-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.

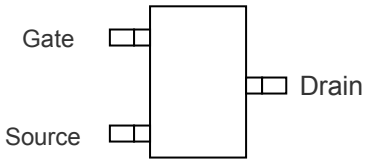
FEATURE

- ***-20V/-3.4A, $R_{DS(ON)}$ =88mΩ(typ.)@V_{GS} =-4.5V***
- ***-20V/-2.4A, $R_{DS(ON)}$ =110mΩ(typ.)@V_{GS} =-2.5V***
- ***-20V/-1.7A, $R_{DS(ON)}$ =150mΩ(typ.)@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

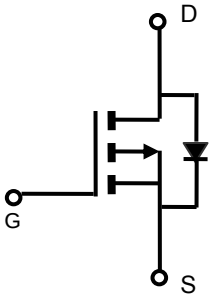
APPLICATIONS

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

PIN CONFIGURATION



TOP VIEW
SOT-323



P-Channel

PART NUMBER INFORMATION

STP7407XX-XX X

- Lead Plating Code
- Handling Code
- Package Code

Lead Plating Code

G : Lead-free product.
This product is Green compliant

Handling Code

TR : Tape&Reel

Package Code

J2 : SOT-323

■ 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	A
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	mW
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
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient			110	°C/W

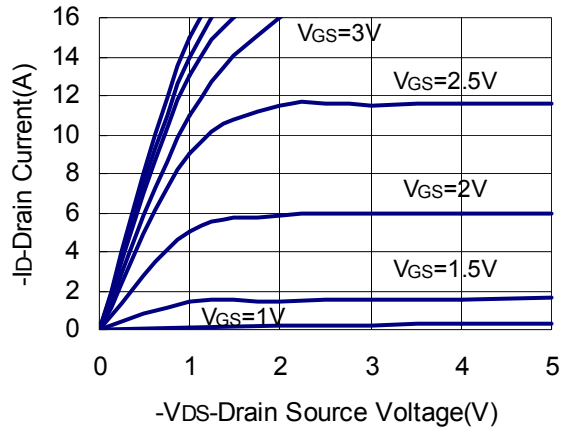
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-0.4		-1.0	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±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°C			-10	
$R_{DS(ON)}$	Drain-source On-Resistance	V_{GS}=-4.5V,I_D=-3.4A V_{GS}=-2.5V,I_D=-2.4A V_{GS}=-1.8V,I_D=-1.7A		88 110 150	95 125 170	mΩ
G_{fs}	Forward Transconductance	V_{DS}=-5V,I_D=-2.8A		6.5		S
Source-Drain Doide						
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_{rss}	Reverse Transfer Capacitance			87		
$t_{d(on)}$	Turn-On Time	V_{DD}=-10V R_L=10Ω I_D=-1.0A V_{GEN}=-4.5V R_G=6Ω		13	25	nS
t_r				36	60	
$t_{d(off)}$	Turn-Off Time			42	70	
t_f				34	60	

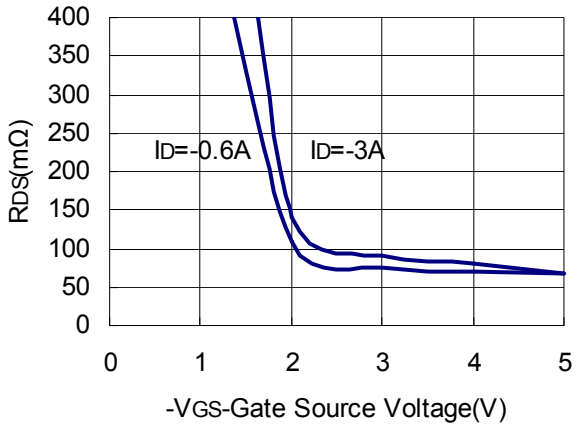
Note : 1. Pulse test: pulse width <= 300us, duty cycle<= 2%
2. Static parameters are based on package level with recommended wire-bonding

TYPICAL CHARACTERISTICS (25°C Unless Note)

