

-30V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The STP3401 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density, advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation gate as 2.5V.

This device is suitable for use as a load switch or other general applications.

STP3401S-TRG ROHS Compliant This is Halogen Free

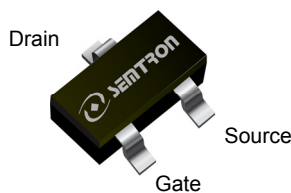
FEATURE

- ◆ -30V/-4.3A, $R_{DS(ON)} = 44m\Omega (typ.) @ V_{GS} = -10V$
- ◆ -30V/-3.5A, $R_{DS(ON)} = 48m\Omega (typ.) @ V_{GS} = -4.5V$
- ◆ -30V/-2.5A, $R_{DS(ON)} = 58m\Omega (typ.) @ V_{GS} = -2.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability

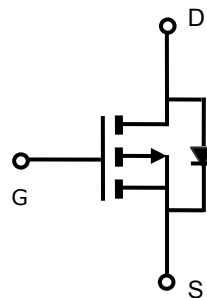
APPLICATIONS

- ◆ High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- ◆ DC/DC Converter
- ◆ Load Switch

PIN CONFIGURATION



SOT-23L
Top View



PART NUMBER INFORMATION

ST P 3401 S - TR G a b c d e f	a : Company name. b : Channel type. c : Product Serial number. d : Package code e : Handling code f : Green produce code
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ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
STP3401S-TRG	S : SOT-23L	TR : Tape&Reel	3K/Reel

- ※ Year Code : 0 ~ 9, 2010 : 0
- ※ Week Code : A(1~2) ~ Z(53~54)
- ※ SOT-23L : Only available in tape and reel packaging.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Typical	Unit	
V_{DSS}	Drain-Source Voltage	-30	V	
V_{GSS}	Gate-Source Voltage	± 12	V	
I_D	Continuous Drain Current ($T_C=25^\circ\text{C}$) ^A	$V_{GS}=-10\text{V}$	-4.3	A
	Continuous Drain Current ($T_C=70^\circ\text{C}$) ^A		-4.0	A
I_{DM}	Pulsed Drain Current ^B	-20	A	
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	1.4	W
		$T_A=70^\circ\text{C}$	0.9	
T_J	Operation Junction Temperature	-55 to 150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	

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	Typ	Max	Unit	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient ^A	Steady-State	-	120	$^\circ\text{C}/\text{W}$
$R_{\theta JL}$	Thermal Resistance Junction to Lead ^A	Steady-State	-	80	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.6		-1.2	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
I_{DSS}	Zero Gate Voltage, Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V$ $T_J=25^\circ\text{C}$			-1	μA
		$V_{DS}=-24V, V_{GS}=0V$ $T_J=55^\circ\text{C}$			-5	
$R_{DS(ON)}$	Drain-source On-Resistance ^B	$V_{GS}=-10V, I_D=-4.3A$		44	50	m Ω
		$V_{GS}=-4.5V, I_D=-3.5A$		48	58	
		$V_{GS}=-2.5V, I_D=-2.5A$		58	70	
G_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-4.0A$		15		S
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	$I_S=-1.0A, V_{GS}=0V$		-0.7	-1.0	V
I_S	Continuous Source Current ^{AD}				-6	A
Dynamic Parameters						
$Q_g (-4.5V)$	Total Gate Charge	$V_{DS}=-20V$ $V_{GS}=-4.5V$ $I_D=-4.0A$		6.2		nC
Q_{gs}	Gate-Source Charge			2.8		
Q_{gd}	Gate-Drain Charge			3.0		
C_{iss}	Input Capacitance	$V_{DS}=-12V$ $V_{GS}=0V$ $f=1\text{MHz}$		672		pF
C_{oss}	Output Capacitance			280		
C_{rss}	Reverse Transfer Capacitance			102		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-12V$ $I_D=-4A$		9		nS
t_r				15		
$t_{d(off)}$	Turn-Off Time	$V_{GEN}=-10V$ $R_G=3.3\Omega$		23		
t_f				21		

