



STC4516



Complementary Dual Enhancement Mode MOSFET

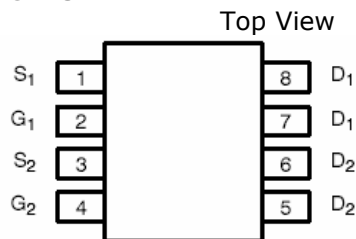
8.5A for N Channel
-7.2A for P Channel

DESCRIPTION

STC4516 is the complementary enhancement mode power field effect transistor using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

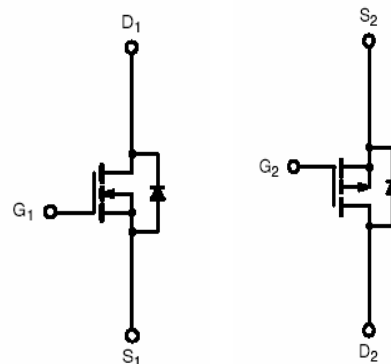
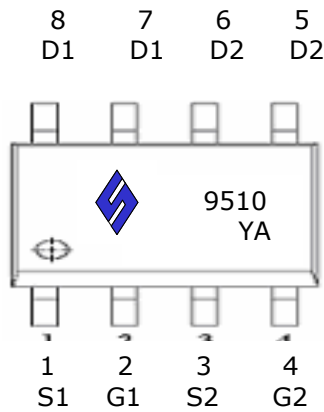
PIN CONFIGURATION

SOP-8



FEATURE

- -30V/-7.2A, $R_{DS(ON)} = 25\text{m-ohm}@V_{GS} = -10\text{V}$ for P Channel
- 30V/8.5A, $R_{DS(ON)} = 14\text{m-ohm}@V_{GS} = 10\text{V}$ for N Channel
- Super high density cell design for extremely low $R_{DS(ON)}$
- SOP-8 package design



N-Channel MOSFET P-Channel MOSFET

Y: Year Code A: Process Code

ORDERING INFORMATION

Part Number	Package	Part Marking
STC4516S8RG	SOP-8	STC4516
STC4516S8TG	SOP-8	STC4516

Process Code : A ~ Z ; a ~ z

STC4516S8RG S8 : SOP-8 ; R : Tape Reel ; G : Pb – Free

STC4516S8TG S8 : SOP-8 ; T : Tube ; G : Pb – Free

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ABSOLUTE MAXIMUM RATINGS (Ta = 25 unless otherwise noted)

P-Channel			
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	-30	V
Gate-Source Voltage	V _{GSS}	+/-20	V
Continuous Drain Current	I _D	T _A =25 -7.2	A
		T _A =70 -5.6	
Pulsed Drain Current	I _{DM}	-20	A
Continuous Source Current (Diode Conduction)	I _S	-2.3	A
Power Dissipation	P _D	T _A =25 2.8	W
		T _A =100 1.8	
Operation Junction Temperature	T _J	-55/150	
Storage Temperature Range	T _{STG}	-55/150	
Thermal Resistance-Junction to Ambient	R _{θJA}	80	/W

N-Channel			
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	+/-20	V
Continuous Drain Current	I _D	T _A =25 8.5	A
		T _A =70 7.5	
Pulsed Drain Current	I _{DM}	20	A
Continuous Source Current (Diode Conduction)	I _S	2.3	A
Power Dissipation	P _D	T _A =25 2.5	W
		T _A =100 1.6	
Operation Junction Temperature	T _J	-55/150	
Storage Temperature Range	T _{STG}	-55/150	
Thermal Resistance-Junction to Ambient	R _{θJA}	80	/W

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ELECTRICAL CHARACTERISTICS (Ta = 25 Unless otherwise noted)

P-Channel						
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-3.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=+20V$			+100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1	uA
		$V_{DS}=-30V, V_{GS}=0V$ $T_J=55$			-10	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq -5V, V_{GS}=-10V$	-25			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7.2A$		0.022	0.025	Ω
		$V_{GS}=-4.5V, I_D=-5.6A$		0.030	0.040	
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-7.2A$		24		S
Diode Forward Voltage	V_{SD}	$I_S=-2.3A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-7.2A$		16		nC
Gate-Source Charge	Q_{gs}			23		
Gate-Drain Charge	Q_{gd}			4.5		
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V$ $f=1MHz$		1650		pF
Output Capacitance	C_{oss}			350		
Reverse Transfer Capacitance	C_{rss}			235		
Turn-On Time	$T_{d(on)}$ t_r	$V_{DD}=-15V, R_L=15\Omega$ $I_D=-1A, V_{GEN}=-10V$ $R_G=6\Omega$		16	30	nS
				17	30	
Turn-Off Time	$T_{d(off)}$ t_f			65	110	
				35	80	