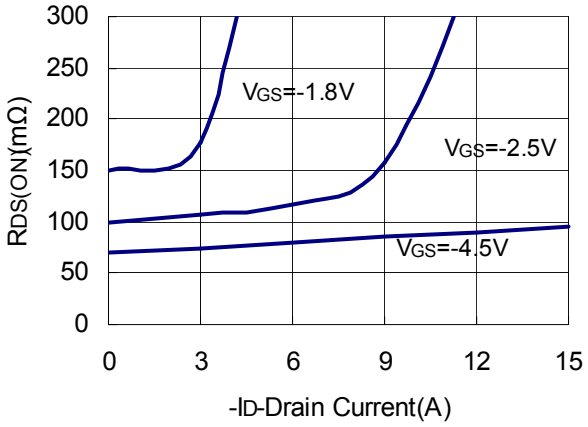
Output Characteristics



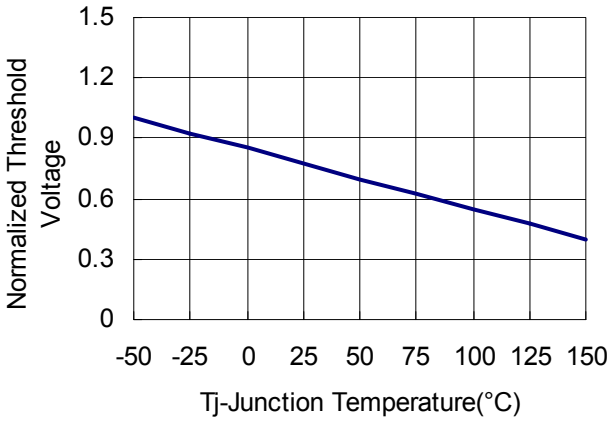
Drain-Source On Resistance



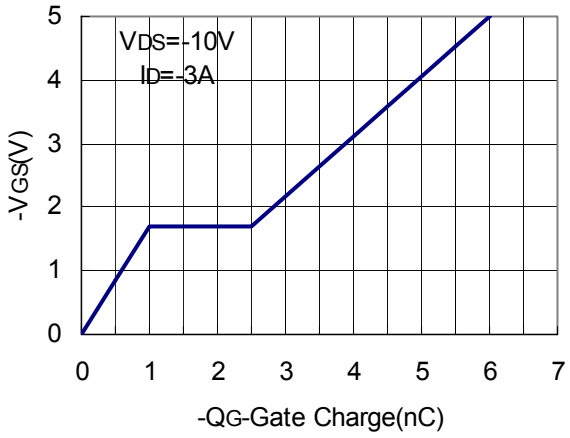
Drain Source On Resistance



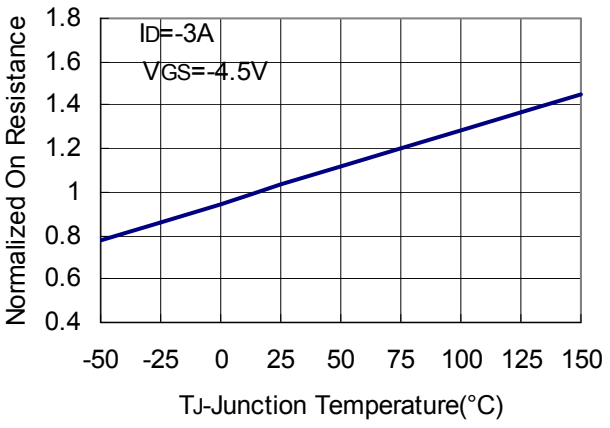
Gate Threshold Voltage



Gate Charge

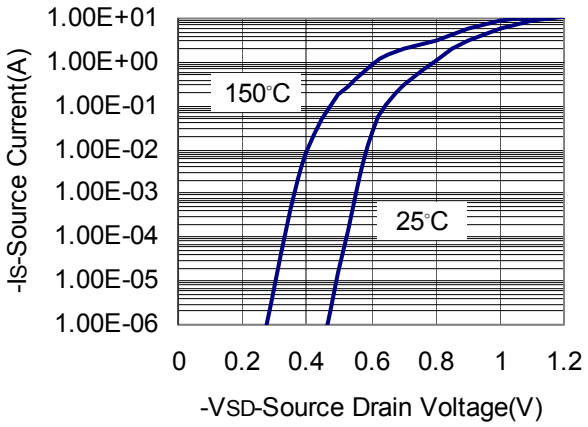


Drain Source On Resistance

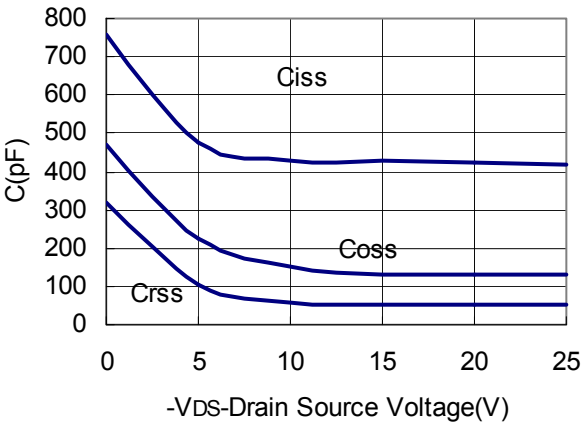


TYPICAL CHARACTERISTICS (25°C Unless Note)