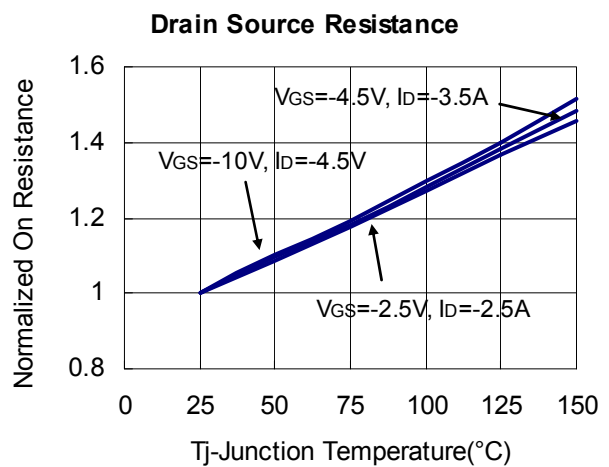
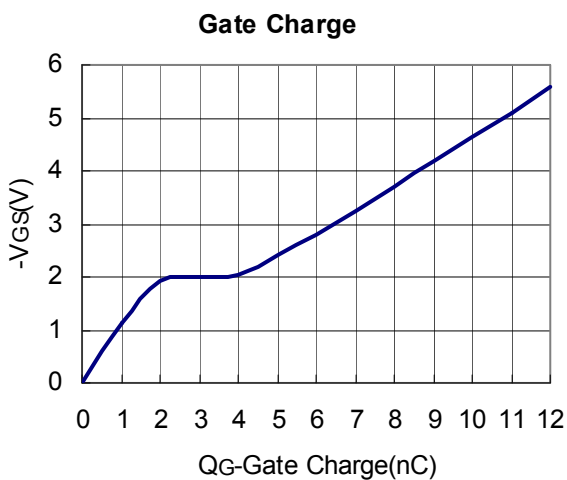
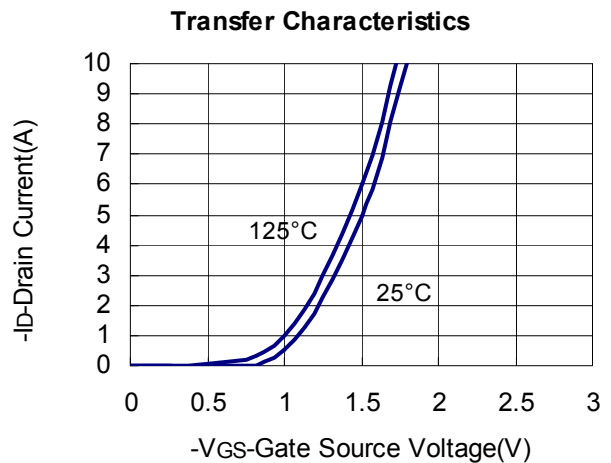
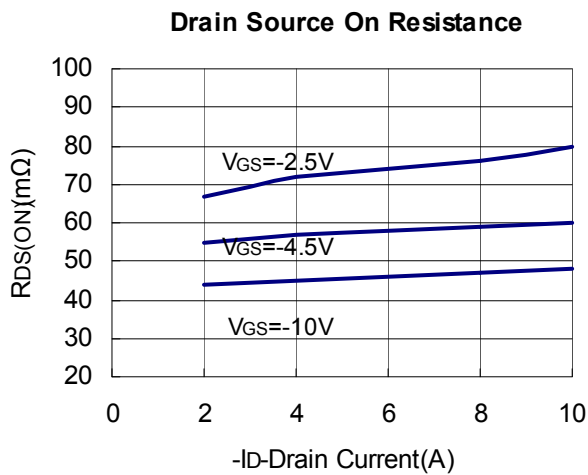
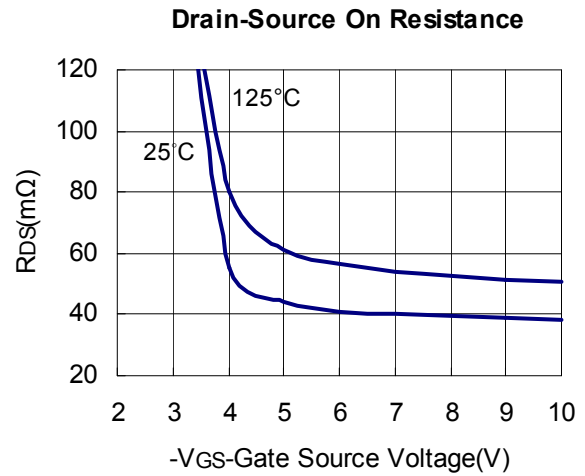
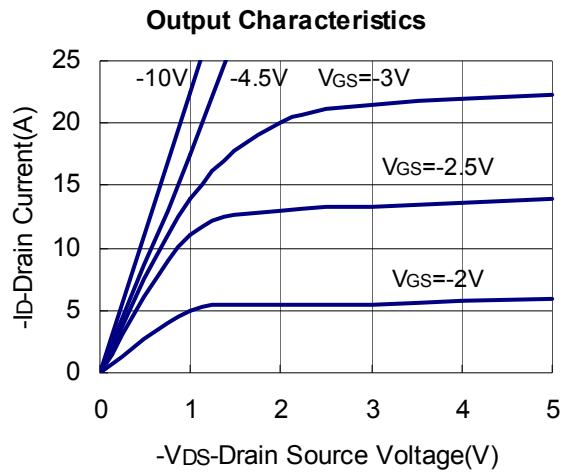
Note:

