

Single P-Channel MOSFET

DESCRIPTION

STP9435M is the P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior fast switching performance. These devices are well suited for high efficiency fast switching applications.

PART NUMBER INFORMATION

SMC 9435 M - TR G
 a b c d e

a : Company name.
 b : Product Serial number.
 c : Package code M:SOP-8
 d : Handling code TR:Tape&Reel
 e : Green produce code G:RoHS Compliant

FEATURES

$V_{DS} = -30V$, $I_D = -6.5A$

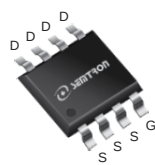
$R_{DS(ON)} = 40m\Omega (Typ.) @ V_{GS} = -10V$

$R_{DS(ON)} = 54m\Omega (Typ.) @ V_{GS} = -4.5V$

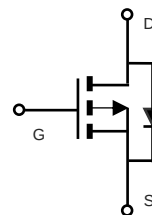
- ◆ Fast switch
- ◆ Low gate charge
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Load Switch
- ◆ Portable Equipment
- ◆ DC-DC Power Management



SOP-8



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	-6.5
		$T_A = 70^\circ C$	-5.2
I_{DM}	Pulsed Drain Current ^B	-26	A
I_{AS}	Avalanche Current ^B	-20	A
E_{AS}	Single Pulse Avalanche energy $L = 0.3mH$ ^B	60	mJ
P_D	Power Dissipation ^A	$T_A = 25^\circ C$	3.1
		$T_A = 70^\circ C$	2
T_J	Operation Junction Temperature	-55/150	$^\circ C$
T_{STG}	Storage Temperature Range	-55/150	$^\circ C$

THERMAL RESISTANCE

Symbol	Parameter		Typ	Max	Units
R _{θJA}	Thermal Resistance Junction to Ambient ^A	t≤10s		40	°C/W
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State		80	
R _{θJC}	Thermal Resistance Junction to Case			30	

