

-20V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The STP7407 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

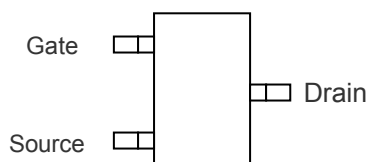
- ◆ **-20V/-3.4A, $R_{DS(ON)} = 88m\Omega(yp.)@V_{GS} = -4.5V$**
- ◆ **-20V/-2.4A, $R_{DS(ON)} = 110m\Omega(yp.)@V_{GS} = -2.5V$**
- ◆ **-20V/-1.7A, $R_{DS(ON)} = 150m\Omega(yp.)@V_{GS} = -1.8V$**
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ This is a RoHS compliance
- ◆ SOT-323 package design

APPLICATIONS

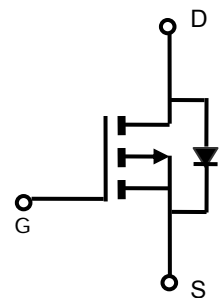
- ◆ Power Management in Note book
- ◆ Portable Equipment
- ◆ DSC
- ◆ LCD Display inverter
- ◆ Battery Powered System
- ◆ DC/DC Converter
- ◆ Load Switch

P-Channel Enhancement Mode MOSFET

PIN CONFIGURATION

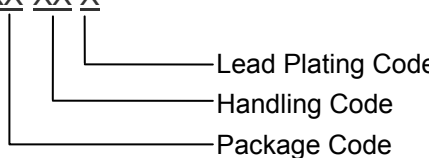


TOP VIEW
SOT-323



P-Channel

PART NUMBER INFORMATION

| | |
|---|--|
| <p>STP7407XX-XX X</p>  <p>Lead Plating Code</p> <p>Handling Code</p> <p>Package Code</p> | <p>Lead Plating Code</p> <p>G : Lead-free product. This product is Green compliant</p> <p>Handling Code</p> <p>TR : Tape&Reel</p> <p>Package Code</p> <p>J2 : SOT-323</p> |
|---|--|

ORDERING INFORMATION

| Part Number | Package Code | Package | Shipping |
|---------------|--------------|---------|------------------|
| STP7407J2-TRG | J2 | SOT-323 | 3000 / Tape&Reel |

※ SOT-23 : Only available in tape and reel packaging. (A reel contains 3000 devices)

※ G : This product is RoHS compliant.

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

| Symbol | Parameter | Typical | Unit |
|------------------|--|--|------------|
| V _{DSS} | Drain-Source Voltage | -20 | V |
| V _{GSS} | Gate-Source Voltage | ±12 | V |
| I _D | Continuous Drain Current (T _J =150°C) | V _{GS} =-4.5V | -3.4 |
| I _{DM} | Pulsed Drain Current | -6 | A |
| I _S | Continuous Source Current (Diode Conduction) | -1.4 | A |
| P _D | Power Dissipation | T _A =25°C T _A =70°C | 330 210 |
| T _J | Operation Junction Temperature | 150 | °C |
| T _{STG} | Storage Temperature Range | -55/150 | °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 | Min | Typ | Max | Unit |
|------------------|--|-----|-----|-----|------|
| R _{θJA} | Thermal Resistance-Junction to Ambient | | | 110 | °C/W |

