

-30V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The STP4407 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 device is suitable for use as a load switch or in PWM and gate charge for most of the synchronous buck converter applications.

STP4407M-TRG ROHS Compliant This is Halogen Free

FEATURE

- ◆ -30V/-12.0A, $R_{DS(ON)} = 11.5m\Omega(typ)$ @ $V_{GS} = -10V$
- ◆ -30V/-10.0A, $R_{DS(ON)} = 16.5m\Omega(typ)$ @ $V_{GS} = -4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP-8 package design

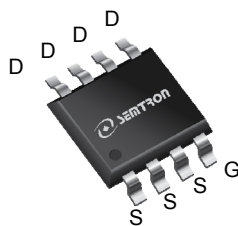
APPLICATIONS

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

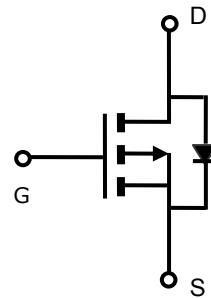


P-Channel Enhancement Mode MOSFET

PIN CONFIGURATION



SOP-8
Top View



PART NUMBER INFORMATION

STP 4407 M - TR G a b c d e	a : Company name. b : Product Serial number. c : Package code d : Handling code e : Green produce code
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ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
STP4407M-TRG	M : SOP-8	TR : Tape&Reel	2.5K/Reel

※ Year Code : 0 ~ 9, 2010 : 0

※ Week Code : A(1~2) ~ Z(53~54)

※ SOP-8 : 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		±25	V
I _D	Continuous Drain Current (T _C =25°C) ^A	V _{GS} =10V	-12	A
	Continuous Drain Current (T _C =70°C)		-10	A
I _{DM}	Pulsed Drain Current ^B		-40	A
E _{AS}	Single Pulse Avalanche energy L=0.1mH ^C		270	mJ
P _D	Power Dissipation	T _A =25°C T _A =70°C	3.2 2	W
T _J	Operation Junction Temperature		-55 to150	°C
T _{STG}	Storage Temperature Range		-55 to150	°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 $\leq 2\%$

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	-	50	$^\circ\text{C/W}$
$R_{\theta JL}$	Thermal Resistance Junction to Lead ^A	Steady-State	-	16	$^\circ\text{C/W}$

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 =-250μA	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0		-2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±25V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-24V, V _{GS} =0V			-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 =-12.0A V _{GS} =-4.5V, I _D =-10.0A		11.5 16.5	15 20	mΩ
G _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-10.0A		10.5		S
Source-Drain Doide						
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V		-0.75		V
I _S	Continuous Source Current ^{AD}				-10	A
Dynamic Parameters						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-8.0A		15		nC
Q _{gs}	Gate-Source Charge			4.1		
Q _{gd}	Gate-Drain Charge			6.4		
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f =1MHz		2350		pF
C _{oss}	Output Capacitance			220		
C _{rss}	Reverse Transfer Capacitance			152		
t _{d(on)}	Turn-On Time	V _{DD} =15V, V _{GS} =-10V, I _D =-5A, R _G =6Ω		9.4		nS
T _r				22		
t _{d(off)}	Turn-Off Time			62		
t _f				14.6		

Note:

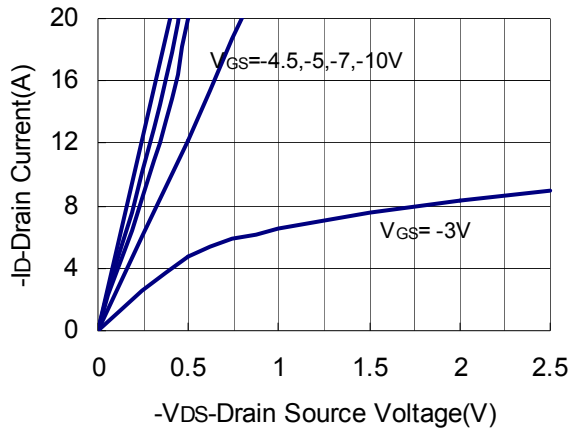
- The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_C=25^{\circ}\text{C}$.
- The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating . The test condition 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.

