

-30V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The STP2305 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.

STP2305S-TRG ROHS Compliant This is Halogen Free

FEATURE

- ◆ -30V/-4.3A, $R_{DS(ON)} = 55m\Omega(typ.)@V_{GS} = -10V$
- ◆ -30V/-3.5A, $R_{DS(ON)} = 65m\Omega(typ.)@V_{GS} = -4.5V$
- ◆ -30V/-2.5A, $R_{DS(ON)} = 87m\Omega(typ.)@V_{GS} = -2.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability

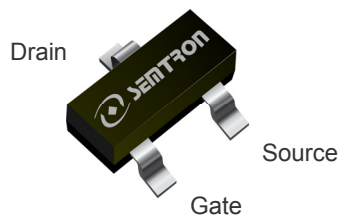
APPLICATIONS

- ◆ Power Management in Note book
- ◆ Portable Equipment
- ◆ DSC
- ◆ DC/DC Converter
- ◆ Load Switch

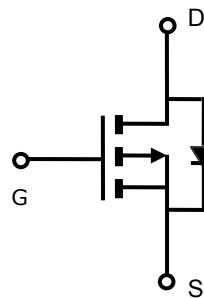


P-Channel Enhancement Mode MOSFET

PIN CONFIGURATION



SOT-23
Top View



PART NUMBER INFORMATION

ST P 2305 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 : Lead Plating Code
G : Lead-free product.

This product is Halogen Free

ORDERING INFORMATION

| Part Number | Package Code | Handling Code | Shipping |
|--------------|--------------|----------------|----------|
| STP2305S-TRG | S : SOT-23 | TR : Tape&Reel | 3K/Reel |

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

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C) ^A | V _{GS} =-10V | A |
| | Continuous Drain Current (T _C =70°C) ^A | | |
| I _{DM} | Pulsed Drain Current ^B | -15 | A |
| P _D | Power Dissipation | T _A =25°C | 1.25 |
| | | T _A =70°C | 0.8 |
| T _J | Operation Junction Temperature | -55 to 150 | °C |
| T _{STG} | Storage Temperature Range | -55 to 150 | °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 _{θJA} | Thermal Resistance-Junction to Ambient ^A | Steady-State | - | 125 | °C/W |
| R _{θJC} | Thermal Resistance Junction to Lead ^A | Steady-State | - | 85 | °C/W |

ELECTRICAL CHARACTERISTICS (T_A = 25°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 =-250μA | -30 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250μA | -0.5 | | -1.2 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-24V, V _{GS} =0V, T _J =25°C | | | -1 | μA |
| | | V _{DS} =-24V, V _{GS} =0V, T _J =55°C | | | -5 | |
| R _{DS(ON)} | Drain-source On-Resistance ^B | V _{GS} =-10V, I _D =-4.3A | | 55 | 60 | mΩ |
| | | V _{GS} =-4.5V, I _D =-3.5A | | 65 | 70 | |
| | | V _{GS} =-2.5V, I _D =-2.5A | | 87 | 98 | |
| G _{fs} | Forward Transconductance | V _{DS} =-5V, I _D =-4.0A | | 10 | | S |
| Source-Drain Diode | | | | | | |
| V _{SD} | Diode Forward Voltage | I _S =-1.0A, V _{GS} =0V | | -0.6 | -1.2 | V |
| I _S | Continuous Source Current ^{AD} | | | | -5.2 | A |
| Dynamic Parameters | | | | | | |
| Q _g (-4.5V) | Total Gate Charge | V _{DS} =-20V V _{GS} =-4.5V I _D =-2.0A | | 6.5 | | nC |
| Q _{gs} | Gate-Source Charge | | | 2.8 | | |
| Q _{gd} | Gate-Drain Charge | | | 3.2 | | |
| C _{iss} | Input Capacitance | V _{DS} =-12V V _{GS} =0V f=1MHz | | 680 | | pF |
| C _{oss} | Output Capacitance | | | 290 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 108 | | |
| t _{d(on)} | Turn-On Time | V _{DD} =-12V I _D =-1A | | 10 | | nS |
| t _r | | | | 16.8 | | |
| t _{d(off)} | Turn-Off Time | V _{GEN} =4.5V R _G =3.3Ω | | 21 | | |
| t _f | | | | 15 | | |

Note:

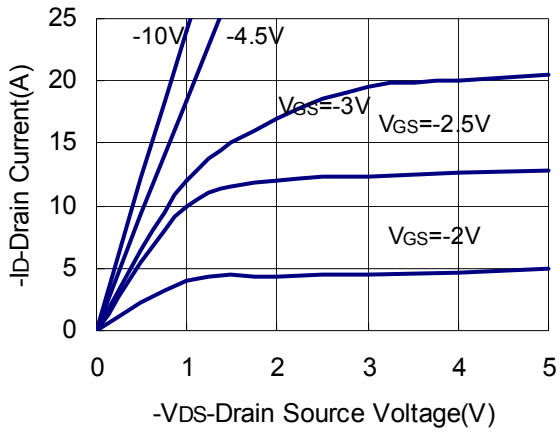
- The value of R_{θJA} is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
- The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.1mH.
- The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

