SGS-THOMSON MICROELECTRONICS

STP19N05L
STP19N06L

# N - CHANNEL ENHANCEMENT MODE
LOW THRESHOLD POWER MOS TRANSISTOR

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STP19N05L	50 V	0.1 Ω	19 A
STP19N06L	60 V	0.1 Ω	19 A

- AVALANCHE RUGGEDNESS TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- LOGIC LEVEL COMPATIBLE INPUT
- 175°C OPERATING TEMPERATURE
- APPLICATION ORIENTED CHARACTERIZATION

APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- REGULATORS
- DC-DC & DC-AC CONVERTERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- AUTOMOTIVE ENVIRONMENT (INJECTION, ABS, AIR-BAG, LAMPDRIVERS, Etc.)

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INTERNAL SCHEMATIC DIAGRAM
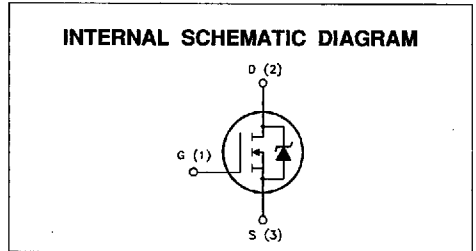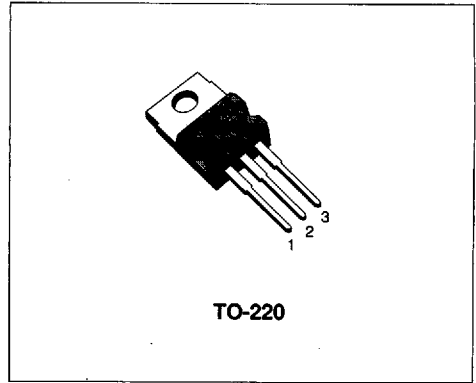
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		STP19N05L	STP19N06L	
V_{DS}	Drain-source Voltage (V_{GS} = 0)	50	60	V
V_{DGR}	Drain- gate Voltage (R_{GS} = 20 kΩ)	50	60	V
V_{GS}	Gate-source Voltage	± 15		V
I_D	Drain Current (continuous) at T_c = 50 °C	19		A
I_D	Drain Current (continuous) at T_c = 100 °C	14		A
$I_{DM}(\bullet)$	Drain Current (pulsed)	76		A
P_{tot}	Total Dissipation at T_c = 25 °C	85		W
	Derating Factor	0.57		W/°C
T_{stg}	Storage Temperature	-65 to 175		°C
T_j	Max. Operating Junction Temperature	175		°C

(•) Pulse width limited by safe operating area

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THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.76	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W
$R_{thc-sink}$	Thermal Resistance Case-sink	Typ	0.5	°C/W
T_l	Maximum Lead Temperature For Soldering Purpose		300	°C

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max, $\delta < 1\%$)	19	A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25$ °C, $I_D = I_{AR}$, $V_{DD} = 25$ V)	60	mJ
E_{AR}	Repetitive Avalanche Energy (pulse width limited by T_j max, $\delta < 1\%$)	15	mJ
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive ($T_c = 100$ °C, pulse width limited by T_j max, $\delta < 1\%$)	11	A

ELECTRICAL CHARACTERISTICS ($T_{case} = 25$ °C unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250$ µA $V_{GS} = 0$ for **STP19N05L** for **STP19N06L**	50 60			V V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	V_{DS} = Max Rating V_{DS} = Max Rating x 0.8 $T_c = 125$ °C			250 1000	µA µA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 15$ V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250$ µA	1		2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 5$ V $I_D = 9.5$ A $V_{GS} = 5$ V $I_D = 9.5$ A $T_c = 100$°C			0.1 0.2	Ω Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)}$ x $R_{DS(on)max}$ $V_{GS} = 5$ V	19			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)}$ x $R_{DS(on)max}$ $I_D = 9.5$ A		10		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	$V_{DS} = 25$ V f = 1 MHz $V_{GS} = 0$		700 200 50		pF pF pF

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ELECTRICAL CHARACTERISTICS (continued)
SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Time Rise Time	$V_{DD} = 30\ V$ $I_D = 3\ A$ $R_G = 50\ \Omega$ $V_{GS} = 5\ V$ (see test circuit, figure 3)		25 80		ns ns
$(di/dt)_{on}$	Turn-on Current Slope	$V_{DD} = 40\ V$ $I_D = 19\ A$ $R_G = 50\ \Omega$ $V_{GS} = 5\ V$ (see test circuit, figure 5)		150		A/µs
Q_g	Total Gate Charge	$V_{DD} = 40\ V$ $I_D = 19\ A$ $V_{GS} = 5\ V$		18		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{DD} = 40\ V$ $I_D = 19\ A$ $R_{GS} = 50\ \Omega$ $V_{GS} = 5\ V$ (see test circuit, figure 5)		130 150 280		ns ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				19 76	A A
V_{SD} (*)	Forward On Voltage	$I_{SD} = 19\ A$ $V_{GS} = 0$			1.6	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 19\ A$ $di/dt = 100\ A/µs$ $V_{DD} = 25\ V$ $T_j = 150\ °C$ (see test circuit, figure 5)		120		ns
Q_{rr}	Reverse Recovery Charge			0.2		µC
I_{RRM}	Reverse Recovery Current			3.5		A

(*) Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
(•) Pulse width limited by safe operating area