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

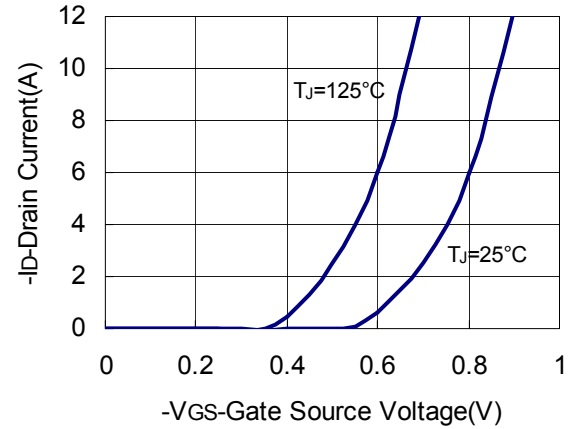
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TYPICAL CHARACTERISTICS (25°C Unless Note)

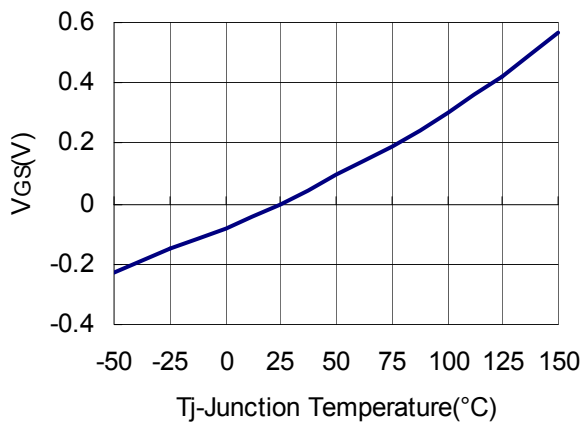
Output Characteristics



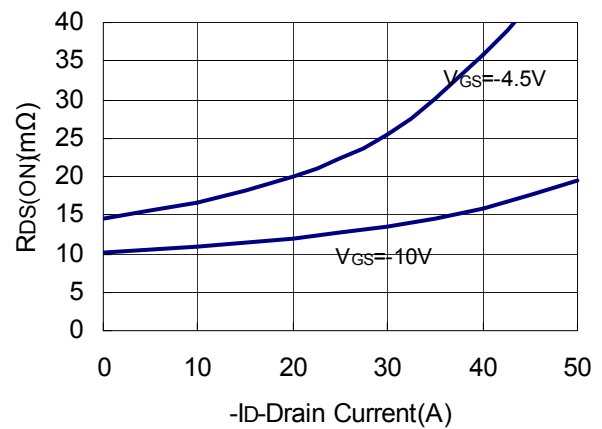
Transfer Characteristics



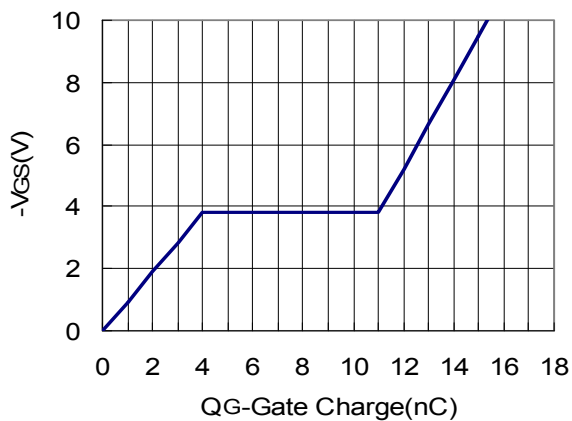
Gate Threshold Voltage



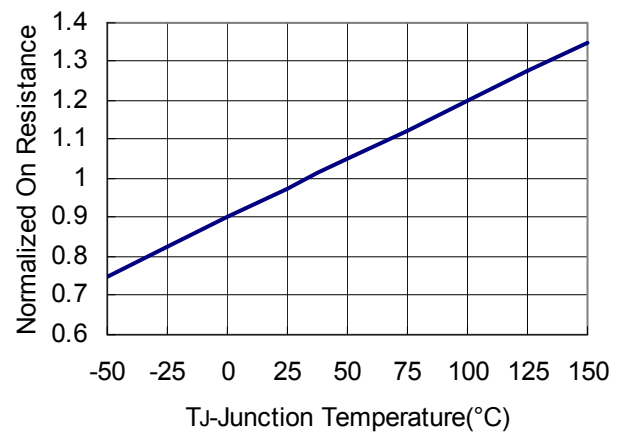
Drain Source On Resistance



Gate Charge

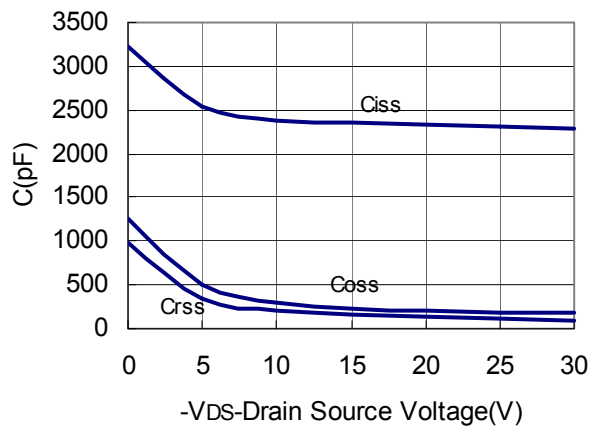