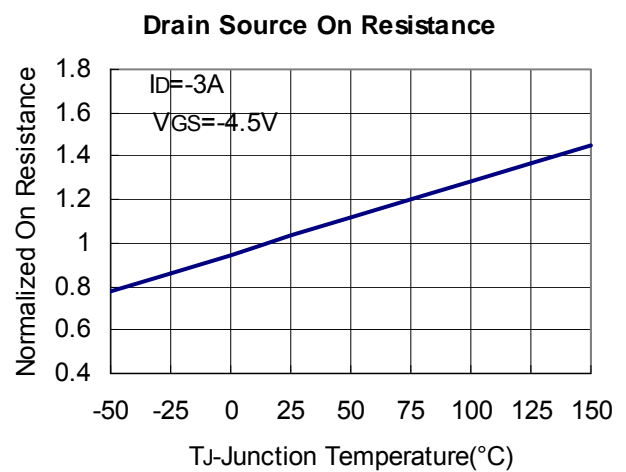
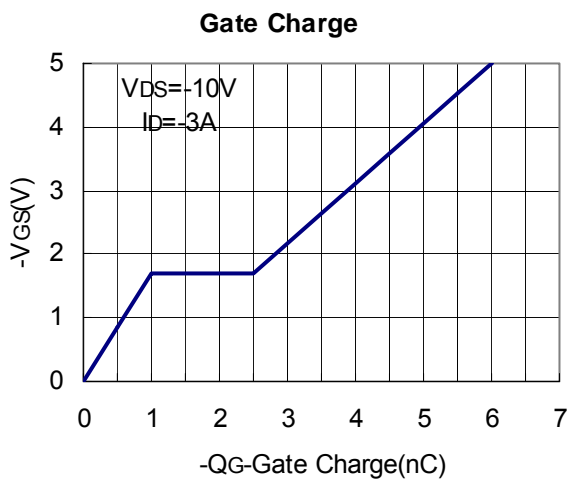
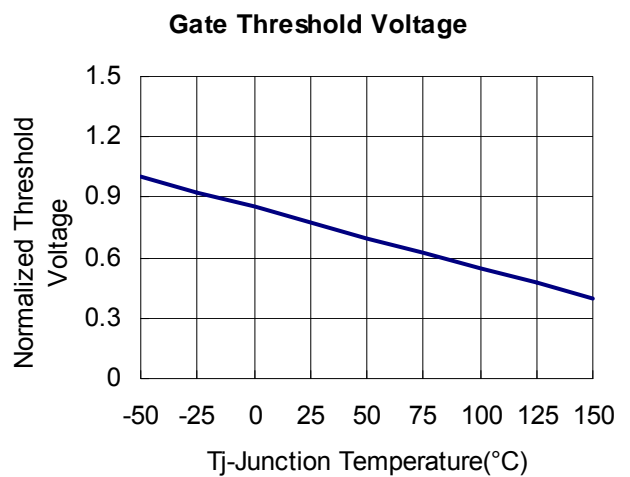
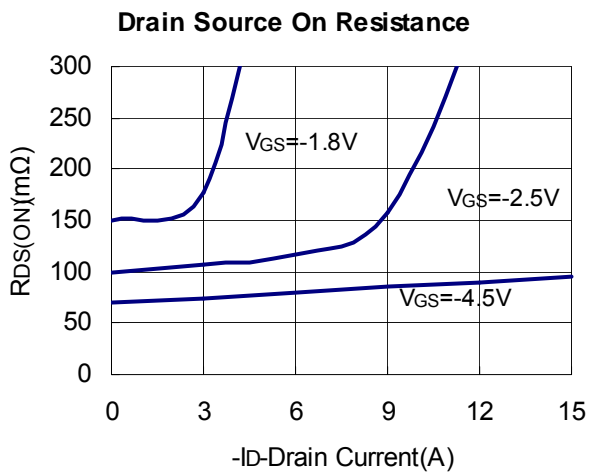
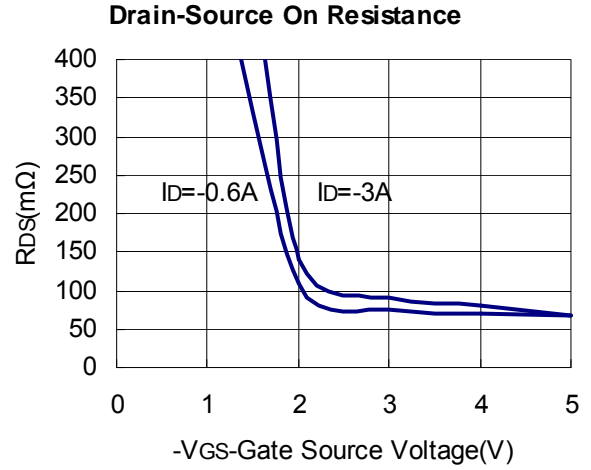
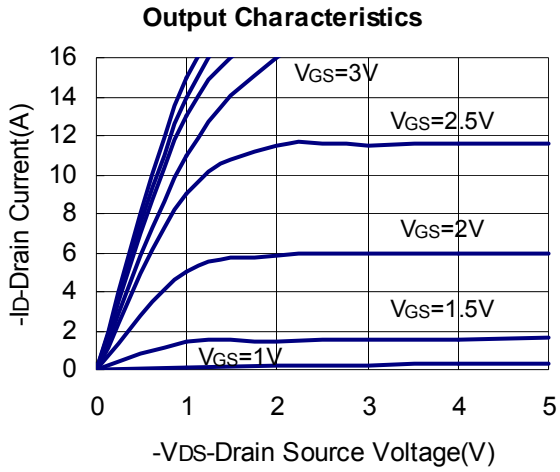
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
|---------------------------|---------------------------------|--|------|------|-----------|------------|
| Static Parameters | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -20 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -0.4 | | -1.0 | V |
| I_{GSS} | Gate Leakage Current | $V_{DS}=0V, V_{GS}=\pm 12V$ | | | ± 100 | nA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-20V, V_{GS}=0V$ | | | -1 | μA |
| | | $V_{DS}=-20V, V_{GS}=0V$ $T_J=55^\circ C$ | | | -10 | |
| $R_{DS(ON)}$ | Drain-source On-Resistance | $V_{GS}=-4.5V, I_D=-3.4A$ | | 88 | 95 | m Ω |
| | | $V_{GS}=-2.5V, I_D=-2.4A$ | | 110 | 125 | |
| | | $V_{GS}=-1.8V, I_D=-1.7A$ | | 150 | 170 | |
| G_{fs} | Forward Transconductance | $V_{DS}=-5V, I_D=-2.8A$ | | 6.5 | | S |
| Source-Drain Diode | | | | | | |
| V_{SD} | Diode Forward Voltage | $I_S=-1.6A, V_{GS}=0V$ | | -0.7 | -1.2 | V |
| Dynamic Parameters | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-3.2A$ | | 7 | 10 | nC |
| Q_{gs} | Gate-Source Charge | | | 1.8 | | |
| Q_{gd} | Gate-Drain Charge | | | 2 | | |
| C_{iss} | Input Capacitance | $V_{DS}=-10V$ $V_{GS}=0V$ $f=1MHz$ | | 415 | | pF |
| C_{oss} | Output Capacitance | | | 223 | | |
| C_{riss} | Reverse Transfer Capacitance | | | 87 | | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}=-10V$ $R_L=10\Omega$ $I_D=-1.0A$ | | 13 | 25 | nS |
| t_r | | | | 36 | 60 | |
| $t_{d(off)}$ | Turn-Off Time | $V_{GEN}=-4.5V$ $R_G=6\Omega$ | | 42 | 70 | |
| t_f | | | | 34 | 60 | |

