

# STS4501

PRODUCT SUMMARY		
V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
-40V	-3.5A	65 @ V <sub>GS</sub> = -10V
		85 @ V <sub>GS</sub> = -4.5V

## FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- SOT-23 Package.



## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	- 40	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	V
Drain Current-Continuous @ T <sub>J</sub> =25°C -Pulsed <sup>b</sup>	I <sub>D</sub>	-3.5	A
	I <sub>DM</sub>	- 14	A
Drain-Source Diode Forward Current	I <sub>S</sub>	-1.25	A
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	1.25	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

## THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient <sup>a</sup>	R θ <sub>JA</sub>	100	°C/W
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ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ <sup>c</sup>	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -32V, V_{GS} = 0V$			-1	$\mu A$
Gate-Body Leakage	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS<sup>a</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.6	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -3.5A$		54	65	m ohm
		$V_{GS} = -4.5V, I_D = -2A$		70	85	m ohm
On-State Drain Current	$I_{D(ON)}$	$V_{DS} = -5V, V_{GS} = -10V$	-20			A
Forward Transconductance	$g_{FS}$	$V_{DS} = -10V, I_D = -3.5A$		8.7		S
<b>DYNAMIC CHARACTERISTICS<sup>b</sup></b>						
Input Capacitance	$C_{ISS}$	$V_{DS} = -25V, V_{GS} = 0V$ $f = 1.0MHz$		660		pF
Output Capacitance	$C_{OSS}$			100		pF
Reverse Transfer Capacitance	$C_{RSS}$			60		pF
<b>SWITCHING CHARACTERISTICS<sup>b</sup></b>						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = -20V$ $I_D = -1A$ $V_{GS} = -10V$ $R_{GEN} = 3.3\text{ ohm}$		10.5		ns
Rise Time	$t_r$			11		ns
Turn-Off Delay Time	$t_{D(OFF)}$			72		ns
Fall Time	$t_f$			22		ns
Total Gate Charge	$Q_g$	$V_{DS} = -28V, I_D = -3.5A, V_{GS} = -10V$		13		nC
		$V_{DS} = -28V, I_D = -3.5A, V_{GS} = -4.5V$		6.5		nC
Gate-Source Charge	$Q_{gs}$	$V_{DS} = -28V, I_D = -3.5A$		1.4		nC
Gate-Drain Charge	$Q_{gd}$	$V_{GS} = -10V$		3.8		nC

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS <sup>b</sup>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = -1.25A$		-0.75	-1.2	V

Notes

- a. Surface Mounted on FR4 Board,  $t \leq 10\text{sec}$ .
- b. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- c. Guaranteed by design, not subject to production testing.