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

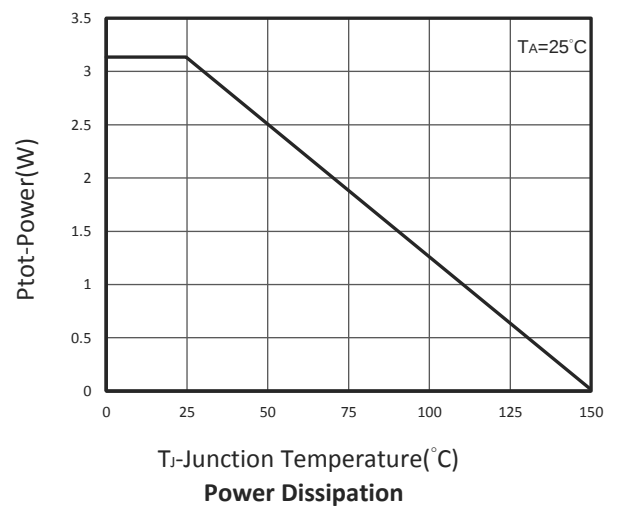
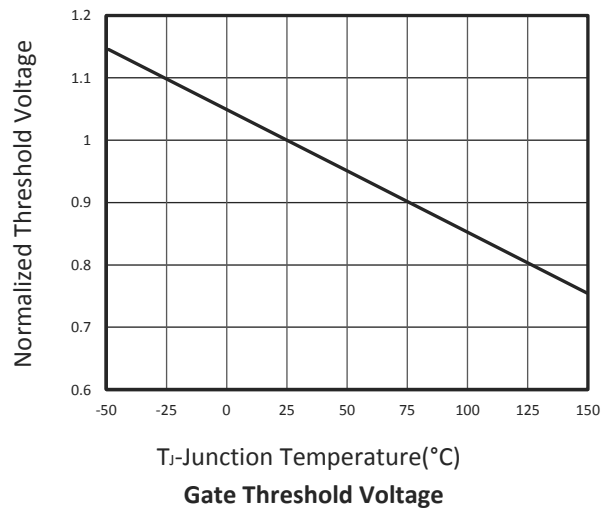
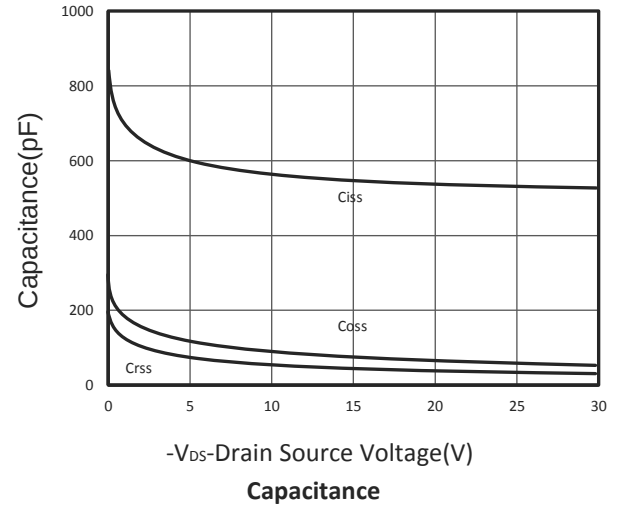
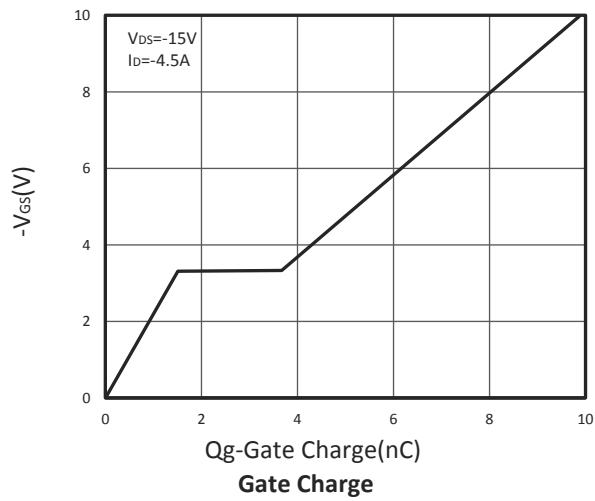
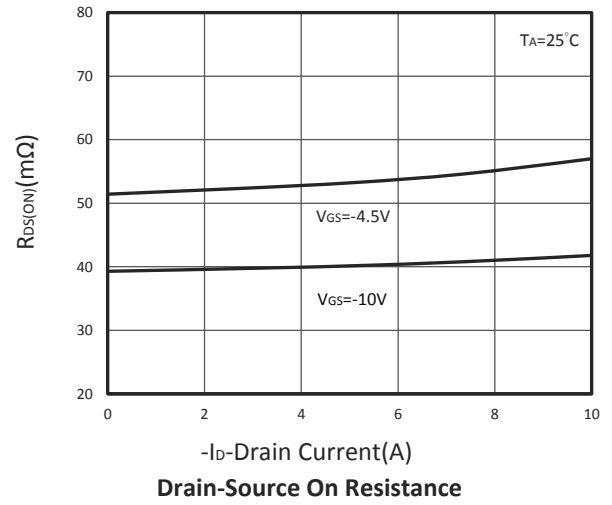
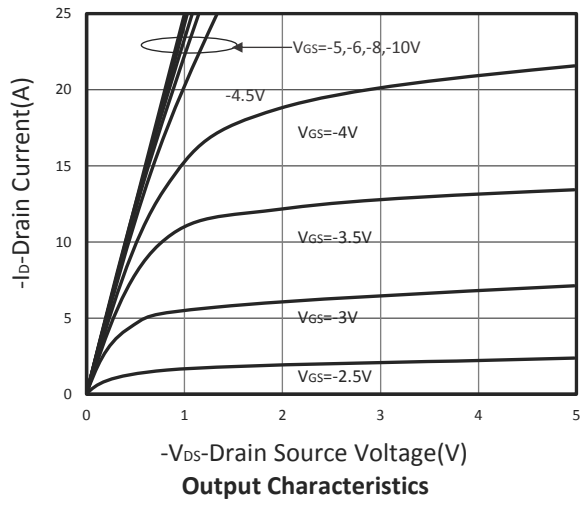
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.5	-2	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V, T _J =25°C			-1	μA
		V _{DS} =-24V, V _{GS} =0V, T _J =75°C			-10	
R _{DS(ON)}	Drain-source On-Resistance [Ⓟ]	V _{GS} =-10V, I _D =-6.5A V _{GS} =-4.5V, I _D =-4A		40 54	48 65	mΩ
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-4.5A		12		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage [Ⓟ]	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-6.4	A
t _{rr}	Revese Recovery Time	I _S =-4.5A, dI/dt=100A/μs		15		ns
Q _{rr}	Revese Recovery Charg	T _J =25°C		9.8		nC
Dynamic and Switching Parameters [Ⓔ]						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V I _D =-4.5A		9.8	13.8	nC
Q _g	Total Gate Charge (4.5V)			4.8	6.7	
Q _{gs}	Gate-Source Charge			1.7	2.4	
Q _{gd}	Gate-Drain Charge			2	2.8	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		580		pF
C _{oss}	Output Capacitance			68		
C _{rss}	Reverse Transfer Capacitance			58		
t _{d(on)}	Turn-On Time [Ⓟ]	V _{DD} =-15V, V _{GEN} =-10V R _G =6Ω, I _D =-1A		8.3		nS
t _r				10		
t _{d(off)}	Turn-Off Time [Ⓟ]			16.8		
t _f				7.8		