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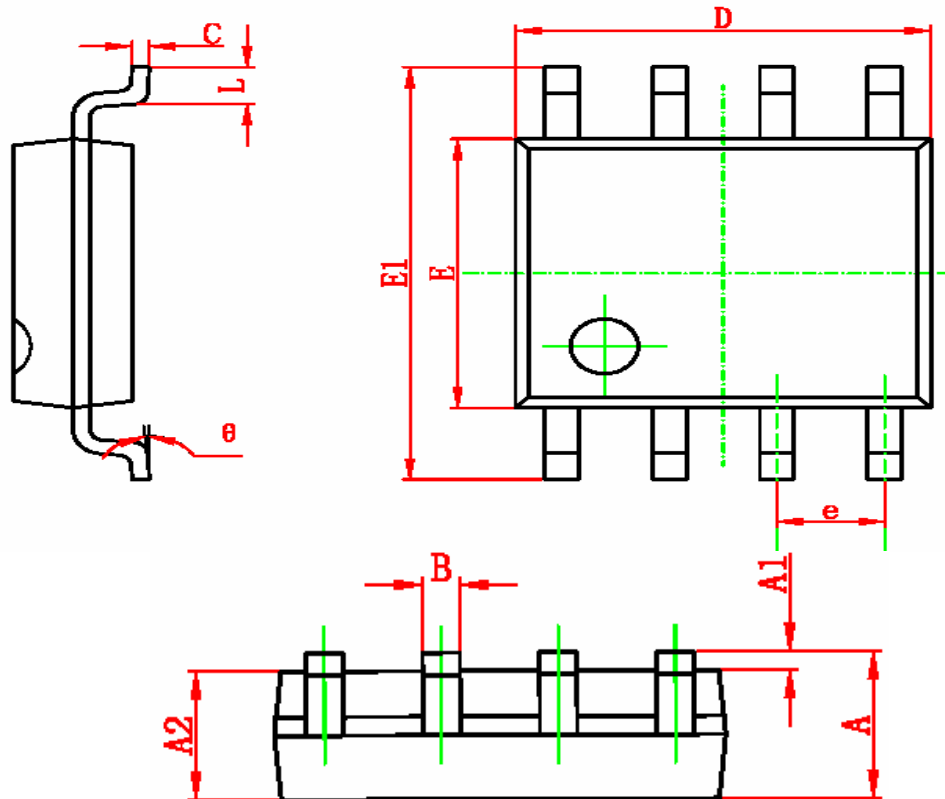
8.5A for N Channel
-7.2A for P Channel

N-Channel						
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$V_{DS}=24V, V_{GS}=0V$ $T_J=55$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=5V, V_{GS}=10V$	25			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8.5A$		0.010	0.013	Ω
		$V_{GS}=4.5V, I_D=7.8A$		0.013	0.018	
Forward Transconductance	g_{fs}	$V_{DS}=15V, I_D=6.2A$		13		S
Diode Forward Voltage	V_{SD}	$I_S=-2.3A, V_{GS}=0V$		0.8	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=10V$ $I_D=2A$		16		nC
Gate-Source Charge	Q_{gs}			4.2		
Gate-Drain Charge	Q_{gd}			2.5		
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V$ $f=1MHz$		1350		pF
Output Capacitance	C_{oss}			258		
Reverse Transfer Capacitance	C_{rss}			150		
Turn-On Time	$T_{d(on)}$ t_r	$V_{DD}=15V, R_L=15\Omega$ $I_D=5.0A, V_{GEN}=10V$ $R_G=1\Omega$		15	20	nS
Turn-Off Time	$T_{d(off)}$ t_f			6	16	
				20	40	
				12	20	

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SOP-8 PACKAGE OUTLINE


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	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270 (TYP)		0.050 (TYP)	
L	0.400	1.270	0.016	0.050