

-20V P-Channel Enhancement Mode MOSFET
DESCRIPTION

The STP2305A is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density, advanced trench technology to provide excellent $R_{DS(ON)}$.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.

FEATURE

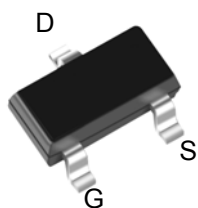
- ◆ -16V/-3.5A, $R_{DS(ON)} = 63m\Omega @ V_{GS} = -10V$
- ◆ -16V/-3.0A, $R_{DS(ON)} = 80m\Omega @ V_{GS} = -4.5V$
- ◆ -16V/-2.2A, $R_{DS(ON)} = 90m\Omega @ V_{GS} = -2.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability

APPLICATIONS

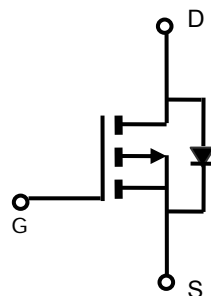
- ◆ High Frequency Point-of-Load Synchronous
- ◆ Newworking DC-DC Power System
- ◆ Load Switch



P-Channel Enhancement Mode MOSFET

PIN CONFIGURATION


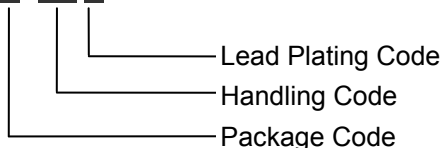
TOP VIEW
SOT-23



P-Channel

PART NUMBER INFORMATION

STP2305AX-XX X


Lead Plating Code

G : Green product.
This product is Halogen free

Handling Code

TR : Tape&Reel

Package Code

S : SOT-23

ORDERING INFORMATION

Part Number	Package Code	Package	Shipping
STP2305AS-TRG	S	SOT-23	3000 / Tape&Reel

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

Symbol	Parameter	Typical	Unit
V_{DSS}	Drain-Source Voltage	-16	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current, $V_{GS}=10V^A$	$T_A=25^\circ\text{C}$ -3.5	A
I_{DM}	Pulsed Drain Current ^B	-10	A
P_D	Power Dissipation	$T_A=25^\circ\text{C}$ $T_A=70^\circ\text{C}$ 1.25 0.8	W
T_J	Operation Junction Temperature	-55/150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55/150	$^\circ\text{C}$

Note:

A. 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 $T_A=25^\circ\text{C}$.

B. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

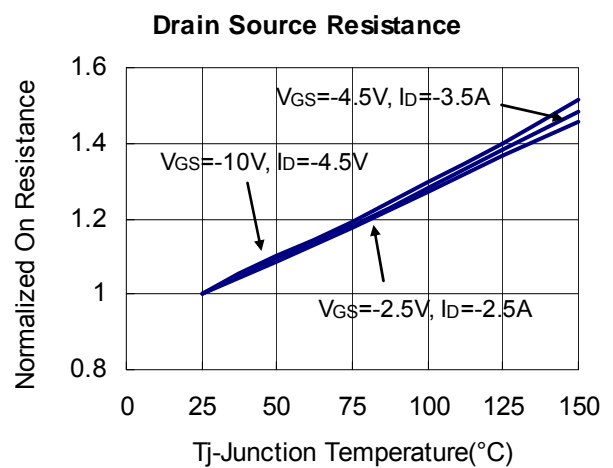
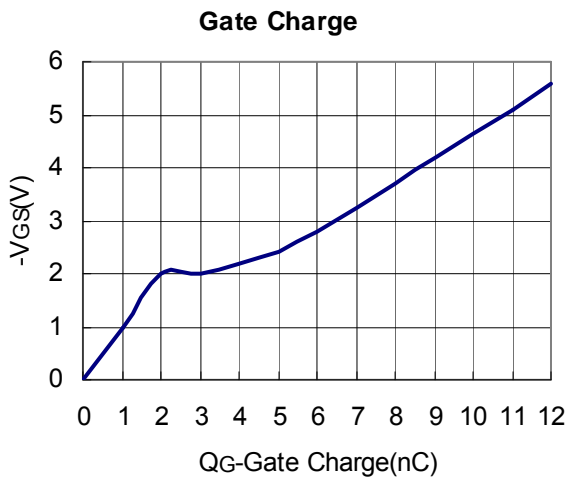
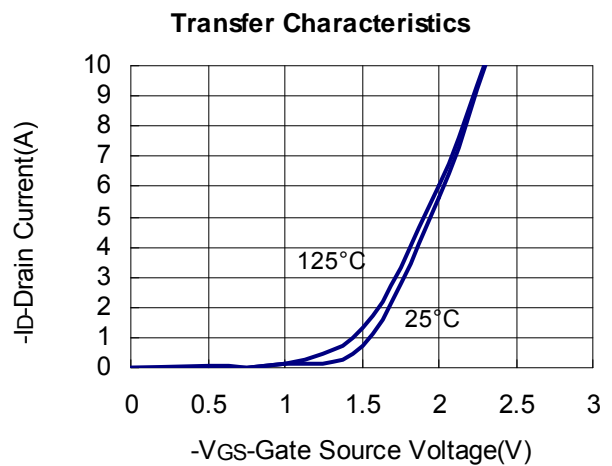
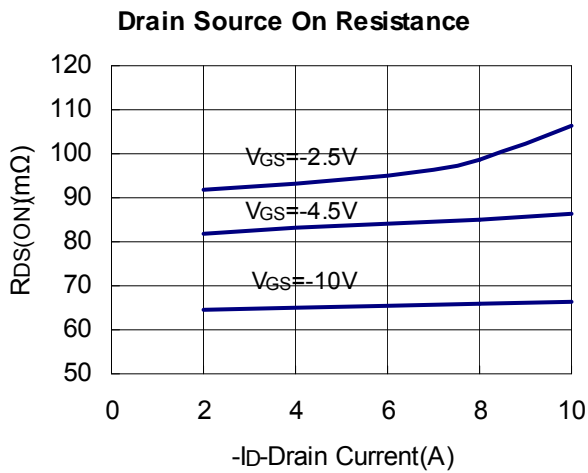
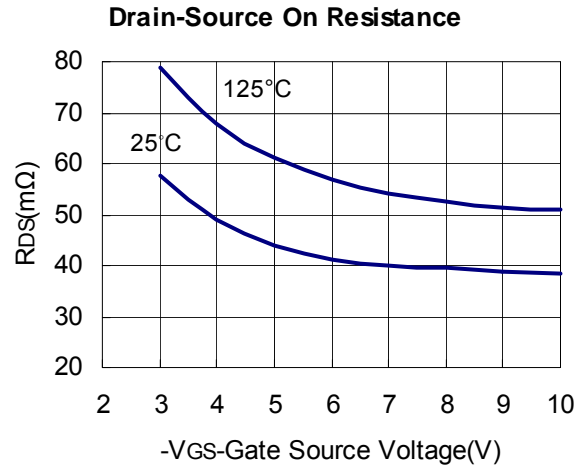
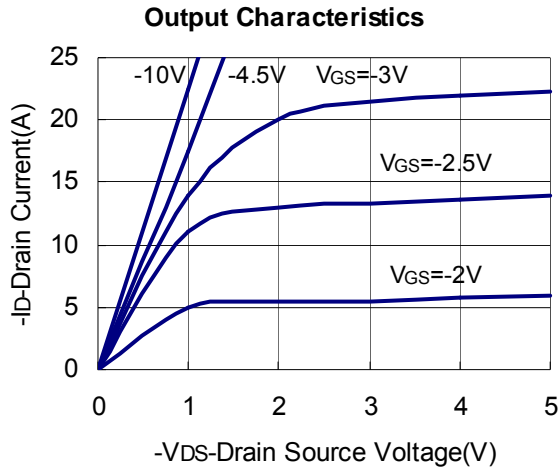
THERMAL DATA

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient			120	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case			65	$^\circ\text{C}/\text{W}$