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

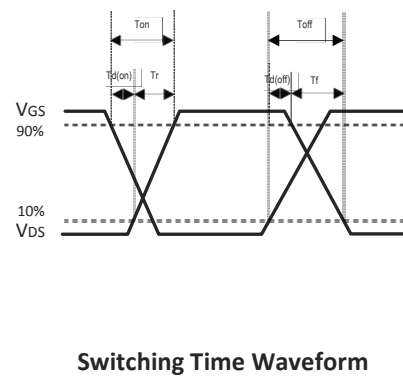
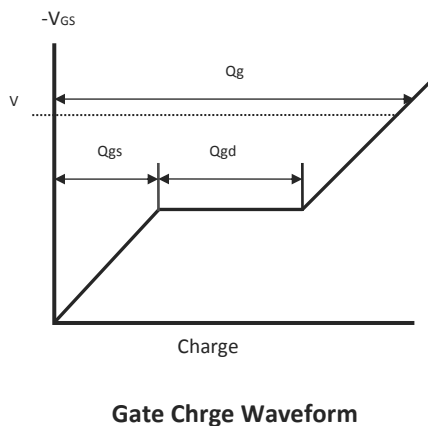
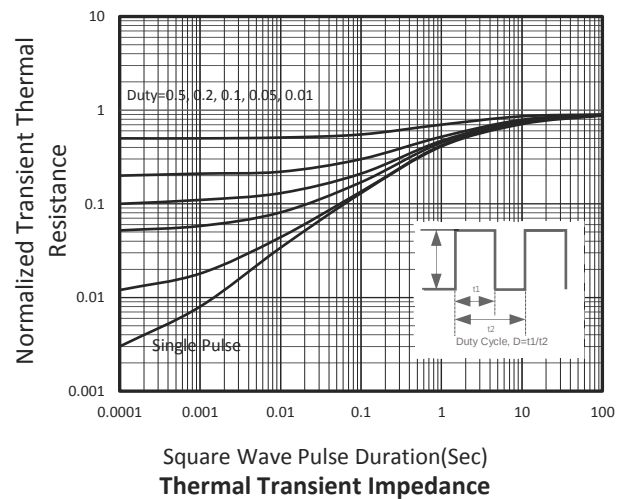
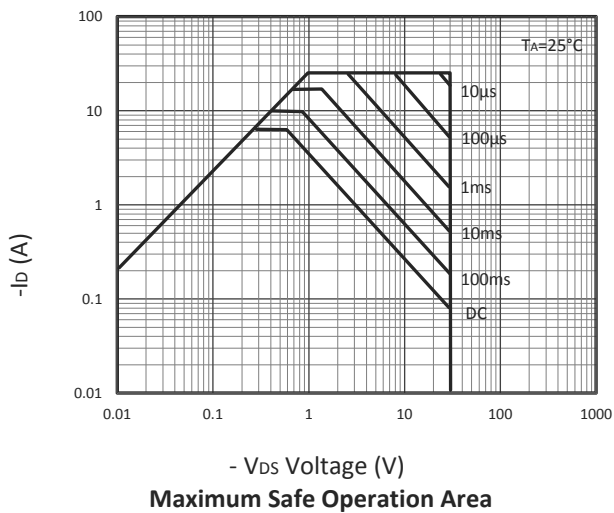
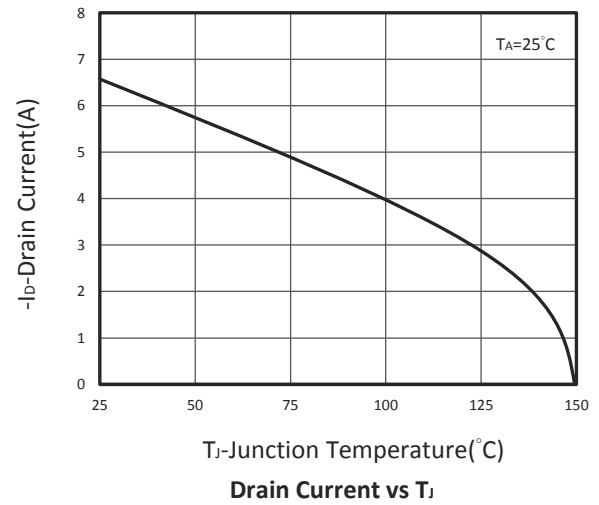
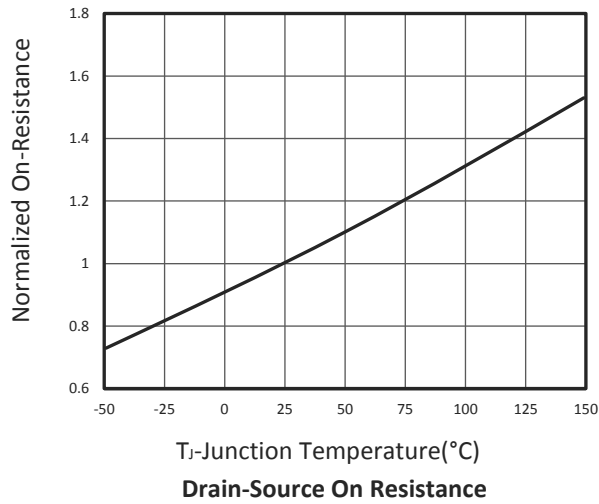
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^{\circ}$ C (initial temperature T_J=25 $^{\circ}$ C).
- C. Using $\leq$ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150 $^{\circ}$ C.
- D. Pulse test width $\leq$ 300 μ s and duty cycle $\leq$ 2%.
- E. Guaranteed by design, not subject to production testing.