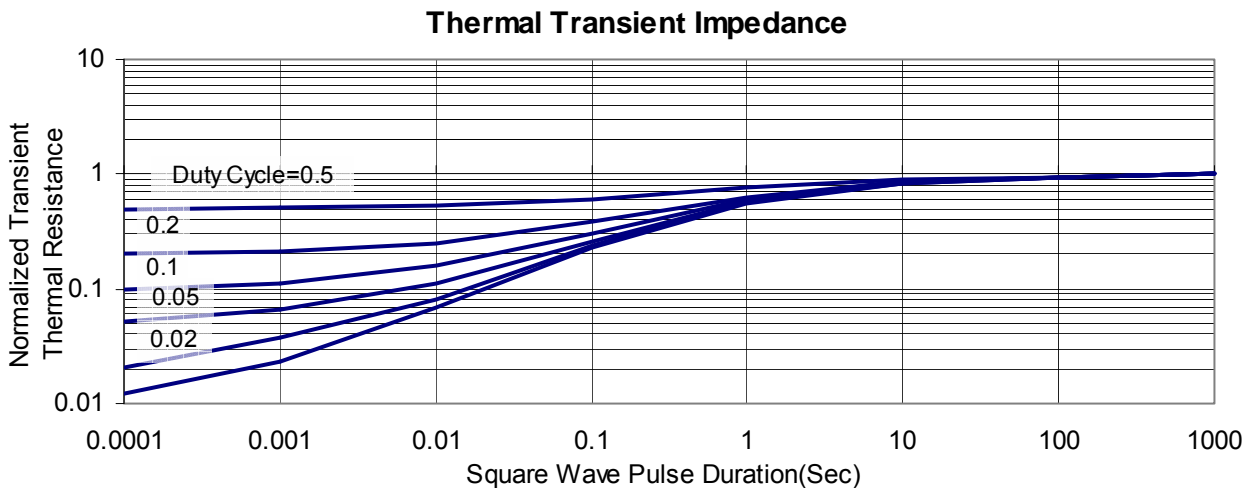
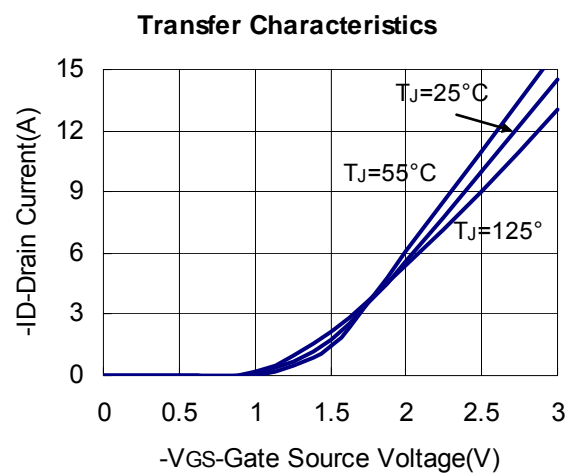
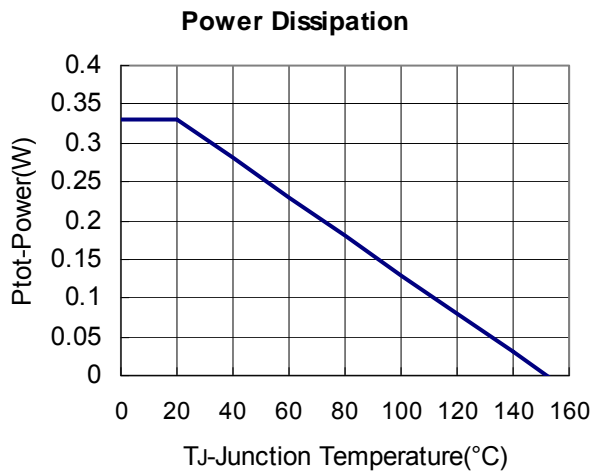
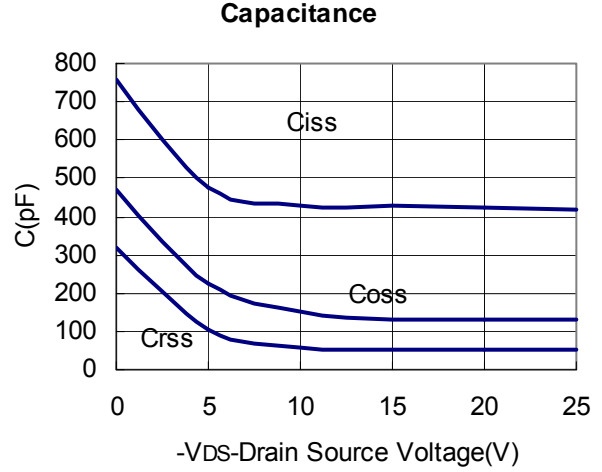
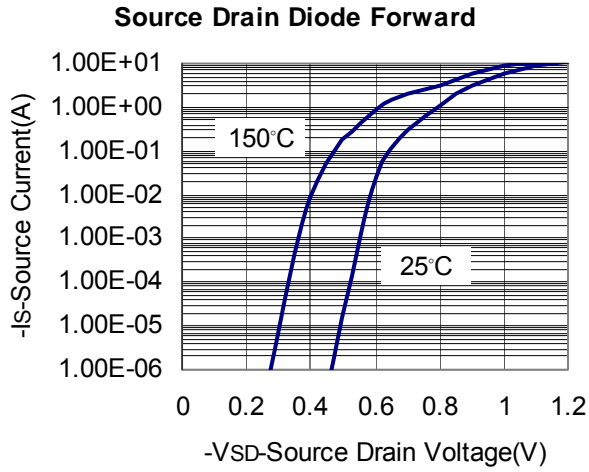
 Note : 1. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