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date

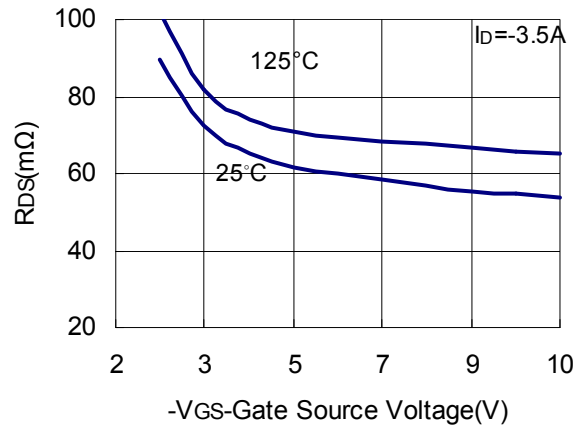
We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

TYPICAL CHARACTERISTICS

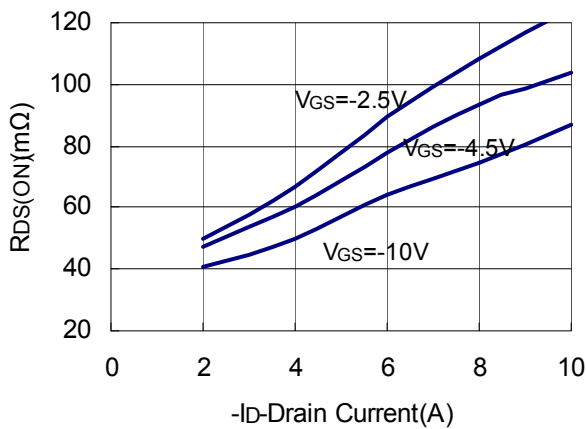
Output Characteristics



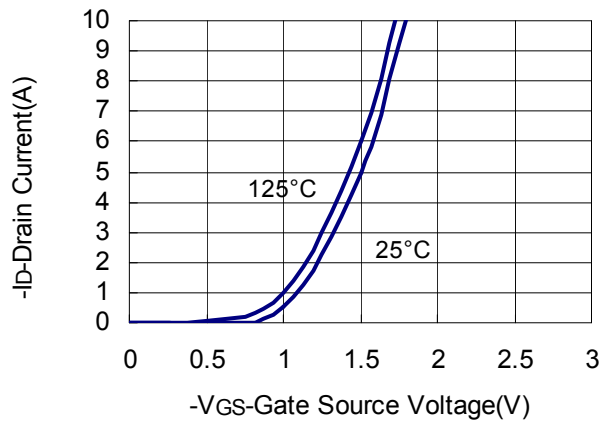
Drain-Source On Resistance



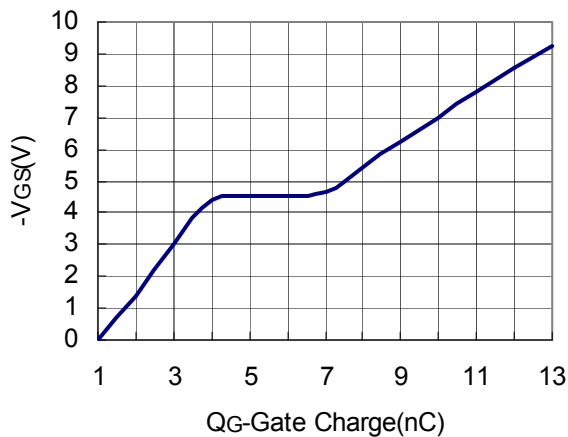
Drain Source On Resistance



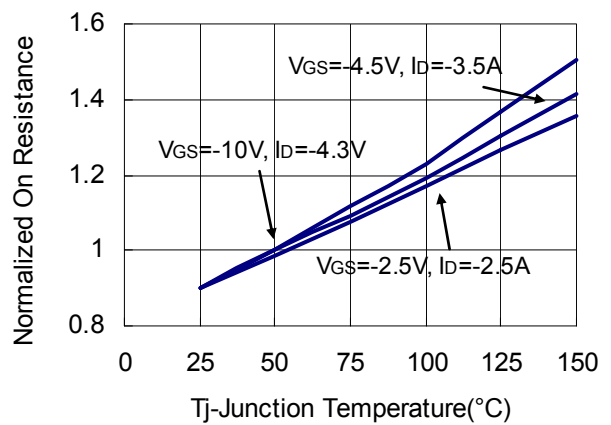
Transfer Characteristics



Gate Charge