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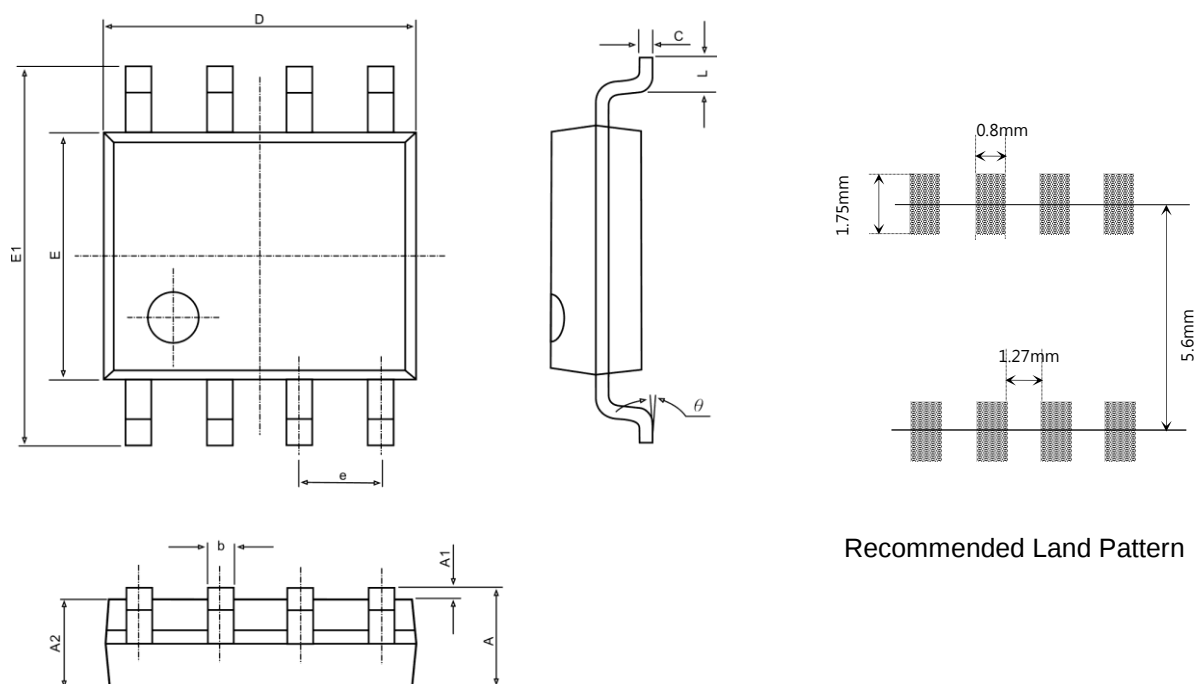
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ SOP-8 PACKAGE DIMENSIONS



Recommended Land Pattern

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	0.130	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	1.270BSC.		0.050BSC.	
L	0.400	1.270	0.016	0.005
θ	0°	8°	0°	8°