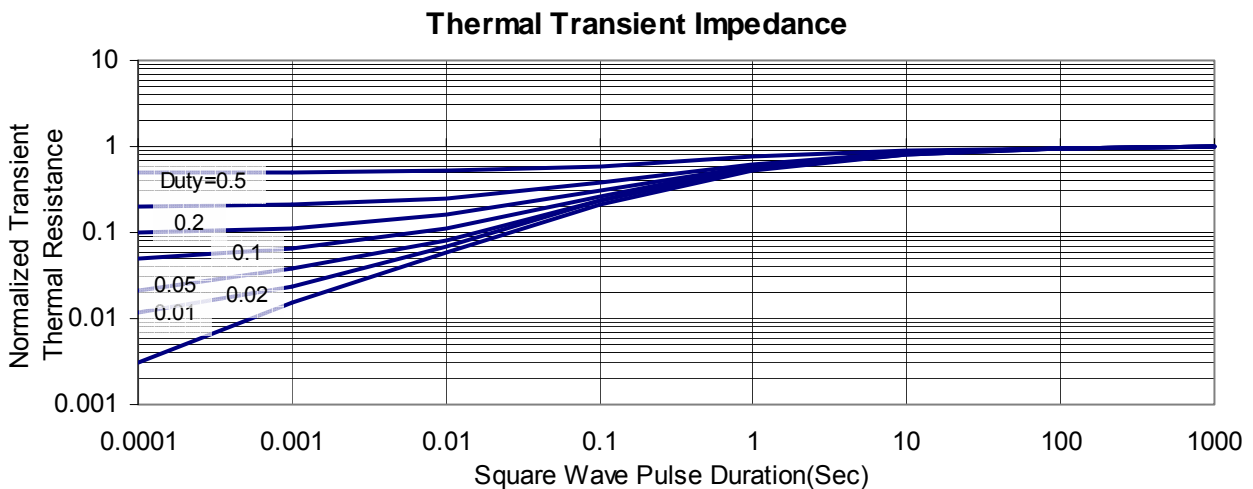
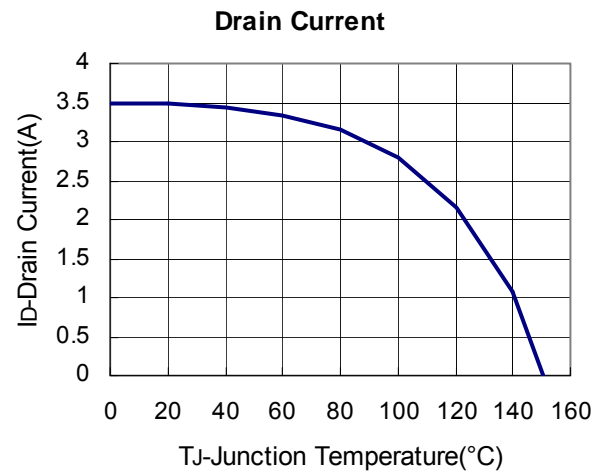
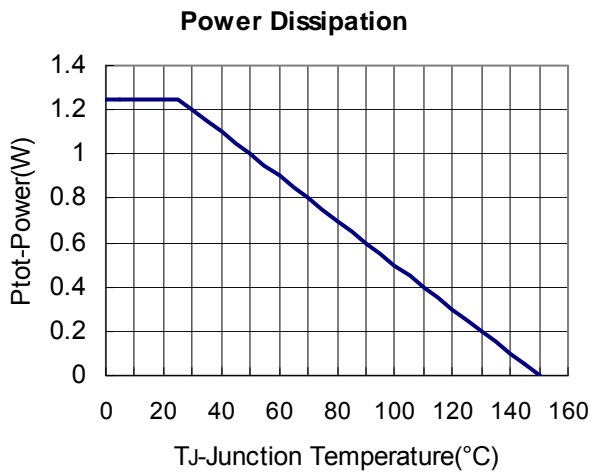
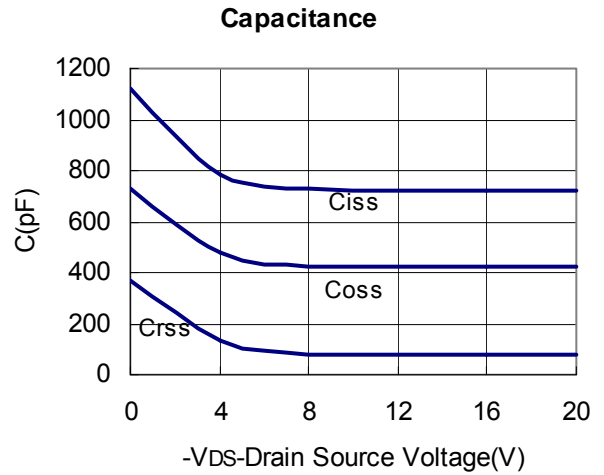
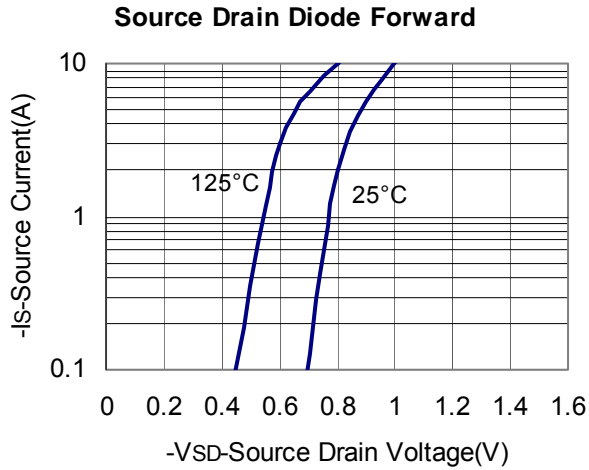
ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ Unless otherwise noted)