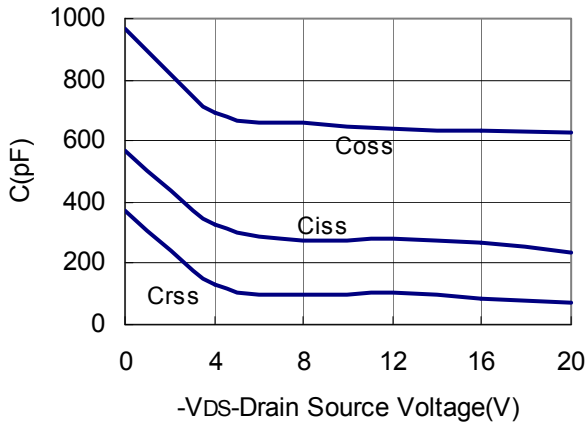


Drain Source Resistance

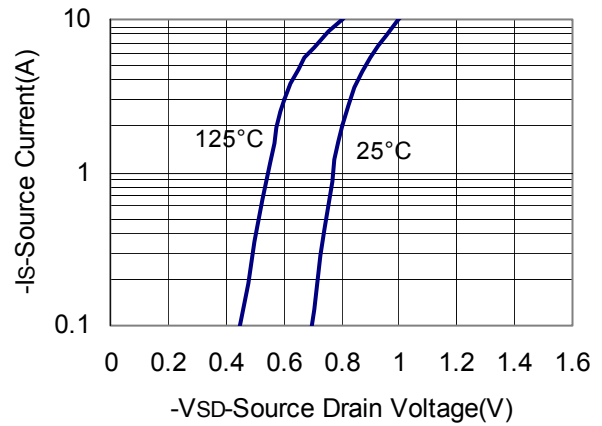


TYPICAL CHARACTERISTICS

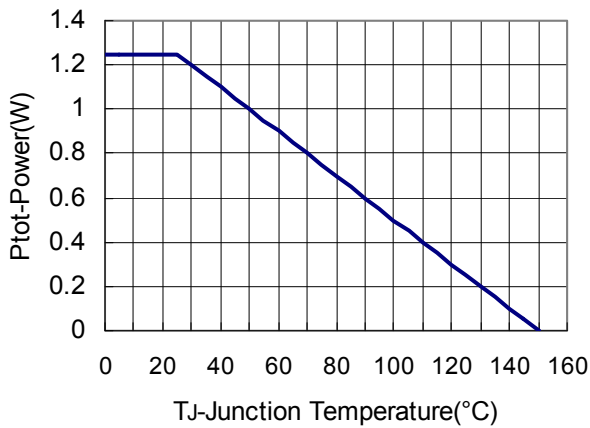
Capacitance



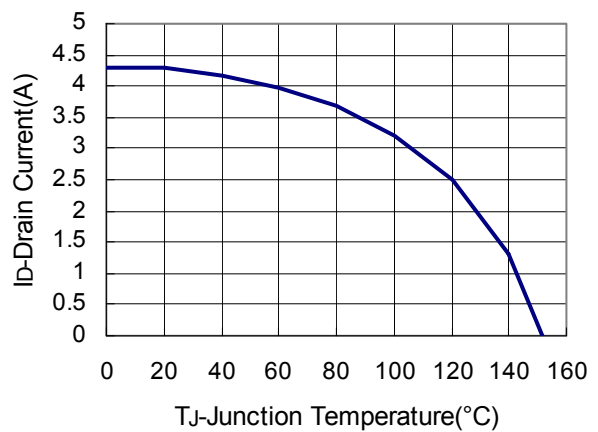
Source Drain Diode Forward



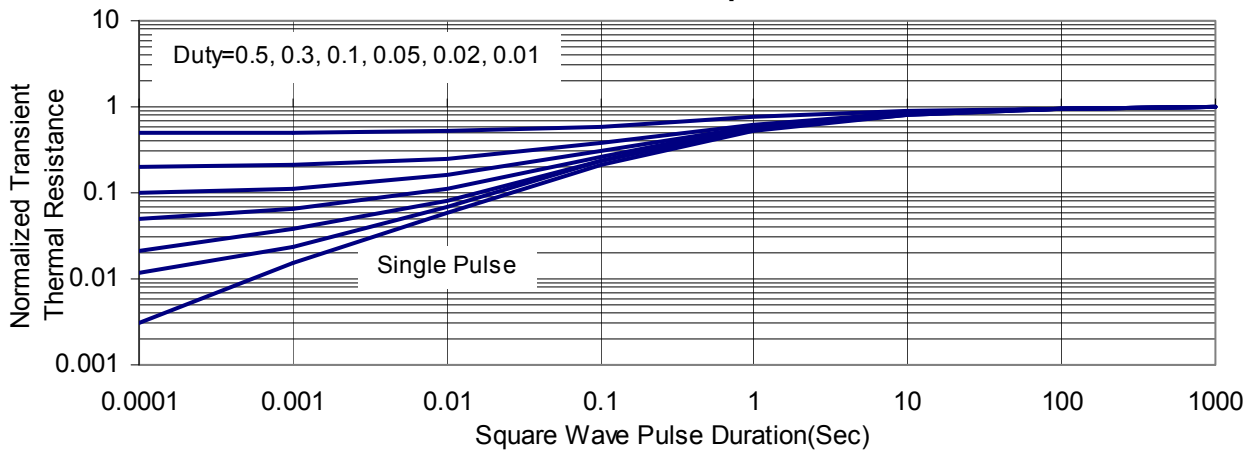
Power Dissipation



Drain Current



Thermal Transient Impedance



SOT-23 PACKAGE DIMENSIONS

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L1 | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