2. Static parameters are based on package level with recommended wire-bonding

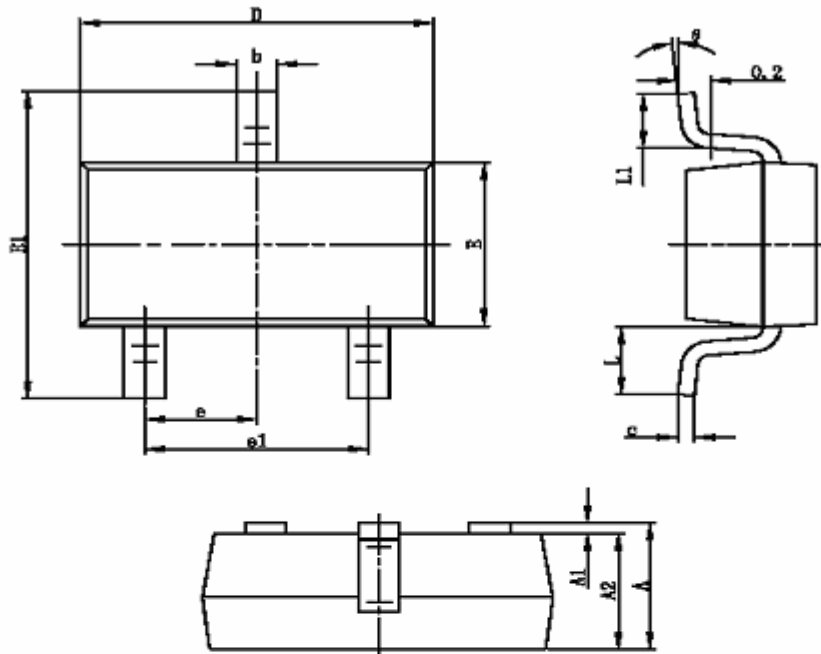
■ TYPICAL CHARACTERISTICS (25°C Unless Note)



■ TYPICAL CHARACTERISTICS (25°C Unless Note)



■ SOT-323 PACKAGE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650TYP | | 0.026TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525REF | | 0.021REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| • • | 0° | 8° | 0° | 8° |