Drain Source On Resistance

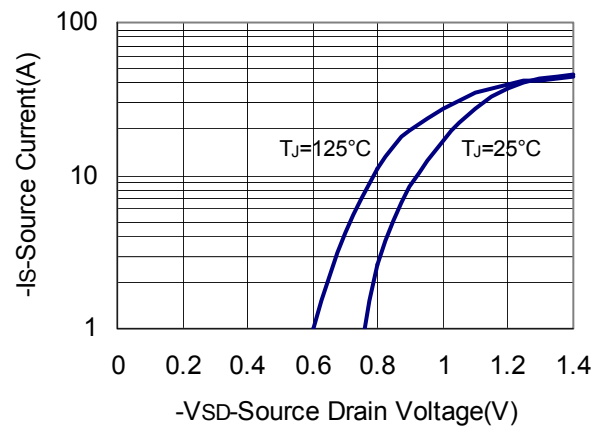


TYPICAL CHARACTERISTICS (25°C Unless Note)

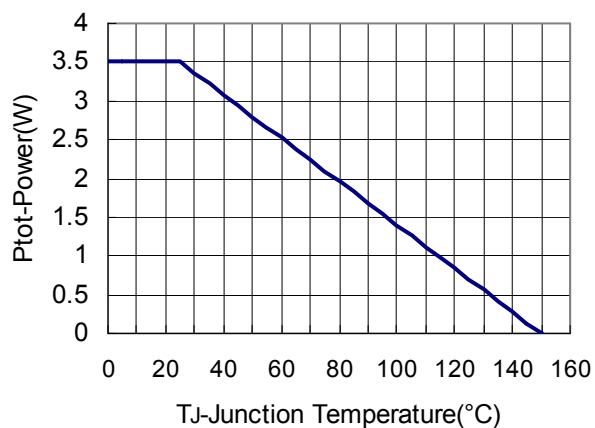
Capacitance



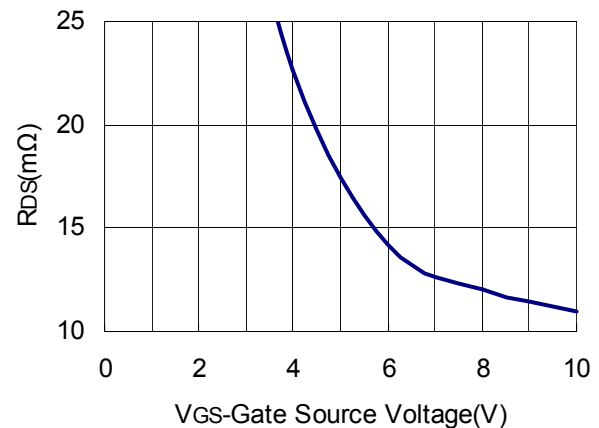
Source Drain Diode Forward



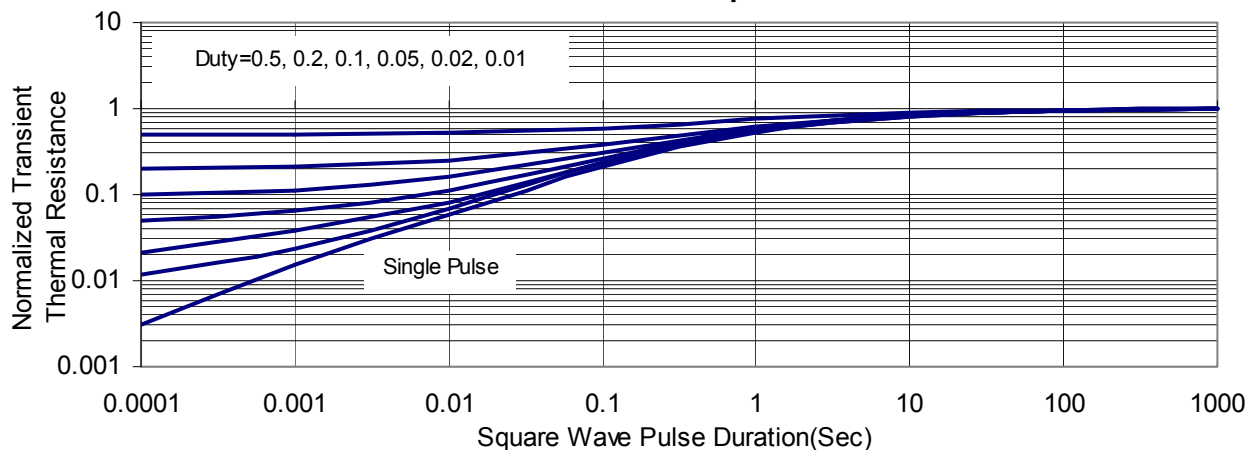
Power Dissipation



On Resistance VS Gate Source Voltage



Thermal Transient Impedance



■ SOP-8 PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.040	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