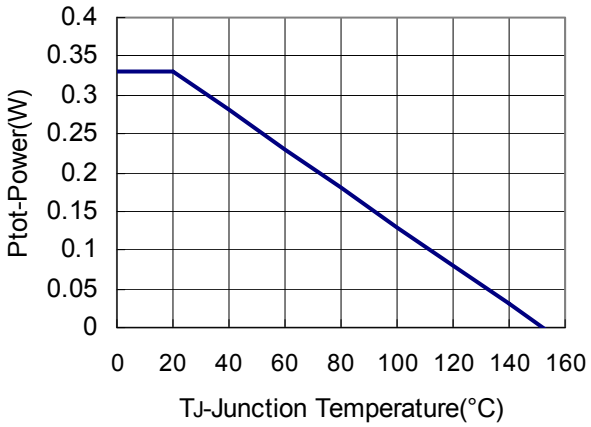
Source Drain Diode Forward



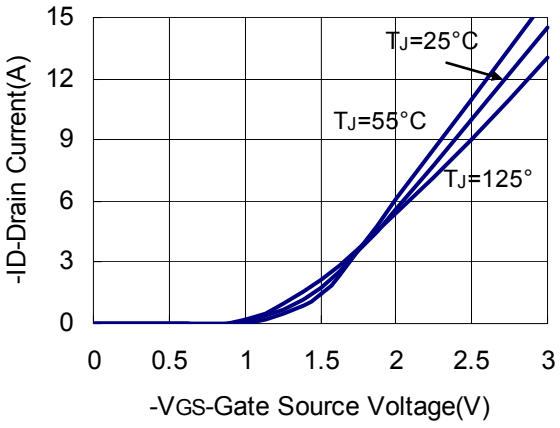
Capacitance



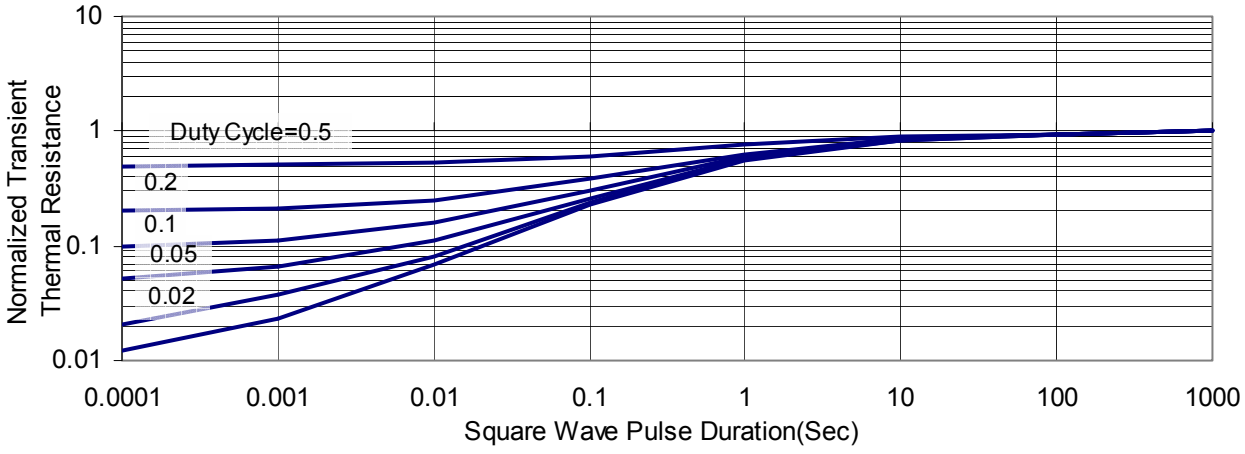
Power Dissipation



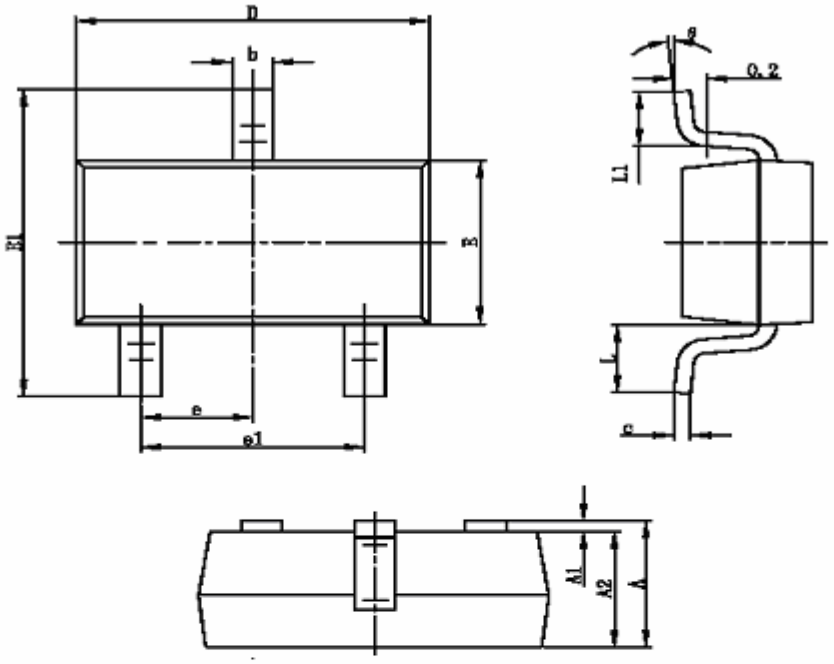
Transfer Characteristics



Thermal Transient Impedance



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
θ	0°	8°	0°	8°