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

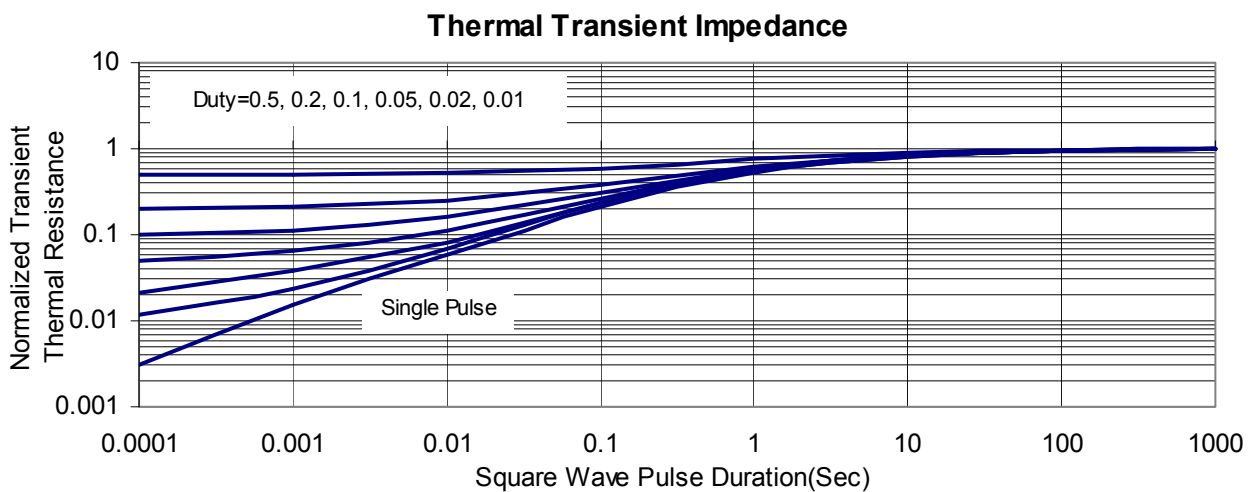
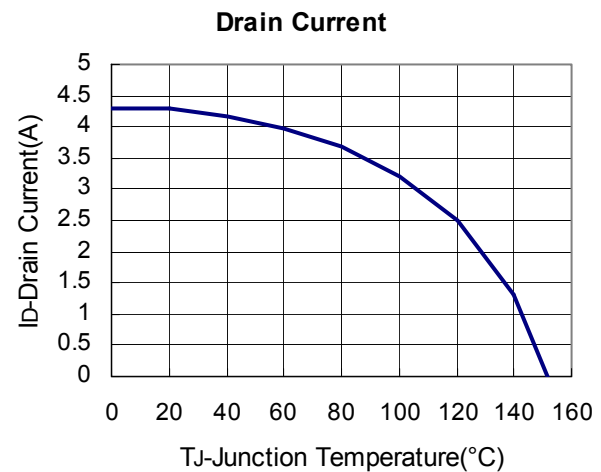
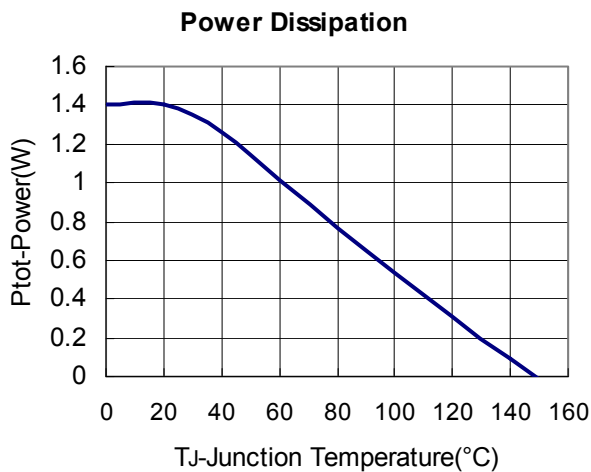
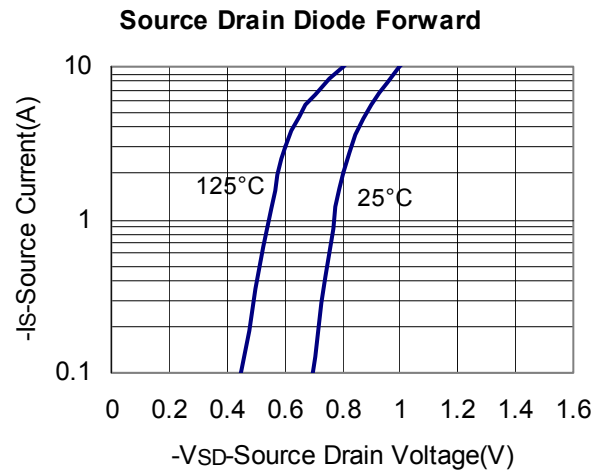
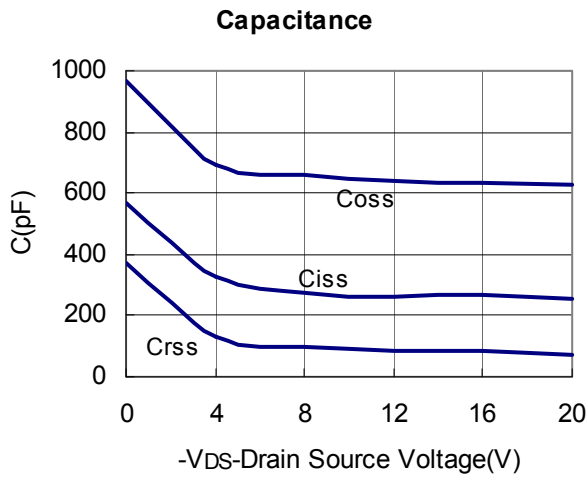
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TYPICAL CHARACTERISTICS (25°C Unless Note)



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SOT-23L PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23L PACKAGE OUTLINE DIMENSIONS