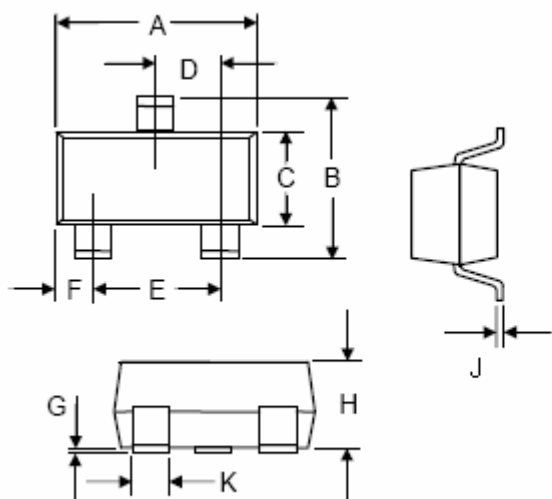
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-16			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3		-1.0	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$			-1	μA
		$V_{DS}=-16V, V_{GS}=0V$ $T_J=55^\circ C$			-10	
$R_{DS(ON)}$	Drain-source On-Resistance	$V_{GS}=-10V, I_D=-3.5A$		63	85	m Ω
		$V_{GS}=-4.5V, I_D=-3.0A$		80	105	
		$V_{GS}=-2.5V, I_D=-2.2A$		90	135	
G_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-3.5A$		10		S
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	$I_S=-1.6A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic Parameters						
Q_g	Total Gate Charge	$V_{DS}=-15V$ $V_{GS}=-10V$ $I_D=-4.0A$		8		nC
Q_{gs}	Gate-Source Charge			15		
Q_{gd}	Gate-Drain Charge			2.2		
C_{iss}	Input Capacitance	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$		720		pF
C_{oss}	Output Capacitance			420		
C_{riss}	Reverse Transfer Capacitance			80		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V$ $R_L=15\Omega$ $I_D=-1A$		14	20	nS
t_r				6	10	
$t_{d(off)}$	Turn-Off Time	$V_{GEN}=-10V$ $R_G=6\Omega$		40	48	
t_f				7	15	

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



■ SOT-23 PACKAGE DIMENSIONS


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.110	0.120	2.80	3.04
B	0.83	0.098	2.10	2.64
C	0.47	0.055	1.20	1.40
D	0.35	0.041	0.89	1.03
E	0.70	0.081	1.78	2.05
F	0.18	0.024	0.45	0.60
G	0.001	0.0039	0.013	0.100
H	0.035	0.044	0.89	1.12
J	0.003	0.007	0.085	0.18
K	0.015	0.02	0.37	0.51