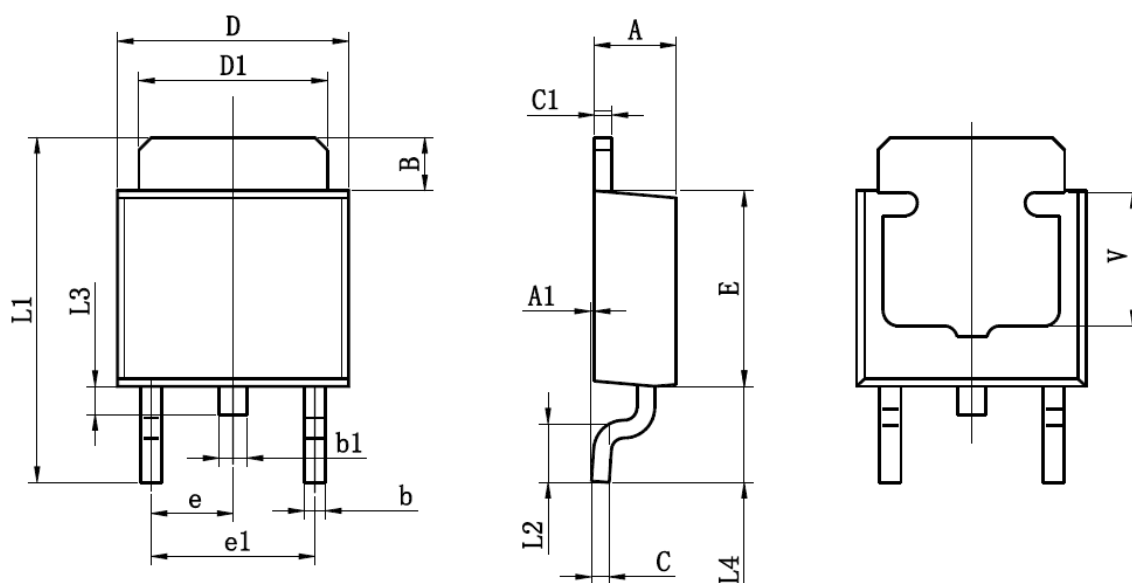


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case


Fig 12a. Unclamped Inductive Test Circuit

Fig 12b. Unclamped Inductive Waveforms

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

Fig 13a. Basic Gate Charge Waveform

Fig 13b. Gate Charge Test Circuit

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	