SGS-THOMSON MICROELECTRONICS

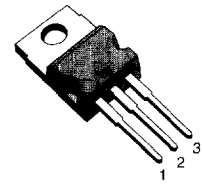
STP8N10L

N - CHANNEL ENHANCEMENT MODE LOW THRESHOLD POWER MOS TRANSISTOR

TENTATIVE DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STP8N10L	100 V	0.45 Ω	8 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

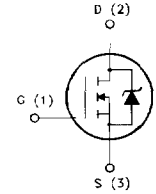


TO-220

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.)

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage (V_{GS} = 0)	100	V
V_{DGR}	Drain- gate Voltage (R_{GS} = 20 kΩ)	100	V
V_{GS}	Gate-source Voltage	± 15	V
I_D	Drain Current (continuous) at T_c = 50 °C	8	A
I_D	Drain Current (continuous) at T_c = 100 °C	6	A
I_{DM}(•)	Drain Current (pulsed)	32	A
P_{tot}	Total Dissipation at T_c = 25 °C	65	W
	Derating Factor	0.52	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

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	2.27	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	°C/W
$R_{thj\text{-}amb}$	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, $\delta < 1\%$)	8	A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25$ °C, $I_D = I_{AR}$, $V_{DD} = 25$ V)	32	mJ
E_{AR}	Repetitive Avalanche Energy (pulse width limited by T_j max, $\delta < 1\%$)	8	mJ
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive ($T_c = 100$ °C, pulse width limited by T_j max, $\delta < 1\%$)	5	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	$I_D = 250\ \mu A$ $V_{GS} = 0$	100			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	$V_{DS} = V_{GS}$ $I_D = 250\ \mu A$	1		2.5	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 5$ V $I_D = 4$ A $V_{GS} = 5$ V $I_D = 4$ A $T_c = 100$°C			0.45 0.90	Ω Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 5$ V	8			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 4$ A		4		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	$V_{DS} = 25$ V f = 1 MHz $V_{GS} = 0$		400 120 50		pF pF pF

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} = 50 V I_D = 4 A R_G = 50 Ω V_{GS} = 5 V (see test circuit, figure 3)		20 40		ns ns
$(di/dt)_{on}$	Turn-on Current Slope	V_{DD} = 80 V I_D = 8 A R_G = 50 Ω V_{GS} = 5 V (see test circuit, figure 5)		200		A/µs
Q_g	Total Gate Charge	V_{DD} = 80 V I_D = 8 A V_{GS} = 5 V		10		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} = 80 V I_D = 8 A R_G = 50 Ω V_{GS} = 5 V (see test circuit, figure 5)		50 50 100		ns ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}(•)	Source-drain Current Source-drain Current (pulsed)				8 32	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 8 A V_{GS} = 0			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 8 A di/dt = 100 A/µs V_{DD} = 30 V T_j = 150 °C (see test circuit, figure 5)		80 0.15 4		ns µC A

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